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Hair Loss,
Hair Removal - Temporary and Permanent,
Hair Retention 2017.

Sunday 6th August 2017
Build - 2017.1922



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Chapter 1

Introduction

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About the author

My name is Sharon Kimble, and I am a former Registered General Nurse and a State Enrolled Nurse, living and working in the United Kingdom.

Paperback copy

For the purposes of a paper copy of this document, I've included all the urls's and cross-references into footnotes. If you're reading the online version then you'll still be able to access them from within the text.

Called "Hair Loss, Hair Removal - Temporary and Permanent, Hair Retention 2017".

I've called this book "Hair Loss, Hair Removal - Temporary and Permanent, Hair Retention 2017" as it is my goal to try and create a one-stop shop for all hair information. Obviously this won't happen with the first edition of this document, but it is my long-term goal.

Its in three parts, which seem to be logical parts to my mind, with the first part being all about 'Hair loss', like in baldness, and male pattern balding, and also female pattern balding. The second part is all about the various methods of removing hair, and the third part being about retaining hair, or even increasing the amount you have.

- **Part 1 - Hair loss**
 - see hair loss ¹.
- **Part 2 - Removing it**
 - see temporary removal methods ²,
 - see unproven methods ³,
 - see permanent hair removal ⁴,
- **Part 3 - Keeping it**
 - see keeping your hair ⁵,
 - see hair transplant ⁶.

¹See **Hair loss** on page **23**

²See **Temporary removal methods** on page **49**

³See **Unproven Methods** on page **106**

⁴See **Permanent** on page **125**

⁵See **Keeping it** on page **185**

⁶See **Hair Transplant** on page **230**

Some working definitions

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What is the function of hair?

The main function of hair is to provide protection against heat loss. Hair traps air next to the skin to provide an invisible, insulating layer.

Hair can also provide an indication of sexual development through the onset of secondary sexual characteristics such as beard development in males.

Hair may also be of importance in attracting mates and may be based on colour, distribution or quality, all indicators of the general health and vitality of an individual. Hair fibre also helps with protection forming a tough barrier helping protect the *epidermis*⁷ from minor abrasions and/or from ultra-violet light. Specialised hair such as eyebrows and eyelashes protect the eyes by channeling or sweeping away fluids, dust and debris. Nasal hair plays an important role in trapping air-borne foreign particles before reaching the lungs. Hair fibre may also increase the surface area for faster evaporation of sweat from neighbouring sweat glands. Some hair follicles have a highly developed nerve network around them and provide sensory, tactile information about the environment. Consequently, the hair follicle is of great importance to the survival of humans.

Although its importance for humans has diminished it is still significant - not just biologically, but also through cosmetic and commercial considerations. The secondary functions of hair are now of primary importance for humans. Hair styles are used to make a statement, to identify the individual with a particular faction of society, and/or to attract a mate. Hair is the foundation for a multi-million pound industry focused on presenting, augmenting, and preserving scalp hair plus removing unwanted body hair (KERATIN.COM, 2016b).

Where is hair found?

Everybody knows where their major hair sites are, excluding the scalp hair, but just to provide a graphic so everybody has the same definition.

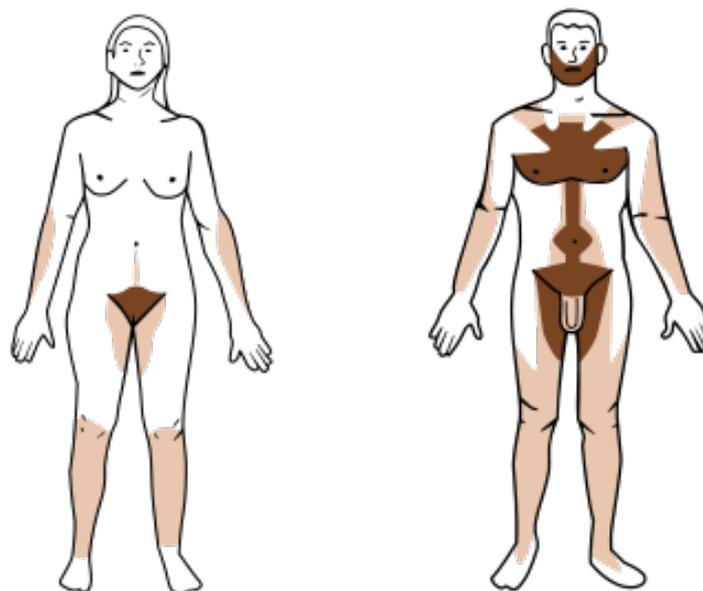


Figure 2.1: Main hair sites on females and male bodies

The darker the colour, the more 'major' the site is.

⁷the outer layer of skin

What is 'hair'?

Hair is an important part of who we are. The average person has 5 million hairs (100,000 - 150,000 are on the scalp). Blonds usually have more hair (about 140,000 hairs), brunettes have slightly higher than average hair (about 105,000 hairs), and redheads have a little less than average (about 90,000 hairs). Hair is composed of keratin, the same protein that nails and the outer layer of skin is made of. Hairs are produced by a small structure underneath the skin called the hair follicle.

Hair follicles are formed while we are still a foetus, and after we are born no new follicles are produced. Hair growth is often regulated by *hormones*⁸ within the body. At puberty, certain male *hormones* trigger the growth of pubic, underarm, and beard hairs. They can also trigger the start of genetic male pattern hair loss.

Each hair grows in a series of phases. In the growth phase⁹, the hair is continually growing for up to five years. At the end of the growth cycle, there is a transitional phase¹⁰ where the hair does not grow and begins to change into the third phase. The third phase is the resting phase¹¹. During this phase, the follicle is no longer growing, and at the end the old hair is pushed out, then the cycle starts over and a new growth phase starts. This happens repeatedly throughout our lives, and is why even people unaffected with hair loss lose 50 - 100 hairs per day.

In people affected with genetic hair loss, there appears to be a higher number of *hormone* receptors in the areas of the scalp with hair loss. In most people affected by hair loss, male *hormone* levels are the same as in normal people, but because there are more receptors in the balding areas of the scalp they are affected as if their *hormone* levels were higher than normal. Researchers are still working on how the presence of a certain male *hormone*, *dihydrotestosterone (DHT)*, causes damage to follicles in people with genetic hair loss. As the follicles are damaged, the hairs grown are thinner and the growth cycles are shorter with each new growth cycle, until eventually no hair or a small, miniaturised hair is all that can be produced. As more and more hairs become smaller and more miniaturised, the person appears balder (REGROWTH, 2015a).

Hair - in greater detail

Hairs vary in colour, diameter, and contour. The different colours result from variations in the amount, distribution, and type of melanin pigment in them, as well as from variations in surface structure that cause light to be reflected in different ways. Hairs may be coarse or so thin and colourless as to be nearly invisible. Straight hairs are round, while wavy hairs are alternately oval and round; very curly and kinky hairs are shaped like twisted ribbons.

Human hair grows at the rate of about one-third of a millimetre a day, or about 0.5 inch (13 mm) per month, and once *keratinized*¹² it is inert. If the colour or shape of a hair is altered as it is formed, several days must elapse before the effect becomes visible. Hairs become white with aging because of the failure of the melanocytes to inject pigment into the cells as they are formed (BRITANNICA, 2016b).

There are different types of hair for different parts of the body.

⁸a chemical substance produced in the body which has a specific regulatory effect on the activity of certain cells or a certain organ or organs

⁹See **Anagen phase** on page 14

¹⁰See **Catagen phase** on page 15

¹¹See **Telogen phase** on page 15

¹²An organic process by which keratin is deposited in cells and the cells become horny (as in nails and hair)

The types of hair produced by the follicle are roughly broken into two categories: **vellus** and **terminal**.

- **Vellus hair** - is the 'peach fuzz' type of hair that is normally found on a woman's cheek or a [prepubescent](#)¹³ child. It is soft and downy, and lacks colour (pigmentation). The follicles producing vellus hair are shallow, and the hair shaft produced is relatively short. Vellus hair is normal in women and is not treated with permanent hair removal techniques.
- **Terminal hair** - is deeply rooted, coarse, and of colour (pigmented). It is the type of hair one attempts to remove in unwanted areas. Terminal hair begins its development as the peach fuzz type, and later, has greater length than its neighbours (accelerated vellus stage), and finally begins to develop colour and some degree of coarseness. At this point, the hair is of a terminal type. Terminal hair grows from the scalp, eyebrows, underarms, pubic area, and other parts of the body.

And another intermediate category which could be placed between the two above -

- **Intermediate** - hairs between vellus and terminal. Thin, but with some pigmentation.

Most often terminal hair develops from normal bodily changes. Beard growth and excess body hair in males is the result of puberty, as well as pubic and underarm hair in men and women. With transgendered women, we are concerned with ridding unwanted hair which is the result of a normal systemic change.

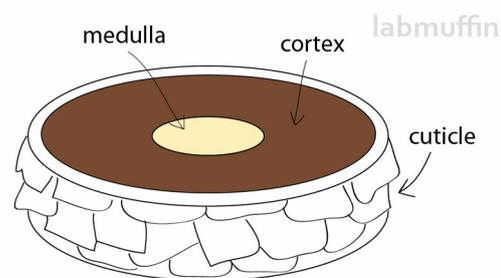
There are other reasons for unwanted hair growth. These causes include disease, adverse effects from certain medications, and emotional changes (mind/body or [psychogenic](#)¹⁴ in origin).

The hair shaft of terminal hair, if cross-sectioned, is comprised of three layers. The inner layer is called the medulla, the cortex (middle layer) makes up the majority of the hair shaft, and the outer layer, called the cuticle, consists of overlapping, flattened cells.

Terminal hair usually does not regress to become vellus hair once again. The typical exception is male pattern baldness. Beard hair will not regress back to the peach fuzz type hair by the absence of male [hormones](#), or the introduction of female [hormones](#) or anti-androgens. However, body hair can be greatly reduced, or eliminated in areas, with the use of hormonal feminisation therapies ([TRANSGENDERCARE, 2016e](#)).

The amounts of each type of hair and hair growth-cycles vary from person to person. That's another reason why it's hard to compare hair removal results between you and others. Depending on the body area, anywhere from 20% to 85% of hairs are in anagen (this is called the anagen/telogen ratio). Many hair-removal methods have been shown to be more effective on actively growing anagen hair. That means that a single treatment from a device cannot treat all your hairs.

One last thing to discuss is potential follicles. Many follicles do not produce a hair, even though they have the potential to do so. Follicles can be activated by hormonal changes (like puberty, pregnancy, aging, etc.) or by other chemicals or medical conditions. That's why even after permanent hair removal, totally new hairs may still grow ([JAMES, 2015a](#)).



CROSS SECTION OF HAIR

Figure 2.2: Cross-section of a human hair

¹³relating to the period before children start to develop adult sexual characteristics

¹⁴the name given to physical illnesses that are believed to arise from emotional or mental stressors

Hair biology

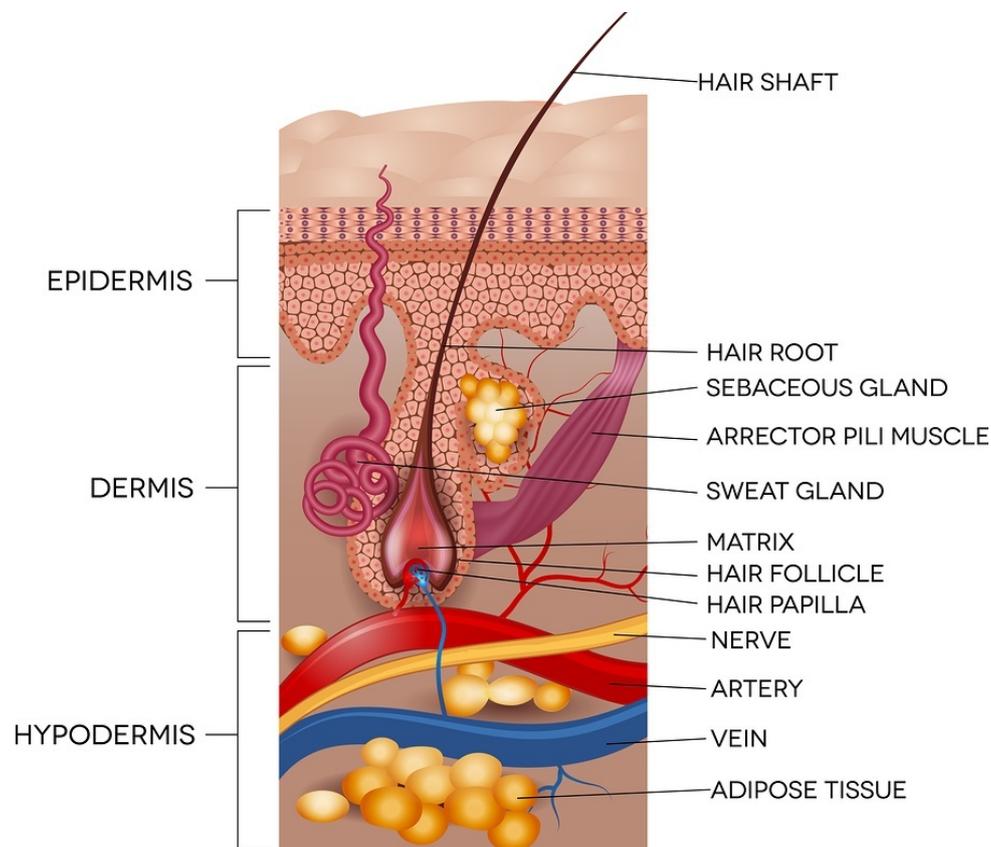


Figure 2.3: The anatomy of a hair

In the diagram of a hair, you can see the relationships of a hair and its surrounding structures.

- the hair canal ¹⁵,
- the organ of hair growth ¹⁶,
- the associated oil gland ¹⁷,
- the shaft or strand of dead and hardened ¹⁸ '*keratinized*' structures (TRANSGENDERCARE, 2016e).

Follicle

All of our facial and body hair grows out of a depression or *indention* ¹⁹ in the skin known as a *follicle* ²⁰. This indentation is similar to what would be formed if you were to stick your finger into an elastic surface. Think of a balloon, your fingertip pushing into its surface - the space

¹⁵See **Follicle** on page 10

¹⁶See **Papilla** on page 11

¹⁷See **Sebaceous glands** on page 11

¹⁸See **Hair** on page 12

¹⁹An indentation or dent

²⁰the tubular invaginations of the epidermis enclosing the hairs, and from which the hairs grow

created by your finger is like the canal of each hair *follicle*. And multiplied on a large scale represents the surface area of the skin that is covered by hair.

So the inside of each *follicle* is much like the skin's surface. It's really just an *invagination*²¹, or inward fold, into the skin with the added mechanism for producing a hair. And the depth, size, and the angle of this inward fold varies over the skin surface. It is dependent on the location on the face or body, by our gender and genetic background, and by biochemical factors such as *hormones*.

The lower portion of the *follicle* has an expanded shape and is called the follicle bulb. Within this bulb, there is an area of actively dividing cells called the hair matrix. This is the source of hair production.

The *follicle* and the hair it produces continues through repeated cycles of growth and rest (TRANSGENDERCARE, 2016e).

Papilla

At the bottom of the *follicle* lies a tiny structure made of dermal cells called the papilla. This tiny organ, indented into the bottom of the hair bulb, feeds the newly formed hair cells from its blood supply. These newly formed hair cells grow continuously, and die continuously, forming a *keratinized* structure - the hair shaft. The hair shaft continues to grow outward from the follicle base. Other *keratinized* structures found in mammals include nails, horns, and hoofs.

The area of the hair bulb/papilla is the main location that is targeted for destruction by permanent hair removal methods. **But, another area needs to be targeted, too.** It is an adjacent area that contains undifferentiated cells, called stem cells, that may maintain the follicle's life, allowing it to continue into another growth cycle if not destroyed as well. The measure of any permanent hair removal method is a combination of properly destroying the hair bulb/papillary region and the stem cells while leaving adjacent structures no more than minimally harmed (TRANSGENDERCARE, 2016e).

Sebaceous glands

Oil glands are what are known as sebaceous glands. These glands are located close beneath the surface of the skin over the entire body. A large number of oil glands are concentrated in the facial/beard area. The sebaceous glands are not always attached to a follicle. But when it is attached to the follicle, its duct opening connects into the follicle near the skin's surface. The oily material secreted is called sebum. There may be more than one gland attached to the follicle. Sebum lubricates the hair shaft and the skin (TRANSGENDERCARE, 2016e).

The sebaceous glands are usually attached to hair follicles and pour their secretion, sebum, into the follicular canal. In a few areas of the body, disproportionately large sebaceous glands are associated with very small hair follicles; in other areas there are glands that are altogether free of follicles.

The outstanding feature of sebaceous glands is their *holocrine*²² mode of secretion, involving complete disintegration of the sebaceous cells. The glands consist of a series of lobes, or acini, each with a duct running toward the main sebaceous duct. The cells are generated by cell division around the periphery of each lobe. As they move toward the centre of the lobe and toward the duct, they synthesise and accumulate fat globules and become progressively larger and distorted. Ultimately they disintegrate to form the secretion.

Human sebum is a complex mixture of lipids - triglyceride fats (57.5%), wax esters (26%), squalene (12%), cholesterol esters (3%), and cholesterol (1.5%). The triglycerides are largely

²¹The infolding of one part within another part of a structure

²²releasing a secretion that is a product of disintegrating cells

*hydrolysed*²³ by bacteria by the time the sebum reaches the skin surface, so that about a third of the surface fat consists of free fatty acids.

The activity of the sebaceous glands is mainly controlled by androgens. The glands are quite large at birth because of the influence of maternal *hormones* during development, but they regress soon afterward. They become active again at, or somewhat in advance of, the first signs of puberty. Their rate of secretion is a little higher in adult men than in women, and it falls off gradually with age in both sexes (BRITANNICA, 2016b).

Hair

The papillary region is often referred to as the 'hair root', but in precise usage it is the hair portion which grows below the surface of the skin, or that which is contained within the follicle canal. And the hair shaft is the portion of the hair that grows above the skin surface (BRITANNICA, 2016b). In this writing, I'm referring to the hair root as the structure which is destroyed to provide permanent hair removal.

Hair follicle inner root sheath

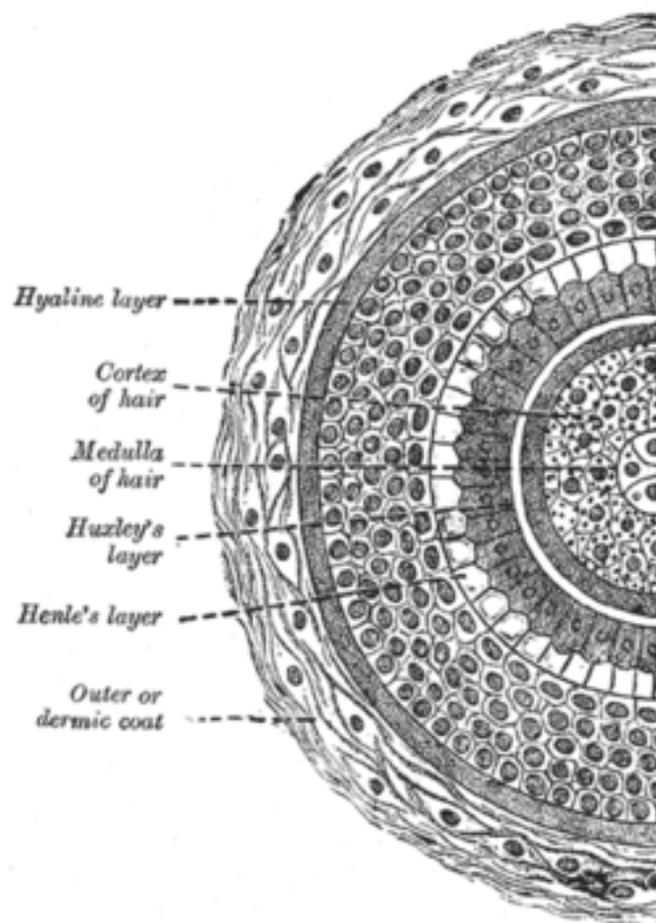


Figure 2.4: Cross section of a hair

²³Hydrolysed is the past tense of the word hydrolysis, therefore a hydrolysed object is one that has undergone hydrolysis. Hydrolysis is a chemical reaction in which bonds are broken in a molecule due to a reaction with water

The cells of the *inner root sheath (IRS)* are interlocked with those of the cuticle of the hair, firmly anchoring the hair in the follicle. The *IRS* must grow at the same rate as the hair, or faster as it moulds and guides the shaft in its passage outward. The outer side of the *Henle's layer*²⁴ of the *IRS* must slide over the axial border of the outer root sheath, which is stationary. These two layers have very smooth surfaces at the interphase, which facilitates the movement of the *IRS*. The cells of *Henle's layer* are *keratinized* immediately after they rise from the matrix and slide easily against the partially *keratinized* axial cells of the outer sheath (KERATIN.COM, 2016a).

The *IRS* is a cornified layer enveloping the *hair shaft (HS)* and forms the channel for the growing hair. The *IRS* is formed during upward growth and differentiation of the matrix cells. *IRS* is comprised of three distinct cell layers: the *IRS* cuticle, the Huxley's layer and the *Henle's layer*. *IRS* cuticle cells attach to the *HS* cuticle cells beneath the skin, but separate at the skin surface to enable *HS* elongation (DISCOVERY, 2016).

The hair growth cycle

The normal standard of hair for a scalp is about 100,000 hairs that grow to a velocity of about half an inch per month. However, after two to six years the hair starts to fall out after a resting period. Subsequently there is 85% hair growth while the remaining hair continues to rest. Nonetheless during the resting period there is a substantial loss of hair ranging from 50 to 100 strands per day. Any abnormal loss or thinning of hair should require a visit to your *General Practitioner, a community-based doctor (GP)*²⁵ (UNKNOWN, 2016).

Hair growth continuously occurs as new hair cells are formed at the base of the follicle and moulded by a structure, called the 'inner root sheath', that surrounds the growing hair shaft. Androgens, the male sex *hormone* (present in both men and women) activates specific areas of the body to produce hair.

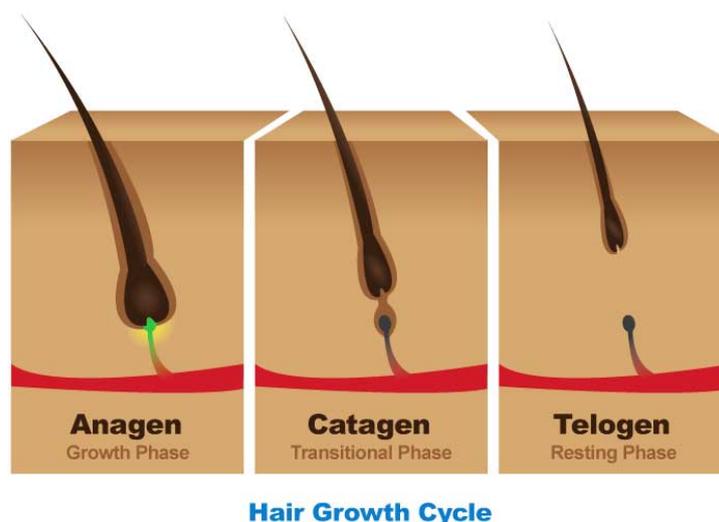


Figure 2.5: The growth cycle of a hair

²⁴this is the third layer of the inner root sheath of the hair, consisting of a single layer of cubical cells with clear flattened nuclei. It is named after German physician, pathologist and anatomist Friedrich Gustav Jakob Henle

²⁵General Practitioner, a community-based doctor

Hair growth varies greatly between individuals and the specific area of the body. Scalp hair, as an example, grows an average of one-tenth of an inch weekly. Leg hair, by contrast, grows at about half that rate.

The life cycle of hair follicles, that is, the repeating cycle of growth and rest phases, affects overall hair production. No new hair follicles are produced after birth - the appearance (and disappearance) of hair is the result of changing ratios in the growth/rest cycle. This life cycle is distinguished as three separate stages -

- the active growth stage ²⁶,
- the transitional stage of arrested growth ²⁷,
- the resting stage of the hair cycle ²⁸ (TRANSGENDERCARE, 2016h).

Anagen phase

The cycle of life for each follicle begins with the anagen phase the reawakening of the follicle's growth stage where a newly formed hair begins to grow. This growth phase continues for a time lasting for as little as several weeks (like in the moustache area) or lasting as long as several years (like in the scalp area). Depending on the area of the body, gender, hormonal and other factors, growth lasts for varying lengths of time. This phase lasts two to seven years, determines hair length and is generally longer in Asians. It is estimated that a full-length hair averages 18 to 30 inches.

Once a person ages, the length of the anagen phase decreases. Hair becomes weaker and thinner after each cycle (HAIR, 2013b).

This is when treatments such as laser and electrolysis are feasible methods of hair removal (DZUREK, 2014c).

Electrolysis and the anagen phase

There are a few key factors in a successful electrolysis session -

- **Hairs need to be visible** - in order for the electrologist to be able to successfully treat each individual hair, the hair needs to be visible. The electrologist needs to insert a hair-thin, needle-like probe into the hair follicle before applying the electrical current.
- **Salt water based solution in the follicle** - electrolysis works by applying an electrical current into the salt/water based solution that is found at the hair follicle. The reaction that follows is what disables the hair follicle from being able to grow hair in the future (DZUREK, 2014c).

When both the above factors are present, electrolysis can be performed and typically the anagen phase is the only phase where this occurs (DZUREK, 2014c).

Laser hair removal and the anagen phase

Laser hair removal works by targeting melanin, a substance responsible for pigment (in both hair and skin), that is only available in abundance during the anagen phase (DZUREK, 2014c).

²⁶See **Anagen phase** on page 14

²⁷See **Catagen phase** on page 15

²⁸See **Telogen phase** on page 15

Repeat treatments are the only answer

Given that both electrolysis and laser hair removal are only effective in the anagen phase, repeat treatments are always needed for results. This is why laser hair removal and electrolysis require repeat treatments for up to a year for the best results (DZUREK, 2014c).

Catagen phase

But ultimately the level of growth begins to slow. This second stage of slowing or arrested growth is known as the catagen phase. This slowing continues into the third and final phase - a period of inactivity or rest. The transition phase happens when the hair follicle shrinks and detaches from the skin (dermal papilla). This phase lasts around ten days (HAIR, 2013b).

Telogen phase

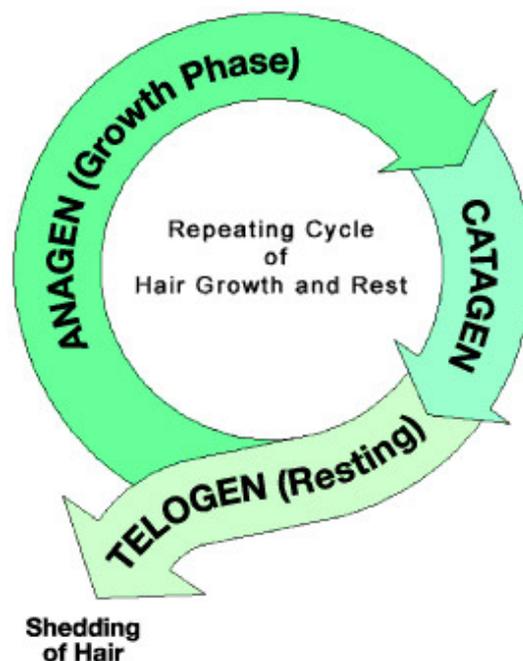


Figure 2.6: The growth cycle of a hair

Finally during the third stage, the resting or telogen phase, the hair has separated from the papilla and is no longer able to be provided with nourishment. At this point, no more new hair cells are formed and the inactive hair remains in place by a thin strand of epidermal cells. By the end of the telogen phase, the hair shaft is now only held in place mechanically, and can be shed by brushing, combing or other tension placed upon it. The hair shaft remaining in place at the end of its growth cycle is called a 'club hair'. It is not uncommon for a **club hair** to remain in place while a newly formed anagen hair is beginning to emerge, forcing the club hair to be shed. This is the phase when the hair is released or 'falls out'. This phase lasts around three months which means the hair follicle remains inactive (with no new hair growth). It is estimated that around 10% - 15% of one's hair is in this phase.

This is why it is normal to experience hair loss of up to 80 to 120 strands a day. This is still considered healthy.

If one's hair enters the resting phase too early, excess hair loss and noticeable thinning can happen (HAIR, 2013b).

Whether the club hair is shed or not, the hair follicle will once again become active and begin to grow a new anagen hair. This process of growth and rest continues throughout our lifetime. In man, follicle activity is generally scattered between all phases of the life cycle. Other mammals have a more orderly growth pattern, which shows as noticeable periods of hair growth and shedding.

This resting phase plays an important role in electrolysis - generally, a follicle cannot be properly treated (and thereby destroyed) during the resting phase. Focusing on the beard area as it is of prime importance, almost half of its hairs are in the resting phase at any time. And depending on the area of the face, this resting phase may last anywhere from 6 to 12 weeks duration. So even if every hair could be permanently removed from the beard, from the very fine and slow growing to the thick and robust, only one half could be killed.

So it is understandable that clearing (meaning *the complete permanent removal of hair*) of an area of unwanted hair such as **the beard, will take about one and a half to two years at best**. This time frame is based on about 200 to 300 hours of treatment using a technique that kills about 70% of the hair follicles that are treated. Keep in mind that all electrolysis methods do not achieve this high kill rate. Thermolysis, may kill only 5% - 15% of hairs treated while the blend method may kill about 70% ([TRANSGENDERCARE, 2016h](#)).

Hair growth by body part

A table called the 'Richards-Merhag' table illustrates the growth rate for each area of the body ([DZUREK, 2014c](#)).

Body part	Telogen	Catagen	Cycle duration
Eyebrows	3 months	1 - 2 weeks	10 months
Ears	3 months	1 - 2 weeks	10 months
Chin	10 weeks	2 - 3 weeks	14 months
Upper lip	6 weeks	2 - 3 weeks	5 months
Armpits	3 weeks	2 - 3 weeks	5 months
Groin	3 months	2 - 3 weeks	8 months
Arms	16 weeks	2 - 3 weeks	10 months
Legs	24 weeks	3 - 6 weeks	11 - 12 months

Table 2.1: Hair growth by body part - 1 ([DZUREK, 2014c](#)).

There are many factors that affect individual hair growth. These growth tables should only be used as a very generalised guide ([TRANSGENDERCARE, 2016d](#)).

Body area	Resting (%)	Growing (%)	Duration of rest	Duration of activity	Follicles /sq.cm	Daily growth	Maximum depth
Scalp	13	85	3 - 4 months	2 - 6 years	350	0.35mm	3 - 5mm
Eyebrows	90	10	12 weeks	4 - 8 weeks		0.16mm	2 - 2.5mm
Cheeks	40 - 50	50 - 60			880	0.32mm	2 - 4mm
Beard/chin	40	60	10 weeks	1 year	500	0.38mm	2 - 4mm
Moustache	45	55	6 weeks	16 weeks	500		1 - 2.5mm
Armpit	70	30	12 weeks	16 weeks	65	0.3mm	3.5 - 4.5mm
Groin	70	30	weeks	months	70		2 - 4.5mm
Arms	80	20	18 weeks	13 weeks	80	0.3mm	
Legs and thighs	80	20	24 weeks	16 weeks	60	0.21mm	2.5 - 4mm

Table 2.2: Hair growth by body part- 2 ([TRANSGENDERCARE, 2016d](#)).

Deep course terminal hair (such as chin area)	5 - 6 weeks
Medium depth terminal hair (side of face and body)	6 - 7 weeks
Medium depth accelerated vellus hair	7 - 9 weeks
Shallow vellus hair (downy hair)	8 - 10 weeks

Table 2.3: Average time for hair to reappear after tweezing or waxing ([TRANSGENDERCARE, 2016d](#)).

Interesting Hair Facts

- Average number of follicles in the human body = 5 million,
- Average total number of hairs on the head = 100,000 - 150,000,
- Average percentage of anagen follicles - 90%,
- Average percentage of telogen follicles - 10% ([DZUREK, 2014c](#)).

Permanent hair removal

Most people assume 'permanent' means that its going to last forever. Not so, look around at various things, hair dyes that are supposedly 'permanent' but you have to keep touching it up to retain the colour. The bones in your body, except that they grow and replace themselves roughly every seven years! But where that supposed 'fact' comes from I have no idea, but it is true that the bones in our skeleton are gradually being replaced by 'new' bone.

How much time should elapse before your results can be considered permanent? I've generally considered it to be one year, meaning exactly twelve months from the date you had the treatment, whatever it was. So that means no shaving of that region, nor tweezing, nor using any other method of hair removal on that region. Nothing! It should still look as smooth as it looked when you completed the treatment for that area, after twelve months.

Long-term hair removal

First of all you need to decide what 'long-term' actually means. One dictionary definition is 'occurring over or relating to a long period of time', which isn't very helpful! One site uses a definition of 'being able to go for 6 months after your final treatment without having to use another method of hair removal'. And they use '6 months' as a working definition, because most hair growth cycles will have completed in 6 months.

Semi-permanent hair removal

A newer term used by some hair removal marketers is 'semi-permanent hair removal'. This is a marketing term used in the salon industry that some salons have started using to describe laser results. In the salon industry, it means 'lasting a few weeks' ([JAMES, 2016d](#)).

Hair reduction versus hair removal

Permanent hair removal is generally taken to be **the complete destruction of the ability of a hair follicle, to regenerate itself and grow further hair.**

Hair reduction refers to a reduction or lessening of the number of hairs as compared to before treatment has started. This does not imply that they are permanently removed, just as at the end of that treatment session there are less hairs remaining within the treated area.

Hair removal refers to the act of **physically** removing hairs from within their follicles, by whatever method is being used.

Permanent hair reduction

Permanent hair reduction means that the number and density of hairs in the treated area are permanently reduced ([HAIRFREELIFE, 2014a](#)).

Response rate

Defined here as - the percentage of people who respond to treatment.

Regrowth rate

Defined here as - the percentage of hair that returns following one or several treatments.

Pubic hair

Cultural views on pubic hair

Since the beginning of the 20th century, societal norms have caused a significant shift in the views toward pubic hair and pubic hair modification. In the early 1990's, people rarely altered their pubic hair. This changed with the Women's Movement in the 1960's and with the publication of media sources like Playboy Magazine. As revealing bathing suits and underwear were made popular, women felt increasing pressure to have their pubic hair groomed or completely removed. Pubic hair has since become a topic of concern for many women, men, and even adolescents. The increasing popularity of oral sex has also sparked an increase of pubic hair grooming.

Societal pressure may cause many people to feel like their pubic hair needs to be altered. In reality, the appearance and texture of pubic hair differs among all people. For some people, pubic hair is thick and coarse, while for other individuals it may be sparse and/or very fine. The colour of pubic hair also tends to vary. Pubic hair and armpit hair can even differ from the hair of the scalp. For most individuals the pubic hair is darker, but in some cases this is not true. For most women, the pubic hair patch is somewhat triangular, with the top zone lying over the mons and extending down towards the anus; for most men, the pubic patch tapers upward to a line of hair pointing up towards the navel (commonly referred to as the 'happy trail').

In general, attitudes toward pubic hair are similar to those regarding underarm hair - cultural and personal norms are reflected by reactions that range from disgust to admiration. Some people feel their pubic hair makes them feel more masculine or feminine, while others may view their pubic hair with contempt. Slang words for pubic hair include the following terms - pubes, bush, curlies, carpet ([UCSB, 2014](#)).

What is the purpose of pubic hair?

There is no definite answer as to why human beings have pubic hair, but theories do exist. The prevailing hypothesis relates to pheromones, which are the odours that the body produces that may be sexually stimulating to others (EVERTS, 2012). The hair that grows in both the genital area and under the armpits wicks away erotic scents that are then evaporated into the air and smelled by others. A more evolutionary-based theory is that a female's pubic hair keeps her genitals warm, making her more likely to take their clothes off, ensuring a male's penile erection (STREICHER, 2014). Another theory is that pubic hair prevents foreign particles from entering the vagina and prevents chaffing. Because this explanation does not address male pubic hair, a third theory suggests that pubic hair serves to absorb odours of the genital region (UCSB, 2014).

Modification of pubic hair

Trimming or removing pubic hair has become quite common in many cultures. Removing the hair above the skin is referred to as **depilation**, whereas removing the entire hair follicle (including the root) is called **epilation**. The removal/trimming of body hair on a man is sometimes referred to as 'manscaping' (UCSB, 2014).

Reasons for why some people modify or remove their pubic hair include the following -

- hygiene (especially during menstruation),
- aesthetics (looks),
- tradition,
- religious beliefs,
- sexual practices (i.e., oral sex, penile/vaginal sex, etc.),
- comfort preferences (UCSB, 2014).

Hair removal cost comparison

There is quite the variety of hair removal methods on the market today, from your day-to-day ease of shaving to the permanence of electrolysis and everything in between.

While shaving is the cheapest option, and long term solutions such as laser hair removal and electrolysis are more of an investment, which method is actually the most cost effective in the long run?

Is laser hair removal worth the expense, or are we just better off spending the money on a salon wax every month?

Based on four different body areas, face (upper lip and chin), half legs, bikini and armpits, we have aimed to provide average costs and compared them across a timeline of 5 years to see which method comes out on top (DZUREK, 2015a).

Average sessions, prices per session and average costs

These averages have been compiled based on existing pricing and average number of sessions required. As they are averages, costs may be higher or lower depending on skin and hair type, area treated, frequency of treatment and where the treatment takes place.

Not everyone is an ideal candidate for laser hair removal and this is something you will need to discuss with your **GP** before opting for this solution (DZUREK, 2015a).

	Shaving	Waxing	Laser	Electrolysis
Face*	365/yr	12/yr	7/yr	20/yr
Half-legs	156/yr	12/yr	7/yr	20/yr
Bikini	156/yr	12/yr	7/yr	20/yr
Armpits	156/yr	12/yr	7/yr	20/yr

Table 2.4: Average number of sessions per year (DZUREK, 2015a).

*Face assumes lip and chin

	Shaving	Waxing**	Laser	Electrolysis
Face*	£1	£19	£114	£34
Half-legs	£1	£27	£228	£69
Bikini	£1	£27	£190	£46
Armpits	£1	£19	£152	£34

Table 2.5: Average price per session (DZUREK, 2015a).

*Based on 4/5 uses per razor, higher end disposable Gillette razors (cheaper razors would bring the price down)

**Based on average salon prices

	Shaving	Waxing	Laser	Electrolysis
Face*	£416	£228	£796	£683
Half-legs	£177	£319	£1,593	£1,365
Bikini	£177	£319	£1,327	£910
Armpits	£177	£228	£1,062	£683

Table 2.6: Average cost over the period of 1 year (DZUREK, 2015a).

	Shaving	Waxing	Laser*	Electrolysis**
Face	£416	£228	£228	£683
Half-legs	£177	£319	£455	£1,365
Bikini	£177	£319	£379	£910
Armpits	£177	£228	£303	£683

Table 2.7: Average cost for 1 year after the first year of treatment (DZUREK, 2015a).

*Assuming 2 touch up sessions a year

**Assuming treatment lasts on average 2 years

	Shaving	Waxing	Laser*	Electrolysis**
Face	£2,078	£1,138	£1,707	£1,365
Half-legs	£887	£1,593	£3,413	£2,730
Bikini	£887	£1,593	£2,844	£1,820
Armpits	£887	£1,138	£2,275	£1,365

Table 2.8: Average cost over the period of 5 years (DZUREK, 2015a).

*Assuming 1 year treatment + 2 touch up sessions per year after the initial year

**Assuming 2 year treatment and no further sessions

Comparison of Different Types of Hair Removal

In order to compare the pricing between different methods one really must look at the long-term costs as opposed to the day-to-day costs (DZUREK, 2015a).

Non-Permanent Options

While shaving may appear to be cheap in the short term, over the years you will always be spending the same amount of money by replacing razors.

Waxing may appear to be another cheaper option, and also less frequent, but, just like shaving, you will be paying the same amount every single year, as your hair will continue to grow.

When it comes to electrolysis and laser hair removal there is a larger investment required upfront, however, in these cases we are dealing with permanent and semi-permanent forms of hair removal, so after the initial treatment is over costs are reduced significantly (DZUREK, 2015a).

Laser vs. Shaving

Let's take the face as an example. We can assume one will require a daily shave, and this would end up costing an average of £416 in disposable razors over the period of a year (shaving creams are not included in this average).

If one decides to invest in laser hair removal, the initial year would cost an average of £796, so about double the price. But from that moment onwards, while shaving would continue to cost £416 a year, laser hair removal touch up sessions would most likely cost less than £228 over the year.

It gets even better when you evaluate the average costs over the span of 5 years. While shaving and waxing continue to cost the same on a yearly basis, they become more expensive than laser hair removal and electrolysis.

This is where the initial investments pay off: by paying upfront, one actually reaps the benefits of having permanent, or at least semi-permanent, hair-free skin.

While the shaver is still going to be shaving his or her face every day, the individual who has been through successful laser hair removal or electrolysis treatments actually doesn't need to worry too much about hair removal anymore.

Possibly a touch-up session here and there as a worst case scenario. While it's important to remember that not everyone is a good candidate for these types of treatment, and significant *hormone* changes may cause additional hair growth over time, in the long run, laser hair removal and electrolysis treatments really pay off as you get not only the results you have always wanted, but also a significant reduction in hair removal costs (DZUREK, 2015a).

Part I

Hair loss

Chapter 3

Hair loss

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Genetic hair loss causes about 95% of all hair loss. Another main cause is an autoimmune condition known as Alopecia Areata ²⁹, Alopecia totalis ³⁰, and Alopecia universalis ³¹. Researchers are also working on a treatment for this condition. Other causes include hair loss due to side-effects of medication, stress, or dietary deficiency (REGROWTH, 2015a).

Partial or complete loss of hair is called *alopecia*.

²⁹See **Alopecia Areata** on page **40**

³⁰See **Alopecia totalis** on page **41**

³¹See **Alopecia universalis** on page **43**

Considerations

Hair loss usually develops gradually. It may be patchy or all over (diffuse). You lose roughly 100 hairs from your head every day. The scalp contains about 100,000 hairs (MEDLINEPLUS, 2015a).

Causes

Heredity

Both men and women tend to lose hair thickness and amount as they age. This type of baldness is not usually caused by a disease. It is related to aging, heredity, and changes in the *hormone* testosterone. Inherited, or pattern baldness, affects many more men than women. Male pattern baldness can occur anytime after puberty. About 80% of men show signs of male pattern baldness by age 70 (MEDLINEPLUS, 2015a).

Physical or emotional stress

Physical or emotional stress may cause one-half to three-quarters of scalp hair to shed. This kind of hair loss is called '*telogen effluvium*'³². Hair tends to come out in handfuls while you shampoo, comb, or run your hands through your hair. You may not notice this for weeks to months after the episode of stress. Hair shedding decreases over 6 to 8 months. *Telogen effluvium* is usually temporary. But it can become long-term (*chronic*³³) (MEDLINEPLUS, 2015a).

Causes of this type of hair loss are -

- high fever or severe infection,
- childbirth,
- major surgery, major illness, sudden blood loss,
- severe emotional stress,
- crash diets, especially those that do not contain enough protein,
- drugs, including retinoids, birth control pills, *beta-blockers*³⁴, calcium channel blockers, certain antidepressants, NSAIDs (including ibuprofen) (MEDLINEPLUS, 2015a).

Some women ages 30 to 60 may notice a thinning of the hair that affects the entire scalp. The hair loss may be heavier at first, and then gradually slow or stop. There is no known cause for this type of *telogen effluvium* (MEDLINEPLUS, 2015a).

Other causes

Other causes of hair loss, especially if it is in an unusual pattern, include -

- *alopecia areata*³⁵ (bald patches on the scalp, beard, and, possibly, eyebrows; eyelashes may fall out),
- anaemia,
- autoimmune conditions such as lupus,
- burns,

³²hair loss occurring in the telogen phase of hair growth, this is the second most common form of hair loss

³³A health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time

³⁴Medical drugs that are used to treat a number of conditions, such as high blood pressure

³⁵This is a type of hair loss that occurs when your immune system mistakenly attacks hair follicles

- certain infectious diseases such as syphilis,
- excessive shampooing and blow-drying,
- *hormone* changes,
- thyroid diseases,
- nervous habits such as continual hair pulling or scalp rubbing,
- radiation therapy,
- tinea capitis (ringworm of the scalp),
- tumour of the ovary or adrenal glands,
- hair styles that put too much tension on the hair follicles (MEDLINEPLUS, 2015a).

Home Care

Hair loss from menopause or childbirth often goes away after 6 months to 2 years.

For hair loss due to illness (such as fever), radiation therapy, medicine use, or other causes, no treatment is needed. Hair usually grows back when the illness ends or the therapy is finished. You may want to wear a wig, hat, or other covering until the hair grows back.

Hair weaves, hair pieces, or changes of hair style may disguise hair loss. This is generally the least expensive and safest approach to hair loss. Hair pieces should not be sutured (sewn) to the scalp because of the risk of scars and infection (MEDLINEPLUS, 2015a).

When to contact your doctor

Call your *GP* if you have any of the following -

- losing hair in an unusual pattern,
- losing hair rapidly or at an early age (for example, in your teens or twenties),
- pain or itching with the hair loss,
- the skin on your scalp under the involved area is red, scaly, or otherwise abnormal,
- acne, facial hair, or an abnormal menstrual cycle,
- you are a woman and have female pattern baldness,
- bald spots on your beard or eyebrows,
- weight gain or muscle weakness, intolerance to cold temperatures, or fatigue,
- areas of infection on your scalp (MEDLINEPLUS, 2015a).

What to expect when you visit your doctor

A careful medical history and examination of the hair and scalp are usually enough to diagnose the cause of your hair loss (MEDLINEPLUS, 2015a).

Your doctor will ask detailed questions about -

- symptoms of your hair loss. If there is a pattern to your hair loss or if you are losing hair from other parts of your body as well, if other family members have hair loss,
- how you care for your hair. How often you shampoo and blow dry or if you use hair products,
- your emotional well-being and if you are under a lot of stress,
- your diet, if you have made recent changes,
- recent illnesses such as a high fever (MEDLINEPLUS, 2015a).

Tests that may be performed (but are rarely needed) include -

- blood tests to rule out disease,
- microscopic examination of a plucked hair,
- skin biopsy (MEDLINEPLUS, 2015a).

If you have ringworm on the scalp, you may be prescribed an antifungal shampoo and oral medicine for you to take. Applying creams and lotions may not get into the hair follicles to kill the fungus.

Your doctor may prescribe a solution, such as minoxidil³⁶ that is applied to the scalp to stimulate hair growth. Other medicines, such as *hormones*, may be prescribed to decrease hair loss and promote hair growth. Drugs such as finasteride³⁷ and dutasteride³⁸ can be taken by men to decrease hair loss and grow new hair.

A hair transplant³⁹ may also be recommended (MEDLINEPLUS, 2015a).

Alternative Names

Loss of hair; Alopecia; Baldness; Scarring alopecia; Non-scarring alopecia (MEDLINEPLUS, 2015a).

Alopecia - possible causes

Androgenic Alopecia

Male pattern hair loss - officially "*androgenic alopecia*", is caused by a particular metabolite of testosterone called *DHT*. Female hair loss associated with advancing age is caused by the same thing. Treatments for it, both in the traditional medical model and *naturopathic*⁴⁰ medicine, focus on limiting the conversion of testosterone to *DHT*. However, the medications (Rogaine and those similar) do have their side-effects, and (the bad news) - hair loss will resume as soon as treatment is discontinued, whether traditional or *naturopathic* (REGROWTH, 2015a).

Alopecia Areata

The autoimmune condition *alopecia areata* is also a possibility - usually in this case, hair falls out in clumps or breaks easily. In some cases hair grows back on its own. Traditional treatment involves *immune system*⁴¹ suppression (*steroids*⁴²). *Naturopathic* treatment involves *immune system* modulation - this approach may look different depending on the patient. One key definitely involves stress reduction (REGROWTH, 2015a).

³⁶See **Minoxidil** on page 195

³⁷See **Finasteride** on page 192

³⁸See **Dutasteride** on page 188

³⁹See **Hair transplant** on page 29

⁴⁰This is a health care system that blends modern scientific knowledge with traditional and natural forms of medicine. The naturopathic philosophy is to stimulate the healing power of the body and treat the underlying cause of disease

⁴¹The body's natural defence against infection and illness

⁴²any of a large number of hormonal substances with a similar basic chemical structure, produced mainly in the adrenal cortex and gonads

Hormonal Imbalance

Hormonal imbalance can also be the culprit. Hair loss is relatively common in menopausal women, but it can also be seen in hypothyroidism, at the end of pregnancy, or following withdrawal of hormonal birth control treatments. In this case, *hormone* balancing would be the appropriate approach (REGROWTH, 2015a).

Fungal Infections

Occasionally fungal infections (tinea capitis) may be the cause, in which case topical *anti-fungals*⁴³ are the appropriate approach, and perhaps natural systemic *anti-fungals* (REGROWTH, 2015a).

Malnutrition

Hair loss can be secondary to malnutrition, from eating disorders like anorexia or just poor diet choices. Certain nutrient deficiencies can cause hair loss, or simple lack of the necessary protein building blocks. In this case, obviously dietary adjustment is the appropriate treatment - or, if the diet is adequate but the patient can't absorb nutrients, then supporting the gut would be the wisest approach (REGROWTH, 2015a).

Stress

Negative changes in the body, including both physical and mental stress or trauma, can contribute to hair loss. This condition is known as *telogen effluvium*. Although this is usually a temporary medical condition, its results can be extreme. Both men and women can experience its symptoms as a result of physical injuries, surgeries, vaccinations, antidepressants, *chronic* illness and continued emotional stress. In cases of *telogen effluvium*, once the stress or trauma has subsided and the body begins to recover, the hair loss will resolve on its own. So controlling your stress instead of letting your stress control you will improve your overall health, which ultimately will restore your natural hair growth cycle. Routine exercise and simple relaxation techniques including meditation, yoga and breathing exercises are some of the many ways to help minimise stress (HAIRLOSSLABS, 2016).

What are my treatment options?

Do Nothing

In an ideal world, this is probably the best solution. It costs nothing or very little. The only downside is that if you do nothing, you will definitely continue to lose hair. Currently, short, buzzed haircuts are in style and many men find that they look good with this kind of hair cut and it minimises the appearance of their hair loss. However keep in mind that fashions change and that this kind of hair cut may be out of style eventually. One thing that can be done to look better even if not treating your hair loss is the use of hair loss concealers. These are cosmetics that make your existing hair look like there is more (they require you to have some hair left and do not work on slick bald spots) (REGROWTH, 2015a).

⁴³effective against fungal infections

Propecia

Propecia is the only [United States Food and Drug Administration \(FDA\)](#) approved oral treatment for hair loss. It is taken once per day and grows hair in about 66% of individuals after two years of treatment. Roughly 83% of individuals on the treatment maintain their existing hair after two years as well. Propecia works by blocking an [enzyme](#)⁴⁴ used to create the male [hormone DHT](#), the [hormone](#) which causes hair loss. Propecia is for men only. It can cause lessening of libido, less semen production, and softer erections in roughly 2% of individuals for each of the three listed side-effects. The side-effects go away in over 50% of individuals who continue the treatment and 100% of individuals who stop using the medication ([REGROWTH, 2015a](#)).

Rogaine

Rogaine (Minoxidil) was the first [FDA](#) approved treatment for hair loss. It is a topical liquid applied to the scalp twice a day and is approved in two strengths - Regular (2%) and Extra Strength (5%). Regular strength Rogaine claims to grow hair in 30% - 40% of individuals, while Extra Strength Rogaine claims to grow hair in 50% - 60% of individuals. Rogaine stimulates the hair follicle to grow, but may not prevent the eventual deterioration of the follicle since it does not block the male [hormone](#) causing hairloss, so results may deteriorate after 2 - 5 years unless it is used with a [DHT](#) blocker like Propecia ([REGROWTH, 2015a](#)).

Other Hair Loss Treatments

Many commercial treatments and custom formulas are available for hair loss. These range from treatments marketed as 'cosmetics' to off-label prescription medications. While some of these treatments do work for some people, there are many products available that seem to offer little benefit to anybody. The cosmetic treatments are best used as an addition to the approved products if you can afford them, or as a last resort if the approved products do not work for you. Some of the prescription custom formulas may be very beneficial. Most contain 5% Minoxidil (or higher), the active ingredient in Rogaine Extra Strength, as well as other medications that help with hair loss. These do not undergo the same rigorous testing as approved medications, so caution should still be used ([REGROWTH, 2015a](#)).

Hair transplant

A hair transplant involves surgically moving hair from the back of the head, where it does not fall out due to baldness, to the top of the head to give you the appearance of having more hair on top. It is a minor surgical procedure but not without its advantages and disadvantages. The advantages of hair transplants is that it moves your own, permanent hair. No continual treatment is needed to keep it there.

The disadvantages are the high cost (multiple transplants are usually needed to get the desired look or amount of hair), risk of scarring, limited amounts of movable hair, and variable abilities of different doctors and clinics. Because different doctors have differing levels of expertise and experience, finding the best hair transplant surgeon is important. For the most natural

⁴⁴An enzyme is a protein produced by the body to speed up a specific chemical reaction in the body. The body produces many different kinds of enzymes for many different body processes, such as digestion and blood clotting. Some inherited diseases are caused by problems with the production of certain enzymes. Doctors may measure the levels of certain enzymes in a person's blood to help diagnose certain types of disease, such as liver problems

appearance, follicular unit grafts⁴⁵ are recommended and considered by most to be the standard of the field.

Whether a hair transplant is the right option for you depends on a variety of factors, such as your willingness to undergo the surgery and cost of a hair transplant, the amount of hair you have available for a hair transplant, and the desired amount of coverage and density.

A scar may be left where the hair is removed from the back of the scalp, but this is covered by the hair around it. If you like your hair extremely short you should consider follicular unit extraction⁴⁶, which leaves no large scar. Follicular unit extraction usually costs more than the standard method of hair transplants (REGROWTH, 2015a). See also hair transplant⁴⁷

Non-surgical hair replacement

Non-surgical hair replacement (often called a hair system or hair piece), involves attaching a fine mesh to the scalp with hairs matched to your hair colour attached. The hair piece is either taped, glued, or clipped onto the scalp to keep it in place and is styled to match your hair style. A technique called hair weaving is no longer performed by reputable companies and should be avoided, because it has been found to cause 'traction alopecia' (hairloss due to constant strain on the hairs). The advantage of non-surgical hair replacement is that it is the only option that can always make you look like you have a full head of hair no matter who you are. Also, there are no side-effects as with medicinal treatments and it is not permanent like transplantation. The disadvantages are a continual high cost per year, extra time for maintenance required to keep the hair looking good, lack of comfort for some people, and paranoia regarding discovery for some. Costs vary widely, but typically range between \$1,000 and \$3,000 per year. Several companies are now marketing programmes to teach you how to create and maintain your own hair system as well as how to purchase the unit directly at a much lower cost. By purchasing and creating the hair piece yourself, your cost per year should easily be in the \$500 or less range, however you will have to perform a lot more maintenance on your own and it can be very difficult to create a natural hair piece on your own with little training (REGROWTH, 2015a).

Cosmetic Concealers

Hair loss concealers are cosmetic sprays, powders, and creams that are applied to the hair and scalp to either make the hair appear thicker and/or darken the scalp. Hair loss concealers are for existing areas of thinning hair, not slick bald areas. The advantages of concealers are that they don't cost a lot and will immediately make your hair look better, unlike the treatment and transplant options which take many months to see results. They also do not have side-effects so they are more appropriate for people who wish to take a more natural approach and do not want to use treatments or go through hair transplantation. The disadvantage of concealers is that they do not do anything to prevent you from losing hair in the long run, so eventually there will be no way for you to conceal the hair loss unless you use one of the other options to treat your hair loss. Also, while today's hair loss concealers are much better at not running in adverse weather or while swimming, there is always the risk of the concealer coming off or running under those conditions (REGROWTH, 2015a).

⁴⁵A graft consisting of a single follicular unit. In appropriate patients, artistic planning - in addition to the correct angulation, orientation, and positioning of follicular unit grafts - can yield an exceptionally "natural" appearance of the transplanted hair

⁴⁶a method of extracting single follicular units, one at a time, from the donor site by using a tiny punch excision. A punch used to extract single follicular units is typically 1mm diameter or less

⁴⁷See **Hair Transplant** on page 29

Female pattern baldness

Female pattern baldness is the most common type of hair loss in women (MEDLINEPLUS, 2014b). During female-pattern baldness, hair usually only thins on top of the head.

It's not clear if female-pattern baldness is hereditary and the causes are less well understood. However, it tends to be more noticeable in women who have been through the menopause (when a woman's periods stop at around age 52), perhaps because they have fewer female *hormones* (NHS, 2015).

Causes

Each strand of hair sits in a tiny hole (cavity) in the skin called a follicle. In general, baldness occurs when the hair follicle shrinks over time, resulting in shorter and finer hair. Eventually, the follicle does not grow new hair. The follicles remain alive, which suggests that it is still possible to grow new hair (MEDLINEPLUS, 2014b).

The reason for female pattern baldness is not well understood, but may be related to -

- aging,
- changes in the levels of androgens (male *hormones*). For example, after reaching menopause, many women find that the hair on their head is thinner, while the hair on their face is coarser,
- family history of male or female pattern baldness (MEDLINEPLUS, 2014b).

Symptoms

Hair thinning is different from that of male pattern baldness. In female pattern baldness -

- hair thins mainly on the top and the *crown area*⁴⁸. It usually starts with a widening through the centre hair part,
- the front hairline remains unaffected except for normal recession, which happens to everyone as time passes,
- the hair loss rarely progresses to total or near total baldness, as it may in men (MEDLINEPLUS, 2014b).

Itching or skin sores on the scalp are generally not seen (MEDLINEPLUS, 2014b).

Exams and Tests

Female pattern baldness is usually diagnosed based on -

- ruling out other causes of hair loss,
- the appearance and pattern of hair loss,
- your medical history (MEDLINEPLUS, 2014b).

The doctor will examine you for other signs of too much male *hormone* (androgen), such as -

- abnormal new hair growth, such as on the face or between the belly button and pubic area,
- changes in menstrual periods and enlargement of the clitoris,
- new acne (MEDLINEPLUS, 2014b).

A skin *biopsy*⁴⁹ or other procedures or blood tests may be used to diagnose skin disorders that cause hair loss.

⁴⁸The area in the top/back portion of the head which contains a swirl or spiral pattern of hair growth. Also called the 'vertex,' it may be the first area where male/female pattern baldness is noticed (ISHRS, 2016)

⁴⁹a medical procedure that involves taking a small sample of body tissue so it can be examined under a microscope

Looking at the hair under a microscope may be done to check for problems with the structure of the hair shaft itself (MEDLINEPLUS, 2014b).

Classification or staging

The Ludwig Classification separates female pattern baldness (androgenetic alopecia) into 1 of 3 unique stages, referred to as the 'Ludwig Scale' (ROSE, 2013). By classifying hair loss according to severity, the Ludwig Scale helps both patients and doctors to better understand several major factors in the diagnosis and treatment of female hair loss -

- the degree to which hair has already been lost,
- the potential for additional hair loss in the future,
- the best course of treatment (ROSE, 2013).

In 1977 E. Ludwig classified 'female-pattern hair loss' into three types -



Figure 3.1: The Ludwig Scale classifying female pattern hair loss

From left to right in the graphic above, these types include Type I, Type II, and Type III.

- **Type I** - in this stage, hair loss is considered to be **mild**. Most women may have difficulty noticing that hair loss has occurred, as the frontal hairline remains relatively unaffected. Hair loss may occur on the top and front of the scalp, however. Such hair loss may be noticeable when the hair is parted down the centre of the scalp, as more and more scalp will become visible over time.
- **Type II** - in this stage hair loss is considered **moderate**. In this stage, women may notice each of the following: Thinning, shedding, general decrease in volume, and a centre part that continues to widen over time. Depending on the severity, a hair transplant procedure may be a viable option for women who exhibit a Type II classification.
- **Type III** - this stage is the final and **most extreme** classification of female hair loss. In this stage, hair is so thin that it has difficulty camouflaging the scalp, rendering it visible to the naked eye. This may be worsened by a number of factors, including [hair miniaturisation](#)⁵⁰, progressive thinning, and extensive loss (ROSE, 2013).

This has since been expanded to its present stage as shown below.

⁵⁰a phenomenon in which strands of hair become thinner, shorter, more brittle, or weak with each successive progression through the hair growth cycle. Over time, the miniaturisation process leads to the appearance of thin or lackluster hair. In some cases, hair may stop growing altogether

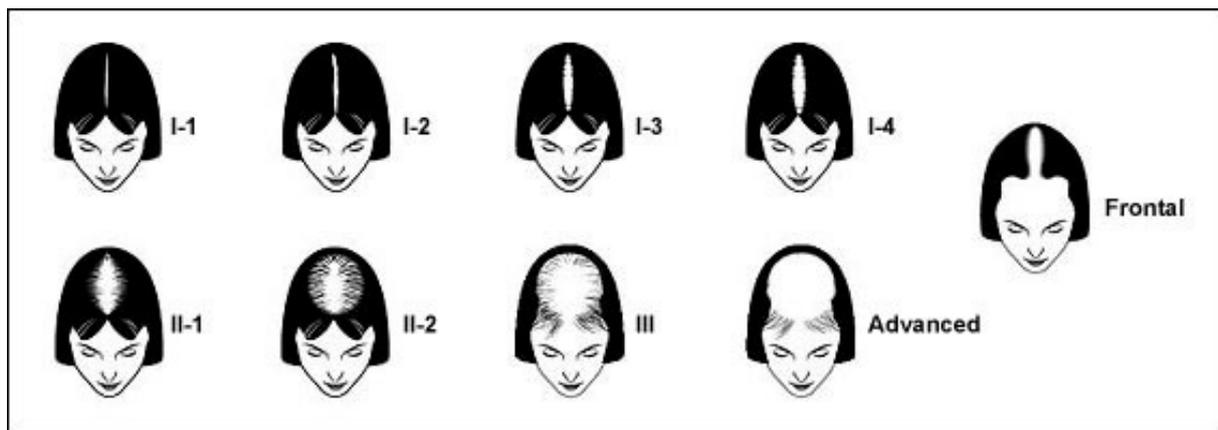


Figure 3.2: Female-pattern baldness classified by the extended Ludwig Scale

As you will see in these illustrations, eight crown density images reflect a range from no hair loss to severe hair loss. Density 8 is rarely seen in clinical practice. One example of frontal anterior recession is also illustrated (again, it's not too common), and one example of general diffuse thinning, lateral view, is shown (MCANDREWS, 2010).

Treatment

Hair loss in female pattern baldness is permanent, if not treated. In most cases, hair loss is mild to moderate. You do not need treatment if you are comfortable with your appearance (MEDLINEPLUS, 2014b).

Medication

The only medication approved by the [FDA](#) to treat female pattern baldness is minoxidil -

- it is applied directly to the scalp,
- for women, the 2% concentration is recommended,
- minoxidil may help hair grow in about 1 in 4 or 5 of women. In most women, it may slow or stop hair loss,
- you must continue to use this medicine for a long time. Hair loss starts again when you stop using it (MEDLINEPLUS, 2014b).

If minoxidil does not work, your doctor may recommend other medicines, such as spironolactone, cimetidine, birth control pills, ketoconazole, among others. Your doctor can tell you more about these if needed (MEDLINEPLUS, 2014b).

Hair Transplant

During hair transplant, tiny plugs of hair are removed from areas where hair is thicker, and placed (transplanted) in areas that are balding. Minor scarring may occur where hair is removed. There is a slight risk of skin infection. You will likely need many transplants, which can be expensive. However, the results are often excellent and permanent (MEDLINEPLUS, 2014b).

Other Solutions

Hair weaving, hairpieces, or a change in hairstyle can help hide hair loss and improve your appearance. This is often the least expensive and safest way to deal with female pattern baldness (MEDLINEPLUS, 2014b).

Outlook (Prognosis)

Female pattern baldness is usually not a sign of an underlying medical disorder.

Hair loss may affect self-esteem and cause anxiety.

Hair loss is usually permanent ([MEDLINEPLUS, 2014b](#)).

When to contact your doctor

Call your doctor or nurse if you have hair loss and it continues, especially if you also have itching, skin irritation, or other symptoms. There might be a treatable medical cause for the hair loss ([MEDLINEPLUS, 2014b](#)).

Prevention

There is no known prevention for female pattern baldness ([MEDLINEPLUS, 2014b](#)).

Alternative Names

Alopecia in women; Baldness - female; Hair loss in women; Androgenetic alopecia in women ([MEDLINEPLUS, 2014b](#)).

Hair loss in women

Hair loss in women (female hair loss) is an issue that affects at least 20% of women. Female hair loss can be caused by many different conditions and can be difficult to diagnose. The information below will help you get started in treating your hair loss. Women with hair loss should know that more is being learned about the condition every day including the causes of hair loss in women. New treatments for women with hair loss are being researched and today there is a lot better chance to treat your hair loss than in the past.

The risk of hair loss in women is affected by genetics, but also by a wide range of health and lifestyle factors - notably factors related to high stress levels, reports a study in the December issue of *Plastic and Reconstructive Surgery*, the official medical journal of the American Society of Plastic Surgeons (ASPS).

'Increased stress, smoking, having more children and having a history of hypertension and cancer were all associated with increased hair thinning', writes ASPS Member Surgeon Dr. Bahman Guyuron and colleagues of Case Western Reserve University School of Medicine, Cleveland. They believe that modifying these factors might help reduce risk in women concerned about hair loss ([REGROWTH, 2015a](#)).

Stress and other factors affect hair loss - not just testosterone

The researchers studied risk factors for hair thinning in a series of 98 identical female twins, average age 54 years. Studying identical twins - who share 100% of genes - provided an opportunity to separate out the genetic and social/environmental factors associated with any disease or condition.

The twins posed for standard photographs, which the researchers used to measure hair loss or thinning at specific locations: the front, sides and top of the head. Testosterone levels were measured, reflecting hormonal causes of hair loss.

The women also completed detailed questionnaires assessing a wide range of possible environmental, lifestyle and health-related factors - from diet and marital history to common diseases. Differences in these factors could help to explain differences in hair loss risk between genetically identical twins.

As expected, higher testosterone levels were associated with increased hair loss, particularly at the sides and top of the head. This was consistent with the hormonal causes of female pattern hair loss.

But the study also identified a wide range of environmental risk factors for hair loss. Although associations differed by site, women reporting higher levels of stress had more hair loss and thinning. Life situations related to higher stress - including being separated or divorced, multiple marriages and more children - were also linked to hair loss.

Other risk factors potentially related to high stress levels included higher income. Prolonged sleep was another risk factor, possibly related to depression/anxiety as well as stress (REGROWTH, 2015a).

Modifying risk factors may help prevent hair loss

Several medical risk factors for hair loss were identified as well, including cancer, high blood pressure and diabetes. Smoking, not exercising, and not using sun protection also increased risk. Women with higher caffeine intake were actually at lower risk of alopecia, possibly because caffeine counters the hormonal effects leading to hair loss.

Although typically regarded as a male problem, hair loss can also occur in women, in whom it causes even greater psychological distress. Hormonal and genetic factors contribute to female alopecia, but do not fully explain the risk. Studying twins allowed the researchers to evaluate other, nongenetically determined risk factors for female alopecia.

The study confirms the impact of hormonal causes for female hair loss, while also highlighting the contribution of various health and lifestyle-related risk factors - many of them related to high stress levels. The good news is that at least some of the identified risk factors are potentially modifiable. Dr Guyuron and coauthors conclude, '*Many of the environmental factors discussed in this study such as smoking, sun exposure and excessive stress can be targeted by both patients and physicians as potential ways to augment hair loss prevention strategies*' (REGROWTH, 2015a).

NB - Even after searching for several days I've been unable to find the article that the previous section refers to, so as far as I'm concerned it's an interesting idea but not worth giving too much credence to until it turns up.

Five causes of female hair loss

- **Telogen effluvium** - This condition can be caused by several factors, including - extreme stress, side-effects from medication you may be taking, or even the way you style your hair. *Telogen effluvium* happens when your hair consistently sheds faster than normal. There are no tests for *telogen effluvium*, but your doctor will be able to track your symptoms. If you feel like you might have this condition, make sure to consult your doctor.
- **Lupus** - If your hair loss comes with extreme fatigue, migraines, and painful or swollen joints, then you may have Lupus. Lupus is an autoimmune disease where your body's *immune system* attacks your healthy tissues. Today, Lupus affects over 1.5 million people. Most women realize they have it during their "childbearing years". Your rheumatologist will be able to properly examine your joints and tissues to determine whether or not you have Lupus.
- **Your genes** - The genetic form of hair loss is called androgenetic alopecia. This is the most common cause of hair loss in both men and women. It can be inherited from either side of your family, but if both of your parents have a track record of hair loss in their sides of the

family, than there's a strong possibility that your hair loss is hereditary. Your dermatologist will be able to examine the pattern of hair loss to determine if it's genetics. Minoxidil is a common treatment for female patterned baldness.

- **Anaemia** - this is also known as an iron deficiency, and can be an underlying cause of hair loss in women. With a depleted iron supply, you will feel sluggish, tired, and virtually energy-less. Eating iron-rich foods like beef and pork will help boost your iron and vitamins in your blood stream for optimal performance throughout the day. Anaemia is determined by a blood test to measure your ferritin, the protein that stores iron in your body.
- **Alopecia areata** - [alopecia areata](#) is also an autoimmune disorder, but one that attacks only your hair follicles. [Alopecia areata](#) affects over 4.7 million people only in the United States! It occurs equally in both men and women. This condition can occur in a few ways - smooth patches of balding on the scalp, eyebrows or legs, hair loss all over the body, or hair loss only on the head. To determine if you have [alopecia areata](#), you should be examined by your dermatologist.

If you suffer from alopecia or any other hair loss related issues, using a ketoconazole shampoo and biotin conditioner can dramatically change the appearance and health of your hair ([HAIR-LOSSLABS, 2016](#)).

Hair loss and renewal in women

The psychological impact of hair loss on women is believed to be even more profound than that suffered by males.

Trials suggest that women confront their alopecia indirectly by attempting to shroud the problem, using altered styling methods and cuts, whereas men usually respond combatively by treating the source of the problem. Women's tendency to use ineffective coping mechanisms intensifies the impact of hair loss by producing unsatisfying results.

Alopecia's consequences on self-esteem alone make the condition treatment-worthy and there are effective, safe therapeutic options. The world of cosmetic remedies is often dotted with unsafe medications, ineffective treatments and false promises. Alopecia's treatment options, therefore, need to be navigated with care, but there is plenty of hope to be found in contemporary medicine.

Androgenetic alopecia is the most common reason for hair loss and is typified by its thinning pattern over the centre of the scalp. It is hereditary, with the genes of both parents playing a role. Female pattern hair loss usually happens late in life, but it can sometimes begin during adolescence. Shrinking follicles eventually stop growing, which results in thinning, followed by baldness. Biopsies and blood tests are performed to accurately diagnose the condition. While some women use Finasteride as a treatment, this option is only [FDA](#) approved for male pattern baldness because of the risks it presents to unborn children. Nevertheless, studies have been conducted demonstrating the drug's efficiency in treating female pattern baldness.

Minoxidil remains the only effective and safe way to stimulate hair growth and slow down balding in women. This topical cream usually demands between four and 12 months of treatment. [Randomised](#)⁵¹, controlled trials have demonstrated Minoxidil's moderate efficacy for female patients. Certain contraceptive tablets containing Estradiol and Cyproterone are also frequently prescribed to block the effects of male [hormones](#) and, in so doing, reverse female pattern baldness ([REGROWTH, 2015a](#)).

⁵¹When referring to an experiment or clinical trial, the process by which animal or human subjects are assigned by chance to separate groups that compare different treatments or other therapies. Randomisation gives each participant an equal chance of being assigned to any of the groups

Hair loss needs to be treated according to its cause and [hypothyroidism](#) is sometimes the culprit. Those with thyroid problems will have [coexisting](#) conditions such as -

- weight changes,
- depression,
- reduced concentration,
- fatigue ([REGROWTH, 2015a](#)).

A simple blood test is done to diagnose [hypothyroidism](#) and if a positive result is found, [hormone](#) treatments are used to stabilise levels. Treating this oft-overlooked condition softens the hair to prevent breakage. Patients with this disorder generally suffer from brittle hair and total baldness is rare.

Iron deficiency anaemia is a common complaint that can induce alopecia. A lack of oxygen-rich red blood cells is responsible for hair loss, but the condition is easily treated with iron supplements and dietary changes. An increase in iron-rich superfoods such as clams, tofu and soybeans is effective when combined with foods that enhance absorption. Broccoli, strawberries and white wine are rich in the heme iron that improves the body's absorption of non-heme, iron-rich foods.

Polycystic ovarian syndrome is a common hair loss trigger, which has the opposite effect on the growth of facial hair. Elevated testosterone and DHEAS levels expose the problem and treatment is hormonal. When oestrogen and progesterone levels are off kilter due to menopause or PCOS, oral contraceptives that have low androgen indices are used to treat the root of the problem. Topical ketoconazole is used off-label to curb testosterone production. Shampoos containing the drug are most effective at 2% prescription strength.

Those with [alopecia areata](#) suffer hair loss when their [immune systems](#) assault their hair follicles. This autoimmune disorder causes patchy bald spots, which are best treated with Minoxidil, corticosteroids and lifestyle changes that combat stress. Diagnostic tests need to be done to rule out other potential causes and measure iron stores.

External factors such as compulsive hair pulling and damaging hair treatments can also impact on hair loss. Over-dyeing, cornrows and chemical treatments can make the hair brittle enough to break. Your pharmacy offers information about holistic and medical treatments for a range of hair loss triggers ([REGROWTH, 2015a](#)).

Male pattern baldness

Over 95% of men suffering from hair loss have a form of androgenic alopecia called male pattern baldness. Male pattern baldness is a genetic issue that is linked directly to your male sex [hormone](#), testosterone. This form of hair loss effects the hair follicles. Over time those suffering from male patterned balding experience shrinking of the hair follicles making it very difficult for hair to grow through the miniaturised hole. The hair soon becomes short, thin strands and eventually stop growing completely. Though the follicles are still present, they no longer produce new hairs ([HAIRLOSSLABS, 2016](#)).

Male-pattern baldness is the most common type of hair loss, affecting around half of all men by 50 years of age. It usually starts around the late twenties or early thirties and most men have some degree of hair loss by their late thirties.

It generally follows a pattern of a receding hairline, followed by thinning of the hair on the crown and temples, leaving a horseshoe shape around the back and sides of the head. Sometimes it can progress to complete baldness, although this is uncommon.

Male-pattern baldness is hereditary, which means it runs in families. It's thought to be caused by oversensitive hair follicles, linked to having too much of a certain male [hormone](#) ([NHS, 2015](#)).

Male pattern baldness is the most common type of hair loss in men ([MEDLINEPLUS, 2015c](#)).

Causes

Male pattern baldness is related to your genes and male sex *hormones*. It usually follows a pattern of receding hairline and hair thinning on the crown, and is caused by *hormones* and genetic predisposition.

Each strand of hair you have sits in a tiny hole (cavity) in the skin called a follicle. Generally, baldness occurs when the hair follicle shrinks over time, resulting in shorter and finer hair. Eventually, the follicle does not grow new hair. The follicles remain alive, which suggests that it is still possible to grow new hair (MEDLINEPLUS, 2015c).

Male-pattern baldness is a hereditary condition. This type of baldness is believed to arise from defects in the hair stem cells, which are located in the hair bulb and eventually mature into progenitor hair cells that then develop into mature hairs (BRITANNICA, 2016b).

Symptoms

The typical pattern of male baldness begins at the hairline. The hairline gradually moves backward (recedes) and forms an "M" shape. Eventually the hair becomes finer, shorter, and thinner, and creates a U-shaped (or horseshoe) pattern of hair around the sides of the head (MEDLINEPLUS, 2015c).

Diagnosis

Classic male pattern baldness is usually diagnosed based on the appearance and pattern of the hair loss.

Hair loss may be due to other conditions. This may be true if hair loss occurs in patches, you shed a lot of hair, your hair breaks, or you have hair loss along with redness, scaling, pus, or pain.

A skin *biopsy*, blood tests, or other procedures may be needed to diagnose other disorders that cause hair loss.

Hair analysis is not accurate for diagnosing hair loss due to nutritional or similar disorders. But it may reveal substances such as arsenic or lead (MEDLINEPLUS, 2015c).

Classification or staging

Hair loss is diagnosed by observing the pattern of hair loss, and a determination of the amount of hair loss in family members. A microscopic exam of the hair, using an optical instrument called a densitometer, provides important information regarding what areas are experiencing hair loss and which are not, as well as an assessment of the hair in the donor area on the back and sides of the scalp to determine one's candidacy for a hair restoration procedure. Hair loss patterns can generally be classified into patterns, as shown in the diagrams below. For men, the Norwood Scale is used to classify various stages of hair loss -

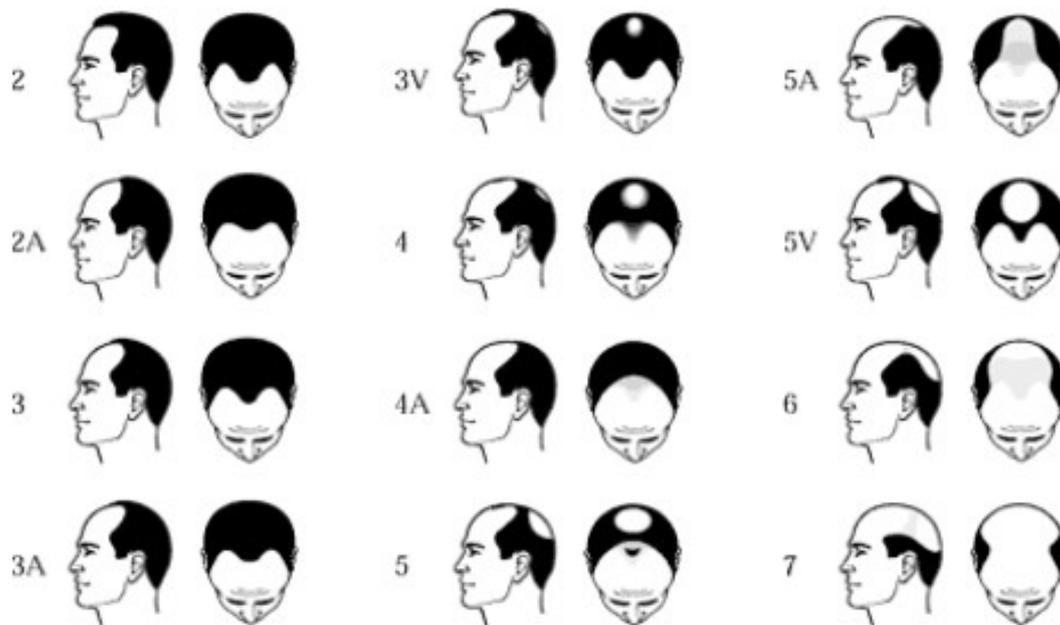


Figure 3.3: The Norwood Scale classifying male pattern hair loss

Treatment

Treatment is not necessary if you are comfortable with your appearance. Hair weaving, hair-pieces, or change of hairstyle may disguise the hair loss. This is usually the least expensive and safest approach for male baldness ([MEDLINEPLUS, 2015c](#)).

Medicines that treat male pattern baldness include -

- Minoxidil (Rogaine), a solution that is applied directly to the scalp to stimulate the hair follicles. It slows hair loss for many men, and some men grow new hair. Hair loss returns when you stop using this medicine.
- Finasteride (Propecia, Proscar), a pill that interferes with the production of a highly active form of testosterone that is linked to baldness. It slows hair loss. It works slightly better than minoxidil. Hair loss returns when you stop using this medicine.
- Dutasteride is similar to finasteride, but may be more effective ([MEDLINEPLUS, 2015c](#)).

Hair transplants consist of removing tiny plugs of hair from areas where the hair is continuing to grow and placing them in areas that are balding. This can cause minor scarring and possibly, infection. The procedure usually requires multiple sessions and may be expensive.

Suturing hair pieces to the scalp is not recommended. It can result in scars, infections, and abscess of the scalp. The use of hair implants made of artificial fibres was banned by the [FDA](#) because of the high rate of infection ([MEDLINEPLUS, 2015c](#)).

Outlook (Prognosis)

Male pattern baldness does not indicate a medical disorder, but it may affect self-esteem or cause anxiety. The hair loss is usually permanent ([MEDLINEPLUS, 2015c](#)).

When to contact your doctor

Call your doctor/nurse if -

- your hair loss occurs in an atypical pattern, including rapid hair loss, widespread shedding, hair loss in patches, or hair breakage,

- your hair loss occurs with itching, skin irritation, redness, scaling, pain, or other symptoms,
- your hair loss begins after starting a medicine,
- you want to treat your hair loss ([MEDLINEPLUS, 2015c](#)).

Alternative Names

Alopecia in men; Baldness - male; Hair loss in men; Androgenetic alopecia ([MEDLINEPLUS, 2015c](#)).

Alopecia areata

[Alopecia areata](#) is a condition that causes round patches of hair loss. It can lead to total hair loss ([MEDLINEPLUS, 2014a](#)).

Causes

The cause of [alopecia areata](#) is unknown. Some people with this condition have a family history of alopecia.

[Alopecia areata](#) is thought to be an autoimmune condition.

[Alopecia areata](#) is caused by a problem with the [immune system](#). This occurs when the [immune system](#) mistakenly attacks and destroys healthy body tissue. It's more common among people with other autoimmune conditions, such as an overactive thyroid (hyperthyroidism), diabetes or Down's syndrome ([WEBMD, 2016a](#)).

[Alopecia areata](#) can occur at any age, although it's more common in people aged 15 - 29. It affects one or two people in every 1,000 in the UK ([WEBMD, 2016a](#)). In a few people, hair loss may occur after a major life event such as an illness, pregnancy, or trauma.

Forms of alopecia include -

- [Alopecia areata](#) - patches of hair loss,
- [Alopecia totalis](#)⁵² - complete loss of scalp hair,
- [Alopecia universalis](#)⁵³ - total loss of all body hair ([MEDLINEPLUS, 2014a](#)).

Symptoms

Hair loss is usually the only symptom. A few people may also feel a burning sensation or itching.

[Alopecia areata](#) usually begins as 1 to 2 patches of hair loss. Hair loss is most often seen on the scalp. It may also occur in the beard, eyebrows, and arms or legs in some people.

Patches where hair has fallen out are smooth and round in shape. They may be peach-coloured. Hairs that look like exclamation points are sometimes seen at the edges of a bald patch.

In [alopecia totalis](#), total hair loss often occurs within 6 months after symptoms first start ([MEDLINEPLUS, 2014a](#)).

⁵²loss of all hair on the head

⁵³loss of all hair on the body

Diagnosis

A scalp [biopsy](#) may be done. Several blood tests may also be done to check for autoimmune conditions and thyroid problems ([MEDLINEPLUS, 2014a](#)).

Treatment

If hair loss is not widespread, the hair will often regrow in a few months without treatment.

For more severe hair loss, it is not clear how much treatment can help change the course of the condition ([MEDLINEPLUS, 2014a](#)).

Common treatments may include -

- [steroid](#) injection under the skin surface,
- medicines applied to the skin,
- ultraviolet light therapy ([MEDLINEPLUS, 2014a](#)).

Wigs may be used to hide areas of hair loss ([MEDLINEPLUS, 2014a](#)).

Outlook (Prognosis)

In most cases of [alopecia areata](#), hair will grow back in a few months. At first, hair may grow back fine and white, but over time it should thicken and regain its normal colour ([WEBMD, 2016a](#)).

However, some people may have a poorer outcome, including those with -

- [Alopecia areata](#) that starts at a young age,
- eczema,
- long-term alopecia,
- widespread or complete loss of scalp or body hair ([MEDLINEPLUS, 2014a](#)).

About 10% of people with this condition may never regrow hair. You are more likely to have permanent hair loss if you -

- have a family history of the condition,
- have the condition at a young age (before puberty) or for longer than 1 year,
- have another autoimmune disease,
- are prone to allergies,
- have extensive hair loss,
- have abnormal colour, shape, texture, or thickness of the fingernails or toenails ([WEBMD, 2016a](#)).

When to contact your doctor

Call your doctor/nurse if you are concerned about hair loss ([MEDLINEPLUS, 2014a](#)).

Alternative Names

[Alopecia totalis](#); [Alopecia universalis](#) ([MEDLINEPLUS, 2014a](#)).

Alopecia totalis

[Alopecia totalis](#) is an auto-immune disorder which results in the total loss of hair, but only on the scalp. It is somewhat of an intermediary condition between [alopecia areata](#) which is patchy scalp hair loss, and [alopecia universalis](#) which extends to total body hair loss. [Alopecia totalis](#) usually appears in two types: One being a fairly sudden and complete loss of all head hair. The

other being a slower form which originates as [alopecia areata](#) and advances to complete scalp hair loss. In this sense it is sometimes tied to [alopecia areata](#), but not all the time.

Most sufferers are children and young adults under the age of 40, though it can affect people of all ages. It can also affect the nails, causing them to become thin, brittle and ridged. According to statistics, 2% of men and 1% of women in western society suffer from some form of [alopecia areata](#). About 2% of those have Totalis or Universalis. This means that about 1 in every 125,000 men and 1 in every 250,000 women have [alopecia totalis](#) or [alopecia universalis](#) (HAIRLOSSTALK, 2012a).

Causes

This condition comes about as a result of an autoimmune disorder which causes your [immune system](#) to attack your hair follicles. In most cases there is small chance of hair recovery, however there have been cases of complete restoration as well. Consider it a genetic autoimmune condition that has an unknown trigger, and which can sometimes be "un-triggered" for unknown reasons. They are still researching why hair follicles are the target of the autoimmune activities (HAIRLOSSTALK, 2012a). It is not known what triggers it, although it is thought to be genetically programmed, there is evidence that long-term [chronic](#) stress or a sudden shock can instigate the condition (BELGRAVIACENTRE, 2016).

Treatment

[Alopecia totalis](#) has been known to cease on its own, although this is rare and many people prefer to seek treatment (BELGRAVIACENTRE, 2016).

The main treatment for [alopecia totalis](#) are therapies which focus on immunomodulation, such as glucocorticoid injections, anthralin, or glucocorticoids taken orally. We have heard reports from some that years of [steroid](#) therapy can put the condition into remission. Years of [steroid](#) therapy is not always enjoyable however, as there are side-effects. It is important to comment that Rogaine (Minoxidil) is not effective for those with [alopecia totalis](#). Some treatments which have been considered include Methotrexate, a treatment for autoimmune disorders, and corticosteroids have been proposed as treatments.

Several genes have been studied and quite a bit of research has focused on the human leukocyte antigen. Two studies demonstrated that human leukocyte antigen DQ3 (DQB1*03) was found in more than 80% of patients with [alopecia areata](#), which suggests that it can be a marker for general susceptibility to [alopecia areata](#). The studies also found that HLA DQ7 (DQB1*0301) and human leukocyte antigen DR4 (DRB1*0401) were found quite a bit more often in patients with [alopecia totalis](#) and [alopecia universalis](#) (HAIRLOSSTALK, 2012a).

News

The comforting news is that [alopecia totalis](#) is not a painful disease and does not make people feel sick. It is not contagious, and people who have the disease are usually otherwise healthy. It has no effect on life expectancy, and will not interfere with your ability to pursue a normal lifestyle. It can be difficult living with hair loss however. It can help to learn about the condition, and speak with others who have the same situation. Professional therapy can also help quite a bit. Returning to your faith can play a major role in understanding what is going on, too (HAIRLOSSTALK, 2012a).

Alopecia universalis

What is it?

Alopecia universalis is the rarest, and most severe, of all the forms of alopecia. It results in total loss of hair across the scalp and body and can also damage and distort nails.

Sufferers of *alopecia universalis* have a genetic mutation in their chromosomes. The condition is something that is present from birth, although may not present itself until later on in life. It is difficult to treat, although some sufferers do spontaneously have hair grow back, even years after the onset of the condition.

Normally, sufferers are otherwise healthy, but are more likely than the general population to experience thyroid disease and *vitiligo*⁵⁴. Those with *vitiligo* may eventually develop *alopecia universalis* over time. Many individuals with *alopecia universalis* are born with some hair but begin losing it very quickly. The disorder is inherited as an autosomal recessive trait. It is caused by a mutation in a gene dubbed HR in chromosome band 8p21.2 - the human version of the gene that is responsible for hairlessness in mice.

Is the "hairless" gene only found in people with *alopecia universalis*? Most likely. Based on the known research, we can safely assume that only individuals with this rare and severe form of *alopecia areata* carry the gene. Unfortunately, there have not been enough studies to verify that this is true of all those afflicted. Aside from genetic tendencies, the contributing causes of *alopecia universalis* are not known.

As lack of body hair leaves areas like the scalp, eyes and nasal cavity particularly vulnerable, it is important that those with *alopecia universalis* take extra care to protect themselves from the sun, bacteria and other potentially harmful elements.

According to the National Alopecia Areata Foundation, fingernails and toenails can also be affected. Symptoms in the nails can range from pinprick-like indentations to severe distortion of the entire nail. *Alopecia universalis* may be *acute*⁵⁵ and short-lived or remain permanently. Regrowth is always a possibility, even for those with 100% hair loss over many years. However, it is not possible to predict when regrowth will occur ([HAIRLOSSTALK, 2012b](#)).

The Pedigree of Alopecia Universalis

In 1998, a researcher named M. Ahmad and his team of colleagues studied a family in which *alopecia universalis* was present in three consecutive generations. The afflicted children in the family showed no other health problems; however, skin biopsies from their scalps showed very few hair follicles. Of the follicles present, few contained hair shafts.

Researchers established that there were no other inflammatory conditions present to inhibit hair growth. The subjects were born without eyebrows or eyelashes and never developed them. They also never developed underarm or pubic hair.

Researchers analysed the chromosomes of all 7 individuals with *alopecia universalis* to detect genetic similarities. They found a marker at the location 8p12, consistent in all 7 subjects, but were unable to determine exactly which gene was at this location.

As a result, they hypothesised that there may be a genetic similarity in hairless mice which might match the one they found in the humans. Fortunately, there were several examples of alopecia in mice. They cloned the mouse hairless gene and used the mouse sequence to make PCR primers. They then used these primers on cDNA made from the mRNA of human skin fibroblasts. This identified a cDNA sequence which gave them the coding sequence of the human "hairless" gene.

⁵⁴ patchy loss of skin colour

⁵⁵ Sudden, severe, and not long lasting

In humans and mice, this gene is expressed in the skin and brain. (The brain function of the gene is not known). It appears to encode a zinc-finger transcription factor. A mutation was found to be present in the "hairless" genes of all the affected individuals in the family that was studied.

Some swear by aromatherapy, but there is little or no evidence to support that it works ([HAIRLOSSTALK, 2012b](#)).

The most effective treatment is topical immunotherapy, which creates an allergic reaction on the skin of affected areas to shock the hair follicles into production. Unfortunately, the treatment needs to be sustainable for hair growth to continue and the success rate is around 40% ([BELGRAVIACENTRE, 2016](#)). The theory behind this method is based on the general knowledge that hair can be stimulated into growth sometimes, simply by irritating the follicles. Chemicals such as Diphencyprone (DPCP) or Squaric acid Dibutyl ester (SADBE) are applied to the scalp. About 40% of patients treated with topical Immunotherapy will regrow scalp hair after about six months of treatment. Treatment must be continued in order to maintain the hair, or until the disease has run its course.

Unfortunately, these treatments are not widely available in the United States, but are used extensively in Europe and Canada. They are being investigated as possible future treatments ([HAIRLOSSTALK, 2012b](#)).

Head coverings

Since treatments for advanced forms of alopecia like [alopecia universalis](#) are less effective, a wig may be a good option for you. Believe it or not, there are many companies which offer undetectable wigs for these uses, as well as for chemotherapy patients. Make sure your provider is willing to cut, thin, and style the wig often for you, and provides sufficient adhesive for your more active days. Some wigs come with suction caps which attach directly to the wig. They're a little more expensive, but are worth the investment ([HAIRLOSSTALK, 2012b](#)).

Scarring alopecia

Scarring alopecia, also known as cicatricial alopecia, is usually caused by complications of another condition. In this type of alopecia, the hair follicle is completely destroyed. This means your hair won't grow back.

Depending on the condition, the skin where the hair has fallen out is likely to be affected in some way.

Conditions which can cause scarring alopecia include -

- **scleroderma** - a condition affecting the body's connective (supporting) tissues, resulting in hard, puffy and itchy skin,
- **lichen planus** - an itchy rash affecting many areas of the body,
- **discoid lupus** - a mild form of lupus affecting the skin, causing scaly marks and hair loss,
- **folliculitis decalvans** - a rare form of alopecia that most commonly affects men, causing baldness and scarring of the affected areas,
- **frontal fibrosing alopecia** - a type of alopecia that affects post-menopausal women where the hair follicles are damaged, and the hair falls out and is unable to grow back ([NHS, 2015](#)).

Scarring alopecia occurs in both males and females, but is less common in children than adults. It accounts for about 7% of hair loss cases ([NHS, 2015](#)).

Anagen effluvium

Anagen effluvium is widespread hair loss that can affect your scalp, face and body.

One of the most common causes of this type of hair loss is the cancer treatment, chemotherapy. In some cases, other cancer treatments - including immunotherapy and radiotherapy - may also cause hair loss.

The hair loss is usually noticeable within a few weeks of starting treatment. However, not all chemotherapy drugs cause hair loss and sometimes the hair loss is so small it's hardly noticeable.

It may be possible to reduce hair loss from chemotherapy by wearing a special cap that keeps the scalp cool. However, scalp cooling is not always effective and not widely available.

In most cases, hair loss in anagen effluvium is temporary. Your hair should start to grow back a few months after chemotherapy has stopped (NHS, 2015).

Telogen effluvium

Telogen effluvium is a common type of alopecia where there is widespread thinning of the hair, rather than specific bald patches. Your hair may feel thinner, but you're unlikely to lose it all and your other body hair isn't usually affected (NHS, 2015).

Telogen effluvium can be caused by your body reacting to -

- hormonal changes, such as those that take place when a woman is pregnant,
- intense emotional stress,
- intense physical stress, such as childbirth,
- a short-term illness, such as a severe infection or an operation,
- a long-term illness, such as cancer or liver disease,
- changes in your diet, such as crash dieting,
- some medications, such as *anticoagulants*⁵⁶ or *beta-blockers* (NHS, 2015).

In most cases of *telogen effluvium*, your hair will stop falling out and start to grow back within six months (NHS, 2015).

Tables

Body Area	Resting per cent	Growing per cent	Rest	Activity	Follicle /sq.cm	Daily growth	Max depth
Scalp	13	85	3 - 4 mths	2 - 6 yrs	350	0.35 mm	3 - 5 mm
Eyebrows	90	10	12 wks	4 - 8 wks		0.16 mm	2 - 2.5 mm
Cheeks	40 - 50	50 - 60			880	0.32 mm	2 - 4 mm
Beard (Chin)	40	60	10 wks	1 year	500	0.38 mm	2 - 4 mm
Moustache	45	55	6 wks	16 wks	500		1 - 2.5 mm
Arm Pit	70	30	12 wks	16 wks	65	0.3 mm	3.5 - 4.5 mm
Pubic Area	70	30			70		2 - 4.5 mm
Arms	80	20	18 wks	13 wks	80	0.3 mm	
Legs/Thighs	80	20	24 wks	16 wks	60	0.21 mm	2.5 - 4 mm

Table 3.1: Hair growth (TRANSGENDERCARE, 2016c)

⁵⁶Medical drugs that reduce the ability of your blood to clot

Hair sites	Reappearance
Deep, course, terminal hair (such as chin area)	5 - 6 weeks
Medium depth terminal hair (side of face, and body)	6 - 7 weeks
Medium depth accelerated vellus hair	7 - 9 weeks
Shallow vellus hair (downy hair)	8 - 10 weeks

Table 3.2: Average time for hair to reappear after tweezing or waxing ([TRANSGENDER CARE, 2016c](#)).

How to prevent hair loss

Vanity may be one of the seven deadly sins, but its also one of the best motivators for living better. People are often plagued with nutritional issues as well as medical ailments and unhealthy habits. One of the biggest issues in the medical area presently is that doctors often treat the symptoms and not the cause. Hair loss is no different. Instead of trying to stop hair loss in its tracks or supplementing fake hair for the loss, try figuring out why you're losing it first. Check your daily routines to see if the reason you're losing your hair is something you're doing by looking at a couple of these factors ([REGROWTH, 2015b](#)).

Eat the right food

Many of the medical problems society faces today are due to bad eating, and hair is no different. Some of the basic vitamins and minerals required to be healthy are often the most uneaten, like protein. Protein is one of the best things for your hair. Eating fish, seeds, nuts, leafy vegetables and eggs not only help build muscles but give your hair the boost it needs to rejuvenate itself.

Another great thing to do is change your diet a little. Eating the same food repeatedly causes your body to adapt and it sticks in a rut. Eating a variety of fruits and vegetables daily, along with minerals and vitamins helps your body become balanced and strengthens your hair ([REGROWTH, 2015b](#)).

Take care of your hair

It sounds crazy, but washing your hair is one of the best things for it. Weird, right? Taking hot, steamy showers feels great, but much like your skin, your hair can become damaged by it. Also, handling your wet hair by brushing or rubbing with a towel can cause the strands to break or become damaged.

Pulling your hair tight with bands or using products that make your hair stiff, like hairspray, can make your hair fall out faster. Try using natural remedies like coconut oil and products that help strengthen hair instead of depleting moisture and vitamins ([REGROWTH, 2015b](#)).

Limit your stress

The human body was never meant to handle stress. Human bodies were designed to solve problems that lasted seconds, not years. So when your body is constantly subjected to stress, it reacts by shedding hair and causing your body to get sick in order to get better.

Try exercising or participating in meditation or yoga. Finding a time to slow down and relax can drive the body back into its natural homeostasis, and limit the amount of hair you lose ([REGROWTH, 2015b](#)).

Be Yourself

Constantly dying your hair and treating your luxurious strands to the chemicals of today's industry can kill the hair you have. Braiding, using rubber bands and perming can pull out the hair you have left and stop new hair from growing. If the hair becomes thin and you want to give it a little volume, try small things that won't harm your hair. Try parting it to the side, wearing it down or using volumizing shampoos and conditioners, along with natural hair products.

Hair, like teeth, will not grow back once its gone. Taking care of your hair before its lost will be better than trying to fix it once its gone. Making small changes can make a big difference (REGROWTH, 2015b).

Part II

Removing it

Temporary removal methods

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Shaving

Shaving provides a fast and simple means of hair removal, and has no effect on hair growth. It is the most common method of temporary hair removal.

Many individuals, regardless of cultural background, believe that shaving facial hair worsens, thickens, or accelerates its growth; this notion is a myth. Shaving does not cause hair to thicken, darken or grow faster ([TRANSGENDERCARE, 2016g](#)).

In 1762 a French barber named Jean Jacques Perret invented the safety razor by attaching a metal guard to his razor blade to prevent the blade from cutting the skin. In 1895 King Gillette started up a company based on his idea of disposable razor blades. By 1915 his company was selling 70 million blades a year.

Best for?

Shaving is the most obvious choice for male facial and head hair removal, but is also a quick and easy method for removal of male and female underarm, arm and leg hair.

Also, a pretty good option for bikini line and genital areas (with caution!) but the regrowth can cause itching and irritation.

Although it can be used for chest and back, due to the temporary nature of this method, it may become rather tedious, and the regrowth appears stubbly.

There are so many shaving options that it can be quite mind boggling, but the first thing you need to decide is whether to go for razor shaving or electric (many of which may now be used wet or dry) (HAIRFREELIFE, 2016a).

Choosing a razor

If you decide to go for the razor shave, then the next option is which type? The two most popular options are double-edged safety razors or the multi-blade cartridge type (HAIRFREELIFE, 2016a). So how to decide? Well the two main considerations for most people are cost and efficacy -

Cost

The initial outlay for a new cartridge razor with blade refill can be anything from £7 upwards. But when you start to look at the replacement costs of the cartridges as compared to the safety blades, it is cheaper in the long-term to use a safety razor. Generally safety razors cost more initially, but over time will save money (HAIRFREELIFE, 2016a).

Efficacy

With their, 4 or 5 blade versions, cartridge razors are designed to be quick and require only one pass, whereas the safety razor's single blade will take longer and require more passes to achieve a nice, close shave.

The downside of this is that cartridge razors are much harsher on the skin, especially the 5 blade's, and are more likely to cause irritation, razor burn and ingrown hairs.

There are cartridge razors designed for sensitive skin, but our recommendation would definitely be to try a safety razor.

So - although either can achieve a nice close shave, using a cartridge razor will be quicker and a safety razor, more gentle on the skin (HAIRFREELIFE, 2016a).

Best Method

Shaving with a cartridge razor is pretty simple nowadays and most have swivel heads that move with the contour of the skin.

They are very safe, with not too much exposed blade, so that you can push the head very gently to the skin to achieve a close shave (HAIRFREELIFE, 2016a).

There are just a few basic steps to follow -

- wash thoroughly to remove dead skin cells and excess oil and soften hair to be shaved,
- apply suitable lather to damp area - shaving foam, gel, cream or soap,
- always shave "with the grain" i.e. in the direction of the hair's growth,
- hold the razor at about a 30 degree angle to the skin,
- do not apply pressure - it should not be necessary and may cause nicks or cuts,
- rinse razor after each pass, or at least when you can see a build up of hair between the blades,
- keep skin taut to create as flat a surface as possible (HAIRFREELIFE, 2016a).

Shaving with a safety razor will take a little practice, as more of the blade is exposed and so the angle of the blade is a bit more crucial to avoid cuts, and as the head is fixed, you need to control this yourself.

It is also important to not use any downwards pressure, but just glide the blade over the skin's surface (HAIRFREELIFE, 2016a).

Electric shavers

Electric shavers have much improved over the years, and there are literally hundreds to choose from including those that can be used either wet or dry and include trimmers for longer hairs.

There are different versions for male and female use and range in cost from around \$20 at the bottom end to \$200 for an 'all bells and whistles' shaver (HAIRFREELIFE, 2016a).

Male shavers

There are two distinct types of head on electric razors; rotary or foil.

In brief, a rotary shaver is best for those with coarse, thick hair which grows in different directions, or those who do not shave every day.

Conversely, foil shavers suit those with fine, straight hair wishing for a precise, close shave on a daily basis. They tend to be gentler for use on sensitive skin (HAIRFREELIFE, 2016a).

Female Shavers

Lady shavers use foil heads and are rounded to adapt to the contours of the body.

They will often include a trimmer feature for bikini trimming and the best are cordless and suitable for wet or dry use, so that you can shave in the shower (HAIRFREELIFE, 2016a).

In summary

- **How it works** - Using a razor or electric shaver, you cut the hair very close to the skin.
- **Tips** - If you use disposable razors or blades, wet your skin and use soap or shaving cream. Shave in the direction the hair grows. Replace your razor often - you can cut yourself with a dull one.
- **Best for** - It works anywhere (WEBMD, 2016d), but especially legs, underarms, and those with lighter, finer hair (DAILYMAKEOVER, 2016).
- **How long it lasts** - 1 - 3 days.
- **Possible side-effects** - ingrown hairs, especially in the bikini area (WEBMD, 2016d).
- **Pros**
 - Shaving can be an inexpensive way to get rid of unwanted hair. Done correctly, it should be painless and shaving can be effective for short-term hair removal (CARTER, 2013b).
 - Inexpensive, painless, quick, and easy, and shaving creams used can help moisturise the skin, keeping it soft (DAILYMAKEOVER, 2016).
 - **Quick and easy** - very little practice required to become an expert shaver,
 - **Versatile** - just about every area of the body can be shaved!
 - **Priced to suit All** - electric shavers, shaving sets, creams, razors etc. can all be found at bargain basement prices right on up to the luxury end of the market,
 - **Easily portable** - travel with your razor/shaver, no problem,
 - **No pain** - just about the only method of hair removal with absolutely no pain involved (HAIRFREELIFE, 2016a).
- **Cons**
 - Shaving may get rid of hair, but will only keep hair away for a few days in the best case.
 - Hair reappears faster than it would with other methods, there's a reason for the saying "five o'clock shadow"! Shaving is also not recommended as a first choice hair removal system for those with very dark body hair, because you may still be able to see the hair root just below the skin even after shaving. Also keep in mind that because you're working with a razor, you're susceptible to cuts and razor burn (CARTER, 2013b).

- Regrowth happens quickly, and since hair is cut off at the surface, regrown hair is blunt, not tapered, so it can appear thicker. Razor burn, nicks, and cuts are possibilities, and those who shave regularly can also become prone to ingrown hairs (DAILYMAKEOVER, 2016).
- **Very temporary** - need to repeat process regularly - in some areas e.g. beard, daily,
- **Hair regrowth** - the appearance of stubble prior to shaving can be unsightly,
- **Risk of razor bumps** (HAIRFREELIFE, 2016a).
- **Bottom line** - If you need a quick fix for getting rid of body hair, shaving will do the trick. Just beware that hair will reappear quickly and blunt ends created by shaving can exacerbate stubble (CARTER, 2013b).

Depilatories

Depilatories break down and dissolve the protein structure of hair by chemical action. The most common depilatories contain thioglycollates, also found in various cold wave lotions. Other active chemical components found in depilatories include barium sulfide and alkalis. The barium sulfide type provides greater effectiveness, but strong odours and irritation discourage its use.

Generally, depilatories produce an undue amount of irritation for the result produced. Also, depilatories may fail completely when used on coarse or thick hair, with no hair being removed (TRANSGENDERCARE, 2016g).

Hair removal creams have come a long way over the years, as manufacturers have worked to improve their performance and the overpowering unpleasant chemical odours of the past.

They are still, however, made up of strong chemicals which work to break down the protein in the hair to dissolve it, for removal at just below the skin's surface.

For this reason, they are not suitable for everyone, and allergic reactions are experienced by some.

Although some creams are suitable for both male and female use, generally there are different products for each, as male hair tends to be thicker and coarser, requiring a stronger mix of chemicals (HAIRFREELIFE, 2016a).

Depilatories are chemicals, liquids or creams, which are used for personal hair removal by creating a chemical reaction with hair protein structure and dissolve it. Although chemicals are harsh, they can not affect hair growth. Depilatories are usually used on legs, arms and pubic areas.

These are chemical based hair removal products used to dissolve hair at the skin's surface. These do not affect hair growth. Ideal for usage on hair on legs and pubic areas.

Hair removal creams, commonly known as depilatories, are widely available and have developed and vastly improved over the years.

There are now depilatory creams, lotions, gels, roll-ons, powders and even sprays available, with different strengths for different genders and parts of the body (HAIRFREELIFE, 2016c).

Before you start

There are a huge variety of cream depilatories available today, at an array of costs ranging from around £4 upwards.

When deciding which to buy, however, there are more things to consider than just the cost. So don't think you can just pick one off the shelf that suits your pocket and off you go - it's not quite that simple!

It is important to recognise the limitations of hair removal creams - they are not suitable for all parts of the body e.g. eyebrows, female genitals, ears and nose.

Also, they contain strong chemicals and it is necessary to carry out a skin test prior to use, so you will need to think about the time to allow for this - at least 24 hours prior to use (HAIRFREELIFE, 2016b).

Choosing the right product

In order to choose the right product you first need to think about where you wish to use it.

Many of the products are gender specific, formulated specially for either male or female use.

Hair is different, in texture, thickness, strength etc. depending on where it is located on the body. Thicker, coarser hair e.g. chest hair, requires a higher strength cream, whereas fine ladies facial hair can be removed with a gentler cream.

The other thing to think about is whether or not you have sensitive skin. If you do you are more likely to have adverse skin reactions to the chemicals in depilatory creams (HAIRFREELIFE, 2016b).

There are a number of specially developed depilatory creams available for those with sensitive skin, so be sure to check the box to see -

- for which area of the body is it recommended,
- is it suitable for sensitive skin (if required),
- is it unisex or gender specific,
- if you know that you are allergic to a particular chemical, check the product ingredients to make sure that it is not present (HAIRFREELIFE, 2016b).

Warning

If you have any skin condition, diabetes, circulatory problems or any medical condition that may be affected by compromised skin seek medical advice prior to use.

Skin test

It is important to carry out a skin test prior to use of any chemical depilatory to ensure that you have no allergic reaction to any of the ingredients.

All hair removal creams and gels etc. will come with a full set of instructions as to how to carry this out for each individual product, and these should be followed carefully (HAIRFREELIFE, 2016b).

Each product may differ slightly in how you are required to do this, and how long you need to wait, but we have outlined the main general points -

- apply a thick layer of cream to a small, inconspicuous part of the treatment area and spread evenly, usually with fingertips,
- DO NOT RUB IN,
- wash hands thoroughly immediately afterwards,
- leave cream on for the recommended time (usually between 4 - 8 minutes) the instructions will state a maximum time which MUST NOT be exceeded,
- remove cream with a dampened cloth or cotton wool,
- rinse area thoroughly with lukewarm water and pat dry,
- wait for at least 24 hours (or whatever length of time is recommended) and if no irritation occurs you can proceed to use as directed (HAIRFREELIFE, 2016b).

Possible side-effects

It is quite common to feel a very mild tingling sensation, but it should never be any more than that.

Adverse reactions can range from irritation to severe chemical burns, so it is important that if you feel irritation or stinging you remove the product immediately, rinse the area thoroughly and do not use it.

The reason that it is extremely important that you only use these products as directed and never for more than the maximum time is that they can cause severe burns and blistering (HAIRFREELIFE, 2016b).

How do hair removal creams work?

The most essential component of the hair's structure is a protein called Keratin, which makes up 65% - 95% of the hair's total fibre by weight and it is this that forms the strength of your hair.

Thioglycolic acid (TGA) is the most commonly used ingredient in hair removal creams, often in salt forms such as calcium thioglycolate and sodium thioglycolate, and accounts for the well-known strong and unpleasant odour.

It is the *TGA* in the cream which breaks down the structure of the keratin to weaken the hair and dissolve it so that it can be easily wiped away from its follicle, just below the skin's surface.

The top layer of your skin (the epidermis) also contains keratin, which is why hair removal creams should never be left on for too long, as the skin may become adversely affected (HAIRFREELIFE, 2016c).

General usage instructions

As previously mentioned, each product will come with its own set of instructions, the following is intended as a general guide only -

- do not use any soaps or astringents for at least 2 hours before or after treatment,
- do not sunbathe for at least 24 hours prior to or after treatment, and do not use on sunburnt, irritated or broken skin,
- apply cream thickly and evenly - either with fingertips or spatula as directed (there are some spray-on depilatory creams now available),
- Never Rub In,
- always wash hands thoroughly and immediately,
- replace cap straight after use and store safely out of the reach of children,
- wait for the allotted time as per manufacturer's instructions,
- do not leave for longer than the maximum recommended time and do not allow to dry on the skin,
- remove product with a damp tissue, cloth or cotton wool and then rinse thoroughly with running water (no soap),
- gently pat dry,
- if an aftercare lotion is provided, use as directed (HAIRFREELIFE, 2016b).

Precautions

Here we have listed some universal precautions which should always be observed when using depilatory creams.

There may be others specific to individual products - so be sure to check the instruction leaflet (HAIRFREELIFE, 2016b).

- no sunbathing for at least 24 hours before or after use,
- do not use if you are undergoing any dermatological treatment - seek medical advice,
- do not use on any area for which the product is not recommended,
- not to be used around the eyes, vaginal, perianal or breast areas, for nose or ear hair or on open, irritated, sunburnt or otherwise compromised skin,
- if product comes into contact with eyes, flush well with water and seek medical advice,

- not to be used on moles or warts,
- do not sunbathe or go swimming for at least 24 hours after treatment,
- if adverse reaction occurs remove the product immediately and rinse thoroughly with water - if irritation persists seek medical advice,
- for external use only - dangerous if taken via the mouth, seek medical help immediately,
- store safely out of reach of children (HAIRFREELIFE, 2016b).

Best for?

The most obvious places where pain-free depilatory creams are a great option are for sensitive areas such as underarms, female upper lip and bikini line.

They also score well for larger areas, such as legs, arms, male chest and back and products are usually tailored to suit a particular area, so do check the recommended uses on the box prior to purchase.

Depilatory creams for facial hair are abundant, but are not suitable for use round the eye or brow area, or for ear or nose hair, where they could cause severe damage (HAIRFREELIFE, 2016a).

Now that the truly pungent and eye-watering odour associated with the original creams are more or less a thing of the past, what are the pros and cons of their use in comparison to other hair removal methods? (HAIRFREELIFE, 2016c)

Advantages compared with other methods

Pain free

The major and most obvious advantage which depilatory creams have over almost all other methods of hair removal is that there is no pain involved (assuming that your skin has no reaction to the chemicals, of course) (HAIRFREELIFE, 2016c).

The only other totally pain-free method is shaving, however there are a couple of ways in which depilatory creams have the advantage -

- Shaving is a frequent and often daily activity - the hair is removed with the blade at the skin's surface and so visible regrowth occurs very quickly. Depilatory creams remove hair at just below the skin's surface, so the results last rather longer - anything from a few days to a week, depending on the location of the hair and the length of its growth cycle.
- A common side-effect of shaving is ingrown hairs, often referred to as razor bumps. This is not so with depilatory creams (HAIRFREELIFE, 2016c).

Quick and easy to use at home

Depilatory creams work quickly - usually anything from 4 - 8 minutes, and are easy to use, with no skill required other than the ability to follow the instructions.

Waxing, tweezing, epilating, threading, home lasers and even shaving, all require technique and take at least some degree of practice to perfect (HAIRFREELIFE, 2016c).

Relatively inexpensive

Whilst it is true to say that the cost is ongoing, depending on how often you need to use the product and for how large an area, depilatory creams do not require a major outlay.

Prices range from around £4 - £11 (anything from £0.60 per fl oz upwards) and will usually be sufficient for several treatments.

The obvious methods involving less outlay are tweezing and threading, but they are not as versatile as depilatory creams in that they are not suitable for tackling larger areas such as legs.

Waxing involves similar ongoing outlay, as does shaving (for replacement blades, shaving foams/creams, aftershave etc).

Epilators, home lasers and such need a high initial outlay, and it is worth checking if they have any replacement parts that need to be taken into consideration (HAIRFREELIFE, 2016c).

Disadvantages compared with other methods

Chemical odour

Whilst manufacturers have worked hard to remedy the strong, offensive odour of the original depilatory creams, there is no disguising the fact that these creams do generally have quite a strong scent.

Many of them have definitely improved considerably and some actually smell quite pleasant, or at least, not unpleasant! (HAIRFREELIFE, 2016c)

Possible allergic reactions

These creams contain strong chemicals and have the ability to cause severe reactions and burns, blisters etc. to the skin.

It is really important that you follow the instructions to the letter and carry out the skin test every time prior to use, no matter how much of a nuisance this seems.

Most important of all, you must never exceed the maximum time recommended.

Remember, it is possible for an individual to develop an allergy to a product over time, even if they have used it before with no problems (HAIRFREELIFE, 2016c).

Frequent treatments required

As previously mentioned, the hair is removed to just below the skin's surface. This means that within a matter of days it will grow to the surface and start to show again.

Therefore, although it will last a little longer than shaving, any hair removal method such as waxing, tweezing, epilating etc. that forcibly removes hair from the root will last considerably longer (HAIRFREELIFE, 2016c).

Pros

- **Pain-free** - providing you are not allergic to any of the ingredients,
- **Relatively inexpensive** - there are products available to suit all pockets,
- **Versatile** - can be used on all skin tones and hair colours (HAIRFREELIFE, 2016a).
- **No skill required** - can be carried out quickly and easily in the home,
- **Convenience** - hair is removed in around 4 - 8 minutes (HAIRFREELIFE, 2016c).

Cons

- **Chemical odour** - some are pretty good, but they do vary,
- **Possible allergic reactions** - you may develop a reaction even after years of use, so testing before each treatment is recommended,
- **Frequency of treatments** - results short-lived in comparison to some other methods,
- **Need several types** - you need to purchase different depilatory creams for specific areas of the body (HAIRFREELIFE, 2016a).
- **Not suitable for all areas** - cannot be used for brows, near eyes, nor for nose or ear hair,
- **Adverse reactions** - need to carry out skin test prior to use (HAIRFREELIFE, 2016c).

In summary

- **How it works** - Depilatory creams or lotions dissolve proteins that make up hair (WEBMD, 2016d), hair removal creams use chemicals to weaken the hair follicle so you can effectively wipe it away (DAILYMAKEOVER, 2016).
- **Best for** - Legs, underarms, and bikini area. There are special formulas for the face, but they sometimes don't work well on coarse hair (WEBMD, 2016d), those who want quick, easy, relatively painless at-home results. Depilatories are most popular for facial hair, bikini lines, and underarms (DAILYMAKEOVER, 2016).
- **How long it lasts** - A couple of days to a couple of weeks,
- **Possible side-effects** - *'They work by dissolving the hairs'*, Pariser says. *'But they also can dissolve the skin if left on too long or if your skin is too sensitive'*. To avoid problems, follow directions carefully (WEBMD, 2016d).
- **Pros** - A depilatory cream will remove hair with less pain than other methods of hair removal. It's a quick procedure, can be done at home, and most depilatory creams are relatively inexpensive (WEBMD, 2016d), can be done at home, and removes hair just below the surface of the skin, ensuring slower and less coarse regrowth than shaving (DAILYMAKEOVER, 2016).
- **Cons** - Depilatory cream results will last longer than shaving, but not as long as waxing or sugaring. You can expect to see hair resurfacing after a few days, though it sometimes lasts as long as a week. One common complaint about depilatory creams is the smell - although this has improved greatly in recent years (WEBMD, 2016d)! Chemicals in these products can irritate sensitive skin, particularly in more delicate areas. These creams are infamous for their odour, and can also lead to ingrown hairs (DAILYMAKEOVER, 2016).

Also, be careful not to leave a depilatory cream on for too long as it could damage the skin. As always, follow instructions and be sure to try a patch test before using a depilatory cream for the first time. Some people may find that they have an instant reaction or will feel itching or burning within a few hours of use, so a patch test is critical!

- **Bottom line** - If you want to remove body hair quickly with minimal pain, and want results that will last longer than shaving, then a depilatory cream is a good option. Just make sure not to leave it on too long! (CARTER, 2013b)
- **Advantages** - Inexpensive, fast, sometimes painless, can be done at home, available almost anywhere (JAMES, 2016b).
- **Disadvantages** - Effect lasts a short time - anywhere from a few hours to several days. Dark-haired users may have visible 'shadow' of dark hair under skin. Often requires use every two or three days. Can cause skin irritation and cuts. Can be a severe skin and eye irritant (JAMES, 2016b).

Tweezing

Tweezing, or plucking, of a hair involves the individual removal of the hair shaft from the follicle with the use of tweezing forceps. With good technique, individuals generally tolerate tweezing with little or no difficulty. However, repeated tweezing with poor technique or poor tolerance can lead to *folliculitis*⁵⁷, ingrown hairs, and distorted follicles (TRANSGENDERCARE, 2016g).

Tweezing is an economical and precise personal hair removal, but it can cause stinging and is time consuming, thus usually used on small facial sites such as eyebrows. The results last from three to eight weeks.

These are the most economical of all hair removal products. It is recommended for small areas like eyebrows. It is time consuming and can be quite painful. Usage of tweezers can prolong hair growth relatively more than normal (WEBMD, 2016d).

Tweezing is a quick and easy way to remove individual hairs by pulling them out or "plucking" them from the root with a pair of tweezers.

⁵⁷repelling, tending not to combine with, or incapable of dissolving in water

It is a relatively inexpensive method, and can be used in conjunction with other methods of hair removal.

Due to the fact that the hair is removed from the root, it has a longer lasting result than shaving, and over time can cause sufficient damage to the hair's follicle to produce lighter, finer regrowth or in some cases, even permanent removal (HAIRFREELIFE, 2016a).

Best for?

Tweezing is absolutely the best for eyebrow shaping, where precision is of paramount importance.

It is also useful for odd stray hairs left behind after waxing, or for any area where a few hairs need to be removed e.g. female chin, or from moles (HAIRFREELIFE, 2016a).

Eyebrows

Tweezers are most popularly used for eyebrow shaping. They are perfect for precise work such as this, as they carefully remove one hair at a time.

It is much harder to go wrong with tweezing than with other methods such as waxing, which removes many hairs at once and is therefore harder to control.

Tweezing is also fairly easy to master at home, and so is convenient and inexpensive. A good pair of tweezers, cared for properly, should last for many years (HAIRFREELIFE, 2016d).

Strays

Tweezers are good for removing any odd stray hairs left behind after waxing or epilating, individual chin hairs, or in fact anywhere where there are individual hairs (HAIRFREELIFE, 2016d).

Ingrown Hairs

Point-tipped tweezers can be used to remove ingrown hairs, if other less intrusive methods such as exfoliation have failed (HAIRFREELIFE, 2016d).

Caution

We would not recommend tweezing nose hairs as the membrane in the nose is very tender - if you have unsightly nose hairs, far better to trim them.

We would also advise against tweezing ear hair, unless it is on the outside of the ear (HAIRFREELIFE, 2016d).

Choosing tweezers

Tweezers have different tips, the main 3 being slanted, pointed or pointed slants.

Slanted

Slant tipped tweezers are easily the most popular; they are versatile and easy to use and especially good for eyebrow shaping.

The flat edge of the slant can be angled parallel to the skin, to run easily along its surface following the contour of the brow.

The tweezer can be turned over to use the pointed end to isolate and grab any odd individual hair that is proving difficult, especially those very fine ones, or where particular precision is required (HAIRFREELIFE, 2016d).

The most popular for eyebrow shaping and general purpose use is the slanted tip type (HAIRFREELIFE, 2016a).

Pointed

Point tipped tweezers lack the versatility of the slants but are most effective when ultimate precision is required.

They are especially good for removing ingrown hairs from just below the skin but also for any very fine hairs that you have been unable to pick up. They have the added bonus of being great for removing splinters, glass fragments and the like.

They have very sharp, needle-like tips (in fact they are sometimes referred to as needle-tip tweezers) and you need to take care when using and storing them.

A steady hand is required and it may take a little time to master their use (HAIRFREELIFE, 2016d).

Pointed slant

The pointed slant theoretically offers the best of both worlds; a slant tipped tweezer with a very sharp point at one end.

I know that some people have a preference for this type of tweezer, but personally I find them a bit harder to use for eyebrows than the slant - more difficult to grab individual hairs without pinching the skin.

Although they are very pointed at the pointy end, they do not have the pin-point tips of the dedicated style point tweezer.

They are undoubtedly sufficiently sharp and precise to cover most eventualities, but still I question that they will be as efficient for removing ingrown hair below the skin (HAIRFREELIFE, 2016d).

What makes a good pair of tweezers?

There are a huge number of different tweezers on the market, ranging from a few dollars at the budget end up to around \$60 at the top.

So how on earth to decide which, out of all these, to choose? (HAIRFREELIFE, 2016d)

Whatever the cost, there are three very important, key factors which must be present in a good, effective pair of tweezers -

Alignment

The tips of the tweezers need to be perfectly aligned to meet from edge to edge. If they do not meet perfectly, you will not be able to grasp hairs consistently.

The very fact that you are working with each hair individually means that this is vitally important (HAIRFREELIFE, 2016d).

Tips

The tips of the tweezers need to be sharp, so that when they grasp the hair they can keep firmly hold whilst you pluck them out.

Dulled tips will lead to the hair slipping when pulled and gradually reduce their effectiveness over time until they become unfit for purpose.

You will see that most manufacturers of the more expensive tweezers offer sharpening services and in fact Tweezerman, a well-known and respected brand in the field, provide a free sharpening service for the life of all their tweezers (HAIRFREELIFE, 2016d).

Tension

The best tweezers (and they don't necessarily have to be the most expensive) have perfectly calibrated tension to provide a gentle resistance when the two arms of the tweezer are squeezed together.

This is important because it enables you to be in control while tweezing; Insufficient tension would make it difficult to grasp the hair firmly enough to remove it, whereas too firm a tension would make the tweezer uncomfortable in use for any length of time (HAIRFREELIFE, 2016d).

In summary

- **Alignment** - the tips need to be perfectly aligned to meet all the way along the edge, so that hairs can be grasped consistently,
- **Tips** - these need to be nice and sharp, so that when the hair is grabbed it keeps firmly hold and there is no slipping,
- **Tension** - the arms need to be carefully calibrated to provide a gentle resistance when they are squeezed together (HAIRFREELIFE, 2016a).

Other features to consider

In addition to the three elements discussed above, there are other special features that you may wish to think about before purchase -

Wide grip design

This is actually a pretty important factor especially if you suffer from weakness or arthritis etc. in your hands or fingers.

Some tweezers, such as The 'Tweezerman Professional Wide Grip' are specially designed with a wide thumb grip to make them easier and more comfortable to hold.

This is just one example and there are many other styles of tweezer with various different wide-grip designs (HAIRFREELIFE, 2016d).

Finish

There are a wide range of colours, coatings and designs available which can make a difference, not only aesthetically but also to the feel and grip of your tweezers e.g. a rubberised or embossed coating may also enhance the grip

One example of this the Revlon Expert Slant Tipped Tweezer. This one has an embossed diamond design and a black enamel coat.

Another example is the Slice Combo Tip Tweezer.

This has a lovely ergonomic design, widening out to give a good firm grip. This is coupled with a rubberised, soft-touch coating, for ultimate comfort and control.

Other designs feature inset stones, cut-outs, animal prints, etc (HAIRFREELIFE, 2016d).

Mini-sized

Some tweezers are manufactured in miniature to make them easy to carry around in purse or pocket, for tweezing on-the-go.

As a stand-in when out and about or for emergencies, they can be a great addition to your beauty kit (HAIRFREELIFE, 2016d).

In summary

- **Grip** - there are various designs out there, some with special wide grips to make it easier for those with difficulties such as arthritis or weakness in the finger to use,
- **Finish** - there are a wide range of finishes available - from colours and coatings to embossed designs and even animal print or gemstones. Some of these serve a purpose, to enhance the feel and grip, as well as just looking good!
- **Size** - size varies from mini, pocket sized tweezers to some that are quite bulky. It is important to choose a size that you are comfortable with and is fit for purpose,
- **Cost** - always an important consideration with any purchase, but do bear in mind that a good quality, well cared-for pair of tweezers should give many years of service, so it is worth buying the best you can afford,
- **Sets** - there are various set combinations on the market, which can be a cost effective way to perhaps have, for example, a slant tipped and a point tipped pair (HAIRFREELIFE, 2016a).

Best Method

The following are the steps to take for effective tweezing, to minimise pain and reduce the risk of infection and ingrown hairs -

- clean thoroughly and exfoliate area to remove dead skin cells and bacteria,
- open pores - either by showering or using a warm flannel or towel against the area for a few minutes,
- ensure you have good light and a magnifying mirror,
- sanitise tweezers prior to use (methylated spirits are good for this),
- hold skin taut with one hand, holding tweezers in the other,
- grasp hair firmly as close to base of hair as possible without pressing into skin,
- pull firmly in the direction of the hair's growth,
- if required, you can apply a calming lotion such as Aloe to the area,
- sanitise after use and store safely (HAIRFREELIFE, 2016a).

Preparation

The following are a few easy steps you can take prior to tweezing to get the best results, minimise pain and reduce the risk of infection and ingrown hairs -

- ensure your skin is clean and, preferably, exfoliated to remove any dead skin cells and bacteria lurking around the hair,
- for body hair, have a warm shower to soften skin and hair and open your skin's pores, Alternatively use a wet, warm flannel or towel against the relevant area for a few minutes to achieve a similar effect,

- if desired, a numbing cream (think [EMLA cream](#) ⁵⁸ or Ametop) may be applied to reduce the pain,
- ensure that you have sufficient light and sanitise your tweezers prior to use using methylated spirits ([HAIRFREELIFE, 2016d](#)).

Method

- hold skin taut with one hand with the tweezers held comfortably in the other hand,
- grasp the hair with the tweezers as close as possible to the skin, but without pressing into it,
- pull firmly and quickly in the direction of the hair growth to 'pluck' it from the root ([HAIRFREELIFE, 2016d](#)).

Aftercare

It is likely that your skin will be red and possibly slightly swollen following tweezing, but this should resolve within 15 - 30 minutes and is not lasting.

Ice may be used against the area to cool and refresh it, and a calming lotion applied.

It is a good idea to bear this in mind when tweezing eyebrows and make time allowances if you are intending to go out ([HAIRFREELIFE, 2016d](#))!

Eyebrow Tweezing

The art of shaping the perfect brow will take time to master - so be patient. It may be worth your while having them done professionally the first time. Then you can just maintain them by tweezing hairs straying outside the desired shape as they appear ([HAIRFREELIFE, 2016d](#)).

Things you will need

- pair of tweezers,
- white eyebrow pencil,
- eyebrow brush,
- magnifying mirror,
- numbing cream (optional),
- tweezer sanitiser,
- calming lotion ([HAIRFREELIFE, 2016d](#)).

Method

Follow the preparation steps as outlined above. Then -

- hold skin taut and tweeze eyebrows in direction of growth,
- use brush to gently brush brow in the direction of hair growth,
- use brow pencil to draw on the desired shape,
- grasp each hair outside of the pencil line, as close to the base as possible without pressing into the skin,
- pull firmly away in the direction of hair growth,
- check at full distance in a normal mirror from time to time to check how it is looking,
- when you have finished, apply soothing lotion to cool the skin (alcohol free) ([HAIRFREELIFE, 2016d](#)).

⁵⁸A eudetic mixture, meaning the melting point of it is lower than the melting point of its constituent parts

Warning

Remember, it is easy to remove a little more hair, but impossible to replace it - eyebrow hair is slow-growing so try to avoid over-plucking by checking regularly as you go along.

Is tweezing painful?

Pulling hair out from the root will always necessitate some pain however the pain from tweezing is, for most people, eminently bearable and resembles pin pricks.

You are only pulling one hair at a time, and can stop and start at leisure. You will find that, over time, the skin builds up a resilience and the pain lessens.

If it bothers you too much, you can use a numbing cream or, apparently, baby teething gel applied with a cotton bud a few minutes prior to tweezing works well (HAIRFREELIFE, 2016d).

Side-effects

The great thing about tweezing is that, providing you follow good hygiene practices, the side-effects such as redness, puffy skin and soreness will be very transient, passing away after 15 - 30 minutes at most.

However, the same as any method involving removal of hair by the root, tweezing can occasionally lead to ingrown hairs (HAIRFREELIFE, 2016d).

How to remove with tweezers

See how to remove with tweezers.

Care of your tweezers

A good quality pair of tweezers should last for years, so caring for them properly is time well spent to ensure that you get your money's worth (HAIRFREELIFE, 2016d).

Here are a few tips to get the most from your tweezers -

Cleaning

Ensure that your tweezers are cleaned properly before and after each use with a sanitiser such as methylated spirits (HAIRFREELIFE, 2016d).

Storage

Store carefully, always replacing the tip covers and putting them in their storage pouch, if provided and putting them safely out of reach of children.

Some tweezers come in a plastic tube, which is ideal to keep your tweezers in, especially for transporting them (HAIRFREELIFE, 2016d).

Maintaining tips

Inspect your tweezers to make sure that they remain aligned and the tips are sufficiently sharp. If the performance deteriorates and they start to slip, the chances are that they need sharpening (HAIRFREELIFE, 2016d).

General care advice

Try to avoid dropping the tweezers as it may damage the tips and put them out of alignment, rendering them useless.

It is possible to increase the tension of your tweezers by gently pulling them apart slightly - but be careful doing this and be aware that once you have done it, you cannot reverse the effect (HAIRFREELIFE, 2016d).

- clean tweezers after each use,
- disinfect tips of tweezers in methylated spirits,
- protect the tips of tweezers with cap and keep in their storage box or tube,
- spring tension can be increased by gently pulling the two halves of the tweezer apart. Once you have increased the spring, you cannot decrease it,
- never drop tweezers. Dropping will dull the tip and throw your tweezers out of alignment (JAMES, 2016b).

Pros

- **Precise** - as hairs are removed individually,
- **Convenient** - can be done 'as and when',
- **Easy** - little time required to perfect method,
- **No mess** (HAIRFREELIFE, 2016a),
- **Portable** - small and easy to carry around - takes up very little space in your luggage!
- **Lasting** - longer lasting than shaving (can last up to 6 weeks),
- **Cost Effective** - one-off cost of a pair of tweezers which can last for several years (HAIR-FREELIFE, 2016d).

Cons

- **Pain** - there will obviously be some pain, but it is highly bearable and totally in your control - as hairs are removed one at a time (HAIRFREELIFE, 2016a). Over time this may lessen as the area builds up resilience (HAIRFREELIFE, 2016d).
- **Ingrown hairs** - there is a risk of ingrown hairs,
- **Not for large areas** (HAIRFREELIFE, 2016a),
- **Not permanent** - the hair will grow back,
- **Time consuming** - can be time consuming as hairs are removed individually, though this will improve over time, with practice (HAIRFREELIFE, 2016d).

In summary

- **How it works** - You pull out individual hairs by the root with tweezers,
- **Best for** - Small areas of the face,
- **How long it lasts** - 3 - 8 weeks,
- **Tips** - Clean tweezers with rubbing alcohol/methylated spirits before and after each use to lower your chance of infection,
- **Possible side-effects** - If the hair breaks off, it could grow back under the skin, causing an ingrown hair (WEBMD, 2016d),
- **Advantages** - Very useful for eyebrows or stray hairs on face (JAMES, 2016b),
- **Disadvantages** - Should not be used for nose hairs. Always trim nose hairs to avoid potentially dangerous infections.

- can be painful,
- difficult for large areas,
- may cause ingrown hairs ⁵⁹,
- may cause pitting or scarring,
- requires use of mirror,
- some areas are difficult to do yourself,
- care must be taken when shaping eyebrows: one or two hairs can make a big difference in eyebrow shape (JAMES, 2016b).

Five Easy Steps To Accurate Tweezing

1. Brush hair in the direction of hair growth.
2. Isolate the hair you are about to tweeze.
3. Tweeze in the direction of hair growth.
4. Pull one hair at a time.
5. Pull gently and smoothly, making sure not to yank (JAMES, 2016b).

Shaping Your Brows

The shape of your brow should follow the natural line of your brow bone. The arch should be highest at the outer corner of the pupil. To determine where the brow should begin, place a pencil straight up from the side of the nostril. To determine where it should end, hold the pencil diagonally against the outer corner of the eye pointing up to the brow bone. Brow should extend slightly beyond the eye at which point it should taper slightly down (JAMES, 2016b).

Not Sure How Much to Tweeze?

Be sure to step back from your mirror and check your brows periodically. Tweeze a few hairs from one eyebrow and then the other so they remain symmetrical. Remember that it's better to tweeze too little than too much (JAMES, 2016b).

Do's and Don'ts

- do tweeze in the direction of hair growth,
- do open your pores with a hot washcloth to make tweezing easier,
- do use a make-up concealer to draw your desired eyebrow shape, then tweeze the hairs that fall below the line,
- don't use creams or moisturisers that can cause the tweezer to slip,
- don't tweeze nose hairs or hairs growing out of moles (JAMES, 2016b).

Waxing

Waxing plucks, or removes a group of hairs at the root. Melted wax or a sugar solution (referred to as sugaring) is applied, covered with a linen strip, allowed to cool, and then quickly stripped off, removing the embedded hairs in the process.

Since waxing removes hair en masse, the newly appearing hairs are often finer than those removed. Waxing is chiefly responsible for creating the illusion of diminishing hair growth. The appearance of finer hair actually results from new hair that is in the early growing (anagen) stage. This new hair lay just beneath the surface, and therefore had escaped being waxed away.

⁵⁹See **Ingrown hair** on page 181

Once repeated waxing is stopped, the normal cycle and normal thickness of hair growth returns ([TRANSGENDERCARE, 2016g](#)).

Waxing is a very popular form of hair removal for both men and women, and is relatively easy to do at home, depending on the area being waxed (rather difficult to wax your own back, for example!)

It removes large areas of hair from the root simultaneously, so it is relatively quick, but also pretty painful, especially the first time ([HAIRFREELIFE, 2016a](#)).

Hot Wax vs Cold Wax

Basically there are two main types of wax - hot wax and cold wax. Each of them have their advantages and disadvantages ([HAIRFREELIFE, 2014b](#)). The section below will help you to decide which technique is right for you -

Hot Wax

Hot wax is melted before applying to the skin, then a strip is pressed onto the wax pulled away, taking the hair with it.

This method can be a bit messy and the technique requires a bit of practice to master.

Although more painful than the cold wax option, the process only needs to be done once at each application ([HAIRFREELIFE, 2016a](#)).

- **before using** - wax is melted,
- **wax** - applied on the skin, then removed by a pulling strip,
- **effectiveness** - better: wax adheres more to the hair,
- **cleanliness** - messy,
- **home use** - more complicated,
- **pain** - more, but doesn't need repeated application ([HAIRFREELIFE, 2014b](#)).

Cold Wax

The wax is just warmed with the hands and is on the pulling strip prior to application.

This is an easier and less messy method, but the wax does not adhere to the hair as well as with hot wax and needs to be repeatedly applied to achieve best results ([HAIRFREELIFE, 2016a](#)).

- **before using** - wax warmed up between hands,
- **wax** - already on the pulling strip when applied,
- **effectiveness** - wax adheres less to the hair,
- **cleanliness** - less messy,
- **home use** - very easy,
- **pain** - less, but needs to be applied repeatedly ([HAIRFREELIFE, 2014b](#)).

Is waxing suitable for everybody?

Waxing, if done properly, is not a dangerous procedure. Although it is safe for most people, there are certain conditions for which waxing hair removal is not recommended ([HAIRFREELIFE, 2014b](#)). Before you start waxing, you should consider the following cases -

Diabetes

Waxing with diabetes is not banned, however you should always consult your doctor before you choose this form of hair removal.

During the waxing procedure the hairs are ripped out of the skin, and therefore it leaves the skin more prone to infection. The skin of diabetics is prone to becoming dry as it loses moisture quickly.

On top of this, hot wax is more likely to cause injury to the skin of diabetics. High blood sugar can prolong healing session. Waxing is the most risky if someone has diabetes-related problems with their legs or feet ([HAIRFREELIFE, 2014b](#)).

Haemophilia

People who suffer from haemophilia have to be very careful with any kind of activities. The same applies to waxing - during the waxing hair removal treatment your skin is subject to sudden, strong pressures, and thus the risk of internal bleeding is higher, which can cause complications for haemophiliacs ([HAIRFREELIFE, 2014b](#)).

Hypersensitive skin

Waxing hair removal is not recommended for those with very sensitive skin because of the pain. Sensitive skin can become very red or inflamed ([HAIRFREELIFE, 2014b](#)).

Any type of contagious skin condition

If you have any kind of contagious skin condition like bacteria or viral infections, waxing hair removal is definitely not recommended. Consult your [GP](#) before going ahead with this treatment ([HAIRFREELIFE, 2014b](#)).

Electrolysis treatment in progress

By having waxing hair removal during an electrolysis treatment the treated skin can become reddened, and the hot wax applied on the skin causes irritation. On top of this, waxing before an electrolysis session makes it more difficult for the electrologist to find and remove the growing hairs ([HAIRFREELIFE, 2014b](#)).

Pregnancy

Just like any other huge hormonal change, pregnancy can cause more sensitive skin than normal. It is recommended to ask for a patch test on a very small area of your body and examine the reactions for 24 hours before having full waxing treatment. Waxing is not dangerous for the baby ([HAIRFREELIFE, 2014b](#)).

Sunburn/heat rash

In these cases, you have to wait at least 24 hours before the waxing treatment in order to give some time to your skin to calm down and recover. Otherwise, the skin is too hot and sensitive to touch making the process a lot more painful ([HAIRFREELIFE, 2014b](#)).

Is there any age limit for waxing?

No, however salons may have their own rules and can refuse to treat a minor. Most beauticians agree that it is advisable for the parent or guardian to be present when treating teenagers under the age of 16.

The waxing of private areas, such as Hollywood and Brazilian waxing, are very likely to be refused for anyone under the age of 18 (HAIRFREELIFE, 2014b).

Best for?

Apart from eyelashes and eyelids, every body part can be waxed, from very large areas, such as the full back, to very small parts, for example the toes. However, it is not highly accurate, therefore wax is often combined with tweezers to remove the remaining few hairs, especially in the case of eyebrows (HAIRFREELIFE, 2014b).

Waxing is very best used on large areas such as back, chest, legs, etc (HAIRFREELIFE, 2016a).

The most common areas are as follows -

- **Female waxing**
 - legs,
 - arms,
 - eyebrows,
 - bikini line,
 - armpits (HAIRFREELIFE, 2016a).
- **Male waxing**
 - chest,
 - back and shoulders,
 - upper arms,
 - legs,
 - pubic area,
 - unibrow (HAIRFREELIFE, 2016a).

Waxing is not the most accurate method for precise hair removal, so tweezers can be used to remove any stray hairs remaining after waxing (HAIRFREELIFE, 2016a).

Waxing sensitive areas of your body

The pain threshold varies greatly from one individual to another and also depends very much upon which part of the body is being treated. The waxing of the most sensitive areas will obviously cause the most pain.

The most sensitive body part for most people is the pubic area, however many people find that the waxing of the eyebrows, the armpit and the legs are equally painful (HAIRFREELIFE, 2014b).

Best method

It is always best to read the instructions provided thoroughly prior to use, but here are the key steps -

- sanitise skin and apply baby powder to minimise wax adhering to the skin,
- apply wax in the direction of the hairs' growth,
- smooth strip on it in the same direction,
- grasp strip tightly and pull firmly and quickly in the opposite direction to hair growth,
- repeat until the whole area is smooth and hairless,
- any stray hairs can be removed with tweezers,
- after wax lotion should be applied to remove any remaining wax and prevent the skin from irritation or infection (HAIRFREELIFE, 2016a).

If you find waxing too painful to bear, you can take painkillers or apply a numbing cream (think [EMLA cream](#) or Ametop) to the area prior to treatment, following instructions (HAIRFREELIFE, 2016a).

Pros

- **Versatile** - safe to use for most areas of the body,
- **Covers large areas** - great for large areas, to remove multiple hairs at a time quickly,
- **Cost effective**,
- **Lasting results** - can be anything from 3 - 6 weeks between treatments,
- **Easy to do** - with just a little practice,
- **No black stubble** - regrowth tends to be lighter and finer than with shaving (HAIRFREELIFE, 2016a).

Cons

- **Pain** - one of the more painful methods,
- **Need for visible hair** - hair has to be fairly long in order to remove it effectively with wax,
- **Risk of ingrown hairs**,
- **Risk of burns** - care needs to be taken with hot wax,
- **Can be messy** (HAIRFREELIFE, 2016a).

Why choose waxing?

If you have a large amount of dense hairs that you wish to remove quickly and want it to last for at least a couple of weeks, waxing is the best solution. Although it is not permanent, this method is relatively cheap and makes the unwanted hair thinner and softer after every treatment. Also, after time, treatments are needed less often and become less painful (HAIRFREELIFE, 2014b).

How to prepare for the waxing treatment?

Waxing doesn't need much preparation, however, to make sure that everything is going to be right, there are a few things you should keep in mind (HAIRFREELIFE, 2014b).

24 hours before waxing

As you remove your hair with wax, the top layer of your skin is also removed, therefore it is easier for bacteria to get in. It is very important that you cleanse the area of skin that you wish to wax. If you go to a salon, the beautician should sanitise your skin before the waxing session starts.

It is also recommended to do a body scrub. Scrubbing removes the oldest skin cells on the skins outermost surface, which prevents you from having ingrown hair. **Be careful: if you rub your skin too hard, you can cause irritation!**

Make sure your hair is long enough for waxing. No matter how expert your beautician is, if your hair is too short or too long, it is very difficult to remove it as it does not stick well enough. For the best result, hair should be at least **1/4 - 1/3 inch long**, but not longer than one inch (HAIRFREELIFE, 2014b).

Waxing for the first time

If you have never been waxed before, it might be a good idea to go to a salon for the first occasion. This will give you a chance to watch and learn the correct technique from an expert.

Be warned that if you have always shaved before, removing the hair for the first time might not be easy. Shaving causes thick and coarse hairs to develop and these are tougher to wax (HAIRFREELIFE, 2014b).

The waxing procedure - what should you expect?

Once you are ready with the preparation, waxing can be started. The procedure is basically the same if done in the home or in a salon. Here is what is going to happen -

1. You need to take your clothes off to uncover the parts of your body you want to be waxed. In many salons you will be offered a gown that you can wear to feel more comfortable.
2. Your skin will be sanitised and talcum powder/baby powder will be applied on it. It prevents wax from sticking too much to the skin.
3. Wax will be applied to your skin in the direction of hair growth, and a strip will be smoothed on it in the same direction by giving it a little pressure.
4. The strip will be pulled off quickly from the opposite direction of hair growth, so that the hairs can be removed from the follicles.
5. Step 3 and 4 are repeated until the whole area is hairless.
6. For the best result, the few eventual remaining hairs are usually removed by tweezers.
7. Post-waxing treatment is very important and can't be missed. After wax lotion is added to the skin which removes the residual wax and prevents the skin from infection and irritation in the same time (HAIRFREELIFE, 2014b).

How Painful is Waxing?

Waxing is usually not too painful, but it can be uncomfortable for most people, especially for the first time. Also, there are many factors that can influence the level of the pain (HAIRFREELIFE, 2014b).

What does the pain depend on?

As mentioned above, the pain depends on various factors. The pain that you are feeling during waxing can depend on -

- how sensitive your skin is,
- which part of your body is waxed,
- how high your *hormone* level is (e.g. menstrual cycle, birth control pills, pregnancy),
- individual's tolerance to pain,
- how coarse your hair is (the waxing of previously shaved hair can hurt more!),
- how much your skin is used to waxing (HAIRFREELIFE, 2014b).

The good news is people tend to experience less and less pain the more sessions that they do. This is because the hair becomes softer so it can be removed more easily from the roots, and at the same time your skin gets used to the feeling (HAIRFREELIFE, 2014b).

How to ease the pain?

For very sensitive clients it is recommended to take a painkiller that contains ibuprofen, or an anti-inflammatory at least 30 minutes before the waxing session or to apply a numbing cream (*EMLA cream*/Ametop) about 45 minutes before the treatment (HAIRFREELIFE, 2014b).

Waxing during your period

Although you can wax during your period you should keep in mind that, because of the changing level of *hormones*, the skin can be more sensitive and therefore waxing can hurt more than it would normally. It is recommended to avoid waxing a few days before and during your period (HAIRFREELIFE, 2014b).

How to wax safely

The most important thing when it comes to waxing is to avoid any kind of infection and injuries. First of all, be careful with the temperature. If the wax is overheated, you can easily burn your skin. Secondly, make sure you observe all the rules regarding pretreatments and post-waxing treatments ([HAIRFREELIFE, 2014b](#)).

Post waxing treatments

After the waxing session, the treated skin has to be washed by post waxing lotion. It is very important in order to ease the burning sensation and to avoid ingrown hair and any kind of infection. Products that contain aloe vera or lavender help the sensitive skin calm down the best. If you are waxed in a salon, your beautician should do it automatically (if it doesn't happen you can ask for it), and you should never forget to use it if you wax yourself ([HAIRFREELIFE, 2014b](#)).

Possible risks and side-effects of waxing

Although waxing is very safe if done properly and all the rules are observed, it is not completely risk free. Here you can read about what risks you should be aware of before you decide to do a waxing hair removal.

The most serious risk is to get an infection, however it is very rare.

Folliculitis is a more common risk. In many cases you can avoid it by keeping your skin clean and hydrated. The pubic area is the most likely to get this inflammation, because that is the most warm and humid area of the body.

Waxing can also cause *dermatitis*⁶⁰. This condition is usually not serious, but it can cause a very uncomfortable feeling. You can prevent it by avoiding dry skin and by using oils, creams and mild soaps ([HAIRFREELIFE, 2014b](#)).

48 Hours After Waxing

After waxing hair removal, there are a few things you should be careful with in the first 48 hours. First of all, you mustn't expose your skin to direct sun or use a tanning bed. Also, you should try to avoid perfumes, going to a swimming pool and hot baths. These things can cause inflammation, irritation or infection ([HAIRFREELIFE, 2014b](#)).

Home waxing

You may prefer to choose waxing in the home for various reasons -

- you need hair removal soon, but you don't get an appointment in time,
- you don't like planning ahead,
- you are too shy to show your body to a stranger,
- you want to save money ([HAIRFREELIFE, 2014b](#)).

No matter what the reason is, if you decide to do it yourself, you need to find out which kind of wax is the most suitable for you. Here is a guide on how to use cold wax, or hot wax at home ([HAIRFREELIFE, 2014b](#)).

⁶⁰a general term that describes an inflammation of the skin

Cold wax

It is a very popular method for home use. It is very easy to use it and it is not very messy either. The only disadvantage of it is that this is the least effective type of waxing.

You can buy cold wax in any high-street pharmacy and it is sold in many different shapes and sizes.

After having cleaned your skin properly, you need to warm up the stripes between your hands.

Place the strips on the area you want and smooth it down in the direction of the hair growth.

Then hold your skin above the strip and pull the strip off quickly in the opposite direction of the hair growth. You may need to repeat it in the same place if the hair isn't removed totally. Use baby oil to remove wax from your skin or the moist towel that cold wax kits usually contain ([HAIRFREELIFE, 2014b](#)).

Hot wax

Using hot wax in your home is more complicated, but it is also more efficient than removing hair with cold wax strips.

To use this method at your home, you will need a waxing kit, wax, cloth strips, baby powder, spatula and moist towel. You need to be aware of the mess it may cause!

Heat the wax to the required temperature. A wax heater can help you not to overheat it, which can be dangerous. The ideal temperature is about 86°F - 104°F or 30°C - 40°C. You can test on a very small area of your skin whether the wax is too hot.

Once you have cleaned your skin properly, put some baby powder on it and apply a very thin layer of wax in the direction of hair growth.

Put the cloth strip on the top of the wax and smooth it down with a bit of pressure in the direction of hair growth.

Then you need to rip off the strip quickly starting from the opposite direction of hair growth.

Repeat, applying wax and removing it, until you have removed all the unwanted hair.

Try not to wax the same area again in order to avoid irritation - if there are a few hairs left, you can remove them with tweezers.

Once you are done, clean the waxed area with the moist towel. Using an after wax lotion is highly recommended to prevent irritation, inflammation or infection ([HAIRFREELIFE, 2014b](#)).

Salon waxing

When is it better to go to a professional?

If you're trying to cut back costs, waxing from home is much more cost efficient, although if you want to be treated by an expert, wish to get rid of hair parts that you can't reach by yourself, get through the whole procedure quickly and minimise the possible risks, then we recommend you to choose a salon ([HAIRFREELIFE, 2014b](#)).

How to find a good waxing salon

The number one thing you want to be sure about is the cleanliness of the salon. Waxing increases the risk of infections, so the salon you will be treated in needs to follow recommended practices for hygiene.

The best way to start your search is listening to word of mouth. You can ask about previous costumers' opinion about a given salon.

Make sure that the waxing salon you choose you will be treated by licensed cosmetologists. You can ask the salon if you are not sure about it, but this information should be on display.

You can call the salon over the phone or ask for information by email. They are bound to give you all the information you wish to know. If they refuse it, you should not trust in them and we recommend to look for a different salon instead.

Make sure the salon cares about hygiene. Ask them if the beautician treats clients wearing disposable gloves, if there is a disposable paper sheet on the bed or seat you will be treated in.

Ask the salon about the product they use. A good waxing salon refuses to use harsh chemicals, because they can cause skin irritation. You can ask about the products the salon uses over the phone or by email.

Ideally, before your treatment, you will be asked whether you have any kind of allergies, medical issues or skin condition in order to avoid complications. In the best salons you will be asked to fill out a questionnaire for this purpose before the waxing procedure. Ask the salon whether this is offered.

Overheated wax can be very dangerous - before applying the wax on your skin, a proper beautician will always check its temperature. You should ask how they make sure that the wax is not too hot ([HAIRFREELIFE, 2014b](#)).

How much does waxing in a salon cost?

The cost of a waxing treatment differs from salon to salon. Here is a table of a typical range of prices for certain body parts -

Body part	Price
Underarm	£11 - £19
Arm	£19 - £30
Half-leg	£27 - £30
Full leg	£45 - £53
Bikini	£23 - £27
Brazilian	£34 - £61
Chest	£34 - £42
Back	£30 - £42
Eyebrows	£6 - £15
Chin or lip	£8 - £11

Table 4.1: Typical salon waxing costs per body part ([HAIRFREELIFE, 2014b](#)).

Using a personal hair removal technique first developed in Egypt, a paste of warmed sugar solution or a wax formula is applied to the skin. Cloth strips (usually cotton) are pressed into the paste, and the strips are then pulled away from the skin, bringing the hairs with them. Hair is removed for four to six weeks, and subsequent re-growth is lessened. Waxing and sugaring can safely be used on most body areas, but is usually painful.

These are kits consisting of warmed sugar solution and cotton or cellophane strips. A sugar solution paste is applied to the area for hair removal and then the cotton or cellophane strips are pressed on the paste and pulled away opposite to the hair growth. These may be painful but hair growth is delayed.

- **How it works** - Hot wax is spread on your skin, and then covered with cloth strips. When the wax cools and dries, the strips are quickly pulled off, taking the hair with them. Some types of wax can be pulled off without cloth strips,

- **Best for** - Anywhere on the body, including the face, underarms, legs, and bikini area (CARTER, 2013b), and great for those with coarse, darker hair that tends to be stubborn (DAILYMAKEOVER, 2016).
- **How long it lasts** - 3 - 6 weeks,
- **Possible side-effects** - Redness and bumps. You could also get an infection around the hair follicles. The more often you wax, the less likely you are to have an infection,
- **Tips** - Hair has to be at least 1/4 inch long for the wax to grab it. So let your hair grow for a few weeks before waxing (WEBMD, 2016d). 'Don't drink and wax', warns Noemi Gruenmager, founder and CEO of Uni K Wax Centres. 'Some people come in after consuming alcohol thinking it'll ease the pain, but alcohol tightens pores, making it much more painful'. Stimulants, like coffee, can also increase sensitivity (DAILYMAKEOVER, 2016).
- **Pros** - With waxing, hair appears to grow back more slowly because you are removing each hair directly by the follicle. You will typically be hair-free for about two to eight weeks depending on the texture of your hair and your personal hair growth cycle. Waxing can be relatively inexpensive depending on whether you choose to go to a professional or attempt it at home. Many people say that the pain of waxing diminishes each time but individual experiences do vary.
- **Cons** - Ouch! Waxing is known to be painful. You'll also need to pay attention to your exfoliating routine to ward off ingrown hairs (CARTER, 2013b). Waxing requires some regrowth in order to be effective, as the wax needs at least a quarter inch of stubble to adhere to. Treatments can be moderately painful, as hair is indeed being ripped out at the root, but it becomes more tolerable over time. Waxing can also result in ingrown hairs (DAILYMAKEOVER, 2016).
- **Bottom line** - Waxing is good for keeping unwanted hair away for a few weeks at a time. Waxing is a great solution for larger body areas such as legs, arms, and underarms, for a few weeks. Be prepared to feel a small amount of pain to achieve smooth skin (CARTER, 2013b).
- **Advantages**
 - can be done at home,
 - fast,
 - inexpensive (JAMES, 2016b).
- **Disadvantages**
 - hairs can break off at or below surface,
 - can be messy,
 - consistency is difficult to get correct (JAMES, 2016b).

Why isn't my waxing working?

- **Your hair isn't long enough** - Your hair needs to be at minimum a quarter of an inch (0.6 cm) long in the area where you want to remove your hair. Otherwise the wax cannot adhere to it correctly (HAIRFREELIFE, 2015a).
- **Your hair is too long** - In case your hair is too long, try trimming it down to at the shortest a quarter inch and at the longest a half inch before the waxing session to see if this works better (HAIRFREELIFE, 2015a).
- **You are dehydrated** - When your skin is dehydrated the pores close firmly around the hairs and they tend to snap off rather than be pulled from the root during waxing. It's best to avoid alcohol the night before a wax and to make sure you drink a lot of water both the day before and the day of your appointment. The more hydrated you are, the better the results. This works for all methods of hair removal, and the added benefit is that it will help keep dry skin at bay (HAIRFREELIFE, 2015a).
- **Hair grows in cycles, and the cycles are not synchronised** - This means that one wax session will pull out the hairs that have grown above the level of the skin, but nothing else. Hairs grow on average at a rate of 1/3 of a millimeter a day, and you cannot see how many hairs are just under the skin waiting to pop out! So while your wax session may stop all the hairs that you can see from coming back for 3 - 6 weeks, there is no way to know at what stage of growth other hairs are at. This means that you may see hairs coming through as

- early as 1 or 2 days after you have waxed. These are not hairs that have already regrown, but other hairs that you just couldn't see before (HAIRFREELIFE, 2015a).
- **You aren't doing it properly** - There is a technique to waxing correctly and it is important to make sure that you follow it. This will help avoid hairs breaking off just below the level of the skin and reappearing a few days later, and even more importantly, it will help avoid the appearance of painful ingrown hairs. Wax needs to be applied in strips in the direction of the growth of the hair, and firmly and rapidly pulled off in the opposite direction of the growth of the hair. If you pull the strip off too slowly you risk breaking the hairs and/or leaving all of the wax behind on your skin. If you do it properly your skin will be smooth and the wax strip will be full of hairs. You can tell if they have been pulled from the root if they have a black bulb at the end of them (HAIRFREELIFE, 2015a).
 - **Your hair has been weakened by years of hair removal** - Weakened hairs tend to break off at skin level no matter how hydrated and exfoliated you are. If you notice that many of the hairs that you remove have been broken off then waxing may not be the right form of hair removal for you. At this point it would be a good idea to look into different forms of hair removal, possibly a more permanent one such as electrolysis (HAIRFREELIFE, 2015a).
 - **Your skin isn't dry** - If you just have got out of the shower or you have been sweating, it may affect how well the wax works on your hairs. It is always best to rub the skin down with a towel and apply baby talcum powder to the treatment area to ensure that the wax adheres correctly to the hairs for the best results (HAIRFREELIFE, 2015a).
 - **You aren't pulling in the right direction** - Always look to see which way your hair grows to make sure that you pull the wax off in the opposite direction of the hair growth. Keep in mind that hair grows in all different directions in some areas, such as the armpits, which may call for more than one pass over certain areas. Always make sure to smooth the wax down completely before you pull it off (HAIRFREELIFE, 2015a).
 - **Your beautician has not been properly trained** - Maybe your beautician hasn't taken the time to match the correct wax and technique with your skin and hair type or simply hasn't been properly trained. Try troubleshooting the issues with him or her, but if they cannot come up with a solution it would make sense to try another salon or spa. If you are waxing at home, try using a different wax or technique (HAIRFREELIFE, 2015a).
 - **You aren't using the right type of wax for your hair type** - It is probably that you aren't using the right type of wax or you aren't using the wax correctly according to type. Soft wax (used with strips) needs to be applied in a thin coat that just covers the hairs. If you layer it too thickly it may not work and can possibly lead to bruising. Hard wax (stripless) works best on thick, coarse hair, and needs to be applied thickly and left to harden. If you don't wait long enough it will not have had time to shrink wrap the hairs and will not work. Cold wax tends to be more painful and is often not pulled firmly enough which will leave you with skin full of wax - and hair (HAIRFREELIFE, 2015a).

Sugaring

Sugaring is a form of hair removal that's very similar to waxing - hair is removed at the root. Sugaring involves applying a warm gel or paste to your skin, then removing the "sugar" with a cotton or muslin strip. Sugaring paste is also usually made from natural ingredients such as sugar, honey and lemon (CARTER, 2013b).

- **Pros** - Sugaring paste or gel is usually a mixture of natural ingredients. This can mean there is less risk of skin irritation, making sugaring a great option for those with sensitive skin. The risk of accidental burning is also reduced because sugaring paste or gel is typically applied at a lower temperature than wax. Similar to waxing, sugaring will keep hair away for two to eight weeks.
- **Cons** - Much like waxing, there is a pain factor associated to this method of hair removal. It can also be difficult to find salons that offer sugaring as a service because most offer waxing. If sugaring is available, it tends to be a little more costly than waxing. For both sugaring and waxing, ensure the salon or practitioner maintains good hygiene standards.

- **Bottom line** - If you have sensitive skin, can bear the pain, and are willing to pay a little more, sugaring is a great hair removal option. Hair will stay away longer and, over time, your follicles may be less noticeable. Sugaring can be a great long-term hair removal method (CARTER, 2013b).

Threading

Called khite in Arabic and fatlah in Egyptian, it's a less common method in the West for removing hair at the root, used primarily on facial hair. Rows of stray hairs are yanked out with twists of cotton thread (JAMES, 2016b).

Threading is a very old form of hair removal practiced in countries such as India and Pakistan, and the Middle East. The technique is commonly used to shape the eyebrows and remove unwanted hair from the upper lip and areas of the face. The procedure utilises a piece of cotton thread which is twisted and pulled along the area of unwanted hair, lifting hair directly from the follicle. The pain experienced during threading is comparable to that experienced during tweezing or waxing. The practice of threading is utilised far less than waxing. However, threading does not normally produce the same degree of irritation as waxing, which strips the top layer of dead skin in the process (TRANSGENDERCARE, 2016g).

In this ancient Middle Eastern method of personal hair removal, cotton thread is entwined with facial hair on the upper lip or eyebrow by rolling it along the skin and then pulling hairs out. It lasts three to eight weeks, and causes minimal skin irritation.

Threading essentially removes hair in the same way as tweezing i.e. by plucking it out from the root, but can remove several hairs at a time.

Although cheap, simply utilising a length of thread, and can be done at home, the technique does require some skill and practice to become efficient.

Often offered in salons, it is quicker than tweezing, but unless you have time to master it, is probably best left to the professionals (HAIRFREELIFE, 2016a).

- **Pros** - Threading is much quicker than tweezing, usually taking only a few minutes to achieve a polished brow area. It's an inexpensive way to get shapely eyebrows, and the pain is about the same as plucking. If you go to an experienced professional, they can quickly shape your brows to the arch that best suits your face and eye structure.
- **Cons** - Threading is recommended as a hair removal method on small areas; it's not an option for removing body hair. It can be very painful for men because they have thicker facial hair (JAMES, 2016b).

Recently, there have been concerns around the hygiene of threading and you'll need to decide how you feel about the process - if you're unsure, ask to watch the technique before booking your appointment. If done incorrectly, hair won't be pulled from the roots and may instead be snapped at skin level, which means noticeable regrowth occurs sooner.

- **Bottom line** - Threading is a great hair removal option for the eyebrow area or for women looking to remove any other unwanted facial hair. Make sure to ask your friends for recommendations or do your research and go to an experienced professional (CARTER, 2013b).
- **Advantages** - Inexpensive, fast, neat, considered less painful than plucking for many. Good for eyebrows and facial hair. Like plucking, results can last up to two to four weeks (JAMES, 2016b).
- **Disadvantages** - Hard to find a professional practitioner outside large cities. Can be painful and cause itching afterwards. Side-effects can include *folliculitis*, skin reddening or puffiness, and changes in skin pigment (JAMES, 2016b).

Friction

Less common method of removing hair at skin's surface, but some consumers find it primarily useful for fine hair on legs (JAMES, 2016b).

- **How it works** - A rough surface is used to buff away hair at the skin's surface. The mitt usually has rough strips or a smoothing surface coated directly onto the mitt (JAMES, 2016b).
- **Advantages** - Inexpensive, fast, essentially painless, can be done at home, available widely, also exfoliates and smooths skin. Many types can be used wet or dry. Good for legs with fine hair. Some use it between shaving or waxing sessions (JAMES, 2016b).
- **Disadvantages** - Effect lasts a short time - anywhere from a few hours to several days. Dark-haired users may have visible "shadow" of dark hair under skin. Often requires use every two or three days. Can cause skin irritation if rubbed too hard. Do not use on face, arms, or bikini area. Do not use on irritated or damaged skin (JAMES, 2016b).
- **Tips** - Legs should be clean and dry. Slip the mitt over your hand with abrasive side facing the legs. Select an area of skin surface approximately the size of the mitt. Use small circular movements and gentle pressure to smooth the surface of your skin. Without lifting mitt off the skin surface, alternate between clockwise and counterclockwise motions until all hair is removed. Do not rub too hard or you may irritate the skin.
 - Wash the mitt in warm soapy water to maintain its cleanliness and effectiveness.
 - Surgi-Soft Mitt is made for use on legs only.
 - Do not use on face, arms, or bikini area. For sensitive skin, 'condition' the mitt by gently rubbing on palm for a few seconds to remove the coarser grit.
 - Do not use on irritated or damaged skin.
 - If irritation occurs, discontinue use.
 - Do not stroke up and down or apply too much pressure.
 - Keep out of reach of children.
 - Follow up with a mild lotion (JAMES, 2016b).

Epilating

The use of epilators for hair removal has increased in popularity as the technology has advanced and new design features have made them more efficient and easier to use (HAIRFREELIFE, 2015c).

Essentially an epilator is a device for simultaneously plucking multiple hairs (HAIRFREELIFE, 2016a).

The literal definition of epilation is the removal of hair by the roots, and is derived from the French word *épiler* and the Latin word *pilus*.

Therefore, although it has widely become associated with epilators, the term epilation actually relates to any form of hair removal involving action to the roots e.g. tweezing⁶¹, waxing⁶², sugaring⁶³ and electrolysis⁶⁴ etc.

This differs from depilatories⁶⁵, which refers to hair removal from above the skin i.e. shaving and depilatory creams (HAIRFREELIFE, 2015c).

⁶¹See **Tweezing** on page 59

⁶²See **Waxing** on page 67

⁶³See **Sugaring** on page 77

⁶⁴See **Electrolysis** on page 126

⁶⁵See **Depilatories** on page 54

What is an epilator?

An epilator is basically an electrical device for simultaneously plucking multiple hairs, in much the same way as a pair of tweezers can be used to remove individual hairs (HAIRFREELIFE, 2015c).

How do epilators work?

There are 3 types of epilator, all working on the same basic principal but utilising a spring coil, rotating discs or metal plates in the device head (HAIRFREELIFE, 2015c).

Spring

The original epilator, Epilady, brought out in the mid-80's, uses a coil spring in the head, held in a curved position. This obviously causes the edges on one side of the coil to be opened out, whilst on the opposite side they are closed tightly together.

The electrical motor is used to continuously rotate the spring as the device is moved across the skin. The hair is trapped in the closed side of the coil, pulled out and released as the coil re-opens.

One disadvantage of this type of epilator is that eventually the tension in the coil lessens and its effectiveness decreases. It therefore becomes necessary to purchase a replacement spring.

In addition, it is more likely to experience pinching when using the electric spring type epilator than the newer, tweezer type devices.

This type of epilator has become outdated and largely replaced by the newer models, although there are manual epilators such as Bellabe, that are sold for use on facial hair.

These manual epilators consist of a coil spring with a handle at each end. The spring is bent into a curve to splay it open on one side and placed against the skin. The handles are then turned in opposite directions, whilst moving gently across the skin, causing the coil to rotate and "pluck" the hair in a similar way as the electric epilator works (HAIRFREELIFE, 2015c).

Disc

Following the success of the Epilady, rival epilators were developed and brought to market. These used a series of rotating metal discs to perform the same function as the spring coil of the Epilady.

As with the spring, when the edges of the rotating discs are together, they grasp the hair and pull it out at the root, then release the hair as the edges rotate to an open position (HAIRFREELIFE, 2015c).

Tweezer

This is the newest and most refined type of epilator. The head consists of a series of metal plates which have a 'tweezer' action as it rotates, continuously moving together and then apart.

As with the earlier models, the hair is caught between the closed plates, pulled out at the root and then released as the plates part (HAIRFREELIFE, 2015c).

Parts of the body

Epilators can be used on all parts of the body, but there are a few things to bear in mind when choosing which one to buy, if you wish to do so with one, multi-purpose device -

- **recommended usage** - ensure to check carefully to see that the epilator is recommended for use on each of the areas that you wish to treat,
- **attachments included** - different parts of the body require different attachments e.g. facial cap or sensitive area cap,
- **speed settings** - most epilators have 2 speed settings, but do check this so that the correct setting can be used for each body part ([HAIRFREELIFE, 2015c](#)).

Features

With so many different epilators on the market, it can be very difficult to choose which is the best for you.

Given that epilators range in cost from a budget version at around \$35 up to \$130+ the first thing you should decide is how much you wish to spend, bearing in mind that it will be a one-off investment.

This will narrow down the options, after which it will be a case of working out which features you require as a 'must have', which are desirable if within budget and which you could live without ([HAIRFREELIFE, 2015c](#)).

To help with this, we have listed below all the features we could find across all makes and models, with a brief outline of the advantages of each (if not obvious) -

- **wet/dry option** - essential if you want to use in the shower or bath,
- **ceramic textured plates** - to effectively capture very fine hair,
- **hypo-allergenic discs** - for sensitive skin,
- **cordless operation** - convenient and easy to use,
- **rechargeable batteries** - no need to purchase expensive replacement batteries,
- **dual speed** - so speed can be altered depending on body part and preference,
- **hair lifter** - to raise the hair up making it easier for the plates to grasp and less likely to miss any hairs,
- **massage attachment** - to reduce pain for more gentle epilation,
- **underarm cap** - specifically for underarm use where skin is sensitive,
- **trimmer cap** - to trim hair to optimum length prior to epilating,
- **ice cap** - to reduce pain and soothe the skin,
- **shaver head** - can be used to shave certain areas for multi-function usage,
- **trimming Comb** - for trimming hair prior to epilating,
- **light inbuilt** - helps to pick out finer hairs to avoid missing any,
- **cleaning brush**,
- **cooling glove** - use to cool skin prior to epilating and soothe it afterwards,
- **storage pouch** - great when travelling ([HAIRFREELIFE, 2015c](#)).

Manual epilators

There are manual epilators, such as the Bellabe, that are for use on facial hair, which use a coil spring with a handle at each end.

The spring is bent into a curve so that it is splayed open on one side and then placed against the skin.

When the handles are turned in opposing directions, the coil rotates to trap hair between the closing edges and pluck the hair from the root ([HAIRFREELIFE, 2016a](#)).

Electric epilators

The first electric epilators used a coil spring in much the same way as described, but with a motor to rotate the coil.

As technology has improved, these have been replaced with first disc, and then tweezer type epilators ([HAIRFREELIFE, 2016a](#)).

Rotary epilators

These devices are similar to electric razors, except instead of a cutting blade on a rotary head, they have rows of tweezers which can pull hairs out by the root ([JAMES, 2016b](#)).

When considering the outlay, do remember that it will be a one-off purchase which should last for many years ([HAIRFREELIFE, 2016a](#)).

These devices are similar to electric razors, but with rows of tweezers on a rotary head instead of a cutting blade. Rotary epilators pull hairs out by the roots. The results last from several days to several weeks, and are good for arm and leg hair. Personal hair removal using rotary epilators is painful, especially on sensitive areas.

These are devices that act as electrical tweezers. These are ideal for removing hair from areas such as legs and arms. Not recommended for sensitive areas as it can be painful ([HAIRFREELIFE, 2016a](#)).

Best for?

Epilators can be used on all parts of the body, but do check carefully if you wish to use one device for multi-purposes that it is recommended for use on each area that you wish to treat.

This is because you will need different attachments e.g. facial cap or sensitive area cap and at least 2 speed settings, depending on what you will be using it for ([HAIRFREELIFE, 2016a](#)).

Best method

Obviously it is important to follow the instructions provided with the device, but we have listed below a few basic good practice guidelines -

- the optimum length of hair for effective use of an epilator is 0.5 mm (if longer, it is likely to be more painful),
- for dry use, ensure that the skin is clean and dry - wash and exfoliate prior to use to remove traces of dirt or grease, bacteria and dead skin cells,
- you can rub in some baby powder to help the hairs stand up,
- for wet use, take a warm shower or bath and gel or foam can be used if you wish,
- hold the skin taut with one hand, holding the epilator at a 90 degree angle to the skin - do not use pressure, simply glide across the skin,
- move the epilator slowly in the opposite direction to the the hairs' growth, in straight lines - you will need to do this more than once to ensure that you have caught all the hairs,
- after epilating, exfoliate gently with a loofah or exfoliating glove, and pat dry carefully,
- use a soothing antiseptic lotion on the area and avoid deodorants or perfumed products,
- clean and disinfect your epilator ready for next time ([HAIRFREELIFE, 2016a](#)).

How to use

Obviously, as with any electrical device, it is important to read carefully and follow all the manufacturers instructions.

We have outlined a broad guide, including hints and tips, on how to use an epilator and best practices before and after use for optimum results and to reduce pain and side-effects ([HAIR-FREELIFE, 2015c](#)).

Preparation

To prepare your skin for dry use, you should ensure that it is clean, dry and free from any chemicals, oils or creams.

It is a good idea to exfoliate to remove any residual bacteria and dead skin. This also causes the hair to stand up, making it easier for the epilator to grab them.

A baby powder can be rubbed into the skin to further aid the hair to stand up.

For wet use, sit in a warm bath or stand under a warm shower for several minutes to allow the hair to relax and pores to open.

You may use a foam or gel with the epilator if you wish.

Optimum length of hair is usually 0.5mm. The longer the hair, the more painful it tends to be ([HAIRFREELIFE, 2015c](#)).

Using the epilator

It is very important to hold the skin taut with one hand, whilst holding the epilator at a 90 degree angle to the skin ([HAIRFREELIFE, 2015c](#)).

Do not use pressure to push down on the epilator.

Run the epilator very slowly in straight lines, in a direction opposite to the way the hair is growing.

You will need to go slowly and most likely cover the same area more than once, to ensure all the hairs are "caught".

Some hairs may break, leaving a faint stubble effect, although not as evident as with shaving, as most hair will have been plucked. These can be shaved later, and then captured with the epilator next time.

If your hair is prone to breaking a lot, it is advisable not to use it wet, but to use the dry method as water tends to soften the hair ([HAIRFREELIFE, 2015c](#)).

After-care

When you have finished, you should exfoliate very gently with a loofah or exfoliating glove.

Dry skin carefully by patting, and apply a soothing, antiseptic lotion. Avoid using deodorant and anything harsh or perfumed.

If you have used the epilator dry, clean with the cleaning brush provided, or if wet, rinse thoroughly under the tap and dry carefully.

In either case, disinfect with a suitable alcohol-based cleaner to avoid causing infections ([HAIR-FREELIFE, 2015c](#)).

Pain

Pain is, of course, subjective and each individual will have a different pain tolerance level.

However, it is inevitable that when hair is torn out by the root there will be pain. How much pain largely depends upon the area of the body and the sensitivity of the skin.

Epilators can be very painful the first time you use them, but it is universally accepted that, if you can grit your teeth and persevere, your skin will gradually become more tolerant and the pain will reduce dramatically over time (HAIRFREELIFE, 2015c).

Side-effects

There should be no serious or long-lasting side-effects from using an epilator (HAIRFREELIFE, 2015c).

That said there are some common, transient side-effects that usually last only a few hours -

- redness/irritation of the skin,
- appearance of tiny red blood spots on the skin,
- an open pore look to the skin, giving it a similar appearance to that of a plucked bird (HAIRFREELIFE, 2015c).

These side-effects are likely to become less and less over time, as your skin becomes accustomed to the epilator and the hair to be removed becomes finer and less dense.

We would advise you to use the epilator at night, before going to bed so that the effects have time to pass, before having to go out. Also, rough or tight clothing may cause further irritation, immediately following treatment.

Using a natural, antiseptic lotion such as 100% tea tree or witch hazel will help to soothe the skin and prevent any infection.

A further, more troublesome side-effect of using an epilator can be ingrown hairs. However, with careful preparation and after care, as explained in how to use ⁶⁶ above, the risk can be minimised (HAIRFREELIFE, 2015c).

In summary

Pros

- **low cost** - although initial outlay may be high, there are no ongoing costs or replacement parts needed,
- **no mess** - unlike waxing and shaving,
- **safe** - there are minor, transient side-effects if any, and skin is not damaged (unlike with waxing, the epilator only affects the hair itself) (HAIRFREELIFE, 2016a),
- **convenient** - for use at home and can easily be taken with you on your travels,
- **relatively long lasting** - anything up to 3 - 4 weeks, longer over time,
- **can treat very short hairs** - from 0.5mm - no need for unsightly regrowth between use,
- **finer, less re-growth** - with regular use, over time, regrowth is widely reported to become finer and lighter,
- **no skin damage** - unlike waxing, epilators remove hair without removing the top layer of skin,
- **wet or dry** - wet or dry device can be used in the shower or bath (HAIRFREELIFE, 2015c).

Cons

- **pain** - one of the more painful methods of hair removal, although tolerance will build up over time,
- **risk of infection** - should not be a problem with good aftercare regime,
- **slower** than shaving, waxing and depilatory creams (HAIRFREELIFE, 2016a),
- **not permanent** - the hair will grow back,
- **risk of ingrown hairs** - in common with many hair removal methods (including waxing),

⁶⁶See **How to use** on page **82**

- **risk of infection** - epilated skin is more at risk immediately afterwards as the hair follicles are opened. Can be minimised with good after care regime (HAIRFREELIFE, 2015c).
- **Advantages**
 - good for legs and arms,
 - can last from several days to several weeks (JAMES, 2016b).
- **Disadvantages**
 - can be hard to use on backs of legs,
 - skin must be pulled tight to avoid pinching,
 - some find it uncomfortable, especially on sensitive areas,
 - harder to use on fine hairs,
 - hair must be grown long enough for tweezers to grasp,
 - plucking hairs can lead to irritated skin and ingrown hairs (JAMES, 2016b).

Laser

Laser hair removal has been commercially available since the mid 1990's. Its efficacy is now generally accepted, and its popularity is growing steadily.

According to the American Society for Aesthetic Plastic Surgery, laser hair removal was the third most popular non-surgical aesthetic procedure carried out in 2012 (with the number of treatments exceeding 1.2 million) (HAIRFREELIFE, 2015b).

What is laser hair removal?

Laser hair removal is the removal of unwanted hair by the process of selective photothermolysis. That is to say that the area being treated is exposed to pulses of laser light with the aim of destroying the hair follicle, causing the hair to fall out (HAIRFREELIFE, 2015b).

Light energy from the laser source is absorbed by melanin in the hair roots and converted to heat, which then destroys the hair follicle. The laser source is applied to the skin surface and several follicles can be treated simultaneously, meaning it is a much more rapid treatment than electrolysis. Laser hair removal is most effective in those with dark hairs and fair skin, but modern lasers are also able to treat those with racially pigmented skin. It is not suitable for treating non-pigmented hairs. Laser hair removal is expensive and treating large areas of skin is still a major undertaking. Permanency is not guaranteed and, like electrolysis, repeated treatments may be needed. Side-effects include scarring, pigment changes in the skin and, rarely, increased hair growth. Effective treatment may require access to more than one type of laser.

Laser hair removal has the potential to provide permanent diminishment of finer, shallowly rooted hair. Over the last few years, its clinical usage has risen dramatically compared to other nonsurgical cosmetic procedures. Currently, the overall technology does not provide a viable method for thick, coarse hair such as that found in the beard. But while laser technology is not currently an effective method of permanent beard removal, it should be considered as an alternative to electrolysis for those individuals who have some sparse, shallow (preferably dark coloured) hair growth remaining. Since the risk factors for laser procedures are greater than needle type electrolysis, we recommend these procedures be performed by doctor (TRANSGENDERCARE, 2016i).

Laser for hair removal was invented in the early 1960's. This technology uses a light beam to transform energy into heat, aimed at the hair follicle, through the skin. Laser treatments can be used on all body sites. While safe, laser treatment is often painful and due to light absorption properties of colour - unsafe to apply to dark or suntanned skin, therefore not designed for personal hair removal. In addition it is usually ineffective on blonde or red hair. Since lasers can destroy large numbers of follicles at a time, it is not as time consuming as electrolysis. Repeated treatments are usually necessary to remove all hair, and further treatments may be necessary from time to time to maintain results.

The idea of using a laser to target a hair resides in the tendency of a dark object (the hair root) to absorb energy more efficiently than the surrounding tissue. It still seems to require about 280 degrees Fahrenheit to render a follicle damaged (LAIRD, 2014b). 280° Fahrenheit, yikes!!!

Very little is known about the long-term impact of laser use and information is difficult at best to obtain about the true results of laser electrolysis.

It is commonly known that laser electrolysis works on a long-term basis in only about 1 out of 50 cases.

Over a five year period, a clinic in Bilbao, Spain, treated 543 patients, using a long-pulsed 755 *see 'nanometer' (nm)* alexandrite laser (Gentlelase, Candela) in 85% of cases, an *intense pulsed light (IPL)*⁶⁷ source (Epilight, Lumenis) in 10% and a 1,064 nm Nd:YAG laser (Lyra, Laserscope) in 5%. Treated areas include the beard, neck and chin, excluding the upper lip. Patients received between three and 23 treatments, with treatments usually performed every two to three months. The results are interesting, nearly 80% of patients saw some hair reduction with ongoing treatment, around 8% showed no improvement, and 10.5% experienced increased hair growth versus baseline (WILLEY et al., 2007).

How laser hair removal works

Laser hair removal devices use visible and invisible (infrared) light to target the dark pigment, melanin, found in hair and skin.

Melanin, which is prevalent around the base of the hair follicle, absorbs the light which is converted to heat energy. This, in turn, damages the follicle sufficiently to cause the hair to fall out, usually 1 - 2 weeks following treatment.

The process matches a specific wavelength of light and pulse duration, determined by the skin and hair type of each individual. The ultimate goal is to try to cause sufficient damage to prevent regrowth.

Hair removal lasers operate between 700 - 1400 *nanometers*⁶⁸ (nms) depending on which type of laser is being used (HAIRFREELIFE, 2015b).

Basic principle

Regardless of the laser system used, the basic principle in terms of hair removal is the same - selective photothermolysis - or the matching of the wavelength and pulse duration of light to achieve the optimal effect on hair follicles while having minimal effect on adjacent tissues. Lasers can create localised damage by heating melanin in the follicle, while leaving the rest of the skin intact. Dark objects tend to absorb more light, which means laser energy is absorbed faster and with more intensity by dark matter in the skin. This dark matter is called chromophore.

Melanin is the main chromophore for all types of hair removal laser systems in the market today. Melanin is a naturally occurring pigment in the skin and is responsible for hair colour. The human hair has two types of melanin - eumelanin and pheomelanin. Eumelanin gives hair black or brown colour pheomelanin gives hair red or blonde colour. Since photons of light are selectively absorbed, only brown or black hair can be effectively removed. Moreover, laser works well with hair that is dark and coarse. The best results are usually achieved in patients with light skin tone and dark hair (LASERHAIRREMOVALGUIDE, 2016).

⁶⁷intense pulsed light

⁶⁸A nanometer is the unit of measurement for the wavelengths of light and infrared radiation

Are you an ideal candidate for laser hair removal

Almost everyone is a candidate, but the procedure is best for patients with dark hair and light skin. The reason behind this is that the laser is able to differentiate hair from skin, meaning you want the laser to detect the hair without detecting the surrounding skin, since the objective is to make the hair absorb the laser energy. With that said, patients with hair pigmentation are ideal candidates for laser hair removal, so long as the hair is not located around the eyes.

It is actually easier to identify patients who are not good candidates for the procedure. These include patients with blonde or white hair, or patients with unibrow. For this group, electrolysis or waxing is usually recommended. For those with dark skin, it is important to know that the risk of scarring is higher because the laser will find it harder to differentiate between hair colour and skin tone. The best thing to do is to discuss your situation with your chosen practitioner during the initial consultation ([LASERHAIRREMOVALGUIDE, 2016](#)).

How long to see results?

There is no single definitive answer to this question as it depends upon a number of variables, including the skin and hair type of the individual, the part of the body being treated, how large the area is, how well the area responds at each session and the type of laser used.

It is fair to say that laser hair removal, in any case, is not a one-off treatment and multiple sessions will be required, probably between 6 - 8 at intervals of several weeks.

The hair in the treated area will fall out 1 - 2 weeks following the treatment. Results should become more noticeable after about the 3rd session, and progressively after each following session ([HAIRFREELIFE, 2015b](#)).

Why multiple sessions?

To fully understand why many sessions of treatment are required, it is necessary to first have a basic understanding of the hair biology⁶⁹ and the hair growth cycle⁷⁰ ([HAIRFREELIFE, 2015b](#)).

Significance to laser hair removal

All hair is not in the same growing stage at the same time, so when an area is treated only a percentage of the hair follicles will be affected.

Therefore, it is necessary to re-treat the area several times to make sure all the follicles are caught at the correct time ([HAIRFREELIFE, 2015b](#)).

Is laser hair removal permanent?

The [FDA](#) has recognised and approved certain devices as providing permanent hair **reduction** ([HAIRFREELIFE, 2015b](#)).

Their definition of this is -

- “ The long term, stable reduction in the number of hairs re-growing after a treatment regime, which may include several sessions.
Permanent hair reduction does not necessarily imply the elimination of all hairs in the treatment area. ”

⁶⁹See **Hair biology** on page **10**

⁷⁰See **The hair growth cycle** on page **13**

What does permanent hair reduction mean?

The [FDA](#) further states that the number of hairs re-growing must be stable over time greater than the duration of the complete growth cycle of hair follicles.

As can be seen from the table at hair growth by body part ⁷¹, this can vary from 4 - 12 months depending on body location. So in terms of the [FDA](#) definition, 'permanent' can vary.

Good results can be achieved, of up to 80% reduction or more. It is most likely that, following initial treatment regime, top-up maintenance sessions will be required at least annually ([HAIRFREELIFE, 2015b](#)).

Is success guaranteed?

According to the American Society for Dermatologic Surgery it is impossible to determine in advance who will require how many treatments and how long hair will remain gone.

In fact, success generally is impossible to determine in advance. Inexplicably, some individuals who are seemingly 'ideal' candidates i.e. with light skin and dark hair, will not respond well to the treatment.

Conversely, some have reported complete hair removal (this is not necessarily common and should not be expected).

It is true to say, however, that good results have been achieved in the majority of cases and that many individuals have expressed themselves very happy with the outcome of their treatment ([HAIRFREELIFE, 2015b](#)).

Laser hair removal - limitations

Whilst certain lasers for hair removal are now able to successfully treat darker skin, there are still none suitable for fair, grey or light red hair.

Although it is likely that this will be remedied at some time in the not too distant future, the only permanent solution in these cases currently available is electrolysis ([HAIRFREELIFE, 2015b](#)).

What are the different types of laser?

With the popularity of laser hair removal steadily increasing all the time it is no surprise that the technology is advancing in leaps and bounds.

There are many different devices currently in use, utilising various laser systems, namely Ruby, Alexandrite, Diode and Nd:YAG.

The following gives a brief summary of each type of laser, their relative merits and disadvantages and for which skin tone on the Fitzpatrick scale each can be used ([HAIRFREELIFE, 2015b](#)).

The Fitzpatrick Scale

The Fitzpatrick scale was developed in 1975 to classify complexions and their tolerance to sunlight. It is widely used as an aid to determining which laser hair removal treatment is most suitable for each individual ([HAIRFREELIFE, 2015b](#)).

⁷¹See [Hair growth by body part](#) on page 16

Skin type	Skin Colour	Hair Colour	Eye Colour	Description
1	White/very pale	Blonde	Blue, grey, green	Always burns, never tans
2	Pale white with beige tint	Chestnut/dark blonde	Blue	Always burns, sometimes tans
3	Beige to light brown (olive)	Dark brown	Dark brown	Sometimes burns, always tans
4	Light to moderate brown	Black	Brown	Rarely burns, always tans
5	Medium to dark brown	Black	Brownish black	Rarely burns, tans more than average
6	Dark brown to black	Black	Black	Never burns

Table 4.2: The Fitzpatrick Scale ([HAIRFREELIFE, 2015b](#)).

Types of laser

- **Ultimate Light or Pulsed Light (IPL)** - This system generates the widest range of wavelength, between 515 *nm* and 1200 *nm*. The quality of light produced varies from one to four pulses and from very short to extremely long durations. There are different machines in the market including EpiLight, Aculight, Quantum, PhotoDerm and Vasculight. The functionalities of these machines differ. EpiLight is the most advanced and specific for hair removal purposes. PhotoDerm is the original equipment which was developed for treating facial blood vessels, facial Rosacea, leg veins and other vascular problems.
- **The Diode Laser** - This system delivers either 800 *nm* or 810 *nm* wavelength. It is one of the most promising systems in the market today and ranks second to EpiLight as the most effective light source for hair removal. The Diode systems generate a longer wavelength when compared to the Alexandrite (755 *nm*) and the Ruby (694 *nm*), but a shorter one than the Nd: Yag (1064 *nm*) laser.

Their longer wavelengths allow the light to go deeper into the skin and are considered safer than lasers with shorter wavelength since they are more effective in avoiding melanin pigments in the epidermis. The longer wavelength is also capable of penetrating the hair follicle without inflicting much epidermal damage. Hence, the Diode laser can be used for patients with darker skin colour.

- **The Nd: Yag** - This laser system generates 1064 *nm* wavelength and can treat any skin colour. However, there is not enough clinical evidence that it can provide long-term hair removal. The original Nd: Yag lasers with ultra short durations used with tar solutions delivered short-term hair loss and there was complete hair regrowth within six months. The latest Nd: Yag systems use longer pulse durations but they are very painful as reported by patients. Moreover, there is not enough data showing that long-term hair reduction can be achieved by modified Nd: Yag laser systems ([LASERHAIRREMOVALGUIDE, 2016](#)).

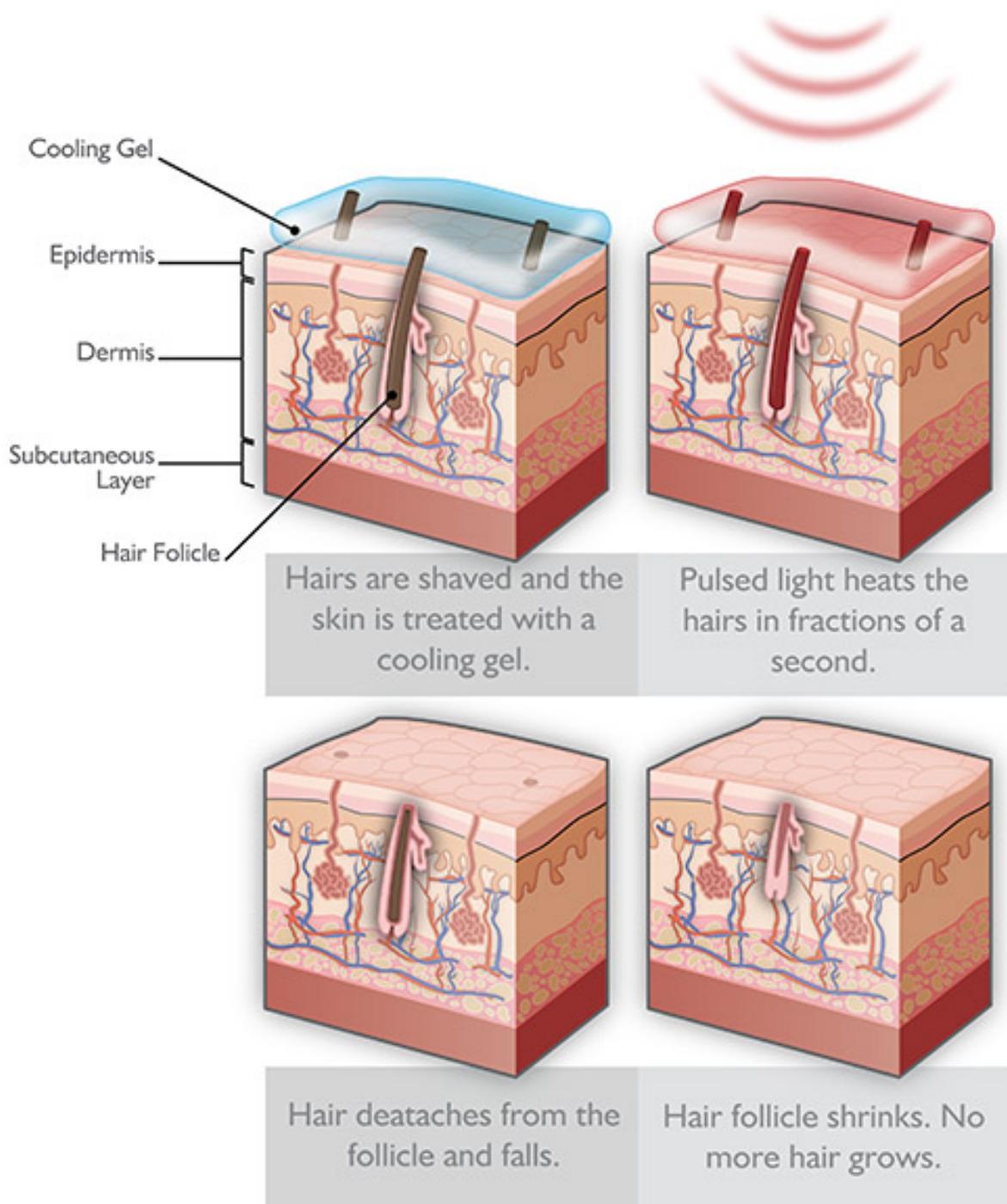


Figure 4.1: How the laser system works

- **Alexandrite** - This system has a shorter wavelength, exactly 755 *nm*. This laser can selectively target deeper hair structures and proves to be effective when treating patients with light skin complexion and hair that is dark enough to allow the laser to penetrate deep into the follicle. Although it is said to be ideal for attaching to melanin, there have been documented reports of side-effects like skin discoloration.
- **Ruby** - This is the oldest laser system developed for hair removal purposes. It emits 694 *nm* wavelength and works well for patients with fine and light hair types. It is known for achieving long-term hair reduction for fair skin and dark hair types. However, it cannot be

used on patients with dark complexion. It also covers a smaller area when compared to other more advanced laser equipment ([LASERHAIRREMOVALGUIDE, 2016](#)).

The Ruby Laser

The Ruby Laser (epilaser) was the first to be developed for use commercially as a laser hair removal system. It has a proven track record for both efficacy and safety.

It works best for those with light skin and dark hair, and has an inbuilt cooling system which conducts heat away from the skin before, during and after each pulse of the laser.

There is a 2 second delay between each laser pulse in order to take the heat from the skin, thus reducing the risks of burns. This also reduces the pain - the quicker the laser pulse, the more discomfort is felt ([HAIRFREELIFE, 2015b](#)).

Wavelength

694 *nm* ([HAIRFREELIFE, 2015b](#)).

Which skin type?

Skin types 1 and 2 on the Fitzpatrick scale ([HAIRFREELIFE, 2015b](#)).

Pros

- long term hair reduction can be achieved,
- less painful than other laser hair removal systems,
- hair regrowth is often finer and sparser,
- built in cooling equipment minimises risk of burns and other side-effects ([HAIRFREELIFE, 2015b](#)).

Cons

- not suitable for tanned or dark skin,
- relatively small treatment area,
- slow laser repetition rate means longer treatment times,
- some risk of burns, scars, redness, swelling, and skin discolouration,
- technology has become somewhat outdated as newer, more sophisticated systems have been developed ([HAIRFREELIFE, 2015b](#)).

Summary

The Ruby laser has a long track record of achieving good results in hair reduction for those with dark hair and fair skin.

There are other, newer types of laser devices which have been developed to treat individuals which fall outside of these parameters ([HAIRFREELIFE, 2015b](#)).

The Alexandrite Laser

The Alexandrite laser uses an alexandrite crystal as the laser medium, emitting red, near infrared light.

This laser has a relatively large spot size and so is considered to be the fastest of the lasers. It has the ability to treat large areas, e.g. back and chest very quickly.

It is most effective for light - olive skin tones and dark hair ([HAIRFREELIFE, 2015b](#)).

Wavelength

755 *nm* (HAIRFREELIFE, 2015b).

Which skin type?

Skin types 1 to 3 on the Fitzpatrick scale (HAIRFREELIFE, 2015b).

Pros

- rapid laser repetition means short treatment times,
- effective on skin types from white to olive tones,
- can effectively treat thinner hair types than other lasers,
- covers large areas of skin, with excellent penetration rate (HAIRFREELIFE, 2015b).

Cons

- not suitable for tanned or dark skin,
- can cause changes to your skins pigment,
- can be more painful due to high repetition rate (HAIRFREELIFE, 2015b).

Summary

The Alexandrite laser hair removal system is ideal for treating large areas and is best suited to those at the lower end of the Fitzpatrick Scale who have dark hair (HAIRFREELIFE, 2015b).

The Diode Laser

These machines are relatively new and are different to other systems in that diodes or semiconductors are used to form the light source of the laser.

The laser wavelength can be adjusted to suit your needs by changing the current applied to the diodes.

Diode laser hair removal systems are suitable for use on darker skin types and best for thick, coarse hair, making them ideal for treating back and chest areas (HAIRFREELIFE, 2015b).

Wavelength

800 *nm* - 810 *nm* (HAIRFREELIFE, 2015b).

Which skin type?

Skin types 1 to 4 on the Fitzpatrick Scale (HAIRFREELIFE, 2015b).

Pros

- longer wavelength allows deeper skin penetration,
- large areas of skin can be treated,
- fast recovery,
- adjustable laser wavelength - flexibility,
- can effectively treat darker skin types,
- reduced risk of epidermis damage (HAIRFREELIFE, 2015b).

Cons

- side-effects may include burns and skin discolouration,
- have been linked to *urticaria* ⁷²,
- limited research available on long-term results (HAIRFREELIFE, 2015b).

Summary

Diode laser systems effectively treat large areas, quickly.

They are suitable for all skin types, but particularly for 1 to 4 on the Fitzpatrick Scale.

There is limited research available on which to form conclusions as to long-term efficacy and safety as they are the newest of the laser hair removal systems currently available (HAIRFREELIFE, 2015b).

Nd: YAG

Nd:YAG (Neodymium-doped Yttrium Aluminum Garnet) laser hair removal systems were developed specifically to be effective on all skin tones, including Asian, for which other systems are ineffective and can be unsafe.

It operates at a higher frequency than other lasers and can therefore penetrate the skin more deeply. It can also operate at a lower frequency, emitting green light to penetrate hair follicles closer to the skin's surface.

It has a large spot size and fast repetition rate, making it suitable and effective for larger areas of skin such as the back, chest and legs (HAIRFREELIFE, 2015b).

Wavelength

1064 *nm* - 532 *nm* (HAIRFREELIFE, 2015b).

Which skin type?

Skin types 1 to 6 (all) on the Fitzpatrick Scale (HAIRFREELIFE, 2015b).

Pros

- this system can work on all skin types including asian and dark skin tones,
- large areas of the skin can be treated quickly and efficiently,
- there may be a longer delay in hair regrowth than with other laser hair removal systems,
- currently offers the most advanced technology on the market (HAIRFREELIFE, 2015b).

Cons

- can be painful,
- less effective clearance of fine, lighter hair,
- limited research available on long-term results (HAIRFREELIFE, 2015b).

Summary

Nd:YAG Laser hair removal systems provide the newest most advanced technology currently on the market. They are suitable for all skin types, but most effective for darker skin and coarse dark hair.

⁷²Also known as hives, welts, or nettle rash, is a raised itchy rash that appears on the skin

Can treat large areas quickly and effectively, but can be more painful than other systems ([HAIR-FREELIFE, 2015b](#)).

IPL

Strictly speaking, [IPL](#) is not a laser system, the main difference being the way in which light is used. In order to avoid confusion, we have included a brief outline below, as some clinics still offer [IPL](#) hair removal.

Whereas lasers emit light rays of a single wavelength (monochromatic), [IPL](#) uses full spectrum light (polychromatic) and low-range infrared radiation.

The rays are filtered to allow range of wavelengths (between 500 - 1200 [nm](#)'s). This means that [IPL](#) uses a scattered approach, covering a larger area than lasers, but in a less targeted way ([HAIRFREELIFE, 2015b](#)).

Wavelength

Variable 500 - 1200 [nm](#) ([HAIRFREELIFE, 2015b](#)).

Which skin type?

Skin type 1 - 2 on the Fitzpatrick Scale ([HAIRFREELIFE, 2015b](#)).

Pros

- can treat large areas,
- may be less painful than laser treatment,
- cheaper alternative to laser ([HAIRFREELIFE, 2015b](#)).

Cons

- only effective for light skin,
- generally considered to be less effective than laser hair removal,
- outdated technology ([HAIRFREELIFE, 2015b](#)).

Summary

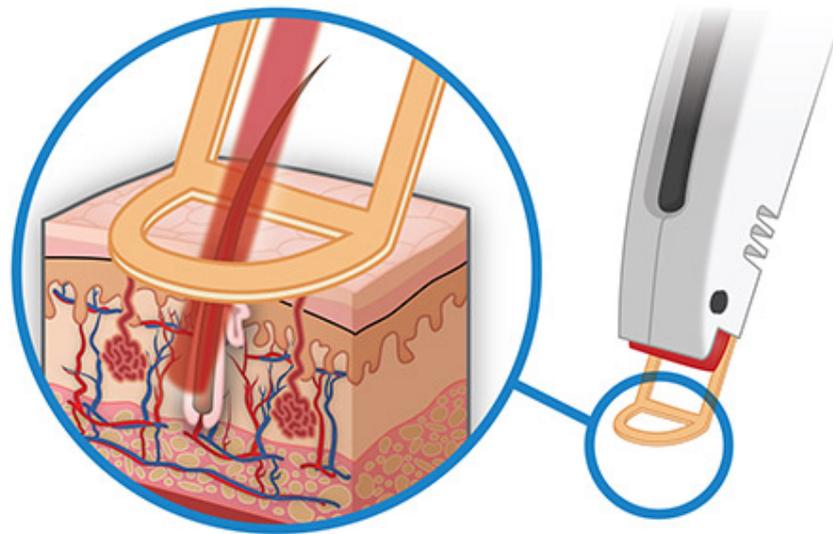
[IPL](#) is most suited to treating individuals with light skin and dark, coarse hair, but the technology is rather outdated and generally considered less effective than laser hair removal ([HAIRFREELIFE, 2015b](#)).

How to prepare for laser hair removal

Laser hair removal is more than just "zapping" unwanted hair. It is a medical procedure that requires training to perform and carries potential risks. Before getting laser hair removal, you should thoroughly check the credentials of the doctor or technician performing the procedure.

If you are planning on undergoing laser hair removal, you should limit plucking, waxing, and electrolysis for six weeks before treatment. That's because the laser targets the hairs' roots, which are temporarily removed by waxing or plucking.

You should also avoid sun exposure for six weeks before and after treatment. Sun exposure makes laser hair removal less effective and makes complications after treatment more likely ([WEBMD, 2016e](#)).



1. The laser light heats the hair.
2. The pigment (melanin) in the hair's follicle reacts to the heat
3. The hair follicle is damaged and no more hair can grow

Figure 4.2: The laser system in close-up

Before undergoing laser hair removal, you must check the background and credentials of the doctor who will perform the procedure. Once you've selected the best possible practitioner, make sure you strictly follow his/her pre-treatment instructions, since there is a general preparation period of about 4 weeks before the first treatment session.

You should limit waxing, plucking and electrolysis for at least four weeks prior to treatment. The rationale behind this is that the laser aims at the hair roots, which you temporarily remove whenever you wax or pluck. You should also avoid tanning because sun exposure can decrease the effectiveness of the procedure and increases the chances of developing complications after treatment.

Sunscreen should be applied everyday and must be used on dark skin to achieve the best possible results from the treatment. In general, the lighter skin tone you have during treatment, the higher your chance of getting better and long-term results. Note that shaving or trimming is allowed until the day of your treatment. As a matter of fact, you'll be instructed to shave and remove body hair on the target areas the day before the initial treatment session ([LASERHAIRREMOVALGUIDE, 2016](#)).

What to expect during laser hair removal

Just before the procedure, your hair that will be undergoing treatment will be trimmed to a few millimetres above the skin surface. The laser equipment will be adjusted according to the colour, thickness, and location of your hair being treated as well as your skin colour.

Depending on the laser or light source used, you and the technician will need to wear appropriate eye protection. It will also be necessary to protect the outer layers of your skin with a cold gel or special cooling device. This will help the laser light penetrate the skin.

Next, the technician will give a pulse of light to the treatment area and watch the area for several minutes to make sure the best settings were used and to check for bad reactions.

When the procedure is completed, you may be given ice packs, anti-inflammatory creams or lotions, or cold water to ease any discomfort. You may schedule your next treatment four to six weeks later. You'll get treatments until hair stops growing ([WEBMD, 2016e](#)).

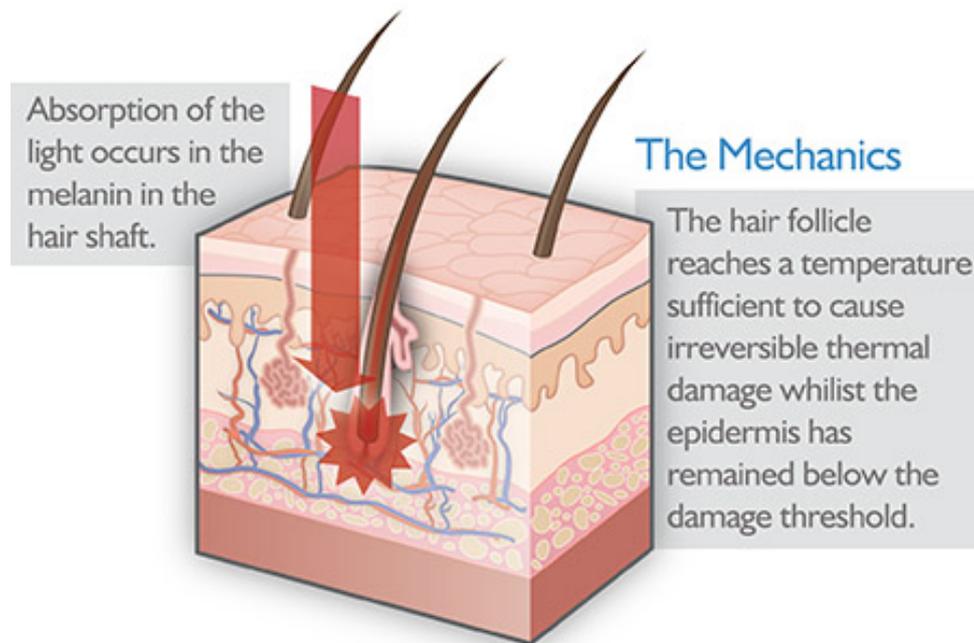


Figure 4.3: How it works

Before the procedure starts, the laser will be adjusted based on your hair colour, thickness, target area, as well as the colour of your skin. Depending on the light source that will be used, you and the practitioner may have to wear protective eye goggles. It is also important to protect your skin's outer layers with a cold gel to help the laser penetrate into the hair root. In some hospitals or clinics, the hand-held laser equipment is equipped with a cooling device at the tip of the instrument.

Next, the practitioner will deliver a pulse of light to the target area and monitor it for several minutes to ensure that the best parameters have been set and also to check for any adverse reactions to the laser before continuing the treatment. The laser beam will penetrate your skin to the follicles where hair growth begins. The heat generated by the laser destroys the hair follicles, thereby inhibiting hair growth.

The pulsed light may feel like a rubber band being popped against your skin, but some equipment works differently. Not every laser zap hurts and some areas such as the lower legs tend to hurt more than other sites like the thighs. However, this will depend on your pain threshold. Several treatments are required over a certain period to achieve optimum results, since the laser can only target actively growing hair follicles at the time of treatment.

Depending on the size and location of the target area, the treatment session may last from 15 minutes to one hour. Once the procedure is done, ice packs, cold water or anti-inflammatory creams may be applied over the treated area to relieve any pain or discomfort. Your next treatment may be scheduled four to six weeks later. The treatments will be continued until hair growth ceases ([LASERHAIRREMOVALGUIDE, 2016](#)).

Recovery and Risks

For a day or two afterward, the treated area of your skin will look and feel like it's sunburned. Cool compresses and moisturisers may help. If your face was treated, you can wear makeup the next day unless your skin is blistering.

Over the next month, your treated hair will fall out. Wear sunscreen for the following month to help prevent temporary changes in the colour of the treated skin.

Blisters are rare but are more likely in people with darker complexions. Other potential side-effects are swelling, redness, and scarring. Permanent scarring or changes in skin colour are rare ([WEBMD, 2016e](#)).

Once you've completed your laser hair removal treatment, there is little recovery time needed as long as you follow and observe the precautions recommended by your doctor. A couple of hours after the treatment, you may notice redness and some swelling in the treated area. Your skin may feel like having a minor sunburn and you may have a stinging sensation for a day or two after treatment. In some patients, these may disappear within an hour or two, but for others, a few days may be needed before the skin recovers and returns to normal.

In order to relieve any pain or discomfort, you may be instructed to apply cold compress or ice packs over the treated area. You may also be prescribed with [over-the-counter \(OTC\)](#) pain medications. Skin moisturisers can also help although you need to ask your doctor about the type of moisturisers that are recommended. In addition, you need to protect the treated area from direct exposure to sunlight until recovery is complete, since sunlight is known to cause a burning sensation in the treated area. In case you can't avoid sun exposure, make sure you apply sunscreen. Even after your skin has returned to normal, it is advisable to use sunscreen before you go outdoors.

You should also prepare for hair shedding during the first couple of weeks after treatment. This is normal and do not mistake it for hair regrowth. Most importantly, note that the symptoms of laser hair removal are mostly mild and temporary. There is virtually no recovery time needed so you can return to your normal daily routine immediately ([LASERHAIRREMOVALGUIDE, 2016](#)).

Potential side-effects of laser hair removal

Laser hair removal, as with all surgical procedures, involves a certain level of risk and potential side-effects.

Some of these are transient and more or less to be expected whereas for other, more serious side-effects precautions need to be taken to minimise the risk ([HAIRFREELIFE, 2015b](#)).

So called 'normal' side-effects

Itching, redness and swelling following treatment are very common and only temporary.

These should be fully explained at the initial consultation prior to treatment, together with advice as to what you can do to alleviate them.

Patch tests i.e. laser treatment carried out on a small, unobtrusive area several days prior to treatment will minimise potential risks, and enable the operator to ensure that the laser is set correctly for your hair and skin type and act as a gauge to likely effectiveness ([HAIRFREELIFE, 2015b](#)).

Less common side-effects

Some of the potentially more serious but less common side-effects are -

- Allergic reactions - numbing creams are sometimes used to minimise pain, which could cause an allergic reaction, however the patch test should detect this prior to treatment of a larger area,
- Burns - these are not usually severe, if the equipment is properly used, and are transient and comparative to minor sunburn,
- Hyperpigmentation - it is possible that your skin may react to the laser light by producing additional pigment cells and causing patches of darker skin (particularly in individuals with light skin),
- Hypopigmentation - if the laser is set incorrectly it will also attack the pigment in the skin of the treatment area, causing lighter patches (particularly in individuals with darker skin),
- Scabs - laser light can cause scabbing to occur - usually fairly minor, similar to those produced by tattooing,
- Infections - incorrectly used lasers can easily cause damage to the skin which is then prone to infections, these have the potential to become serious,
- Bruising - bruises can occur as a result of damage to the small blood vessels near the surface of the skin,
- Changes in Sensation - occurs if the nerve endings are damaged, resulting in tingling or numbness,
- Increased hair growth - a rarity for which there is no current understanding of the cause ([HAIRFREELIFE, 2015b](#)).

Precautions to minimise risks

Before treatment

Before embarking on any laser hair removal treatment you should carry out the following precautionary measures to minimise any potential risks -

- check that the laser device to be used is [FDA](#) approved for hair removal,
- carry out research to check that the clinician is medically trained, fully qualified and experienced for the equipment being used,
- consult with your dermatologist - they can advise you as to whether your skin is suitable for laser hair removal as well as explaining what you can expect during the treatment programme and the associated risks and benefits,
- if you are taking any medication, consult your doctor - some medications cause the skin to become more sensitive,
- avoid exposure to the sun for as long as possible, and at least 4 weeks prior to treatment,
- you should avoid artificial tanning products and lotions,
- plucking, waxing or any other type of hair removal involving pulling hair out by the root should be avoided (shaving is, however, fine and can even increase the effectiveness of the treatment),
- for underarm hair removal, use of deodorant should be avoided for couple of days prior to treatment,
- moisturising lotion or other creams should be avoided for 24-hours before each session ([HAIRFREELIFE, 2015b](#)).

After treatment

- for any minor irritations e.g. itching, redness and swelling, a soothing lotion can be used. This should be very temporary - if it persists take advice from your dermatologist,
- gently exfoliate the treated area with a loofah sponge or washcloth to shed dead hair cells two or three times per week,
- treat any regrowth by shaving, do not remove hair from the roots (by plucking, tweezing or waxing etc.) in between sessions,

- avoid sunlight as much as possible, and use sunscreen liberally if you are going to be exposed to sunlight for long. (Your skin will be more sensitive and prone to sunburn) ([HAIRFREELIFE, 2015b](#)).

How painful is laser hair removal?

Most individuals find the pain from laser hair removal to be tolerable. It has been compared to having an elastic band pinged against the skin.

However, some people have more sensitive skin than others and some a lower threshold for pain ([HAIRFREELIFE, 2015b](#)).

How to reduce the pain

- having a patch test prior to treatment will give an idea of what to expect,
- sometimes a numbing cream can be used, or painkillers taken prior to treatment,
- discuss the options with the operator at the time of the patch test ([HAIRFREELIFE, 2015b](#)).

Effects

- long-term hair removal ([GENDYS, 2011](#)).

Side-effects

- skin may be red and raised for anything from 15 minutes to 24 hours post treatment and can feel like mild sunburn,
- sensation similar to being flicked with an elastic band ([GENDYS, 2011](#)),
- there are normal side-effects that may occur following laser hair removal treatments, so don't be too concerned when you experience some itching, redness and swelling in the treated area. These usually last for about two to three days. More serious side-effects include skin discolouration and acne formation,
- some degree of pain can be expected during treatment. Most clinics have numbing creams although the use of strong ones over large skin areas should be avoided. The cream is typically applied 30 minutes before treatment. Applying cold compress or an ice pack after treatment can help in relieving the side-effects faster,
- side-effects like hypo/hyper-pigmentation or, in rare instances, burning of the skin means there is a need to adjust the type of laser used or the laser settings. Potential risks include skin burns, discolouration, formation of white spots, *purpura*⁷³, acne flare-up and infection. All these can be prevented or at least minimised by using the correct type of laser at the appropriate settings for the patient's skin type and target area. Rare side-effects include crusting, blistering, scarring, and changes in skin texture ([LASERHAIRREMOVALGUIDE, 2016](#)).

Benefits

- laser can be used to treat individual hairs or extensive amounts of hair,
- extremely effective on coarse hair growth,
- the hair needs to be just visible on the surface of the skin for treatment thus allowing the client to shave and avoiding conspicuous growth before treatment,
- treatment is scheduled at monthly intervals with results being apparent within two weeks of the first session,
- the total number of sessions needed to produce the desired result is much less than traditional methods of treatment,

⁷³red or purple discolourations on the skin that do not blanch on applying pressure. They are caused by bleeding underneath the skin

- no risk of infection post treatment,
- make up can be applied immediately after treatment,
- no risk of scarring ([GENDYS, 2011](#)),
- **Precision** - Lasers can selectively target dark, coarse hairs while leaving the surrounding skin undamaged.
- **Speed** - Each pulse of the laser takes a fraction of a second and can treat many hairs at the same time. The laser can treat an area approximately the size of a quarter every second. Small areas such as the upper lip can be treated in less than a minute, and large areas, such as the back or legs, may take up to an hour.
- **Predictability** - Most patients have semi-permanent hair loss after an average of three to seven sessions ([WEBMD, 2016e](#)).

Hair removal lasers were first used in 1997 and subsequently gained the approval in the U.S. from the [FDA](#) for 'permanent hair reduction'. In this context, the term 'permanent' refers to stable and long-term reduction with regard to the number of hair re-growing following a specific treatment. There are patients who achieve this while some have reported regrowth after several months.

On the whole, laser hair removal is effective in removing hair from areas such as the face, arm, underarm, thigh, leg, bikini line, and other spots where there is unsightly hair growth. The benefits of the procedure include the following -

- **Less frequent shaving** - This will certainly save you precious time and money, especially if you're someone who is always on the go. A series of five treatment sessions has been shown to reduce hair permanently by as much as 70% to 90%. Moreover, laser hair removal can spare you from the agony and blood loss if you are the type who often cuts yourself while shaving.
- **Softer and smoother skin** - Most women and athletes say their legs tend to feel stubbly in only two to three days after shaving or a couple more days after waxing. One of the notable benefits of laser hair removal is that it will give you smoother and softer skin after every treatment session.
- **No more waxing** - Admit it, smearing hot wax and then ripping it off to remove hair could be painful and unpleasant. This method is already considered old school and can be costly for treating some sensitive areas. Laser hair removal can get the job done and save you from this indignity.
- **Less scarring and discolouration** - Because of ingrown hairs, itching and skin irritation that typically go with shaving, a lot of patients develop discolouration known as post-inflammatory hyper-pigmentation. After laser hair removal reduces the number of hairs, the discolouration almost always disappears. Any discolouration that persists can be treated with a lightening cream.
- **No more plucking** - Using tweezers and plucking random hair once in a while is one thing, but tweezing hair in the upper lip is an entirely different story. Laser hair removal can eliminate the pain of plucking.
- **Speed and precision** - Each laser pulse only takes a fraction of a second and destroys more hair simultaneously. The laser can target an area roughly the size of a quarter each second. Small areas can be treated in less than a minute, while large areas like the back may take up to one hour. Finally, there is no downtime and lasers can effectively treat coarse, dark hair while leaving the adjacent skin intact ([LASERHAIRREMOVALGUIDE, 2016](#)).

Risks

- exposure of laser light can be dangerous to the eye, specially designed goggles must be worn and safety instructions adhered to,
- 10% chance of mild transitory skin pigmentation change which usually resolve naturally within six months ([GENDYS, 2011](#)).

Limitations

- only hair containing dark pigment will respond (not suitable for grey, red or blonde hair),

- only Caucasian skins without suntan can be treated,
- difficult to treat very fine hair ([GENDYS, 2011](#)).

Is laser hair removal safe?

Laser hair removal is inherently safe, provided it is carried out by a suitably trained, qualified and experienced practitioner in a safe and controlled environment.

A recent clinical survey entitled '*Treatment Errors resulting from use of lasers and IPL by medical laypersons: results of a nationwide survey*' ([HAMMES et al., 2013](#)) concluded that laser hair removal should not be carried out by insufficiently trained, non-medical operators with inadequate diagnostic abilities.

In addition, that their lack of knowledge often led them to make unrealistic promises to the consumer ([HAIRFREELIFE, 2015b](#)).

What about radiation from laser hair removal?

It is ionising electromagnetic radiation which is associated with burns, radiation sickness, genetic damage and cancer.

The type of radiation used in laser hair removal systems is non-ionising electromagnetic radiation and therefore does not pose a serious health risk ([HAIRFREELIFE, 2015b](#)).

Warning

Laser hair removal has only been available commercially since the mid 90's and so there is a lack of information concerning the long-term effects on the skin ([HAIRFREELIFE, 2015b](#)).

Intense Pulsed Light (IPL)

Much like laser, this more recent technology invented in the 1990's, uses light to transform energy into heat, aimed at the hair follicle, through the skin. Advantages and characteristics of laser apply to [IPL](#) ([GENDYS, 2011](#)).

Effects

- long-term hair removal ([GENDYS, 2011](#)).

Side-effects

- very little skin reaction although a small number of clients may experience mild redness which lasts a very short period of time ([GENDYS, 2011](#)).

Benefits

- [IPL](#) can be used to treat individual hairs or extensive amounts of hair. However the large treatment head allows for the fast treatment of large body areas for example the back and reduces the time for treatment of areas such as the face,
- can treat most skin tones,
- the hair needs to be just visible on the surface of the skin for treatment thus allowing the client to shave and avoiding conspicuous growth before treatment,
- treatment is scheduled at monthly intervals with results being apparent within two weeks of the first session,

- the total number of sessions needed to produce the desired result is much less than traditional methods of treatment,
- no risk of infection post treatment,
- make up can be applied immediately after treatment,
- no risk of scarring ([GENDYS, 2011](#)).

Risks

- exposure of intense pulsed light to the eye can be dangerous, specially designed goggles must be worn and safety instructions adhered to,
- chance of mild transitory skin pigmentation change which usually resolve naturally within six months ([GENDYS, 2011](#)).

Limitations

- Only hair containing dark pigment will respond (not suitable for grey, red or blonde hair) ([GENDYS, 2011](#)).

Essentially, [IPL](#) and laser hair removal devices work similarly in that they both use light rays to target the dark pigment in hair and around the follicle, to create heat energy which damages the follicle and causes the hair to fall out.

Whilst home [IPL](#) devices are not as powerful as those used by professionals in a clinic and therefore not as effective, advances in technology mean that it is now possible to achieve pretty good results in the comfort of your own home.

Permanent hair reduction can be achieved using [IPL](#), with patience and perseverance. It is worth taking note that it will take some time to achieve good results and you should be prepared for this.

One good thing is that you can continue to shave whilst using [IPL](#) devices, so there is no need to suffer unsightly regrowth between treatments.

You should not use any method that involves removing hair from the root in conjunction with [IPL](#) as the hair needs to be actively growing within the follicle for it to be effective ([HAIRFREELIFE, 2016a](#)).

Best for?

[IPL](#) hair removal is great for most areas of the male and female body, but the downside is that it is not suitable for anyone with a darker skin tone or light, grey or red hair.

The machine should have an inbuilt skin tone sensor to test the skin prior to use. If the tone is too dark, the machine will stay 'locked' and you will not be able to use it. This is for safety purposes, as use on inappropriate skin tones could potentially cause severe burns and side-effects.

Some may be used for female facial hair, but not anywhere near the eye area, so not for brows.

These devices should be approved for general retail by the [FDA](#) who are the body responsible for the protection of public health, and you should check this prior to purchase ([HAIRFREELIFE, 2016a](#)).

Pros

- **Cost effective** - once initial high outlay paid,
- **Convenient**,
- **Easy to use**,
- **Quick** - depending on size of flash head,
- **Various strength settings** - some have up to 5 settings, to enable you to choose the best and most comfortable for each area you are treating,

- **Skin sensor** - for safety,
- **Cordless/rechargeable options** - on some models,
- **FDA regulated** - peace of mind ([HAIRFREELIFE, 2016a](#)).

Cons

- **Time** - results take time to achieve,
- **Cost** - high initial cost of machine,
- **Limitations** - best for those with light skin and dark hair ([HAIRFREELIFE, 2016a](#)).

Hair Inhibitors

Hair inhibitors are chemicals that claim to be able to change the structure of the hair follicle, mimicking the process of baldness and causing newly grown hair to grow finer and softer, until all hair gradually disappears. Personal hair removal using hair inhibitors is designed to take place following personal hair removal by some other means that involve hairs being pulled out by the roots. Treatment should be repeated twice monthly until all hair growth ceases, allegedly after six months. Hair inhibitors can be used on all hair types and all body sites, but the efficacy of this personal hair removal method has never been proven.

These hair removing products are retardants that act on the hair follicle, making it weaker on every application and eventually leading to zero hair growth. These are not ideal for coarse hair as it is difficult to treat and may take a very long time ([WISEGEEK, 2016](#)).

Problems

Razor burn

Razor burn is a temporary skin irritation caused by shaving. Different people get razor burn for different reasons, but most of the time, it has to do with shaving too closely, too forcefully, or with a dull razor. It is usually identifiable by the itchy red bumps it leaves behind, and in most cases, only lasts for a few days. Simple lotions and creams are often the best treatment, but sufferers should keep an eye on their symptoms in case ingrown hairs start forming - these are very uncomfortable, and can lead to more serious infection ([WISEGEEK, 2016](#)).

Main symptoms

Most razor burns first appear as slight red rashes. Small red bumps are also common, usually right around the hair follicle. These are often itchy, inflamed, and unsightly. Razor burn is most common on the throat, the underarms, and the bikini line - areas where the skin is often already somewhat sensitive - but it is possible anywhere ([WISEGEEK, 2016](#)).

Why it happens

There are several main causes for razor burn, but skin sensitivity is often the most to blame. When a razor is pulled too fast or pushed too hard against skin that is not used to such force, the burn's signature redness often appears. The main idea in shaving is to clip hair follicles as close to their source as possible; there is a certain skill involved in removing just the hair and not the top layer of skin, however ([WISEGEEK, 2016](#)).

Pushing too hard can cause the razor to grab skin cells as well as hair. This does not usually cause bleeding, but will frequently lead to irritation. People most at risk are those who are new

to shaving, those who are shaving a new area for the first time, and those who are working with a dull razor. The sharper the equipment, the less resistance is required (WISEGEEK, 2016).

Lubrication and temperature

Proper lubrication is also an important part of preventing razor burn. Shaving usually works best when the area is coated either with soap or with a specially-formulated gel or lotion. These products moisten the skin and soften the hair while also serving as something of a protective barrier between the skin and the razor. Many people also begin by washing the area to be shaved in warm water. Skin that is either unwashed or splashed with cold water tends to constrict, which makes it more sensitive to irritation; warmer temperatures, on the other hand, can promote relaxation, which leads to plasticity and reduced resistance (WISEGEEK, 2016).

Care and healing

Once razor burn has appeared, most medical professionals recommend leaving it alone and shielding the affected skin from outside irritations whenever possible. Gentle lotions and topical creams can also be used to calm the itch and pain. It is usually a good idea to avoid shaving around the rash until it has completely disappeared in order to prevent further inflammation (WISEGEEK, 2016).

Things to watch for

Rashes that last for more than a few days, that seem to get worse, or that result in large, pimple-sized bumps filled with pus should be treated by your *GP*. These may be signs of ingrown hairs or infection, which may require medication like antibiotics to remedy. Early treatment can also prevent long-term scarring (WISEGEEK, 2016).

How to get rid of razor bumps

You may have your morning shaving routine down pat, but if you're still getting razor bumps, you could be skipping a few important steps. *'When trauma occurs to your skin, it reacts by becoming inflamed and bumpy,'* explains dermatologist Dr. Mona Gohara, MD. And certain bad shaving habits - for example, shaving dry or going against the way your hair grows - can lead to even more irritation (ESCOBAR, 2015).

So how do you make them go away? Here's how -

How to make razor bumps disappear If you already have them on your legs or elsewhere, Gohara recommends using a topical antibiotic or over-the-counter cortisone cream. And definitely avoid picking at them - irritating your skin or potentially opening wounds will do nothing but make the problem worse - and make it more difficult to shave later on (ESCOBAR, 2015).

How to avoid them altogether You've heard it once and you'll hear it again: **exfoliate, exfoliate, exfoliate**. According to Gohara, using an exfoliating wash while shaving will do the trick. Marta Camkiran, senior esthetician at New York City's Haven Spa, also recommends always shaving in the direction of hair growth to avoid irritating the follicles.

The temperature of your shower can also affect your shave, so always use warm water to shave to ensure your follicles are open and the hairs are softer. Tool-wise, Gohara advises against using multiple-blade razors, as they can be much more traumatizing to the skin. Instead, stick with single or double-blade razors.

But if you're still getting them after taking all these precautions, Camkiran suggests seeking alternative methods, such as waxing or laser hair removal ([ESCOBAR, 2015](#)).

Unproven Methods

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Unproven hair removal methods may be thought of as the methods that convey the notion of permanence (or are marketed as permanent), but do not have any consistent, measurable or repeatable degree of permanence using controlled scientific measure ([TRANSGENDERCARE, 2016i](#)).

Transdermal Electrolysis

Transdermal electrolysis is a no-needle method of treatment purported to achieve permanent hair removal results. The usage, transdermal, indicates through or by way of the skin.

The theory behind this **unproven** method is the transmission of electrical current that is delivered through the skin, where it is directed to the site of the hair follicle. In practice, an applicator covered with electroconductive jelly is placed in contact with the skin, and direct electrical current is applied. The destruction of hair follicles that is claimed is said to be brought about by galvanic action (units of lye created).

The transdermal process of targeting hair producing cells with direct electrical current suggests that these cells would remain unaffected, as current would travel through the path of least

resistance. It is highly unlikely that any unbiased analysis would conclude this method produces permanent hair removal (TRANSGENDERCARE, 2016i).

Promoters claim an electrified cotton swab can remove hair permanently, but there is no scientific proof of this (JAMES, 2016b).

Clinical data

There is no published clinical data indicating transdermal or transcutaneous methods can result in permanent hair removal.

Claims by the promoters conflict with laws of physics. Hair is a poor conductor of electricity. Skin is a better one, and conductive gel is an excellent conductor. Because electricity follows the path of least resistance, any energy applied by the device is not going to travel selectively down a hair. It's going to dissipate across the gel on the skin's surface.

Proven permanent methods hurt because the amount of energy required to destroy a hair follicle comes in contact with the rich bundle of nerves around each hair (C. SCHUSTER, 1992). Even plucking hurts, and it's been shown to be temporary. The reason these 'transcutaneous' procedures don't hurt much is because the energy is not strong enough to stimulate the nerves, let alone damage the hair growth matrix permanently (JAMES, 2016b).

Why transdermal electrolysis is a scam

The physics don't make sense

Hair is an incredibly bad conductor of electricity ⁷⁴ whereas skin conducts electricity well ⁷⁵ because it is 70% salt water. Given that electricity will always flow primarily through the path of least resistance ⁷⁶ then either no electrical current or a current that's greatly reduced will ever reach the hair follicle (DZUREK, 2014b).

Transdermal electrolysis would have to fly in the face of basic laws of physics in order to be effective!

Complete lack of scientific data

It would be massively lucrative to sell a scientifically proven device that was as effective as needle electrolysis but without all the side-effects of an invasive treatment. Yet no studies have been published and no research effort is going into this sector (DZUREK, 2014b).

Conclusion

Anyone with an ounce of physics expertise knows that transdermal electrolysis is a waste of research effort because the physics don't make sense (DZUREK, 2014b).

Despite a booming hair removal market, nobody is investing any money into transdermal electrolysis research because the results are already known - it doesn't work!

⁷⁴<http://www.rafischer.com/hairpg2.htm>

⁷⁵<http://www.itis.ethz.ch/itis-for-health/tissue-properties/database/low-frequency-conductivity/>

⁷⁶<http://physics.stackexchange.com/questions/5670/electricity-takes-the-path-of-least-resistance>

No-Needle Tweezers Electrolysis

As with transdermal electrolysis, no-needle tweezers electrolysis attempts to achieve permanence without direct contact with the cells that produce hair growth.

While needle-based electrolysis methods allow for contact between the conductor (needle) and follicle, no needle methods claim that transmission of current can be achieved by using the unwanted hair as a conductor. In practice, the hair shaft is grasped with tweezers that conduct a galvanic (direct) current. The current passes through the tweezers in an attempt to transmit treatment energy down to the base of the follicle via the hair shaft.

This method, as is the case with transdermal electrolysis, does not provide permanence.

- electric current is applied to a hair through an electrified tweezer,
- the tweezer grasps the hair above the skin's surface and holds it anywhere from 15 seconds to several minutes,
- promoters claim (without adequate proof) that the electricity travels down the hair and permanently damages the hair root (JAMES, 2016b).

Advantages

- some find treatment has less associated pain and side-effects compared to ordinary tweezing,
- safe if performed properly (JAMES, 2016b).

Disadvantages

- no published clinical proof of claims that they can achieve permanent hair removal,
- no published clinical proof that electricity can travel through a hair and cause permanent damage to the root,
- up to 100 times slower than ordinary tweezing,
- can be expensive despite no published proof of permanence (especially costly "professional" units and treatments) (JAMES, 2016b).

Clinical data

- Published clinical data indicate that electric tweezers cannot achieve permanent hair removal (VERDICH, 1984).
- Unpublished reports written or commissioned by manufacturers typically claim permanent results (COLE, 1990), (KONNIKOV, 1990).
- However, non-manufacturers have demonstrated that electric tweezer claims of "hair conductivity" do not pass scientific scrutiny (J. SCHUSTER, 1992a), (ORDEN, 1998).
- Despite their scientific-sounding sales pitches, these devices have not demonstrated they can achieve permanent hair removal (JAMES, 2016b).

Other Considerations

If one does consider the use of either of these methods, great caution should accompany their use. In addition to any delays brought about in the overall transition process, a significant cost may be involved.

Electronic tweezers or electrolysis tweezers are usually marketed directly to the consumer. A variety of tweezers units are made available through mail order and magazines with a cost of \$50 to \$200. Unfortunately, pharmacy chains sometimes carry these products as well. Presenting these products in a trusted environment such as a pharmacy, coupled with a minimal cost, does a disservice to the consumer by falsely connoting an effective method.

Transdermal units are typically sold to the cosmetology, spa, and beauty trade, although there have been instances of direct sales to the transgender consumer (transgender publications, testimonial-based marketing). Units range in cost from several hundred to several thousand dollars. When used in a salon setting, transdermal electrolysis is normally offered as one of many services, and is typically operated by those with little or no training in permanent hair removal techniques. Charges for the services are comparable to normal needle type electrolysis services. Transdermal techniques are typically marketed as a safe from scarring/complications, pain free alternative to traditional electrolysis. While the method of transmitting electrolysis current (through skin contact) renders these machines incapable of producing permanent results, the unit's circuitry may contain a viable electrolysis epilator at its core ([TRANSGENDERCARE, 2016i](#)).

Transcutaneous hair removal

Similar to transdermal electrolysis, this variation uses an adhesive patch rather than a cotton swab to supposedly pass electricity from the patch, through the hair and into the gel. This method still cannot defy physics ([PERMANENCE, 2014](#)).

Promoters claim an electrified adhesive patch can remove hair permanently, but there is no scientific proof of this ([JAMES, 2017g](#)).

- conductive gel is spread on the skin,
- electricity is passed through an adhesive patch which is touched to the gel,
- electricity supposedly travels down the hair follicle and permanently damages the hair root ([JAMES, 2017g](#)).

Quack claims

- "Painless and permanent",
- "No side effects",
- "Clinically proven",
- "More effective than electrolysis, and without the needle",
- "Hair can conduct enough energy to kill the root",
- "Offer your salon clients permanent hair removal",
- "Makes a great home business" ([JAMES, 2017g](#)).

Background

These devices are heavily promoted to beauticians through trade shows and magazines. Many practitioners believe the device actually works as claimed, thus unwittingly taking money from consumers for ineffective "professional" treatments.

Called transdermolysis, no-needle electrolysis, and non-invasive electrolysis, as well as "hands-free" or "continuous" hair removal ([JAMES, 2017g](#)).

History

After the U.S. Federal Trade Commission brought charges against the Removatron electric tweezer ([FTC, 1989](#)), a North Carolina beauty salon owner named Hubert Lee Cole started [American Hair Removal System \(AHRs\)](#) and patented [direct current \(DC\)](#) electric tweezers. In the early 1990's Cole and his partner Mark Chandler, M.D. modified their TE 629 electric tweezer. They discovered that they could replace their electric tweezers with an electrified cotton swab and get the same results. They called this method "transdermal" electrolysis, and the modified devices were sold with the electric tweezer apparatus as an "optional treatment".

The transdermal apparatus continues to be promoted illegally as painless and permanent. [FDA](#) stated in a 1999 letter pointing out that [FDA](#) had not evaluated these claims ([JAHNES, 1999](#)).

In the late 1990's [AHRS](#) changed their company name to [International Hair Removal Systems \(IHRS\)](#) and made another unproven modification using adhesive patches. They changed their method name to "transcutaneous" hair removal and changed the device name to SuperPhaser Gold.

Like a lot of quack devices, transcutaneous hair removal is based in part on an accepted scientific method. Patches for active transdermal delivery of drugs (called iontophoresis) use direct current applied to an adhesive patch. This is used to deliver medication that might otherwise need to be injected. For instance, one company has a useful product for children that delivers lidocaine anaesthetic without using a needle. Unfortunately, this useful scientific innovation captured the attention of the hair removal quacks, who saw that "no-needle" anaesthesia offered a chance to expand the quackery of "no-needle" electrolysis they'd been promoting for years. They patented the idea and proceeded to think about marketing strategy (rather than bothering to test it) ([TSALIOVICH, 2003](#)).

Newer devices are sold with the electric tweezer apparatus and the transdermal cotton swab option as well as the patches. The "transcutaneous" method continues to be promoted illegally as painless and permanent, even though the [FDA](#) has not evaluated these claims.

On 2 April 2001, the [FDA](#) told [IHRS](#) they were in violation of federal law in making claims of painless and permanent hair removal using transcutaneous patches. This was their second such warning ([JAMES, 2017g](#)).

Electric tweezers were first patented in the year 1959. Following this many electrical tweezers were promoted especially targeting beauticians. They also responded well by heavy procurement by charging heavily the consumers for this unproven permanent treatment. In 1985, the company Remoatron was charged for its deceptive advertisements and unproven claims. Its market share of electric tweezers was more than 80%. However, the U.S. Federal Trade Commission's order barring electric tweezers had a loophole. It stopped the use of [alternating current \(AC\)](#) tweezers only. Exploiting this, direct current electric tweezers came on the market. Since then electrical tweezers using direct electric current continue to be sold on the market ([PERMANENTHAIRREMOVALINFO, 2012](#)).

Clinical data

There is no published clinical data indicating transdermal or transcutaneous methods can result in permanent hair removal.

Claims by the promoters conflict with laws of physics. Hair is a poor conductor of electricity. Skin is a better one, and conductive gel is an excellent conductor. Because electricity follows the path of least resistance, any energy applied by the device is not going to travel selectively down a hair. It's going to dissipate across the gel on the skin's surface.

Proven permanent methods hurt because the amount of energy required to destroy a hair follicle comes in contact with the rich bundle of nerves around each hair ([J. SCHUSTER, 1992b](#)). Even plucking hurts, and it's been shown to be temporary. The reason these "transcutaneous" procedures don't hurt much is because the energy is not strong enough to stimulate the nerves, let alone damage the hair growth matrix permanently ([PERMANENTHAIRREMOVALINFO, 2012](#)).

Types of electric tweezers

Electric tweezers are electronic appliances that are designed to remove the hair permanently. It consists of a pair of tweezers at the tip. The handle incorporates a button to switch on the high frequency electrical signal and to close its tweezers ([PERMANENTHAIRREMOVALINFO, 2012](#)).

- **Radio frequency electric tweezers** - The manufacturers of these tweezers claim through the TV commercials that modified **AC** travels down all the way to the root of a hair grasped by their tweezers. The mechanism is just like needle thermolysis where the hair follicle is damaged by the electricity. This product was first introduced in 1959 and does not have any substantial medical proof. Even after the directive of US FTC, the product still exists in the market under the new phrase as "ultrasound" tweezers.
- **Galvanic electric tweezers** - Instead of **AC**, it uses **DC** in its mechanism. The propaganda claims to have enough current to reach the root of a hair and acts just like regular galvanic electrolysis, which is yet to be supported by scientific evidence. They also claim that the **FDA** has allowed them to sell these devices for permanent hair removal (**PERMANENTHAIR-REMOVALINFO, 2012**).

Dietary supplements

There are no published clinical data to back up claims that certain foods, **OTC** medications, vitamins or other preparations taken by mouth can slow or stop hair growth.

The only oral products that have demonstrated they can affect hair growth are prescription oral medications.

There are a few old wives' tales floating around that eating certain foods can reduce your hair growth. These rumours have never been proven with testing.

Recently, some people have suggested that eating a meat tenderiser called papain or another called bromelain can reduce hair growth. These rumours have no basis in clinical research and should be disregarded (**JAMES, 2016b**).

While there are a number of medications capable of retarding hair growth, none of them are found in nature and their use is heavily regulated. Any **OTC** substance claiming to reduce or stop hair growth is making false claims (**PERMANENCE, 2014**).

Photoepilators

A burst of filtered light is aimed at one hair at a time, which is then tweezed. No published proof that this lasts longer than just tweezing (**JAMES, 2016b**).

Advantages

- Some find treatment has less associated pain and side-effects compared to tweezing.
- Safe if performed properly (**JAMES, 2016b**).

Disadvantages

- No published clinical data demonstrating long-term effectiveness.
- Expensive and slow (**JAMES, 2016b**).

Background

This is the earliest commercial device to emerge from research into laser hair removal. The original device used blue-green light filtered from a xenon light source, the same source used in flash lamps. The 225-watt device emitted energy levels of 9 - 10 J/cm² in a 3 millisecond flash (**OMICRON, 1970**). As with other laser and light devices, it is intended to target blood and melanin pigments and makes them heat up (called selective photothermolysis).

The filtered light traveled down a fiberoptic probe inserted into the follicle. This fiberoptic probe was not disposable and had to be sterilised with each use. Also, it was difficult to find a probe slender enough to fit into a follicle without breaking. Later versions have the fiberoptic wire held above the follicle (JAMES, 2017e).

History

In 1969, electrolysis chain Gregory Systems approached Richard A. Harte of Palo Alto, California and provided funds for the development of a prototype photoepilator. The company eventually cancelled the project later that year, stating - "*We abandoned our investment after we found it was only a temporary method*" (SYSTEMS, 1975). However, the device was carried forward under the name Omicron Systems.

In 1970, the Omicron prototype was completed and test data was submitted, and a 12-month conditional approval by the California Department of Health was secured in April 1971. In November 1971, the Omicron device was first put to commercial use.

It didn't take long for problems to arise, especially with the probes. The original probes were plastic and very thick (10 mils). They were not very flexible and did not hold up to the heat of the flash lamp well. They needed about an hour of sterilisation after use - 20 minutes in boiling water followed by 30 minutes in a disinfectant. Care had to be taken not to shatter the probes during cooling.

Omicron halted manufacture in February 1972 and voluntarily withdrew sale of their photoepilator on April 5, 1972, after their 12-month conditional approval in California ran out. That state's Bureau of Food and Drug also deemed Omicron's sterilisation procedures and test protocol regarding efficacy were unsatisfactory. On September 18, 1972, Omicron submitted formal acknowledgement of voluntary withdrawal.

In 1973, Omicron was sued for breach of contract in California Superior Court by ten owners of their device. The case was settled out of court, with owners receiving refunds after returning the devices. Unfortunately, the devices were then resold to Carol Block of Illinois, whose company continues to sell photoepilation franchises and treatment under the brand name D'Plume XXIII.

In 1990 [FDA](#) sent a warning letter to Carol Block ([FDA, 1990](#)) -

“The training manual and promotional material contain statements which represent and suggest that the devices are adequate and effective for the permanent removal of hair, which statement is false or misleading or otherwise contrary to fact, since these devices are not adequate and effective for such purpose”.

Block frequently gets her service listed in the yellow pages under electrolysis to imply permanence.

In 1999 Jennifer Maxx Inc. of New York received [FDA](#) clearance for her photoepilator device, which she currently sells as franchises and treatments under the name ThermaLight 2000. The ThermaLight 2000 is indicated for removal of unwanted body hair through the application of pulsed light energy applied to the hair follicle at the surface of the skin (non-invasive photoepilation). As with the predecessors, there is no proof this photoepilator can achieve permanent hair removal (JAMES, 2017e).

Clinical data

There are still no published studies to back up claims of permanence using a photoepilator.

Most consumers opting for light-based treatments forego photoepilators for newer lasers that treat larger areas more rapidly with higher power levels. Newer light-based devices also have published clinical data available ([FDA, 1990](#)).

Photo-dynamic therapy

An experimental method combining chemicals and radiation to induce controlled hair loss or reduction (JAMES, 2016b).

- A chemical is administered which selectively pigments a follicle's regenerative structures.
- Laser or other radiation selectively targets the darkened cells while sparing surrounding tissue (JAMES, 2016b).

Advantages

- Theoretically could target any hair colour (JAMES, 2016b).

Disadvantages

- Experimental.
- Commercial use is not expected in the foreseeable future (JAMES, 2016b).

Background

Hair growth cells and cancer cells share some interesting characteristics - rapidly dividing with multiple potentials for differentiation. This is part of the reason many combinations of chemotherapy and radiation result in hair loss - they disrupt the same kinds of cellular activity (THATTE, BAGADEY, and DAHANUKAR, 2000). It has been theorised that combinations of these drugs and radiation may be used to induce a controlled amount of hair loss or reduction (JAMES, 2017d).

History

Photodynamic therapy (PDT) has been useful in treating some types of cancers (DE ROSA and BENTLEY, 2000), (MORTON et al., 2001), (GUILLEN and OTHERS., 2000). Certain chemicals have been observed to darken some types of skin cells (KALKA, MERK, and MUKHTAR, 2000), which can then be selectively targeted by laser to induce apoptosis or 'programmed cell death' (GRANVILLE, McMANUS, and HUNT, 2001). Recent data suggests *PDT* may have uses in the treatment of acne as well (HONGCHARU et al., 2000).

In addition, the presence or absence of certain genetic markers in mice such as p53 have been observed to be "on-off" switches for chemical/radiation induced hair loss (BOTCHKAREV et al., 2000). Learning to manipulate genetic markers like these in conjunction with chemicals and/or radiation may lead to new hair reduction treatments (JAMES, 2016b).

Clinical data

This has been proposed as a theoretical possibility of hair removal, and in 1995 an experimental clinical trial was performed (GROSSMAN et al., 1995). However, commercial use of the procedure is not expected in the near future (JAMES, 2016b).

Home Treatments

Here are two systems of hair removal that you can do at home on yourself, or if you have an accepting partner, they can do for you.

Please note that I do not recommend, I am just giving the information to you which you may not be aware of.

Silk'n

I have used this site as it seems to have a lot of information in an easily understood format, but I have no knowledge of their products except what they say on their website.

<https://www.silkn.com/> seem to have four main products which you can use at home. Here <https://www.silkn.com/compare-hair-removal-devices/> compares their products against each other.

Triabeauty

This site gives virtually no information about their products, as compared to the **Silk'n** site except it does include prices, and can be found at <http://www.triabeauty.com/laser-hair-removal-products>.

Home Pulsed Light (HPL)

This further development of light based technologies combines optical energy used to disable hair growth with a unique acoustic effect that enhances the normal process of epilation by photothermolysis.

*With clinically tested and proven results, this unique technology finally enables safe, effective and painless light based personal hair removal at home. Like other light-based technologies the **Home Pulsed Light (HPL)**TM based Silk'nTM device should not be used to treat darker skin types and is ineffective on lighter hair colours. It is suitable to quickly cover large skin areas like legs, arms, bikini line, underarms, etc.*

I have italicised some of their text here as I am construing it as 'advertising', just to warn you to take it with a dose of salt!

Laser Hair Removal & the FDA.

{Laser Facts from the [FDA](#)}

The popularity of laser hair removal has increasingly grown, prompting many laser manufacturers to conduct research and seek [FDA](#) clearance for their lasers for this indication. The market is growing so quickly that [FDA](#) cannot maintain an up-to-date list of all laser manufacturers whose devices have been cleared for hair removal, as this list continues to change. To learn if a specific manufacturer has received [FDA](#) clearance, you can check [FDA's Website](#) at {Medical Devices Databases} under the 510(k) database. You will need to know the manufacturer or device name of the laser. You can also call [FDA's Center for Devices and Radiological Health, Consumer Staff](#), at 240-276-3103, fax your request to 240-276-3151 or send an e-mail to: DSMICA@cdrh.fda.gov.

*Manufacturers should be aware that receiving an [FDA](#) clearance for general permission to market their devices does not permit them to advertise the lasers for either hair removal or wrinkle treatment, even though hair removal or wrinkle treatment may be a by-product of any cleared laser procedure. Further, manufacturers may not claim that laser hair removal is either painless or permanent unless the [FDA](#) determines that there are sufficient data to demonstrate such results. Several manufacturers received [FDA](#) permission to claim, "**permanent reduction**," NOT "**permanent removal**" for their lasers. This means that although laser treatments with these devices will permanently reduce the total number of body hairs, /they will not result in a permanent removal of all hair. The specific claim granted is "intended to effect stable, long-term, or permanent reduction" through selective targeting of melanin in hair follicles. Permanent hair reduction is defined as the long-term, stable reduction in the number of hairs re-growing after a treatment regime, which may include several sessions. The number of hairs regrowing must be stable over time greater than the duration of the complete growth cycle of hair follicles, which varies from four to twelve months*

according to body location. Permanent hair reduction does not necessarily imply the elimination of all hairs in the treatment area.

FDA does not make comparisons between systems or how well or safely they work compared to another company's system. **FDA** does not recommend one laser system over another.

Lasers cleared for body hair removal are also cleared for facial hair removal (**FDA, 2014**).

Vaniqa

A topical agent containing the ornithine decarboxylase inhibitor called eflornithine is available. It has recently been licensed in the UK for treating facial **hirsutism**⁷⁷ in women. There are no published peer-reviewed studies but data presented at academic meetings suggest that it reduces hair growth by about 20%. Continued treatment is needed to maintain the response.

Eflornithine, is an antiprotozoal drug, which inhibits the **enzyme**^{??} ornithine decarboxylase in hair follicles and topical application can reduce the growth of unwanted facial hair (**BNF, 2016**).

Eflornithine is a prescription drug indicated in the treatment of facial **hirsutism**. Eflornithine hydrochloride cream for topical application is intended for use in women suffering from facial **hirsutism** and is sold by Allergan, Inc. under the brand name Vaniqa. Besides being a non-mechanical and non-cosmetic treatment, eflornithine is the only non-hormonal and non-systemic prescription option available for women who suffer from facial **hirsutism**. Eflornithine is on the World Health Organisation's List of Essential Medicines (**DRUGBANK, 2015a**).

Each gram of Vaniqa 11.5% w/w cream contains 115 mg eflornithine (as monohydrate chloride) (**EMC, 2016**).

Pharmacokinetics

Steady state cutaneous penetration in women from Vaniqa on facial skin of shaving women was 0.8%.

The plasma half-life was approximately 8 hours. Steady state was reached within four days. Excretion was mainly in the urine (**EMC, 2016**).

How it works

Eflornithine prevents hair growth by inhibiting the anagen phase of hair production. This occurs by eflornithine irreversibly binding (also called 'suicide inhibition') to ornithine decarboxylase (ODC) and physically preventing the natural substrate ornithine from accessing the active site (**DRUGBANK, 2015a**).

Typical dosage

Apply thinly twice daily (**BNF, 2016**).

Side-effects

Common -

- acne,
- burning,
- dry or tingling skin,

⁷⁷excessive hair growth

- hair loss,
- headache,
- ingrown hairs,
- pseudofolliculitis barbae ⁷⁸,
- rash,
- skin itching,
- stinging (MEDICINENET, 2016a).

Rare -

- bleeding skin,
- contact dermatitis,
- herpes simplex,
- nausea,
- numbness,
- swollen lips (MEDICINENET, 2016a),
- rash (WEBMD, 2016g).

Interactions

Minoxidil should not be used with other topical medications because they may increase its absorption and side-effects (MEDICINENET, 2016b).

X-ray Epilators

This was branded permanent hair removal (and actually did seem to give permanent hair removal for some clients) however the side-effects were severe with many clients ending up with cancerous tumours as a result of the treatment.

The effect was so severe that one study estimated that the x-ray epilator was solely responsible for 1/3 of all radiation related cancers in women (HAIRFREELIFE, 2014a).

Microwave

These devices are extremely dangerous. They use a wand similar to laser but emit microwaves to heat the hair using the same principle as thermolysis. Makers claim that, unlike laser, microwave can be used on all hair colours. The glaring problem with these devices is their propensity to "cook" all of the skin they are pointed at whereas thermolysis goes to great lengths to target individual follicles. The microwave method is relying on the skin being extremely dry while the follicles are full of moisture. Unfortunately this is not the case (PERMANENCE, 2014).

This device uses microwaves like the kind used in a microwave oven. Microwaves are just radio waves (within a certain frequency range) that have an interesting property - they are absorbed by water, fats and sugars. When they are absorbed, they cause molecules to vibrate, which results in heat.

Here's the problem and potential danger with microwaves - microwaves can heat ALL the water and fat in your skin, not just the parts near the hairs.

The primary difficulty in hair removal is delivering enough energy to the hair structures to cause permanent damage without damaging the surrounding tissue. Frequencies in the microwave range have been shown to be effective when conducted down a metal probe. This is how the

⁷⁸swollen patches that are sometimes reddened and contain a buried hair

type of needle epilation called thermolysis works. The damage occurs only to the areas of the hair follicle right around the metal probe.

Unlike lasers, a microwave does not rely on selective photothermolysis. Microwaves don't heat up a target (like laser do to melanin) while sparing other structures. This indiscriminate heating of all water and fat in the skin is potentially problematic. To generate enough heat to damage a hair follicle, a microwave might also generate enough heat to destroy other things like blood and sweat or oil glands needed to keep skin healthy. In addition, there is a very real possibility of causing eye damage from microwaves directed at the face.

Until there is published data on these devices, the danger of collateral skin damage represents an unknown risk. I urge all consumers and practitioners to avoid using this device until there is more information (JAMES, 2017c).

Advantages

- Targets all colours of hair (JAMES, 2017c).

Disadvantages

- Targets everything else in the skin, too,
- Not cleared for use on the face,
- Not enough data on safety or effectiveness (JAMES, 2017c).

Quack claims

- "Delivers precise, controlled pulses to the hair follicle".
 - Pulses are delivered to all tissue nonselectively.
- "Causes destruction of the follicle without damage to the surrounding skin".
 - There is no published data showing this device causes destruction of the follicle, let alone selective destruction. They offer no explanation why the device will spare other moisture-containing structures and substances in the skin (JAMES, 2017c).

History

In 1999, FDA cleared these devices, but they specifically stated they are not to be used on the face (FDA, 2006). One company in the US has been cleared to sell these devices, but they have sold very few of them (MWMD.OB, 2001).

Clinical data

There is no published clinical data on safety or effectiveness of microwaves delivered in this manner for hair removal.

Again, I strongly recommend that consumers avoid microwave hair removal until there is some published clinical data demonstrating the devices are safe and effective for hair removal (JAMES, 2017c).

Electronic tweezers

Electric tweezers have been available since 1959. In 40 years, there has been no published clinical data demonstrating these devices can achieve permanent hair removal as claimed (JAMES, 2016a).

Electronic tweezers have no clinical research backing up the many quack claims that are associated with this method of hair removal.

Advertisers claim that users can get permanent hair removal with no side-effects and substantiate these claims with convincing arguments that blend science and fiction to persuade buyers into purchasing these devices (HAIRFREELIFE, 2014a).

Pubic hair removal

There are a wide variety of methods used to remove or alter pubic hair. The most common short-term method for reducing or removing pubic hair is shaving, while the most common long-term methods include waxing or laser-hair removal. Below are descriptions of the various methods for pubic hair modification (UCSB, 2014).

Shaving

A razor (straight razor, safety razor, or electric razor) is used to cut the hair at the level of the skin or relatively close to it. Contrary to popular belief, shaving with a razor does not make hair grow back faster, thicker, or darker. Shaving with a razor creates a flat end to the hair, giving it more sharp edges than naturally pointed hair. Prior to shaving, it is recommended that you first wet the area to be shaved and then apply shaving cream, soap, or body wash. This will help to prevent nicks (cuts), bumps, blisters, ingrown hairs, and general irritation. Shave in the direction of the hair growth (with the grain) to avoid ingrown hairs and irritation. Shaving against the grain of hair can cause nicks, bumps, blisters, etc. The effectiveness of this method may deteriorate when the blades begin to rust (they are not necessarily getting dull!). Try soaking the razor in white distilled vinegar or another preferred cleanser to remove the rust. It may be necessary to shave down lengthy hairs with an electric razor before using a regular razor (UCSB, 2014).

Bikini Waxing

Waxing is a procedure that involves pulling out sections of hair using various types of waxes. To perform a bikini wax, a licensed aesthetician or cosmetologist applies warm wax to a female's bikini line (inner thigh area), places cloth strips atop the wax, and then removes them by pulling the material off the skin. Oftentimes a small thatch of hair is left above the vagina, sometimes in the shape of a heart or triangle. Certain websites and magazines offer printout stencils for pubic hair designs.

Since this method can be very painful, pain-reducing gel is often recommended before applying the wax. It is possible that some skin irritation, bleeding, and inflammation of the hair follicles can occur as a result of removing the wax, so do not be alarmed if this occurs. Wax should not be put on skin that is chapped or sunburned or on the face of a person using facial products like Retin-A or Differin (these weaken the skin and could result in skin tearing when the wax is pulled off). If a licensed aesthetician or cosmetologist performs the waxing, treatment costs typically range from \$25 to \$50. Do-it-yourself waxing products can also be purchased and used in the comfort of your own home. Hair needs to be at least 1/8 inch long for waxing to be effective, so do not shave in the days or weeks leading up to your appointment. Results typically last 3 - 8 weeks (SIDONS, 2014), (UCSB, 2014).

Brazilian waxing

The 'Brazilian wax' is similar to a bikini wax, but it involves complete removal of hair from the vulva (the external female genitals), perineum, anus, buttocks, and mons, using a wax mixture

made from natural beeswax, tall oil, and sometimes botanicals. This wax mixture is stronger and more effective at removing the thicker pubic hairs compared to the synthetic waxes frequently used for leg waxing. While the Brazilian wax has long been associated with women, there are a growing number of men getting the male equivalent of the Brazilian wax. The procedure is performed by licensed cosmetologists or aestheticians at numerous spas and salons (EVERTS, 2012), (UCSB, 2014).

The origin of brazilian waxing

Though genital waxing has grown in popularity over the past 20 years, the practice is not new. Waxing of the genital areas has been prevalent for centuries in Ancient Greece, Rome, Egypt, Arabia, Turkey and Persia. In the past, however, the waxes were sugar-based and made with lemon. The Brazilian wax specifically started on the beaches of Rio de Janeiro, where many young women wear gossamer bikinis called fila dental (as in dental floss). The Brazilian wax was introduced to the United States in 1987 when seven Brazilian sisters, Jocely, Jonie, Joyce, Janea, Jussara, Juracy and Judseia Padilha, opened a hair removal salon called J. Sisters International Salon in Manhattan, New York (EVERTS, 2012), (UCSB, 2014).

Typical waxing procedure

- Females may or may not be provided with a paper G-string. The client will then be asked to disrobe from the waist down and lie down on a waxing table.
- Talcum powder is sometimes spread over the area to be waxed, which prevents the hot wax from sticking to the skin.
- Hot wax is applied with a wax strip and given a short amount of time to harden. The wax strip is then pulled off in the opposite direction of hair growth (against the grain) with a cloth strip.
- This process is repeated until all of the hair on the vulva, mons, perineum, and anus is removed. The application and removal of the wax is done in sections as the cosmetologist works around the client's body.
- Once the waxing is complete, tweezers are used to remove any remaining stray hairs that were not removed during the waxing.
- The remaining strip of pubic hair on the mons verenis (often called a 'landing strip') is trimmed or waxed depending on the client's request. If the remaining hair is trimmed, it may be dyed or shaped into various patterns, including triangles, hearts or squares. If the remaining hair is removed, the procedure is called a full Brazilian wax or Hollywood wax (UCSB, 2014).

Men and women who want to take the risk of dyeing their pubic hair should avoid hair covering the genitals and only dye the hair that covers the pubic bone (the mons). The dye can cause irritation if applied to the labia - both inner and outer lips of the vulva. For males, it is important to avoid the penile shaft and the scrotum because they both tend to be sensitive. Many people experience irritation or allergic reactions, including burning of the vaginal area, itching, blisters, redness, or complete loss of hair. It is important to test for sensitivity first by doing a skin patch test 48 hours before attempting to tint hair. The entire Brazilian waxing session performed by a licensed cosmetologist or aesthetician at a salon will typically last 15 - 30 minutes (EVERTS, 2012), (UCSB, 2014).

The results

The results from a Brazilian bikini wax typically last from three to six weeks, depending on the individual's hair regrowth rate. Regrowth of pubic hair is generally minimal during the first two weeks and increases by the third. Heat stimulates hair growth, so regrowth may be quicker in the summer months. With regular waxing, hair regrowth will generally slow down, and the time between waxing sessions will increase (UCSB, 2014).

Pain

It is normal to feel pain during a Brazilian or bikini wax; however, the severity of pain varies greatly among women. The most painful area is usually the mons verenis (the area above the clitoris), whereas the least painful area is behind the genitals and around the anus. The best time to have your pubic hair waxed is a week after menstruation, since the genital area is least sensitive during this time. In contrast, the pain is likely to be greatest immediately before and during menstruation, when the area is most tender. Typically the first Brazilian wax is the most painful. The pain should gradually decrease in subsequent waxing sessions when the hair is thinner and easier to pull out (UCSB, 2014).

Tweezing

Tweezing is a laborious method that involves plucking each individual pubic hair. There may be pain, skin irritation, and inflammation of the hair follicle as a result of tweezing. Hairs often grow back as ingrown hairs, meaning that they continue to grow underneath the surface of the skin, can create long spirals, and can often lead to infections. Tweezers cost anywhere from \$3 to \$30. Results last about three to eight weeks (UCSB, 2014).

Laser hair removal and intense pulsed light

Laser hair removal is [FDA](#) approved. Working with small areas of the skin, the laser beam destroys hair follicles and impairs hair regrowth. Redness or pigmentation changes of the skin may result after treatment. Laser treatment works best on people with light skin and dark hair, but may not be effective on deeply-embedded hair follicles. Since this procedure works by targeting the root of the hair, it is recommended that you avoid plucking, waxing, and electrolysis beginning six weeks prior to the procedure so that the root is left intact. Only a doctor or licensed technician should perform laser hair removal. This procedure is very expensive, and multiple treatments are necessary for lasting results. The average cost for one session of laser hair removal is between \$200 and \$300, but costs may vary depending on the size of the treated area and number of treatments. This procedure can be used for pubic hair removal, but only for hair along the bikini line. Results are long lasting, but some hair may grow back. If hair does grow back, it is typically more sparse and much finer than pretreated hair (GARDNER, 2015).

Hair removal creams and lotions

Creams and lotions, also referred to as depilatories, contain chemicals that dissolve the protein structure of hair and cause it to separate from the skin. Some depilatories can increase acne and cause skin irritation or chemical burns if the formula is too strong or the cream is left on too long. These creams and lotions are not intended for use on the labia minora (the inner lips). Depilatories are sold [OTC](#) at most drug stores and cost \$5 - \$10. Results last about one week (UCSB, 2014).

Side-effects of hair removal

Please note that hair removal in general may cause irritation of the skin, along with razor burn and/or ingrown hairs. Ingrown hairs form when the hair fails to grow out of the skin and curls over inside the follicles under the skin (just like the 'razor bump' hairs curl above the skin). By curling, the hair creates a painful 'foreign body' reaction in the hair follicle. The resulting inflammation in the follicle then creates an unsightly 'bump', oftentimes filled with pus. Products such as 'Tend Skin' may reduce the occurrence of ingrown hairs and/or razor burn (UCSB, 2014).

Methods not recommended for pubic hair removal

While there are a wide variety of hair removal methods on the market, it's important to note that not all methods are appropriate for pubic hair removal. Often, these methods are too strong to be used on such a sensitive area (UCSB, 2014).

Epilators

Mechanical epilators are devices that pull out the entire hair follicle. These should not be used on sensitive skin areas such as face, genitals, or armpits because the soft skin of the bikini area may tear. In addition, the hair must be about a quarter inch or longer to work, and the epilator could still miss some hair. Mechanical epilators cost anywhere from \$50 to \$100. Results last about one week (UCSB, 2014).

Electrolysis

Electrolysis is a very laborious method of hair removal because each hair must be treated individually. During electrolysis, a qualified professional inserts a needle under the skin that passes an electric current through the hair follicle to damage it. Because this process is so time-consuming and requires multiple treatments, it can be very expensive. Electrolysis can also be painful and there is a risk of scarring and infection. This procedure should only be performed on the eyebrows, face, thighs, abdomen, breasts, and legs. Results are long lasting, but some hair may grow back (JALIMAN, 2015), (UCSB, 2014).

Drugs that can cause hair loss

Acne

All drugs derived from vitamin A as treatments for acne or other conditions, including - Accutane (isotretinoin) (WOMENSHAILOSSPROJECT, 2007).

Blood

Anticoagulants (blood thinners), including -

- Panwarfin (warfarin sodium),
- Sofarin (warfarin sodium),
- Coumadin (warfarin sodium),
- Heparin injections (WOMENSHAILOSSPROJECT, 2007).

Cholesterol

Cholesterol-lowering drugs, including -

- Atronid-S (clofibrate),
- Lopid (gemfibrozil) (WOMENSHAILOSSPROJECT, 2007).

Convulsions/ Epilepsy

Anticonvulsants, including -

- Tridone (trimethadione) (WOMENSHAILOSSPROJECT, 2007).

Depression

Antidepressant drugs, including -

- Prozac (fluoxetine hydrochloride),
- Zoloft (sertraline hydrochloride),
- Paxil (paroxetine),
- Anafranil (clomipramine),
- Janimine (imipramine),
- Tofranil (imipramine),
- Tofranil PM (imipramine),
- Adapin (doxepin),
- Sinequan (doxepin),
- Surmontil (trimipramine),
- Pamelor (nortriptyline),
- Ventyl (nortriptyline),
- Elavin (amitriptyline),
- Endep (amitriptyline),
- Norpramin (desipramine),
- Pertofrane (desipramine),
- Vivactil (protriptyline hydrochloride),
- Asendin (amoxapine),
- Haldol (haloperidol) (WOMENSHAILOSSPROJECT, 2007).

Diet

- Amphetamines (WOMENSHAILOSSPROJECT, 2007).

Fungus

- Antifungals (WOMENSHAILOSSPROJECT, 2007).

Glaucoma

The beta-blocker drugs, including -

- Timoptic Eye Drops (timolol),
- Timoptic Ocudose (timolol),
- Timoptic XC (timolol) (WOMENSHAILOSSPROJECT, 2007).

Gout

- Lopurin (allopurinol),
- Zyloprim (allopurinol) (WOMENSHAILOSSPROJECT, 2007).

Heart

Many drugs prescribed for the heart, including those known as the beta blockers, which are also used to treat high blood pressure, and include -

- Tenormin (atenolol),
- Lopressor (metoprolol),
- Corgard (nadolol),
- Inderal and Inderal LA (propranolol),
- Blocadren (timolol) (WOMENSHAILOSSPROJECT, 2007).

High Blood Pressure

- See above list of beta blockers under heart ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Hormonal Conditions

All hormone-containing drugs and drugs prescribed for hormone-related, reproductive, male-specific, and female-specific conditions and situations have the potential to cause hair loss, including -

- Birth Control Pills,
- Hormone-replacement therapy (HRT) for women (oestrogen or progesterone),
- Male androgenic hormones and all forms of testosterone,
- Anabolic steroids,
- Prednisone and other steroids ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Inflammation

Many anti-inflammatory drugs, including those prescribed for localised pain, swelling and injury ([WOMENSHAIKLOSSPROJECT, 2007](#)).

- Arthritis drugs,
- Nonsteroidal Anti-Inflammatory Drugs including:
 - Naprosyn (naproxen),
 - Anaprox (naproxen),
 - Anaprox DS (naproxen),
 - Indocin (indomethacin),
 - Indocin SR (indomethacin),
 - Clinoril (sulindac) ([WOMENSHAIKLOSSPROJECT, 2007](#)).

An anti-inflammatory that is also used as a chemotherapy drug -

- Methotrexate (MTX),
- Rheumatex (methotrexate),
- Folex (methotrexate) ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Parkinson's Disease

- Levodopa / L-dopa (dopar, larodopa) ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Thyroid Disorders

- Many of the drugs used to treat the thyroid ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Ulcer

Many of the drugs used to treat indigestion, stomach difficulties, and ulcers, including [OTC](#) dosages and prescription dosages ([WOMENSHAIKLOSSPROJECT, 2007](#)).

- Tagamet (cimetidine),
- Zantac (ranitidine),
- Pepcid (famotidine) ([WOMENSHAIKLOSSPROJECT, 2007](#)).

Chapter 6

Permanent

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Electrolysis

Electrolysis has the longest known track record together with the most effective results for permanent hair removal (ELECTROLYSIS.CO.UK, 2015). The medical condition of blindness caused by ingrown eyelashes, lead to the invention of hair removal using electrolysis in 1869 by the ophthalmologist, Dr. Charles Michel from St. Louis.

Electrolysis involves the destruction of the hair root by an electric current, either passing through a needle or the water molecules surrounding the root. Electrolysis is usually permanent, but it is expensive, time consuming and painful. As electrolysis is not a method of personal hair removal, results depend on the skill level of the practitioner ([SILK'N](#), 2014b).

Electrolysis hair removal involves the removal of hair by use of electric current. A hair-like thin metal probe is inserted into the hair follicle. Electricity is then delivered through the port causing damage to hair generating areas and thus reduced growth in unwanted hair.

Electrolysis hair removal is usually permanent but may involve some pain during the procedure and is time consuming. The factors for treatment depend upon the size of the area to be treated, the curvature of the hair follicle, the level of skin sensitivity, and hormonal balance. The pain tolerance is individual. Some feel only mild pain while others might feel excessive pain which is not tolerable. Electrolysis hair removal is not a one time process. A person might need to repeat it once or twice a year. The time required will depend on how thick or thin the hair is (ELECTROLYSIS.CO.UK, 2015).

Electrolysis (sometimes known as electrology) works by passing a small amount of energy into each hair follicle via a very fine needle, in order to disable the follicle, thus causing the hair to fall out.

The actual hair itself is a dead structure. It is the matrix, which is the name given to the actively dividing cells at the base of the hair follicle that produce the hair, which is the target for treatment.

In addition, there are germinating cells located below the sebaceous gland, which also need to be destroyed to achieve effective permanent hair removal.

The aim is for the hair follicle to be permanently disabled, so that regrowth does not occur - the hair itself merely indicates the location of the follicle and helps to determine the depth to which the needle should be inserted ([DZUREK](#), 2015d).

Treatment times

All hairs have differing cycles of growth and are not all visible on the surface of the skin at the same time. Also, hair removed using electrolysis may not necessarily destroy the hair follicles' capability of producing new hair. Therefore, it is necessary to have some repeat treatments and your practitioner will calculate how often you need them based on the area treated, the technique he or she has used, and how hairy you normally are! ([CONSULTINGROOM, 2016](#))

The amount of treatment time that may be required for different areas is extremely variable, but could be -

Site	Time in hours
Upper lip	4 - 10
Chin	2 - 12
Underarms	4 - 12
Arms	5 - 10
Bikini line	8 - 16

Table 6.1: Estimated treatment times ([CONSULTINGROOM, 2016](#)).

How does electrolysis work?

Electrolysis involves the insertion of a very fine, disposable, sterile probe (the same diameter as the hair) into the hair follicle, which is a natural opening in the skin. A tiny amount of energy is then skilfully discharged into the hair follicle. The only sensation felt by the client is heat passing down the probe to the base of the follicle. The follicle destruction is achieved by heat (with thermolysis) or a chemical reaction (with galvanic) or both blended together (with the blend).

The treatment can be adapted to suit each client's skin, hair and pain threshold.

During a course of treatments there will be a constant, gradual decrease in the growth of the hair until it has all been permanently removed (a bit like watching a man go bald, e.g. 200 hairs reduce to 150, 125, 100 etc. until there are no hairs left, as follicle destruction has been achieved). The number of treatments required will vary from person to person and will be discussed at the initial consultation.

Electrolysis can be used on any part of the body. No type or volume of body hair is too stubborn for treatment and no body part too embarrassing. Treatment areas include all facial areas, legs, bikini line, chest, nipples, back, abdomen, underarms, fingers, toes and eyebrows.

The first sign that electrolysis treatment is working is that the hair growth becomes softer, finer and lighter in colour. You will see and feel the difference throughout the course of treatment, so you do not have to wait until the end of your course to see a difference ([ELECTROLYSIS.CO.UK, 2015](#)).

There are 3 methods of electrolysis to choose from in order to tailor your treatment to your skin type and reaction, and all 3 are capable of permanently removing hair. They are -

- Galvanic,
- Thermolysis (is also called diathermy or RF diathermy in some countries),
- Blend.

Galvanic

Galvanic electrolysis has been in use for more than 150 years (first successfully used in 1875) and has a proven track record ([DZUREK, 2015d](#)).

This type of electrolysis hair removal uses direct electrical current, which passes through a needle to stimulate a chemical reaction in the hair follicle and thus destroys it. Salt and water (saline) around the probe is chemically altered to produce sodium hydroxide (known as 'lye'). As the sodium hydroxide builds up, hair follicles are damaged and destroyed.

Galvanic electrolysis is actually a chemical process. Galvanic lye is a chemically unstable compound which provides free radicals to breakdown tissue and allow separation of the follicle wall surrounding the hair. A note - the follicle containing the hair is comprised of some 6 known layers. Galvanic lye (sodium hydroxide) causes a breakdown of the weaker layers and allows the inner-most part of the follicle to be removed. However, the lye continues to work for some time after the hair is removed, facilitating the death of the outer layers and re-growth cells.

Properly applied, galvanic electrolysis will not damage surrounding tissue excessively, nor will it damage the sebaceous glands as galvanic lye encounters difficulty in breaking down the sebum contained in the sebaceous glands. Even more important, is the recent discovery of a bundle of undifferentiated stem cells surrounding the midpoint of the follicle (please see hair). Called 'The Bulge', this bundle of stem cells sits outside the follicle itself.

All the functions of 'The Bulge' are somewhat unclear. One thing seems certain. These stem cells are utilised by both the skin and the hair follicle as a means of renewing damaged tissue. Scarier yet, is the possibility that any process that uses heat for killing the hair (i.e. laser, thermolysis (RF or diathermy) may also damage this bundle of stem cells. Preservation of 'The Bulge' seems important to maintaining skin texture and resisting aging. Preserving this 'bulge' and the sebaceous glands is equally paramount in electrolysis work as well (RUSTING, 2001).

Because of the effectiveness and permanence of galvanic, far fewer passes are needed. Approximately $\frac{1}{5}$ to $\frac{1}{10}$ as many passes are required to have the same effect as thermolysis (Radio Frequency or Diathermy). With galvanic electrolysis, a significant reduction can be achieved in 3 - 5 passes over the area. The skin benefits from the reduced collateral damage caused by treating the same area 10's of times with other methodologies. Also, it should be noted that the precision of the process of galvanic electrolysis is far superior to that of any other method. Utilising duration of treatment cycle and intensity settings, each hair can be custom treated determined by its size and relative location to other hairs that have been treated (TRANSGENDERCARE, 2016a).

The galvanic method was the first method developed for removing superfluous hair. This method removes hair through chemical decomposition. Galvanic refers to galvanism or galvanic cells (a battery). As does a battery, the galvanic method uses direct current. It is long been understood that the application of direct electrical current to a solution of salt water produces a reaction that causes the salt and the water to break into their constituent parts. These parts quickly rearrange themselves to form an entirely new substance. This process is called electrolysis. The new substances that are formed are sodium hydroxide (lye), hydrogen gas, and chlorine gas.

It is the sodium hydroxide, or lye, which is the source of follicle destruction in the galvanic method.
The galvanic method is basically a chemical process.

Here is the mechanism behind "true" electrolysis - with the galvanic method, the body salts combined with the moisture found in body tissue make a type of salt water solution. The moisture content of this salt water solution is at its greatest concentration deep within the follicle. When the electrolysis current is applied to the inserted needle, the newly manufactured lye causes a chemical decomposition of the hair growing cells to occur. Two electrodes are required for this process to take place. One electrode is actually the electrology needle, the other electrode touches the patient's body in some location. This "patient electrode" is usually a metal wand held in the patient's hand. This process is very slow and requires about two minutes to generate enough lye to spread through the follicle of a course, deeply rooted hair. This single needle galvanic method is no longer used because of this time constraint (TRANSGENDERCARE, 2016a), In 1916, an additional 5 needles were added to the unit to reduce the time required for treatment. This is known as the multi-needle method (DZUREK, 2015d). However, modern electronic design allows the multiple needle galvanic method (12 to 16 hairs treated simultaneously) to work very effectively. The galvanic method kills about 80% of the hairs treated (TRANSGENDERCARE, 2016a).

There are two factors affecting regrowth, which makes galvanic electrolysis the ideal method.

- The continuing effect of galvanic lye in the follicle tissue following the removal of the needle. This continued destruction damages the outer follicle wall as well as any DNA bearing material left in the follicle after the removal of the hair itself.
- Continued degradation of Sodium Hydroxide (Galvanic Lye) which is chemically unstable, results in the formation of Hydrogen Peroxide which sterilises the former follicle site and inhibits the germination process of new hair.

Redness and swelling is limited to 24 - 48 hours in the very worst cases.

There are some relatively minor side-effects which you should be aware of -

- Galvanic (or any other process) can cause the spread of some ailments of the skin. Check before you begin treatments.
- The use of galvanic current can cause the re-sensitising of certain dental work. This sensation invariably disappears when treatment stops.
- Galvanic current is passing through you. Be aware of this when it comes to minor pains or twitches (LAIRD, 2014a).

Multi-needle galvanic electrolysis is a highly effective means of permanently removing unwanted hair, however it is time-consuming, requiring at least 3 minutes per hair.

This method is best suited to course, thick hair e.g. beards and all types of body hair (DZUREK, 2015d).

Pros

- Proven track record of good results,
- Has the flexibility to treat curved hair follicles effectively,
- Provides the most effective method of the three - with minimal regrowth,
- No heat is involved, therefore little or no effect on surrounding tissue (DZUREK, 2015d).

Cons

- Length of treatment time - minimum of 3 minutes per hair (DZUREK, 2015d).

Thermolysis

Also called **Diathermy** and **Radio Frequency**.

This is a newer method than galvanic, having been first established in 1923, which offers a quicker alternative solution (DZUREK, 2015d).

In this method, alternating electrical current is used which passes through the needle and creates a vibration effect in the hair follicle, which in turn irritates the water molecules surrounding the base. This generates heat which damages the hair follicles. This method is definitely quicker, taking just a few seconds per hair, but is not as reliable or effective when compared to galvanic electrolysis, so is typically used for fine hair (DZUREK, 2015d). This method also can be quite painful.

Thermolysis was devised and described as a hair removal technique by Dr. Bordier of Paris, France, about 1923. His concept was the use of a wave of electro-magnetic energy raising the temperature in the tissue surrounding the hair. The rapid oscillation of the radio frequency (RF) wave would cause molecular agitation of the moisture in the follicle with resulting temperature rise which would then increase with time or intensity. The increase in friction resulted in an increase in temperature.

In 1945, the concurrent use of both thermolysis and galvanic electrolysis became possible. This was done by Henri St. Pierre and Arthur Hinkle whose company continues to manufacture equipment to this day. But thermolysis would continue to gain popularity because of two facets. It was fast and much simpler to perform than galvanic or blend electrolysis (LAIRD, 2014c).

Thermolysis, also called shortwave method, high frequency method, or diathermy, destroys the hair follicle by heat or electrocoagulation. It is the most widely practiced method of permanent hair removal available today. All thermolysis equipment operates at a specific radio frequency approved by the FCC (Federal Communications Commission), since it is a type of radio device. With thermolysis treatment, high frequency radio energy is emitted (mostly) from the tip of the electrolysis needle, first inserted into the hair follicle. The high frequency energy agitates the molecules making up the hair growing cells. This agitation causes the cells to heat, ideally to the point of permanent tissue destruction. This destruction is referred to as electrocoagulation. A microwave oven is another example of radio waves heating organic tissue. The thermolysis method does not require the use of the second patient electrode.

Thermolysis is ideally suited for thin, shallowly rooted hairs. It is a straightforward approach, and requires a minimum of operator training. However, its usefulness greatly degrades with the larger, coarse and deeply rooted hairs that generally comprise the typical male beard. We find the incidence of treatment complications to be somewhat higher with thermolysis as compared to multiple needle galvanic or the blend (described next).

Additionally, treatment complications greatly increase with the use of flash (high intensity, short duration) thermolysis. We find the adverse result of pitted scarring to be greatest with flash thermolysis.

The flash method is intended for treating small follicles, but has been adopted for treatment of large follicles. The flash method dispenses a high intensity blast of high frequency energy within less than one second's duration. When this intensity is proportionate to the size of small follicle, it is an acceptable method. But when this intensity is increased enough to treat larger follicles, serious permanent side-effects may occur. This intense heat can cause pitted scarring. For details on how this side-effect occurs, please see high frequency blowout. Thermolysis typically provides a 5% - 15% kill rate for follicles treated ([TRANSGENDERCARE, 2016a](#)).

Properly done, small, peach fuzz hairs can be removed easily. Swelling and discoloration are generally gone in about 2 - 3 hours. The "point effect" of the energy radiating downward from the tip of the needle is also quite useful when treating small sebaceous hairs. This removes the need for actual insertion itself. Simply touching the skin at the base of the hair brings the sebaceous bulb within range of the power band.

But, if done inexpertly it can result in serious burning and scarring!

Generally, the original intent of thermolysis was to remove a few sparse hairs or an upper lip of peach fuzz. Both St Pierre and Arthur Hinkle warned against the use of Flash Thermolysis for the purpose of removing coarse deep terminal hair such as beards.

For the removal of sparse hair, thermolysis can even be used without significant impact to the skin. However in the case of facial beards or seriously dense and deep hair, thermolysis is subject to a problem with **overlapping of power**. With this overlapping of power, the overlap between any three hairs is sufficient to cook the skin into a serious second degree radiation burn with severe tissue damage!

It is prudent to point out here that the instant power stops, so does any means of further damage to the hair follicle. Not so, with galvanic electrolysis which produces sodium hydroxide (galvanic lye). With thermolysis, we find that with each pass, we remove the main hair, but stimulate surrounding follicle sites! The skin then tries to protect itself against stimulation and one of those mechanisms for protection is growing more hair!

In the hands of an inexpert operator tissue [desiccation](#) and scarring can occur. Usually scabbing will follow for a couple of weeks and then the skin displays a small circular scar around the original hair site. In severe thermolysis overtreatment, sunken pits are also observable. Large areas of high power thermolysis will ultimately present as white blotches in the skin ([LAIRD, 2014c](#)).

Pros

- Speed - only 1 - 3 seconds required per hair,
- Results can be seen instantly (DZUREK, 2015d).

Cons

- This method is not suitable for curved hair follicles,
- Has a high regrowth rate,
- The surrounding tissue is heated - limiting treatment,
- Only effective on very light, fine, vellus hair,
- Can only effectively treat hair in the anagen (growing) phase (DZUREK, 2015d).

High frequency blowout High frequency blowout is characterised by a popping and crackling sound during treatment. During flash thermolysis treatment, high frequency energy is produced at the tip of the probe. When too much energy is delivered, the fluid found in surrounding tissue immediately turns to steam. It is important to note that steam is a very poor conductor of current. So once steam forms, the energy is blocked from being transmitted deep in the follicle as would normally occur. So the brunt of the high frequency energy is now transmitted high up in the follicle. Now the tissue close to the surface is exposed to a blast of high energy along with the rising steam that continues to travel upwards, finally being expelled from the follicle with a popping or crackling sound. When delivering high energy treatment as described here, this entire process can take place within less than one second's time. And the result can be pitted scarring (JAMES, 2016c).

- High-frequency blow-out is when intense high frequency current converts water in the tissue to steam that blows out of the follicle,
- Sizzle is heard as steam escapes from the follicle opening,
- The lower follicle fills with non-conductive steam that prevents coagulation of the lower follicle,
- Hair regrows and the skin is over treated!
- Flash users have been told that the sebum is being cooked,
- A puff of smoke, smell of burning tissue, result in the needle drying out the skin with tissue stuck to the needle (MICKEY, 2013).

This drastic level of tissue destruction is totally unnecessary (MICKEY, 2013).

Blend

Just as the name suggests, this type of electrolysis hair removal is a combination and simultaneous use of galvanic and thermolysis techniques electrolysis by passing **AC** and **DC** current through the needle (SILK'N, 2014a). This combination method alleviates the shortcomings of each of the individual techniques, while bolstering their advantages. By doing so, blend electrolysis incorporates the high kill rate associated with the galvanic method along with the swiftness found in thermolysis. It is especially useful in treating the deep, course hair follicles that typically make up the beard. We have found no better approach than the use of blend electrology in the treatment of the male to female transsexual (TRANSGENDERCARE, 2016a). The blend method is also called the **dual action method**.

Basically, most of the blend's capacity for destroying the hair growing cells is accomplished by way of chemical decomposition. That destruction, as indicated previously, is through galvanically produced lye. But unlike galvanic on its own, this combination current reduces the normal two-minute duration down to about 10 seconds. And just as important, the high kill rate is still maintained. We find the kill rate for blend to be about 70% - 80%.

The high frequency current that is used to produce a cooking action with thermolysis, is instead used with the blend mainly as an accelerant. This is attributed to three separate actions -

- **Increased Causticity** - heated lye is considerably more caustic,

- **Porosity** - the tissue very close to the needle is turned into a porous mass through which the heated lye solution can easily diffuse,
- **Agitation** - rather than working its way through the tissue by diffusion, the lye surrounding the needle is spread by agitation. This turbulence sends the hot lye solution into every area in the hair follicle and around the hair shaft (TRANSGENDERCARE, 2016a).

This spreading action is also very important when one considers the need for properly destroying the undifferentiated cells found slightly higher up in the follicle, called stem cells, that are responsible for new hair growth. Additionally, the blend is able to successfully treat curved and distorted follicles along with near-miss insertions due to its spreading action.

Despite all of its technical advantages, blend electrolysis does have some circumstantial disadvantages. Typically, galvanic action tends to be somewhat more painful than thermolysis. Proper pain management, while certainly feasible, does prove to be more of an issue. Also, administering effective blend electrolysis is a more complicated and involved process, requiring more training and expertise along with more sophisticated equipment. While older, foot pedal type epilators may prove satisfactory for smaller, less involved situations, state-of-the-art computerised blend epilators are better suited due to the extensiveness and sheer volume of follicles requiring treatment during beard removal. However, computerised epilators have been readily available for about the last ten years, and the increase in transgender individuals seeking services has allowed many electrologists throughout the country to develop expertise in this area (TRANSGENDERCARE, 2016a).

Pros

- Speed - 7+ seconds per hair,
- Indications are that regrowth rates are less than for thermolysis (DZUREK, 2015d).

Cons

- The surrounding tissue is heated - limiting treatment,
- Hydrogen gas produced as a byproduct of galvanic process may cause blow-out when heated (DZUREK, 2015d).

Effects

Long term hair removal (GENDYS, 2011).

Side-effects

- Skin can be red and raised and may feel tender for up to 24 hours,
- Many people find electrolysis painful, although some clinics do offer pain relief (GENDYS, 2011).

Benefits

- Can treat any hair and skin colour,
- Can treat hair of any diameter (GENDYS, 2011).
- Electrolysis is clinically proven for safety and effectiveness,
- Ideal for upper lip, cheeks and face (SILK'N, 2014a).

Risks

- After care instructions must be followed to avoid the high risk of infection,
- Incorrect needle insertion, incorrect needle size, incorrect application of current and over treatment can all cause scarring and pitting of the skin (GENDYS, 2011).

Limitations

- As electrolysis relies on the treatment of individual follicles this restricts the amount of treatment that can be conducted in any session,
- Weekly treatments are required,
- Electrolysis is progressively permanent and results can be slow,
- In order to insert the needle at the correct angle the client must have three days visible hair growth for treatment,
- Make up cannot be applied for 24 hours post treatment (GENDYS, 2011).
- Electrolysis can be painful, expensive and tedious,
- Can be difficult for removing hair from large areas,
- Many people suffer from red patches after treatment which takes about a week to disappear,
- Not recommended for large areas such as legs, back and bikini areas (SILK'N, 2014a).

Side-effects

Common

The amount and severity of the side-effects that you experience with electrolysis depends largely on the sensitiveness of your skin, the duration of the session and the density of the hair in the patch that's being treated (DZUREK, 2014d).

Most people experience one or more of the following side-effects following an electrolysis session

- Redness for up to a few hours after treatment (rarely longer than a day),
- Red dots on the treated area (usually only last a few days),
- Rarely small scabs may appear on the treated area (usually lasts up to 1 week),
- Localised swelling (for most people these usually look like insect bites, although for the rare few that react badly to electrolysis, this can cause large raised bumps on the surface of the skin),
- Acne breakouts (usually caused from skin insensitivities and disappears within a week),
- Skin dryness (sometimes the reaction from the electrolysis can leave the patient with dry skin - a simple aloe gel is your best line of defence against this side-effect) (DZUREK, 2014d).

Rare

Permanent scarring and pitting In some rare cases you may find that the electrolysis procedure has damaged your skin enough to form severe scabbing, which may then over time progress into a scar. In some cases, the scars may take 6 - 12 months to fully show themselves on your skin.

The two most common reasons for permanent scarring are over treatment of a certain area or using a setting that's too strong for the customer (DZUREK, 2014d).

Questions and advice

What you should be asking your potential electrologist

- What percentage of their clientele is trans?
- Explain where you are in your transition - Are you already living as a female? Do you need to keep your treatment private?
- Ask how your treatment plan can be organised so that it allows you to maintain your routine life?

- Ask about timing so that you have the best hair free days at the time of week when it is most important to you?
- Ask for an estimated time frame and how long it will take to notice results (DZUREK, 2016)?
- What brand and model of electrolysis machine do you use?
- Has the device been cleared for use by the FDA? Only applicable in the USA.
- How much experience do you have with this device?
- Why do you use this device over other devices that are on the market?
- Do you have any professional affiliations relating to electrolysis?
- How many clients have you treated with this device?
- What side-effects have you noticed with this device and how long do they last?
- What is your policy if the procedure doesn't work and I don't get the results that I'm expecting?
- How painful will the procedure be?
- How many sessions am I likely to need?
- Can you provide any client details who have had positive results and haven't had treatment for for at least a year?
- If I still have remaining hair after the number of sessions that you recommend, what is your policy?
- Do you have any results guarantee?
- What is your policy if I receive scarring or other forms of permanent skin damage from the treatment (DZUREK, 2014a)?

Go armed with a list of things you want to know about - it is really easy to forget once you are sitting there! Above all make sure that you feel that you have sufficient information to make your decision - and take time to think it all through thoroughly (DZUREK, 2016).

That last point about thinking it through is a very important one, you are considering investing a large amount of money on them and time with them. If you don't feel comfortable with them, then don't sign up for treatment with them!

What they should be asking you

- Have you ever had electrolysis before?
- If so, do you know which type of electrolysis you have had?
- Have you ever had laser?
- If so, what were the results (DZUREK, 2016)?

Further thoughts

- Look for an electrologist who has experience in treating trans people as they will have the knowledge and experience to support you through the process, and thus to achieve the best possible outcome.
- Read online reviews and information about the electrologist, but don't rely on this alone.
- Talk to the electrologist and let him or her educate you, not the other way round! Do they inspire confidence in you?
- Ask questions about the process, a reputable professional will be happy to provide enough information to enable you to make an informed choice.
- If you are not clear about their proposed treatment plan and the details of your treatment, you should look for a more experienced professional.
- Don't be in a rush and take your time to make the right choice - after all it is a major decision and you will be spending a lot of time with your electrologist during the course of your transition (DZUREK, 2016).

Common questions

Will there be any skin damage?

This is a commonly asked question and the answer is no - not if electrolysis is administered correctly. In fact, the skin will actually improve in appearance when the hair is removed (DZUREK, 2016).

Does it hurt?

Only if administered incorrectly. It can be very comfortable if performed in the right way (DZUREK, 2016).

Isn't it much slower than laser?

This is relative, as compared to laser (which is NOT permanent) the process is slower, but achieving permanent results takes some time.

The multi-Needle works much faster than traditional electrolysis, and has the ability to treat up to 32 hairs simultaneously. This also means that the pain factor can be controlled, delivering a virtually pain-free treatment (DZUREK, 2016).

What are the side-effects?

Remember that our skin is a living organ, consisting of appendages (the hair and nails) and we are introducing something foreign into the skin that is unnatural.

Therefore, the response/defense to this is swelling in order to heal, and sometimes tiny scabs form after aggressive treatment - also our skin's way of healing and completely normal.

An abnormal reaction would be excessive swelling or pain after treatment lasting 7 - 21 days and would be indicative of infection or circulatory problems. This would require medical treatment (DZUREK, 2016).

Pre-Treatment Advice

Is a Patch Test Required?

I'm not sure why or how this question became part of a practice within our industry. There is no benefit to the client or practitioner from performing a patch test unless, of course, a rare skin condition exists.

Any valuable information is obtained from Q and A's during the consult and upon examination of the hair and skin (DZUREK, 2016).

How to Prepare?

Your professional will advise you about what they want you to do to prepare for the session, and should include the following -

- Avoid drinking alcohol before the treatment,
- The hair being treated should be visible, but not long,
- Drink plenty of water (DZUREK, 2016).
- You must work as close to your pain threshold as possible for the most effective treatment.
- Get as comfortable as possible during the treatment.

- Find the time of day that works best for you. Early or late, awake or tired, everyone is different.
- Eliminate as much stress as possible on the day of the appointment.
- Your diet can affect your sensitivity. Avoid stimulants like caffeine, chocolate or sugar on the day of your appointment.
- Avoid sun exposure 48 hours prior to your treatment to avoid dilation of the blood vessels.
- Female clients may find that they are more sensitive during or right before their menstrual cycle and may want to avoid making appointments during that time.
- Drink plenty of water the day before, the day of and the day after the treatment. Dehydrated follicles are more difficult to treat. Hydration will also help your skin heal more quickly.
- Some find a meal just before treatment helps reduce discomfort.
- There are many topical creams that are available either with or without a prescription. [EMLA cream](#) (by prescription) and LMX (non-prescription) are the most popular. [EMLA cream](#) should be applied an hour before treatment. You should apply generously and cover with a piece of saran wrap/clingfilm. Use medical tape to keep in place. Hose or bike shorts over the bikini area will help keep saran in place and warm the area. Heat will activate the numbing cream even more. A stronger option is BLT (20% Betacaine, 8% Lidacaine and 4% Tetracaine, by prescription only)
- Do not use Retin A, Tazorac or any serious retinoid for at least 1 week prior to your electrolysis treatment. Discontinue Accutane for at least 6 months prior to electrolysis.
- Pain or the fear of pain should not keep you from getting hair permanently removed if you really want it ([ZAPAHAIR, 2016c](#)).
- You might find it useful to take a dose of ibuprofen or paracetamol, both [OTC](#) remedies, at least one hour before treatment starts. Keep in mind the maximum dose of these drugs to ensure that you don't overdose ([DZUREK, 2016](#)).

Finally, of course, relax and allow your electrologist to do their job!

What to expect at a session

A typical session lasts from 1 - 5 hours of treatment.

During the treatment the patient is simply lying down while the probes are inserted and hair removed. The probes are then re-inserted into more hair follicles and it continues.

We usually give a short 15 minute break between long 4 - 5 hour treatments, and of course toilet breaks are always given as and when needed.

You will feel a heating pattern underneath the skin while the galvanic chemical is pumped into the follicle.

This sensation may be felt more keenly in some areas than others, due to the nerve endings and how thick or thin the skin is each particular area ([DZUREK, 2016](#)).

Post-treatment advice

You should always allow yourself several days to recover between treatments, 7 - 14 days is ideal.

Take an anti-inflammatory for 2 days following treatment and drink plenty of water.

Avoid using harsh facial washes or scrubs while you are receiving treatment.

You can use shaving as a temporary solution between treatments, remembering that hair needs to 1/8 inch above the skin on treatment days. Anything longer is unnecessary and anything shorter is not recommended ([DZUREK, 2016](#)).

- Following your treatment, do not touch or scratch the area treated! Bacteria are on everything and by touching your skin you are transferring bacteria from doorknobs, etc. to the treated area. This will cause a breakout (whiteheads).

- Do not wash or wear make-up over the treated area for 24 hours. Even washing with soap will cause irritation and possible infection. Translucent powder is permissible.
- Avoid perfume or alcohol-based products. They will dry out your skin. You can wipe the area with witch hazel, if needed.
- Apply Bacitracin, Polysporin, Neosporin or another antibacterial ointment or cream to the treated area the night after your treatment. This will help your skin heal even faster, especially facial areas. Apply with Q-tips or clean hands. If your skin is still irritated on the second day, apply a Hydrocortisone cream (Cortisone, Cortaid, anything with 1% hydrocortisone or hydrocortisone acetate). It is anti-inflammatory and will reduce redness and swelling. Also works on pimples!
- Avoid excessive sweating if having work done below the neck. Sweat can cause bacteria to enter into the open follicles and cause minor infection. Exercise before your electrolysis appointment instead of afterward.
- Avoid the sun for the next 72 hours to avoid the formation of brown pigment spots. Your skin defends against UV rays by producing pigment, which will deflect some of the harmful rays. If your skin is injured or traumatised it can over-produce pigment in those areas. This can result in hyper-pigmentation. ALWAYS WEAR SUNSCREEN.
- Do not swim in a chlorinated pool for the first 48 hours following treatment.
- If small scabs appear, do not scratch them away. This can cause scarring. Allow them to fall off naturally. This is nature's way of healing the follicle that we have treated. (The scabs are lymph fluid that has drained out of the follicle and dried up). Keeping the area moisturised will often curtail the formation of scabs. If discomfort should occur in closely treated areas apply an Epsom salt compress - Add 1 teaspoon Epsom Salt to 1/2 cup warm water, mix and soak up with a washcloth. Lay washcloth over treated area for 10 minutes and repeat until discomfort subsides.
- If you are prevented from coming in as soon as you would like for your next treatment, DO NOT TWEEZE! The offending hair can be clipped off with small scissors, shaved, bleached or you can use a depilatory such as Nair ([ZAPAHAIR, 2016c](#)).

What To Expect After Treatment

After electrolysis, your treated skin may temporarily be red, swollen, and tender. You may need additional treatments to permanently remove all unwanted hair. You should notice a loss of unwanted hair in the treated area within several weeks to months after the first treatment ([WEBMD, 2014](#)).

Who should not have electrolysis?

Electrolysis should not be done on the inside of your ears or nose. It also should never be done to remove hair from a mole or a birthmark. If you have a pacemaker, you should not have electrolysis on any part of your body ([WEBMD, 2014](#)).

How Well It Works

When electrolysis is done correctly, it permanently removes unwanted hair. Successful hair removal depends on the skill of the person doing the electrolysis ([WEBMD, 2014](#)).

Risks

Electrolysis poses few risks in a healthy person. During treatment, you may feel some pain from the electrical current flow. After treatment, your skin may be red, swollen (inflamed), and

tender. These are temporary side-effects. Electrolysis can cause scarring, [keloid scars](#)⁷⁹, and changes in skin colour of the treated skin in some people ([WEBMD, 2014](#)).

The Electrolysis Epilator

All needle type electrolysis is performed with the use of an epilator. The electrolysis epilator is the electronic device that emits the treatment energy used in the destruction of the hair follicle.

Along with the epilator, the electrologist uses a probed instrument, called the needle holder, which holds a small needle in its tip. The needle holder is connected to the epilator via a thin electrical cable. Some types of epilators also use a second electrical cable, the patient electrode, that the patient holds (or is attached) in order to complete the electrical circuit.

Electrolysis epilators are divided into three types: thermolysis units, multiple needle galvanic units, and blend units. Modern epilators are computerised or, to some degree, automated. Computerised epilators are known to more precisely regulate the treatment energy delivered, and some have additional features such as auto-sensing, which automatically starts the treatment once the probe is inserted into the follicle. Considering the magnitude of treatment required for beard removal, a full featured, computerised epilator can greatly enhance the process ([TRANSGENDERCARE, 2016b](#)).

Thermolysis Epilators

Thermolysis units are designed for a single purpose - to emit [high frequency \(HF\)](#) treatment energy. The electrolysis needle, itself, does not get hot. This [HF](#) energy is used to heat surrounding tissue and kill the hair growing cells by electrocoagulation, or a cooking action. Most of the [HF](#) energy leaves at the tip of the probe, or needle. Thermolysis units do not require the use of a second electrode (which the patient would hold). Depending on the specific thermolysis method employed and the size of the follicle, treatment may last from less than one second's duration to more than 15 seconds.

Thermolysis provides the least effective method for treating thick, course hair, but is an acceptable way to treat very fine, shallow hair ([TRANSGENDERCARE, 2016b](#)).

Galvanic (Multiple Needle) Epilators

The second type of electrolysis epilator is the galvanic unit. Modern technology is all but eliminated the use of single needle galvanic units. Today, galvanic units will be of the multiple needle type. In the multiple needle galvanic process, usually 12 to 16 follicles are being treated at once - each with its own needle and associated needle holder. Because the electrologist cannot hold these dozen or so needle holders during treatment at once, they are suspended over the treatment area by a harness. The use of a harness, as one may imagine, does not offer the same degree of control as the electrologist's hand. Therefore, multiple needle electrolysis is usually performed on the body as compared to the face. It is best suited for the bikini or inner thigh area. Galvanic units require the use of the patient electrode. Galvanic treatment requires about two minutes for large follicles. This explains the reasoning behind multiple needle versus single needle use.

Galvanic is a very effective method for treating thick, course hair ([TRANSGENDERCARE, 2016b](#)).

⁷⁹smooth, hard growths that sometimes form when scar tissue grows excessively

Blend Epilators

The third type of electrolysis epilator is the blend (or double action) unit. Blend epilators are a combination of thermolysis and galvanic units in one machine. During blend treatment, galvanic treatment is performed along with thermolysis heating action. Both treatment energies are delivered at the same time. This combination, or double action, method is much more effective and efficient than either thermolysis or galvanic on its own. The blend epilator is a single needle unit. Additionally, blend epilators are able to function as a thermolysis epilator as well. We find a computerised, auto-sensing blend epilator to be the unit of choice for permanent beard removal. Blend units require the use of the patient electrode. If you are not holding a patient electrode (or one is attached), you are not receiving blend treatment.

Blend treatment requires about 8 to 12 seconds for large follicles, and is well-suited for facial work ([TRANSGENDERCARE, 2016b](#)).

Electrology 3000

This is an *intense* version of electrolysis practiced at Carrollton, Dallas, Texas, USA. I say '*intense*' because they have 2 electrologists, if they're working on your face, working for about 7 hours a day, hence my description as *intense*.

What tends to happen is along these lines - you are sitting down in a comfortable chair and, assuming that they are working on your face, you have Novocain injections (a local anaesthetic) into the area that they are going to work on. Then you will have 2 electrologists working on either side of your face to achieve initial clearance. This might take 3 or 4 days, working on it for 7 - 8 hours a day ([ELECTROLOGY3000, 2016](#)).

How Do I Prepare for My Session?

You should have had no other form of epilation, i.e. waxing, plucking, other electrolysis, or laser for at least 3 months prior to your first treatment. Additionally, if you have had cosmetic surgery you must be at least three months post-operative before beginning electrolysis, unless your doctor instructs you to wait longer.

As with all cosmetic surgery, before you begin your treatment with E3000, you should speak to your doctor to make sure you are a suitable candidate for electrolysis and have no other health concerns.

Again, shaving is the only form of epilation you should be practicing prior to arriving at E3000. Stop shaving 3 - 4 days before your first appointment for facial areas and 4 - 5 days on all body areas you would like cleared.

Note - Cutting of the hair with scissors is not an option. It makes differentiating between which hairs are active and which hairs are inactive nearly impossible ([ELECTROLOGY3000, 2016](#)).

- Please dress comfortably, as you will be lying in a chair for a number of hours, and perhaps several days.
- Ensure you get plenty of sleep the night before your visit. Being well rested improves your pain tolerance and overall stamina.
- Go light on the caffeine the night before and the morning of your appointment for the same reason mentioned above.
- We understand that our clients come to us in various stages of transition and it is our desire to provide an accepting environment where you will feel comfortable and safe.
- We respect the person that you are inside the outer shell, so we refer to everyone as 'She' and 'Her' unless you request otherwise.
- We will call you by either your male name or your female name. Just let us know your preference.

- You are welcome to dress in either male or female mode, whichever you feel most comfortable with (ELECTROLOGY3000, 2016).

What do I do at the end of a session?

At the end of the day when you get back to your room, start off by taking a nice warm shower to clean your body and relax the muscles from being in a chair all day.

Then focus on the swelling. You should expect swelling and redness to be directly related to the amount of work we did.

Since the face swells the most and the upper lip most of all, please be prepared to spend the first night applying cold to the face for 15 minutes followed by a 10 minute break. Continue alternating with the cold pack throughout the evening. Follow the manufacturer's recommended dose and schedule of ibuprofen, unless you have been instructed otherwise by any doctor, to reduce the swelling.

When it comes time to sleep, sleep in an inclined position. You may need to ask for additional pillows from the front desk of the hotel in order to be supported and comfortable throughout the night (ELECTROLOGY3000, 2016).

What are the after-effects of electrolysis?

Injections of lidocaine seem to scare some clients much more than they actually should. Usually the fear of it is far worse than the actual event. We often work through previously numbed areas to make it as painless as possible. We honestly care about you and hope it shows.

Dr. Victoria Carpenter, D.O., is the doctor legally in charge of numbing and use of medications, yet all of us whom she delegates will treat you with the utmost kindness, sensitivity and attention to safety (ELECTROLOGY3000, 2016).

- **Swelling** - Swelling is normal and is directly related to how much work was done. The first clearings will cause the most swelling. This is especially true of the upper lip because the number of hairs being treated is the most ever, and the upper lip is not attached to bone underneath, so it can swell like a balloon. This is why we recommend that you stay up and keep cold on it for the first night, while taking an anti-inflammatory such as 200mg of ibuprofen every 6 hours. The swelling on the first morning after we treat the upper lip is as big as it gets, and if you do your homework, it will be much better than if you just let it go. If you do not do your homework as suggested you may wake up to a baboon in the mirror. This is NOT the end of the world, however, nor is it permanent, but allowing the swelling to go unchallenged will make the recovery period much longer. If you take care as we ask, you can expect the swelling to last about 3 - 4 days after the first clearing, and less after the others.
- **Redness** - Redness is part of normal inflammation. It is actually pinkness and it diminishes each day. Just how many days it will last varies a lot from person to person, but here are some things that may help predict the duration. The more work we do, the longer it may last. The more fair skinned a person is, the longer it may last. The more weathered the skin has been, the longer it may last. The first few clearings are the most work, so the redness may last between a few days to a few weeks. From then on, it is much less of an issue (ELECTROLOGY3000, 2016).

What can I put on my skin during the healing process?

We recommend you not apply any make-up, sun block, astringents, creams, alcohol, harsh soaps or cleansers or deep scrubs for at LEAST 3 days - longer if the area is still healing. Please keep in mind that almost any foreign substance that is introduced to your skin while in the healing process will likely only delay it and you run the risk of infection (ELECTROLOGY3000, 2016).

Relieving inflammation

Inflammation - that is the body's reaction to treatment. Or more precisely, it is the body's reaction to trauma or injury. What we think of as successful electrolysis treatment is really the selective, precise and irreversible damage of the hair-producing cells located in the follicle.

In the best case, this damage is contained to a degree whereby the skin and surrounding tissue heals and continues to withstand the repeated process of electrolysis. And through successive electrolysis treatments one ultimately becomes hair-free. Given the right circumstances, the successfully treated skin area looks very much like any other's skin that has always been hair-free - the skin is soft to the touch, the texture is smooth, and no changes in the skin's natural colour have occurred.

If you have not experienced electrolysis before, you will no doubt be unprepared for how timely and intrusive a process is ahead. But both of these factors can be greatly diminished.

In this section, we will examine the variety of ways to minimise the physical trauma. Carrying out many of the methods found in this section will require a bit of perseverance on your part. Not because you are unwilling or lacking in discipline, but because the professional electrology community is not a medical community. It does not have direct access to a few medications that would greatly enhance treatment. And some practitioners may not have been sufficiently trained in the prevention and minimisation of treatment-based trauma. There are also a variety of [OTC](#) remedies ([TRANSGENDERCARE, 2015a](#)).

The damaging effects of treatment

For beard removal to be successful, intensive electrolysis is a necessity. In the beard area, one has tens of thousands of hair follicles that need to be destroyed. If you are contemplating full beard removal in two years time, intensive electrology sessions are mandatory. And despite claims of 80 to 100 hours, a very successful programme would likely require 200 to 300 hours of treatment. And for the sake of efficiency, four to six hours per week would be needed.

Based on this treatment plan, hundreds of follicles would need be treated during the course of a single session. And there will be quite a lot of inflammation as a result, that is, if preventative measures are not taken.

Given the best of any technique, trauma is still inflicted to the hair follicle and some of the surrounding area. And multiplied by several hundred-fold during the session, the area would be extremely inflamed following electrolysis. If not, the treatment was palliative, that is, not using enough treatment energy to destroy the follicles. But while a large, treated area may be traumatised when left unchecked, it can be greatly reduced and virtually prevented with the proper procedures ([TRANSGENDERCARE, 2015a](#)).

After effects of treatment

What after-effects might you expect without a concerted effort towards trauma prevention/reduction?

With long treatment encounters over one, two or three days as some clinics offer, you may suffer from inflammation that will require weeks of recovery. The treated area will be severely reddened, swollen and inflamed. Within hours after treatment, a small degree of weeping from some of the follicles may occur. This will eventually lead to crusting or scabbing, followed by one, two or several weeks of deep tissue damage. Considering the amount of treatment, you may consider this is normal and unpreventable.

While these symptoms, or after-effects, are the result of treatment, they are largely preventable. After-effects are usually the result of a chain of related factors.

1. The first is bacteria. It is in the air, it is on that clean towel used to dry your face, it is on your hands. The presence of bacteria degrades the healing process. So, a good deal of inflammation simply results by not caring for the treated area with an antibacterial medication. Some folk have found great relief using **aloe vera** cream or gel. If it is applied immediately after treatment, inflammation is lessened.
2. The second factor is the pathway to the injury. Each treated follicle and the area immediately surrounding it have been injured. The skin's protective barrier has been breached. While the electrolysis needle most likely did not puncture through the follicle, the emitted treatment energy damaged the surrounding tissue. As a result, there is a small amount of weeping of serum from the tissue. And as mentioned earlier, some of this weeping may be present to the extent of resulting in a small scab. This minute exposure to the follicle, multiplied by several hundred similar injuries, is the pathway to infection. This moist pathway for bacteria must be removed, and be removed immediately following treatment. The use of a drying agent that is applied to the skin following treatment will block this pathway to infection. A good choice is a weak solution of phenol. This medication may be found over-the-counter in a phenolated (1%) calamine lotion. Calamine lotion is an effective topical treatment for poison ivy, insect bites, and the like. But here the key ingredient is phenol. It is a very effective drying agent. In this dilute 1% solution, it is slightly acidic and will additionally counteract the mildly base (alkaline) after-effect of blend or galvanic treatment. It is as effective in drying the skin following thermolysis treatment. This is **not** the same as calamine lotion used for treating sunburn, or chicken-pox.
3. The third factor is the body's heightened reaction to extended periods of trauma. While decreasing pain and even emotional stress are beneficial in reducing the effects of trauma, here we are looking at the body's production of histamines. Histamines are a normally present chemical in the body that exerts its effect in response to trauma. As example, the reddening in the skin that normally follows a burn is the result of histamines on the injured tissue. The planned use of an antihistamine can counteract the excessive and damaging effects of inflammation that result from extended electrolysis sessions ([TRANSGENDER CARE, 2015a](#)). To get an effective antihistamine you need to speak to your [GP](#) to get it prescribed for you.

NB All methods of electrolysis (thermolysis, galvanic, and blend) have the potential of damaging the skin. But probably the most serious result is *pitted scarring*. Pitted scarring is associated with the use of fast, high intensity thermolysis treatment also called flash thermolysis. While the flash technique is perfectly safe when used to treat fine, shallow hair, it can become quite dangerous when this method is applied to thick, deeply rooted hairs like those found in the beard.

Pain Management

The pain ladder of sensitive areas

- genital area is most sensitive,
- underarms,
- chin,
- middle of the upper lip,
- around the edge of the nipples,
- midline of the abdomen is least sensitive.

As you go further down the pain ladder, so the sensation of pain lessens and it becomes more comfortable and easier for you to bear.

Pain management

Speaking realistically - you cannot 'control' pain, you can only 'manage' it!

Everyone experiences pain differently. For some, hair removal causes almost no sensation. For most, it's painful at times, but basically bearable. Most clients can get effective treatment on all but the most sensitive areas by taking no more than a couple of Tylenol. For an unlucky few, it's the most excruciating thing they've ever experienced.

Just because it hurts doesn't mean you're a wimp. Recent data indicates that certain genes are predictors of low pain tolerance. It can actually cause psychological trauma for some - those with a low tolerance to pain sometimes discontinue hair removal, which leaves them with a feeling of frustration and despair, which tends to make them much more obsessive of their condition (JAMES, 2017b).

Given the amount of energy needed to destroy a course, deeply rooted hair follicle, most often electrolysis treatment can be rather painful. And while patients do have a wide variety of responses to electrolysis, the most significant factor seems to be the ongoing nature of the discomfort.

Pain is not just a sensation but an experience. It should be thought of as an unpleasant sensation as well as an emotional experience associated with actual or potential tissue damage.

Pain can be highly variable between individuals as well as in the same individual at different times. The most common reaction to *acute* pain is anxiety (TRANSGENDERCARE, 2016f). And in turn, anxiety can exacerbate an increased response to pain. This is because as you start to anticipate the upcoming pain, you very naturally tense up, which means that you are prepping your body for pain, and your nerve endings become heightened and more receptive - all of which means that its going to hurt even more. The ideal situation is for you to go to sleep whilst electrolysis is taking place. But not many people are able to achieve this state of nirvana, so various things are tried to minimise the effects of pain.

Electrolysis pain is particularly difficult to imagine prior to any treatment experience because most individuals can make little comparison to past physically painful experiences.

For most individuals, the experience of physical pain has been in the form of sudden injury (a serious cut, a broken arm, etc.), where physical trauma is inflicted and our internal mechanism for dealing with that pain (both physically and psychologically) is put into play. However, the electrolysis experience is not a single traumatic event followed a response to injury, and eventual recovery. Electrolysis trauma is continually doled out during the treatment encounter, which may last for several hours duration. Generally, one's mechanism for dealing with a continuing series of painful experiences is not as effective as with a single random encounter.

Acute pain is normally associated with the concept of nociception, which is derived from *noc* (Latin for harm or injury). It is only used to describe the neural response to traumatic stimuli. There are three types of *acute* pain: superficial, deep somatic, and visceral. These three types all have different features.

Electrolysis pain is the superficial type of *acute* pain, which is due to the nociceptive input arising from the skin and surrounding tissue. It is characteristically well-localised and described as a sharp, pricking, throbbing, or burning sensation.

But to truly empathise with the potential for discomfort, one must consider the ongoing nature, not only of a single electrology encounter, but the continuation of encounters, within the treatment process. Certainly for many transgender patients, a great deal of emotional and psychological stress is involved with the process of permanent hair removal (TRANSGENDERCARE, 2016f).

Here are the main factors that will affect how hair removal feels for you -

Your pain threshold

Not only is every person's pain threshold different, your own threshold will vary from day to day, minute to minute, and from one body area to another (JAMES, 2017b).

What method of hair removal you use

Each method feels different, and one may be easier for you than another. It varies by person (JAMES, 2017b).

What methods of pain reduction you use

From cheap and easy options to highly effective topical anaesthetics, there is a solution to make hair removal tolerable (JAMES, 2017b).

Your choice of practitioner

Electrologist, waxing, and laser technician skill plays a tremendous role in how it feels. I have had simultaneous treatment from two electrologists where one's method caused no pain, and the other's had me jumping off the table (JAMES, 2017b).

How long you have been getting treatment

Some clients feel they get more sensitive to the pain over time, while others feel the opposite (JAMES, 2017b).

Your stress level

Adrenaline and tension can exacerbate the pain. Try to be calm and relaxed when you go to treatment (JAMES, 2017b).

Your comfort level during treatment

Take off your shoes, your belt, empty your pockets, wear loose clothes. The more comfortable you are, the more relaxed you'll be. If you're too hot or cold, it may also have an effect (JAMES, 2017b).

Amount of energy needed to remove your hairs

More energy often means more pain (JAMES, 2017b).

Whether you are on medications

Certain medications affect the pain of hair removal, either positively or negatively (JAMES, 2017b).

Modality of electrolysis or type of laser used

With electrolysis some people can't take galvanic at all, some can't stand thermolysis. With light-based methods, some find flash lamp unbearable, while others prefer it to lasers (JAMES, 2017b).

Time of day

Some people prefer treatment in the morning when they're not very awake; others prefer at night when they're tired. For some reason I find it helps to do it tired. I get much more relaxed. Keep in mind that a practitioner might be fresher in the morning, too, which can affect performance (JAMES, 2017b).

Time of month

Many women find hair removal more painful just before or during their periods (JAMES, 2017b).

Your diet

Stimulants (especially caffeine) and sugar may make you more sensitive to pain. Try to avoid them. Also, many people find doing hair removal right after a meal helps manage the pain (JAMES, 2017b).

Cheap and easy pain management tips

Here are a few of the most common methods of pain management. Try these first. If these don't work well enough, you might consider topical anesthetics (JAMES, 2017a).

Over-the-counter pain medications

Many find that [OTC](#) analgesics are enough to dull the pain: Advil, Alleve, Tylenol, regular aspirin (although you may want to avoid salicylates, which interfere with blood clotting in some people). Many take this in conjunction with other methods listed here (JAMES, 2017a).

Antihistamines

This is not a pain management tip, but it can make your session more comfortable. You may find an antihistamine tablet or nasal spray like Dristan can help reduce sneezing and the amount of mucus your nose produces while working on your upper lip. Some find these also help reduce swelling (JAMES, 2017a).

Antacids

Kathy writes - "I would like to pass on something I have stumbled across recently which has helped mitigate a significant amount of discomfort from electrolysis. I have been taking Pepcid AC an hour before my treatments and it works. Of course it is still uncomfortable but it is much more tolerable. I do not have any idea how it works but it does. This was passed on to me by a friend who regularly has her legs waxed. I hope it can help others" (JAMES, 2017a).

Ice

Some people like to numb the area with ice before treatment, although some electrologists and almost all waxers prefer the skin to be normal temperature during treatment. Check with yours first. Wrap an ice cube in a wet washcloth or inside a plastic bag. Some like to freeze pieces of wet tissue to use. If you don't like the water dripping everywhere as the ice melts, you might try one of those reusable frozen packs for use in coolers, or one of those gelpacks they make

to put over your eyes. You don't need a lot of icing - five minutes before starting, then for as long as needed as you move to a new area. This may also reduce swelling. For some, this slows the process down too much. Some lasers use ice before and during treatment, while others use cooled gel or a cryogenic spray immediately before the pulse (JAMES, 2017a).

Additional options

Get comfortable Take off anything binding like shoes, socks, belt. Wear loose clothes. Have a fan blowing on you. Any discomfort not related to laser, waxing, or electrolysis should be eliminated (JAMES, 2017a).

Start slow If you dive right in with several long sessions or tackle the most sensitive parts first, you may not want to repeat the experience (JAMES, 2017a).

Ask about adjusting the intensity There is a trade-off here. You should work at the highest energy level you can stand with laser and electrolysis, otherwise you're wasting your time and money. However, it shouldn't be past what you can stand. Adjusting the intensity happens throughout a typical session, so don't hesitate to try to find a comfortable working point (JAMES, 2017a).

Save sensitive parts for the end of your session No matter how long you've been going, this is probably the best way to do it. Sensitive areas can sometimes leave me tense and exhausted. Doing them last means there's a light at the end of the tunnel, and after that, your session is done. Some like to get this over with first, though. It depends on you (JAMES, 2017a).

Don't return to a treated area Some find that they build up a mild tolerance in an area as it's being treated. Slowly moving out from that area can help keep the pain lower. Going back to a tender place that has already received treatment during that session can hurt much more. You should never treat a lasered area twice in the same session (JAMES, 2017a).

Something to hold Some people squeeze stuffed animals during treatment. Maybe you'll like this too, especially if you're fidgety like me. I usually hold a couple of tissues which I twist, tear and use to wipe away [EMLA](#) (JAMES, 2017a).

Something in your mouth Some people find that having a breath mint or hard candy to melt and play around with can help. Careful with gum or something that requires chewing or moving the jaw - it may slow facial treatment down. You should probably avoid smoking and chewable tobacco products during treatment (JAMES, 2017a).

Watch Some like to watch the whole process with a hand-held mirror. This lets them prepare for when and where a hair is about to be treated. Others can't stand to watch. While I find that it's interesting to see waxing or electrolysis, it gets real old real fast. For me, it did make it seem less painful for some reason. You won't be able to do this with laser due to protective eyewear (JAMES, 2017a).

Get involved Some people like advanced warning just before the current is applied or the wax strip is pulled off (JAMES, 2017a).

Be motivated This may sound silly, but those who really want this done are willing to deal with the occasional pain. If the pain makes you not want to go, perhaps you should step back and think about what you really want (JAMES, 2017a).

Bring a friend Occasionally, clients will bring a friend along to pass the time. If you know someone else who is also undergoing treatment, you could schedule back-to-back appointments, drive there together, and keep each other company. The moral support can also be good for those who are prone to forgetting appointments or reluctant to go (JAMES, 2017a).

Sleep (or lack thereof) Some people have to be wide awake for hair removal. It's easier to take when they're fresh. For others (like me) going in very tired does seem to help (JAMES, 2017a).

Exercise Some people find that being in shape makes the pain more tolerable. This makes sense, because exercising reduces your stress level and helps increase the production of natural painkillers (endorphins) in the body (JAMES, 2017a).

Hydrate Some claim drinking a lot of water helps with pain. Plus, it can't hurt! (JAMES, 2017a)

Reduce your stress levels If you have a stressful job or home life, get treatment when you'll be relaxed. Give yourself plenty of time to get to treatment so you're not stressed about that. Try not to get wound up on the day of your appointment. That's why many people get week-end treatment. For those who can't control their stress level on their own, they may find a tranquilizer such as Valium useful (JAMES, 2017a).

Acupressure I find a little acupressure can work wonders. When I get treatment in certain areas, the pain travels away from the treated area. For instance, a couple of places near my ears are much more tolerable if I press a finger between the treated spot and my ear. This blocks the pain from traveling to my ear, which I find very unpleasant. I find blocking the pain from traveling down my neck during treatment is very useful as well. Have your electrologist or waxer push down with the fingers he or she is using to stretch the skin. The closer to the treatment site, the better. Some laser handpieces require pressure on the skin, which can help with pain (JAMES, 2017a).

Pinch/stretch skin This is similar to acupressure, in that it can keep the sensation from spreading or shooting down a nerve (JAMES, 2017a).

Rubbing Have your electrologist or waxer rub the spot right after treatment, which seems to diffuse the pain a bit. Don't touch it yourself - that increases the chance for irritation or infection (JAMES, 2017a).

Placing cotton rolls in mouth An excellent variation on acupressure is to put a cotton roll (like the ones they use at the dentist) or a tightly-folded piece of facial tissue between your lips and teeth during work around the mouth. This elevates your lip so the practitioner isn't smashing your lip against your teeth while treating that area, and it makes it easier to see the fine hairs. It also has the effect (for me, anyway) of greatly reducing the tears and mucous that can be triggered by working near the nostrils. It's kind of like pressing your finger against your upper lip when you're about to sneeze (JAMES, 2017a).

Breathing techniques Concentrating on breathing can help some people. Try slowing down your breathing with deep breaths. Try breathing in through your nose and out through your mouth. On every outward breath, just mentally "let go". Say "aaaah", or "blaaah", or "ummmm" under your breath or to yourself, and go mentally and physically floppy. Holding your breath and counting to a set number can be good, as can breathing out just after the treatment. Some people like to hold their breath until a certain amount of treatment has been done. Experiment and see if it helps you (JAMES, 2017a).

Relaxation techniques Some people can take themselves into a light trance by visualising and consciously relaxing various parts of their bodies. Try to focus on the feet and legs since they're about as far away from the head as possible. It doesn't exactly lessen the pain, rather it **disconnects** one from that pain. Anyone who is reasonably well-practiced in self-hypnosis, visualisation, or meditation can find these techniques helpful during a long session. To get that feeling of "letting-go", visualise a sunlit garden, and imagining walking down a series of steps as you go deeper and deeper with each breath into solitude and serenity. Imagine slowly sinking down into a bath, the warm water gently relaxing each part of your body until you're floating. Another method is to push the pain and stress away from your face each time you exhale. Push the pain down your arms and out your fingertips. Dangling your hands off the table may help this (JAMES, 2017a).

Double up Pay the same amount but be done in about half the time by having two electrologists or waxers work at once. Nicki writes, "I get twice the hours of work for the same number of hours of my lying there being tortured so it's much quicker to make progress. Also, I find (and this may surprise you) that when you're getting sensitive areas like the lips or chin cleared, having someone else working somewhere else is actually an advantage: it's a distraction!" (JAMES, 2017a)

Chit-chat A conversation with the practitioner or clients who may be waiting can help make the time zip right by. I like to invite in people waiting. Find something you like to talk about - movies, music, current events (ugh, a pun!), sex, fashion, community gossip, whatever. Chatting during work around your mouth may slow the process down, though, and any talking can interfere with relaxation techniques. Let your practitioner know if you'd prefer silence before you start (JAMES, 2017a).

Music Some people like to bring their own music if it's not a salon with music piped in. Familiar songs do seem to make the time go by faster. A Walkman might get in the way, but maybe that's an option if you really want to blast something (JAMES, 2017a).

Pain control

The discomfort of electrolysis pain that continues during the extended electrolysis session is not only an unpleasant sensation but an emotionally taxing experience.

Non-Medicinal

Some people have found that listening to soothing music through headphones can help divert from pain, others find that relaxation techniques such as meditation can help you to remain calm and take the focus away from the procedure.

Treating the area with ice right before the session starts can also help relieve any painful symptoms (DZUREK, 2015b).

Prescribed medication

A variety of techniques that involve cosmetic procedures such as permanent hair removal, the coagulation of soft tissue, and skin resurfacing in the specialties that include electrology, dermatology, and plastic surgery, can only be adequately performed after the highly sensitive nerve endings in the skin are anaesthetized. Effective transdermal administration of anaesthetic is the preferred method due to its low-risk factors and minimal intrusion. Adjunct relief can be accomplished with oral medication in the form of nonopioid analgesics, either of a prescription type or an *OTC* analog.

Transdermal anaesthetics are widely used in dental applications such as the application of an anaesthetic to the gum prior to injecting anaesthetic. But mucous membranes, such as the lining of the mouth, allow topical anaesthetics to be readily absorbed and perform well. However, the skin possesses mechanics and physiology of absorption that are quite different. The skin provides a remarkable barrier and is highly impermeable to the passage of pathogens, toxic materials and physiologic fluids. Accordingly, the skin is highly resistant to the absorption of analgesics.

The skin's impermeability may be attributed to the thin layer of dense, metabolically inactive cells approximately ten microns (10 - 15 cells) thick, called the stratum corneum or cornified layer. As a result of the high degree of keratinization of the cells which comprise the stratum corneum, a formidable barrier is created. By comparison, the effective absorption through mucosal surfaces, as previously cited, is very effective since the stratum corneum is absent.

While transdermal absorption depends on a variety of factors that include skin hydration, body temperature, permeability of the drug delivery system, and size of the active drug molecule, amongst others, its effective delivery is considered preferable to the inherent risks of routine anaesthetic injection that are associated with ongoing electrolysis treatment.

EMLA cream is a relatively well utilised eutectic transdermal anaesthetic that is prescribed by doctors for electrology patients. It is aptly named for the mixing of its anaesthetic constituents, lidocaine and prilocaine, creating a 'Eutectic Mixture of Local Anesthetics'. Eutectic refers to a mixture whose melting point is lower than that of its constituent parts. In the case of *EMLA cream*, that eutectic mixture is lidocaine and prilocaine in a ratio of 1:1 by weight (2.5% each). *EMLA cream*, however, is an oil-in-water emulsion whose anaesthetic effect is very weak, short lived, and requires in excess of one hour of being covered by an *occlusive dressing*⁸⁰ prior to the procedure. For these reasons, it has limited use in medical practice. An appropriate situation for its use, as an example, may be with the paediatric patient. By applying *EMLA cream* and numbing an area prior to venipuncture, such as blood drawing, a young patient may be relieved from some of the trauma of the situation. But extensive procedures are much more physically traumatic than a needle stick, and *EMLA cream* provides little benefit.

In such cases as extensive electrolysis (i.e. beard removal), *EMLA cream* and similarly rated topical anaesthetics are not sufficient. The method of choice for laser resurfacing, transdermal anaesthetic application, is also an excellent choice for electrolysis; the drug is still a eutectic mixture, but increased to approximately a factor of six in anaesthetic compared to *EMLA cream*. A vasoconstrictor is also added to localise the effect, so the anaesthetic will not be so quickly metabolised away.

Lidocaine is a highly effective anaesthetic. The local anaesthetic action of lidocaine occurs by stabilising the neuronal membrane as it inhibits the ionic fluxes required for the initiation and conduction of impulses. However, it is not effectively absorbed through the skin. But, the lowered melting point by way of a eutectic mixture is not the only enhancement that allows for effective passage through the skin. The base must be *hydrophobic* ?? . Unfortunately, *EMLA cream* is comprised of more than 90% water. To create an effective transdermal preparation, an ointment base is essential. An example of an ointment base is petrolatum. As compared to *EMLA cream*, such a product would be comprised of less than 1% water. For ease of use in

⁸⁰a film dressing to cover EMLA Cream, and such like

referring to these high potency topical eutectic-type anesthetics that are custom formulated for our (TGIP) patients, we have named the drug Epil-EZ.

In clinical use, electrology patients report little or no treatment discomfort with the use of Epil-EZ anaesthetic. The skin requires the usual preparation by cleansing with an alcohol pad, followed by a thin layer of anaesthetic. Within a few minutes, the area is sufficiently numbed to begin treatment. From one application, the area remains desensitised on an average of about 3 hours, with some patients experiencing a return of sensation in as little as 90 minutes, and others, as long as 6 hours. Subsequent application of Epil-EZ will quickly regain the anaesthetic effect. Additionally, vasoconstriction and the anaesthetic effect tend to reduce swelling and inflammation during and after the process. Under normal conditions, the limiting factor to extensive treatment is not discomfort but the amount of electrolysis that can be administered within a given area.

Most electrology practice, as it typically functions, involves brief treatment encounters with patients experiencing mild to moderate *hirsutism*; the affected areas usually possess somewhat fine and shallow follicles. Treatment usually incorporates brief visits over extended periods of time as unwanted hair growth is brought under control.

But in many instances that involve transgender care, the electrologist is unable to sufficiently control the degree of pain and after-effects that are associated with extensive treatment with the use of *OTC* preparations (TRANSGENDERCARE, 2016f).

The three most widely practiced alternatives to medical pain management appear to be -

Shortening of the treatment encounter

- Contrary effect -
 - Under many circumstances, beard removal may require approximately 200 hours of treatment. Treatment encounters that utilise no more than one or two hours may make the normal process of beard removal impractical. Maintaining a timeline congruent with hormonal management is especially important since increased sensitivity to electrology pain typically occurs as the skin softens (TRANSGENDERCARE, 2016f).

Reducing treatment energy

- Contrary effect -
 - Electrolysis energy is downwardly adjusted to allow for longer sessions to be comfortably tolerated. This reduction of treatment energy may minimise electrolysis pain, but the overall response to treatment suffers greatly with markedly fewer follicles killed (TRANSGENDERCARE, 2016f).

Inadequate topical analgesic and antibacterial preparations from OTC products

- Contrary effect -
 - While *OTC* topical preparations are often sufficient for less intensive treatment (fewer hairs, shallowly rooted), the extensive treatment associated with coarse, deeply rooted follicles may be too painful or intrusive for the patient. Patients may suffer needlessly through the process or prematurely withdraw from electrolysis treatment, transitioning with the added burden of a significant amount of facial hair remaining. Additionally, the intrusiveness of extensive facial electrolysis suggests a need for topical antibiotics following treatment, which have been demonstrated to significantly reduce recovery time and lessen the risk of scarring (TRANSGENDERCARE, 2016f).

Here, the patient often requires the support of a medical provider as an adjunct to the electrology process.

In such a situation, the doctor forms a bridge between transgender medical patient and the electrologist in order to safely provide the necessary management of medical therapies (prescribing of more potent topical anaesthetics than are normally available *OTC*, and topical antibiotics as

indicated), and providing the necessary patient education to allow for their safe administration during the electrology treatment encounter.

In such arrangements where non-doctor ancillary health care providers are involved, an importance should be placed on meeting established training guidelines in their respective field; as the electrologist aids the patient in the application of prescription topical anaesthetics and topical antibacterial preparations during the course of electrology treatment, one measure of proficiency may be holding a certification of CPE or CCE, as established by either of two national electrologist affiliations.

In essence, the doctor helps to facilitate a safe and controlled environment for the transgender patient requiring permanent hair removal. As in other situations where responsibility is placed on the patient to follow doctor direction, maximum benefit is often based on proper compliance with the treatment plan (TRANSGENDERCARE, 2016f).

OTC medications

In the U.S., the [FDA](#), regulates the concentration of each active ingredient that can be formulated in non-prescription products, also called [OTC](#) products.

The commonly used [OTC](#) topical anaesthetics belong to the "caine" family and will contain no more than a specific maximum concentration for the active ingredient. The limitation for active ingredients reflects the relative potency of the drugs. As an example, the maximum concentration set for lidocaine is 4%, while benzocaine preparations have a maximum concentration of 20%. Caine mixes, or combinations of caine products within a preparation, also have set maximum concentrations.

So, the analgesic effect of preparations is used to set whether the sale of a product is controlled by prescription. As an example, [EMLA cream](#), which contains a combination of lidocaine (2.5%) and prilocaine (2.5%) is a prescription product. [EMLA cream](#), with its combination of these two analgesics, produces a greater analgesic effect than similar non-prescription products. However, [EMLA cream](#) is still a very weak anaesthetic and has little to offer when compared to alternative doctor prescribed compounded medication.

While electrologists have no allowance for the purchase of more potent medication than is available to the general public, specialised non-prescription analgesic products are made available through electrology trade suppliers and vendors. Your electrologist will likely be the best source of non-prescription topical analgesics (TRANSGENDERCARE, 2016f).

Ibuprofen is the easiest and cheapest medicinal pain relief on the market. Take the recommended dose 30/60 minutes before your session starts and this will help numb nerve endings. Paracetamol is also useful, but aspirin isn't recommended due to its ability to thin blood and potentially cause bleeding (DZUREK, 2015b).

Not recommended

- Alcohol,
- Using prescription drugs when you have not been prescribed them,
- Mixing drugs and/or topical anaesthetic (DZUREK, 2015b).

Other ways

The pinch technique One of the main reasons that people tend to shy away from electrolysis is because they fear it will be too painful. The idea of a metal probe being inserted into a hair follicle and zapping it just sounds like it could be a lot worse than more temporary methods of hair removal.

If you are looking for a natural way to make the treatment more bearable you should ask your electrologist if they can proceed using the pinch technique (DZUREK, 2015c).

What is the Pinch Technique? The pinch technique is used when the electrologist pinches a small area of the skin to be treated between the thumb and the index finger during electrolysis.

The idea is to stop the nerve endings in the area from sending the pain signals back to the brain, therefore causing less discomfort during the procedure.

While the technique may not completely remove the pain, it has been proven to lessen the sensations significantly. If you want to remove any sensation of pain you can also ask your electrologist if it would be beneficial to use numbing pain before treatment (DZUREK, 2015c).

How does it work? Before commencing on any area the electrologist should pinch a small section of the skin to be treated between the thumb and index finger.

The skin should only be pinched and pulled into a vertical pull.

A horizontal pull may actually create the opposite effect, meaning more discomfort or pain for the patient.

It is important to make sure that while the skin is being pinched in place it is also held taut. This action actually helps "pop" the hairs up and makes it easier for the electrologist to insert the probe and apply the current.

The pinch is continued to be held in place until all of the treated hairs have been removed with tweezers. Once one area has been treated, the next area will be gathered and pulled in the same pinching action and processed in the same way.

It is important to remember to collect enough skin in the pinch to make sure that the technique works in regards to pain reduction and also stretches the skin properly to be able to see and work on all follicles correctly (DZUREK, 2015c).

How effective Is It? Those who use it swear by it. It is especially effective on super-sensitive areas such as the upper lip where almost everyone feels some degree of discomfort during the procedure. It's also very effective on areas where hair grows in all types of directions.

In addition to being a great pain reducer it also helps the electrologist see in which direction each hair is growing so that he/she can make sure to insert the probe correctly.

If electrolysis is to be successful, the probe needs to literally kill the follicle, and the dead hair should immediately come out easily. The pinch technique seems to make the procedure easier (DZUREK, 2015c).

Can you ask your electrologist to use it? Yes, most definitely. The technique is not taught in training, but it is something that is usually picked up with experience.

You can ask your electrologist if they are familiar with the technique and if they are willing to use it during your treatment as a natural aid to reduce pain.

If they are not familiar with it there is no harm in asking them how they aim to reduce discomfort and if they would be willing to try using the technique (DZUREK, 2015c).

Risks in hair removal pain management

Whether cheap and easy methods or more powerful topical anaesthetics, there are certain minor risks associated with hair removal pain management. The most common problem with pain management is that it turns off the body's ability to tell if you are being overtreated during a hair removal procedure. Topical products have additional risks which are outlined in their package inserts.

However, several methods of dealing with hair removal pain have far more serious risks, up to and including death (JAMES, 2017f).

Should be avoided -

- Alcohol,
- Topical anaesthetics used on large areas (JAMES, 2017f).

Not recommended -

- Prescription painkillers (**potentially dangerous**),
- Injectable anesthetics (**potentially dangerous**),
- Combinations of medications (**very dangerous**) (JAMES, 2017f).

Deadly combinations

Perhaps the most dangerous thing to do is combine drugs, especially if you have not used them individually before. Prescription drugs should never be combined with alcohol or other prescription and *OTC* medications. The results can be lethal.

On 19 February 2000, 20-year old Jonathan Briese of Virginia died from an allergic reaction to pain relief medications during a laser hair removal procedure. Dr. James J. Donohue IV reports he had given Mr. Briese the following -

- Xanax, (a brand of the anti-anxiety drug alprazolam),
- Lortab, (a brand of the pain reliever hydrocodone),
- a topical anesthetic cream applied to the back

Source: Washington Post (31 January 2001, p. B1)

In response to this tragic event, I have compiled a list of pain reduction methods you should avoid, especially in combination (JAMES, 2017f).

Should be avoided

Alcohol - should be avoided Risks -

- impairs ability to gauge over-treatment,
- thins blood,
- impairs driving,
- dangerous in combination with pain medications (JAMES, 2017f).

Although some consumers have written suggesting this, others find alcohol actually makes it worse. Like aspirin, alcohol thins the blood, and it can increase the amount and duration of bleeding/bruising, so if you have other options, you should rely on those.

I do not recommend the use of alcohol for hair removal pain management. If you do decide to use alcohol, don't drink and drive to your appointment, or combine alcohol with pain relievers or tranquilizers (JAMES, 2017f).

Topicals over large areas - should be avoided Risks -

- impairs ability to gauge over-treatment,
- dangerous in combination with pain medications,
- can cause severe allergic reaction,
- use on a large area can reach toxic levels of drug absorption (JAMES, 2017f).

Topical preparations are generally a very good option to reduce hair removal pain, but it's important to be careful when using them on large areas like the back or legs. Do a test with the product on a small area, then wait a few days before undergoing a procedure using a large dose. If you have a noticeable skin reaction to the test dose (itching, blistering, skin colour change lasting more than a few hours), you should not use the topical over a large area (JAMES, 2017f).

Not recommended

Prescription pain medications and tranquilizers - not recommended Risks -

- impairs ability to gauge over-treatment,

- potentially addictive,
- impairs driving,
- dangerous in combination with pain medications (JAMES, 2017f).

Although some people are able to get prescriptions for hair removal pain management, this is probably excessive. Some readers have written to me about using prescription drugs such as Vicodin, Lortab, Percocet, Percodan, Lorcet, Ultram, or Paracetamol or generic equivalents such as codeine, dihydrocodeine, dextropropoxyphene, etc. Some have used a prescription tranquillizer like Valium or Xanax. This is probably excessive and potentially dangerous.

First off, a prescription drug may interfere with your ability to drive. If you are driving a car to and from hair removal, prescription medications should be avoided (JAMES, 2017f).

Most importantly, prescription drugs can be habit-forming. As Amy points out in a letter, "Opiates are highly addictive and should be used only for the express purpose for which they were prescribed".

S___ writes that she was having difficulty bearing electrolysis: "I finally asked my doctor for a prescription for the pain. He wrote me a prescription for Vicodin ES. I began taking them regularly for electrolysis. Then for back pain. Then for neck pain. Then to get a buzz I knew that hydrocodone, or Vicodin, was habit forming, but in my ignorance I thought that I could deal with it. I couldn't. What made matters worse was the fact that I was completely ignorant of the side-effects associated with opiates, especially coming off of them. I found myself in the most profound depressions after each electrolysis session". Her addiction spiraled downward into a suicidal depression. Fortunately, S___ stopped short of the overdose she had laid out for herself, and was able to get help to overcome her addiction. Don't put yourself in danger of addiction just to deal with hair removal pain.

I do not recommend using prescription pain medications for hair removal. Try a topical anaesthetic - it should be plenty (JAMES, 2017f).

Novocaine/lidocaine injections - not recommended Risks -

- impairs ability to gauge over-treatment,
- dangerous in combination with pain medications,
- dangerous unless performed under direct medical supervision,
- extremely dangerous when administered by unqualified personnel,
- extremely dangerous when self-administered (JAMES, 2017f).

While very effective (to the point of overkill), this method is difficult to find. Some people have worked out a deal with a dentist or doctor to get shots of anaesthesia before their electrolysis or laser appointments. However, the American Dental Association sent a letter to all dentists in 1999 stating they did not recommend this procedure. In some states where electrolysis and laser is regulated, this is illegal.

A method that was advertised by Allied Health Association in recent years was packaging a J-tip compressed gas injection system with prescription anaesthetics. This was being sold to unqualified personnel and should be avoided. Thanks to the [American Electrology Association](#), the US [FDA](#) stepped in on 5 May 2000 to stop this potentially dangerous problem.

Some consumers have written to me about self-injecting anaesthesia prior to hair removal. **Self-injection of anaesthetics is extremely dangerous and can be fatal** if the anaesthetic is injected directly into the bloodstream. I do not recommend using injectable anaesthetics for hair removal unless done in consultation with a medical professional (JAMES, 2017f).

If you still decide to use one of these methods

If, despite these warnings, you plan to use alcohol, injectable anaesthetics, prescription drugs, topicals over a large area like the back or legs, or a combination of medications -

- do not combine drugs,
- do not drive to or from a hair removal procedure under the influence of drugs or alcohol,

- ensure the practitioner is qualified to administer drugs and knows how to handle an adverse response,
- ensure that the facility has proper resuscitation equipment and an emergency response plan (JAMES, 2017f).

If you have a reaction to a pain reduction method

If you begin to feel nausea, excessive itching or rash, heart rate increase, slowed breathing, or lightheadedness, you may be having an allergic reaction. The doctor on duty should be notified immediately and emergency response should be undertaken. In the event of vomiting, loss of consciousness, or stoppage of heart or breathing, ☎ 911 or 999 should be called immediately (JAMES, 2017f).

Topical anaesthetics

These are creams or gels that you apply directly to the skin in advance of having treatment. They are described at EMLA Cream on page 156 and Ametop on page 159.

Electrolysis Pain

Given the amount of energy needed to destroy a coarse, deeply rooted hair follicle, most often electrolysis treatment can be rather painful. And while patients do have a wide variety of responses to electrolysis, the most significant factor seems to be the ongoing nature of the discomfort.

Pain is not just a sensation but an experience. It should be thought of as an unpleasant sensation as well as an emotional experience associated with actual or potential tissue damage.

Pain can be highly variable between individuals as well as in the same individual at different times. The most common reaction to *acute* pain is anxiety. And in turn, anxiety can exacerbate an increased response to pain.

Electrolysis pain is particularly difficult to imagine prior to any treatment experience because most individuals can make little comparison to past physically painful experiences.

For most individuals, the experience of physical pain has been in the form of sudden injury (a serious cut, a broken arm, etc.), where physical trauma is inflicted and our internal mechanism for dealing with that pain (both physically and psychologically) is put into play. However, the electrolysis experience is not a single traumatic event followed a response to injury, and eventual recovery. Electrolysis trauma is continually doled out during the treatment encounter, which may last for several hours duration. Generally, one's mechanism for dealing with a continuing series of painful experiences is not as effective as with a single random encounter.

Acute pain is normally associated with the concept of nociception, which is derived from *noc* (Latin for harm or injury). It is only used to describe the neural response to traumatic stimuli. There are three types of *acute* pain: superficial, deep somatic, and visceral. These three types all have different features.

Electrolysis pain is the superficial type of *acute* pain, which is due to the nociceptive input arising from the skin and surrounding tissue. It is characteristically well-localised and described as a sharp, pricking, throbbing, or burning sensation.

But to truly empathise with the potential for discomfort, one must consider the ongoing nature, not only of a single electrology encounter, but the continuation of encounters, within the treatment process. Certainly for many transgender patients, a great deal of emotional and psychological stress is involved with the process of permanent hair removal (TRANSGENDERCARE, 2015b).

Pain Control

The discomfort of electrolysis pain that continues during the extended electrolysis session is not only an unpleasant sensation but an emotionally taxing experience.

A variety of techniques that involve cosmetic procedures such as permanent hair removal, the coagulation of soft tissue, and skin resurfacing in the specialties that include electrology, dermatology, and plastic surgery, can only be adequately performed after the highly sensitive nerve endings in the skin are anaesthetized. Effective transdermal (percutaneous) administration of anaesthetic is the preferred method due to its low risk factors and minimal intrusion. Adjunct relief can be accomplished with oral medication in the form of nonopioid analgesics, either of a prescription type or an *OTC* analog.

Transdermal anesthetics are widely used in dental applications such as the application of an anaesthetic to the gum prior to injecting anaesthetic. But mucous membranes, such as the lining of the mouth, allow topical anaesthetics to be readily absorbed and perform well. However, the skin possesses mechanics and physiology of absorption that are quite different. The skin provides a remarkable barrier and is highly impermeable to the passage of pathogens, toxic materials and physiologic fluids. Accordingly, the skin is highly resistant to the absorption of analgesics.

The skin's impermeability may be attributed to the thin layer of dense, metabolically inactive cells approximately ten microns (10 - 15 cells) thick, called the stratum corneum or cornified layer. As a result of the high degree of keratinization of the cells which comprise the stratum corneum, a formidable barrier is created. By comparison, the effective absorption through mucosal surfaces, as previously cited, is very effective since the stratum corneum is absent.

While transdermal absorption depends on a variety of factors that include skin hydration, body temperature, permeability of the drug delivery system, and size of the active drug molecule, amongst others, its **effective delivery is considered preferable** to the inherent risks of routine anaesthetic injection that are associated with ongoing electrolysis treatment.

EMLA cream is a relatively well utilised eutectic transdermal anaesthetic that is prescribed by doctors to electrology patients. It is aptly named for the mixing of its anaesthetic constituents, lidocaine and prilocaine, creating a 'Eutectic Mixture of Local Anaesthetics', hence *EMLA*. Eutectic refers to a mixture whose melting point is lower than that of its constituent parts. In the case of *EMLA cream*, that eutectic mixture is lidocaine and prilocaine in a ratio of 1:1 by weight (2.5% each). *EMLA cream*, however, is an oil-in-water emulsion whose anaesthetic effect is very weak, short lived, and requires in excess of one hour of covered application prior to the procedure, using an *occlusive dressing*. For these reasons, it has limited use in medical practice. An appropriate situation for its use, as an example, may be with the paediatric patient. By applying *EMLA cream* and numbing an area prior to venipuncture, such as blood drawing, a young patient may be relieved from some of the trauma of the situation. But extensive procedures are much more physically traumatic than a needle stick, and *EMLA cream* provides little benefit.

In clinical use, electrology patients report little or no treatment discomfort with the use of *EMLA cream* anaesthetic. The skin requires the usual preparation by cleansing with an alcohol pad, followed by a thin layer of anaesthetic. Within a few minutes, the area is sufficiently numbed to begin treatment. From one application, the area remains desensitised on an average of about 3 hours, with some patients experiencing a return of sensation in as little as 90 minutes, and others, as long as 6 hours. Subsequent application of *EMLA cream* will quickly regain the anaesthetic effect. Additionally, vasoconstriction and the anaesthetic effect tend to reduce swelling and inflammation during and after the process. Under normal conditions, the limiting factor to extensive treatment is not discomfort but the amount of electrolysis that can be administered within a given area (*TRANSGENDER CARE, 2015e*).

EMLA Cream

EMLA cream is a mild topical pain reliever consisting of dilute (2.5%) mixture of lidocaine and prilocaine in equal parts. Outside of electrolysis use, it has limited use for procedures due to its

minimal pain relieving properties. While [EMLA cream](#) is regularly used in electrolysis, patients will likely find very limited pain relief.

Eutectic refers to a mixture whose melting point is lower than that of its constituent parts. The goal of such a topical anaesthetic is to maintain the eutectic temperature as to allow for greater absorption through the skin barrier. However, [EMLA cream](#) is contained in a cream base, detracting from its eutectic potential by requiring thick application and covering for a long duration.

For the greatest effect when using [EMLA cream](#) or other topical preparations, the skin must be thoroughly cleansed/degreased. This process is called de-fatting. In the case of [EMLA cream](#), an [occlusive dressing](#) must be applied over the drug ([TRANSGENDERCARE, 2015c](#)).

EMLA stands for 'eutectic mixture of local anaesthetic'.

A local anaesthetic that is similar pharmacologically to lidocaine. Currently, it is used most often for infiltration anaesthesia in dentistry ([DRUGBANK, 2013d](#)).

Manufacturer AstraZeneca.

Contains Emla cream = Lidocaine 2.5%, prilocaine 2.5% ([BNF, 2016](#)).

Pharmacology Inhibits the conduction of nerve impulses from sensory nerves ([EMC, 2016](#)).

Indications Used as a topical anaesthetic for skin anaesthesia, and on the genital mucosa to facilitate the removal of warts in adults ([BNF, 2016](#)).

Pharmacokinetics At its peak within 2 - 5 minutes, and with a duration of $\frac{1}{2}$ - 1 hour ([EMC, 2016](#)).

Pharmacodynamics Prilocaine binds to the intracellular surface of sodium channels which blocks the subsequent influx of sodium into the cell. Action potential propagation and never function is, therefore, prevented. This block is reversible and when the drug diffuses away from the cell, sodium channel function is restored and nerve propagation returns ([DRUGBANK, 2013d](#)).

- **Elimination** - Prilocaine is metabolised in both the liver and the kidney and excreted via the kidney ([DRUGBANK, 2013d](#)).

How it works Prilocaine acts on sodium channels on the neuronal cell membrane, limiting the spread of seizure activity and reducing seizure propagation. The antiarrhythmic actions are mediated through effects on sodium channels in Purkinje fibres ([DRUGBANK, 2013d](#)).

Typical dosage

- **Electrolysis** - 2g for a minimum of 60 minutes, maximum of 5 hours ([EMC, 2016](#)).
- **Genitals** - Up to 10g for 5 - 10 minutes before the procedure starts ([BNF, 2016](#)).

Route Topical = [EMLA cream](#) ([BNF, 2016](#)).

Contraindications Hypersensitivity, and secondary bacterial infections ([BNF, 2016](#)).

Side-effects

Skin

- transient paleness,
- redness,
- *oedema*⁸¹, (BNF, 2016).

Interactions

- **Acetaminophen** - The risk or severity of adverse effects can be ↑ when Acetaminophen is combined with Prilocaine.
- **Amyl Nitrite** - The risk or severity of adverse effects can be ↑ when Amyl Nitrite is combined with Prilocaine.
- **Benzocaine** - The risk or severity of adverse effects can be ↑ when Benzocaine is combined with Prilocaine.
- **Butalbital** - The risk or severity of adverse effects can be ↑ when Butalbital is combined with Prilocaine.
- **Celecoxib** - The risk or severity of adverse effects can be ↑ when Celecoxib is combined with Prilocaine.
- **Chloroquine** - The risk or severity of adverse effects can be ↑ when Chloroquine is combined with Prilocaine.
- **Dapsone** - The risk or severity of adverse effects can be ↑ when Dapsone is combined with Prilocaine.
- **Flutamide** - The risk or severity of adverse effects can be ↑ when Flutamide is combined with Prilocaine.
- **Hyaluronidase** - The risk or severity of adverse effects can be ↑ when Hyaluronidase is combined with Prilocaine.
- **Isosorbide** - The risk or severity of adverse effects can be ↑ when Isosorbide is combined with Prilocaine.
- **Isosorbide Dinitrate** - The risk or severity of adverse effects can be ↑ when Isosorbide Dinitrate is combined with Prilocaine.
- **Isosorbide Mononitrate** - The risk or severity of adverse effects can be ↑ when Isosorbide Mononitrate is combined with Prilocaine.
- **Lidocaine** - The risk or severity of adverse effects can be ↑ when Lidocaine is combined with Prilocaine.
- **Mafenide** - The risk or severity of adverse effects can be ↑ when Mafenide is combined with Prilocaine.
- **Metoclopramide** - The risk or severity of adverse effects can be ↑ when Metoclopramide is combined with Prilocaine.
- **Nitric Oxide** - The risk or severity of adverse effects can be ↑ when Nitric Oxide is combined with Prilocaine.
- **Nitrofurantoin** - The risk or severity of adverse effects can be ↑ when Nitrofurantoin is combined with Prilocaine.
- **Nitroglycerin** - The risk or severity of adverse effects can be ↑ when Nitroglycerin is combined with Prilocaine.
- **Nitroprusside** - The risk or severity of adverse effects can be ↑ when Nitroprusside is combined with Prilocaine.
- **Phenazopyridine** - The risk or severity of adverse effects can be ↑ when Phenazopyridine is combined with Prilocaine.
- **Phenobarbital** - The risk or severity of adverse effects can be ↑ when Phenobarbital is combined with Prilocaine.
- **Phenytoin** - The risk or severity of adverse effects can be ↑ when Phenytoin is combined with Prilocaine.
- **Primaquine** - The risk or severity of adverse effects can be ↑ when Primaquine is combined with Prilocaine.

⁸¹this is the medical term for fluid retention in the body. It often causes swelling in the feet and ankles

- **Quinine** - The risk or severity of adverse effects can be ↑ when Quinine is combined with Prilocaine.
- **Sodium Nitrite** - The risk or severity of adverse effects can be ↑ when Prilocaine is combined with Sodium Nitrite.
- **Sulfadiazine** - The risk or severity of adverse effects can be ↑ when Sulfadiazine is combined with Prilocaine.
- **Technetium Tc-99m tilmanocept** - Prilocaine may ↓ effectiveness of Technetium Tc-99m tilmanocept as a diagnostic agent.
- **Zopiclone** - The risk or severity of adverse effects can be ↑ when Zopiclone is combined with Prilocaine (DRUGBANK, 2013d).

Shelf Life 3 years (EMC, 2016).

Notes Apply thickly, using the spatula provided, and cover with an occlusive dressing at least 1 hour before procedure.

Do not apply to broken skin (EMC, 2016).

Warning Do not use near your eyes (BNF, 2016).

Instructions for applying EMLA cream

- In adults, apply 2.5g of cream per 20 to 25cm² (approximately 2 inches by 2 inches) of skin in a thick layer at the site of the procedure.
- Take an occlusive dressing and remove the centre cut-out piece.
- Peel the paper liner from the paper framed dressing.
- Cover the EMLA cream so that you get a thick layer underneath. Do not spread out the cream. Smooth down the dressing edges carefully and ensure it is secure to avoid leakage.
- Remove the paper frame. The time of application can easily be marked directly on the occlusive dressing. EMLA cream must be applied at least 1 hour before the start of a routine procedure and for 2 hours before the start of a painful procedure.
- Remove the occlusive dressing, wipe off the EMLA cream, clean the entire area with an antiseptic solution and prepare the patient for the procedure. The duration of effective skin anaesthesia will be at least 1 hour after removal of the occlusive dressing (TRANSGENDER-CARE, 2015d).

Precautions

- Do not apply near eyes or on open wounds.
- Do not use in children under one month of age.
- Keep out of reach of children (TRANSGENDER-CARE, 2015d).

Ametop

Used as a topical anaesthetic for skin anaesthesia.

Tetracaine (also known as amethocaine; trade name Pontocaine. Ametop and Dicaine) is a potent local anaesthetic of the ester group. It is mainly used topically in ophthalmology and as an antipruritic, and it has been used in spinal anaesthesia (DRUGBANK, 2015b).

Also known as Tetracaine, Amethocaine (BNF, 2016).

Manufacturer Smith & Nephew Healthcare (BNF, 2016).

Contains Ametop = Tetracaine - 4% in a 1.5g tube (BNF, 2016).

Pharmacology Amethocaine is a local anaesthetic and is believed to act by blocking nerve conduction mainly by inhibiting sodium ion flux across the axon membrane. Amethocaine achieves this by acting upon specific receptors that control gating mechanisms responsible for conductance changes in specialised proteinaceous sodium channels. Blocking sodium ion flux prevents the setting up of an action potential in the nerve axon, thus preventing pain receptors signalling to the central nervous system (SKYSCAPE, 2014).

Indications Used as a topical anaesthetic for skin anaesthesia prior to venepuncture or venous cannulation (BNF, 2016).

Pharmacokinetics It is not necessary to apply Ametop gel for longer than 30 - 45 minutes and anaesthesia remains for 4 - 6 hours in most people after a single application (SKYSCAPE, 2014).

Typical dosage Electrolysis 1.5g for no longer than 30 - 45 minutes (SKYSCAPE, 2014).

Route Topical = Ametop (BNF, 2016).

Contraindications Hypersensitivity to tetracaine has been reported (BNF, 2016). Do not apply Ametop gel to broken skin, mucous membranes or to the eyes or ears (SKYSCAPE, 2014).

Side-effects

Common

- [erythema](#)⁸² (SKYSCAPE, 2014).

Not so common

- blanching,
- transient local [oedema](#),
- abnormal sensations,
- [urticaria](#),
- local burning/discomfort (SKYSCAPE, 2014).

Slight [erythema](#) is frequently seen at the site of application and is due to the pharmacological action of amethocaine in dilating capillary vessels. This may help in delineating the anaesthetised area.

Slight [oedema](#) or itching are less frequently seen at the site of application. This may be due to the local release of histamine and 5-HT.

More severe [erythema](#), [oedema](#) and/or itching confined to the site of application have rarely been reported (SKYSCAPE, 2014).

Usage Apply the contents of the tube to the centre of the area to be anaesthetised and cover with an [occlusive dressing](#) (cling film can also be used). After the appropriate time the gel should be removed prior to treatment (SKYSCAPE, 2014).

⁸²a skin condition characterised by redness or rash

The contents expellable from 1 tube (approximately 1 gram) are sufficient to cover and anaesthetise an area of up to 30 square centimetres (SKYSCAPE, 2014).

Do not apply to broken skin. Not to be taken internally (SKYSCAPE, 2014).

Interactions

- **Hyaluronidase** - The risk or severity of adverse effects can be increased when Hyaluronidase is combined with Tetracaine.
- **Technetium Tc-99m tilmanocept** - Tetracaine may decrease effectiveness of Technetium Tc-99m tilmanocept as a diagnostic agent (DRUGBANK, 2015b).

Warning Repeated exposure to Ametop gel may increase the risk of sensitisation reactions to Amethocaine (SKYSCAPE, 2014).

Ametop gel, like other local anaesthetics may be ototoxic and should not be instilled into the middle ear or used for procedures which might involve penetration into the middle ear (SKYSCAPE, 2014).

Occlusive dressings

These dressings generally work best on things like hands, arms, legs, etc. To use them to cover the face would be quite expensive, you would be better off using *clingfilm*.

Other prescription-only medications

Analgesics such as co-proxamol or dihydrocodeine can be used to supplement the effect of *EMLA cream*, and should generally be taken around an hour before treatment starts. These are prescription-only drugs (known as *prescription only medication, meaning that it has to be prescribed by your GP (POM)s*); mild *OTC* analgesics (aspirin, paracetamol, co-codamol, ibuprofen etc.) are generally ineffective. You should be made aware that some people become drowsy on such medicines and may be unable to drive.

Sedatives may assist some people when treating the most painful areas such as the upper lip, simply by improving the persons ability to tolerate pain. Lorazepam (1 - 2mg) or other benzodiazepines have been found to work well in some people. It should be stressed that sedatives should only be used when really necessary; also the individual must be warned that she will most likely be unfit to drive after taking the sedative. Lorazepam is best taken about one hour before treatment starts (LOOKING-GLASS, 1997).

Advice in a nutshell

- Electrolysis is the most reliable option available today that has been proven to remove TS facial hair permanently. Laser can be an acceptable or even preferable alternative in some cases, but laser is usually not enough by itself to remove TS facial hair permanently.
- If you cannot afford to risk your time, money, or complexion on unproven technology, start electrolysis now and make a commitment to stick with it.
- There are three main types (modalities) of electrolysis. The following generalisations are hotly debated. Thermolysis uses heat and is generally considered to treat more hairs per session but is not as efficient at killing hairs with one treatment. Galvanic uses an electro-chemical reaction and is generally considered more effective at killing hairs with one treatment but treats less hairs per session. The Blend combines both modalities in an attempt to get the benefits of both. All three methods have vocal champions and detractors, as do the many kinds of electrolysis probes available. Many people contend

- that electrologist skill is more important than modality used. Others feel very strongly that one modality is better than another.
- Start electrolysis as soon as you possibly can in your transition, and stick with a regular treatment schedule. Start treatment on your face. Worry about body hair once the face is down to one hour a week. Try to get as much as possible done before going full-time.
 - Find an electrologist who has had experience successfully removing male facial hair. Choosing an electrologist will be the most important factor in how long your treatment takes, how much it costs, how comfortable it is, and how your skin fares. Ask the recommendation of local TSs who are done and are happy. Meet the client in person and look at their face, if possible. 'Gender-friendly' doesn't necessarily mean 'skilled'. Many states regulate electrologists, and certification from professional electrolysis organisations can help you decide as well. Your choice of electrologists and your adherence to a strict skin care regimen are vital in avoiding permanent skin damage.
 - Electrolysis may take from 1 to 4 years or more, with an anecdotal average around 2 years. Even the fastest options usually require 10 months of treatment just to get you to maintenance levels. Completion may require less than 40 hours to more than 700, with a widely accepted anecdotal average between 200 and 300 hours. It takes a big time and money commitment, so plan accordingly. Electrolysis may be the most expensive part of your transition, even more than SRS. Luckily, the costs are spread out over time. But since it will cost anywhere from \$25 - \$250 a week or more, you must have a realistic budget in place. If your money situation is tight, you should spend as much as you can afford on electrolysis each week, because even a little is better than nothing. Also, the biggest financial strain is early on when you are trying to get your face cleared. Once you're past that, maintenance is much more financially manageable.
 - Female *hormones* will not get rid of existing facial hair. *Hormones* are not necessary for electrolysis to work, but anti-androgens like spironolactone, etc., probably help retard future growth. However, some electrologists feel that by retarding regrowth, you slow your time to completion, and many clients feel that *hormones* make their skin more sensitive to electrology. *Hormones* (specifically anti-androgens) do affect body hair, so work on the face while the *hormones* start to work on the body hair.
 - Some feel that shaving is important in the early stages of treatment (and it doesn't make hair grow in thicker). Electrolysis is most effective on actively growing hairs. Treating your resting hairs is a waste of time and money, it can hurt more (they're closer to the surface) and increases the potential for skin damage. If at all possible, do not shave until your face has recovered from your last session, but once it's healed, some suggest you shave before your next session. That way you are only treating hairs that will be affected. If you absolutely must shave immediately after treatment, you may find an electric foil razor less irritating on inflamed skin. You will need 18 to 48 hours' growth for treatment so your electrologist has enough hair to see the angle and to grasp with tweezers. Others feel that if you don't need to shave between sessions, it's best to avoid it.
 - There are many ways to manage or eliminate the pain of electrolysis. Topical anesthetics like prescription *EMLA*, or *OTC* ELA-Max provide the best combination of ease, cost, safety, and effectiveness. For those requiring complete pain reduction, some use injected anesthesia administered by medical professionals. Injections are illegal in some states that regulate electrolysis, so you may need to approach this with discretion. However, pain or fear of pain should never keep you from getting electrolysis.
 - Some transgender women have reported success with [do-it-yourself electrolysis](#). Others had theirs done at [Electrology 2000](#). These options are great for some, but they aren't best for everyone. Please see my pages on these options for a discussion of advantages and drawbacks.
 - Anyone considering sex reassignment surgery is strongly urged to consult with their surgeon about genital electrolysis prior to SRS. In many cases, genital electrolysis can help eliminate the need for skin grafts taken from the abdomen or hips, and it can help prevent the problem of hair growth inside the vagina post-surgically.
 - There is no 'one way' that works for everyone. Listen to the **first-hand** experiences of others, but consider it advice, not gospel. You must find what works best for **you**. Because

of all the variables, your situation will be unique and not exactly comparable with anyone else's (JAMES, 2015b).

Summary

- Because pain varies widely from person to person, you must experiment to find out what works best for you.
- You must work as close to your pain threshold as possible for the most effective treatment. Communication with the practitioner about this is vital. Have him or her turn it up if you can stand it.
- Get as comfortable as possible during treatment
- Find the time of day that works best for you. Early or late, awake or tired, everyone is different.
- Eliminate as much stress as possible on the day of hair removal appointment.
- Those on *hormones* and those requiring a lot of treatment may find their pain threshold decreases over time.
- Your diet can affect your sensitivity. Avoid stimulants like caffeine, chocolate, or sugar the day of an appointment. Some find a meal just before treatment helps reduce discomfort.
- In your early sessions, save the most sensitive parts for the end of the session. Once you have found an effective pain management method, try doing the sensitive parts first to see which way makes a session go faster for you.
- You may find an antihistamine reduces mucus production and swelling while working under the nose.
- The most effective methods of pain reduction are prescription painkillers, prescription tranquilizers, topical anaesthetics, and injected anaesthesia administered by a medical professional. These carry certain risks you should know about.
- Distractions such as talking, listening to music, or holding something can help.
- Placing cotton rolls or balls or folded tissue inside your mouth between the teeth and lips during treatment around the mouth can greatly reduce discomfort and mucus production during work under the nose. It also makes hairs more accessible for the electrologist.
- While some use alcohol or aspirin to reduce pain, these can cause blood thinning and prolong bleeding if a follicle is accidentally damaged during treatment.
- Avoid alcohol or prescription painkillers if you are driving to treatment.
- *EMLA cream* and ELA-Max are very popular topical anaesthetics. *EMLA cream* requires a prescription and works best when applied carefully - cleanse skin with alcohol or methylated spirit, apply *EMLA cream* in a thick layer, cover with an airtight dressing, which should be cut to size and taped in place, then wait until it reaches optimal effectiveness. This may vary from 15 minutes to 2 hours, so try at least an hour the first time and then experiment. Most people do not get 100% anesthesia from *EMLA cream*, but they get enough to make treatment bearable. It loses its effects quickly once uncovered, so timing is important. Many find that fresher tubes work better, and that it is affected negatively by temperature changes. Many prefer ELA-Max, because it's *OTC* and easier to use.
- Some electrologists and clients have made arrangements for injected anaesthesia prior to treatment. Ask if you are especially averse to pain and don't mind paying.
- Pain or the fear of pain should not keep you from getting hair removed permanently if you really want it (JAMES, 2015c).

Why hair regrowth even after permanent hair removal through electrolysis is possible

To make things more complex, the body can activate "new" follicles into hair growth at any point in time. In reality, these aren't new follicles (they've always existed) but are simply triggered into life at certain points.

Changes in *hormone* levels is a common trigger for bringing to life a dormant follicle. This is why it's sometimes difficult for the consumer to understand exactly what "permanent" means when it comes to reduction and removal (DZUREK, 2014c). Here are some other triggers for hair growth -

- Polycystic ovary syndrome,
- Menopause,
- Insulin resistance (DZUREK, 2014c).

While electrolysis is the only method of hair removal that has been approved by the *FDA* as being 'permanent hair removal', it still does not prevent the activation of new follicles that weren't previously active at the time of treatment.

With that in mind, it's still physically possible to grow new hairs in an area that was treated - they just aren't coming from the previously denatured follicles. Of course, to the average consumer, this is not often fully understood, and most salons are not always keen to run through the finer points, of which this is one (DZUREK, 2014c).

Ethnic variations in facial and body hair

Asians, both men and women, have relatively little body hair. However, many women in Japan find even slight extra hair growth disturbing. Sometimes it is assumed that women from Mediterranean countries (Italy, Greece, etc.) will not be bothered by extra hair since it is more common in those parts of the world.

Black people have fewer hairs than white people but the hair tends to be equally noticeable because it is curly and dark, so the incidence of visible *hirsutism* is similar in white and black people.

African-Americans have another problem when they develop excessive hair. The curliness makes the hairs more likely to become ingrown after they are removed. This can result in a pimple-like breakout termed PFB (*pseudofolliculitis barbae*). As these lesions heal, they often leave dark patches that do not fade completely (HORMONEHELPNY, 2008).

History of electrolysis

1875

The first person to use electrolysis for hair removal was Doctor Charles E. Michel (1833 - 1913), a St. Louis, Missouri ophthalmologist (eye doctor) who, in 1875, reported the results of his use of electrolysis in trichiasis (ingrown eyelashes) (St. Louis Clinical Record, October, 1875, 2:145-148). He had been performing electrolysis since 1869.

Doctor W.A. Hardaway, a St. Louis, Missouri dermatologist, gave the credit for the first use of electrolysis to Doctor Michel (Transactions of the American Dermatological Association, 1878, 4:337-340.) In this paper, Doctor Hardaway described his own results and those of others; an indication that numerous other physicians were also performing electrolysis (ZAPAHAIR, 2016a).

1880 - 1900

The use of electrolysis became well known in the latter part of the nineteenth century. During this time, Dan Mahler established an electrolysis practice, and subsequently, an electrolysis equipment firm. The family business exists today as the Instantron Company, which has been operating continuously for over a century and is one of the world's largest suppliers to the electrolysis profession (ZAPAHAIR, 2016a).

1916

Paul N. Kree, of New York, developed the multiple needle technique for galvanic electrolysis. He was instrumental in the increased marketing of electrolysis services to the general public. Electrolysis spread from the medical profession to lay electrologists. The Kree Company dominated the performance and teaching of electrolysis in North America until the late 1970's (ZAPAHAIR, 2016a).

1924

Doctor Henri Bordier, of Lyon, France, developed the method of thermolysis (also called short-wave, diathermy, high-frequency etc.) Medical literature of this period indicates that thermolysis was probably attempted as far back as 1910, in Germany by Doctor Eitner (ZAPAHAIR, 2016a).

1925

Doctor A. Rostenberg introduced thermolysis into the North American medical journals (ZAPAHAIR, 2016a).

1928

Doctor Mildred Trotter published her classic article proving shaving does not affect hair growth (ZAPAHAIR, 2016a).

1940's

New equipment eliminated the crude spark-gap diathermy machines, which provided an unpredictable performance. Thermolysis became more widespread with the use of the simplified and more consistently reliable vacuum tube machines. Arthur Hinkel and Henri St. Pierre applied for the patent of their blend machine in 1945 and received it in 1948 (ZAPAHAIR, 2016a).

1956

Gordon Blackwell began publishing Electrolysis Digest, and continued until 1986. His reviews and critiques were vital to the dissemination of helpful information to electrologists throughout the world (ZAPAHAIR, 2016a).

1968

Arthur Hinkel and Richard Lind widely publicised the blend in their text, Electrolysis, Thermolysis and the Blend. Hinkel formalised the concept of intensity x duration = units of lye (treatment energy), which is fundamental to a better understanding of electrolysis. The work of Hinkel and St. Pierre was brilliant, conceptually and technically, and of great assistance to a better scientific understanding of electrolysis (ZAPAHAIR, 2016a).

1970's

Electrolysis equipment became much more reliable and simple to use with the development of transistorised equipment. In November, 1979, the Copperwaites of Toronto established Interna-

tional Hair Route, a publication which continues to print articles of interest to all electrologists ([ZAPAHAIR, 2016a](#)).

1980's

Computerised electrolysis equipment became smaller, more reliable, and easier to use. Mr. Mark Van Orden, of the Fischer Company, was able to incorporate Hinkel's formula into programmable computerised epilators. The AIDS virus stimulated development of pre-sterilised, disposable needles. In the early 1980's, Drs. Toshio Kobayashi and Shiro Yamada described their technique of high-powered thermolysis, using an insulated needle ([ZAPAHAIR, 2016a](#)).

1990's - Present Day

Standardised training and improved equipment are making electrolysis more popular and more accessible to people around the world. It is still the only method recognised by the [FDA](#) as Permanent Hair Removal ([ZAPAHAIR, 2016a](#)).

NHS hair removal

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If you ask your [GP](#) for referral for funding for hair removal, he/she will probably say either of -

- hair removal is considered to be a 'cosmetic procedure' and there is no funding available for it, or
- your request for referral will proceed to your [primary care trust \(PCT\)](#) ⁸³ and/or your [clinical commissioning group \(CCG\)](#) ⁸⁴, where it will very likely be rejected as it is
 - a 'cosmetic procedure',
 - the wrong people to be referred to.

To get funding you need to be a patient at a [The UK-wide National Health Service \(NHS\)](#) ⁸⁵ [Gender Identity Clinic \(GIC\)](#) ⁸⁶. These are located at -

- [West London Mental Health NHS Trust Gender Identity Clinic](#) aka Charing X
- [The Tavistock and Portman NHS Foundation Trust Service for children and young people with gender identity issues](#)
- [Sheffield Health and Social Care NHS Foundation Trust Sexual and Relationship, Sexual Medicine and Transgender Services](#) aka Porterbrook
- [Leeds Gender Identity Clinic](#)
- [Northern Region Gender Dysphoria Service](#) in Newcastle
- [Northampton Gender Clinic](#) in Daventry
- [Nottingham Centre for Gender Dysphoria](#)
- [The Laurels Gender Identity and Sexual Medicine service \(Devon Partnership NHS Trust\)](#) in Exeter
- And that's it! There are no more.

⁸³primary care trust

⁸⁴clinical commissioning group

⁸⁵The UK-wide National Health Service

⁸⁶Gender Identity Clinic

So how do I access NHS hair removal funding?

As people will be aware [NHS](#) England introduced an interim gender policy in 2013 which entitled trans men and women access to hair removal. This policy allows patients who are currently on the [NHS](#) England Gender Pathway to receive up to eight sessions of either laser, [IPL](#) or electrolysis to the face and neck. It also allows patients both female to male and male to female to have hair removal to the donor site tissue prior to reconstructive surgery (there is no specified number of treatments here). The Clinical Reference Group (CRG) have been looking closely at the provision of hair removal for patients on the [NHS](#) Gender Pathway and a new policy is expected to be published for public consultation in late 2014.

Which never happened!

The process varies dependent on which [GIC](#) you are attending.

Leeds GIC

If you are attending Leeds [GIC](#) simply explain to your Lead Clinician that you would like to be referred for hair removal. Your Clinician will complete the necessary paperwork and forward a referral letter to your preferred electrologist, the clinician will also advise you to contact your electrologist and to see if you are suitable for treatment, you will then have a test patch. A report should then be written stating your suitability for treatment and your suggested treatment plan, this report is then sent to your Lead Clinician. Once your electrologist has received authorisation back from the [GIC](#) (usually within a week), treatment can then be started. When you have completed your course of treatment a further report should be written to your Lead Clinician.

London GIC (Charing Cross), Nottingham (GIC), Sheffield (Porterbrook Clinic), The Laurels (GIC)

If you are currently attending a [GIC](#) and you are on the [NHS](#) Gender Pathway you will need to ask your Clinician to complete a PPN form and a one-signature letter to authorise hair removal. You will need to take a copy of both of these documents and take them along to your preferred electrologist. The original letters are sent off by the [GIC](#) to your area team from [NHS](#) England (that's the team where you [GP](#) is registered) this is because this team will be responsible for funding your hair removal treatment. You are free to ring any electrologist and book in for a consultation and test patch at their clinic. You must take your letters with you to your first appointment so that they can take a copy. You are then free to start treatment with them. They will be unable to provide any treatment without this documentation.

Funding via [NHS](#) England will be made available to you only once so **make sure you use your funding wisely.**

There is no definition of how long a 'session' is, or how many treatments comprise a 'session', that is left for you to negotiate.

Removal by site

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Face

Top lip

You can shave your upper lip. It has the benefit of being quick and easy, but has the negative effect of regrowth being stubbly and irritating. Most women prefer one of two methods to get rid of unwanted facial hair - wax or depilatory creams.

Waxing facial hair for many women means a trip to the salon or day spa and having it done professionally. This, however, is too expensive for some women, so there are do-it-yourself alternatives. You can visit your beauty supply store and find prepared wax strips designed for facial hair removal. If you read and follow the directions carefully, the results will be satisfactory and longer-lasting than shaving would be.

Depilatory creams for removing facial hair are sometimes problematic in that when the hair is sufficiently coarse that it becomes more imperative to get rid of it, it is too coarse for most facial

hair removers to dissolve easily. Stronger formulas can be too harsh for use on the face and therefore the result is that you either have poor results, or risk chemical irritation in order to get rid of the unwanted hair.

Because of this, selecting depilatory creams for facial hair removal requires careful contemplation and research. On the plus side hair removed with depilatory creams grow back with a softer feel because the ends are tapered and therefore the skin feels smoother longer.

If you feel you have a more serious problem with facial hair growth, you can talk to your doctor about medical options that may be appropriate for you. Only your doctor can determine if you would be a candidate for these prescription drugs but for some women they are a real benefit (HAIRFINDER, 2017g).

Chin

Shaving, waxing, laser/pulsed light, electrolysis, [OTC](#) creams, prescription creams (GARDENER, 2014).

Neck

Shaving, waxing, laser/pulsed light, electrolysis, [OTC](#) creams, prescription creams (GARDENER, 2014).

Eyebrows

Properly shaped and trimmed eyebrows frame your face and improve your appearance. While using tweezers to get rid of eyebrow hair is common and simple, tweezing can cause significant discomfort and irritation. Evaluate effective alternatives to tweezing before you choose a method. Base your choice on the amount of money you are willing to spend, the sensitivity of your skin and the degree of permanence you desire (KETCHAM, 2014).

Step 1

Wax your eyebrows with a home eyebrow waxing kit or visit a salon for a professional waxing. Waxing involves applying hot wax to the desired area, then placing a strip of cloth on top of the wax. The strip is ripped off, against the direction of hair growth, to get rid of eyebrow hair. Home kits are available at most grocery stores and pharmacies and cost as little as \$25 (KETCHAM, 2014).

Step 2

Use a razor to shave off unwanted eyebrow hair. Shave eyebrows with or without shaving cream, and always use a clean razor to prevent infection. While shaving is quick and easy, it is difficult to get clean brow lines. Be aware that results last only days and razor contact with the delicate skin near the eyes may cause irritation and shaving bumps (KETCHAM, 2014).

Step 3

Find a salon that offers eyebrow threading. Threading works in a way similar to tweezing, but it removes multiple hairs at one time. The beautician twists thread around a group of hairs, then pulls it sharply in the direction of hair growth to remove hair at the follicle. Threading produces a straight line and results last for several weeks (KETCHAM, 2014).

Step 4

Visit a electrologist to undergo electrolysis on your eyebrows. Electrolysis involves administration of an electrical current directly to the hair follicle to render it inactive. The unwanted eyebrow hair then falls out. Electrolysis is typically expensive and the procedure can cause scarring. Repeated sessions may be necessary, but in most cases, the results are permanent (KETCHAM, 2014).

Nose

Whilst some of the aesthetical changes men are faced with as they get older can actually enhance their appearance, making them look more distinguished and even sexier; thick, black strands of hair protruding from the nostrils are definitely not one of the more 'desirable' aging males attributes.

Some men accept nose hair as another physical sign of their growing presence on the Earth, whilst many men strive to remove this unsightly telltale sign that they are getting older. Consequently there are several methods and many products available to eliminate pesky nose hair from obtruding into view (HAIRFINDER, 2017f).

Why does nose hair grow as men become older?

As men depart their twenties and start to creep up their thirties, they can often be shocked to find thick, black hairs that start to descend from the nostrils. As they get older the amount of nose hair visible gradually increases. The hair that grows from the nose and ears is controlled by hormones. Many experts assert that this unwelcome growth is linked to an increase in the hormone *DHT*, which is more prevalent in men than women, and is the hormone responsible for causing male pattern baldness.

Although a man's nose has always contained hair, it begins to grow more rapidly the more *DHT* is produced, which can be as much as 1cm a month. Dealing with this excessive growth can be a time consuming, tedious and a painful procedure (HAIRFINDER, 2017f).

How not to remove unwanted nose hair

Often men panic at the first sign of whiskers projecting from their nose and ears and fumble around with inappropriate tools desperately trying to remove their new feline features. Avoid using scissors to trim nose hair at all costs, as it only takes a slight tremble of the hand to snip the skin and cause permanent tissue damage. If you do proceed with scissors, ensure they are sharp and the right size to yield successful results, whilst minimising the chances of an accident.

Tweezers should also be avoided as a method of nasal hair trimming. Whilst the 'pluck one hair and two will grow back' theory may be a myth, plucking hair from this delicate area will prove to be extremely painful. Plucking with tweezers may also cause small lesions to occur and can inflame the nasal cavities which can lead to infection. The most effective, easy and painless way to remove unwanted nose hair is to use electric nose hair trimmers (HAIRFINDER, 2017f).

How to use nose hair trimmers

Always ensure you are in a well-lit area before you use electric trimmers. Clean the nose beforehand so that the nose hairs are separated and free from dirt. Begin by trimming the lower hairs and trim the hair until it is no longer visible from below the nose line. Guide the nose from side to side to contact those hard to reach hairs.

According to customer reviews the two best nose hair trimmers are the Panasonic Nose Hair Trimmer, and the Motokata Nose Hair Trimmer. Both trimmers operate using dual rotary blades and are at the height of 'trimming technology', providing precision and accuracy, resulting in a clean, smooth trim.

Of course 'nose hair technology' should be used conservatively, as Mother Nature gave us all nose hair for several reasons. The hair in our noses acts as a barrier against bacteria and germs floating in the air, invisible to the naked eye. Secondly nose hair warms and moistens the air we breathe in.

Removing too much would make us more prone to allergies, respiratory infections and sinusitis. Whilst the endless pursuit to retain youth is becoming increasingly ubiquitous in modern society, always ensure to trim nose hair safely and conservatively to secure a look of sophistication and distinction ([HAIRFINDER, 2017f](#)).

Ears

Hair diminishing from the head only to reappear in the most undesirable of places, like the ears and the nose, is a normal woe of many men approaching their middle age. Whilst the research carried out on this embarrassing subject is far from conclusive, there is enough evidence to suggest that the cause of this misplacement of men's hair can be blamed on the hormone [DHT](#).

Whilst [DHT](#) is produced on all human beings, it is more rampant in men, especially older men. Whilst countless scientific accounts insist [DHT](#) is responsible for causing male baldness, a comparatively lower number assert that the hormone is also accountable for the increase of unsightly strands of hair jutting out of the ears of men whose youth is no longer on their side. Help, however is on the side of men afflicted with excessive ear hair and comes in a variety of advice and products ([HAIRFINDER, 2017e](#)).

Why should men be bothered by elongated ear hair?

Women? Mates? Age creeping up on them? The list goes on and on to why men are enthused into a state of panic the day they find their first ear hair protruding from their ears. Although regardless of ear hair being an unattractive and unwelcome indication of a man's real age, ear hair can also be annoyingly itchy when it starts to surmount across the ear. Hearing can also be adversely affected by excessive ear hair.

Thinking logically, if thick, dense strands of hair are growing like a jungle encompassing an ear, hearing is bound to become more muffled. Although the reasons to why men should be bothered by ear hairs do not stop there. An unwarranted amount of 'ear whiskers' obtruding into view, may cause an excessive build up of wax and prove to be a threat to a man's hygiene ([HAIRFINDER, 2017e](#)).

How to remove male ear hair

There are several methods available to eliminate these unattractive hairs from tarnishing a man's look. Scissors may sound like the obvious way to curb excessive ear hair, but in reality scissors are arguably the most ineffective and dangerous way to remove ear hair. On fatal 'miss snip' could cause permanent damage to the ear canal.

If scissors are the only viable option, ensure to use a very sharp pair, which are small enough to fit comfortably into the ear, to decrease the chances of an accident and scarring.

Tweezers are another popular ear hair removal tool, although again proceed with extreme caution. Plucking hairs out of the ears can cause inflammation and lesions on the wall of the ears, and often subsequently leads to an infection, not to mention the pain which accompanies plucking in this delicate area.

Electric ear hair trimmers are the most painless, effective and recommended method to remove excess ear hair. To guarantee maximum results and minimise the chance of an accident, use the trimmers in an illuminated area, preferably with a magnified mirror. Ensure to clean the ears prior to using the trimmers to free the ears from wax, dirt and debris which may hamper the effectiveness of the ear hair trimmers.

Because ear hair is such a common problem in aging men, there are a plethora of electric ear hair trimmers available on the market and choosing a trimmer can be confusing. Panasonic Nose & Ear Hair Trimmers have consistently good reviews, and as the name suggests, can trim both unwanted ear and nasal hair.

As removing ear hair by means of trimmers, tweezers and scissors can be both a time consuming and arduous task, ear hair laser removal is the latest technology to rewind the signs of aging and deter Mother Nature from accomplishing her work. Laser hair removal also offers a permanent solution to those unsightly spiders' legs sprouting from the ears (HAIRFINDER, 2017e).

Bikini line

Shaving

If you want to feel extra smooth around your bikini line, you've got a few options. First: **shaving**. While it's not a particularly long-lasting method, it's typically pain-free and you can do it in the comfort of your own home. To avoid the dreaded razor burn that plagues so many folks who shave, dermatologist Christine Choi Kim, M.D., recommends waiting until your skin is hydrated from the shower or bath. 'Use a moisturising foam, cream, or gel instead of soap to shave, and try *Tend Skin* if you get ingrown hairs⁸⁷ or razor bumps⁸⁸ easily', she says (ESCOBAR, 2016).

Waxing

Another option for your bikini line is **waxing**. 'The hair in the bikini area tends to be coarse and thick, which is ideal for waxing,' says Katherine Goldman, owner of Strip Bar Wax in San Francisco. 'And since the hair is pulled out from the root, it grows back thinner over time.' There are multiple types of wax, including strip wax (applied hot and removed with cloth or paper sheets) and hard wax (applied hot, then removed after cooling and hardening).

If a long-lasting method is number one on your priority list, **waxing** may be your best option. 'It lasts around three to six weeks,' says Noemi Grupenmager, founder of Uni K Wax.

It's worth mentioning that some reports mention an increased risk in [sexually transmitted infection \(STI\)](#)'s due to pubic hair removal. Dermatologist Robert Brodell, M.D., told LiveScience.com that irregularities in the skin, which can be caused by using a razor or waxing, 'open the door for catching the infection'. So, here's your friendly reminder to always use proper protection (ESCOBAR, 2016).

Legs

Shaving

The most common method for removing leg hair is, of course, **shaving**. If you don't mind dedicating a bit of time to it every few days (depending on how quickly your hair grows), this is a great option. Use a sharp razor as well as a moisturising foam, cream, or gel, advises Heidi

⁸⁷See **Ingrown hair** on page 181

⁸⁸See **Razor burn** on page 103

Waldorf, M.D., director of laser and cosmetic dermatology at Mount Sinai Hospital. If you start to notice razor burn ⁸⁹, it may also be due to your clothing. *'Tight clothes such as leggings, stockings, and jeans can cause ingrown hair ⁹⁰ and bumps because it compresses the hair against your body, increasing /irritation'* explains Grupenmager. *'Exfoliating twice during the week or up to two days prior to any form of hair removal will help'*. (Just be sure to avoid exfoliating directly after you shave, when your skin is most sensitive) (ESCOBAR, 2016).

Mistakes when shaving your legs

Shaving your legs as soon as you hop into the shower Understandably, you want to get your morning routine underway, but experts advise hanging out in the shower or bath for about 15 minutes before you start shaving - this will soften the hair and open up follicles. Any longer, though, and your skin will wrinkle and swell, making it harder to score a close shave (GONTCHAROVA, 2014).

Doing it first thing in the morning Shaving at night will leave your legs smoother. As you sleep, your legs swell slightly, which can make hair retreat back into its follicles (GONTCHAROVA, 2014).

Not using anything to lather up (or worse, using bar soap) No matter how in a hurry you may be, skip the temptation to shave 'dry'. Lather up your legs with a moisturising shaving cream to make sure the razor glides easily over your skin, and you'll avoid nicks and cuts. In a pinch, hair conditioner will do just as good a job. But skip the bar soap - *'It doesn't create enough lubrication for a razor to slide easily against your skin, which can up the odds of cuts'* dermatologist Ellen Gendler, M.D. (GONTCHAROVA, 2014).

Using those single-blade disposable razors This is fine once in awhile, like if you're staying in a hotel, but for every-day use it's best to invest in a four- or five-blade razor. They provide the smoothest results, letting you navigate tricky areas like your knees and ankles. *'Single-blade disposables are likelier to drag against the skin'* says cosmetic dermatologist Neal Schultz, M.D. (GONTCHAROVA, 2014).

Not replacing your razor blade often enough You may have bought yourself a nice razor, but it won't do you any good if you don't change your blade at the first sign of dullness (usually, about five to 10 shaves). Old blades are not only ineffective, but more likely to cause bumps and redness and trap bacteria, which can potentially cause infections (GONTCHAROVA, 2014).

Shaving up the leg before you shave down the leg On your first pass, only shave in the direction your hair grows (down the leg), and if you have very sensitive skin, don't shave upward at all. While going 'against the grain' may get you a closer shave, it also increases the possibility of irritation, nicks, and cuts. Once your hairs are already very short, and the skin is warm and lubricated, going against the direction of hair growth is much safer. *'If you'd still like a closer shave, reapply the gel and shave again - against the direction of the hair growth'* says Dr. Schultz (GONTCHAROVA, 2014).

⁸⁹See **Razor burn** on page 103

⁹⁰See **Ingrown hair** on page 181

Not preventing or treating razor burn Close shaving can result in ingrown hairs ⁹¹ and untreated razor burn ⁹² can turn into long-term scars. To help prevent those annoying red bumps in the first place, use an exfoliating body scrub twice a week to shed the skin that's trapping hairs. To treat bumps, put a warm compress on the affected area - the heat will relax the hair. After showering, apply lotion to soften the hair, leaving your skin less prone to infections (GONTCHAROVA, 2014).

Shaving with your guy's razor A lot of women think using a men's razor is more effective, so we tested the market leaders. The three-blade Gillette Mach3 disposable finished in last place, while the refillable three-blade Gillette Mach3 Turbo did just as well as the top women's razors (GONTCHAROVA, 2014).

Waxing

If you have a higher pain tolerance and prefer to keep regrowth at bay, consider **waxing**, as it normally lasts between 3 - 6 weeks (ESCOBAR, 2016).

Depilatory cream

Another hair removal method many folks know and love - **depilatory cream**. While you may recall the potently-scented formulas of years past, these are still around, but now with new-and-improved concoctions that promise to be less irritating and more fragrance-friendly. *'Depilatory creams use chemicals such as calcium thioglycolate or potassium thioglycolate, which break disulfide bonds in keratin, thereby weakening the hair'* explains Dr. Kim. Just be sure to do a patch test ⁹³ before applying one of these to your skin, and don't leave it on for longer than the instructions direct (ESCOBAR, 2016).

Underarms

Shaving

Underarm hair grows almost 50% faster than the hair on your legs, according to the experts who make Venus razors, so **shaving** on a daily or every-other-day basis makes sense for lots of folks. That said, some people do tend to be more sensitive than others and can get irritated from shaving, so make sure you're always using a sharp razor and rinsing it between strokes to avoid it getting clogged. *'If you're prone to shaving bumps, use a shaving gel or lotion, shave in the direction of the hair, and change the blade often'* Dr. Waldorf says. *'After shaving, apply OTC hydrocortisone cream to any red or inflamed areas, or areas that frequently develop bumps'* (ESCOBAR, 2016).

Waxing

Getting a quick **wax** every month or so can keep your underarm hair at bay without reaching for the razor every morning. Worried about little bumps? *'If you wax regularly, you will have a very slim chance of getting ingrown hairs ⁹⁴ or bumps'* says Grupenmager. Consult a dermatologist if

⁹¹See **Ingrown hair** on page 181

⁹²See **Razor burn** on page 103

⁹³See **Patch test** on page 178

⁹⁴See **Ingrown hair** on page 181

you're still concerned about whether or not your underarm area can handle waxing (ESCOBAR, 2016).

Laser

Laser hair removal is a much longer-term method, but if you're sure you'll never again want hair in a specific spot, such as your underarms, it could be worthwhile to consider it. *'By getting rid of 70% to 90% of the hair, if not more, you reduce or remove the necessity of hair removal'* explains Dr. Waldorf. *'The less you have to do, the less irritation or side-effects you'll get in the long term.'* Even though it's on the pricier side (approximately \$50 to \$300 per session, depending on the body part), you could wind up saving money on razors, shaving cream, and waxing (ESCOBAR, 2016).

Miscellaneous

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Hair myths

- **I can train my hair to do something** - Fact - your hair's growth patterns are determined by the hair follicle. No amount of blowdrying, combing, or styling can "train" your hair to grow differently. Certainly, you can use a dryer and/or styling products to temporarily change your growth pattern, but permanent change is not possible. If your hair has a natural cowlick or part, there's not much you can do about it ([MENSHAIR, 2016](#)).
- **Shaving will make my beard grow thicker or faster** - Fact - hair is basically protein and keratin and has no blood supply or nervous system. Your body does not know that your beard is shaved (or two inches long for that matter) because it has no way of communicating this information to your body. People often believe that shaving causes the beard to grow faster or thicker, but facial hair typically grows thicker and faster as you age so it's only a coincidence ([MENSHAIR, 2016](#)).
- **Trimming my eyebrows will make them grow faster** - Fact - see the answer to the myth above. Same rules apply ([MENSHAIR, 2016](#)).
- **Plucking gray hairs will make more grow back in in their place** - Fact - hair has colour because cells in our hair follicles called melanocytes create pigment (colour) in the hair. When these cells stop producing the pigment, the hair loses its colour. Plucking out one gray hair will not affect the melanocytes in the other hair follicles, so other hairs will not turn gray as a result. Gray hair can occur as a result of age or a medical condition. Your 'gray' hair is actually transparent, but appears gray due to the dead cells that make up the strand. Also, smokers are four times more likely to have gray hair and premature hair loss - another good reason to quit ([MENSHAIR, 2016](#)).
- **Hair can turn gray over night** - Fact - if you've read the answer to the above myth, you should already be able to figure out the answer to this one. Only chemically bleaching the hair can make an entire strand lose its colour overnight - and not even that can do it completely ([MENSHAIR, 2016](#)).
- **Growing my hair longer will hide my baldness** - Fact - actually, in almost every circumstance, growing hair longer makes the thinning and baldness appear much more noticeable. When the sides and back are worn fuller, it makes the top appear thinner. The rule of thumb - if you can see scalp on the top, cut the sides short enough so you can see an equal amount of scalp. This will give an overall uniform appearance and take the emphasis off of the thinning areas. Guys with comb-overs are only fooling themselves ([MENSHAIR, 2016](#)).

- **Shampoo will make my hair grow faster** - Fact - any shampoo which claims to make hair grow faster is making a false claim. Hair will grow at a fairly consistent rate - about half an inch per month - no matter what you do. There are certainly shampoos that will make the hair appear thicker by swelling the follicle and shampoos that will deeply condition the hair and help prevent breakage, but none that can actually increase the growth rate. Some say that doing things like taking vitamins and massaging the scalp can help your hair grow faster, but I've found no scientific proof to support such claims (MENSHAIR, 2016).
- **Baldness comes from my mother's side of the family** - Fact - complete myth. Hair loss can be inherited from either side of the family and it may (or may not) skip many generations. It is entirely genetic and can come from either side of the family (MENSHAIR, 2016).
- **Wearing tight hats causes hair loss** - Fact - in order for that to happen, the hat would have to be so tight as to cut off circulation to the follicles. If that were the case, the hat would likely be much too tight for you to wear comfortably, so it's not likely. Wearing a tight hat can, however, cause hair breakage and damage (MENSHAIR, 2016).
- **Dandruff is caused by dry scalp** - Fact - dandruff is actually thought to be caused by a fungus called malassezia, which can sometimes grow out of control and begin feeding on the oil on your scalp. This can cause an increased number of dead cells which, when combined with dirt and oil from your scalp, form flaky white scales. Dry scalp has nothing to do with it (MENSHAIR, 2016).

Patch test

You've probably seen the phrase '**patch test**' on your depilatory cream box. Basically, it's that mini disclaimer that advises you to take a little bit of the cream and dab it on your skin a day or two before applying it all over your legs to see whether you experience any negative reactions.

Please don't skip doing the patch test as it's a big mistake according to the experts. '*Traditional depilatory cream usually has harsh chemicals like ammonia*' explains Dr. Marnie Nussbaum, a New York City dermatologist. '*It can cause irritation and allergic reactions on the skin*'.

And don't think just because you've used a certain brand before that you're in the clear. Even if you've already tried a particular brand in the past, you should always do a patch test first. '*At any point, you can develop an allergy to something*' warns Dr. Nussbaum. Even more reason to be vigilant - companies tend to change their formulas often.

So what's the best way to do it? Take a small amount of the cream and apply it with a cotton bud to an inconspicuous part of your body, like the inside of your elbow, then wait 24 - 48 hours to see how your skin reacts. If it's itchy, burning, or red, skip that depilatory cream brand. The last thing you want is irritated legs.

Chapter 10

Common hair/scalp disorders

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There are many medical conditions that can affect the hair and scalp, most of them resulting in hair loss or some type of skin rash. These causes can be hereditary in nature or can be caused by an infection or lack of proper nutrition.

Scalp conditions that can cause hair loss

Dermatitis (seborrheic eczema)

This is a common inflammatory condition of the scalp. It is characterised by flaky, dry and scaly skin patches; and when these flakes fall off, they are called 'dandruff'. In infants, this condition is called 'cradle cap' (HAIR, 2013a).

Psoriasis

This is an inflammatory skin condition involving the auto-immune system that is characterised by red, scaly and dry patches (HAIR, 2013a).

Ringworm (tinea capitis)

This is a fungal skin infection commonly occurring in children characterised by ring-like patches around the skin

While symptoms for these scalp conditions vary, they almost always include rashes, hair thinning or hair loss, hair breakage, itchiness, and at time, pain (HAIR, 2013a).

Common hair conditions or disorders

Excluding common hair problems such as dry, chemically treated/damaged, oily hair and split ends, here are some common hair conditions -

Hair loss

This is also known as alopecia and is a common concern for both men and women (HAIR, 2013a).

Alopecia areata

Total hair loss that occurs in round patches. Cause is usually unknown, but is mostly linked to stress. Hair usually grows back (HAIR, 2013a).

Female pattern baldness

Women experience baldness by way of uniform thinning across the scalp with a preserved hair-line (HAIR, 2013a).

Male pattern baldness

This is the most common type of hair loss in men, characterised by a receding hairline, hair loss at the crown, or both (HAIR, 2013a).

Telogen effluvium

Hair fall that abruptly falls out in large patches, typically after a month or two after a personal shock (surgery, childbirth, severe stress, etc) (HAIR, 2013a).

Pediculosis capitis (head lice)

A common, highly contagious infection that often occurs in children (HAIR, 2013a).

Folliculitis

Inflammation of hair follicles due to a bacterial infection, usually caused by Staphylococcus aureus (HAIR, 2013a).

Piedra

Hair shaft fungal infection that causes hair loss because fungal nodules cling to hair strands (HAIR, 2013a).

Trichodystrophy

Hair breakage or hair that does not grow (HAIR, 2013a).

Ingrown hair

Ingrown hair is a condition where the hair curls back or grows sideways into the skin. It may or may not be accompanied by an infection of the hair follicle (*folliculitis*) or "razor bumps" (*pseudofolliculitis barbae*), which vary in size. While ingrown hair most commonly appears in areas where the skin is shaved (beard, legs, pubic region), it can appear anywhere.

Anything which causes the hair to be broken off short with a sharp tip can cause ingrown hair. Shaving is the leading cause, followed by tight clothing. The embedded hair causes a localised inflammation (sometimes painful) response in the skin. Sometimes ingrown hair occurs naturally without shaving (ZAPAHAIR, 2016b).

Symptoms include -

- rash,
- itching skin,
- hair which remains in spite of shaving, and
- infection and pus collecting under skin (ZAPAHAIR, 2016b).

Treatments for ingrown hairs include putting a warm washcloth over the ingrown hair, shaving in a different direction, exfoliating with facial scrubs, sponges, towels, or creams containing acids, treatment with Ibuprofen and prophylaxis with twice daily topical application of diluted Glycolic acid. Ingrown hair will often fall out after a couple of weeks (ZAPAHAIR, 2016b).

Types of Ingrown Hairs

Superficial Ingrown Hair One of the most common types primarily found on the legs, more specifically on the lower legs. I refer to this ingrown hair as superficial because the hair is not embedded deep within the epidermis. Releasing it is relatively simple.

- **Cause** - Generally, the superficial ingrown occurs from a lack of exfoliation.
- **Solution** Regular exfoliation. Using massage gloves at shower and bath time will help to release and prevent ingrown hairs (ZAPAHAIR, 2016b).

Dormant Ingrown Usually found on the lower legs, these types of ingrowns lay parallel to the skin and are often too deep to remove. Generally, they dissolve in time. Dormant ingrowns can be lanced by a **GP** (ZAPAHAIR, 2016b).

- **Cause** - The natural direction of the follicle has been disrupted and/or the skin type has *keratinized* at a faster rate and in a tighter, surging pattern. The skin tends to feel like very tight, smooth leather. This skin type makes it more challenging to remove the hair because the mouth of the follicle forms tightly around the hair's shaft.
- **Solution** - The best skin solution is regular exfoliation of the skin combined with removing the hair in the natural direction of growth. (Shave in the direction of hair growth, not against it) (ZAPAHAIR, 2016b).

The J-Peg Ingrown This is a hair inside the follicle, which begins to curl back down into the skin as it grows and attempts to either pass through the accumulated dead skin cells covering the mouth of the follicle or through an opening that does not exist. As a direct result, it creates

a bump and can cause some discomfort until the hair is released. Generally, this type does not become infected when it develops in areas other than the face or bikini (ZAPAHAIR, 2016b).

- **Cause** - Lack of exfoliation and skin softening. The reason why this ingrown becomes infected is the natural direction of the follicle has been disrupted.
- **Solution** - Epilating a hair in the natural direction of growth far exceeds the benefits of removing it against the natural direction of growth. A good home regimen of exfoliating and hydrating the skin will allow one to free their own follicles of accumulated dead skin cells, thus preventing the hair to become ingrown (ZAPAHAIR, 2016b).

The Bikini Ingrown Hair These ingrown hairs most often look like little black dots or pinkish-red bumps. That's if they are not infected. Then there are those that look like purplish-red bumps which can actually become cystic.

The pressure from the hair growing inside the bump along with infection (pus and blood accumulation) can cause much discomfort until the hair is released (ZAPAHAIR, 2016b).

- **Cause 1** - Lack of exfoliation and removing the hair in the opposite direction of the natural pattern of growth. When hair is removed in the opposite direction of growth, often, the hair is broken off at the skin's surface allowing dead skin cells to easily form over the mouth of the follicle trapping the broken hair beneath. As the hair continues to grow, a red bump quickly develops and can often leave the skin feeling itchy and uncomfortable. The one characteristic all ingrown hairs have is dead skin cells blocking the mouth of the follicle.
- **Cause 2** - Lack of hydrating and moisturising the newly exfoliated epidermis. I have seen so many women make the mistake of applying lotion to their skin only when it has a dry fallow look to it. The idea is to apply a good hydrating lotion when the skin looks great so that it keeps on looking its best.
- **Cause 3** - Some people are highly prone to ingrown hairs. Their skin tends to keratinize at a much faster rate than the average person.//
- **Solution** - Removal of the hair in the natural growth only. Regular exfoliation, softening the skin and hydrating on a daily basis. A regular electrolysis regime will help to achieve maximum results (ZAPAHAIR, 2016b).

Treatment of ingrown hairs

The following are some recommendations that will help eliminate and prevent ingrown hair problems (ZAPAHAIR, 2016b).

- Drink plenty of water daily. We are all too familiar with this fact. Drink as much water as you can each day for maximum hydration.
- Use a hydrating lotion everyday. Lotions containing animal or petroleum by-products should be avoided. They can clog pores and cause many other reflecting complications to the skin.
- Exfoliate dead skin cells. Using Dead Sea salt mixed with cured sesame seed oil to massage onto the skin is an uncomplicated exfoliating option for all skin types. The results are excellent, lasting at least two weeks and leave an immediately visible impression.
- Epilate the hair in the natural direction of the follicle. When hair is removed against its natural direction, you will have hair breakage and you will promote ingrown hairs.
- If you are prone to getting serious ingrown hairs you may need to use a glycolic-based lotion to promote addition exfoliation (ZAPAHAIR, 2016b).

How to remove with tweezers

You will need a good quality, sharp, point-tipped pair of tweezers, plenty of light and, preferably, a magnifying mirror -

- exfoliate regularly to help keep ingrown hairs at bay,
- sterilise your tweezer tips with methylated spirits, either put the liquid on a cotton ball to wipe tweezers thoroughly or simply dip them in a little of the solution,

- wash and exfoliate the skin around the ingrown hair to ensure skin is free from bacteria and dead skin cells,
- use a hot compress (a clean flannel steeped in hand-hot water is fine) against the area to draw the hair nearer to the surface and open pores,
- use one tip of the tweezers to carefully tease out the end of the hair to the skin's surface,
- once the hair is released it is best to leave it for a few days, for the skin to calm down and the hair to grow out naturally. If it is long and unsightly you can trim it down. Plucking it out immediately runs the risk of it just growing back deeper,
- after treatment, dab the area with antiseptic to close the pores and prevent infection,
- you may also treat the area with an antibiotic cream,
- make sure that the area is kept clean, exfoliate regularly and try to avoid wearing tight clothing against it to prevent recurrence (HAIRFREELIFE, 2016d).

Use the pointed tip of the tweezer carefully and gently and avoid 'digging around' trying to reach deeply embedded ingrown hairs. Sometimes it is impossible to remove them without help - in which case you should seek medical advice.

Part III

Keeping it

Chapter 11

Keeping it

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The actions of *hormones* on hair growth are complex, and include not only sex *hormones* but also those of the thyroid, adrenal cortex, pituitary and pineal. Androgens stimulate facial and general body hair formation and, after the first 30 years, tend to cause the thick terminal hairs of the scalp to change to small vellus hairs, causing recession from the forehead and maybe almost complete baldness. In females, oestrogens tend to maintain vellus hairs in their formation of minute hairs. In older men, growth of hairs on the eyebrows and within the nostrils and external ear canals increase, whereas elsewhere on the body, growth slows and the hair becomes finer. Figures for the rate of growth of individual hairs vary considerably. A rate of 0.2 - 0.44 millimetres per twenty-four hours in males is usually given, with the higher rate occurring on the scalp. Shaving does not appear to affect the growth rate (BNF, 2016). This means that under the usage of oestrogens hair growth may reoccur on the scalp, and beard growth will slow down, which therefore has implications for electrolysis.

Know your hair type

Oily hair

Appearance

- strands separate and stick to your head (NAYYAR, 2016c).

Care guidelines

- shampoo as often as necessary even if that means everyday,
- use a mild shampoo,
- use very little shampoo,
- put a conditioner on the ends unless the hair is very oily,
- don't use too hot a hairdryer,
- don't brush or comb more than necessary (NAYYAR, 2016c).

Special treatments

- to help reduce sebum production use 2.75 pints of water with the strained juice of 1 lemon added for the final rinse after shampooing (NAYYAR, 2016c).

Dry hair

Appearance

- tangles easily, brittle (NAYYAR, 2016c).

Care guidelines

- shampoo your hair every 4 - 6 days,
- use a mild shampoo,
- use a cream conditioner after every shampoo, combing it thoroughly through the hair and leaving it on for a few minutes before rinsing (NAYYAR, 2016c).

Special treatments

- massage 2 tablespoon of warm olive of almond oil into your hair,
- wrap your head in a warm damp towel or a plastic turban and keep it on for at least 30 minutes,
- do this every 3 - 4 weeks (NAYYAR, 2016c).

Combination hair

Appearance

- oily roots/dry ends (most common type) (NAYYAR, 2016c).

Care guidelines

- adapt the guidelines above for your own hair type (NAYYAR, 2016c).

Hair restorers

Dutasteride

What is it?

Dutasteride is a 5- α -reductase *enzyme* inhibitor. It works by lowering levels of a *hormone* called *DHT*, which is a major cause of prostate growth. Lowering *DHT* leads to shrinkage of the enlarged prostate gland (DRUGS.COM, 2014).

Dutasteride belongs to a class of drugs called 5- α -reductase inhibitors, which block the action of the 5- α -reductase *enzymes* that convert testosterone into *DHT*. Finasteride also belongs to this group, but while dutasteride inhibits both isoforms of 5- α -reductase, finasteride inhibits only one. Even so, a clinical study done by GlaxoSmithKline, the EPICS trial, did not find dutasteride to be more effective than finasteride in treating *Benign Prostatic Hyperplasia (BPH)*.

Also known as

Avodart, Dutasterid in Germany, Dutasterida in Spain.

Manufacturer

Avodart = GlaxoSmithKline (BNF, 2016).

Contains

Dutasteride 500 micrograms (mcgs)⁹⁵, a yellow capsule (BNF, 2016). The capsules are opaque, yellow, oblong soft gelatin capsules imprinted with GX CE2 on one side in red ink (ABRAMOVITZ, 2016). They also contain mono- and diglycerides of caprylic/capric acid, butylhydroxytoluene (E321), with the capsule shell containing gelatin, glycerol, titanium dioxide (E171), iron oxide yellow (E172), triglycerides, medium chain, and lecithin. The red printing ink containing iron oxide red (E172) as the colourant, polyvinyl acetate phthalate, propylene glycol and polyethylene glycol (EMC, 2016).

Pharmacology

Inhibits the conversion of testosterone to 5- α -dihydrotestosterone, a potent androgen (DRUGS.COM, 2014).

Indications

Used for treatment of BPH (BNF, 2016), and (anecdotally) for treatment of male pattern baldness.

Pharmacodynamics

Dutasteride is a synthetic 4-azasteroid compound that is a selective inhibitor of both the type 1 and type 2 isoforms of steroid 5- α -reductase (5AR), intracellular enzymes that convert testosterone to 5- α -dihydrotestosterone DHT. Type I 5- α -reductase is predominant in the sebaceous glands of most regions of skin, including scalp, and liver. Type I 5- α -reductase is responsible for approximately one-third of circulating DHT. The Type II 5- α -reductase isozyme is primarily found in prostate, seminal vesicles, epididymides, and hair follicles as well as liver, and is responsible for two-thirds of circulating DHT (DRUGBANK, 2013a).

How it works

Dutasteride inhibits the conversion of testosterone to 5- α -dihydrotestosterone (DHT), which is the androgen primarily responsible for the initial development and subsequent enlargement of the prostate gland. Testosterone is converted to DHT by the enzyme 5- α -reductase, which exists as 2 isoforms, type 1 and type 2. Dutasteride is a competitive and specific inhibitor of both type 1 and type 2 5- α -reductase isoenzymes, with which it forms a stable enzyme complex. Dissociation from this complex has been evaluated under in-vitro⁹⁶ and in-vivo⁹⁷ conditions and is extremely slow. Dutasteride does not bind to the human androgen receptor (DRUGBANK, 2013a).

Pharmacokinetics

Following oral administration of a single 0.5 mg dutasteride dose, the time to peak serum concentrations of dutasteride is 1 to 3 hours. The absolute bioavailability is approximately 60%. The bioavailability of dutasteride is not affected by food (EMC, 2016).

⁹⁵micrograms

⁹⁶outside the body

⁹⁷within the living organism

Dutasteride is highly bound to plasma proteins greater than 99.5%. Following daily dosing, dutasteride serum concentrations achieve 65% of steady state concentration after 1 month and approximately 90% after 3 months.

Steady state serum concentrations (*steady state serum concentrations (CSS)*⁹⁸) of approximately 40 ng/mL are achieved after 6 months of dosing 0.5mg once a day. Dutasteride partitioning from serum into semen averaged 11.5% (TRANSGENDERCARE, 2015f). Following oral dosing of dutasteride 0.5 mg/day to steady state, 1.0% to 15.4% (mean of 5.4%) of the administered dose is excreted as unchanged dutasteride in the faeces. The remainder is excreted in the faeces as 4 major metabolites comprising 39%, 21%, 7%, and 7% each of drug-related material and 6 minor metabolites (less than 5% each). Only trace amounts of unchanged dutasteride (less than 0.1% of the dose) are detected in human urine.

The elimination of dutasteride is dose dependent and the process appears to be described by two elimination pathways in parallel, one that is saturable at clinically relevant concentrations and one that is non-saturable.

At low serum concentrations (less than 3ng/mL), dutasteride is cleared rapidly by both the concentration dependent and concentration independent elimination pathways. Single doses of 5 mg or less showed evidence of rapid clearance and a short half-life of 3 - 9 days.

At therapeutic concentrations, following repeat dosing of 0.5 mg/day, the slower, linear elimination pathway is dominating and the half-life is approximately 3 - 5 weeks (ABRAMOVITZ, 2016).

- **Elimination** - Dutasteride is extensively metabolised in humans. Dutasteride and its metabolites were excreted mainly in faeces.
- **Half life** - 5 weeks (DRUGBANK, 2013a).

Pharmacodynamics

The onset is rapid, with a peak within 2 - 3 hours. Its mechanism of action inhibits types I and II 5- α -reductase, interfering with the conversion of testosterone to 5- α -dihydrotestosterone. It is excreted in the faeces 45% (5% unchanged), urine < 1%, and with a half-life of about 5 weeks (ABRAMOVITZ, 2016).

Dosage

- 0.5mg/day (BNF, 2016).

Route

Orally (BNF, 2016).

Contraindications

Should not be taken by women, children or adolescents (BNF, 2016). Avodart is contraindicated in patients with hypersensitivity to dutasteride, other 5- α -reductase inhibitors, or any of the excipients. Avodart is also contraindicated in patients with severe *hepatic*⁹⁹ impairment (EMC, 2016).

Side-effects

Common

⁹⁸steady state serum concentrations

⁹⁹relating to the liver

- inability to get an erection (PATIENT.INFO, 2015),
- dizziness (WEBMD, 2016b).

Infrequent

- reduced desire to have sex (WEBMD, 2016b).

Rare

- breast tenderness,
- decreased amount of semen upon ejaculation,
- depression,
- hives¹⁰⁰,
- itching,
- swelling of the testicles (WEBMD, 2016b).

Interactions

Drug-drug

- **Atazanavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Atazanavir.
- **Boceprevir** - The serum concentration of Dutasteride can be ↑ when it is combined with Boceprevir.
- **Ceritinib** - The serum concentration of Dutasteride can be ↑ when it is combined with Ceritinib.
- **Clarithromycin** - The serum concentration of Dutasteride can be ↑ when it is combined with Clarithromycin.
- **Cobicistat** - The serum concentration of Dutasteride can be ↑ when it is combined with Cobicistat.
- **Darunavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Darunavir.
- **Idelalisib** - The serum concentration of Dutasteride can be ↑ when it is combined with Idelalisib.
- **Indinavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Indinavir.
- **Itraconazole** - The serum concentration of Dutasteride can be ↑ when it is combined with Itraconazole.
- **Ketoconazole** - The serum concentration of Dutasteride can be ↑ when it is combined with Ketoconazole.
- **Nefazodone** - The serum concentration of Dutasteride can be ↑ when it is combined with Nefazodone.
- **Nelfinavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Nelfinavir.
- **Posaconazole** - The serum concentration of Dutasteride can be ↑ when it is combined with Posaconazole.
- **Ritonavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Ritonavir.
- **Saquinavir** - The serum concentration of Dutasteride can be ↑ when it is combined with Saquinavir.
- **Telaprevir** - The serum concentration of Dutasteride can be ↑ when it is combined with Telaprevir.
- **Telithromycin** - The serum concentration of Dutasteride can be ↑ when it is combined with Telithromycin.
- **Voriconazole** - The serum concentration of Dutasteride can be ↑ when it is combined with Voriconazole (DRUGBANK, 2013a).

¹⁰⁰an allergic skin reaction causing localised redness, swelling, and itching

Effects on Lab Test Results

May lower prostate-specific antigen [PSA](#)¹⁰¹ level ([ABRAMOVITZ, 2016](#)).

Overdose

In volunteer studies of Avodart, single daily doses of dutasteride up to 40 mg/day (80 times the therapeutic dose) have been administered for 7 days without significant safety concerns. In clinical studies, doses of 5mg daily have been administered to subjects for 6 months with no additional adverse effects to those seen at therapeutic doses of 0.5 mg. There is no specific antidote for Avodart, therefore, in suspected overdosage symptomatic and supportive treatment should be given as appropriate ([EMC, 2016](#)).

Note

Women of childbearing potential should avoid handling crushed, broken or leaking capsules of dutasteride, as it can be absorbed through the skin ([BNF, 2016](#)), dutasteride may inhibit development of the exterior genitalia of a male foetus; therefore, pregnant women should not come into contact with the drug as it can be absorbed through the skin ([UNKNOWN, 2015](#)). If contact is made then the affected area should be washed immediately with soap and water ([EMC, 2016](#)).

Do not donate blood until 6 months after discontinuation of this drug ([INSTITUTE, 2014](#)), to prevent possible blood administration to a pregnant female ([ABRAMOVITZ, 2016](#)).

Alert

This drug is considered a *teratogen*¹⁰². Follow safe-handling procedures when preparing, administering, or dispensing drug ([ABRAMOVITZ, 2016](#)).

Finasteride

An orally active testosterone 5- α -reductase inhibitor. It is used as a surgical alternative for treatment of [BPH](#) ([DRUGBANK, 2013b](#)).

This drug is taken in pill form on a daily basis and appears to be effective in preventing further hair loss in most cases and growing new hair in a significant minority of cases. Finasteride works by reducing the body's production of dihydrotestosterone, a powerful variant of testosterone that helps cause male pattern baldness ([BRITANNICA, 2016a](#)).

Also known as

Propecia, Finasterid in Germany, Finast ride in France, Finasterida in Spain.

Contains

Propecia - Finasteride 1mg in a film-coated tablet. Tan octagonal, film-coated, convex tablets, marked with a 'P' logo on one side and 'PROPECIA' on the other ([EMC, 2016](#)).

¹⁰¹prostate specific antigen which is a marker for prostate cancer. The higher the PSA level the greater the chance you have prostate cancer

¹⁰²Any substance that causes birth defects

Pharmacology

A specific inhibitor of the enzyme 5- α -reductase that metabolises testosterone into the more potent androgen, dihydrotestosterone (BNF, 2016).

Indications

Benign prostatic enlargement, male-pattern baldness in men (BNF, 2016).

How it works

The mechanism of action of Finasteride is based on its preferential inhibition of Type II 5- α -reductase through the formation of a stable complex with the enzyme. Inhibition of Type II 5- α -reductase blocks the peripheral conversion of testosterone to DHT, resulting in significant decreases in serum and tissue DHT concentrations, minimal to moderate increase in serum testosterone concentrations, and substantial increases in prostatic testosterone concentrations. As DHT appears to be the principal androgen responsible for stimulation of prostatic growth, a decrease in DHT concentrations will result in a decrease in prostatic volume (approximately 20% - 30% after 6 - 24 months of continued therapy). In men with androgenic alopecia, the mechanism of action has not been fully determined, but finasteride has shown to decrease scalp DHT concentration to the levels found in hairy scalp, reduce serum DHT, increase hair regrowth, and slow hair loss (DRUGBANK, 2013b).

Pharmacodynamics

Finasteride is a synthetic 4-azasteroid compound. This drug is a competitive and specific inhibitor of Type II 5- α -reductase, an intracellular enzyme that converts the androgen testosterone into 5-dihydrotestosterone (DHT). Two distinct isozymes are found in mice, rats, monkeys, and humans - Type I and II. Each of these isozymes is differentially expressed in tissues and developmental stages. In humans, Type I 5- α -reductase is predominant in the sebaceous glands of most regions of skin, including scalp, and liver. Type I 5- α -reductase is responsible for approximately one-third of circulating DHT. The Type II 5- α -reductase isozyme is primarily found in prostate, seminal vesicles, epididymides, and hair follicles as well as liver, and is responsible for two-thirds of circulating DHT. Although finasteride is 100-fold more selective for type II 5- α -reductase than for the type I isoenzyme, chronic treatment with this drug may have some effect on type I 5- α -reductase (DRUGBANK, 2013b).

Pharmacokinetics

Finasteride is variably absorbed following oral administration, with a mean bioavailability of about 63% (RxLIST, 2014), peak plasma concentrations are achieved 1 - 2 hours after taking an oral dose. It is metabolised in the liver, and excreted in the urine and faeces as its metabolites. The mean half-life is 6 hours in patients less than 60 years, but may be prolonged to about 8 hours in patients older than 70 years (TRANSGENDERCARE, 2015b), and in some patients up to about 15 hours (RxLIST, 2014). 39% excreted in the urine, and 57% excreted in the faeces (RxLIST, 2014), and it is also excreted in the semen (BNF, 2016).

- **Elimination** - Following an oral dose of ^{14}C -finasteride in man ($n = 6$), a mean of 39% (range, 32% - 46%) of the dose was excreted in the urine in the form of metabolites; 57% (range, 51% - 64%) was excreted in the faeces. Urinary excretion of metabolites was decreased in patients with renal impairment. This decrease was associated with an increase in faecal excretion of metabolites,
- **Half life** - 4.5 hours (range 3.3 - 13.4 hours),
- **Clearance** - 165 mL/min (healthy young subjects) (DRUGBANK, 2013b).

Typical dosage

1 mg/day (MEDICINENET, 2014).

Contraindications

Hypersensitivity to any component of this product; women who are or may potentially be pregnant; children (EMC, 2016).

Side-effects

Common

- inability to have an erection (WEBMD, 2016c).

Infrequent

- abnormally low blood pressure,
- altered interest in having sexual intercourse,
- breast tenderness,
- decreased amount of semen upon ejaculation,
- fluid retention in the legs, feet, arms or hands (WEBMD, 2016c).

Rare

- hives,
- itching,
- depression,
- low sperm count,
- orgasm problems,
- problem with ejaculation,
- testicular pain (WEBMD, 2016c),
- increased risk of high-grade prostate cancer, and
- increased risk for male breast cancer (MEDICINENET, 2014).

Interactions

- Carbamazepine, rifampin, St. John's wort - May ↓ finasteride level. Avoid use together (ABRAMOVITZ, 2016).
- Itraconazole, erythromycin and similar drugs ↑ blood levels of finasteride (ABRAMOVITZ, 2016).

Notes

Warn woman who is or may become pregnant not to handle crushed tablets because of risk of adverse effects on male foetus. Finasteride may produce genital abnormalities in the male foetus, and therefore crushed or broken tablets should not be handled by females who are or may become pregnant (ABRAMOVITZ, 2016).

Inform patient that signs of improvement may require at least 3 months of daily use when drug is used to treat hair loss.

Instruct patient to report breast changes, such as lumps, pain, or nipple discharge (ABRAMOVITZ, 2016).

Minoxidil

Minoxidil is a drug that is used for treating male-pattern baldness and hair loss in women. The mechanism of action leading to growth of hair is unknown (MEDICINENET, 2016b).

One drug, minoxidil, when applied to thinning areas of the scalp on a daily basis, is thought to be effective in preventing further hair loss in many cases and in growing new hair in a much smaller proportion of cases. The mechanism of minoxidil's action remains unknown but is apparently related to the drug's ability to dilate blood vessels, thereby affecting the blood supply (and the supply of circulating male *hormones*) to those areas of the scalp that are losing hair (BRITANNICA, 2016a).

Also known as

Regaine, Rogaine, Rogaine in the USA.

Pharmacokinetics

On average 1.4% of the total applied dose of Minoxidil is absorbed from intact skin (EMC, 2016). Only about 1.4% - 1.7% absorbed (BNF, 2016). Following cessation of topical dosing of Regaine Regular Strength, approximately 95% of the systemically absorbed drug is eliminated within 4 days. Minoxidil and its metabolites are excreted principally in the urine (EMC, 2016).

Typical dosage

Apply 1ml twice daily to dry hair and scalp (BNF, 2016).

Contraindications

Hypersensitivity (ABRAMOVITZ, 2016).

Side-effects

Common

- {contact *dermatitis*},
- dryness of the scalp or
- flaking,
- irritation of the skin,
- itching (MEDICINENET, 2016b).

Infrequent

- hives,
- rash,
- skin inflammation due to a topically applied medication,
- dry skin,
- redness of skin (WEBMD, 2016f).

Rare

- oedema,
- widening of blood vessels (WEBMD, 2016f).

Interactions/incompatibilities

Minoxidil should not be used with other topical medications because they may increase its absorption and side-effects ([MEDICINENET, 2016b](#)).

How it works

Minoxidil is thought to promote the survival of human dermal papillary cells (DPCs) or hair cells by activating both extracellular signal-regulated kinase (ERK) and Akt and by preventing cell death by increasing the ratio of BCL-2/Bax. Minoxidil may stimulate the growth of human hairs by prolonging anagen through these proliferative and anti-apoptotic effects on DPCs. Minoxidil, when used as a vasodilator, acts by opening adenosine triphosphate-sensitive potassium channels in vascular smooth muscle cells. This vasodilation may also improve the viability of hair cells or hair follicles ([DRUGBANK, 2013c](#)).

Warning

Avoid contact with eyes, mouth and mucous membranes (i.e. nasal passages), broken, infected or inflamed skin. Avoid inhalation of spray mist and use with topical drugs known to enhance absorption (i.e. [EMLA cream](#)). Flammable, wash hands after use ([BNF, 2016](#)).

Eat right

Eat plenty of fruits, vegetables, meats, and fish. Diet may seem unrelated to your hair, but it makes a huge difference. Diet also has the added benefit of improving your body at the same time.

Since hair is made of protein, make sure you're getting plenty of protein in your diet. People who suffer from anorexia nervosa or those who undergo extreme weight-loss programmes will experience stunted hair growth.

Some proteins to consider incorporating into your diets -

Lean meats such as chicken and turkey, fish, eggs, soy products, beans, and nuts.

These foods will help promote healthy keratin production, which are the building blocks of hair.

Eat the right kinds of fat. Certain fats are essential to both a healthy lifestyle and healthy hair production. Fats in moderation help maintain healthy hair and skin production.

Fats will help you process the vitamins and minerals in your diet that are necessary for healthy hair production, including Vitamins A, D, E, and K.

Eat the right kinds of fats. Saturated fats, trans fatty acids, and hydrogenated fats are examples of fats that you should avoid. Omega 3 fats, found in marine and plant oils, are good for healthy hair.

For this reason, B-complex tablets containing fish oils are helpful in speeding up the growth of hair follicles.

Make sure you're getting enough iron and zinc. Iron and zinc, along with other vitamins, are essential in creating great, healthy hair. Iron is responsible for delivering oxygen to your cells, from the blood in your toes all the way up to your hair follicles. (That's why blood smells like iron). Lean animal meats are great ways to get iron, but if you're vegetarian, consider eating beans, lentils, and soy products such as edamame or tofu.

Zinc assists in the repair of your tissues, making sure that the oil glands around your follicles are working in the proper way. Get your zinc by eating oysters, low-fat roast beef, toasted wheat germ, roasted pumpkin and squash seeds, dark chocolate, and cocoa powder.

Get enough vitamin C. Vitamin C deficiencies can cause hair that is weak, lustreless, and prone to breakage.

Your body uses vitamin C to build collagen, which is crucial in developing hair growth. Vitamin C also assists in breaking down iron, another building block of hair, so maintaining good levels of vitamin C is necessary to absorb iron.

The body cannot make vitamin C on its own. It's therefore crucial that you eat and drink foods that have high concentrations of vitamin C. Cantaloupe, citrus fruits, broccoli, bell peppers, and spinach are all fantastic and great-tasting foods that are packed with vitamin C.

Adults need 40mg of vitamin C a day, and it cannot be stored in the body, so you need it in your diet every day (NHS, 2014).

Taking large amounts (more than 1,000mg per day) of vitamin C can cause -

- stomach pain,
- diarrhoea,
- flatulence (NHS, 2014).

These symptoms should disappear once you stop taking vitamin C supplements (NHS, 2014).

Fruits for Hair Growth

Diet plays a very important part in promoting hair growth. It is extremely important to nourish and nurture those tresses both from within and without. Therefore, a well balanced diet rich in vitamin B12, iron, zinc and calcium are essential to prevent hair loss. Since hairs contains protein known as keratin, a high protein diet consisting of fish, lentils, cheese, nuts and eggs apart from promoting hair growth improves general health. Combined with a sugar-free, low starch, fat-free diet, inclusive of fresh green and yellow fruits and vegetables promote healthy gorgeous looking hair (UNKNOWN, 2016).

Vitamin Supplements for Hair Growth

Besides consuming a well-balanced diet, vitamin supplements enable rapid hair growth by strengthening the follicles. Biotin, Vitamins A, D, E, K, C and B6, silica, magnesium, zinc, sulphur, beta-carotene and folic acid are the essential vitamins required for attaining those tresses. However, it would be wise to use the supplements in moderation, as over-use may cause adverse effects (UNKNOWN, 2016).

Drink Plenty of Water

Hair is made up of 95% protein and 5% water and to help keep the tresses shimmering, conditioned and moisturised you need to be drinking eight to ten glasses of water everyday. This helps flush the body of unwanted toxins that are detrimental for health. Hence, adjusting the volumes of water in the body is indispensable to promote shiny, silky and fuller looking hair (UNKNOWN, 2016).

Exercise Regimen

For rapid hair growth and gorgeous locks, meditation, yoga or regular exercise for half an hour, boost circulatory health, permitting the nutrients to penetrate the scalp, resulting in dense growth (UNKNOWN, 2016).

Sleep Patterns

Another important factor for encouraging hair growth is not to miss out on the seven to eight hours beauty sleep (UNKNOWN, 2016).

Encouraging hair growth

Regular trims for faster hair growth

Trim hair for faster hair growth. The key for encouraging hair growth is to snip off the split ends. The hair ends up being weak and damaged due to split ends. Therefore, getting a regular trim of 1/4 inch, every three months stimulates the hair growth (UNKNOWN, 2016).

Washing routine

To maintain healthy hair, it is important to wash hair two or three a week with a quality shampoo. Nonetheless frequent shampooing does more harm than good. Hence, hair rinsing with water and conditioning hair ends may prove beneficial (UNKNOWN, 2016).

Hair products for faster hair growth

Choose products containing natural ingredients which will make your hair grow faster with a natural sheen (UNKNOWN, 2016).

Oil Massage for Hair Growth

Massage the scalp gently with oil, as this stimulates the supply of blood to the roots providing sufficient nutrition and encouraging hair growth. Besides stimulating the follicles, regular massage helps strengthen hair (UNKNOWN, 2016).

Hair Protection

Dressing up the hair regularly in up-swept styles such as buns, up-dos and rolls with the hair ends neatly tucked away without being exposed to air, stimulates hair growth. Also wearing a silk or satin scarf at bedtime will keep the hair protected from becoming entangled, limp, dry and kinky (UNKNOWN, 2016).

Hair care

Unlike most girls we don't have a long history of caring for our hair, be it long or short. I once asked a colleague that I was working with how long it took to grow her beautiful, waist-length hair, and she replied with some surprise at my question 'All my life!' So I've found out some tips on hair care so you don't drop yourself in it as I did! :)

Reduce Styling Damage

Excessive styling can hurt your hair, it probably looks fantastic on you, but it's not the best for your hair. Certain chemical applications and cleansers may cause thinning, damage or even hair

loss if improperly used. Styling your hair in certain manners may make hair loss even worse. It's okay to style your hair in isolation, but repeated styling can exacerbate damage to hair.

Try not to repeatedly perm, crimp, chemically or mechanically straighten, curl, bleach or colour hair. These processes can cause serious damage to your hair, altering the natural makeup of each strand. Excessive heat, in either blow-drier or flat-iron form, can singe the hair, so try to manually dry your hair whenever possible (UNKNOWN, 2014b).

Brush and comb sparingly

There used to be a myth that brushing your hair 100 times a day would promote hair growth. Not only is this false, brushing your hair to excess can actually pull hairs out of the scalp.

Comb your hair when it's dry, not wet. Your hair is especially vulnerable when it's wet, so it's best to wait until it's on the drier side before you take a wide-toothed comb to go through your lovely locks.

Try not to detangle or pull at your hair without the aid of a leave-in conditioner or detangling spray.

Don't use rubber bands to style or pin the hair back

If you need to pull your hair back and pin it up, use a hair tie. The hair tie won't cause the hair to get stuck on its surface as much and lodge it from its roots.

Avoid using styles that put unnecessary stress on hair. Cornrows and tight ponytails, for example, pin the hair back, putting stress on the follicle. Instead, try to opt for a hairstyle that minimizes the stress on your follicles, so they can promote healthy growth (UNKNOWN, 2014b).

Clean your hair carefully

Use the right products when cleaning your hair. Depending on how oily your hair is, shampoo and condition your hair only about 3 - 4 times per week. You don't need to shampoo and condition every day, as this will suck out the natural oils present in your hair.

Those with curly, coarse, or dry hair may want to wash their hair only 2 - 3 times weekly, as natural oils are key for strong and healthy hair. People who have oily skin probably want to wash their hair more than the 3 - 4 per week average, as a buildup of oil can be harmful to growth.

Choose products that contain ingredients that are healthy for hair. Ingredients like avocado, coconut, jojoba, and olive are all beneficial when used in moderation. They help retain moisture and oils while minimizing split ends and other hair damage (UNKNOWN, 2014b).

Plan how often you get your hair cut

Cutting hair does not make hair grow faster from the roots. This is a myth. It does, however, stop loss of length from the tips, as it prevents breakages from split ends.

How often you should cut your hair depends on how healthy it is and how fast you want it to grow; it is totally up to your own judgement.

Normal hair grows anywhere from $\frac{1}{2}$ inch to $\frac{5}{8}$ inch per month. Most stylists recommend getting a hair cut every 6 - 10 weeks, meaning that if you cut off $\frac{1}{4}$ to $\frac{1}{2}$ inch, your hair should still grow longer (UNKNOWN, 2014b).

How Exercise and Stress Affect Hair Growth

Maintaining a healthy lifestyle will promote hair growth. Your body acts like a finely-tuned machine, and certain things, like sleep, can help regenerate cells and promote overall health.

Severe cases of stress, suffered after the death of a loved one, for example, or extreme emotional isolation, can cause the body to go into a kind of survival mode in which it only produces things vital to bodily survival. During these times, hair production may stop.

On the other hand, when your body has enough nutrients and energy stored up so that it doesn't need to focus on simply keeping you alive, it can devote resources to build up and protect your hair. Maintain a good diet and healthy lifestyle maximise your body's daily resources (UNKNOWN, 2014b).

Clear physical stressors from your life

Surgeries, severe injuries, and other trauma can cause stunted hair growth or even hair loss. In these cases there may be a three month delay in the production of hair growth while the body focuses on repairing other cells and injuries.

Identify stressors and let your body heal them. If you have just gone through intense physical trauma, give your body time to heal itself before expecting to see hair growth. Once your body is healed, you should begin to see hair growth again.

Anaemia, low blood count and thyroid abnormalities also may be acting as physical stressors while directly contributing to halted hair growth. They can easily be detected with an inexpensive blood test. Talk to your doctor if you believe you might be suffering from any of them (UNKNOWN, 2014b).

Clear emotional stress from your life

Learn how to manage the normal stress that your body produces as a result of daily activities and unexpected occurrences. In large quantities, stress can halt hair production, though it will not contribute to baldness in either males or females.

Exercise is a great way to release pent-up stress. Jogging, swimming, lifting light weights, or even walking is part of a healthy lifestyle. It will help your body process foods and vitamins, sleep better, and reduce large amounts of stress (UNKNOWN, 2014b).

Health Concerns That Could Affect Hair Growth

Make sure that any health concerns you may have aren't contributing to stunted growth. In both men and women, a host of medical issues can cause the slowing down of hair production. Addressing these medical issues, in some cases, causes hair production to return to normal. Talk with your doctor if you have any diagnosed medical conditions, as these may contribute to hair loss or stunted hair growth. As mentioned above, low blood count and thyroid conditions, in addition to *hormone* imbalances, may contribute to decreased hair growth.

Ask your doctor whether any medications you are taking could be factors in hair loss or diminished hair production. Acne medication, birth control, *steroids*, anticlotting drugs, and antidepressants have all been linked to hair loss in both males and females.

Talk with your doctor before beginning any *OTC* hair growth products, as they may interfere with other medication you are taking. Consult your *GP* before beginning a strenuous diet. Improper nutrition is a factor in decreased hair growth (UNKNOWN, 2014b).

Check for scalp infections

Scalp infections, caused by ringworm or *folliculitis*, can damage the scalp area, preventing follicles from growing in a healthy manner.

If you think you may have a scalp infection (and not simply dandruff), talk with your *GP* about topical and *anti-fungal* medications that you can use to cure your scalp infection before discussing hair growth treatments. Much of the time, once the scalp infection is cured, normal hair growth continues (UNKNOWN, 2014b).

Home Remedies

Promote hair growth with natural home remedies, be careful, however, when applying home remedies, as they may damage your hair instead of stimulating growth.

A mix of aloe vera and honey. Mix the flesh of three leaves of aloe vera with honey and apply it over the scalp. Wait 20 minutes and wash hair out as usual.

An energy-packed breakfast. Mix together a spoonful of soya lecithin, a spoonful of wheatgerm, a spoonful of honey, a spoonful of brewer's yeast, and a yogurt. Try this homemade recipe every day for breakfast.

Tomatoes, olive oil and aloe vera. Blend a tomato with a tablespoon of olive oil. Heat until warm and apply the mixture to the scalp, letting stand as long as possible. This mixture can be enhanced by adding aloe vera.

Rosemary water. Wash your hair every day with rosemary water. You can buy rosemary shampoo or make rosemary water on own (UNKNOWN, 2014b).

Promote hair growth with store-bought remedies

Certain store-bought remedies, while not proven to stimulate hair growth, may work in some instances.

Biotin may work. Biotin is a water-soluble B vitamin. It's supposed to increase hair and nail growth, also helping with acne, slow-healing skin and stronger hair. Check the package label for suggested dosage.

MSM may also work. MSM stands for methylsulfonylmethane. It's a naturally-occurring sulphate found in some plant species, and is reputed to help build collagen and repair tissue. For hair, it's supposed to slow shed, speed growth, and increase shine and thickness (UNKNOWN, 2014b).

Brush your hair every day

Want your hair to grow faster? Then become a friend of the comb and brush every day. A very simple trick, it really does not cost anything to have healthy and beautiful hair, combing and brushing at least 3 times a day, with one time before going to bed to sleep. This stimulates the blood circulation in the scalp, allowing the hair to grow longer and healthier (UNKNOWN, 2014a).

Rinse with cold water

Record it in your memory - rinse your hair with cold water or moderately, at best, lukewarm. This is not to tell you that you should bathe with cold water; it is simply the last rinse. Hot water may "hurt" our scalp, making the hair look dry and dull. Cold water, however, seals the

hair cuticle which makes the much brighter, silky hairs that reflect light better. What's more, it accelerates hair growth (UNKNOWN, 2014a).

Use conditioner first

Another trick to give shine to the hair? Reverse the order in which you wash it - first rinse it, then shampoo and conditioner. This allows the hair to get more hydration and allows for better hair cuticles. The result? Hair has more shine and softness. If in the final rinse of your hair you put a few drops of lemon, you will get an even more noticeable shine (UNKNOWN, 2014a).

Do not abuse the dryer or curling tongs

The constant exposure to heat in the hair leads to a dry scalp, which in the short or long term makes the hair look dull and lifeless. So it is important not to become addicted to the dryer; ideally dry your hair in cold or warm air and in small sections for a short time, i.e. not pointing the hair dryer without moving.

The same goes for curling tongs - do not use them every day and try to allow them not to be too hot as you apply them, they literally burn the hair strands. Ideally apply a protective serum or hair cream before exposing it to the heat of the curlers (UNKNOWN, 2014a).

How often should I wash it?

'A healthy scalp and beautiful hair are linked, and nothing cleans hair and scalp like a wet shampoo'. Shampooing exfoliates your scalp, which keeps your hair follicles in tip-top shape. 'I'm often asked how often one should shampoo and the answer is different for everyone' Dr. Fusco says. 'But I recommend at least once a week for most and twice a week for those with dandruff' (DEL RUSSO, 2015).

Wash your hair two to three times a week, max

How often should you wash your hair? It's the perennial question of the hair industry and most experts seem to agree that cutting back is a good thing - and washing every day is a mistake, no matter how much you might crave clean-feeling locks.

"Your hair's natural oils are designed to condition and protect your tresses, so when you shampoo daily, it strips these vital oils away" explains New York-based hair stylist Dan Sharp, whose clients include Kate Winslet, Hilary Swank and Charlize Theron.

"It creates a vicious cycle of over-production of oils and a need to shampoo very often. Ideally, to keep your hair healthy, you only need to wash two to three times a week, max" (STYLIST, 2014).

Don't overwash coloured hair

This is especially true for coloured hair, which can lose its sheen quickly with too much washing.

"The biggest mistake people make is over-washing coloured hair" says colourist Tracey Cunningham, the woman behind Gwyneth Paltrow's icy blonde hue.

"Buy a good-quality shampoo - Pureology ones are great - and wash it every few days using styling products in between to keep it looking fresh".

"I shampoo just once or twice a week" agrees Naomi Watts' hair stylist Marie Robinson. "Don't shampoo daily. Simply rinse and condition the hair every other day as shampoo can wash out the colour" (STYLIST, 2014).

Take into account your hair type and lifestyle choices

Of course, how often you need to wash your locks also depends on the type of hair you have.

"Your hairdresser can advise how often you should be washing - it depends on how active your scalp is in producing oil" says Tom Gallagher, creative director at the award-winning Oribe Hair Care.

"The curlier your hair is, the longer you can go between washes" explains dermatologist Dr. Doris Day. *"The straighter it is, the faster the oil wicks down, so that can make it oilier faster. If you have superstraight hair, you may not be able to go more than two days without washing"*.

And lifestyle choices like going to the gym may also affect how often you shampoo your tresses. But even here, there are ways of cutting back - you could try simply rinsing your hair rather than adding in shampoo.

"You may not be able to imagine not washing your hair after a workout (we totally get that), but you can always rinse out sweat without shampooing" says hair stylist Kerrie Urban. *"A water-only rinse will remove salt and sweat without stripping hair oils"* (STYLIST, 2014).

Invest in some good dry shampoo

And finally if you're aiming to scale back the amount of times you wash your hair per week, remember dry shampoo is your friend.

"Use dry shampoo instead of washing your hair every day. It will help reduce the oil build up in your hair and gives amazing texture" says stylist Mark Townsend, who tends to Reese Witherspoon's hair. *"You can also leave dry shampoo in (instead of brushing it out) to give volume"*.

"As opposed to washing your hair every day, dry shampoo will help to refresh your hair at the roots and the tips whilst helping you to retain all the essential moisture your hair needs" agrees hair visionary Luke Hersheson of the Hershesons empire (STYLIST, 2014).

Avoid hot showers and shampoo your scalp, not your ends

Come shampoo time, many of us reach for a large dollop of the good stuff to scrunch into our hair; but there's a technique to good hair washing and overdoing things on the product front will do more harm than good.

"Healthy, beautiful, shiny hair starts in the shower so make sure to use the right shampoo and conditioner for your hair type and level of damage" says Mark Townsend.

"The volume of shampoo you should use depends on the length and thickness of your hair, but a blob the size of a 20p coin is a good start" says Michael Lendon, advanced creative director at Aveda. *"Longer hair needs a 50p-size dollop"* (STYLIST, 2014).

Aim for the scalp not the ends

It's not just how much shampoo you use, but where you apply it that counts.

"Use shampoo on the scalp only - not on the ends of your hair. The shampoo will rinse down in the shower, but you don't want to scrub the ends" says Kerrie Urban (STYLIST, 2014).

Massage your scalp to encourage circulation

"Giving your head an invigorating massage as you shampoo is a good way to encourage blood circulation and helps to detoxify the scalp" notes Aveda's Michael Lendon.

Oribe's Tom Gallagher agrees - *"Having strong, healthy hair is the best way to make any hair look expensive. A lot of it is about properly shampooing and conditioning and taking care of your scalp - massage it well while washing to get circulation going"* (STYLIST, 2014).

Avoid hot water

"Cool off in the shower" says Brian Phillips, founder of Canada's World Salon. *"Blasting your scalp with extremely hot water will dry out your hair and create tangles that could result in breakage"* (STYLIST, 2014).

Towel-dry your hair before applying conditioner

What conditioner you use and how you use it is, if anything, more important than the shampoo stage. Make sure you invest in a few good quality conditioners and leave-in treatments or hair masks, especially if you have coloured hair.

"Invest in your colour at home" says stylist Tracey Cunningham. *"Gwyneth's hair is in such good condition because she regularly uses at-home treatments. People are cheap with what they use on hair but don't treat their cashmere jumper that way"*.

Good conditioner is also crucial when it comes to thick, curly hair.

"For curly, highly textured hair; always deep condition" says celebrity hair stylist Ted Gibson, who tends to Lupita Nyong'o's hair. *"No two minute conditioners here. Deep conditioning involves a conditioner that will add moisture and strength (protein) back to hair. You should use heat by either applying conditioner to hair while taking a shower and let it sit while showering or by covering the hair with a plastic cap and applying heat from an outside like a hair dryer"*.

"I believe it's important to use leave-in conditioners and also not to shampoo it so often. Rinse it if you want to but don't necessarily shampoo it" (STYLIST, 2014).

Gently towel-dry the hair before applying conditioner

"Make sure you towel-dry hair after shampooing and before you apply conditioner - excess water in your hair means the conditioner won't be able to penetrate the hair shaft and deliver the necessary moisture to keep hair looking healthy and shiny" advises industry legend Charles Worthington.

If you're short on time, at least squeeze out excess water - *"hair that's saturated with water doesn't have room to absorb anything else"* he says (STYLIST, 2014).

Avoid the roots and concentrate on the ends

"Try not to put the conditioner on the roots, because that can cause your scalp to get greasy faster" says stylist Kerrie Urban.

It's also a good idea to think ahead and anticipate situations where your hair might dry out.

"While you exercise, you perspire, which means that your hair gets damp with sweat that can actually make it dry" says famed LA-based hair styling talent Andy LeCompte. *"Before you hit the gym (especially during the summer; but this works year-round too) wet your hair and add in some conditioner from the mid-lengths to the ends. Rinse out the conditioner post-workout and you'll be left with shiny, hydrated hair"* (STYLIST, 2014).

"Avoiding too much sun helps too" notes colourist Marie Robinson, on the topic of hydrated hair (STYLIST, 2014).

Brush your hair twice a day, from the bottom up

Healthy hair needs regular brushing but don't tear through your locks mindlessly.

"For perfectly shiny, healthy and untangled hair, you need to brush your hair twice a day" says stylist Laura Superbi of iconic French hair salon Jean Louis David. "Once in the morning and once before going to bed, for about a minute each time".

"Don't be rough with your hair - treat it nicely and it will repay you by looking healthy and shiny" cautions Michael Lendon of Aveda (STYLIST, 2014).

Comb wet hair, don't brush it

"When your hair is soaking wet, it is weaker, fragile and more susceptible to breakage" says New-Beauty editor Anna Jimenez. "Try not to rough-dry hair with a towel, and instead gently press the water out. Also, do not brush your hair while it is wet. Use a wide-tooth comb, working from the ends of your hair on up" (STYLIST, 2014).

Brush from the bottom up

"Brushing from the roots causes damage - always brush from the bottom and work up" advises Tracey Cunningham (STYLIST, 2014).

Use different brushes for blow-drying and styling

"At home, you should have a round brush for blow-drying, a Mason Pearson brush for styling and a tail comb to move hair around a little" says celebrated hair stylist and darling of the fashion world, Guido Palau (STYLIST, 2014).

Keep your brushes clean

According to Anna Jimenez *"Filthy hair brushes that are covered in hair, oil and product build-up are breeding grounds for bacteria. Clean them at least once a month with a mixture of baking soda and lukewarm water. A toothbrush will help you to get into all those tiny bristles".*

Laura Superbi is of a similar mind - *"To make sure your hairbrush lasts, look after it. Do this by regularly removing all of the hair that gets stuck in the brush. Clean once a month with warm water and a small amount of shampoo" (STYLIST, 2014).*

Use a low-heat setting for hairdrying and point the nozzle down, not side-on

As a general rule of thumb, one of the worst things you can do for your hair is overheat it with excessive blow drying. If you want to avoid dry and damaged locks, you need to either rein in how often you use a hairdryer or pay attention to how you're using it and take care to apply heat protection products beforehand (STYLIST, 2014).

Cut back on heat-styling tools

"Don't use heat-styling tools daily. Flat irons, curling irons and even blow drying can damage the hair shaft. Damaged hair is not able to retain colour the way that healthy hair can" says colourist Marie Robinson.

"I almost never blow-dry my hair or use hot tools" she adds. "I usually apply Oribe Dry Texturizing Spray, go to bed with damp hair, and wake up with waves".

You can also bypass hot tools by multitasking your hair style, as celebrity stylist Dan Sharp explains "styling doesn't always have to involve a hot tool. If you give yourself a fierce blowout on Monday, rock it out on Tuesday and on Wed do a fab high ponytail. Making your style last a few days will /really help prevent damage" (STYLIST, 2014).

Use protective treatments

Hair guru Nicky Clarke recommends "always using protective styling products before blow-drying".

"Add a pea-size amount of Nicky Clarke Instant Calmer from the mid-levels to the ends of your hair to seal in moisture and smooth the cuticles down before you head out into the cold" he says.

"Do use leave-in treatments to blow dry your hair, it will protect and moisturise your hair every day" says Alex Brownsell of hip UK hair label Bleach.

"Always use a heat-protector spray, such as Aveda's Brilliant Damage Control spray (£16 RRP)" adds Michael Lendon of Aveda (STYLIST, 2014).

Wait before blow-drying your hair and use lower heat settings

"Try not to blow-dry your hair immediately after shampooing" says Anna Jimenez. "Ideally, you should allow your hair to first dry for 15 minutes under a towel turban. This saves effort and also cuts down on the hair exposure to the blow-dryer".

"If at all possible, don't use the high heat settings of your blow-dryer. The air stream should feel comfortable on the back of your hand" (STYLIST, 2014).

Keep the dryer at a distance your hair

"You should always be careful with heat, but this is especially true if your hair is thinning. Keep the hairdryer nozzle two inches away from your hair" says Michael Lendon.

"The nozzle should be pointed straight down, about three inches away from the hair, which, admittedly, isn't easy to do yourself" explains Julia Robert's hair stylist Serge Normant. "Most people come at their heads from the side, which makes hair frizzy and staticky by pushing it all over the place" (STYLIST, 2014).

Move your hair around

You need a bit of movement for the ideal blow-dry, as hair care expert Harry Josh explains -

"The perfect at-home blow-out - it's not as hard as it sounds. Start by flipping your head upside down, and shake your hair around while you blow-dry - the more you move, the more volume you'll get. Once it's about 80% dry, flip back up and blow-dry hair in sections to smooth, focusing on polished ends. The last three inches are key - move your brush and dryer right down to the very end of the strands and take your time. It will make all the difference".

Schwarzkopf air stylist Armin Morbach notes - "You should keep the blow-dryer moving constantly to avoid applying too much heat in a single spot. We recommend dividing the hair in several portions and securing the strands with large hair clips or grips".

"Work your way up blow-drying your hair from the neckline to the crown of your head so that you don't hit the same strand of hair multiple times".

Nicky Clarke adds *"Whilst blast drying your hair, for more fullness, remove the nozzle and direct the dryer towards the roots whilst lifting hair away. To keep hair flatter, use a nozzle to follow the shape of your head and move your hair around with a comb"* (STYLIST, 2014).

Try castor oil, hair oil and dry shampoo

Every hair stylist has a secret arsenal of favourite products to give your hair that extra dose of va-va-voom. Here, some of the world's leading experts share their star formulas. . .

Stylist Andy LeCompte is a big fan of hair oil - *"Just like applying facial oil can help regulate oil production on your skin, hair oil can do the same for your scalp. There's no need to go crazy with applying oil, but don't be afraid to use oil if you have oily hair. It'll actually help to regulate how oily your scalp is, because your hair won't feel as though it needs to naturally overcompensate for dryness"*.

Guido Palau can't get enough of hairspray -

"Hairspray is to hair what salt and pepper are to food. Once sprayed, you're finished".

"Yes, it can be sticky and overwhelming, but find a medium-hold hairspray to start with and spray it into your hands and then run your hands through your hair to smooth down the frizz".

"You need a bit of hairspray for any updo you are trying to achieve, so just start lightly with the spray".

Celebrity stylist Serge Normant is an advocate of castor oil -

"With a tiny drop of castor oil plus dry shampoo, hair has a two-days-after-shampooing feel. It's also a great, nourishing scalp conditioner, especially for African-American hair, which can be thin and brittle".

"I mostly use it on shoots, though, applying it very sparingly as an all-over pomade to give extra shine under the lights" (STYLIST, 2014).

Do not wash your hair every day

The debate about how often you should wash your hair will continue forever and ever. However, since it is known that super hair, unless you have very oily hair, it is not good shampooing every day; if you have dry hair, wash it every day to decrease the dryness, and if you have greasy hair, it will become more dependent on the wash to make it look clean (UNKNOWN, 2014a).

Remove any knots



Figure 11.1: A bad hair day at its worst!

What are those annoying knots in your hair? A hair full of knots does not look neat and also make it impossible for any hairstyle. A trick to remove hair knots easily? You have to put a little oil - it can be olive oil, jojoba oil or even coconut oil in your hand and dip into it and cover the knots with the oil to completely cover them. Wait 20 minutes and then unravel the knots with your fingers (UNKNOWN, 2014a).

Apply a mask

There are thousands of homemade hair masks that can provide excellent results, with the advantage that we are looking after our hair with natural and economic products. One of my recommended is the mask with honey, egg and olive oil

Mix the egg with some honey. Add the mixture to a bowl with olive oil. After washing your hair with shampoo and rinsing it with water, as you always do, apply the mask. Generously massaging the scalp for several minutes and leaving the mask for half an hour to take effect. Later rinse well with cold water. Apply this remedy once every two weeks, for example, and enjoy a more hydrated, soft and shiny hair (UNKNOWN, 2014a).

Cut the tips from time to time

Short flicks do not make your hair grow faster ... this is a myth! Anyway, we do need to grow healthy hair, and also to make it look nicer and care for it, do you prefer to stay with open and split ends? This is the most easy and obvious trick (UNKNOWN, 2014a).

Taking care of the hair from external agents

Do not abuse the hair dyes, or chemical treatments. Note that they are a foreign agent, they are not natural for the hair and can easily damage it. Make sure the products you use are of good quality. If you want to protect your hair from the chlorine in the swimming pool, use a shower cap, or from sun on the beach use a hat (UNKNOWN, 2014a).

Follow a balanced diet

In conclusion, I include a tip that may have little to do with the beauty treatments we see here but, undoubtedly, is as or more important than them. Girls, to have perfect hair, we must start with the basics - eating a healthy diet. We must eat lots of vegetables, lots of fruits, fish, nuts, dairy products and drink plenty of water.

A healthy diet provides all the nutrients we need to stay healthy, from head to toe. And when we are healthy our body and hair will be so too (UNKNOWN, 2014a).

Healthy hair - do's and don'ts

- choose brushes and combs with widely spaced and smooth tipped bristles and teeth to avoid the risk of splitting hairs and scratching the scalp,
- wash combs and brushes in shampoo or soap at least once a week,
- always rinse your hair thoroughly,
- use a conditioner to smooth the outer surface of the hair, which is roughened by washing,
- apply extra conditioner when using a hairdryer, rollers, or tongs,
- always try a temporary rinse first, before you risk using permanent colour,
- go to a professional hair stylists for permanent dyeing or bleaching,
- don't over brush your hair, for it may increase the greasiness of oily hair and break the ends of dry hair,

- don't tangle the hair while washing it,
- don't give dry hair two applications of shampoo,
- don't rub hair too vigorously when drying, it may break and tangle the hair,
- don't have a permanent bleach if all you really need are "highlights",
- don't apply a permanent colour until you have tested the solution on your skin for 36 hours to check for any adverse reactions (NAYYAR, 2016b).

What to avoid

Tight hairstyles

Tight hairstyles such as cornrows and ponytails have a tendency to irritate and cause stress to the scalp, leading to hair fall. This makes the hair weak and damage the root of the hair follicles, at times indicating permanent hair damage (UNKNOWN, 2016).

Rubber bands

Rubber bands used to secure hair is a big no-no as they end up breaking hair from the roots. The same applies to wearing hair into ponytails as they cause extensive damage to the tresses. Hence, it would be wise to avoid them (UNKNOWN, 2016).

Wet Hair

Avoid combing or brushing wet damp hair as they cause breakage and hurt the scalp (UNKNOWN, 2016).

Harmful Shampoos

Avoid harmful shampoos and conditioners with silicon or ammonium laurel sulphate as they have a tendency to strip the hair of natural oils, making hair limp and lifeless destroying even the most gorgeous tresses. Therefore, deciding on the right products that suit the hair type, containing natural substances is essential (UNKNOWN, 2016).

Chemical Treatments

Using chemical styling products such as hair colours, dyes, bleach and other chemical treatments like rebonding, perms, creating permanent waves make the hair brittle reducing the speed of growth (UNKNOWN, 2016).

Heat Treatments

Heat applied to hair cause extensive damage to the hair cuticles. Therefore avoiding hair dryers and hot curling irons would enhance hair growth preventing breakage and split ends (UNKNOWN, 2016).

Sun Damage

Since heat penetrating into the hair does harm, avoiding exposure of hair to the harsh rays of the sun's UV rays for prolonged periods may result in sunburn on the scalp, split ends, thinning,

weakening of hair making them dry and brittle. Therefore, to avoid exposure wearing a hat and using hair products with sunscreen, provide maximum protection (UNKNOWN, 2016).

Be Gentle

Avoid being hard on the tresses. Use a wide-toothed comb to brush the hair gently holding them close to the roots prevent untangling and knots, which is one of the common factors leading to hair loss (UNKNOWN, 2016).

Avoid bad hair days

Women

Stop the abuse!

Stopping the abuse is our first priority! Put down those super-hot hair dryers, curling tongs and flat irons, and give your hair a break. Excess heat is damaging as it depletes moisture from our hair and scalp and, over time, can strip away our natural protective oils. The result? Hair that's dry, frazzled and prone to breaking.

Give your hair a break from the heat. If possible, attempt to air dry at least once a week to give your hair a break from damaging styling tools. When you do use heat styling tools, use the lower settings on your styling devices and try a heat protection spray to create a barrier between your hair and the heat to help prevent damage. The sooner you stop the abuse, the healthier your hair will start to look (CARTER, 2013a).

Make time for hair care

Some days are so hectic that our hair just doesn't have a chance. And most bad hair days are really our own fault. You may be better off skipping your morning shampoo if you don't have the time to do it right (CARTER, 2013a).

There are a few simple rules to proper shampooing -

- scrub your scalp to remove excess oils and product buildup,
- remove all traces of shampoo and conditioner when you rinse. Most shampoos and conditioners need plenty of water to remove dirt and residue and to release their conditioning ingredients. Hair that hasn't been rinsed thoroughly can be limp, oily and unmanageable,
- just when you think you're done rinsing, rinse some more. And to help seal the hairs cuticle and give you more shine, rinse with cool or lukewarm water, never hot (CARTER, 2013a).

Beware of product overload

The more products you pile on your poor defence-less hair, the greater your chances are of having a really bad hair day. Hair products can weigh our hair down and make it look dull and lifeless. Lighten up on the products and let your hair breathe (CARTER, 2013a).

Quick tips

- look for powerful moisturizing and conditioning ingredients when you choose your shampoo and conditioner,
- go sulphate free! Sulphates are harsh, drying and can strip the colour from your hair,
- just when you think you are done rinsing your hair, keep rinsing and count to ten,

- your hair is weakest when it is wet, so be gentle when combing wet hair and avoid putting it into a ponytail or braid until it is thoroughly dry. This will help prevent damage,
- consider investing in a good hairdryer with ionic technology. It may help your hair dry faster and with less damage. Remember, the louder your blow-dryer is, the lower the quality may be,
- ease up on the products to avoid build-up which could cause lifeless, unmanageable, oily hair (CARTER, 2013a).

Basic hair care

Hair is a reflection of your health and personality. If taken care off it can add to your beauty. Your hair and scalp need proper care now and always. A sign of neglect over a period of time will show up in form of dry brittle hair, split-ends, hair falling out, dandruff etc. From the moment you wake up to the time you go to sleep and even as you sleep, there are many factors that can lead to hair breakage (NAYYAR, 2014).

Diet

A well-balanced diet, rich in silica, calcium and iron, will help reduce or prevent hair loss. Green, leafy vegetables, especially sea vegetables, are good mineral sources. Raw oats provide silica. Eat plenty of iron-rich foods, like liver (avoid if you are pregnant) and other organ meat, whole grain cereals, dark green leafy vegetables, eggs, dates, and raisins. The hair is comprised mostly of protein, therefore to encourage hair growth, adhere to a diet rich in protein. A recommended diet for this purpose includes calves liver, brewer's yeast, wheat germ, and two tablespoons of granulated lecithin. Along with protein, these foods are also high in B vitamins, an important nutrient for hair. Silica is found in the outer coverings of potatoes, green and red peppers and cucumbers. Bean sprouts are also high in silica. Eat whole foods including sprouts. Vitamin C improves the absorption of iron. Include a good serving of fruits and vegetables in your diet. Vitamin E is important for healthy hair growth. Eat avocados, nuts, seeds, and olive oil on a regular basis. If hair loss is due to thyroid dysfunction, eat more foods rich in vitamin A and iodine. Eat vegetables such as carrots or spinach in unrefined, cold-pressed seed oils such as flax, walnut or pumpkin seed and sea salt. Take turnips, cabbage, mustard, soy beans, peanuts, pine nuts and millet if there is a deficiency of iodine (NAYYAR, 2014).

Washing routine

Your hair-type will determine your cleansing routine, some of you may need to shampoo daily, others every other day, others even once a week. The water you use to wash your hair should neither be too hot, or too cold. Use your fingertips, and never your nails, to gently scrub your scalp. Be sure to rinse your hair thoroughly in order to get all of the soap out and then maximise the shine.

If possible, wash your hair leaning over a basin or the bath, so that blood circulation is increased around your scalp and hair roots. Continue this by gently massaging your head with your fingertips while shampooing, begin at the nape of the neck and use the pads of your fingertips, keep your nails well clear and don't use your entire hand. Gently rotate your scalp (not your hair) with circular movements, traveling towards the crown of your head. Do this in a slow gentle fashion for a couple of minutes. Next exert a little more pressure as you move towards your hairline. At the same time use the thumbs to move over your ears towards the temples. Take your time and relax and enjoy your shampooing ritual, you will feel the benefit after you have finished. After shampooing rinse your hair well, then pat your hair dry with a towel as opposed to rubbing it with the towel (NAYYAR, 2014).

Combing

To begin with combing, first separate hair into small sections. Untangle your hair with a wide-tooth comb, carefully work from the ends in a downward direction only. Use only a wooden or tortoise shell comb - never rubber. Do not pull or yank hair. Brush hair only when dry. Hair is weakest when it is wet and brushing can easily damage it. Even when hair is dry always comb before brushing (NAYYAR, 2014).

Drying

Air-dry whenever possible. Try to minimise the use of the blow dryer as the strong heat tends to damage the hair, also the moisture lost makes them look rough and lifeless. Give your hair a break from that blow dryer, those curling irons and so many perms. When you are kind to your hair, it rewards you by looking and feeling better. Choose a hairstyle that will let your hair fall naturally (NAYYAR, 2014).

Environment

Before going out to the beach or pool, comb conditioner through the hair. This helps to protect hair from the sun, chlorine, salt water, and from the sun's heat, and serves as a deep conditioning treatment. Wear a hat, cap or scarf if you can to protect your hair from over-exposure to the sun, salt or chlorinated water, wind and air pollution (NAYYAR, 2014).

Trimming

Get your hair trimmed on a regular basis (approximately every two months). This is especially important for growing out layers and/or bangs to reshape and make each stage of growing hair out a style (NAYYAR, 2014).

Shampoo and conditioning

Choose simple, cheap shampoos that promise only to wash away the dirt and the oil. The more complicated the formula is and the more expensive the shampoo the less it does good in your hair. Conditioners, are an invention of the cosmetic industry and if your hair is dried out and dull looking you have been abusing it. Use a milder shampoo and try washing your hair less frequently. Also, always apply conditioner from the ears down - never condition the scalp. Do not over-condition for it might cause the cuticle layer of hair to lift making hair brittle and leading to breakage. Some of today's new line of shampoos have a special ingredient advertised as a hair thickener as well as a shampoo that will make your hair look thicker. These shampoos actually coat each strand of hair with a layer of protein each time you use it thus making the hair appear thicker. These shampoos are really very good and can have quite a beneficial effect on most women. Always check the label on the back of the shampoo or conditioner to see what it contains before using it. Look out for urea, lactic acid and lecithin (NAYYAR, 2014).

Styling

Your hair style is a reflection of your personality and a wonderful way to express your individuality. All too often conventional styling products contain alcohol or other harsh chemicals. These ingredients are used to keep the hair in place and to give the appearance of shiny healthy hair. In the case of these mass-marketed products the look achieved is only surface deep and they tend to damage the hair. Choose styling products which will make your hair look great, and impart essential botanicals and vitamins to each strand (NAYYAR, 2014).

Sleep Pattern

Comb your hair before going to bed, do not let the bands or clips stay on. Even the way you sleep can affect your hair. Restless sleepers may actually be breaking hair as they sleep. If you're a restless sleeper, try a satin pillowcase so that the hair glides when you move in your sleep. On regular cotton cases hair can get caught and break. Putting hair up to sleep is also helpful. Hair should be put in a ponytail on top of the head. Always use rubber bands that are rapped in cloth (NAYYAR, 2014).

Check for products used

Some of you might have scalp problems such as seborrhea dermatitis, or dandruff, therefore look in your local supermarket or pharmacy and get a product that is designed for these problems and read the directions carefully and this should solve your scalp problems. Before buying a new product try using a sachet and watch its effect on your hair, has it lead to unwanted hair-fall, etc., and once you are sure then only buy it for regular use. You can also consult a dermatologist who will help you in choosing the right kind of product for your hair. Before using a dye, test it by applying it to a small area on the arm. If a patch of inflammation has developed, the dye must not be used on the hair. Bleaching the hair repeatedly with hydrogen peroxide may make them brittle. If this happens the hair may turn rough, develop split ends, or become thinned or shortened.

Patience and proper maintenance is the key, to hair care. It is VERY important to trim split ends as the need arises. Eat a well-balanced diet, work out and supplement your diet with vitamins, which are specifically designed to help balance your hair. Remember that hair is a man-made fibre and is a natural reflection of your health and well being. So if you are unhealthy to your body, your hair will lack the look you desire. Treat your body with care, follow a proper hair care programme and supplement your diet with balancing vitamins and a drop of patience and your hair will look and feel great (NAYYAR, 2014).

Steps to healthy hair

The first step to healthy hair is cleansing. This means choosing the right shampoo and using the right amount of shampoo. Most shampoo formulas are made for "normal to dry hair" or "normal to oily hair". A good way to determine which of these you need is to take a spray bottle with water and lightly mist your hair when it is dry (HAIRFINDER, 2017b).

Shampooing

Does the water absorb immediately, or does it bead up on the surface for a moment before being absorbed? If the water absorbs immediately, you should use a shampoo for "normal to dry hair" because it has more moisturising ingredients. If the water beads up at first, use a shampoo for "normal to oily hair". The spray test is usually performed to determine the hair's porosity, but works here because porous hair (where the water absorbs immediately) tends to be dry, while resistant hair (where the water beads up) tends to accumulate more surface oils.

Once you've chosen your shampoo, you're ready to wash your hair. You need to completely saturate the hair with water. This is especially easy to do in the shower as you simply place your head under the spray. Run your fingers through your hair to make sure the water penetrates to the scalp. (If your hair is resistant, or particularly laden with dirt, oils and styling product, it can sometimes repel the water and only appear thoroughly wet at the surface). Be sure to use warm water, which helps to open cuticle layer a bit and lets the ingredients in the shampoo be most effective, and don't squeeze or shake the water from the hair.

Next, you need to use the right amount of shampoo. Most package directions for shampoo call for a "quarter-sized" [2.5cm circle] amount. These instructions are intended for hair of average length - somewhere between chin and shoulder length. If you have really short hair (shorter than chin length) you should use a little less (a nickel-sized [1.5cm circle] amount). If you have longer hair (length that is past the shoulders) use more (a half-dollar-sized [4cm circle] amount). Rub the shampoo between your palms and apply it to the scalp. Massage the scalp and shampoo until the shampoo forms lather, running your fingers through your hair to distribute the lather evenly then rinse your hair completely (until the water runs clear).

Repeat the shampoo process, and note that the second time around the lather should be much thicker and foamier. This means that the dirt and oils that were initially on the hair have been removed (or dramatically lessened) and that the hair is clean. After a few times of shampooing your hair you'll recognise whether the lather is sufficiently thick to know if you need a second shampooing or not. If you do get a full, rich lather on the first go around, you don't have to repeat the shampooing ([HAIRFINDER, 2017b](#)).

Conditioning

Step two to having healthy hair is conditioning, and again, using the right conditioner and the proper amount are important. If your hair was porous, try using a conditioner high in moisturisers. If it was resistant, you will probably want to go with a lighter formula.

Before applying the conditioner to your freshly shampooed hair, you'll want to squeeze out the excess water from your hair, especially if your hair is long. The best way to do this is simply run your hands over your head and down your neck, pressing gently to force the extra water out of the hair. For very long hair, you can use the above method at the scalp and neck, then gather the hair into one hand and squeeze the remaining length between two fingers and slide them to the ends of the hair.

Once again, follow the directions on the conditioner package to determine how much you need. Use less if your hair is short, and more if it is very long. Apply the conditioner to the palm of your hand and rub your hands together to spread it then apply the conditioner to your hair using a stroking motion. There is no need to apply the conditioner directly to the scalp, just to the hair since working the condition through the hair tends to spread it onto the scalp as well.

Work your fingers through your hair to "comb" it through the hair from the scalp area to the ends. If you have very long hair, you may need to get a little more conditioner to completely cover the ends of the hair.

Allow the conditioner to sit on the hair the length of time directed by the packaging. This is usually one minute for most rinse-through conditioners, though it may be as much as 3 - 5 minutes for some of the more moisture-rich conditioners. When the conditioner has been on for the required length of time, rinse it thoroughly from the hair. Again, while rinsing, run your fingers through your hair to make sure to remove all the residual conditioner, especially at the scalp area where it could result in an oily look once the hair is dried.

Once again, be sure to rinse the hair completely, running your fingers through the hair to help push out the lather and make sure that you get all the shampoo off the scalp as well.

It's always important to completely rinse shampoos and conditioners from the hair after using them. Shampoos contain surfactants that can cause the scalp to feel dry and itchy if not fully rinsed away, and conditioners can result in the hair looking flat and limp if not rinsed properly. A good conditioner will have properly moisturised the hair and smoothed the cuticle layer during the time it sits on the hair. You don't need to be able to feel the conditioner residue to have gotten the proper effect ([HAIRFINDER, 2017b](#)).

Drying

Now we come to the step where most people do the most harm to their hair. It's astonishing how brutal some people are when they towel-dry their hair.

When the hair is wet, it is most vulnerable to stretching and breakage. To properly dry the hair, you should first squeeze out the excess water as described above (running the hands over the head and neck, and pinching the hair between two fingers to force out the water from the ends of long hair). Next take your towel and lay it over the head and blot the water from the hair by pressing the towel to the scalp and squeezing the hair length between the folds of the towel. You can massage the towel on the scalp area, but use only the fingertips and very small movements (less than 1/2 an inch [or 1.5cm]). Ideally, you should turban your hair up into the towel and leave it there for 10 to 15 minutes. While your hair is turbaned, you can dry the rest of your body and do other things, like getting dressed.

This does mean that you'll need to use more than one towel, but the benefit is that your hair will be much easier to style, especially if you have very long hair, which can become knotted and matted when wet if not treated gently. Once the hair has had time for the towel to absorb the water, take down the turban and use a wide-tooth comb, working from the ends of the hair upward to comb out the damp hair until it is smooth. It's always recommended that you use a wide-tooth comb to detangle damp hair. It provides even, low tension to separate tangled strands. Some people have been known to use "pronged" brushes, but unless the prongs of the brush are sufficiently spaced, you end up with the hair being directed in multiple directions at once and it can result in breakage. A comb with wide-set teeth is a much safer choice ([HAIRFINDER, 2017b](#)).

Hair combing and brushing basics

The idea of needing special instruction on how to comb or brush your hair may seem unnecessary. However, there are still a lot of hair myths and old wives' tales floating around out there and we need to dispose of them ([HAIRFINDER, 2017c](#)). Here are some common myths about combing and brushing the hair -

- you should brush your hair 100 strokes every night,
- never brush your hair when it's wet, and never comb it when it's dry,
- sharing combs and brushes can cause dandruff,
- daily brushing makes hair grow faster,
- brushing the hair is better for it than combing,
- you can train your hair to follow a style by combing it in that style daily ([HAIRFINDER, 2017c](#)).

Every single one of these is a myth, and is untrue. Let's take them one at a time and see what makes them false.

You should brush your hair 100 strokes every night

Over-brushing the hair can lead to hair damage, such as split ends. If you are brushing your hair before bedtime, you should only brush it sufficiently to remove any tangles (doing so gently). You should also use a natural-bristle brush (such as boar's hair) and work from the ends of the hair to the scalp ([HAIRFINDER, 2017c](#)).

Never brush your hair when it's wet, and never comb it when it's dry

This harkens back to the days before we had "brushes" with tines. Bristled brushes by their very nature pull the hair in hundreds of slightly different angles as the brush passes through the hair. When the hair is wet, it is swollen and weaker and brushing with bristled brushes can stretch and damage the hair. It IS advisable to always use a wide-toothed comb on wet hair, but a brush that has widely-spaced tines is an acceptable tool for detangling wet hair. As for combing dry hair,

the idea was that a regular comb would snarl in long hair and worsen tangles. However, using a wide-toothed comb to detangle long hair is perfectly fine, as long as you always remember to treat the hair gently and with respect (HAIRFINDER, 2017c).

Sharing combs and brushes can cause dandruff

This is untrue. Dandruff is caused by a fungus that is found in everyone's hair. The difference between someone with dandruff and someone without dandruff is that the fungus responsible for dandruff isn't active in the person without it. That being said, sharing combs and brushes isn't a good practice because there are many other things that can be spread by sharing these implements (HAIRFINDER, 2017c).

Daily brushing makes hair grow faster

There are benefits to brushing the hair that are proven, specifically when using a natural-bristle brush. Brushing helps to remove dirt, and product build-up in the hair and from the scalp. It helps to distribute the natural oils produced by the follicles and glands of the scalp. It helps to stimulate the scalp to promote blood-flow and regulate the oil production. But there has never been any studies done that indicate daily brushing has any effect on the growth rate of the hair (HAIRFINDER, 2017c).

Brushing the hair is better for it than combing

This relates to our first myth at the top of the section. Your hair actually responds better to combing because it creates less stress on the hair and the stress it does generate is more uniform in nature. Brushing the hair became popular because brushes tend to work faster at removing tangles and smoothing the hair, but where a comb has a single row of tines that separate the hair into small clusters of strands, a brush has several hundred bristles that separate the hair into several hundred strands. The brush therefore creates more stress on the hair itself (HAIRFINDER, 2017c).

You can train your hair to follow a style by combing it in that style daily

As nice as this would be if it were true, it isn't. This myth is generally proffered by those who wear short hair styles (usually men). What generally happens is that it's the wearer of the style who becomes "trained" and finds it easier to create the desired look with his or her hair.

The application of moisture and heat can make physical changes in the wave pattern of the hair, and many times, by styling the hair immediately following a warm shampooing and conditioning, you will create the desired wave pattern in the hair which will "set" as the hair dries and cools (HAIRFINDER, 2017c).

Identifying and selecting quality tools

Combs // Combs are the easier group of styling tools to categorise and label, because there are so few differences to be found among the different types. You should select combs made from smooth, hard plastic and be sure that there are no sharp edges or seams left by the moulding process.

The **Styling Comb** is generally six to eight inches in length and has two different sets of teeth on either end. One end will have moderately spaced teeth that are thicker and the other end will feature closely-spaced, fine teeth. The end you use on your hair will depend on your hair's density and texture. The styling comb is best used on hair of average density and texture.

The **Tail Comb** has a combing region of closely-spaced teeth at one end and a long thin "tail-like" handle. The tail is used for separating and sectioning the hair for various styling processes, from roller sets to braiding.

The **Wide-Tooth Comb** comes in a variety of sizes and shapes. It is generally larger than the styling comb and can have teeth that are as much as 1/4 to 1/2 inch apart. In many cases the teeth are wider at the spine of the comb and taper toward the ends to aid in separating the hair. A wide-tooth comb is good for combing through wet hair and for combing dense or curly hair.

The **Pick** is a variation of the wide-tooth comb, although its teeth may be more closely spaced. The pick is used for detangling and "fluffing" very curly and kinky hair. It can also be useful to separate the curls in hair that has been styled to be curly without causing the hair to frizz.

The size of the comb you choose will depend largely on the length of your hair, its density and texture. A good rule of thumb is to take the comb and insert it into clean, dry hair. The wide tooth comb should pass easily through the hair without any hindrance. For a styling comb, however, you should be able to insert the comb easily into the hair and release it, having the comb stay in place until you move your head, at which point it should fall out easily ([HAIRFINDER, 2017c](#)).

Brushes // There are nearly as many different types of brushes as there are types of hair, and there are new designs constantly being developed and introduced. Many of the new styles of brush are created specifically for use with a particular styling technique and may or may not be suited to all hair types.

The **Styling Brush** is a brush with bristles - either synthetic or natural - and can come in many shapes and sizes. The best styling brushes use natural fibre bristles - usually boar's hair. However, if you choose to use a synthetic bristle brush, be sure to choose one that is well made and will be gentle to your hair and scalp. A good test is to take the brush and run it along the soft inside of your forearm near the bend of your elbow. The bristle should feel smooth, but firm. If the bristles feel scratchy or harsh, then the brush isn't for you. The last thing you want is a brush that is going to leave tiny scratches on your scalp or be harsh to your hair.

The **Vented Brush** is one that has tines instead of bristles. The tines are set into a base that has open spaces to allow air to pass through it. The vented brush is designed for use with blow drying allowing the hair to be dried more quickly because the brush doesn't inhibit the warm air from circulating through the hair. There are tined brushes that are not vented, but instead have the tines set into a solid base (or a rubberised base) in a variety of shapes and designs. These "brushes" are little more than an attempt to get the effect of using several combs at once. Generally, they are no good for use when drying the hair, and are more damaging to the hair than combs.

The **Round Brush with Bristles** is a styling tool that is best suited to short, wavy hairstyles. They are best used to provide lift and uniformity to the hair by rolling them through the hair to create a smooth, wavy effect. These brushes can come in a variety of sizes, though they tend to be smaller.

The **Round Brush with Tines** is designed for use with blow dryers for styling the hair into soft curves and waves. Initially created as a variant of the vented brush, most current designs feature a metal- or ceramic-covered base that holds the heat of the dryer to create soft curls and curves in the hair. These brushes are available in many sizes, from small barrels with long tines to create smaller, tighter curls, to large barrels with shorter tines to create big, soft waves.

The **Paddle Brush** generally features a wide, flat base with short to mid-length tines and is designed for use with a blow dryer for straight hair styling. Originally, these brushes were designed with vented plastic bases like the vented brush, but now can be found with metal- and ceramic-covered bases to make better use of the dryer's heat to straighten and smooth the hair.

In all cases, the size of the brush you want depends on the density of your hair and its length. For shorter hair, smaller brushes are generally preferred to give better control in styling. With long

hair, however, a larger brush is usually beneficial to enable you to style the hair more quickly (HAIRFINDER, 2017c).

Blow dryer

Hand-held hair dryers have become a staple in hair care. These tools are designed to use directed streams of heated air to dry the hair quickly. A good blow-dryer will come with both a concentrator and a diffuser attachment. The concentrator attachment is designed to further narrow the stream of air, and direct it better. It is used most often to blow-dry hair into straighter/smoothier styles. The diffuser attachment is designed to soften the air stream and distribute the heated air for a gentler flow. The diffuser is used most often to dry curly hair without straightening the curl (HAIRFINDER, 2017d).

Tips

- when blow-drying the hair, ALWAYS use a good protective conditioner beforehand,
- direct the air stream along the hair shaft at an angle toward the ends of the hair. This minimises the risk of the hot air roughing up the cuticle of the hair and leaves the finished style looking smoother,
- keep the air stream moving and always hold the dryer at least 6 - 8 inches away from the hair. Most incidents of damaged hair from blow-dry styling come as a result of holding the hair in the heated air stream too long (HAIRFINDER, 2017d).

Hot rollers

These tools use a combination of heat and/or moisture to change the curl pattern of the hair. Designed to be used on dry hair, hot rollers work by wrapping segments of hair around the heated tools, and leaving the tools in place until they cool. One factor that works as a plus for hot rollers is convenience. You can wrap your hair in hot rollers and then continue to get ready while they cool and "set". Finish dressing, apply your make-up, have breakfast, or do anything you need to while you let the rollers cool. Once cooled, remove the rollers and style your hair as desired (HAIRFINDER, 2017d).

Tips

- always make sure the hair is wrapped smoothly and held securely in the rollers. Good tension in the roller ensures that you get the best curl result,
- a light misting of hairspray on the wrapped rollers will give a little extra hold and "lift" to the curled hairstyle,
- make certain that your hair is completely dry before using the hot rollers and ALWAYS let the rollers cool COMPLETELY before removing them. Most of the incidents of poor results from using hot rollers come as a result of having still-damp hair before using the rollers, or from taking down the rollers before they have completely cooled. Remember heat and moisture will break the side bonds needed to change the curl pattern of the hair, but they don't get reset into the new curl pattern until the hair is again cooled and dry (HAIRFINDER, 2017d).

Curling Irons / Flat Irons

Similar to hot rollers, curling irons and flat irons use heat (and in the case of curling irons, occasionally a little moisture) to change the curl pattern of the hair. The main difference is that the curling iron lets you add curl in specific places (the flat iron let's you straighten target sections of the hair). You can style your hair in a myriad of ways and then use the curling iron to add curls only where you want them, or use the flat iron to give a smooth sleek finish. Curling irons come in a variety of sizes from tiny, pencil-thin barrels for tight spirals, to large barrels

for big soft curls. Similarly, flat irons come in varying widths to give finer control. Generally, the longer your hair is, the larger the curling iron you want to use. With flat irons, the larger the heating surfaces on the flat iron, the larger the segment that can be straightened will be (HAIRFINDER, 2017d).

Tips

- curling irons only work well on completely dry hair. If your hair is even a little damp, the resulting curls will be limp, if they manage to hold at all. (Using a flat-iron on still-damp hair only serves to swell the hair shaft. Applying the concentrated heat of the flat iron's elements onto the damp hair basically "cooks" the hair, and can seriously damage it),
- curls formed using a curling iron must be allowed to cool fully before they are manipulated further. (Likewise, segments straightened with a flat iron should be left to cool to prevent reversion to the previous curl pattern). Wrap the segment of hair around the curling iron barrel, hold the tool in place for a few seconds to evenly heat the hair, then gently slide the barrel out of the curl and allow it to sit in place until it cools,
- lightly misting the segment of hair with hairspray will give a stronger hold to the resulting curl, or will help to eliminate frizz in flat-iron styles (HAIRFINDER, 2017d).

Simple solutions to your biggest hair worries

When it comes to hair care, think seasonally.

- During the winter, there's no humidity in the air, so hair flattens out as it loses moisture. Switch to lighter products and non-greasy formulas.
- For summer's high humidity, go with formulas that slick hair down and maintain shape and shine

(NAYYAR, 2017).

Problem - Dry and frizzy hair

90% of us suffer with dry, brittle, or frizzy hair because our hair is deficient of (moisture) WATER! Curly or frizzy hair can often be very hard to manage. Harder still is trying to turn your frizzy, curly hair into a smooth, straight and silky looking hairdo. For curly hair, work anti-frizz gel through hair and blow-dry using a diffuser attachment. For straight hair, apply straightening cream, then divide hair into sections. Always start with the underneath hair first and then work your way through the hair to the top and front sections. Each section of hair should be a manageable amount for you to handle straightening. This will depend on the thickness of your hair and what you can manage. It is best to start with a small amount and increase the size of the sections, as you become more experienced with the process. Using a big round brush to hold hair taut, blow-dry each section, aiming air down the hair shaft. Finish with a straightening iron after hair is dry.

You could also use very large velcro rollers and roll each section of hair up in them and then let it dry naturally. This method works well and is probably the least harsh to the hair but it takes longer. The rollers will also tend to curl up the ends of the hair slightly, but if that is not the look you desire you could use the round brush and blow dry them straight out (NAYYAR, 2017).

Fast fix

Finger-dry roots to avoid overheating. Use a lightweight de-tangling spray. Rub finishing emulsion between your palms and smooth over any frizz. When letting hair dry naturally, don't put your fingers through your hair until it is completely dry - especially on humid days.

You can also make use of this weekly home remedy "hair mask" to give your hair a smooth, shiny appearance. Mix one egg to one part mayo and one part olive oil. Make a paste and apply to

hair. Wrap hair in a towel and allow to work at least 30 minutes. Rinse out and shampoo and condition as usual (NAYYAR, 2017).

Problem - Greasy hair

Greasy hair is due to a build-up of the natural secretion ('grease' or, more correctly, sebum) from sebaceous glands in the scalp. The sebum passes into the hair follicle and spreads upwards and over the hair shaft. It is not absorbed into the shaft.

For oily hair that needs frequent washing, avoid using shine-enhancing products, which can make greasy hair look stringy. Don't use creamy conditioners and waxes that stay on the hair shaft and put your oil production into overdrive. Don't over-brush. Use a dab of leave-in conditioner on the ends only, avoiding the scalp. After you have styled your hair, avoid fingering it or running your fingers through it (NAYYAR, 2017).

Fast fix

Blot your scalp with oil-absorbing sheets intended for your face (NAYYAR, 2017).

Problem - Lanky or limp Hair

Shampoo with a volumizing product, then apply a light conditioner to the ends. When your hair is 60% dry, apply 5 - 10 spritzes of body boosting spray to your roots. While blow-drying, lift sections of your hair with fingers or a vent brush and aim heat at roots.

If your hair does not hold a curl at all, try doing a wet set to lock in more tendrils. Shampoo and towel dry hair, apply a light mousse and then wrap in curlers. Sit under a hood dryer until hair is dry. Carefully remove curlers and then replace with hot rollers.

Leave the rollers in until completely cool. Remove curlers and carefully arrange curls with your fingers. Spray with a good holding hairspray to retain the curls (NAYYAR, 2017).

Fast fix

Lift your hair at the roots and spritz with light, flexible-hold spray (NAYYAR, 2017).

Problem - Fly-away hair

Static electricity is caused by friction between your comb and your hair, and between individual hairs. Don't comb too often. Conditioners coat the hair, which provides insulation. Use the highest-level conditioner you can that doesn't weigh your hair down. Using a light spray of leave-in conditioner might be just the solution for you. You also can try applying a drop of silicone serum, which will keep hair under control and add a bit of shine (NAYYAR, 2017).

Fast fix

Lightly spray on leave-in conditioner or apply drops of silicone serum (NAYYAR, 2017).

Problem - Porous hair

Porous hairs will quickly soak up whatever you put on it, as well as the humidity in the air. If your hair gets frizzy on muggy days and flat on very dry ones, it's probably porous. Coarse

hair is often porous, as is any hair that has been permed, straightened, permanently coloured or otherwise damaged (NAYYAR, 2017).

Fast fix

Use a rich conditioner and leave on as long as possible. Look for products containing proteins and humectants, especially at the ends. Silicon serums can help smooth down the cuticle and add shine. A hat is still your best option for protecting your locks (and face) from the drying effects of summer (NAYYAR, 2017).

Daily hair care

All of us know how to shampoo and condition our hair - or do we? The following necessary tips may help you to improve your daily hair care routine (NAYYAR, 2016a).

An effective hair-care involves cleansing, toning and conditioning routines carried out regularly.

An important aspect of effective care is the use of proper hair-care products. Different types of hair need different hair-care products. The use of wrong products is detrimental to the hair.

After cleansing, the scalp and hair need toning exercise. The toning of scalp and hair is achieved by gently massaging the head. This helps in stimulating and invigorating the blood circulation required for the healthy growth of hair.

Brushing the hair regularly is important both to free it of dust, dead cells and tangles and to stimulate the scalp. A brush which has bristles with rounded tips is best, since it is less likely to scratch the scalp or tear and split the hair. Also the best brush has boar and nylon bristles - the boar bristles carry oil and help moisturise hair, while the nylon ones gently exfoliate the scalp. The key to a good stroke is in brushing the hair from nape of the neck towards the crown of the head.

The most important part of hair-care is conditioning. It is a restorative routine. If the hair is excessively stripped of moisture or oil due to harsh cleansing, sun or application of harsh chemicals such as perm lotions, etc., the conditioning routine aims at restoring and correcting the imbalance. Conditioning products are especially useful for long hair, where the overlapping scales which cover the outer layer of hair often get roughed up as it grows. Usually, dry hair should be conditioned once a week, normal hair once a fortnight and oily hair not more than once a month. All conditioners are mainly a combination of oils or waxes, detergents and emulsifiers, with optional extra ingredients, often incorporating herbal extracts with gentle plant and vegetable oils and essences.

It is important to dry the hair correctly and in a natural way. It can be easily damaged when wet. The head should be wrapped in a clean towel for a few minutes to remove excess moisture. Rubbing with the towel should be avoided. For wet hair a comb is preferable as brushing may stretch and tear the hair. The best way to dry hair naturally is finger drying. In case of a hair dryer, always use it on the coolest setting, since heat dries out the hair. Over-drying does the most damage, so avoid holding the dryer over one area for too long, stop drying hair a little before it feels completely dry and avoid using attachments like nozzles as they concentrate the heat too much. Lemon juice after rinsing acts as a natural setting lotion.

Hair can be damaged by over-exposure to the sun. The sun dries the hair, makes it dull, causes breakage and frays the ends. Hair damaged by the sun is weak and unhealthy. Hence, it is important to protect the hair from the sun by covering it with a scarf etc.

Choose shampoo according to your hair type. For example, use a rich shampoo with conditioner and moisturiser for dry hair, a mild shampoo with conditioner for normal hair, a mild shampoo with adequate conditioner for combination hair, and a lemon and egg shampoo for greasy hair.

To avoid scalp infections, avoid the use of other's towel or comb. Make it a point to regularly clean your towels and combs.

Do not tie or pull back hair back tightly with pins, hair or rubber-bands. Also, try and avoid undue use of rollers, curlers, crimpers or go in for perms which tend to weaken the hair (NAYYAR, 2016a).

Hair problems

Split ends

Split ends are caused when hair is damaged, either by harsh shampoos, too much direct from the sun or a hair dryer, perming or bleaching or very often simply because the tips of hair are very old.

The only cure for split ends is to have them trimmed off - if left, they may split further up the hair, making it look dull and lifeless (WOMENFITNESS, 2017).

Split end treatments

- Mix 1 tsp honey with 2 Tbsp olive oil, then beat in 1 egg yolk. Massage on hair in small sections. Wrap your head with a shower cap for 30 minutes. Rinse and shampoo.
- Massage hair and scalp with warm avocado or olive oil. Wrap hair securely in a towel. Leave oil on hair about 8 hours or overnight. If left on overnight, put a shower cap over your head to avoid staining pillows and bedding. Wash hair, then rinse with a vinegar and/or water solution.
- Hot Oil Treatment

1/2 cup olive oil

1/2 cup boiling water

Place olive oil and boiling water into large glass bottle or jar with a lid. You may need to wrap a towel around the bottle to avoid burning yourself. Shake very well until oil is emulsified. Massage into hair, taking care not to burn your head. Put a shower cap or plastic bag over your hair and wrap your head in a hot towel that has been soaked in hot water then wrung out. Leave mixture on your hair for 1/2 hour, then shampoo as usual (WOMENFITNESS, 2017).

Very-greasy hair

Mainly due to hormonal problem, the sebaceous glands tend to become overactive and produce too much sebum.

Tips on managing greasy hair

- avoid too much brushing of hair because it might further stimulate the oil glands that are already over-active,
- wash your hair every third or fourth day or even more frequently, depending on individual comfort. A good nourishing liquid shampoo is often the best answer. Its important to use only the best shampoo for oily hair,
- excessive oiliness if neglected can lead to falling hair. If treated in time it can be prevented,
- wear your hair in easy-to-manage, well cut style. Light perming can help as it lifts the hair slightly away from the scalp, making it less easy for the sebum to travel up the hair shaft (WOMENFITNESS, 2017).

Very-dry hair

May result from hereditary or hormonal problems-or due to a result of damage caused by over-use of heated rollers, hot hair dryers, perms and bleaches (WOMENFITNESS, 2017).

You can protect your hair

- by using very mild shampoos and good quality conditioners,
- by having them trimmed regularly,
- by going in for once-weekly hot oil treatment. Use warm olive or almond oil and massage it carefully into the scalp and hair,
- leave the oil on overnight, if possible, by covering the hair with a plastic bath cap and a toweling turban. Wash the oil off the next day by applying diluted shampoo directly to the scalp before applying water,
- **mayonnaise conditioner** - to recondition the hair, shampoo hair with homemade shampoo or a shampoo from the natural foods store. Rinse and towel dry. Apply regular mayonnaise (not salad dressing) to the hair. Massage in. Let sit for 10 - 15 minutes, shampoo again lightly and rinse with an apple cider vinegar and water solution (WOMENFITNESS, 2017).

Dandruff

Dandruff is a dry scaly condition of the skin on the scalp and less often, on the face and the torso.

It comes in two types -

- **Pityriasis-capitis** - this is the simple kind consisting of white dry flakes falling from the scalp. The result is due the rate at which the scalp sheds its dry skin cells, which in turn depends on the health and diet of the individual stress, too seems to be related (WOMENFITNESS, 2017).
 - can be controlled by -
 - * paying more attention to health hygiene,
 - * consuming more fresh fruits in your diet,
 - * drinking plenty of water,
 - * rinsing the hair carefully after shampoo,
 - * brushing gently to rid the hair of trapped cells,
 - * lightly massaging the scalp to dislodge the dandruff flakes (WOMENFITNESS, 2017).

If a simple routine like this does not work, consult a dermatologist on the use of anti-dandruff shampoo, which might slow down the rate at which the cells are shed from the scalp (WOMENFITNESS, 2017).

- **Seborrhoeic dermatitis** - if the scalp is very greasy, an individual might end up with this type of dandruff, which is thick, oily, scaly, crusted and weeping. This condition almost always needs medical care and attention, but if it is mild you can treat it at home by either using an anti-dandruff shampoo or trying home remedies. The best remedy however is to wash hair regularly with a shampoo containing selenium compound or cool tar extracts. Consult a dermatologist if the problem is severe or persists (WOMENFITNESS, 2017).

Tips on Managing Dandruff

- restore the health of the scap by bringing about a positive change in your diet and living habits,
- light oil massage, can help to dislodge the existing dandruff flakes. Massage the scalp carefully. The fingertips should be used to move, the skin on the scalp in small circulatory motions,

- keep your scalp very clean. This can be achieved by washing hair twice a week with liquid shampoos,
- dandruff can be infections. Keep your belongings clean and separate to eliminate the chances of infection. Whenever you wash your hair, soak your hair brushes and combs in hot water containing antiseptic lotion,
- treatment with herbal extracts has been found to be effective. Herbs like heena, amla, lemon, reetha have antiseptic properties and are wonderful cleansers.
- bring about a positive modification into your lifestyle, to eliminate stress and overcome dietary deficiencies ([WOMENFITNESS, 2017](#)).

Besides the anti-dandruff creams, lotions, oils and shampoos available in the market, there are many simple household remedies to fight dandruff described below -

- mix two tablespoons of cosmetic vinegar and six tablespoons of hot water. Dab with cotton into the scalp, parting the hair with a comb apply all over the scalp. Preferably it should be used at bed time. Tie a scarf over the hair to avoid staining the pillow. Next morning wash the hair with shampoo. After the hair is thoroughly cleansed pour over as a last rinse a mixture of three tablespoons of cosmetic vinegar and one cup of hot water. Then dry the hair thoroughly. This should be done twice a week for three months,
- hot oil therapy is another method to cure dandruff. Massage hot oil into the scalp at bedtime. Next morning an hour before your bath, rub lemon juice mixed with cosmetic vinegar (mix 1:2 ratio) into the scalp. Give the hair a good wash and egg shampoo,
- give your hair a hot steam bath. Massage hot oil with a hot damp towel and leave it on the head like a turban so that the steam can fight dandruff. You may use two towels for this purpose,
- here is another beauty tip for your hair. After giving your hair a good wash, boil five teaspoons of dried used tea leaves in lime water and use it as a last rinse after shampoo. This gives the hair a lustrous shine and provides nourishment too ([WOMENFITNESS, 2017](#)).

More treatments options for dandruff -

- make an infusion of 1 ounce each of fresh or dried rosemary and sage in 2 cups of water. Let steep for 24 hours, then use daily as a hair rinse,
- boil 5 heaped Tbsp dried thyme in 2 cups water for 10 minutes. Strain and cool. Pour 1/2 mixture over clean, damp hair. Massage into scalp, do not rinse. Use second half of solution another day,
- instead of shampooing, massage handfuls of baking soda into the hair and scalp to absorb oil and to loosen dead skin on scalp. Rinse thoroughly, use no other shampoos. While initially the hair may seem dry, after several weeks, dandruff will be gone and hair will be smooth and shiny,
- Mint Rinse
Boil
1 cup water,
1 cup apple cider vinegar
1 handful of fresh mint leaves
Strain and pour into a container. With fingertips, massage solution into the scalp, let dry without rinsing out.
- use the hot oil treatment recipe given earlier,
- Soothing Herbal Hair Rinse
Combine equal parts of dried rosemary, comfrey, witch hazel leaves and nettles to make about 1/2 cup. Add to 2 cups of water in a covered pot. Bring to a boil. Remove from heat and let steep overnight. Strain. Shampoo and rinse hair then use herb tea for a final rinse to relieve itchy, flaky scalp ([WOMENFITNESS, 2017](#)).

Age appropriate hairstyles

Hairstyles that look good on you in your 20's might not have the same effect in your 40's or later. What makes a look fashion forward and what is a faux pas? It is the age old question and

there is not just one simple answer to it. Should women shorten their hair with the amount of birthdays they celebrated? Is there even such a thing as an age appropriate haircut?

Demi Moore, Bo Derek and Ali McGraw would most likely disagree since they still wear their hair over the shoulder long and look absolutely spectacular, now in their 40's, 50's and even 70's.

Beautiful short-haired celebrities of different decades of age are Hale Berry, Sharon Stone, Jamie Lee Curtis, and Dame Judi Dench. Each of them found a look that works with their face shape, proportions and personality.

When it comes to hairstyles and age, the strict rules like "no long hair after 40" are outdated ideas. Today age is looked at in a different way. Women are independent, stylish and confident; they are changing conventions and how we look at aging and the fashions of our lives. We all want to age gracefully and are proud of the years we have been blessed with but we also want to keep the gap between how we feel inside and what we see in the mirror as small as possible ([HAIRFINDER, 2017a](#)).

Length of Hair

Long hair, medium or short hair does not matter so much as does having a hairstyle that matches your type and lifestyle. Yet there are certain rules that apply and these have nothing to do with pressures of society, norms or trends. It is simply about esthetics.

If you did not look good with long hair in your younger years, it will not change when you get older and vice versa ([HAIRFINDER, 2017a](#)). But if you think your long, glamorous mane is one of your best assets and would like to continue flaunting it, make sure of the following -

- keep it healthy. Nothing ages more than drab, stringy hair without shine,
- keep it groomed. Do not let down the maintenance. We might get away with having sexy, messy hair in our younger years, but later it just looks careless,
- add style. Do not let your hair just grow without any fine tuning. Layers, tapered sides, wispy elements throughout not only add luxurious volume, they also soften your face and bring out the best of you,
- careful with the bangs. Thick straight fringes bring a lot of attention to the eyes, which also includes potential lines that might appear more prominent. Instead opt for a soft, textured fringe if you really want to have one,
- keep the lines flowing and soft. Avoid any harsh lines and corners. These will also enhance the possible lines in your face,
- stick with soft and natural colours and don't be afraid of grey,
- if your hair is very thin, go for a medium long or short cut,
- always, always avoid wearing tight little buns unless you spruce up the ballerina look with a pair of dramatic earrings ([HAIRFINDER, 2017a](#)).

Fabulous long hairstyles for grown-up women often include large waves, soft curls, tapered, face framing sides with a lot of feathery texture.

Medium looks that are well cut and styled should also have soft lines, some movement and be in harmony with the face shape. Layers are the magic word for long and medium haircuts. Movement, volume and a visual softening makes them the miraculous fairy dust in the world of hair.

Very short hairstyles can have their own challenges as we age. Our hair does not only change its colour, but also its texture and can become more wiry, dry and hard to control over the years. Casual and chic blow dry looks are not as easy to achieve any more and you'll either need more softening styling products or opt for a style that works with the feel of your hair.

Textured pixie cuts are a classic and very popular with many women. Just make sure that the ends do have a fine texture and keep the cut groomed to avoid looking like a metal brush, especially when the hair is grey. Also be careful with the gel and spiking up the short tresses. Punk does not even look good on Billy Idol anymore. The tendency of some among us to keep

going with the funky punky 80's looks until they almost reach that decade in their own life is perhaps not the best idea. Wispy and expressive is good, but stay clear of the sharpened, needle-stiff spikes ([HAIRFINDER, 2017a](#)).

Hair colour

Perhaps an even bigger question whether to wear the hair short or long after our college days have become a distant memory, is about the colour. First of all relax. No decision about hair colour is irreversible. So have fun with it! If your hair is turning grey and you are not ready for going all natural, then there are many colour options and products available to help you out.

Talk to your stylist about the perfect colour that matches your skin tone and is expressive enough for your personality. Now here is where you may enter perilous terrain. Expressive is good, intense can work well too, but there are indeed a few things to consider when picking your hair colour ([HAIRFINDER, 2017a](#)).

- avoid very dark and harsh colours like black, blue black, very dark browns. These colours will not look natural and enhance all of the potential little issues you may have with your skin,
- by all means avoid any shade of purple, pink or light blue. No need to elaborate on this one,
- neon colours, extreme shades of red, everything that looks more like candy than hair needs to be left to a new generation,
- stick with a warm, natural tone that matches your skin tone and brings out the colours of your eyes. In case of doubt go lighter than dark, since dark hair does add harshness and years,
- highlights are the wonder weapon to look fresh and attractive. They soften the colours and add much flattering dimension to your hair,
- grey is the new blonde. It is sophisticated chic and sexy. Consider this before you pour on the pigments. If you don't like the exact shade that comes to you naturally, try a precious silver or platinum colour ([HAIRFINDER, 2017a](#)).

As a summary, there is no such a thing as specific haircuts that are appropriate for a certain age group only. The lines are much more diffuse than they ever were and we have a wide range of choices for gorgeous hairstyles at any age. The only things to keep in mind are the basic rules to find a cut that just really works for you and that brings attention to your good sides and distracts a bit from others. Keep it soft and keep it flowing and fun, in long or short, but most of all keep it uniquely you ([HAIRFINDER, 2017a](#)).

How to wash your hair

Who knew there was so much to know about washing your hair? Don't fret, Hairfinder experts 'break' it all down so that any future 'breakage' can be avoided while performing the cleansing task that we all do so often. Whether you are a daily shampooer, an every other day washer or the cleanse when you feel like it kind there is no doubt about it, washing your hair is a task that most of us do on a regular basis.

A great number of shampooers hop in the shower utterly sleep-dazed or in some sort of robotic-like stupor. Maybe you're just waking up or perhaps you've had a long day and all you want to do is unwind with a warm shower. You may want to skip shampooing if you are too tired to do it correctly. You could be causing irreversible damage to your hair.

We understand that there's a great deal to consider for proper shampooing and fortunately for our readers our experts clarify and enlighten on the very important Do's and Don'ts of hair cleansing. For a task performed so often, there are many things one needs to be aware of. Before one even steps into the shower to shampoo, getting the best results begins at home by researching which shampoos are pH balanced. Shampoos are a hair product that is on one's hair

more than any single other product, some of you use it every single day. Having the proper pH shampoo makes ALL the difference in the world (BUNYEA, 2017).

Understanding shampoo

If one has an oily scalp, dehydrated stiff ends or even thinning hair a pH-balanced shampoo can aid in repairing the hair and even provide you with the dazzling hair you're worthy of. The pH scale is measured from 0 - 14. A shampoo that is more acidic will have a pH rating from 0 to 6.9 while a shampoo that is more alkaline will have a pH rating from 7.1 to 14. The ideal shampoo is between 5.0 - 6.0 (the pH level where our hair, skin and nails exist). Unfortunately, most shampoos do not have pH ratings published on them but we share a few pearls of wisdom to help the selection process go smoothly (BUNYEA, 2017).

- for colour-treated hair select a shampoo that has components such as macadamia and coconut oil or vitamin E to add moisture. When terms like moisturising or hydrating are printed, pH levels are low (acidic),
- for oily hair go for a pH-balanced cleanser that contains panthenol,
- for dry hair use a pH-balancing shampoo that contains fatty alcohols like cetyl alcohol,
- shampoos can also undergo the litmus assessment. Simply, dip a litmus paper in the shampoo and compare its colour to the pH scale chart (BUNYEA, 2017).

How often to shampoo

As hair varies and textures differ by ethnicity, so does the demand to use shampoos. One may be washing hair more frequently than is necessary. Ultimately, hair is a fibre that does not benefit much from washing. Let's think of a wool fibre. The more you launder it, the more damaged it is going to appear.

In general the longer, thicker, more processed and curly the hair is, the drier it tends to be, so these hair types can go longer between washes. If oil production on the scalp is high and one needs to shampoo more often, use an "everyday shampoo" because it contains weaker detergents. Experts agree that shampooing twice a week should suffice, of course there are always exceptions (getting sweaty or using loads of styling product may merit more shampooing) but perhaps a dry-shampoo is the way to go for in between shampoos (BUNYEA, 2017).

How to properly wash hair

Hair is in its most fragile state when it is wet, so gentleness is crucial. To begin, brush the hair to make sure that one goes into the shampooing process tangle free. Next, thoroughly soak hair by using relatively warm water to open the cuticle (this allows the shampoo and conditioner to penetrate and truly cleanse). Then apply a splodge of shampoo to the palm of your hand. Dip the fingers from the other hand into the shampoo and dab a little on the scalp in the bangs area, around the ears, the nape of the neck and the crown areas. Continue this until the scalp is generously covered with cleanser.

Next, using the finger tips gently scrub, concentrating at the roots, making sure to thoroughly scrub the entire scalp (in a downward motion). Some water may be added for a better lather. Once this step is completed, you may choose to add another dollop of shampoo (depending on how much product there is to wash away) this time, first spread the shampoo all over the hands and apply the shampoo to the rest of the hair (the ends almost never need shampoo) by running the shampoo from top to bottom.

After the scalp is systematically cleaned, it is time to rinse away all that dirt that has built up. Rinse with cool water beginning from the bang area and work the water down the hair shaft by gently tapping hair a few times to make sure all of the soap is rinsed out.

When spreading conditioner, the root area can be skipped all together. Conditioner only needs to be applied to the hair shaft and ends. Apply from top to bottom and let the conditioner work while you leave it in for a few minutes as you go on to wash the rest of your body. When it is time to rinse out the conditioner, use cold water. While not always the most practical, the very best way is to rinse with the coldest water (in perhaps the sink). It may be slightly inconvenient but the cold water seals the cuticle, creating a nice shine when dry.

Now that we have clarified how to properly wash ones hair, let discuss the mistakes that can be so easy to make when doing something as innocent as washing our hair (BUNYEA, 2017).

Using too much shampoo

Hair experts can agree that a quarter-sized amount of shampoo will be enough for shoulder length hair. The individual will have to adjust the amount accordingly. Using too much shampoo can essentially impede the cleansing process by not allowing it to be properly worked into the hair (BUNYEA, 2017).

Concentrating and applying shampoo to the same spot

A very common mistake is to put shampoo in the same spots each time we shampoo (such as the crown or bangs area) and work up the suds from that spot but this can cause inflammation, tenderness and overall irritation to that area of the scalp. Having shampoo concentrated in the same areas repetitively can also cause the scalp to become dry and flaky. Experts recommend varying the areas of the scalp that one first applies the shampoo on. This common mistake is born out of routine and can easily be prevented by following our step to applying shampoo (with finger tips) found earlier (BUNYEA, 2017).

Squeezing/twisting to remove excess water

Before one gets out of the shower with soaking wet hair, naturally, our first instinct is to twist and squeeze the additional water out of our hair and down into the drain. While removing excess water is okay, squeezing too hard and twisting it while it is still wet can cause the hair to break (in several spots, not just at the ends). To remove the surplus of water, gently run hands from the top to the ends a few times rather than one abrasive time (BUNYEA, 2017).

Towel damage

Likewise, rubbing hair vigorously with a towel can also create breakage. Once the excess water is out of the hair, blot the hair a few times with a towel, instead of rubbing it. Towels can damage your hair. As mentioned earlier, hair is most fragile when it is wet. Causing friction with a towel can harm the cuticle, which leaves the hair susceptible to more damage and subsequently creates an undesired wiry or frizzy appearance. Purchasing an extra absorbent towel may be a worthy investment, especially if you have particularly dense hair (BUNYEA, 2017).

Brushing while wet

Whether hair is dry or damp, using a fine toothed comb is something that should be avoided altogether. Have we pointed out that wet hair is more susceptible to damage? One of the easiest things to take away from this section is to be very careful with wet hair. One of the best things you can do for your hair is to wait until it is dry to brush it (when it is in a much stronger state)... but if you must brush it, use a wide toothed comb or even finger brushing it is better than using a fine toothed comb (BUNYEA, 2017).

Washing hair as soon as it's oily

As you know from the information we have provided above, washing one's hair removes the natural oils from the hair and the oils then kick in gear to produce sebum again, but did you know that you can actually train your hair to get oily more slowly? Yes, you read that correctly, by waiting one additional day in between the regular shampooing of one's scalp, the sebum that is normally produced will slow down. The scalp produces sebum after shampooing. Essentially, by washing your hair less, you train your scalp and hair to require less washing (BUNYEA, 2017).

You do not saturate hair prior to washing

As mentioned above in the steps to our guidelines for properly washing one's hair a full and complete saturation is required to achieve best results. Not including this vital step into the hair washing routine can leave an ineffective cleanse, as the shampoo and water are meant to work together. The water is just as important as the shampoo itself. Do not fret, in the grand scheme of things, this is a mere oversight and can easily be fixed by fully immersing the hair into the water for 3 minutes prior to lathering up (BUNYEA, 2017).

Using silicone-centred shampoos

Upon immediate use dimethicone (silicon) shampoos can make one's hair feel sleek and smooth, however over time, they leave a waxy build up on the hair shaft and end up dehydrating the hair by blocking all of the nutrients from being absorbed.

No one wants to jeopardise the integrity of their hair and with environmental (sun, surf, wind and excessive water) along with chemical (colouring/highlighting) and physical (curling irons, flat irons) components that can cause damage. It is very important to recognise what elements one has control over (such as selecting the correct shampoo for a specific hair type and need as well as learning to be gentle with hair when it's wet). So that we are damaging our hair as little as possible. Hair, unlike the skin, doesn't contain nerve connections and therefore can't give feelings of pain when damaged but take note that hair is an involved system, much like skin. It has numerous layers that can be unsettled by environmental, chemical or physical damage (BUNYEA, 2017).

Possible new treatments

PRP or "Platelet-Rich Plasma"

This is the 'new kid on the block', and *platelet-rich plasma (PRP)*, in which a blood sample is taken from you, spun in a centrifuge which separates the *PRP* from the rest of the blood. A topical anaesthesia is then applied to your scalp to reduce any discomfort during the treatment, and then the highly concentrated *PRP* is then injected subcutaneously into the scalp. Your hair will then be washed and you may return to your daily routine (PACIFICCENTERPLASTICSURGERY, 2014).

I'm slightly sceptical about this as it has been used on so few patients, 11 in the 2014 study, and a 2005 study had 23 patients, whilst another study in 2014 had 64 patients, most of which in the studies showed some improvement, but I feel that they weren't followed up properly. If the followup time was longer then there would be greater long-term knowledge (KHATU et al., 2014), (CHAUDHARI et al., 2012), (SOUSA and TOSTI, 2013).

Here, the results of a [randomised, placebo](#)¹⁰³-controlled, [half-head](#)¹⁰⁴ group study to compare the hair regrowth with [PRP](#) versus [placebo](#) are reported. Hair regrowth was quantified by a blinded evaluator using computerised [trichograms](#)¹⁰⁵. The safety and clinical efficacy of [autologous](#)¹⁰⁶ [PRP](#) injections for pattern hair loss were investigated. Of the 23 patients enrolled, 3 were excluded. At the end of the 3 treatment cycles, the patients presented clinical improvement in the mean number of hairs, with a mean increase of 33.6 hairs in the target area and a mean increase in total hair density of 45.9 hairs per cm² compared with baseline values. No side-effects were noted during treatment. The data clearly highlight the positive effects of [PRP](#) injections on male pattern hair loss and absence of major side-effects. [PRP](#) may serve as a safe and effective treatment option against hair loss; however, more extensive controlled studies are needed ([GENTILE et al., 2015](#)), ([TRINK et al., 2013](#)).

Hair Transplant

A hair transplant is a surgical procedure to improve baldness ([MEDLINEPLUS, 2015b](#)).

Description

During a hair transplant, hairs are moved from an area of thick growth to bald areas.

Some hair transplants are done at a doctor's surgery ([MEDLINEPLUS, 2015b](#)). The procedure is performed as follows -

- you receive local anaesthesia to numb the scalp. You may also receive medicine to relax you,
- your scalp is thoroughly cleaned,
- a strip of your hairy scalp is removed using a [scalpel](#)¹⁰⁷ and set aside. This area of your scalp is called the donor area. The scalp is closed using tiny stitches,
- small groups of hairs, or individual hairs, are carefully separated out from the removed scalp,
- the bald areas that will receive these healthy hairs are cleaned. These areas of your scalp are called the recipient areas,
- tiny cuts are made in the bald area,
- healthy hairs are carefully placed in the cuts. During a single treatment session, hundreds or even thousands of hairs may be transplanted ([MEDLINEPLUS, 2015b](#)).

Why the procedure is performed

A hair transplant can improve the appearance and self-confidence in people who are balding. This procedure cannot create new hair. It can only move the hair you already have to the areas that are bald.

Most people who have a hair transplant have male or female pattern baldness. Hair loss is on the front or top of the scalp. You must still have thick hair on the back or sides of the scalp to have enough hair follicles to move.

¹⁰³a simulated or otherwise medically ineffectual treatment for a disease or other medical condition intended to deceive the recipient

¹⁰⁴treatment to one half of the scalp, the other half was not treated

¹⁰⁵the microscopic examination of hair shafts

¹⁰⁶involving one individual as both donor and recipient

¹⁰⁷A surgical knife

In some cases, people with hair loss from lupus, injuries, or other medical problems are treated with a hair transplant ([MEDLINEPLUS, 2015b](#)).

Risks

Risks of surgery in general include -

- bleeding,
- infection ([MEDLINEPLUS, 2015b](#)).

Other risks that can occur with this procedure -

- scarring,
- unnatural-looking tufts of new hair growth ([MEDLINEPLUS, 2015b](#)).

It is possible that the transplanted hair will not look as good as you had desired.

If you plan to have a hair transplant, you should be in good health. This is because surgery is less likely to be safe and successful if your health is poor. Discuss your risks and options with your doctor before undergoing this procedure ([MEDLINEPLUS, 2015b](#)).

The procedure

A hair restoration procedure is an outpatient medical procedure performed at a specialist treatment centre. The hair on the back and sides of the scalp, which typically are not affected by *hormones* that can cause hair loss, is transferred to other parts of the scalp. These permanent hairs, taken from the "permanent zone", which is often called the "donor area" can be moved to other parts of your scalp where the hair loss has occurred, often called the "recipient area." These new hairs will continue to grow in their new location as if they were still located in the permanent zone of your scalp.

Patients will often ask why the transplanted hair will not go away and bald like the hair previously located in these areas of hair loss, and the analogy we use often is that "it's the trees, not the soil." That is, the permanent hairs can be moved around and will continue to be permanent in their new location. The process is called Follicular Unit Transplantation. Hair exits the scalp in groups called "follicles". Each follicle produces one, two, three and sometimes four hairs per follicle. A *follicular unit*¹⁰⁸ contains the hair follicle itself, the sebaceous gland, and the erector pili muscle. During the dissection, the anatomy of the follicular unit is respected as each follicle is dissected from the surrounding tissue. These follicular units are sorted and briefly stored in a special nutrient tissue bath at a cool temperature prior to implantation in their new location. These transplanted follicles will continue to grow in their new location in the same way they were growing in the permanent zone; in essence, the follicles do not "know" that they have been moved, and your new hair will grow permanently in the area to which it was transplanted ([ATLANTAHAIRSURGEON, 2016c](#)).

There are two methods that can be used to remove the follicles from the permanent zone. One is the linear method¹⁰⁹ and the other is follicular unit extraction¹¹⁰.

Linear method

Using this method, following careful anaesthesia of the area to make sure it is completely numb from any possible discomfort, a narrow strip of scalp from the permanent zone is removed, and under a dissection microscope, these follicles are separated from each other. The incision is then

¹⁰⁸A follicular unit is a naturally occurring grouping of one, two, or three (and rarely, four) hair follicles found in the skin. The average follicular unit contains about 2.4 hairs

¹⁰⁹See **Linear method** on page [231](#)

¹¹⁰See **Follicular unit extraction** on page [232](#)

closed using Facial Plastic Surgery technique. After healing, there will be a fine line scar, usually 1–2mm in thickness, in the donor area where the hair was taken. This scar is easily hidden by your existing hair in the donor area. The surgeon then uses highly specialised instruments to create the recipient sites in the areas of hair loss. This needle-like instrument is used to create the recipient sites, which are slightly smaller than the needle a doctor or nurse uses to draw your blood from your arm for blood work labs at regular doctor visits. In short, very small recipient sites are created in the area to be transplanted. Each person has different sized follicles, so the surgeon calibrates the recipient site instrument to the exact size of your individual hair follicle size. As these recipient sites will determine the pattern and direction of the new hair growth, this very critical step is only performed by the surgeon.

The follicular units, or "grafts", are then placed with surgical precision into the sites prepared for them. The number of grafts transplanted varies from person to person, and mainly depends on how much hair you have lost. Typically, around 2,000 grafts, each containing one to three hairs, are transplanted. It is possible to transplant up to 3,500 grafts in a single procedure day.

After the procedure, which typically lasts 3 to 8 hours depending on how much hair is required for transplantation, the patient leaves the office without any bandage and a medical hair-net to cover the newly transplanted hair. Since the surgeon is careful to remove the hair from the head, and not the neck, after the procedure there won't be any increased pain from turning your head side-to-side or up and down. The skin in the area of the wound moves in tandem on either side of the wound, so there is not stretching or pulling on the wound as it heals. This provides for smaller scars, and much less pain than if the follicles were removed from the neck. Most patients are able to return to work the next day, though many decide to take 2 - 3 days off from work to allow the follicular unit grafts to securely heal in their new location. The sutures are removed 10 days following the procedure. If you are traveling for your procedure, know that the sutures can be removed easily by your local doctor. Alternatively, if you prefer, the surgeon can use a dissolvable suture so that there is no need to return to your treatment centre or to your local doctor for suture removal ([ATLANTAHAIRSURGEON, 2016b](#)).

Follicular unit extraction

Follicular unit extraction is a method of obtaining the follicular unit grafts from the permanent zone, or donor area, without using a [scalpel](#), nor using any stitches to close the wound, and with no linear scar in the donor area. Following careful anaesthesia of the scalp, the follicles are removed one at a time by the surgeon, using a highly-specialised instrument it is used to dissect and extract one individual follicle at a time from your scalp. No linear incision is made to obtain a strip of scalp, so there is no linear scar in the donor area at all. Instead of a linear scar in the donor area, which is typically easily hidden by your existing hair in the area, there are a number of tiny, circular scars, the number of which reflects the number of follicular unit grafts extracted from the scalp on your procedure day. These tiny round scars are about 1mm or less in diameter. The procedure is less invasive than the strip method, and the tiny scars created in the donor area are so small that they are virtually impossible to see, even when a person looks carefully through your hair in the donor area ([ATLANTAHAIRSURGEON, 2016a](#)).

After Surgery

Hair restoration surgery is not a medically intensive procedure. You will feel awake and relaxed as you leave the clinic following your procedure. In the days following the procedure, you will have a small amount of wound care to perform, using the materials given to you on your procedure day. You will be provided with all the post-procedure items for proper care of your new hair. Minimal downtime is required, and many patients return to work as soon as one or two days following the procedure, and resume a full exercise regimen within 7 days. The transplanted area will have some redness that will last for 7 to 10 days, depending on your skin. You are able to wear a baseball cap or other hat during this time of redness. Depending on how much hair you have around the transplanted area, you may be able to camouflage the

transplanted area with little effort, and hide any visual evidence of the procedure having been done ([ATLANTAHAIRSURGEON, 2016c](#)).

Post-surgery hair growth

Unlike some other cosmetic surgery procedures, the results are not immediately apparent. There is a "dormant" phase that occurs as the new hair follicles heal into their new location on your scalp. The transplanted hair starts to grow after approximately 3 months after your procedure. Notably, the new hair does not all grow in at once. In a way, each hair is on its own schedule in terms of growth. Roughly 20% of the new hair will start to grow between month 2 and 4, and about 60% of the new hair will start its growth between month 4 and 8. It varies from patient to patient, but the remainder of the new hair will start growing somewhere between months 8 and 12 following the procedure ([ATLANTAHAIRSURGEON, 2016c](#)).

Outlook (Prognosis)

Most hair transplants result in excellent hair growth within several months after the procedure. More than one treatment session may be needed to create best results.

The replaced hairs are usually permanent. No long-term care is necessary ([MEDLINEPLUS, 2015b](#)).

Alternative Names

Hair restoration ([MEDLINEPLUS, 2015b](#)).

% this is it % perhaps as well

Glossary

A

- AC** alternating current..... 111, 112, 131
acute Sudden, severe, and not long lasting..... 43, 143, 155
AHRS American Hair Removal System..... 110, 111
alopecia areata This is a type of hair loss that occurs when your immune system mistakenly attacks hair follicles..... 25, 27, 36, 37, 40–43
alopecia totalis loss of all hair on the head..... 40–42
alopecia universalis loss of all hair on the body..... 40–44
anti-fungal effective against fungal infections..... 28, 201
anticoagulants Medical drugs that reduce the ability of your blood to clot..... 45, 122
autologous involving one individual as both donor and recipient..... 230

B

- beta-blockers** Medical drugs that are used to treat a number of conditions, such as high blood pressure..... 25, 45
biopsy a medical procedure that involves taking a small sample of body tissue so it can be examined under a microscope..... 31, 38, 41
BPH Benign Prostatic Hyperplasia..... 188, 189, 192

C

- CCG** clinical commissioning group..... 167
chronic A health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time..... 25, 28, 42, 193
coexisting existing at the same time..... 37
crown area The area in the top/back portion of the head which contains a swirl or spiral pattern of hair growth. Also called the 'vertex,' it may be the first area where male/female pattern baldness is noticed ([ISHRS, 2016](#))..... 31
CSS steady state serum concentrations..... 190

D

- DC** direct current..... 110, 112, 131
dermatitis a general term that describes an inflammation of the skin..... 73, 195
desiccation the state of extreme dryness..... 130
DHT dihydrotestosterone..... 8, 27, 29, 171, 172, 188, 189, 193

E

- EMLA** eutectic mixture of local anaesthetic - a eutectic mixture has a melting point that is lower than either constituent alone; therefore, this mixture of lidocaine and prilocaine in a 1:1 ratio is present in liquid phase..... 146, 156, 162
EMLA cream eudetic mixture..... 64, 70, 72, 136, 149, 151, 156, 157, 159, 161, 163, 196
enzyme An enzyme is a protein produced by the body to speed up a specific chemical reaction in the body. The body produces many different kinds of enzymes for many different body processes, such as digestion and blood clotting. Some inherited diseases are caused by

- problems with the production of certain enzymes. Doctors may measure the levels of certain enzymes in a person's blood to help diagnose certain types of disease, such as liver problems..... 29, 116, 188, 189, 193
- epidermis** the outer layer of skin..... 7
- erythema** a skin condition characterised by redness or rash..... 160
- F**
- FDA** United States Food and Drug Administration... 29, 33, 36, 39, 87, 88, 98, 100, 102, 103, 111–113, 115, 116, 118, 121, 134, 151, 154, 164, 166
- follicle** the tubular invaginations of the epidermis enclosing the hairs, and from which the hairs grow..... 10, 11
- follicular unit** A follicular unit is a naturally occurring grouping of one, two, or three (and rarely, four) hair follicles found in the skin. The average follicular unit contains about 2.4 hairs..... 231
- follicular unit extraction** a method of extracting single follicular units, one at a time, from the donor site by using a tiny punch excision. A punch used to extract single follicular units is typically 1mm diameter or less..... 30
- follicular unit graft** A graft consisting of a single follicular unit. In appropriate patients, artistic planning - in addition to the correct angulation, orientation, and positioning of follicular unit grafts - can yield an exceptionally "natural" appearance of the transplanted hair.. 30
- folliculitis** a bacterial infection in the hair follicles..... 59, 73, 78, 181, 201
- G**
- GIC** Gender Identity Clinic..... 167, 168
- GP** General Practitioner, a community-based doctor .. 13, 19, 26, 69, 104, 142, 161, 167, 168, 181, 200, 201, 236
- H**
- hair miniaturisation** a phenomenon in which strands of hair become thinner, shorter, more brittle, or weak with each successive progression through the hair growth cycle. Over time, the miniaturisation process leads to the appearance of thin or lackluster hair. In some cases, hair may stop growing altogether..... 32
- half-head** treatment to one half of the scalp, the other half was not treated..... 230
- Henle's layer** this is the third layer of the inner root sheath of the hair, consisting of a single layer of cubical cells with clear flattened nuclei. It is named after German physician, pathologist and anatomist Friedrich Gustav Jakob Henle..... 13
- hepatic** relating to the liver..... 190
- HF** high frequency..... 138
- hirsutism** excessive hair growth..... 116, 150, 164
- hives** This is an allergic skin reaction causing localised redness, swelling, and itching..... 191
- holocrine** releasing a secretion that is a product of disintegrating cells..... 11
- hormone** a chemical substance produced in the body which has a specific regulatory effect on the activity of certain cells or a certain organ or organs 8, 9, 11–13, 21, 25–29, 31, 36–38, 72, 162–164, 187, 188, 195, 200, 231
- HPL** Home Pulsed Light..... 115
- HS** hair shaft..... 13
- hydrolysed** Hydrolysed is the past tense of the word hydrolysis, therefore a hydrolysed object is one that has undergone hydrolysis. Hydrolysis is a chemical reaction in which bonds are broken in a molecule due to a reaction with water..... 12
- hydrophobic** repelling, tending not to combine with, or incapable of dissolving in water.. 149
- hypothyroidism** a condition in which the thyroid gland does not make enough of the hormones that are needed for metabolism and energy use..... 37
- I**
- IHRS** International Hair Removal Systems..... 111
- immune system** The body's natural defence against infection and illness... 27, 35, 37, 40, 42
- in-vitro** outside the body..... 189

- in-vivo** within the living organism 189
- indention** an indentation or dent 10
- invagination** the infolding of one part within another part of a structure 11
- IPL** intense pulsed light 86, 94, 101, 102, 168
- IRS** inner root sheath 13
- K**
- keloid scars** smooth, hard growths that sometimes form when scar tissue grows excessively...
138
- keratinized** organic process by which keratin is deposited in cells and the cells become horny
(as in nails and hair) 8, 10, 11, 13, 181
- M**
- mcgs** micrograms 189
- N**
- nanometer** A nanometer is the unit of measurement for the wavelengths of light and infrared
radiation, usually abbreviated to 'nm' 86
- naturopathic** This is a health care system that blends modern scientific knowledge with tra-
ditional and natural forms of medicine. The naturopathic philosophy is to stimulate the
healing power of the body and treat the underlying cause of disease 27
- NHS** The UK-wide National Health Service 167, 168
- nm** see 'nanometer' 86, 89–94
- O**
- occlusive dressing** a film dressing to cover EMLA Cream, and such like ... 149, 156, 157, 159,
160
- oedema** this is the medical term for fluid retention in the body. It often causes swelling in the
feet and ankles 158, 160
- OTC** over-the-counter ... 97, 112, 121, 124, 136, 141, 145, 149–151, 153, 156, 161–163, 170,
175, 200
- P**
- PCT** primary care trust 167
- PDT** Photodynamic therapy 114
- placebo** a simulated or otherwise medically ineffectual treatment for a disease or other medical
condition intended to deceive the recipient 230
- POM** prescription only medication, meaning that it has to be prescribed by your *GP* 161
- prepubescent** relating to the period before children start to develop adult sexual characteristics
9
- PRP** platelet-rich plasma 229, 230
- PSA** prostate specific antigen which is a marker for prostate cancer. The higher the PSA level
the greater the chance you have prostate cancer 192
- pseudofolliculitis barbae** swollen patches that are sometimes reddened and contain a buried
hair 117, 164, 181
- psychogenic** the name given to physical illnesses that are believed to arise from emotional or
mental stressors 9
- purpura** red or purple discolourations on the skin that do not blanch on applying pressure.
They are caused by bleeding underneath the skin 99
- R**
- randomised** When referring to an experiment or clinical trial, the process by which animal or
human subjects are assigned by chance to separate groups that compare different treat-
ments or other therapies. Randomisation gives each participant an equal chance of being
assigned to any of the groups 36, 230
- S**
- scalpel** A surgical knife 230, 232

steroid any of a large number of hormonal substances with a similar basic chemical structure, produced mainly in the adrenal cortex and gonads 27, 41, 42, 189, 200

STI sexually transmitted infection..... 173

T

telogen effluvium hair loss occurring in the telogen phase of hair growth, this is the second most common form of hair loss 25, 28, 35, 45

teratogen Any substance that causes birth defects..... 192

TGA thioglycolic acid 56

trichograms the microscopic examination of hair shafts..... 230

U

urticaria Also known as hives, welts, or nettle rash, is a raised itchy rash that appears on the skin 93, 160

V

vitiligo patchy loss of skin colour 43

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