Ethnic skin types:

The Fitzpatrick scale should not be used as the only guideline. All skin types should be assessed and the client's parent's and grandparent's ethnic origin should be considered to identify melanin levels to avoid over treatment.

Hair removal

General health and wellbeing, in particular skin conditions, have major effects on the outcomes of hair removal treatment. Skin must be studied before, during and after treatment. Dehydrated, dry, oily, combination, mature and sensitive skin all affect the currents used in electrolysis and pulse length and fluence in laser and IPL treatments. In all treatments the operator must be skilled to handle each case differently.

Laser and IPL hair removal relies on the melanin in the skin to heat the area to kill the hair follicle. Darker hair and skin heats faster causing it to be more prone to burning and problems. Fine and light coloured hair can be difficult to heat enough for hair follicle damage. Electrolysis works for all hair and skin types and is the only proven permanent hair removal method. Laser and IPL are a permanent hair reduction.

Hair grows in cycles and each hair has its own cycle. There are three main stages to a cycle; Anagen, an active growing phase lasting 2-8 years depending on where it is; Catagen, a short regression phase lasting 2-3 weeks in which the cells stop reproducing; Telogen, a few months resting phase, which allows the hair to be completely detached and fall out. Many factors can affect the growth, including central nervous, respiratory, digestive, endocrine, circulatory and urinary systems. All these factors affect the permanency of the hair removal, meaning the root and its surrounding tissue are not completely killed off and have the potential of regenerating and growing hair again, leading the treatment to not appear effective.

Following are two sections on Electrolysis and Laser/IPL treatment to include as much information as possible to make an informed choice when deciding on treatments.

Electrolysis:

Electrologists are members of professional bodies and their clinics also need to be registered with local authorities under local government regulations.

All needle type electrology is performed with the use of an epilator. The electrolysis epilator is the electronic device that emits the treatment energy thereby providing the chemical reaction and/or heat within a hair follicle to destroy it. 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 an electrical cable. Galvanic and Blend 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: multiple needle galvanic units, thermolysis units, and Blend units. Modern epilators are computerized or, to some degree, automated. Computerized 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 facial hair removal, a full featured, computerized epilator can greatly enhance the process.

Electrolysis Type	About	Pros & Cons
Galvanic/DC	The galvanic method was the first method developed for removing hair, first used for permanent hair removal in 1875 by Charles E. Michel, M.D. This method removes hair through chemical decomposition. 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. *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 rarely used because of this time constraint. 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 percent of the hairs treated.	Modern technology is all but eliminated the use of single needle galvanic units. Today, galvanic units will be of the multiple needle type. Due to controlling multiple needles at once, this is usually performed on the body and not the face. Very effective method for treating thick, course hair Effective on deep and distorted follicles. Less discomfort Slower process, therefore longer overall treatment time

Thermolysis	The thermolysis method is not true electrolysis since no chemical action is involved. It does, however, provide for permanent hair removal. Thermolysis is often referred to as electrolysis. In this everyday usage, electrolysis refers to all types of permanent hair removal using needle electro-epilation. 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. Thermolysis was first put into practice in 1923, but did not become popular until the 1940s. 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. 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, course and deeply rooted hairs that generally comprise terminal testosterone driven hair growth. The incidence of treatment complications can be somewhat higher with thermolysis as compared to multiple needle galvanic or Blend (described next). Additionally, treatment complications greatly increase with the use of flash (high intensity, short duration) thermolysis. The adverse result of pitted scarring to be greatest with flash thermolysis.	Quick treatment of each follicle therefore larger areas can be cleared in one sitting. Good for treating fine, shallow hair. Not effective on deep distorted follicles, therefore reduces chances of permanent removal. Least effective method for thick, coarse hair, but is an acceptable way to treat very fine, shallow hair.
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. Thermolysis typically provides a 15-25% kill rate for follicles treated.	
Blend	The blend method, also called dual action method, is the combination and simultaneous use of galvanic and thermolysis techniques. 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	Speed of thermolysis combined with the effectiveness of galvanic, therefore quicker overall treatment time.

	useful in treating the deep, course hair follicles comprising facial terminal testosterone driven hair growth. ***There is no better approach than the use of blend electrology in the treatment of facial hair removal for Transwomen.*** 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. Typically the kill rate for blend to be about 50 – 70%. 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 computerized blend epilators are better suited due to the extensiveness and sheer volume of follicles requiring treatment during facial hair removal. However, computerized 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.	***Well-suited for facial work.***

Laser & IPL

Currently all UK establishments providing light heat energy must register with the Healthcare Commission under the Care Standards Act 2000 (amended 2003). These are not an easy treatment and contrary to some marketing messages laser and light treatments rely on the skill and knowledge of the operator.

In terms of hair removal, lasers and light systems are used to cause selective damage of the Anagen hair follicle through the principle of selective photothermolysis. They use different frequencies targeting different pigmentation to damage the hair follicle by heating the hair shaft and hindering growth. This relies on melanin in the hair shaft to create the heat. The surrounding areas should be unaffected if the laser has been administered properly. Protection is also provided by cooling the skin by air/cryogen sprays; simultaneous contact cooling (lasers operated through a scanner using water); ice packs or cooling gels. Cooling also reduces pain, which can be more intense on bony areas and be more painful at certain times for physical reasons (such as menstruation) or emotional reasons (such as stress). The pain has been described as similar to a flick of a rubber band.

Hair will be shaved by the operator immediately before treatment to prevent thermal energy building up in the hair shaft and burning the skin. The hair appears to be growing a few days following treatment, this is known as a hair cast and is actually the treated hair shafts being shed from the follicle. These will fall out between 2 days and 2 weeks after treatment. New hair growth appears as hairs enter the anagen phase, new hair growth can be treated again and the percentage of regrowth decreases with each subsequent treatment.

Laser should not be used on:

- Broken skin or on skin conditions such as eczema, dermatitis or psoriasis or acne.
- Certain medications, in particular photo-sensitising drugs, certain antibacterial, antibiotics, antifungal, non-steroidial anti-inflammatories, cardio-vascular drugs, some anti-depressants and hormonal medication (including herbal remedies such as St John's Wort) as these can cause adverse skin reactions.
- Artificial/fake tan.
- Pigmentary conditions (vitiligo or melasma)
- Moles, tattoos and permanent make-up
- During pregnancy

Light-based treatments are also known triggers of the herpes simplex (cold soles). Good skin condition and hydration levels are also an important as this helps heal the skin.

The heating of the melanin is dependent on the wavelength of the laser light used or filtered light from IPL equipment. Below is a list of laser types and IPL.

Laser Type	Suitable for Skin Type & Hair Type	Pros & Cons
Argon	No longer used for hair removal	N/A
Alexandrite	Skin type: 1, 2, 3 Not good for dark skin Hair type: Best for dark hair on light skin	One of the quickest laser methods available. Type of laser emitting visible light/near infra-red wavelength, absorbed strongly by melanin increasing risk of pigmentary changes. Lower settings needed for longer duration and extra cooling.

Diode	Skin type: 1 – 5 Especially effective in types 1-4 Hair type: Best results for Black & Brown hair Newest & most common, laser system today	Type of laser emitting near infra-red wavelength, absorbed strongly by melanin increasing risk of pigmentary changes. Lower settings needed for longer duration and extra cooling.
Nd:YAG	Skin types: 5 & 6 (can do lighter skin too) (Designed for treating darker skin) Hair type: Not good for fine hair	Using a different infra-red wavelength which is much less absorbed by melanin reducing the risk of post-inflammatory and pigmentary changes. Requires more treatments and can be more painful
Ruby	Skin type: 1 & 2 Cannot be used for tanned/dark skin Hair type: Cannot be used for white/light hair Effective on fine hair.	Uses a visible light/near infra-red wavelength, absorbed strongly by melanin increasing risk of pigmentary changes. Lower settings needed for longer duration and extra cooling.

IPL

IPL Type	Suitable for Skin Type & Hair Type	Pros & Cons
Fluorescent pulsed light (FPL)	Best for Darker hair on light skin. Not good for blonde hair	
IPL	Intense Pulsed Light Skin types: 1-5 (Best for Pale to medium skin) But - Not good for dark skin and dark hair.	IPL is a non-laser source. It has a full spectrum of light and uses filters to select the appropriate wavelength needed for each treatment. IPL beams cover a larger area than lasers.

Sources:

- Encyclopedia of Hair Removal, G Morris & J Brown, 2006