

LASER

Laser is now the most talked about procedure. Now even the common man is synonymous with this world. Nowadays physician need not tell about it rather their patients come and enquire about it to them. It is the fantasy of some people to do the procedure with this equipment. Laser is being used widely in many of medical procedure but we will confine our talk about it to **hair** and its application in **skin** related procedure.

INTRODUCTION:-

Now let us first know what the term **LASER** means.

L = LIGHT

A= AMPLIFICATION BY THE

S= STIMULATED

E= EMISSION OF

R= RADIATION.

HISTORY: - Einstein introduced the concept of stimulated emission of light in 1917.

1st Ruby Laser was developed by Miamian in 1960.

Laser energy when applied on the human body is absorbed either by blood (Hb) water (in the skin) or melanin.

Depending about the color of the laser light they are of different type.

Red Light – Ruby Laser, Alexandrite (694-755nm)

Blue-green Light – Argon Laser.

Yellow Light – Pulsed dye.

Colorless Light – CO₂ Laser

Nd-yag Lasers – with wavelength of 1064nm

Di-ode Laser – here low power molecules are used.

LASER are used in medicine for

Surgical application: - manly for cutting, co-agulation and breaking.

Therapeutic: - pain & anti inflammatory.

Aesthetic: - Hair removal, resurfing, photo rejuvenation, pigmentation etc.

LASER LIGHT

Generation of Laser: - Laser light is generated by

1. lasing medium which may be liquid, gas or crystal
2. Mirrors: - which reflect the excited photons back to the cavity of the lasing medium.
3. Source of excitation for the lasing medium which may be the log continuous light, radio frequency, high voltage discharge, etc..

Wave length: - It is very important to select the exact right wave length to avoid the side-effect.

- o Fluence :- it is calculated as energy/area square joules/cm².

$$\text{energy} = \frac{\text{energy of a laser pulse.}}{\text{Cross sectional area of the beam.}}$$

Cross sectional area of the beam.

- o So fluence can be increased by increasing energy output or by decreasing the spot size .Darker the skin/ hair color lesser the fluence, fairer the skin greater the fluence.

Pulse width or duration. It is the measured time during which a fixed quantity of energy is delivered. It is measured in millisee(ms).

Thermal Relaxation Time: - it is the time taken for an object to cool to the temperature achieved immediately following a laser exposer. This technique allows the half safety as we have melanin on epidermis also apart from the hair on the epidermis.

Spot size: - It varies accordingly with the size of area to be treated.

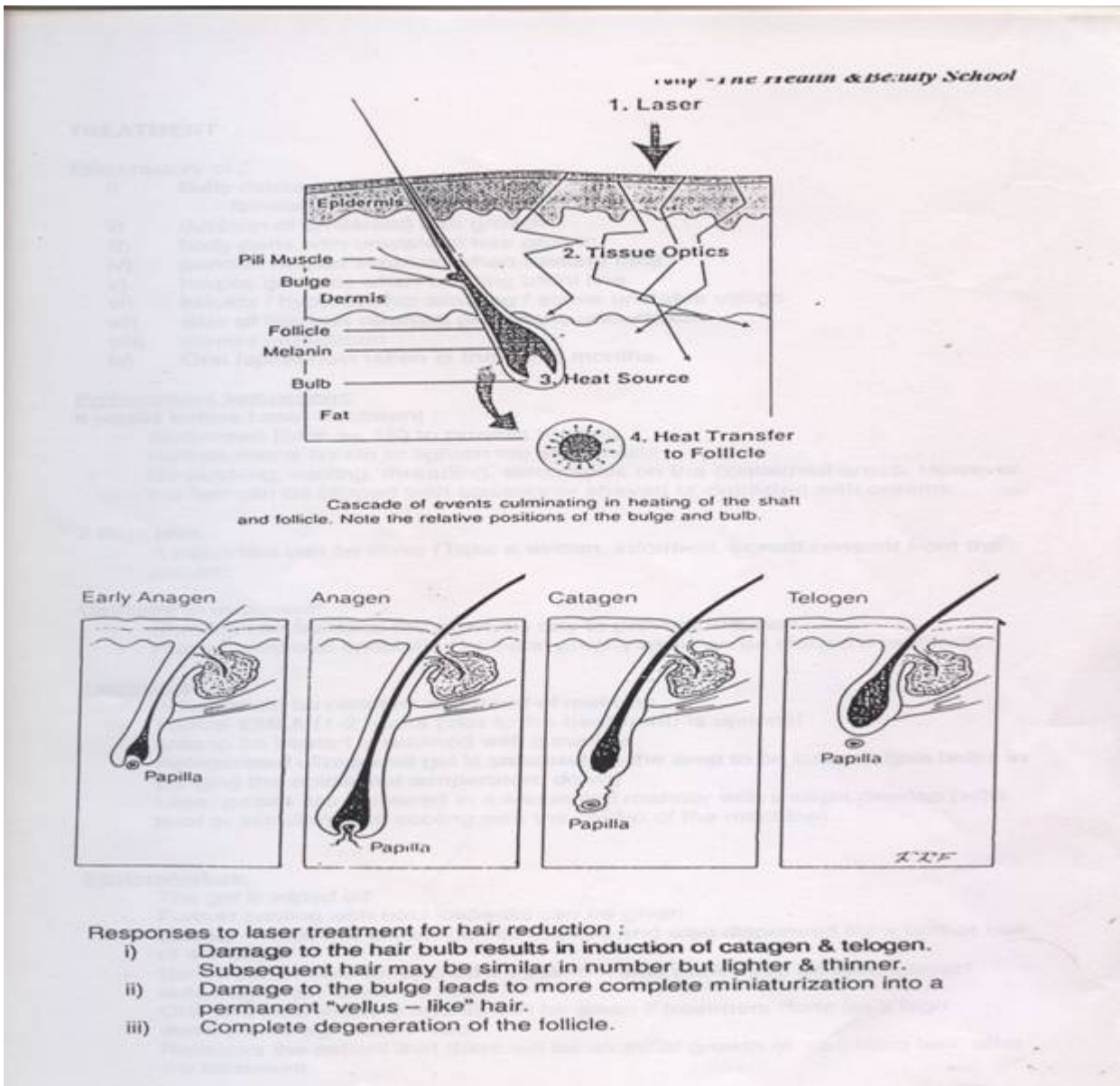
COSMETIC USE OF LASER:

Laser in hair removal: -

Indication for laser hair reduction: - a) Hirsutism b) Hyper trichoses c) Psuedofolliculitis barbac.

Cosmetically Laser hair reduction is done so that regular waxing is the depilatory method used to remove unwanted hair can be avoided.

Hair Growth cycle: - Hair growth is characterized by cyclic periods of growth(anagen phase) transilion(calagen) and rest(telogen phase). This varies from different body parts.



HAIR GROWTH TABLE: -

BODY SIZE Anagen.	% telogen	%Anagen	Duration of Telogen	Duration of
Face months	30	70	2-3 months	12
Axillae months	70	30	3-6 months	3-6
Lower Limb months	80	20	3-4 months	4-5
Scalp years.	15	85	2-3 months	4-7

How does laser treatment work for hair reduction

- i. Damage to the hair bulb results in induction of calagen & telogen. Subsequent hair may be similar in no but lighter & thinner.
- ii. Damage to the bulge leads to more complete miniaturization into a permanent vellous like hair.
- iii. Complete degeneration of the follicle.

Treatment: -

- i. First find out the cause of unwanted hair growth eg. Familial, cyst/tumor, drug, hormonal etc.
- ii. Duration of unwanted hair.
- iii. Unwanted hair in which body part
- iv. Oral isotractionoin taken in the last 6 months.
- v. Last date of any depilatory procedure undertaken]
- vi. Current medicine intake
- vii. History of herpes / koloid tendency / unstable vitiliyo or hypertrophic scarring.

Pretreatment Advice: -

- i. Not to wax hair for 6 weeks, can clip the hair with scissors or shaved.
- ii. Two days prior a patch test with the written informed consent signed.
- iii. Prophylactic oral antibiotic / antiviral can be given.

Technique:-

- i. Areas has to cleaned and freed of any make up.
- ii. Topical EMLA (1-2 hours prior to treatment) is optional.
- iii. Area to be treated is outlined with a marker.
- iv. Cool ultrasonic gel to be applied on the area of laser procedure done so that it brings down the temperature of that area.
- v. Laser pulse is delivered overlapping slightly each other.

Post Treatment:-

- i. The area to be cleaned of gel.
- ii. Cooling the area with ice packs.
- iii. Application of steroid antibiotic cream and advice to apply for next 3 – 4 days.
- iv. Advice on using sunscreen if the part is exposed to sun eg .face.
- v. Reassurance to the point that their may be initial growth of hair which will shed itself.
- vi. Their may be peri follicular oedema immediately for next 3-4 hours.
- vii. Erythema.
- viii. Slight pain may be experienced by some people.



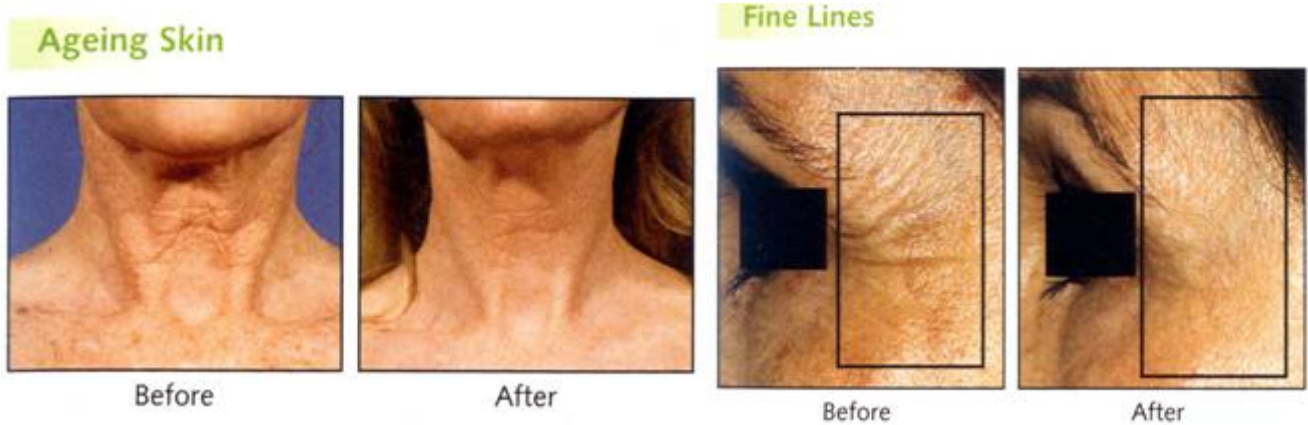
Contra-indication: - Absolute

- i. Lupus or other auto immense difference.
- ii. Pace maker
- iii. Epilepsy
- iv. pregnancy
- v. Service with acutance in the last 6 months.
- vi. Operation which has inserted a metal inside a body steel rod cans the service area.

Laser in Skin:-

1) **Rejuvenation:** - it is the procedure designed to produce healthier younger looking skin. Principles: - it brings about balance between collagen production & breakdown leading wrinkles, facial sag & rough skin texture.

It stimulates collagen & thus helps to reverse the process partially and thus reduce wrinkles and improve skin texture



2) **Acne :-** in acne they work by targeting the porphyrins found in the bacteria



propionibacterium acnes



3} Malesma



Laser is used to remove Tattoo, pigmentation, scar revision, freckles, and birthmarks.

In all this condition you get nearly 90% results. So now lasers procedure are substitute for some of the surgeries which were first essential but now they can be rectified by using **laser** procedure.