

## Permanent Hair Reduction with Sheerwave IPL 360



## Selective Photothermolysis

ALSO CALLED  
Laser Hair Removal

## Hair Removal - Results

- **Permanency:** The FDA and HEALTH CANADA defines permanent hair removal when all hair does not return for a longer period of time than the complete growth cycle
- Electrolysis = Permanent hair removal
- Laser and IPL = Permanent hair reduction

## Hair Removal - Results

- **Permanency:** The FDA and HEALTH CANADA defines permanent reduction when a significant amount of hair does not return for a longer period of time than the complete growth cycle
- Typical number of treatments for 90% of patients
  - 4-6 sessions for legs, hands, underarm and bikini lines
  - 6-8 sessions for back, chest and face

## Selective Photothermolysis (SPTL) Definition

“The matching of a specific wavelength and pulse duration to obtain optimal effect on a targeted tissue with minimal effect to surrounding tissue.”

Anderson and Parrish, Science, 1983

## Achieving Selective Photothermolysis\* Theory

1. A wavelength that reaches and is preferentially absorbed by the desired target structures
2. A pulse duration less than or equal to the time necessary for cooling of the target structures
3. Sufficient fluence to reach a damaging temperature in the targets

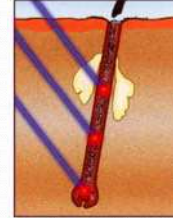
R. Anderson, Cutaneous Laser Surgery, Chapter 1, (Mosby, 1994)

## Photo-Epilation Treatment Goals

- Target the hair shaft with light and be absorbed with enough energy
- Coagulate the hair follicle – create a local burn
- No collateral damage to the tissue or skin

## Photo-Epilation

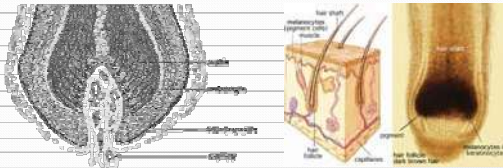
- Heat follicle to a temperature high enough to destroy it without damaging surrounding tissue using LASER or LIGHT energy.



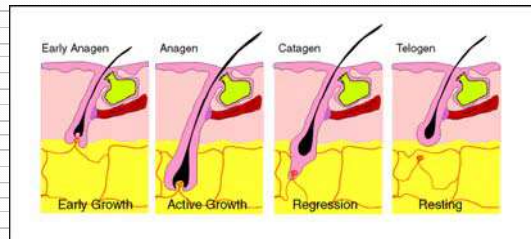
Laser/light penetrating the hair follicle

## How Does It Work

1. By damaging the follicle by coagulating the melanocyte and Matrix cells
2. By partially Clotting capillaries with heat energy, which means less nutrition and oxygen to the hair follicle
3. By triggering matrix cells to operate calcium pumps and exhaust the cells energy resulting in inhibiting cell metabolism



## Hair Growth Phases



# Hair Depth-Density-Phases

| Area of the body | Depth of follicle | Hair density | Telogene phase duration | % of hairs in the Telogene phase | % of hairs in the Anagen phase |
|------------------|-------------------|--------------|-------------------------|----------------------------------|--------------------------------|
| Scalp            | 5-7 mm            | 350/sq.cm    | 3 months                | 15%                              | 85%                            |
| Beard            | 2-4 mm            | 500/sq.cm.   | 10 weeks                | 30%                              | 70%                            |
| Upper lip        | 1-2.5 mm          | 500/sq.cm.   | 6 weeks                 | 40%                              | 60%                            |
| Axilla           | 4-5mm             | 65/sq.cm.    | 3 months                | 75%                              | 25%                            |
| Back/Chest       | 2-5mm             | 70/sq.cm.    | 3 months                | 85%                              | 15%                            |
| Breasts          | 2-4mm             | 70/sq.cm.    | 4 months                | 75%                              | 25%                            |
| Arms             | 2-4 mm            | 80/sq.cm     | 5 months                | 85%                              | 15%                            |
| Legs             | 2-4.5 mm          | 60/sq.cm.    | 6 months                | 85%                              | 15%                            |
| Bikini           | 4-5 mm            | 70/sq.cm.    | 3 months                | 70%                              | 25%                            |

## Hand Piece

Patented Technology Focuses Energy Underneath the Skin

The diagram shows a hand piece on the right. On the left, two cross-sections of skin are shown. The first shows a magnifying glass over a spot on the epidermis. The second shows the same spot with energy being focused on the dermis, indicated by red and blue lines representing energy paths.

## Targeted Focused Energy

The diagram shows a cross-section of skin with a hand piece positioned above it. A red circle highlights a hair follicle. Labels with arrows point to 'MELANIN IN EPIDERMIS' and 'MELANIN IN FOLLICLE', indicating the target areas for the energy.

## Different Depths of Hair Follicles

The diagram shows a cross-section of skin with several hair follicles. Labels with arrows point to 'NORMAL DEPTH' (shallow follicles) and 'DEEP FOLLICLES' (deeper follicles).

## When the Skin is Not Adhering to the Sapphire

- To provide a safe treatment, it is essential to ensure that the entire surface of sapphire is fully adhered to the surface of the skin. If it's not possible to ensure maximum adhesion, it is recommended to use a white plastic opaque film to cover the portion of the sapphire not adhering to the skin.

## Treatment Hand Piece Position

Full contact of the prism on the skin is essential to avoid burning of the skin

The diagram shows two cross-sections of skin. The left one shows a 'Sapphire' prism in full contact with the skin, marked with a green checkmark. The right one shows the prism partially lifted from the skin, marked with a red X.

## Hair Reduction Suggestion

### Treatment Protocols

- To provide the most effective treatment, two passes are used
  - The first pass is horizontal and the second is vertical overlapping each spot by 10% to 20%
  - The second pass is performed using deep follicle option, this will offer better results as the hairs are not at the same depth in the skin



## Treatment Intervals

- Generally use 4 to 6 weeks between sessions
- Hot seasons and warm areas: 2 to 3 weeks between sessions
- Ideally, wax the first time. After 3 to 6 weeks, when hair regrows, start the first treatment for optimal results

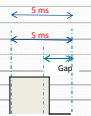
## Treatments Intervals



- After the 5th treatment: All treatments should be booked 6 weeks apart
- For best results: The first two treatments can be done 2 weeks apart
- The number of treatments will vary depending on the area and individual characteristics of the client and their skin type

## 3 Hair Removal Options

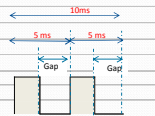
### Hair Removal



Pulse Width = 5 ms

Total Energy = 13 J/cm<sup>2</sup>  
(colored area)

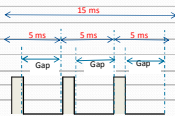
### Deep Follicles



Pulse Width = 10 ms

Total Energy = 13 J/cm<sup>2</sup>  
(the sum of the colored areas)

### Sensitive Skin



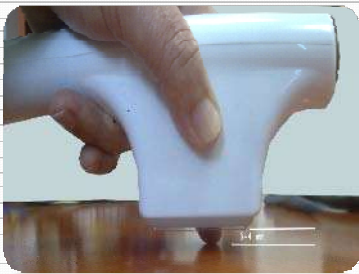
Pulse Width = 15 ms

Total Energy = 13 J/cm<sup>2</sup>  
(the sum of the colored areas)

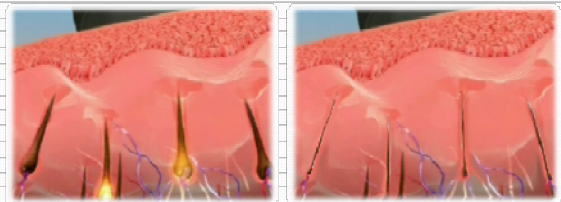
## Dark Skin Consideration

- The longer the pulse time in milliseconds the less energy will be delivered using the same amount of Joules
- For Fitzpatrick 4 skin types, there is less chance of burning the skin

## Special Applications for Fine Hair Only



## Special Applications for Fine Hair



Normal Hair

Fine Hair

## Treating Fine and Blond Hairs




1. Prepare the treatment area
2. Apply wax and remove the hair with a cotton strip
3. Wait 20 minutes, enabling the blood droplets to coagulate and darken
4. Apply gel to the treatment area
5. Press the hand piece firmly to the skin and flash 2 times, both vertically and horizontally





Hair Before Waxing      Damage to the follicle

## Fitzpatrick Scale

| phototype   | peau            | cheveux               | yeux           | taches de rousseur | coups de Soleil          | bronzage           |
|-------------|-----------------|-----------------------|----------------|--------------------|--------------------------|--------------------|
| 0 (albinos) | presque blanche | blancs                | bleus          | absentes           | systématiques            | impossible         |
| I           | très claire     | blonds, roux          | bleus, verts   | présentes          | systématiques            | absent             |
| II          | très claire     | blonds, châtain clair | clairs         | absentes ou rares  | fréquents                | difficile, lent    |
| III         | claire          | châtains              | marrons        | absentes           | assez fréquents          | progressif         |
| IV          | mate            | châtains, bruns       | marrons, noirs | absentes           | rare                     | bronzage bien      |
| V           | foncée          | bruns, noirs          | foncés         | absentes           | exceptionnels ou absents | intense            |
| VI          | noire           | noirs                 | foncés         | absentes           | absents                  | intense et profond |

## Results and Expectations

**A successful treatment offers 80%-90% permanent hair reduction**

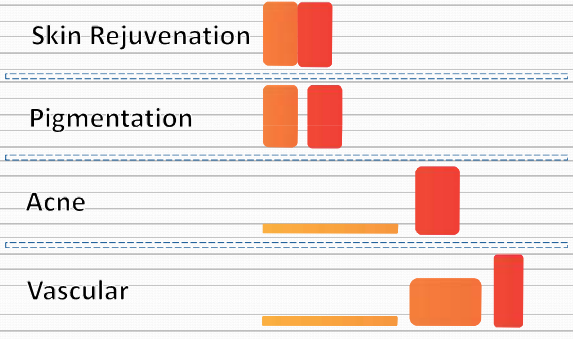
## Possible Side Effects

- Burns
- Hyperpigmentation
- Hypopigmentation
- Erythema
- Crustings

## Treating Side Effects

1. If patient's/client's complain about excessive pain or if Erythema is observed, apply a cool gel to retain moisture to the skin
2. Ask the patient/client to apply a pH balancing cream or an over the counter medication based ointment like Trolamine or Biafine (3 times a day) to avoid blisters
3. The red and brown marks will start to lighten up within a week

## Flash Patterns



Skin Rejuvenation

Pigmentation

Acne

Vascular

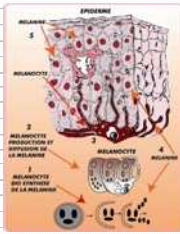
## Hyperpigmentation

**Hyperpigmentation:** also known as age spots, Melasma, etc., is an esthetic skin disorder that can be treated and lightened by applying an Intensive Light Energy.

## 2 Types of Pigmentary Changes

- Hypomelanosis
- Hypermelanosis

## Hypermelanosis Main Cause: Melanocytes



**Melanine** is found in higher quantities in the **basal** structure and **keratinocytes** cells or Dermal Macrophage

## Etiological Factors Hypermelanosis

- Pregnancy
- Genetics (racial background, particularly Latino), particularly affects women and those living in the tropics
- Endocrinological (hormonal balance)

## Etiological Factors Hypermelanosis

- Hereditary or Developmental Disorders
- Metabolic Disorders
- Endocrine Disorders
- Inflammatory Disorders
- Chemically Induced Disorders
- Nutritional Disorders
- Neoplastic Disorders

## Chemically Induced Disorders

### • Tetracycline Case



### • Chemotherapeutic Agents



Chemotherapy-induced stomatitis

### • Nutritional Disorders

**Vitamin B12 deficiency** occurs frequently among elderly people (more than 20% of the time), but it can also affect younger people. Since clinical symptoms may be subtle, it is often unrecognized. A lack of Vitamin B12 can result in fatigue, tiredness and apathy, feelings of illness, dizziness, vertigo, memory loss, cognitive impairment (attributable to old age).

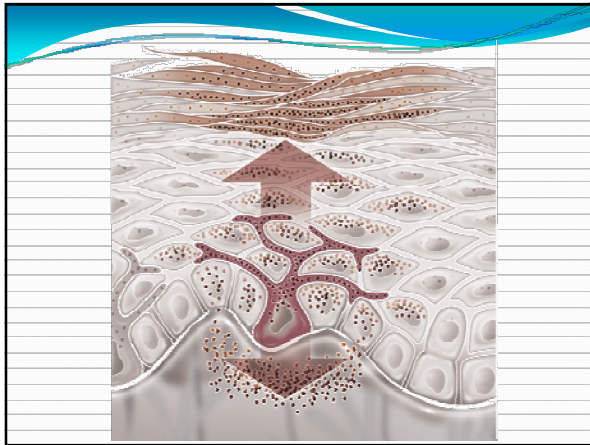
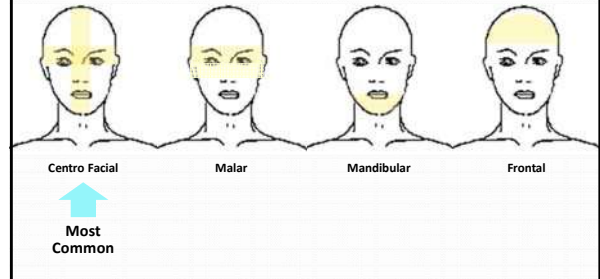


## Facts Are

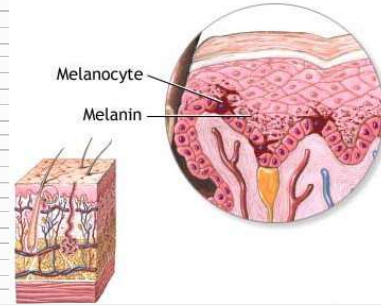
- 50% - 70% of pregnant woman develop Melasma
- 8% - 29% of women taking birth control develop Melasma

## Melasma

### 4 Different Clinical Patterns



**EPIDERMAL:** Melanocyte is dendritic cell filled with pigment in the basal and upper basal layers

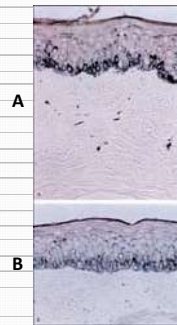


**DERMAL:** Melanophage in dermal structures  
ex: poikiloderma of Civatte or pigmented contact dermatitis



Fontana masson stain for melanin

## Melasma



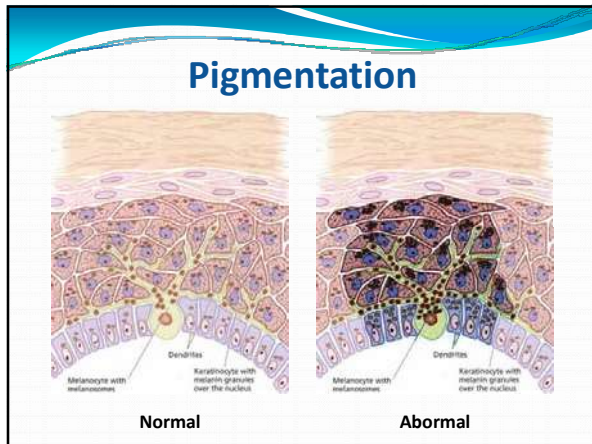
A) Hyperpigmentation:

- Epidermal Melanin
- Dermal melanofages

B) Normal Skin

Grimes et al. Am J Dermatopathol 27:96, 2005





## ACNE

**17 million people in the United States are affected, making it the most common skin disease**

## Acne

Acne typically appears on the:

- Face
- Neck
- Chest
- Back
- Shoulders

## Terminology

**Non-inflammatory Acne Lesions:**

- Open Comedones
- Closed Comedones

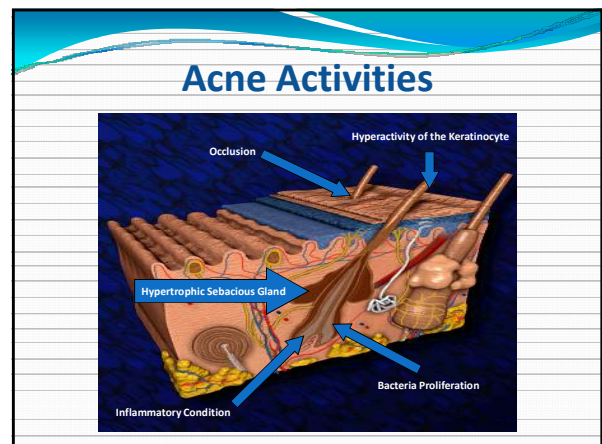
**Inflammatory Acne Lesions:**

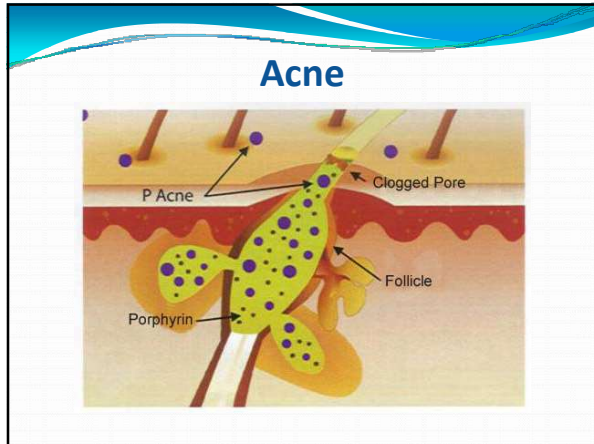
- Papules
- Pustules
- Cysts/Nodules

## Bacteria Involved In Acne

- Propionibacterium acne
- Staphylococci
- Corinebacterium acne
- Helicobacter pylori
- Micro-yeast

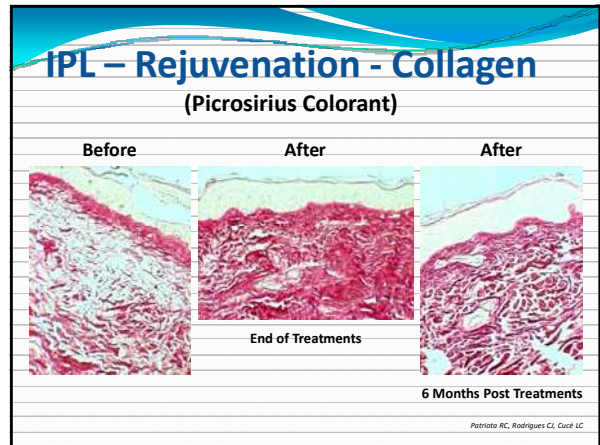
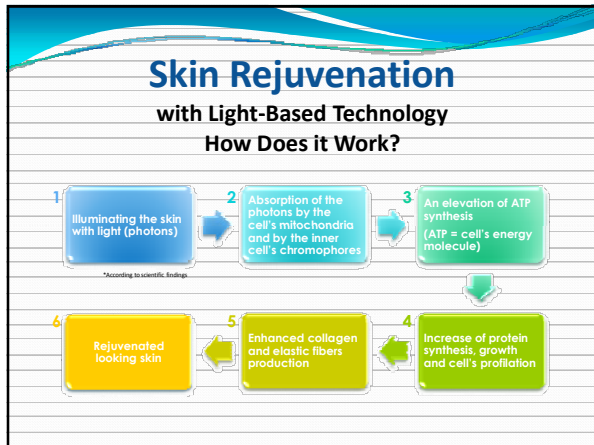
**Propionibacterium Acne**





### Skin Rejuvenation

The demand for youthful skin is now greater than ever. Today, with the help of Light-Based Technology, patients are finally able to reclaim their youthful skin in a matter of minutes with no pain in a safe and inexpensive manner.



### What is Rosacea?

Rosacea is a family of neuro-vascular skin disorder

### Sensitive Skin: Characteristic

**Permanent skin state often genetic**

**Visible aspect:**

- Thin, transparent
- Redness, often permanent
- Skin microcirculation disrupted

**Often related to skin condition:**

- Rosacea
- Atopic or seborrheic Dermatitis



Prone to develop: eczema, psoriasis, herpes

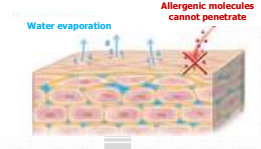
Alteration of the skin barrier function

Vulnerable to irritants

Higher sensitivity during winter

### Skin Protective Barrier

**NORMAL SKIN**

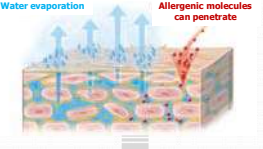


Water evaporation

Allergenic molecules cannot penetrate

Allergens don't affect the skin

**ATOPIC SKIN**



Water evaporation

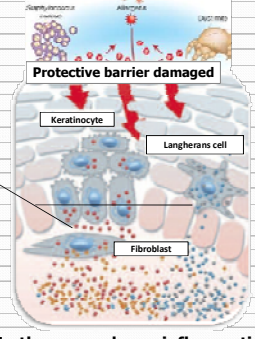
Allergenic molecules can penetrate

Water evaporation, dehydration

Allergens can affect the skin

Inflammatory reactions

### Redness: Inflammatory Reactions



**Production of cytokines (inflammatory molecules) by keratinocytes + by langerhans cells**

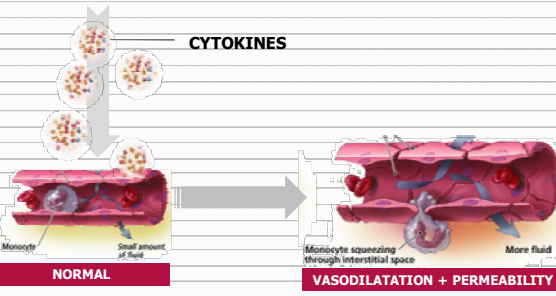
**Protective barrier damaged**

**DID YOU KNOW?** Sensitivity (itchiness, pain, heat) is due to the cytokine production

**Erythema, oedema, inflammation**

### Cytokine effect on blood capillaries

**CYTOKINES**








**NORMAL**

**Microvessels squeezing through interstitial space**

**More fluid**

**VASODILATATION + PERMEABILITY**

### Rosacea Stage

| 1   | 2   | 3   | 4   |   |
|---|---|---|---|---|
|  |  |  |  |  |
| <b>Erythema</b><br>Diffuse redness  | <b>Couperose</b><br>Telangiectasia  | <b>Acne Rosacea</b><br>Demodex folliculorum<br>Papule pustule                       | <b>Rhinophyma</b>   | <b>Ocular rosacea</b>   |
| Chronic dilatation of blood capillaries   | Permanent Pathologic dilatation of the capillaries                                  | Proliferation of the Demodex Folliculorum in the hair follicle and sebaceous gland  | Connective tissue hypertrophy   | Inflammation. 50% of people prone to Rosacea can develop it                         |

### Area Affected by Rosacea


Areas often plagued by rosacea



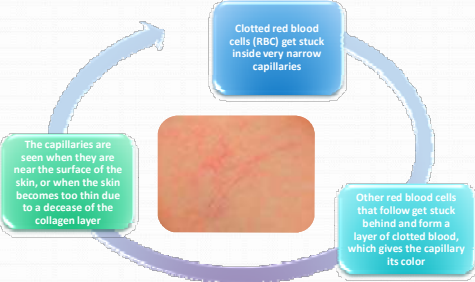


## Stages of Rosacea

1. Diffused redness
  - Permanent and non-permanent
2. Telangiectasia
  - Dilated capillaries
3. Acne rosacea
  - Demodex folliculorum mite
4. Rhinophyma
5. Ocular rosacea



## How Do Spider-Like Capillaries Form?




## Vascular Treatment Using Light-Based Technology

### How Does it Work?

When handling the capillaries two treatments are actually being administered:

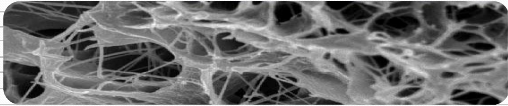
1. **Breaking the layer of clotted blood and opening the capillary again**, resulting in free blood flow through the capillary and the disappearance of the purple color.
2. **Stimulating the collagen layer to produce more collagen**, resulting in thicker skin that conceals the capillaries.



## Vascular Treatment Using Light-Based Technology

### Collagen Rejuvenation

In addition, the light energy that turns into heat energy creates a skin rejuvenation process that produces new **collagen** and subsequently thickens the skin, making it less transparent and the capillary less visible.




Source of collagen image: Bath University

## Tattoo Removal

### Not Recommended

Having a tattoo these days is more common than it has ever been. With so many people having tattoos, there are more and more people who desire to get rid of them.

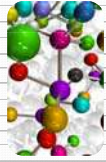
Tattoos are the result of pigments that are inserted into the skin and stay there. After these pigments (colors) are inserted into the skin, they form constructions of pigment molecules which are too large to pass between the skin cells, and stay trapped inside the skin for many years.



## Removing Tattoos Using Light-Based Technology

### How Does it Work?

1. The energy of the light pulse is absorbed in the pigments of the tattoo, shakes the connections between the pigment molecules and gradually breaks the big pigment molecules constructions into small ones.
2. When a piece is small enough to pass between the cells, it is treated by the immune system as foreign bodies and is driven out of the blood stream and the body.
3. After several treatments the tattoo fades away.



Tattoo removal using light-based technology started because it is a well known fact that a tattoo which is often exposed to sun light fades away quicker than tattoo that is not exposed to sun light.

## Lasers

First of all, you need  
to learn some physics!



## LASER

L Light  
A Amplified by  
S Stimulated  
E Emissions of  
R Radiation

## IPL

I Intense  
P Pulsed  
L Light

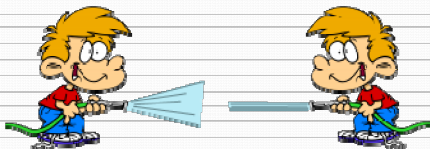
## Laser vs. Intense Pulsed Light

Both are light-based technologies  
Both work by selective photothermolysis

### What is the difference?

- Lasers emit only one specific wavelength light
- Intense Pulsed Light uses broad range of light, consisting of many different wavelengths

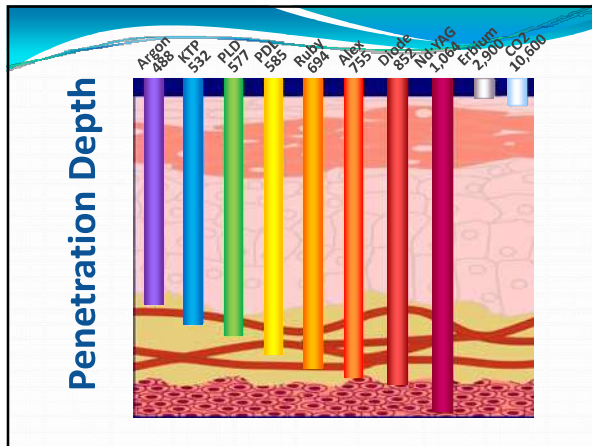
## IPL vs. LASER



## Laser Physics

### Output of energy

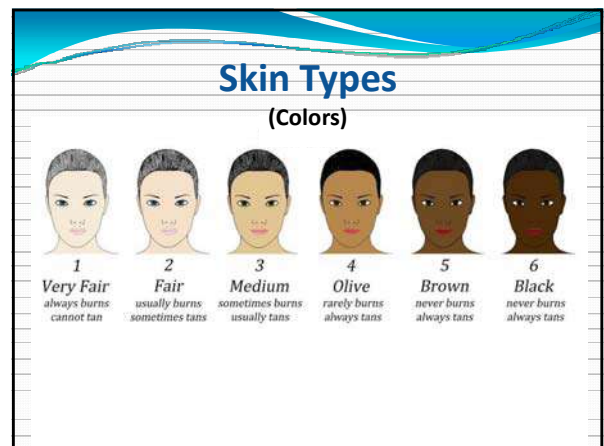
- Continuous wave: Watts
- Pulsed mode: Joules
- Fluence = Energy (j)/cm<sup>2</sup>  
= j/cm<sup>2</sup>



# Skin Types

- ## Skin Types
- ### Fitzpatrick Types
- I Always burn, never tan
  - II Always burn, sometimes tan
  - III Sometimes burn, sometimes tan
  - IV Never burn, always tan
  - V Moderately pigmented (Hispanic, Asian)
  - VI Black

- ## Contraindications
- ABCD : Skin malignancy or precancerous pigmented lesions (actinic keratosis – SSC, nevocellular nevi – melanoma)
  - Pregnancy
  - Tanned skin
  - Diseases stimulated by light (lupus, epilepsy, solar urticaria)
  - Use of photosensitive medications or herbs
  - Use of anticoagulants for VL treatment
  - Fragile and dry skin (accutane or low pH AHA's)
  - Fragile blood vessels (diabetes, alcoholism)
  - History of keloid scarring





## Skin Types

### Fitzpatrick Scale for Skin-Type Classification

| Skin type | Skin color                   | Hair color (earliest)  | Eye color (most common) | Description                          |
|-----------|------------------------------|------------------------|-------------------------|--------------------------------------|
| I         | White or very pale           | Blonde                 | Blue, grey, green       | Always burns, never tans             |
| II        | Pale white with beige tint   | Lightest or dark blond | blue                    | Always burns, sometimes tans         |
| III       | Beige to light brown (olive) | Dark brown             | Dark brown              | Sometimes burns, always tans         |
| IV        | Light to moderate brown      | Black                  | Brown                   | Rarely burns, always tans            |
| V         | Medium to dark brown         | Black                  | Brownish black          | Rarely burns, tans more than average |
| VI        | Dark brown to black          | Black                  | Black                   | Never burns                          |

## Pre-Treatment

- Patient/client history - eligibility
- Patient/client information and expectations
- Informed consent form
- Photographing
- Clean treatment area
- Shave or protect hair as applicable
- Some case: Cool area to minimize pain and protect epidermis (not vascular)
- Pain management: EMLA or Lidocaine 4% for 1 h (rarely)
- Intensity test (optional)
- Test patch

## Post Treatment

- Moisturizing and conditioning the skin between session
- See the protocols sheets
- SPF 30
- Alaska post laser wax (asked info sheet)

## IPL 360

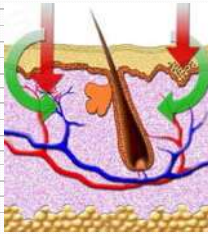
Powered by Active Technologies



The image shows the IPL 360 device, a tall, grey, cylindrical unit on wheels. To its right are two hand pieces: a larger, grey, ergonomic one and a smaller, white, rectangular one. To the left of the device is a small graphic with the text 'IPL360 powered by Active Technologies'.

## Applications

- Two of the most popular uses of IPL systems
- Photorejuvenation
  - Vascular
  - Pigmentation (Dyschromia)
  - Texture and pore size
- Hair Removal
  - Variety of skin types
  - Variety of hair colors
  - Treatment of acne
  - Hyperhidrosis



The diagram illustrates the IPL treatment process on a cross-section of skin. A hair follicle is shown in the center, with red arrows pointing down to the root, indicating the absorption of light energy. Green arrows point up from the skin surface, representing the cooling effect of the treatment. The skin layers (epidermis and dermis) and blood vessels are also depicted.

## Special Features

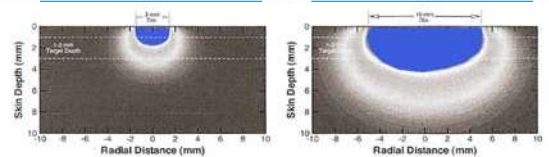
### IPL 360

- The least painless IPL technology on the market
- The fastest IPL technology on the market
- Unique patented hand piece for light and fine hair and skin rejuvenation
- The most easy on the market to maintain
- Integrated cooling hand pieces
- Integrated measuring system (intensity of the flashes)
- Small hand piece: 15x50mm (200k pulses) duration plus air cooling system
- Large hand piece: 15x30mm (250k pulses) duration plus integrated cooling system

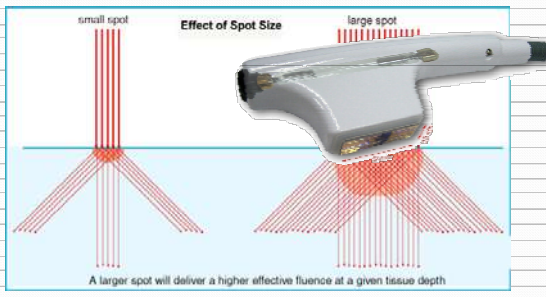
## Safety Standards and Approvals

- **FDA** US Safety & Effect Standard
- **Health Canada** Health Ministry Approval
- **CE-M-MDD** Medical Standard
- **ISO-13485** Medical Manufacturing Standard
- **TGA** Australian Medical Approval
- **CFS** Health Ministry Approval
- **CSA** Canadian & US Standards

## Depth and Penetration of Light

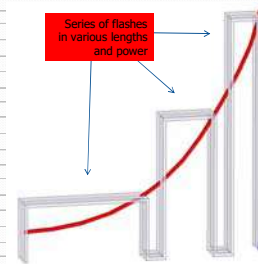


## More Efficient IPL Technology with a Larger Spot Size



## IPL 360's Unique Flash Pattern System

The IPL 360 advanced technology offers a unique pattern of flashes that are adjusted to the individual treatment mode. The series of flashes differ in their length and power, build up heat in the targeted tissue and enhance the effectiveness of the treatment.



| TREATMENT        | Passages | Flashes | Light or firm contact | Gel temperature  | Energy program            | Treatments | Treatment interval                  | Colored marker |
|------------------|----------|---------|-----------------------|------------------|---------------------------|------------|-------------------------------------|----------------|
| Hair removal     | 2        | 1       | firm                  | Cold gel         | 0-12                      | 4-15       | 4-6 weeks                           | no             |
| Acne             | 2        | 2       | 1-light<br>2-firm     | Cold gel         | 0-8                       | 5-8        | 2-7 days                            | no             |
| Pigmentary spots | 1        | 2**     | light                 | Room temperature | +2 - +3 of normal program | 5-8        | 3 days after first- 2-3 weeks after | yes ***        |
| Pigmentary zone  | 1        | 2       | light                 | Room temperature | 5-12                      | 5-8        | 3 weeks                             | yes ***        |
| Vascular         | 1        | 3       | light                 | Cold gel         | 3-8                       | 6-10       | 2 weeks                             | no             |
| Rejuvenation     | 2        | 1       | 1-light<br>2-firm     | Room temperature | 3-8                       | 6-10       | 2-4 weeks                           | no             |
| Tattoo           | 2        | 2       | light                 | Room temperature | 5-12                      | 6-10       | 3-4 weeks                           | no             |

(\*\*) A first treatment, then a second after 20 minutes if no rednesses. (\*\*\*) When using a brown marker, limitate energy level to 8. (\*\*\*) **For the face, the highest program is 8.**