
Postgraduate Certificate in Cosmetic Dermatology

Lasers and Light-Based Therapies

In the field of cosmetic dermatology, light-based therapies and lasers have become increasingly popular due to their effectiveness in treating various skin conditions. In this explanation, we will cover key terms and vocabulary related to lasers and light-based therapies in the context of the Postgraduate Certificate in Cosmetic Dermatology.

Lasers: An acronym for "Light Amplification by Stimulated Emission of Radiation," lasers are devices that emit light beams of a single wavelength and high energy. They are used in cosmetic dermatology for various purposes, such as hair removal, skin rejuvenation, and treatment of vascular and pigmented lesions.

Light-based therapies: These are non-invasive treatments that use light to improve the appearance of the skin. They include Intense Pulsed Light (IPL), LED (Light Emitting Diodes), and photodynamic therapy.

Intense Pulsed Light (IPL): IPL is a type of light-based therapy that uses a broad-spectrum light source to treat various skin conditions, such as pigmentation, vascular lesions, and photoaging. IPL can also be used for hair removal.

LED (Light Emitting Diodes): LED is a low-energy light-based therapy that uses different wavelengths of light to improve skin conditions, such as acne, rosacea, and pigmentation.

Photodynamic therapy: Photodynamic therapy is a light-based therapy that uses a photosensitizing agent and a light source to treat various skin conditions, such as actinic keratosis, acne, and skin cancer.

Wavelength: Wavelength refers to the distance between two consecutive peaks or troughs of a wave of light. Different wavelengths correspond to different colors of light and have different effects on the skin.

Chromophore: A chromophore is a molecule that absorbs light and gives it a specific color. In cosmetic dermatology, chromophores include melanin (responsible for skin and hair color), hemoglobin (found in blood vessels), and water.

Fluence: Fluence refers to the amount of energy delivered per unit area of skin. It is measured in J/cm² and is an important parameter in laser and light-based therapies.

Pulse duration: Pulse duration refers to the length of time that the laser or light beam is delivered to the skin. It is measured in seconds or fractions of a second and is an important parameter in laser and light-based therapies.

Spot size: Spot size refers to the diameter of the laser or light beam. It is measured in millimeters and is an important parameter in laser and light-based therapies.

Thermal relaxation time (TRT): TRT is the time it takes for a heated target to cool down to 50% of its peak temperature. It is an important parameter in laser and light-based therapies as it helps determine the

appropriate pulse duration.

Epidermal cooling: Epidermal cooling is a technique used to protect the epidermis during laser and light-based therapies. It involves cooling the skin before, during, and after the treatment, thus reducing the risk of burns and pigmentation changes.

Selective photothermolysis: Selective photothermolysis is a principle used in laser and light-based therapies to target specific chromophores in the skin. It involves delivering a specific wavelength, fluence, and pulse duration to selectively heat and destroy the target chromophore while minimizing damage to surrounding tissues.

Adverse effects: Adverse effects are unwanted side effects of laser and light-based therapies. They can include burns, pigmentation changes, scarring, and eye damage.

Post-inflammatory hyperpigmentation (PIH): PIH is a common side effect of laser and light-based therapies, especially in darker skin types. It is characterized by the development of dark spots or patches on the skin due to inflammation and melanin overproduction.

Test spots: Test spots are small areas of skin treated with a laser or light-based therapy before the full treatment. They are used to assess the patient's response to the treatment and to determine the appropriate settings for the full treatment.

Fractional lasers: Fractional lasers are a type of laser that delivers energy in a fractionated pattern, creating microscopic columns of damage in the skin. This allows for faster healing and less downtime compared to traditional lasers.

Ablative lasers: Ablative lasers are a type of laser that vaporizes the skin, removing the epidermis and a portion of the dermis. They are used for skin resurfacing and have a longer downtime compared to non-ablative lasers.

Non-ablative lasers: Non-ablative lasers are a type of laser that heats the skin without vaporizing it. They are used for skin rejuvenation and have minimal downtime compared to ablative lasers.

Q-switched lasers: Q-switched lasers are a type of laser that delivers short, high-energy pulses of light. They are used for tattoo removal and the treatment of pigmented lesions.

Pulsed dye lasers (PDL): PDL are a type of laser that delivers yellow or orange light to selectively target hemoglobin. They are used for the treatment of vascular lesions, such as spider veins and port-wine stains.

In conclusion, understanding the key terms and vocabulary related to lasers and light-based therapies is crucial for success in the Postgraduate Certificate in Cosmetic Dermatology. By familiarizing yourself with these terms, you will be better equipped to understand the mechanisms of these treatments, assess patient outcomes, and make informed decisions about treatment plans. Remember to always consider the patient's skin type, the target chromophore, and the appropriate parameters when using laser and light-based therapies.