

Vbeam

Mechanism of Action

The **Vbeam Laser System** is a flashlamp-excited pulsed dye laser indicated for dermatological applications. It delivers pulsed laser energy at a wavelength of 595nm that passes through the dermis and epidermis skin layers and is absorbed by the oxyhemoglobin in the blood vessels rather than by the surrounding tissue.

Selective Photothermolysis - The process of targeting a specific chromophore. Vbeam targets oxyhemoglobin. Ideally, the wavelength selected for irradiation of vascular lesions is highly absorbed by the lesion and only minimally absorbed by other competing chromophores in the skin.

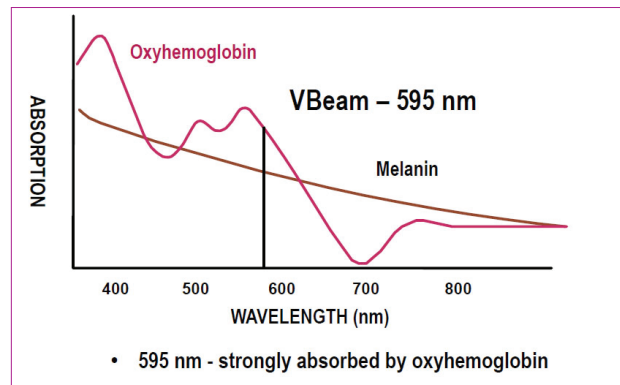


Figure 1

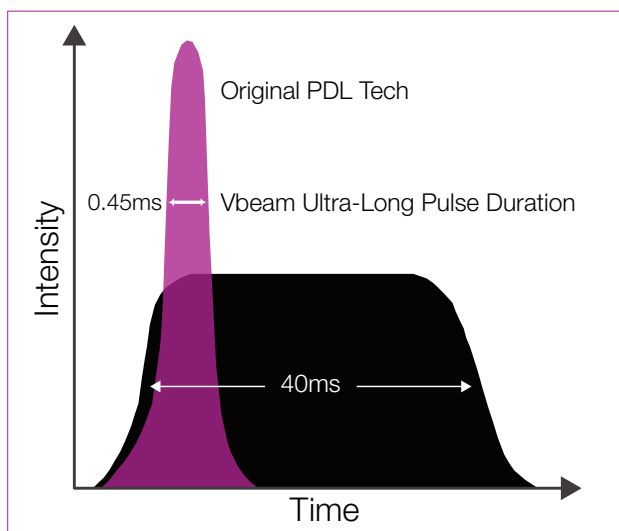


Figure 2

Pulse Duration - By varying the pulse duration, treatments can be performed purpurically (with bruising) by rupturing the blood vessel, or sub-purpurically by slowly heating the vessel causing coagulation of the blood vessel.

The Vbeam family has 0.45ms, 1.5ms, 3ms, 6ms, 10ms, 20ms, 30ms & 40ms pulsed durations. The shorter the pulse duration the more destructive the energy becomes, while with the longer pulse durations, the energy is more gentle thus causing coagulation of the target without harming structures around the treated area.

For coagulation and treatments without purpura, the laser pulse duration should be shorter than the thermal relaxation time of the target absorbing the laser radiation in order to confine the thermal damage and spare surrounding tissue. The relaxation time of a target is determined by the target's size (milliseconds or greater for vascular lesions).

Unique Micro-Pulse Design - The pulses delivered with the Vbeam can be divided into a maximum of 8 micro-pulses, thus delivering the total energy with consistent, uniform distribution across the entire pulse. This enables using a total of higher energy per pulse, without causing damage to the surrounding tissue.

Treating Pigmented Lesions - Vbeam can be used to treat superficial, benign pigmented lesions by using a special hand piece.

The hand piece applies pressure to the area, causing bleaching of the underlying blood vessels. The 595nm laser, in the lack of presence of oxyhemoglobin will be now absorbed by the melanin in the skin as shown in the absorption graph in figure 1. Once the hand piece is removed, normal blood flow is resumed in the underlying vessels.

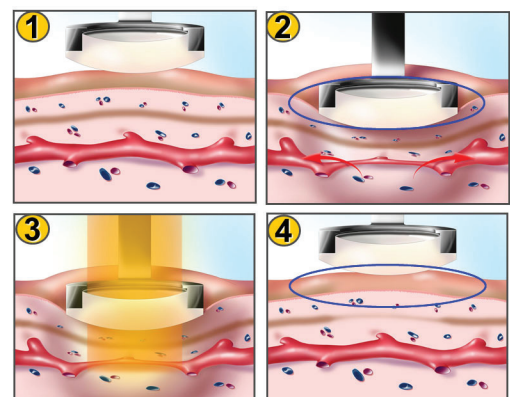


Figure 3

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