Difference between Laser and IPL Technologies explained

Laser hair removal or light-based hair removal is based upon the principles of selective photothermolysis–which states that the light energy must be well absorbed by the targeted chromophore for efficacy and less well absorbed by competing chromophore(s) to prevent collateral thermal damage. In the case of Laser hair reduction, the targeted chromophore is perifollicular melanin and the competing chromophore is epidermal melanin.

Lasers are single wavelength devices with absorption coefficients relatively specific to the chromophores they are intended to target. Intense Pulsed-light (IPL) devices expose the patient to a broader spectrum of light energy defined by cut-off filters, typically in the range of 600-1200 nm. The fact that lasers and IPL devices may target multiple chromophores allow these products to be marketed as being capable of treating a variety of conditions in addition to hair removal, including treatment of vascular and pigmented lesions, warts, wrinkles, and even acne.

Since no two lasers or IPL devices have identical operating parameters (i.e., wavelength, fluence, pulse duration, spot size, or epidermal cooling methodologies), the performance levels of these products differ substantially.
In particular, the comparative results of lasers and IPL devices vary greatly in hair removal.

Discussion
Lasers and intense pulse-light devices are gaining in popularity not only because of patient demand for permanent hair reduction, but also because of physician demand for increased utility. Unfortunately, these devices vary widely in their ability to deliver on their promoted indications, including hair removal.

Because lasers use single wavelengths of energy, the side-effect profile and dependability of response are superior to IPL devices. This differing performance level is a function of IPL design–IPL subjects the skin to a wider range of light energies of varying absorption coefficients for the chromophores targeted for cosmetic laser procedures.

While IPL devices are marketed for a variety of treatment applications, their performance levels are inferior to lasers, particularly in hair removal. Further, IPL needlessly exposes patients to some unnecessary and/or ineffective wavelengths of radiation and are lacking, by definition, the purity of treatment available with a single-wavelength laser.

Specifically, IPL hair removal treatments resulted in an increased frequency of complications and offered overall inferior results when compared to laser hair reduction.

Based on the experience at the Cleveland Clinic, they have ceased using IPL devices in their department due to the inconsistency of response between patients and even between sessions on the same patient. Another reason for the cessation of IPL use was the unacceptably high complication rates. At the Cleveland Clinic, they had far more adverse skin reactions (usually minor and transient, but occasionally serious) from IPLs than from any laser system.

By contrast, the GentleLASE alexandrite (755 nm) laser from Candela is marketed as a hair removal laser, and its performance is exemplary. The large spot, deliverable fluence and skin protection afforded by the patented, cryogen-based DCD system available on all Candela lasers make the GentleLASE an especially easy-to-use and comfortable laser.

Based upon physician feedback and patient satisfaction, the GentleLASE, in our opinion, is the "gold standard" in laser hair removal. The GentleLASE laser is the superior treatment modality when compared to any IPL technology we are aware of for permanent hair reduction.

The above information is a summarized version of the Clinical Paper comparing Single Wavelength and IPL Technologies.