

The *In Situ* Effect Of Air Cooling On 810nm Diode Laser Treatment For Hair Removal

Daniel Barolet

University of Montreal, Montreal, Canada

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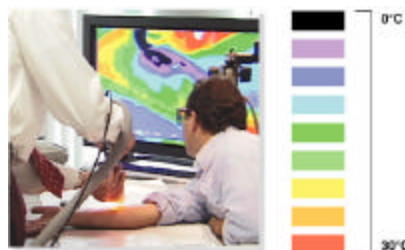
Air cooling is the latest method for active skin cooling. It delivers a continuous flow of chilled air (-18°C) before, during and after laser exposure (pre-, parallel-, and post-cooling).

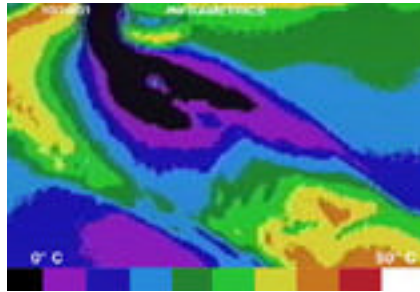


It provides more comfortable treatments (better analgesic effect for patients) and unlimited post-treatment cooling. With cold air the treatment is more practical, safer and more pleasant. Faster treatments become possible since there is no need for time intervals to apply a cooling medium (gel). The area under treatment is always visible. The procedure is not dependent on surface topography facilitating access to specific more complex areas i.e. bikini, intergluteal fold, ears, nostrils, etc. Furthermore, with this non-contact cooling method, there is no medium disturbing of the path of the laser beam and no interface inducing losses caused by dispersion, transmission and reflections. Finally, it has no disposable requirements.

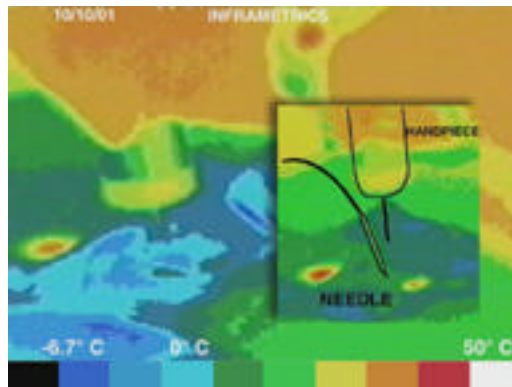
The purpose of the study was to demonstrate the in situ epidermal sparing benefits of using air cooling for laser hair removal.

Several temperature measurements were monitored at two different skin levels during diode (810nm) laser hair removal treatment using air cooling. At the epidermal level, an infrared camera allowed for precise skin surface temperature inframetric measurements.





For deeper hair follicle temperature measurements in the reticular dermis, a thermocouple (probe) connected to a data acquisition device was inserted 4-5mm under the skin surface.

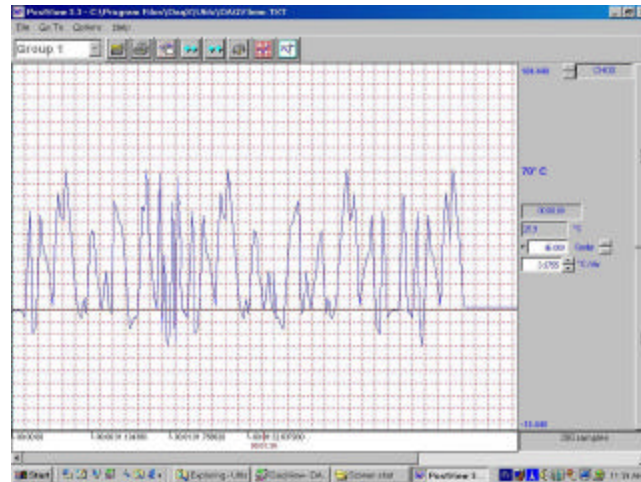


Precise temperature readings were monitored during 810nm diode laser treatment (*F1 diode laser*TM from Opus Medical using 7 mm spot size, 4 hertz repetition rate and fluences ranging from 20 to 40J/cm²).



***F1 diode laser*TM from Opus Medical**

Peak epidermal temperatures during laser pulses were ranging from 0° to 5° C providing adequate epidermal sparing effect for safe laser hair removal. Temperature measurement probes at the hair bulb level (4-5mm deep) reached effective coagulative endpoints for irreversible damage from 62° to 70.5° C with air cooling.



Other findings:

- No epidermal damage or dyspigmentation
- Similar clinical efficacy with or without air cooling (hair measurements taken 3 & 5 months post treatment)
- Exceptional analgesic effect during laser treatment

Conclusion

Air cooling provides sufficient epidermal protection and excellent analgesia without excess transcutaneous cooling. Expected deep follicular photocoagulative endpoints are not altered by this new skin cooling method.