

CLHRS Exam Review Outline

This lists the key topics covered on the NCLC Certified Laser Hair Removal Specialist (CLHRS) exam, but a MUCH BETTER way to review for this exam is the ONLINE PRACTICE EXAM available at

<https://lascertification.org/Practice-Exams.php>

Remember that the Certified Aesthetic Laser Operator (CLO/A) credential also INCLUDES the CLHRS as part of it.

- ❖ Hair Removal Lasers – in millisecond range
- ❖ Pulse applied in time that is – longer than trt for skin but shorter than the follicle
- ❖ “crystal” sapphire windows are contact cooling
- ❖ slowing repetition rate of pulses is better tolerated by the patient for pain
- ❖ Fitzpatrick scale considers skin color & sunlight sensitivity
- ❖ Sebaceous glands – lubricate skin to retain fluid
- ❖ Telogen phase – dormant/resting
- ❖ NHZ is space where exposure exceeds MPE
- ❖ LTCA – occupied only by personnel with laser safety training
- ❖ Power Density – spot size makes most rapid change
- ❖ NdYag, 1064nm infrared
- ❖ MPE – max permissible exposure limit used in skin & eye safety calculations
- ❖ Dark Skin – diode or NdYag best for hair removal
- ❖ Alexandrite – 755nm red
- ❖ Laser Safety Audits performed by LSO once a year
- ❖ Power density – focused spot size and power setting in watts
- ❖ True laser pulse – compression of laser energy momentarily exceeded that which it otherwise could in a CW mode
- ❖ Topical cooling gels – least effective for skin cooling
- ❖ Excess skin heating – hyper & hypopigmentation, blisters, scarring
- ❖ FDA definition of permanent hair removal – long term stable reduction in number of hairs regrowing after a treatment regime
- ❖ Safety Eyewear & LTCA – must be made available to personnel but not worn until in NHZ
- ❖ Diode lasers – typically 530-1500 nm range
- ❖ Contraindication to hair removal – keloid scarring
- ❖ Visible light roughly 400-700nm, or 4000-7000Angstroms, or .4-.7um
- ❖ LSO – does NOT establish clinical treatment protocols
- ❖ Hair growth from follicle
- ❖ Fitzpatrick lightest I and darkest VI
- ❖ Target for hair removal is usually terminal hair (and follicle of course)
- ❖ HCLS classification of ANSI based on capability of the energy to injure personnel or patient
- ❖ PDT in aesthetics generally uses blue light
- ❖ Easiest hair color to target – black
- ❖ Aversion response – eye safety classification of some low level lasers depends on whether MPE can be exceeded or not in the 0.25s aversion response time.
- ❖ Optical density – protection – higher numbers are more protection

**National Council on Laser Certification
Certified Laser Hair Removal Specialist (CLHRS)
Exam Review Outline**

- ❖ Laser Operators/Assistants – only facility authorized personnel appropriately trained in laser safety and operation of that laser
- ❖ Local Exhaust Ventilation (smoke evac) – wall suction and smoke evacuators
- ❖ Keratinocytes – form barrier against foreign bodies & infections
- ❖ Forgetting to activate the skin cooling system can result in blistering or burning of the skin
- ❖ Safety Glasses – ANSI – have wavelength and OD labeled on the glasses
- ❖ Nonlaser light source for laser hair removal – IPL
- ❖ Hardest skin type to treat for hair removal – VI
- ❖ Major competing chromophore in hair removal – melanin
- ❖ Contraindication to laser hair removal – white or gray hair
- ❖ Eccrine glands – sweat
- ❖ Synchronization of hair growth – not all in same phase at same time
- ❖ Skin color – primarily from melanin
- ❖ Hair Removal – heats follicle to severely damage or destroy it
- ❖ Retinal Risk – through fluid – from about 300nm to about 2000nm
- ❖ Pt eye protection for procedures around face – cover eyes with plastic or metal eye shields
- ❖ Retinal hazard – NdYag, Alexandrite, Diode, KTP, Pulsed Dye, CuBr, Argon, XeCl (excimer)
- ❖ Corneal hazard – CO₂, ErYag, HoYag, ArFl (excimer)
- ❖ Hair removal works best in Anagen phase (growth)
- ❖ One desirable end point for HR – redness around hair shaft – perifollicular edema
- ❖ Risk in HR performed by nonphysicians – miss or misdiagnose a serious skin condition
- ❖ Velus hairs – peach fuzz & fine
- ❖ LSO medical vs industrial – classification scheme for medical lasers minimizes need for measurements & calculations by medical LSO
- ❖ Stratum corneum – epidermis at surface
- ❖ NHZ determined by LSO
- ❖ Skin – epidermis, papillary dermis, reticular dermis, subcutaneous tissue
- ❖ Hair shaft at end of growth cycle sheds
- ❖ LSO appointed by mgmt of a facility
- ❖ OD is logarithm, difference from 4-6 OD is 10x10, or 100 fold factor
- ❖ Window coverings – when window is within NHZ and wavelength transmits through glass
- ❖ Skin cooling – reduce pt pain & discomfort, swelling & inflammation & risk of burns
- ❖ Radiant Exposure – J/cm² – sometimes called energy density. Also incorrectly called fluence by some manufacturers.
- ❖ Layers of Dermis – 2 – epidermis & dermis
- ❖ Most important safety rule – never allow laser output to point toward anyone's face
- ❖ Nonbeam hazards – Dyes, gases, electrical, smoke
- ❖ White hair – difficult or impossible to remove
- ❖ Fire Extinguishers – ANSI – generally require an operational unit that is prominently located
- ❖ TRT of hair follicle – 40-100 millisecond (ms)
- ❖ Fluid circulating through sapphire windows is for cooling for skin protection

**National Council on Laser Certification
Certified Laser Hair Removal Specialist (CLHRS)
Exam Review Outline**

- ❖ Significant contraindication for laser hair removal is dark tan in a caucasian
- ❖ Excess skin heating past dermis into subcut tissues results in 3rd degree burn with scars
- ❖ Father of Lasers in Medicine – Dr Leon Goldman
- ❖ LSO evaluates total laser hazard by capability of energy to injure, personnel exposed, and the delivery system utilized
- ❖ Diode laser for hair removal – 810nm
- ❖ Significant eye risk – direct impacts into the eye from a collimating hand piece
- ❖ Typical range for hair cycles other than scalp is 4-12 mos
- ❖ Pregnant women – no risk for laser “radiation”
- ❖ Layers in a hair shaft – 3
- ❖ Regions to a hair follicle – 3
- ❖ TRT – time for structure to dissipate heat
- ❖ Typical hair removal NdYag set in J/cm²
- ❖ Light Skin/Dark Hair easiest combination for LHR
- ❖ Chromophore – object that absorbs the light
- ❖ Prior to LHR – NO waxing, plucking or electrolysis
- ❖ Sheaths to a hair follicle – 2
- ❖ Lasers thermal target is hair follicle
- ❖ Laser operator – prior to pt Rx ensure that aiming beam is functional and coincident with treatment beam
- ❖ Multiple treatments for LHR because not all follicles in correct phase at same time
- ❖ Ruby Laser – Chromium Ion – 694nm red
- ❖ ANSI 136.3 applies to all settings where laser used on people
- ❖ LASER – Light Amplification by the Stimulated Emission of Radiation
- ❖ Anagen phase – growth
- ❖ Desirable end point in LHR – ejection or vaporization of shaft from follicle
- ❖ Safety Eyewear do NOT provide protection from direct impacts
- ❖ Catagen – regression/atrophy phase
- ❖ Epidermis renews itself every 3-5 weeks
- ❖ Terminal hairs – coarse hairs on scalp, eyebrows, armpits, bikini line
- ❖ Strong contraindication – active infections such as cold sores or herpes.