

# Bactericidal activity of erbium, chromium: yttrium–scandium–gallium–garnet laser in root canals

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**Abstract** The aim of this study was to investigate the effectiveness of the erbium, chromium:yttrium–scandium–gallium–garnet (Er,Cr:YSGG) laser by measuring its bactericidal effect inside root canals experimentally colonized with *Enterococcus faecalis*. We also determined the optimal conditions for the Er,Cr:YSGG laser to achieve the maximal bactericidal effect. An Er,Cr:YSGG Waterlase™ laser was used, and its antimicrobial effect was compared with that of sodium hypochlorite (NaOCl) at various concentrations as widely used in clinics. This laser emits photons at a wavelength of 2.78 μm. It is a pulsed laser operating at 20 Hz (20 pulses/s). Significant differences between measurements in the different groups ( $P < 0.05$ ) were observed, depending on time and power used. The use of NaOCl 5% was the most effective procedure, with NaOCl 0.5% being the least effective; however, laser treatment was as effective as NaOCl 5% when applied at 2 W for 60 s.

**Keywords** Laser · Endodontics · Disinfection · *Enterococcus*

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