

Ambient Formaldehyde Levels from Formocresol in a Dental Clinic Environment

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Background/Objectives: Formocresol medicaments used in vital pulpotomy treatment within North America contain 19% or 190,000 parts per million (ppm) (Buckley's) or 48.5% or 485,000 ppm (Sultan's) formaldehyde. Use of these formulations in clinical practice could expose the dental environment to vapors containing formaldehyde. The purpose of this study was to measure ambient formaldehyde levels from formocresol within a dental clinic.

Methods: Buckley's formocresol (diluted 1:5), Sultan's formocresol and Buckley's formocresol were assessed for formaldehyde vaporation. A Miran 205b Portable Ambient Air Analyzer (Thermo Electron Co., Franklin, MA), a single beam infrared spectrophotometer, was used to determine ambient formaldehyde levels of formocresol formulations under different conditions for 5 minutes: Condition 1) a No. #3 cotton pellet saturated with formocresol with the analyzer 46 cm from the cotton pellet; Condition 2) a No. #3 cotton pellet saturated with formocresol with the analyzer < 3 cm from the cotton pellet; Condition 3) an open bottle of formocresol with the analyzer < 3 cm from the opening.

Results: The maximum formaldehyde ppm level (mean \pm standard deviation, n = 3) over a 5 minute period was: Condition 1) 0.14 ± 0.02 ppm with Buckley's formocresol (diluted 1:5), 0.29 ± 0.12 ppm with Sultan's formocresol, 0.40 ± 0.26 ppm with Buckley's formocresol; Condition 2) 1.52 ± 0.33 ppm with Buckley's formocresol (diluted 1:5), 6.81 ± 0.68 ppm with Sultan's formocresol, 7.56 ± 1.68 ppm with Buckley's formocresol; Condition 3) 0.42 ± 0.07 ppm with Buckley's formocresol (diluted 1:5), 6.51 ± 2.55 ppm with Sultan's formocresol, 9.40 ± 1.82 ppm with Buckley's formocresol.

Conclusions: All ambient formaldehyde levels at 46 cm (approximate exposure distance of dentist or assistant from formocresol source) were below the Short Term Exposure Limit of 2 ppm for 15 minutes (Occupational Safety and Health Administration, USA).