

Use of Ozone to Treat Dental Unit Water Lines. H M AL SHORMAN^{1*}, W COULTER¹, E LYNCH¹, A CLAXSON², C J SILWOOD² and M GROOTVELD^{1,2}
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Unfortunately, many studies concerning the clinical evaluation of ozone have been based on assessments of its harmful effects rather than demonstrating any therapeutic benefits it may offer. Ozone is one of nature's most powerful oxidants which accounts for its ability to kill bacteria, spores and viruses. Ozone decomposes to a harmless, non-toxic and environmentally safe molecule (oxygen). In this investigation, a multicomponent evaluation of the oxidative consumption of the water from dental unit water lines (DUWL) by ozone (O₃) has been performed using high resolution proton (¹H) nuclear magnetic resonance (NMR) spectroscopy. The ozone-generating equipment employed in this study was the HealOzone Unit (CurOzone, USA). Water was collected from DUWL from ten dental units and each of the samples was divided into two equivalent portions (1 ml). The first of these were treated with O₃ generated from the above device for a period of 10 seconds; the second group of portions served as controls. Samples were subjected to ¹H NMR analysis at an operating frequency of 600 MHz. Results acquired revealed that some of the biomolecules in the DUW were acetate, propionate, formate, the amino acid glycine, aromatic compounds and occasionally ethanol. Ozone treatment of the DUW gave rise to oxidation of ethanol and an increase in formate levels presumably due to oxidation of carbohydrate.

High field ¹H NMR spectroscopy provides much useful analytical data regarding dental unit water lines and the fate of O₃ in them, information which is of much relevance to its potential therapeutic actions.