

Reconstructing the life-time lead exposure in children using dentine in deciduous teeth

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Data will be presented to demonstrate that the circumpulpal dentine of deciduous teeth can be used to reconstruct a detailed record of childhood exposure to lead. By combining high spatial resolution laser ablation ICP-MS with dental histology, information can be acquired on the concentration of lead in dentine from *in utero* to several years after birth, using a true time template of dentine growth. Time corrected lead analyses for pairs of deciduous molars confirms that between-tooth variation for the same child is negligible and that meaningful exposure histories can be obtained from a single, multi-point ablation transect on longitudinal sections of individual teeth. For a laser beam of 100 micron diameter, the lead signal for each ablation point represents a time span of 42 days. Simultaneous analyses for Sr, Zn and Mg suggest that the incorporation of Pb into dentine (carbonated apatite) is most likely controlled by nanocrystal growth mechanisms. The study also highlights the importance of discriminating between primary and secondary dentine and the dangers of

translating lead analyses into blood lead estimates without determining the age or duration of dentine sampled. Further work is in progress to validate deciduous teeth as blood lead biomarkers.

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