Safety of Amalgam in Children (7/06)

Bellinger DC, Trachtenberg F, Barregard L, Tavares M, et. al. Neuropsychological and renal effects of dental amalgam in children: A randomized clinical trial. JAMA 2006;295:1775-1783.

Studies have demonstrated that minute amounts of elemental mercury in amalgam is vaporized under pressure from mastication. The effects of long-term exposure to low-doses of elemental mercury in children are not known. The purpose of this study was to compare the neuropsychological and renal function of children whose dental caries were restored using amalgam or composite resin materials. A total of 534 children of ages 6 to 10 years with no prior amalgam restorations and 2 or more posterior teeth with caries were randomly assigned to receive dental restorations during a 5-year period using either amalgam (n=267) or composite resin (n=267) materials. Full-scale IQ on the Wechsler Intelligence Scale for Children was selected as the primary outcome measure. Secondary measures included tests of auditory memory, visual-motor integration, attention and emotional state. Total mercury was measured in urine and hair. Urinary albumin was determined by an automated nephelometric method. On average, 15 surfaces were placed per child during the 5-year period. Children in the amalgam group had a significantly higher mean urinary mercury level five years after baseline than did children restored with composite resin (0.9 vs. 0.6 ug/g of creatinine, $p < 0.001$). **Despite the increase in elemental mercury exposure in the amalgam treatment group, there were no statistically significant differences in adverse neuropsychological or renal effects observed over the 5-year period in children whose caries were restored using dental amalgam or composite materials. The authors concluded that there is no reason to discontinue the use of amalgam as a standard of care for caries in posterior teeth.**

DECS Comment: This study was designed to answer a specific question on the safety of amalgam restorations as the standard of care for children in the United States. The increased mercury exposure in the amalgam group was still well within established background levels. Although no significant difference was found between the amalgam and composite resin treatment groups, a study period greater than five years may be needed to observe very subtle effects of mercury from amalgam in children. The safety of composite was not assessed in this study. The American Dental Association provides in a position statement "that amalgam is a valuable, viable and safe choice for dental patients." See link: www.ada.org/prof/resources/positions/statements/amalgam.asp.