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## Effects of Life-long Fluoride Intake on Bone Measures of Adolescents A Prospective Cohort Study

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### Abstract

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Controversy persists concerning the impact of community water fluoridation on bone health in adults, and few studies have assessed relationships with bone at younger ages. Ecological studies of fluoride's effects showed some increase in bone mineral density of adolescents and young adults in areas with fluoridated water compared with non-fluoridated areas. However, none had individual fluoride exposure measures. To avoid ecological fallacy and reduce bias, we assessed associations of average daily fluoride intake from birth to age 15 yr for Iowa Bone Development Study cohort members with age 15 yr dual-energy x-ray absorptiometry (DXA) bone outcomes (whole body, lumbar spine, and hip), controlling for known determinants (including daily calcium intake, average daily time spent in moderate-to-vigorous intensity physical activity, and physical maturity). Mean (SD) daily fluoride intake was 0.66 mg (0.24) for females and 0.78 mg (0.30) for males. We found no significant relationships between daily fluoride intake and adolescents' bone measures in adjusted models (for 183 females, all  $p$  values  $\geq .10$  and all partial  $R^2 \leq 0.02$ ; for 175 males, all  $p$  values  $\geq .34$  and all partial  $R^2 \leq 0.01$ ). The findings suggest that fluoride exposures at the typical levels for most US adolescents in fluoridated areas do not have significant effects on bone mineral measures.