GROWTH AND MATURATION IN HUMAN BIOLOGY AND SPORTS

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BY FELLOWS AND COLLEAGUES

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Environmental pollutants and toxicants associated with industry and power generation and have potentially negative consequences for the growth, maturation and development of youth. Lead is one of a variety of toxicants with such potential effects. Lead and lead compounds are common in the earth’s crust, ∼70 ppm (Baselt, 2002) and are associated with power generation and several industrial processes. Lead and lead-compounds are well-known to be toxic to developing humans, causing growth retardation, delayed sexual maturation and neurobehavioral developmental deficits.

**Lead and Growth.** Elevated levels of blood lead adversely affect prenatal growth (Andrews et al., 1994; Dietrich et al., 1987), but this has not been noted in all studies (McMichael et al., 1986; Factor-Litvak et al., 1991). A frequent finding among children is reduced length/stature in association with increased blood lead levels. Age at exposure, duration, and nutritional status are related to the degree of growth stunting, with younger, chronically exposed, undernourished children at greatest risk (Ballew et al., 1999). The estimated stunting effect of blood lead level on linear growth appears to follow a dose-related pattern of reduction in height by ∼1-3 cm for each 10.0 µg/dL increase in blood lead level (Table 1).

**Lead and Maturation.** Information on the influence of elevated blood lead levels on indicators of biological maturation commonly used in growth studies is limited largely to age at menarche and to a lesser extent stages of puberty (breast and pubic hair development in girls, genital and pubic hair development in boys).