

# Abstract

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## Elevated vitamin A intake and serum retinol in preadolescent children with cystic fibrosis.

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**BACKGROUND:** Persons with cystic fibrosis (CF) and pancreatic insufficiency (PI) are at risk of vitamin A deficiency because of steatorrhea, despite pancreatic enzyme replacement. Long-standing vitamin A supplementation may increase the risk of vitamin A toxicity.

**OBJECTIVE:** The aim was to describe the vitamin A intake and serum retinol concentrations of preadolescent children with CF, PI, and mild-to-moderate pulmonary disease, who were cared for under current practice recommendations.

**DESIGN:** This cross-sectional study evaluated children aged 8.0-11.9 y with CF and PI from 13 US CF centers. Dietary and supplemental vitamin A intakes were compared with the Dietary Reference Intakes (DRIs) for healthy children, CF recommendations, and data from the National Health and Nutrition Examination Survey (NHANES), 1999-2000. Serum retinol concentrations were compared with NHANES data.

**RESULTS:** The 73 subjects with CF had a dietary vitamin A intake of 816 +/- 336 microg retinol activity equivalents (165 +/- 69% of the recommended dietary allowance), which was similar to the NHANES value. The supplement intake provided 2234 +/- 1574 microg retinol activity equivalents/d and exceeded recommendations in 21% of the subjects with CF. Total preformed retinol intake exceeded the DRI tolerable upper intake level in 78% of the subjects with CF. The serum retinol concentration was 52 +/- 13 microg/dL (range: 26-98 microg/dL), which was significantly higher than the NHANES value (37 +/- 10 microg/dL; range: 17-63 microg/dL;  $P < 0.001$ ).

**CONCLUSION:** Although supplementation helps to prevent vitamin A deficiency in children with CF and PI, their high vitamin A intakes and serum retinol concentrations suggest that usual care may result in excessive vitamin A intake and possible toxicity that would increase the risk of CF-associated liver and bone complications.

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