

More iodine recommended for U.S. pregnant and lactating women

A policy statement developed by the American Academy of Pediatrics (AAP) appeared in the journal *Pediatrics* on May 26. It recommends iodine supplementation for breastfeeding mothers and recommends that young infants not be exposed to tobacco smoke or drinking water with excess nitrate. The AAP calls for better labeling of supplements to reflect their actual iodide content. It also calls on the federal government to adopt a national primary drinking water regulation for perchlorate and encourages state and local governments to enact clean-air and smoke-free legislation. This is the first time that the AAP has issued a statement on iodine. The document is available to download at:

<http://pediatrics.aappublications.org/content/133/6/1163.full.html>

By iodizing table salt in 1924, the U.S. had largely eliminated the endemic “goiter belt.” But since the 1970s, median iodine levels have decreased, and today around one-third of U.S. pregnant women are marginally iodine deficient (1). This status is often attributed to an increase in the consumption of processed foods, which use non-iodized salt. Although the American Salt Institute supports the goal of universal salt iodization, processed food manufacturers have been reluctant to switch to iodized salt, quoting their concern that the taste or other characteristics of the food would be altered.

The American Thyroid Association (2) and the National Academy of Sciences (3) recommend that breastfeeding women should consume 290 µg of iodide per day, which generally requires a supplement containing 150 µg of iodide (combined iodide intake should be between 290 and 1100 µg per day). It is thought that only 15–20% of American pregnant and breastfeeding women take supplements that contain any iodide (4), and many of these supplements may be inadequately formulated and labeled.

In addition to causing harm to the developing nervous system, iodine deficiency may also make the mother and child more vulnerable to some environmental pollutants. Iodide is transported into the thyroid gland and into breast milk via the sodium-iodide symporter (NIS), a protein in the cellular membrane. Although the NIS has a high affinity for iodide, other anions such as thiocyanate, nitrate, and perchlorate can compete with iodide for uptake. This may decrease iodide concentration in the thyroid or breast milk and augment the effects of iodine deficiency.



Breastfeeding sharply increases iodine requirements

Exposure to thiocyanate comes mainly from cruciferous vegetables and tobacco smoke. Nitrate can be found in some leafy and root vegetables, but the main source of excess exposure is drinking water. Although municipal water supplies are regulated in the U.S., nitrate is a common pollutant of private wells. Perchlorate (ClO_4^-) is used industrially as an oxidizer and has become a widespread environmental contaminant. The Environmental Protection Agency (EPA) detected it in about 4% of U.S. drinking water systems (5). It has also been found in cow's milk and several varieties of food. NHANES (2001–2002) samples revealed widespread human exposure to perchlorate, and a median urine perchlorate concentration of 3.6 µg per g of creatinine (6).

Perchlorate exposure and excretion were also found to be significantly higher in breastfed infants (7).

To limit exposure to thiocyanate and nitrate, young infants should not be exposed to tobacco smoke or drinking water with excess nitrate. Clinicians should advise pregnant women not to smoke and to avoid all exposures to second-hand tobacco. On the other hand, dietary nitrate and thiocyanate do not appear to increase a child's exposure during breastfeeding. And because few infants consume large quantities of cruciferous, leafy, or root vegetables, these sources are not of concern.

The current state of discordance between the label and the actual content of iodide in supplements is unacceptable. The FDA is aware of this situation and was investigating it in the fall of 2013. The statement recommends that the FDA corrects this situation and, if voluntary action on the part of the suppliers is insufficient, do what is necessary to allow consumers to identify and use iodide supplements with confidence.

The statement also recommends that clinicians advise women who are pregnant or planning to become pregnant to take a daily supplement with at least 150 μg of iodide. If the mother is vegan or does not consume dairy or fish, testing urine to check for iodine deficiency may be indicated.

The AAP policy statement has been widely recognized as timely and commended for acknowledging the importance of iodine in early neurodevelopment.

In June, the journal *Pediatrics* published a letter by Leung et al., in which the authors expressed two concerns about the policy. Firstly, they suggest that the recommendation to take a supplement with “at least” 150 μg of iodide should be hedged with a clear warning about the potential toxicity of excess iodine (above 1100 μg daily). Secondly, they draw attention to the limitations of measuring UIC to determine iodine status in women at risk of deficiency. Due to the substantial day-to-day and hour-to-hour variation in urinary iodine excretion, this method does not accurately determine iodine status in individuals (9).

The U.S. Council for Responsible Nutrition (CRN), a leading trade association representing the dietary supplement industry, urged supplement manufacturers to review the policy’s recommendations particularly about the dose and form of iodine. CRN has compared the current situation to that of folic acid several decades ago, when scientific and policy communities, and the industry came together to establish the recommendations for intake, which resulted in significant reductions in neural tube birth defects. CRN hopes to see similar support develop for iodine supplementation.

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