

# Potential Risks of Excess Iodine Ingestion and Exposure: Statement by the American Thyroid Association Public Health Committee

Angela M. Leung,<sup>1,\*</sup> Anca M. Avram,<sup>2</sup> Alina V. Brenner,<sup>3</sup> Leonidas H. Duntas,<sup>4</sup> Joel Ehrenkranz,<sup>5</sup>  
James V. Hennessey,<sup>6</sup> Stephanie L. Lee,<sup>7</sup> Elizabeth N. Pearce,<sup>7</sup> Sanziana A. Roman,<sup>8</sup>  
Alex Stagnaro-Green,<sup>9</sup> Erich M. Sturgis,<sup>10</sup> Krishnamurthi Sundaram,<sup>11</sup>  
Michael J. Thomas,<sup>12</sup> and Jason A. Wexler<sup>13</sup>

for the American Thyroid Association Public Health Committee

## Dear Editor:

Iodine is a micronutrient required for normal thyroid function. In the United States, recommended daily allowances (RDA) for iodine intake are 150  $\mu\text{g}$  in adults, 220–250  $\mu\text{g}$  in pregnant women, and 250–290  $\mu\text{g}$  in breastfeeding women (1,2). The U.S. diet generally contains enough iodine to meet these needs, with common sources being iodized salt, dairy products, some breads, and seafood. During pregnancy and lactation, women require higher amounts of iodine for the developing fetus and infant. The American Thyroid Association (ATA) recommends that women take a multivitamin containing 150  $\mu\text{g}$  of iodine daily in the form of potassium iodide (KI) (3) during preconception, pregnancy, and lactation to meet these needs (4).

Ingestion of greater than 1100  $\mu\text{g}$  of iodine per day (tolerable upper limits for iodine) (1) is not recommended and may cause thyroid dysfunction. During pregnancy and lactation, when the risk of excess iodine are primarily related to the fetus and newborn infant, the recommendations for the upper limit vary and range from 500–1100  $\mu\text{g}$  of iodine daily (2). In particular, infants, the elderly, pregnant and lactating women, and individuals with preexisting thyroid disease (such as autoimmune Hashimoto's disease, Graves' disease, nontoxic thyroid nodules, history of partial thyroidectomy, and other conditions) are susceptible to adverse effects of excess iodine intake and exposure

(5). The public is advised that many iodine, potassium iodide, and kelp supplements contain iodine in amounts that are up to a hundred times higher than the daily tolerable upper limits for iodine. The ATA advises against the ingestion of iodine and kelp supplements containing in excess of 500  $\mu\text{g}$  iodine daily for children and adults and during pregnancy and lactation. Long-term iodine intake in amounts greater than the tolerable upper limits should be closely monitored by a physician. There are only equivocal data supporting the benefit of iodine at higher doses than these, including a possible benefit for patients with fibrocystic breast disease (6). There is no known thyroid benefit of routine daily iodine doses in excess of the U.S. RDA.

There are a limited number of medical conditions in which the short-term use of high amounts of iodine is indicated. Exceptions for the recommendations to not exceed the tolerable upper limits include closely monitored patients prescribed Lugol's solution or saturated solution of potassium iodide (SSKI) in their treatment of severe hyperthyroidism, such as thyroid storm and prior to surgery in patients with Graves' disease, and individuals in the vicinity of a nuclear power plant who are recommended to take KI in the event of a nuclear accident. SSKI is not indicated nor recommended in individuals with thyroid nodules. Finally, patients receiving the large amounts of iodine in iodinated contrast dyes, as required for radiologic studies, should be

<sup>1</sup>Division of Endocrinology, UCLA David Geffen School of Medicine, Los Angeles, California.

<sup>2</sup>Division of Nuclear Medicine/Radiology, University of Michigan Medical Center, Ann Arbor, Michigan.

<sup>3</sup>Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institutes of Health, Department of Health and Human Services, Bethesda, Maryland.

<sup>4</sup>Unit of Endocrinology, Metabolism, and Diabetes, Evgenidion Hospital, University of Athens, Athens, Greece.

<sup>5</sup>Department of Medicine, Intermountain Healthcare, Salt Lake City, Utah.

<sup>6</sup>Division of Endocrinology, Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

<sup>7</sup>Section of Endocrinology, Diabetes, and Nutrition, Boston University School of Medicine, Boston, Massachusetts.

<sup>8</sup>Department of Surgery, Duke University School of Medicine, Durham, North Carolina.

<sup>9</sup>University of Illinois College of Medicine at Rockford, Rockford, Illinois.

<sup>10</sup>Department of Head and Neck Surgery, UT MD Anderson Cancer Center, Houston, Texas.

<sup>11</sup>Department of Otolaryngology, SUNY Downstate Medical Center, Brooklyn, New York.

<sup>12</sup>Carolina Endocrine, P.A., Raleigh, North Carolina.

<sup>13</sup>Division of Endocrinology and Metabolism, Georgetown University School of Medicine, Washington, District of Columbia.

\*Chair of American Thyroid Association Public Health Committee.

monitored for iodine-induced thyroid dysfunction if risk factors are present.

Key points include:

- Adequate iodine intake is required for normal thyroid function.
- The recommended iodine intake in nonpregnant adults is 150  $\mu\text{g}$  daily.
- Pregnant and breastfeeding women should take a prenatal vitamin that contains 150  $\mu\text{g}$  of potassium iodine daily.
- Given a tolerable upper limit of 1100  $\mu\text{g}$  iodine daily, ingestion of an iodine or kelp supplement containing in excess of 500  $\mu\text{g}$  iodine daily should not be done.
- Certain exceptions to these recommendations include those for specific medical conditions, which usually require only a limited number of doses for a short-term duration; such individuals should be closely monitored for thyroid dysfunction.

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Address correspondence to:  
 Angela M. Leung, MD, MSc  
 Division of Endocrinology (111D)  
 UCLA David Geffen School of Medicine  
 11301 Wilshire Boulevard  
 Los Angeles, CA 90073

E-mail: [amleung@mednet.ucla.edu](mailto:amleung@mednet.ucla.edu)

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