

Q

Please summarize highlights of the Institute of Medicine’s new recommendations for water intake for the general public, including children.

A

In February 2004, the Institute of Medicine (IOM) released new recommendations on water, as part of its new report *Dietary Reference Intakes: Water, Potassium, Sodium, Chloride and Sulfate*. Designed to review the role of these key nutrients in deficiency states, as well as in the development of chronic diseases, this report updated the 1989 US Recommended Dietary Allowances (RDA) and the Canadian Recommended Nutrition Intakes (RNI). Where applicable, it also set Adequate Intakes (AI) and Tolerable Upper Intakes (UL) for different subsets of the population.

Daily fluid needs are difficult to predict across the population because life stage, gender, metabolism, body composition, dietary intake, physical activity and environmental factors vary among individuals. Therefore, the IOM Committee determined that it was not possible to set an estimate of average requirement (EAR) for water; instead it set an AI by age and gender (see chart). The AI, the recommended average intake based on observed or experimentally determined approximations or estimates of water intake assumed to be adequate by a group (or groups) of apparently healthy people, is set to prevent potential acute effects of dehydration. The Committee did not set a UL since healthy people are able to excrete excess water to maintain fluid balance, but noted that acute toxicity could occur if fluid intake exceeds the kidneys’ maximal excretion rate of approximately 0.7 – 1.0 L/hour.

Similar to the AI of other nutrients for healthy individuals, daily consumption below the AI may not cause additional health risks because a wide range of intakes is compatible with normal hydration. On the other hand, higher intakes of total water may be required for individuals exposed to warmer climates, for those who are very physically active or for special populations. For instance, children do not adapt to high temperatures as well as adults because they produce less sweat, thereby reducing their ability to cool themselves. Therefore, it’s important for parents and coaches to know and watch for signs of heat exhaustion and to encourage re-hydration during active play and sports, especially in the warm summer months. Palatable beverages promote voluntary fluid intake. Flavor, temperature, color and aroma contribute to palatability, so offering water and other beverages the child enjoys will help ensure adequate hydration. For child and adult athletes,

Dietary Reference Intakes for Water\*

Age Group	Adequate Intakes
<b>Infants</b> Ages 0 to 6 months	<b>0.7 L/day of total water</b> , assumed to be from human milk.
<b>Infants</b> Ages 7 to 12 months	<b>0.8 L/day of total water</b> , assumed to be from human milk and complementary foods and beverages. This includes approximately 0.6 L (~3 cups**) as total fluid, including formula, juices and drinking water.
<b>Children</b> Ages 1 to 3 years	<b>1.3 L/day of total water</b> . This includes approximately 0.9 L (~4 cups**) as total beverages, including drinking water.
<b>Children</b> Ages 4 to 8 years	<b>1.7 L/day of total water</b> . This includes approximately 1.2 L (~5 cups**) as total beverages, including drinking water.
<b>Boys</b> Ages 9 to 13 years	<b>2.4 L/day of total water</b> . This includes approximately 1.8 L (~8 cups**) as total beverages, including drinking water.
<b>Boys</b> Ages 14 to 18 years	<b>3.3 L/day of total water</b> . This includes approximately 2.6 L (~11 cups**) as total beverages, including drinking water.
<b>Girls</b> Ages 9 to 13 years	<b>2.1 L/day of total water</b> . This includes approximately 1.6 L (~7 cups**) as total beverages, including drinking water.
<b>Girls</b> Ages 14 to 18 years	<b>2.3 L/day of total water</b> . This includes approximately 1.8 L (~8 cups**) as total beverages, including drinking water.
<b>Men</b> Ages 19 years +	<b>3.7 L/day of total water</b> . This includes approximately 3.0 L (~13 cups**) as total beverages, including drinking water.
<b>Women</b> Ages 19 years +	<b>2.7 L/day of total water</b> . This includes approximately 2.2 L (~9 cups**) as total beverages, including drinking water.
<b>Pregnancy</b>	<b>3.0 L/day of total water</b> . This includes approximately 2.3 L (~10 cups**) as total beverages, including drinking water.
<b>Lactation</b>	<b>3.8 L/day of total water</b> . This includes approximately 3.1 L (~13 cups**) as total beverages, including drinking water.

\*Source: DRI Report, 2004.

\*\*Conversion Factors: 1L = 33.8 fluid oz; 1L = 1.06 qt; 1 cup (0.24 L) = 8 fluid oz.

including people who exercise vigorously on a regular basis, it is important to note that for every pound of body weight lost during physical activity, three cups of fluid need to be drunk. A quick indicator of hydration status is the color of a person's urine, which ideally should be light in color, although diet, medications and vitamin use can affect this. A urine color chart can be used as a tool to help educate athletes about proper hydration.

The body maintains tight control over its fluid balance because hydration status affects physiological functions. Daily fluid intake is balanced with the volume of fluid lost through urine, feces, sweat and respiration. As the body loses water, it can be more difficult to maintain homeostasis during environmental exposure, physical activity or illness, so it's essential to replace fluids. Fortunately, normal thirst and hunger signals allow most healthy people to maintain hydration status and keep their total body water within normal levels. For healthy adults at rest, the body fluid balance is maintained at  $\pm 2\%$  of the total body weight over a 24-hour period.

Drinking water is a primary fluid to sustain hydration; however, the water available in other beverages also contributes significantly to an individual's daily fluid intake. Estimates are that between 71% to 80% of total water intake for children and teens (based on age and gender), and about 81% for adults comes from drinking water and other beverages, including caffeinated beverages. (The IOM concluded that the diuretic effect of caffeine is transient and does not result in dehydration; therefore, caffeine-containing beverages can count toward meeting fluid needs.) The water in foods also counts toward daily fluid goals, accounting for between 20% to 29% of total water intake for children and teens (based on age and gender), and about 19% for adults. For example, many fruits and vegetables contribute substantial amounts of water—up to 90% by weight; some luncheon meats, such as ham, can be as much as 70% water by weight, while meats and poultry can be 50-60% water by weight. Even cereals, cookies and crackers can contribute to an individual's daily fluid needs, albeit to a much lesser extent since they are only about 5% water by weight.

Using these numbers as guidelines, you can help your clients meet their fluid needs with a healthy eating plan. A typical diet can provide enough fluid for the average person—here's one example:

- Breakfast—cereal and milk, fruit, juice and coffee;
- Lunch—a bowl of vegetable soup, a turkey sandwich topped with lettuce and tomato, some cut-up veggies and milk, juice or water;
- Dinner—lean meat or fish, brown rice, vegetables, salad, a roll, berries and milk.

Choosing fruits and veggies at snack-time can also boost water intake. Advise clients to sip water throughout the day, in addition

to the fluids consumed at meals, and to complement meals and snacks with water, milk, 100% fruit juice, tea or coffee. Also remind clients to drink plenty of water before, during and after physical activity to replace fluid losses. Special sports beverages can also be used to help replace lost fluids, and may be useful during strenuous physical activity. The good news is that there are many enjoyable, tasty ways to help meet your clients' fluid needs.

#### Further Reading:

Institute of Medicine. Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate. Washington, DC: National Academy Press, 2004; Section 4:1-81.

Rosenbloom C, ed. Sports Nutrition, A Guide for the Professional Working with Active People. Chicago: The American Dietetic Association, 2000: 95-6.

## Q

Can you suggest an online nutrition education resource that is appropriate for middle school-age children?

## A

There are numerous online resources that provide age-appropriate nutrition education information for "tweens" (children 9 to 12 years of age). We've chosen to highlight Kidnetic.com—an interactive resource for kids and parents that will also be of interest to health professionals and educators who work with this age group and their families.

Developed by the International Food Information Council (IFIC) Foundation in partnership with the American Academy of Family Physicians, the American College of Sports Medicine, the American Dietetic Association, the International Life Sciences Institute Center for Health Promotion and the National Recreation and Park Association, Kidnetic.com addresses food, fitness, fun, feelings and family dynamics in an interesting and educational way. There are separate sections for kids and parents. Take some time to visit the site and judge for yourself. Funding for the IFIC Foundation and its projects, including Kidnetic.com, comes from the broad-based food, beverage and agricultural industries.

### For Kids

Here's a sampling of sections from which kids can choose when they explore the Kidnetic.com website and sign up to join the **Power Pack**:

**Wet Head—The Game** features fun activities that appeal to 'tweens, who can choose games that can be played by one person

or a group, either indoors or outside. There's also a place where kids can submit their own game ideas to help others get moving.

**Busy Buddy** is an interactive character that kids can "adopt." Their Busy Buddy will appear each time they log onto Kidnetic.com. Kids can teach Busy Buddy lots of cool tricks; in return, Busy Buddy reminds them to stay active and have fun.

**Inner G** challenges kids to match various parts of the body to "missing parts" in a graphic of the human body. After each successful match, kids learn about the workings of important body organs, as well as foods that provide essential nutrients when eaten as part of a healthy diet.

**Bright Papers** include articles on topics of interest to kids and their parents. Examples for kids include *Totally Weird Ways to (Fruit and) Veg Out*, *Are You Up for the 10,000 Step Challenge?* and *Five Fun Ways to Get Physical*.

**Shout Out** is a message board where kids can post messages to share their ideas about issues such as fitness, food, fun and feelings. They can also hear what other kids have to say on these topics.

**Time Challenge** encourages kids to test themselves against the clock while doing fun activities. The challenges are an enjoyable way for kids to be active without needing lots of time or special equipment.

**Recipe Round Up** provides a selection of kid-friendly recipes that 'tweens will enjoy preparing and sampling. Check out the easy-to-follow format that makes food prep convenient and simple.

## For Parents

Check out the **Parents' Place** (click on the button in the upper right-hand corner of the Kidnetic.com home page). This section, designed just for parents, offers lots of useful information, as well as a place where parents can ask questions and share their experiences with others.

**Kidnector** encourages parents and kids to keep communication lines open by talking to each other. This section offers an opportunity for kids and parents to exchange e-mail messages and foster positive communications. Thought starters can help put the conversation in motion.

**Ask An Expert** allows parents to ask questions and access information on fitness, food, fun and feelings from a team of well-qualified experts. A *Frequently Asked Questions* section addresses some key concerns relating to children's well being.

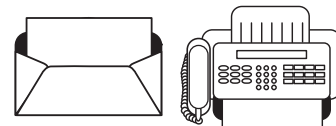
**Bright Papers**, mentioned previously, supply background information on fitness, food and health for kids and parents. The parents' section includes more in-depth material.

**Join the Discussion Board** is a forum where parents can submit topics and hear other parents' points-of-view on the challenges and joys of raising healthy kids. A snapshot of topics posted includes: "My kids won't eat vegetables," "My child doesn't want to play sports" and "My kids are real couch potatoes."

## For Professionals

There's a new tool, *Leader's Guide to Healthy Eating & Active Living for Kids & Families*, designed to help health professionals, educators and community youth organization leaders promote healthy lifestyles to children ages 9 to 12 years. Based on features from the Kidnetic.com site, the leader's guide includes different modules that teach kids about fitness, food, fun, feelings and families. All content in the modules has been reviewed by the five organizations that have partnered with the IFIC Foundation on Kidnetic.com. Visit <http://ific.org/kidnetic> to view the guide and to download the free modules.

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Please indicate if you would like your name to appear with your question. Published questions will be answered either by members of the Nutrition Update Advisory Committee, health professionals or Kraft Foods staff. We look forward to hearing from you.

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