

## Chapter 03

### **Let's Celebrate Liquids**

#### **L is for liquids, water for life.**

BY KATHLEEN KUNTARAF

Li Ming was a retired woman who enjoyed working in her garden. Even the unusual heat wave that hit her region one summer didn't deter her from tending her flowers and other plants. The temperature rose above 100 degrees Fahrenheit, and the humidity teetered at 90 percent. On the third day of these record-breaking temperatures, Li Ming called her daughter, Kim, but she sounded confused on the phone. Kim became alarmed and rushed to Li Ming's house, where she found her mother lying on the kitchen floor unconscious. Apparently, Li Ming's large fan wasn't enough to fight the effects of the heat and humidity, and she suffered heat stroke—which can be life threatening.<sup>1</sup>

One can lower the risk of heat-related illness, such as heat stroke, by drinking plenty of liquids, particularly water and fruit and vegetable juices. Next to air, water is the most vital element needed for survival. By weight, a newborn infant is approximately 75 percent water, and an adult about 70 percent. A man weighing 198 pounds has about 138 pounds of water in his body.

The gray matter of the brain is approximately 85 percent water, blood is 83 percent water, muscles are about 75 percent water, and even hard marrow bones are 20 to 25 percent water.<sup>2</sup> Almost every cell and tissue of the body not only contains water but is continually bathed in fluid and requires water to perform its functions.

Water, the liquid of life, is a medium in which metabolism takes place. It is:

- the transport system within the body

- a lubricant for movement
- the facilitator of digestion
- the prime transporter of waste via the kidneys
- a temperature regulator
- a major constituent of the circulating blood

About two thirds of the water our body requires come from ingested liquid, about one third from our food, and a small amount of liquid is synthesized during food metabolism. Fruits and vegetables generally have higher water content than other food groups. Examples include:

<b>Fruits</b>	<b>Vegetables</b>
Watermelon	Carrots
Citrus	Bell peppers
Grapes	Lettuce
Apples	Tomatoes
Papaya	Cucumbers
Strawberries	Squash
Apricots	Celery
Cherries	Broccoli
	Cauliflower
	Spinach

Ideally, the body maintains a balance between the amount of water lost each day and the amount taken in to replace it. The amount of daily water lost depends on climatic conditions and physical activities, as shown in the following table:

<b>*Daily Loss of Water in Milliliters Per Day of an Average Human Body at Normal Temperature</b>		
	<b>Low Activity</b>	<b>Prolonged Heavy Exercise</b>
Insensible (invisible) loss from skin	350	350
Insensible (invisible) loss from lungs	350	650
Sweat	100	5000
Feces	100	100
Urine	1400	500
<b>Total Output</b>	<b>2300</b>	<b>6600</b>

This table shows that sweat is excreted 50 times quicker under conditions of prolonged heavy exercise compared to low activity in normal temperatures. The average human excretes a total of some 2,300 milliliters of water daily during low activity at normal temperature, and 6,600 milliliters in prolonged heavy exercise.<sup>3</sup>

### **What If Water Intake Is Inadequate?**

When we don't provide our bodies with enough water, they attempt to avoid dehydration by decreasing sweat and urine output. If this compensatory mechanism proves inadequate and insufficient fluid intake persists, dehydration will occur.

Dehydration causes an impairment of the body cooling mechanisms, along with a possible rise in body temperature and an inefficient clearance of body waste. The blood thickens and blood flow becomes impaired, increasing the risk of intravascular clotting. This may manifest as stroke or heart attack.

Insufficient water intake also leads to constipation—to the delight of the laxative

industry.<sup>4</sup> Exercise and fiber intake play a role, as well.

Dehydration may cause a person to experience dizziness or headache. During prolonged, arduous exercise serious dehydration may occur, so careful attention to fluid intake is particularly important under these circumstances. Drinking an inadequate amount of water also increases the risk of developing kidney and gallstones.<sup>5</sup>

In 1995, *The Journal of the American Medical Association* called attention to the hazards facing older Americans from inadequate fluid intake.<sup>6</sup> It's estimated that adequate hydration of older people could save thousands of days of hospitalization and millions of dollars each year. Such an observation has implications for all age groups worldwide.

### **How Much Water Is Needed to Stay Hydrated?**

To help stay hydrated during prolonged physical activity or in hot weather, the 2005 *Dietary Guidelines for Americans* recommends that we drink fluids during the activity as well as several glasses of water or other fluid after the physical activity is completed.<sup>7</sup>

In the healthy person, a practical guide to water intake is to consume sufficient amounts throughout the day to ensure that the urine is a pale color. (Urine may be a bright yellow color after taking certain medications, including vitamin pills and antituberculosis medication.)

Begin drinking water in the morning, because the body is relatively dehydrated from insensible (invisible) perspiration during sleep. Then continue to drink water at regular intervals throughout the day.

Be sure to drink water that is pure and clean. It is the most healthfully beneficial

liquid we can consume because it's relatively free of electrolytes and diuretic agents such as caffeine. Alcoholic drinks, apart from their other deleterious effects, are also diuretic agents. Most soft drinks are loaded with sugar, contributing to problems of obesity, diabetes, and dental caries.

### **Water as a Cleansing Agent**

Another important use of water is cleansing. Regular bathing removes accumulated dirt and contaminating debris, reducing the risk of infection.

Frequent hand washing may reduce transmission of many infectious agents from person to person. If people thoroughly washed their hands with soap and water before eating and after activities that soil their hands, a large percentage of infectious diseases would be eliminated.

### **Hydrotherapy**

Hydrotherapy is the use of water as a simple home therapeutic application. It's best applied as a help for simple muscular aches, pains, and bruises. When dealing with muscular aches, apply hot, wet towels alternated with cold, wet towels (ending with a cold application) to affected areas to improve blood flow. If recent injury and bruising have occurred, cold compresses are more appropriate. Caution should be exercised where the skin is diseased or cut. When blood flow becomes impaired or there is neurological damage resulting in an inability to feel heat, hot applications may lead to serious injury, so caution is again advised. This is especially applicable to people with diabetes or those whose

nerves have been damaged by injury or surgery.

There are many modes of hydrotherapy, such as cold mitten friction, hot foot baths, heat compresses, and ice compresses, and it's unfortunate that so few utilize this most useful tool for relief.

A man injured his elbow during a badminton game. He would not listen to advice to compress the hematoma of his elbow with ice, which would reduce the bleeding. The next day the bruised area around his elbow had swollen so much that he went to see the doctor right away. The doctor advised the use of ice compresses at home, and charged a \$100 consultation fee!

"The external application of water is one of the easiest and most satisfactory ways of regulating the circulation of the blood. . . . But many have never learned by experience the beneficial effects of the proper use of water. . . . All should become intelligent in its use in simple home treatments."<sup>8</sup>

### **Appropriate Concern for Earth's Inhabitants**

Water is a precious and indispensable resource. It's therefore important to conserve water resources:

1. Avoid wasting water. When possible, install toilets and shower heads in your home that use less water. When brushing your teeth, turn on the water taps only to wet and then rinse your toothbrush; turn taps off while brushing your teeth. Repair leaking faucets; continuous small drips over time can turn into huge amounts of wasted water. Also watch for other appropriate ways to conserve water in your day-to-day routines.

2. Avoid polluting water. Water can be polluted by human excrement, industrial waste, and chemicals. Animals raised in large agricultural feed-lot operations consume huge quantities of water, and their excrement has the potential to pollute groundwater and nearby rivers and streams. Eating a vegetarian diet helps to conserve water, because foods consumed in a plant-based diet require much less water to produce.

### **Water of Life**

Life cannot exist without water. All body functions require it. Water cleanses, refreshes, and powerfully aids the body's restoration. Similarly, in our spiritual lives, we cannot live eternally without the Water of Life.

What does the term "Water of Life" mean? Two thousand years ago Jesus Christ met a woman in Samaria who had come to a well to draw water. He asked her for a drink, and in the ensuing conversation He said He could give her water that would take away her thirst forever. "Whoever drinks of this water [from the well] will thirst again," Jesus told her, "but whoever drinks of the water that I shall give him will never thirst. But the water that I shall give him will become in him a fountain of water springing up into everlasting life" (John 4:13, 14, NKJV). Such a concept implies a spiritual thirst-quenching that would satisfy the yearning for peace, joy, freedom from guilt, forgiveness, and a sense of oneness with God.

Christians find such a solution in the person of Jesus Christ. His life was in marked contrast to the turmoil, strife, jealousy, anger, and dissatisfaction among the people both of

His day and ours. His offer to all is that we come to Him and dedicate ourselves to His service. He promises that this will bring relief from toil, anxiety, and stress, providing rest and fulfillment in Him. His offer is still valid today. May we be transformed as we drink, bathe, and are soaked in His compassion, love, and acceptance.

### **Life Application Questions**

#### **Chapter 3—Liquids**

1. Based on my level of activity, how much water does my body lose daily? How much liquid am I taking in every day? Based on the suggested criteria of the color of my urine, am I getting sufficient liquids on a daily basis? What can I do to increase my intake of liquids? Do I need to fill a water bottle each morning and make sure I drink it all? Would a schedule to drink at specific times each day be useful (not forgetting the important first glass in the morning)?
2. Ron and his family enjoy exercising outdoors. When it is hot and humid, they drink a lot of sodas to keep hydrated. Sometimes they complain of headaches and dizziness. What is wrong? How could I encourage them to exercise but also keep them safe? What are the symptoms of dehydration and heat stroke that I should look for?
3. What percentage of my liquid intake is pure water? What drinks increase the chance of dehydration because they are diuretic in nature? Do I consume too many sugary drinks (including fruit juices) that contribute to a weight problem? Do I make too many of these drinks readily available for my family, rather than keeping them for special times only?
4. Because a third of the water my body gets comes from my food, do I need to reevaluate the amount of high-water foods I'm eating? Which of the fruits and vegetables mentioned that are high in water content am I going to choose to use more regularly?
5. How often do I use water as a cleansing or healing agent? How should I tactfully remind others to wash their hands more frequently in order to stop the spread of infections? When is it appropriate to use hydrotherapy? Do I have ice or ice packs in my refrigerator for use on bumps or bruises?



6. How often do I think about and thank God for the wonderful gift of sufficient water? Which of the suggested ways to conserve water will I begin implementing? Which plant-based foods consume less water in production and reduce the amount of contamination of water supplies?
7. Being thirsty reminds us of the greater thirst for the “water of life” that Jesus offers. How can I accept that gift so that I also can be a source of life to those with whom I interact on a daily basis?

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<sup>1</sup> U.S. Department of Health and Human Services, National Institute on Aging, “Hyperthermia”; <http://www.nia.nih.gov/health/topics/hyperthermia>. Accessed online April 4, 2012.

<sup>2</sup> M.G. Hardinge, *A Philosophy of Health* (Loma Linda University School of Public Health, 1980), p. 37.

<sup>3</sup> H. C. Guyton, J. E. Hall, *Textbook of Medical Physiology* (Philadelphia, Penn.: W.B. Saunders Co., 2000), p. 265.

<sup>4</sup> WebMD, “The Basics of Constipation”; <http://www.webmd.com/digestive-disorders/digestive-diseases-constipation#causes>. Accessed online April 4, 2012.

<sup>5</sup> E. Braunwald, A. S. Fauci, et al., editors. *Harrison's Principles of Internal Medicine* (New York: McGraw Hill) 2011, pp. 1616, 1617.

<sup>6</sup> A. D. Weinberg, K. L. Minaker, “Dehydration, Evaluation and Management in Older Adults,” Council on Scientific Affairs, American Medical Association, *The Journal of the American Medical Association*, Nov. 15, 1995; 274(19): pp. 1552-1556.

<sup>7</sup> United States Department of Agriculture, “Dietary Guidelines for Americans” (2005), “Adequate Nutrients Within Calorie Needs”; <http://www.health.gov/dietaryguidelines/dga2005/document/html/chapter2.htm>. Accessed May 24, 2007.

<sup>8</sup> Ellen G. White, *The Ministry of Healing* (Mountain View, Calif.: Pacific Press Publishing Association, 1942), p. 237.