COCONUT WATER: A NATURAL REHYDRATION BEVERAGE

Dr. Bruce Fife

The hospital doors burst open and in rushed the medical team carrying the body of Ian, a local resident. Just hours before Ian had collapsed to the floor of his home. Barely alive but conscious, he was having difficulty speaking. His entire left side was weak and uncoordinated. That side of his face drooped and was pooling saliva. Ian had just suffered a stroke.

Ian was admitted to the Atoifi hospital, a 100-bed facility on the remote South Pacific Island of Malaita in the Solomon Islands. Over the next 36 days doctors worked to save Ian's life. He had difficulty swallowing and required tube feeding and intermittent intravenous (IV) hydration. His condition grew worse each day. He became weak, shaky, and dizzy. Finally, he was unable to tolerate the tube feedings and began vomiting. Intravenous hydration again became necessary.

Within a few hours the hospital's remaining supply of IV solution was exhausted, putting Ian's life in jeopardy. New supplies weren't expected for several days. Ian's situation became desperate.

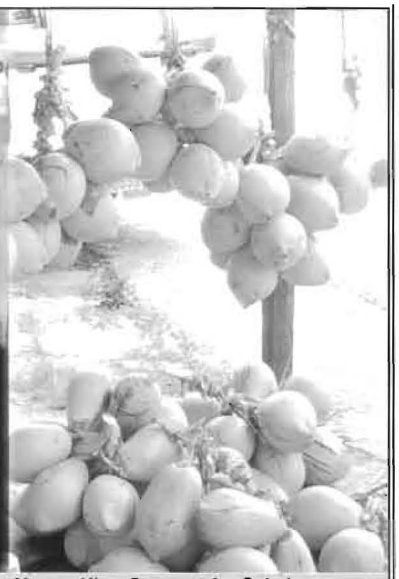
With no solution in sight, and Ian's life on the line, his physician made a bold move. The island had a rich supply of coconuts. The physician had heard that on other islands coconut water, the liquid inside the coconut, was successfully used as an emergency IV solution. With no other options available, he decided to administer coconut water directly into the patient's bloodstream. A needle was inserted into the soft eye of a coconut. A tube connected this needle with another that was inserted directly into Ian's arm. Over the next two days he received the water from several coconuts. During this time he made a astounding recovery, so much so that he was well enough after the second day to be released from the hospital. For the 36 days he struggled for survival, commercial IV solution had little effect, but when coconut water was delivered into his bloodstream he made such a miraculous recovery that he was sent home on the 39th day.

Young Red Tender Coconuts

Coconut water has proven to be a superior rehydration fluid when taken both intravenously and orally. It is completely compatible with the human body as demonstrated by being injected directly into the bloodstream without any harmful effect.

Ian's story was reported in the *American Journal of Emergency Medicine* in 2000. This was not the first instance where coconut water was used as an intravenous rehydration solution. IV coconut water therapy has been around for over 60 years. The first clinical study was reported by a team of doctors in Havana, Cuba in 1942. Previous studies on animals had shown coconut water to be safe when administered intravenously. In this study 12 hospitalized children were given coconut

Dr. Bruce Fife (Middle) and his wife, Mr. Romulo N. Arancon, Jr., APCC Executive Director (Right).



Young King Coconut for Sale in a Road Side in Sri Lanka

water IVs as part of their treatment. The children tolerated the coconut water well without any adverse effects, demonstrating that coconut water can be used as an IV solution in humans.

At the time this study was published, World War II was raging and before long Japanese and British military doctors were using IV coconut water in field hospitals. After the war, news of the successful use of IV coconut water inspired further investigation and the publication of numerous studies. The consensus among the studies was that fresh coconut water is a suitable substitute for commercial IV solution for rehydration therapy. What makes coconut water useful is that it is naturally sterile (i.e., free of germs), has a chemical profile similar to, although not quite identical to, blood plasma, is low in protein so it does not cause immune or allergic reactions, is well tolerated by the body, supplies essential nutrients, causes no harm, and provides much needed fluid.

Young Aromatic Coconut from Thailand Ready for Delivery

Using the juice from the inside of a coconut as an IV solution is not as bizarre as it might sound. The composition of coconut water is remarkably similar to human blood plasma. Like plasma it contains a mixture of sugars, minerals, amino acids, vitamins, hormones, and other substances necessary for growth and development. It is the lifeblood of the coconut embryo.

Coconut water has been a popular beverage in the tropics for generations and it wasn't long before physicians began experimenting with it for oral rehydration. They found that it was just as effective orally as it was intravenously in combating dehydration. Due to coconut water's chemical composition it is absorbed through the intestinal wall quicker than plain water, bringing about a faster recovery and eliminating the need for IV rehydration therapy.

Today coconut water is used worldwide as a home treatment for dehydration-related diseases such as cholera and influenza. Cholera, which is a major health problem in many underdeveloped countries, is characterized by severe diarrhea and vomiting. Death rates from cholera are high. Death, however, is not caused by the infection itself, but by dehydration resulting from the loss of body fluids. Giving cholera patients adequate amounts of coconut water results in a remarkable 97 percent recovery rate.

One of the secrets to coconut water's success as a rehydration fluid is its mineral or electrolyte content. Coconut water contains the same major electrolytes as those in human body fluids. When we lose water from

diarrhea or perspiration, we also lose electrolytes. It is necessary to replace both water and electrolytes. Coconut water does this; plain water doesn't. For this reason, coconut water has recently become popular as a natural sports rehydration beverage. Some people call it *Nature's Gatorade*, but it is far better than Gatorade.

In hot weather or during heavy physical activity we lose a substantial amount of water as sweat. Not only do you lose water, but you also lose electrolytes, particularly sodium and potassium. Electrolytes are essential for energy production and nerve and muscle function. Our bodies require precise amounts of each electrolyte. The loss of just 6 percent of potassium, for instance, can cause heart failure. So maintaining proper electrolyte levels is essential. When we become dehydrated we are generally deficient in electrolytes as well. Drinking water may replenish the lost fluids, but not the electrolytes. An athlete who loses a lot of water and does not adequately replenish electrolytes will experience muscle cramping, weakness, nausea, vomiting, diarrhea, and eventually go into a coma and may die. Electrolyte deficiency is one of the biggest dangers athletes face, particularly for those who participate in endurance races such as marathons and triathlons.

It may seem obvious to drink when the weather is hot or during heavy physical activity, but many people underestimate the magnitude of their fluid loss. It is very difficult to avoid dehydration during a long race or when working in the heat because the rate of sweat loss usually exceeds the rate of absorption of ingested fluids. The maximum rate of fluid absorption by the gastrointestinal tract during exercise is approximately 27 ounces per hour. The rate of fluid loss through sweating can easily reach 1 liter (34 ounces) per hour and can soar to 2 liters per hour under very strenuous conditions. If you lose 34 ounces of sweat and drink an equal amount of water you will still become dehydrated because the body can only absorb 27 ounces. Thus, it is not possible to drink enough to stay hydrated, and dehydration will still occur despite drinking plenty of fluid.

Drinking only water, without a source of electrolytes, can dilute the electrolytes in your bloodstream, causing a serious electrolyte deficiency. Many athletes have been sent to the hospital for this very reason.

The problem with commercial sports drinks, however, is that their electrolyte content is too low to be of much benefit. Sodium and chloride (salt) are usually the only electrolytes they contain. Potassium, another essential electrolyte that is lost, is often not even included. Commercial sports drinks also contain various questionable additives such as chemical dyes, emulsifiers, and preservatives. Basically, these popular sports drinks are nothing more than non-carbonated soft drinks with a little added salt. Contrary to popular opinion and marketing hype, these drinks are not recommended for preventing serious dehydration.

Coconut water offers a superior option to commercial sports drinks. Unlike these other beverages, coconut water is recommended for rehydration. Coconut water is completely natural with no harmful chemical additives. Unlike sports drinks, it contains all the major electrolytes important to the human body—sodium, potassium, chloride, magnesium, calcium, phosphate, and sulfate as well as important trace minerals such as zinc and selenium and contains more potassium than a banana. It also supplies other important nutrients missing from sports drinks, such as amino acids, vitamins, and antioxidants, all of which support a healthy body and proper hydration.

Coconut water has proven to be a superior rehydration fluid when taken both intravenously and orally. It is completely compatible with the human body as demonstrated by being injected directly into the bloodstream without any harmful effect. Can you imagine the damage that would occur if you tried to inject Gatorade into your bloodstream? The purpose of consuming rehydration beverages is to replace fluids and nutrients lost from the blood, so it is only logical to use a product that can do this effectively and harmlessly.

Coconut water is available in most good health food stores and some grocery stores. It comes packaged in easy-to-carry cans, bottles, and tetra paks. Tetra paks are the most convenient because you can take them with you anywhere, even when you exercise, and don't have to worry about them breaking. You can even freeze them beforehand so you have a cool, refreshing drink during your workout.

You can also get coconut water straight from a fresh coconut if you desire. You want to make sure you get a "young" coconut. Young coconuts are those that have not fully matured. The water in the mature brown, hairy coconuts you see in the grocery store is too old and tastes much different. Whole young coconuts are also sold in health food stores. They are perishable so you will find them in the refrigerated section.

Dr. Bruce Fife is a Certified Nutritionist and Doctor of Naturopathic Medicine, based in USA.