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Long Live Your Liver


Dr. David G. Williams

School has begun here in Texas, as it has in most parts of the country. Along with the start of the school year comes football.

Last week I went to watch my 13-year-old son, Mason, at football practice. What I saw shocked me.

There were about 50 kids trying out for the team, and at least half of them were obese. Not just overweight, but seriously obese. In all, three quarters of the group was either overweight or obese. These are children starting the seventh grade. They are just starting to experience all the physical and emotional stress and pressure associated with puberty and their teenage years. Unbeknownst to them at this point, their obesity will subject them to an even greater burden for decades to come.

Johns Hopkins University released data this year showing that the prevalence of obesity in the US increased from 13 percent to 32 percent between the 1960s and 2004. If the growth rate of obesity and overweight continues at this pace, which is expected, *within just 7 years* 75 percent of adults and nearly 24 percent of US children and adolescents will be overweight or obese. The report goes on to say that *obesity will soon become the leading preventable cause of death in the United States*.

An External Sign of an Internal Problem

I'm sure this comes as no surprise to you. It doesn't surprise me. What shocked me, however, was just how quickly obesity has turned into a full-blown epidemic. Years ago, I predicted we would begin to see "adult" diseases in children; that prediction is coming true at a pace that startles even me. Problems like type 2 diabetes (it used to be called "adult-onset" diabetes), high blood pressure, cardiovascular disease, et cetera are now commonly being diagnosed in our children. I think that this is, regrettably, only the tip of the iceberg.

Over the next couple of decades, we are going to see an unprecedented increase in liver disease among both children and adults in this country. What is now only a trickle of isolated cases will quickly turn into a raging flood. Unfortunately, I don't think anyone is prepared to deal with the consequences.

If you're currently overweight, there's a one-in-ten chance that you already have liver disease and don't know it. And there are already indications of how widespread liver problems have become.

When liver disease is mentioned, most people think about either excessive alcohol consumption or viral hepatitis. Only about a third of all cases of liver disease are related to these problems, however. And while there are over 100 different causes of liver disease that aren't alcohol-related, obesity has taken the lead among them as the primary cause of liver disease. Obesity results in what is called non-alcohol fatty liver disease (NAFLD).

Finding a Hidden Problem

Current estimates are that somewhere between 5 and 10 percent of the US population currently have liver disease. But many experts I've spoken with now believe that 10 percent may be far too low an estimate.

In This Issue

You will observe with concern how long a useful truth may be known, and exist, before it is generally received and practiced on. — Benjamin Franklin

The actual incidence of liver disease is difficult to determine, for several reasons.

First, the liver is a very resilient organ. It can sustain a great deal of damage and still continue to function adequately. It also has the ability to regenerate when only one-fifth of its original volume remains. For these reasons, it's not uncommon for someone with a severely diseased liver to exhibit only mild symptoms, or even none at all—right up to the time the liver actually fails.

Secondly, diagnosing liver problems isn't that easy. Basing the diagnosis on symptoms alone is difficult, because the majority of people with liver disease don't seem to be that far from healthy. In the early stages of the disease, the symptoms are ones we all experience at varying times: insomnia, fatigue and tiredness, inability to concentrate, flu-like aches and pains and low grade fever, depression, loss of sex drive, low blood sugar, generalized itchiness, and abdominal pain. (Of course, it's also possible that these symptoms are so prevalent because liver disease has become so prevalent.)

The symptoms most people (doctors included) associate with liver disease—such as jaundice (yellowing of the skin) and abdominal swelling from fluid accumulation—occur only in the advanced stages of the disease.

Diagnosing liver disease based on lab tests is also difficult. Abnormal liver function tests may certainly indicate a problem, but false positives are common and *in cases of fatty liver disease most tests come back negative.*

This leaves only a few other diagnostic options. Ultrasound can sometimes detect a fatty liver. Combined with liver function and enzyme tests and a symptom survey, this might be one of the better options.

There's also palpation of the liver, where a doctor feels for an enlarged liver (which is difficult in obese patients), and/or a biopsy, which only tests a small area of the liver and can be dangerous or even fatal if bleeding occurs.

Given the complexity of diagnosing liver disease, it's understandable why so few patients are being treated during the initial stages of the disease. It's simply being overlooked. The majority of doctors and the public are totally unaware of the problem. Liver disease only shows up on the radar screen when it develops into a more advanced situation. Therein lies the problem. The only treatment option at that point is a liver transplant. Not only is this procedure extremely dangerous and outrageously expensive, there aren't enough organs available to meet the current needs—much less the increased demand we'll see in the very near future.

Hundreds of thousands of individuals will soon be caught in this situation. Don't let it be you or someone you know. If you're currently overweight or obese and have the early symptoms that I mentioned above, you need to take steps to reverse the situation. Just because you don't drink excessively or haven't been infected with a hepatitis virus, don't fall into the trap of thinking it's not a problem. Fatty liver disease is now starting to show up in people in their 20s and 30s—and even in children. And all of these people "felt fine" and seemed to be in good health except for being overweight.

An Abdominal Tragedy

The liver is a phenomenal organ. A few of its many functions include:

- filtering blood;
- breaking down and recycling red blood cells;
- producing bile necessary for fat digestion;
- regulating cholesterol;
- storing minerals and vitamins, especially B vitamins;
- producing crucial proteins;
- breaking down excess hormones;
- storing energy (in the form of fatty acids) and regulating various sugars; and
- breaking down toxins (drugs, pesticides, et cetera).

The detrimental effects on the liver from excess alcohol and viral infections are well-documented. Exactly how excess fat damages the liver isn't yet fully understood, but I suspect it has to do primarily with the last two functions I've listed above.

Under normal circumstances, when blood sugar levels drop between meals and additional energy is required,

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the liver releases fatty acids from stored fats into the bloodstream. And when food is being digested and insulin is released, the liver stores fatty acids as fats for reserve energy later.

In overweight individuals, who are generally insulin-resistant, the bloodstream has a constant excess of circulating fatty acids. The liver tries to remove these by both storing more fat and increasing oxidation. The increased oxidation creates more free radicals, which trigger inflammation and damage in the liver. In addition, many of the body's toxins are warehoused in fatty tissue. When they are broken down later for energy, the toxins are released *en masse*—causing cellular damage to the liver and other tissues. This sequence of events explains why many severe weight-loss events result in the manifestation of cancer.

Regardless of whether liver disease stems from alcohol, a viral infection, or obesity, the end result is the same. (It's important to keep in mind that alcohol and obesity combined produce more damage than either alone.) As liver cells are destroyed, cavities form and the surrounding areas become inflamed. As scar tissue fills the voids, it obstructs blood flow throughout the liver. This process is called cirrhosis, and eventually leads to liver failure. Fluid begins to accumulate in the abdominal cavity, jaundice develops, digestion becomes impaired, wasting occurs, and the individual can die from toxicity, the rupture of a blood vessel, or liver cancer. Liver cirrhosis is a horrible thing to die from.

It's Not Too Late…Yet

Until quite recently, it was generally felt that once the scarring and damage from cirrhosis occurred it was permanent and irreversible. Research has shown, however, that if caught in the early stages, liver damage can be reversed. (*J Clin Invest 98;102(3):538–549*)

Studies have repeatedly shown that even modest weight loss provides significant benefits in reducing liver inflammation. (*Gut 04;53:413–419*)

The key is to catch the problem in the early stages and to immediately stop the situation that is causing the damage. If alcohol is causing the problem, it must be eliminated. If it's obesity (or a combination of alcohol and obesity), one must lose weight by changing the diet and exercising. When the offending cause is removed, the body has the ability to gradually remove the fibrous scar tissue and rebuild the liver.

To reduce additional free-radical damage during the weight-loss period, I highly recommend using a variety of antioxidants, including vitamins C and E, coenzyme Q10, lycopene, and lutein. To enhance the breakdown of scar tissue, I would definitely use a quality nattokinase supplement as well. A protein called fibrin is involved in the formation of scars, and nattokinase helps dissolve fibrin accumulation. A liver support product should also be used. Ingredients to look for include N-acetylcysteine (500 mg daily or more), milk thistle (500 mg daily), the amino acids L-cysteine and L-methionine (500 mg daily each), and alpha lipoic acid (100 mg daily).

And make sure your supplement program includes a quality source of trace minerals—particularly selenium, which activates tumor-suppressing genes.

I have also recommended the daily use of lecithin granules, primarily to help prevent and reverse atherosclerosis. One of the components of lecithin is choline, a compound that's also useful to prevent fatty liver disease. Lecithin is somewhat low in choline content, however, so if you suffer from liver disease I would suggest additional choline intake from foods such as beef liver, eggs, cod, cauliflower, and peanut butter. The range of foods that contain choline once again illustrates the benefits and importance of eating a varied diet.

One recent study found that when the daily intake of choline was reduced to 50 mg per day (down from a recommended amount of 550 mg), 80 percent of postmenopausal women, 44 percent of premenopausal women, and 77 percent of men developed fatty liver and/or muscle damage. To reverse the damage a daily intake of 825 mg was required. (*Am J Clin Nutr 07;85(5):1275–1285*)

I used to say that I rarely make predictions. But it doesn't take any special talent to make this prediction, only a willingness to see what's there. It's glaringly obvious to me that the medical community and the public will soon be getting a painful and costly education on fatty liver disease. Just as with the current epidemic of diabetes, fatty liver disease is directly linked to our rampant obesity problem. And as with diabetes, there are hundreds of thousands of unsuspecting individuals walking around who already have the disease. Unlike diabetes, however, by the time the problem is recognized, it may be too late to save the individual—or a liver transplant may be their only hope.

I understand as well as anyone that maintaining a proper diet and exercise program is hard, and it gets harder with every year you age. It's obvious from the statistics that fewer and fewer people are making that commitment each year. In the long run, however, it will be a small price to pay—particularly when you compare it to the price paid by the "sheeple," who are just calmly doing whatever their neighbor does.

The Benefits of Hot Peppers

A reader recently wrote in to say that, while he and his wife have developed a taste for hot peppers and spicy foods, he's concerned that by eating all that hot food they're setting themselves up for future ulcers and other stomach problems.

Contrary to what many say, eating chili peppers doesn't cause ulcers. In fact, peppers have been shown to trigger mechanisms that actually protect the lining of the stomach. Just because the peppers can cause a burning sensation upon entering and exiting your body doesn't necessarily mean they burn a hole in the stomach or other parts of the gastrointestinal tract.

Keep in mind that your stomach is routinely exposed to hydrochloric acid with a pH of 1.0 without injury. (The pH scale runs from 0 to 14, with 0 being the most acidic and 14 being the most alkaline.) Studies in Hungary recently found that consumption of capsaicin actually decreased the acid output of the stomach, while at the same time increased protective secretions. In simple terms, peppers act as an antacid.

Capsaicin was also particularly effective at protecting the stomach from ulcerations caused by alcohol and NSAIDs (nonsteroidal anti-inflammatory drugs). These drugs, as I've said numerous times, cause injury to the protective mucosal lining of the stomach—which results in bleeding. Capsaicin reduced the amount of NSAID-induced bleeding dramatically. (*World J Gastroenterol 05;11(33)5180–5184*) (*J Physiol Paris 97;91(3-5):151–171*)

Researchers in Singapore compared the eating habits of 103 ulcer patients to those of 87 controls and found that ulcer patients consumed hot peppers an average of 8 times per month—compared to 24 times a month in the control group. Further evaluation revealed that eating the chili peppers reduced the risk of developing gastric ulcers by 53 percent. (*Dig Dis Sci 95;40:576–579, 580–583*)

Hot chili peppers don't cause gastric ulcers. They help prevent ulcers.

NSAIDs are one of the leading causes of gastrointestinal ulcers and bleeding. I won't go into detail about this again, because I've covered it so many times in the past. Suffice it to say that aspirin and the other NSAIDs taken by millions of individuals every day in this country for pain, headaches, et cetera, are an overlooked cause of ulcers. [*Editor's note: For more information about the dangers of NSAIDs and about safe alternatives to them, visit the Subscriber Center of the* Alternatives *Web site at* www.drdavidwilliams.com.]

Another cause of ulcers you rarely, if ever, see mentioned is low melatonin levels. Although melatonin is a powerful hormone—practically in the same category as testosterone and estrogen—it gets little attention. The trigger for melatonin production in the pineal gland is low light levels. As our society stays up later, uses artificial lighting far into the night, and gets less sleep, our bodies obviously produce less melatonin. The use of NSAIDs and alcohol also impair melatonin production.

Decreased melatonin production has been linked to increased rates of cancer, poor immune system function, and several other problems. And though few people associate lower melatonin levels with an increased incidence of ulcers, research shows this to be the case.

If you or someone you know has a chronic ulcer problem, it's highly possible their production of melatonin is below normal. Animal studies have shown that increasing melatonin levels by even small amounts can have a dramatic effect in both healing and preventing stress-induced ulcers. (*J Gastroenterol 01;36(2):91–95*) (*Neuroreport 97;8(9-10):2305–2309*) (*J Pineal Res 05;39(4):375–385*)

Other Uses for Peppers

Not only do hot chili peppers help prevent ulcers, they can lower blood pressure, improve circulation, and even stop the formation of various cancers.

The chemically active component in most peppers is capsaicin, which binds to nerve receptors. It initially causes a burning sensation, which is followed by an analgesic effect or the blocking of pain. This helps explain how capsaicin-based creams can alleviate the pain in arthritic joints, for example.

(If you can't afford a capsaicin cream, or need to make one in a hurry, simply mix one part cayenne powder with five parts of warmed Vaseline or other base cream. Vaseline is very convenient in a pinch; it's cheap and readily available, and it melts easily and then congeals again when cooled. Studies have also shown that Vaseline isn't absorbed through the skin. Always make sure you wash your hands well after handling cayenne powder or any capsaicin-based cream. I know in my case it seems like I always end up wiping or touching my eyes afterward, for some reason. It's not a pleasant sensation.)

Capsaicin is also a COX-2 inhibitor; it reduces the production of certain prostaglandins that cause inflammation. Capsaicin triggers other protective and beneficial processes such as relaxing blood vessels—resulting in higher blood flow and lower blood pressure.

Putting Peppers to Work

Chili peppers are one of the unsung heroes of natural medicine. Even if you don't eat chili peppers, I highly recommend that you keep a large container of cayenne pepper powder around at all times. It's safe and inexpensive, and has dozens of uses.

Cayenne pepper works great for reducing blood pressure. One-half to one teaspoon twice daily mixed in a glass of warm water will often work wonders. If you find it difficult to take it this way, you can encapsulate it and start with 2 or 3 capsules a day.

It also reduces the adhesiveness of blood platelets. In simple terms, it reduces blood clots—which are one of the major contributing factors to heart attack and stroke. A few capsules or a teaspoon of cayenne powder could be one of the easiest and least expensive ways to help prevent blood clot problems associated with extended airline travel (deep vein thrombosis).

It can be used to help open blood vessels and get oxygenated blood to vital organs immediately following a heart attack. (Take a tablespoon of hot sauce such as Tabasco, or a heaping tablespoon of cayenne pepper, in a glass of warm water.) Also, a tablespoon three times daily for two days following a stroke can help lower blood pressure while at the same time improving circulation.

A nasal spray of water and cayenne pepper has been shown to successfully stop chronic cluster headaches. The spray was used in the nostril on the same side as the headache. There was the expected burning, tearing, and irritation upon initial use, but, once the polypeptide compounds that transmit the pain impulses were depleted, these symptoms began to subside. The best results are achieved after numerous applications over a period of several days. Relief can last for months, and in one study there was close to a 70 percent cure rate.

If using a nasal spray seems like too much trouble, you can use a capsaicin cream instead. Use a cotton swab to apply a small amount of cream about one inch inside the nostril on the side of the headache. Remove the cotton swab and gently massage the nostril from the outside to make sure the cream is absorbed. You can expect the same burning sensation in the nostril and possibly tearing, et cetera, for the first five or six applications. (*Headache 90;30(2):69–79*)

Capsaicin creams can also be used to reduce the inflammation and irritation of psoriasis and the pain associated with diabetic neuropathy and shingles.

Cayenne pepper and other chili peppers in the diet have also been shown to increase one's metabolic rate and improve the excretion rate of cholesterol. Capsaicin can also help lower blood sugar levels. One or two capsules with meals is generally the recommended dosage.

Cayenne powder can be applied directly to wounds to stop external bleeding if there's nothing better available.

The powder can also be used as a gargle in cases of severe sore throat pain. Just add about ¼ teaspoon to a cup of regular gargling solution (warm water and dissolved salt).

With the increasing Mexican-American population in this country, the consumption of salsas and chili peppers has become more widespread. In fact, salsa has now surpassed ketchup as the most widely consumed condiment. Chili peppers have been used extensively in the hotter climates for centuries. Instinctively, inhabitants of these areas found that hot peppers actually have a cooling effect on their bodies. Science has since discovered that capsaicin has a profound effect on the hypothalamus gland—causing a drop in overall body temperature and allowing for a greater tolerance to environmental heat.

I do enjoy hot peppers. My whole family likes them, especially my wife. It's not uncommon for her to sprinkle Tabasco on her jalapeño peppers.

Hopefully we discover more of the benefits of chili peppers as time passes. I have no doubt there are dozens of benefits and uses waiting to be uncovered. In the meantime, ulcers are not a problem. Enjoy your jalapeños and other hot peppers.

Vitamins, Hormones, and Sugar

Quite a few conditions are considered to be "age-related"—that is, they tend to be absent in younger people and the incidence rises with age. For years, researchers have been looking for a common cause for all these conditions; one current theory is oxidative damage. What seems to get passed over is the possibility that these conditions could be related to each other.

Now, a group with the College of Physicians and Surgeons at Columbia University has found a link between the health of bones and the way the body uses and stores fat. The process of breaking down old bone and building new bone, called remodeling, requires a fair amount of energy. The researchers had already discovered that the hormone leptin, secreted by fat cells, helps regulate the rate of bone turnover. They reasoned that messages would pass the other way as well: Something in bones would affect fat storage. In experiments using

(*Glucose Level continued on page 32*)

NEWS TO USE FROM AROUND THE WORLD

Sleep…Sleep…and Only Half Awaken

BOSTON, MASSACHUSETTS—I've suggested for some time now that many of the new diseases on the increase are probably related to environmental exposure to one or more chemicals. A group of scientists are now looking into the possibility that one of the causes of Alzheimer's disease may be the exposure to anesthetics commonly used in surgery.

The anesthetics under suspicion are isoflurane and halothane, both of which are inhaled. Patients given the chemicals commonly experience cognitive problems, but these were believed to be short-lived interruptions rather than permanent damage. When researchers tested the chemicals on animals, however, significant mental decline was noted. And it's possible that other chemically related anesthetics, such as desflurane and sevoflurane, might also cause similar problems.

The research is still underway, and hopefully will continue. Although the researcher who reported the possible problem said he found the early results "alarming," he told doctors and patients there was no need for panic at this point. (*JAMA 07;297(16):1760*)

My first question to him would be, knowing what he knows, would he accept one of these anesthetics if he was undergoing surgery? I don't think it would be too hard to guess what his reply would be.

I think that in time we'll discover that a long list of various medications, chemicals, and pesticides contribute to the increase in neurological diseases like Alzheimer's, Parkinson's, Lou Gehrig's (ALS), et cetera.

Apples for Immune Support

BOONE, NORTH CAROLINA—Researchers at Appalachian State University have found that the bioflavonoid quercetin can effectively reduce susceptibility to viral infections.

The study was funded by the US Department of Defense, which has been searching for ways to maintain the immune system of troops undergoing the physical and cognitive stresses of combat. I would suggest keeping this study in mind, particularly when it comes to fighting off the flu and other viral pathogens.

In the study, 20 cyclists took 1,000 mg of quercetin a day for five weeks and a control group of 20 cyclists took a placebo. Three weeks into the study, the athletes rode a bicycle three hours a day to the point of exhaustion. Extreme exercise weakens the immune system and increases an individual's susceptibility to infection.

While 45 percent of the cyclists taking the placebo developed an illness following the exercise, only 5 percent of those on the quercetin experienced any illness. There were no side effects from taking the quercetin.

It was interesting to note that blood and tissue samples indicated that the immune-boosting effects didn't take place until after the three-hour intense exercise period. The researchers commented that it obviously takes a significant amount of stress to bring out quercetin's infection-fighting properties.

They also found that, following the three-hour exercise period, quercetin helped the athletes maintain their mental alertness and reaction time—which didn't occur in the placebo group. In this respect, the effects of quercetin were comparable to that of caffeine.

Additional studies will be undertaken to see if lower doses are as effective and if quercetin would be beneficial to the general population in counteracting the negative aspects of mental stress. (*College of Fine and Applied Arts, Appalachian State University, 2007*)

Quercetin, as you may recall, is a powerful antioxidant found in red grapes, red wine, red apples, all onions, green tea, and broccoli. From earlier studies, it seems to work best when taken with vitamin C.

Higher quercetin intake has been associated with decreased cholesterol levels and a lower risk of heart disease and diabetes. It is associated with a reduction in the risk of several types of cancers. The normal intake in this country from food sources is estimated to be in the neighborhood of 20 to 50 mg daily. A diet high in fruits and vegetables could easily provide 200 to 500 mg. You can easily find quercetin capsules containing 250 to 500 mg in most health food stores.

Cranberries—Good for Your Heart

QUEBEC, CANADA—Researchers at Laval University have found that drinking cranberry juice can reduce your risk of several forms of heart disease. A group of 30 men was asked to drink up to a pint of cranberry juice each, daily for three weeks. The study was looking for an effect on the oxidation of cholesterol and the level of what are called adhesion molecules. The levels of both decreased significantly, compared to levels at the beginning of the study. (*Br J Nutr 07 Aug 29;1–8. E-pub ahead of print*)

As I've often said, cholesterol in your bloodstream doesn't become a problem until it oxidizes—at which point it begins to damage the lining of blood vessels.

Adhesion molecules play a role in damage to the lining of your blood vessels. Reduced levels indicate an increased ability of your arteries to resist the effects of damaging substances such as oxidized cholesterol.

If you'll remember, I first reported on the cardiovascular benefits of cranberry back in June of 2005. At that time I promised you I'd keep you up to date on any further research in the area. This latest study shows that cranberries both strengthen your arteries directly and

weaken the force directed against them. The protective ability of cranberries is due to their content of certain antioxidants. The compounds peonidin and petunidin resist breakdown in your body, and they are found in cranberries at higher levels than in other fruits.

The researchers in the study gave the men a "low-calorie cranberry juice cocktail." I can just imagine what was in the drink. Most cranberry "cocktail" drinks contain only about 25 percent juice or less, and are loaded with added sugars or artificial sweeteners. You're far better off eating cranberries themselves, or getting cranberry powder in your diet. The whole berries are pretty tart; you'll want to sweeten them with something such as xylitol. If you choose a powder, you don't need very much of it per day—just 50–100 mg combined with plenty of other fruits and vegetables is enough to do the trick.

More Changes in Resuscitation

WEST LAFAYETTE, INDIANA— Standard cardiopulmonary resuscitation (CPR) has been in use since the 1960s. Studies performed over the last few years have uncovered numerous problems with conventional CPR:

—The survival rate is typically only around 5 to 10 percent—which is pretty dismal, to say the least.

—Even medical professionals are reluctant to perform mouth-to-mouth rescue breathing. One survey revealed that 45 percent of doctors, and 80 percent of nurses, would refuse to perform mouth-to-mouth breathing on a stranger.

—To compress the heart adequately to keep blood flowing, the sternum need to be depressed 1-1/2 to 2 inches with each push. It takes 100 to 125 pounds of force to move the sternum that far. Only about two-thirds of trained rescuers use enough force, and fewer than one-fifth of untrained rescuers.

—The pressure required to move the sternum is also enough to crack the patient's ribs.

In the last few years, medical researchers have been working on methods to improve the survival rate. Now an engineer at Purdue University has developed a new resuscitation technique that promises to be more effective than standard CPR.

Professor Leslie Geddes has found that compressing the abdomen rather than the chest increases blood flow through the heart by 25 percent over standard CPR. Additionally, air is expelled from the lungs during the compression of the abdomen. Upon release of the force, inhalation occurs—which bypasses the need for mouth-to-mouth breathing.

I hope this new OAC-CPR (only rhythmic abdominal compression-cardiopulmonary resuscitation) becomes common knowledge both in the medical field and in the public sector. Testing is underway to make sure the technique can be duplicated effectively in the field. If all goes well, I can see where it would become preferred over conventional CPR.

In the studies, Professor Geddes used what he calls a "pressure applicator." It's basically a slab of wood shaped like a scaled-down version of a baseball home plate, with handles attached. The pressure applicator provides consistent results for testing purposes, but the procedure can easily be done using just one's hands.

I suspect we'll see see a lot more research in the area of CPR over the next couple of years. It's an area that has been neglected for far too long. If you'll remember, I reported on a variant of CPR in the September, 2006 issue of *Alternatives*. That form, called CCR (for cardio-cerebral resuscitation) uses only the chest compressions, without any attempt at mouth-to-mouth resuscitation. I still believe that CCR is better than conventional CPR, but it does carry the same risk to the victim—broken ribs from vigorous chest compression—and it requires training to be done properly. This newer procedure can be done by rescuers with little or no training, and carries a greatly reduced risk of injury to the patient.

Before leaving the subject, I want to pass along some very important findings just released from the University of Berkeley.

It has always been thought that death or irreversible damage occurred if the heart or brain cells were deprived of oxygen for as little as 4 or 5 minutes. New research has found that oxygen-starved cells last for hours, not minutes, after being deprived of oxygen. It is when oxygen is returned to the cells that they die. This has been a problem in the resumption of blood flow following open-heart surgery, but now doctors are beginning to use this knowledge to change the way heart attack victims are treated.

One recent study involved heart attack victims from four different hospitals. When the victims didn't respond to CPR after ten minutes, doctors continued to maintain blood pressure above 60 mm/Hg and used mechanical devices to keep the blood circulating throughout the body. While this was occurring they determined the cause of the heart attack, fixed it, and then slowly increased oxygen levels. While some of these victims actually experienced cardiac arrest for up to 2 1/2 hours, there was still a survival rate of about 80 percent. (As I said earlier, standard techniques have a survival rate of somewhere between 5 and 10 percent).

I suspect that in the very near future rescuers will be instructed to continue these newer CPR techniques for far longer periods of time. If the blood can be kept circulating until the patient can be transported to a hospital and the problem repaired, I think we'll begin to see much higher survival rates.

(Glucose Level continued from page 29)

mice, the group found that the messenger is a protein called osteocalcin—a substance produced by osteoblasts, the cells that build new bone. (*Cell 07; 130:456–469*)

(The path from cause to solution gets a little tangled, but I'll do my best to straighten it out for you. If some of what comes next seems a little basic, it's to help you understand what's going on later.)

Glucose in your bloodstream can go one of two ways. First, your body uses what it needs for energy production in cells. Second, what's left over gets turned into fat.

Insulin is the hormone that opens cell walls and allows glucose to enter. When there isn't enough insulin present, or when cells don't respond to insulin, glucose accumulates in the bloodstream and eventually gets converted to fat by your liver. Osteocalcin stimulates the cells that make insulin, and it makes individual body cells more receptive to insulin. Together, these actions increase the efficiency with which your body burns insulin, and reduce your need for insulin, your blood levels of glucose, and the amount of glucose that's stored as fat—all this by simply increasing your production of osteocalcin.

Making More of the Maker

As I mentioned earlier, osteocalcin is secreted by the osteoblast cells that build bone; its local function is to transport calcium from the bloodstream to the sites where new bone is being created. The more osteoblast activity you have, the more osteocalcin there is available.

There are several ways to increase your osteoblasts. One option is to use the hormone progesterone. Dr. John Lee showed many years ago that application of 1/4 teaspoon of progesterone cream daily reliably increased bone mass in menopausal women. Recent studies on bone cells show that it works by increasing the number and activity of osteoblasts. (*Endocrinology 05;146:2620–2628*)

You can also take a supplement of the amino acid L-arginine, 5–6 grams per day. [*Editor's note: See the April 2007 issue of* Alternatives *for more about L-arginine and bone health.*] The surest method, however, is to get regular weight-bearing exercise. (By weight-bearing exercise, I mean activity that increases the stress on your bones: using weights or resistance devices; vigorous walking; even dancing.) Stress on your bones creates tiny cracks in old, weak bone. Your body responds by creating more osteoblasts, which fill the cracks with new, strong bone.

One way of adding stress to your bones is, of course, to gain weight. Higher body mass is associated with higher bone mass. This isn't a license to put on weight forever, though. A trial in Turkey showed that bone health depends more on lean mass (that is, muscles) than on fat mass. And a study sponsored by the National Institutes of Health showed that extreme obesity (a body mass index greater than 40) actually resulted in lower bone mass. (*Rheumatol Int 03;23:87–91*) (*Obesity (Silver Spr) 07;15:1980–1987*)

Making More of the Messenger

An increase in the number and activity of osteoblasts will only result in more osteocalcin if your body has the raw material it needs. One of the required elements is vitamin K, which acts as a coenzyme in osteocalcin production. Another required element is vitamin D, which stimulates the osteoblasts to secrete osteocalcin. In one trial, bone cells that were exposed to vitamin D produced up to nine times as much osteocalcin as cells that weren't exposed. (*J Biol Chem 85;260:8706–8710*)

Coming back to my original point, healthy bone contributes to healthy glucose levels. Increasing the amount of new bone you build will help you directly control your weight. (As an aside, the drugs prescribed for osteoporosis work by stopping the breakdown of old bone, rather than by supporting the building of new bone. They likely will have no effect on your glucose level.)

If you needed more evidence of the inter-relatedness of body systems, here it is. As I mentioned earlier in the article about liver disease, trouble in one part of your body can show up in another area. Don't be caught unaware.

Take care,

If you have questions or comments for Dr. Williams, please send them to the mail or e-mail addresses listed to the right. Of course, practical and ethical constraints prevent him from answering personal medical questions by mail or e-mail, but he'll answer as many as he can in the Mailbox section of *Alternatives*. For our part, we'll do our best to direct you to his issues, reports, and products related to the subject of your interest.

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