Shorts

The *JAMA* cross-sectional study involved 788 adults who had urine arsenic measurements taken as part of their participation in the 2003–2004 National Health and Nutrition Examination Survey. The researchers adjusted for biomarkers of seafood intake in order to figure out the person's exposure to inorganic arsenic. They found a "positive association between total urine arsenic, likely reflecting inorganic arsenic exposure from drinking water and food, with the prevalence of type 2 diabetes in a population with low to moderate arsenic exposure." Further adjustments for family history of diabetes, hormone therapy use, and dietary supplements did not change this conclusion, according to a reply posted December 17, 2008. From this study, authors could not conclusively state that inorganic arsenic promotes diabetes. Diabetes may, instead, affect how the body metabolizes and excretes the mineral. The study's authors call for "high-quality prospective studies conducted in populations exposed to a wide range of arsenic levels."

AMA Morning Rounds. Study suggests inorganic arsenic in drinking water may increase type 2 diabetes risk. August 20, 2008.

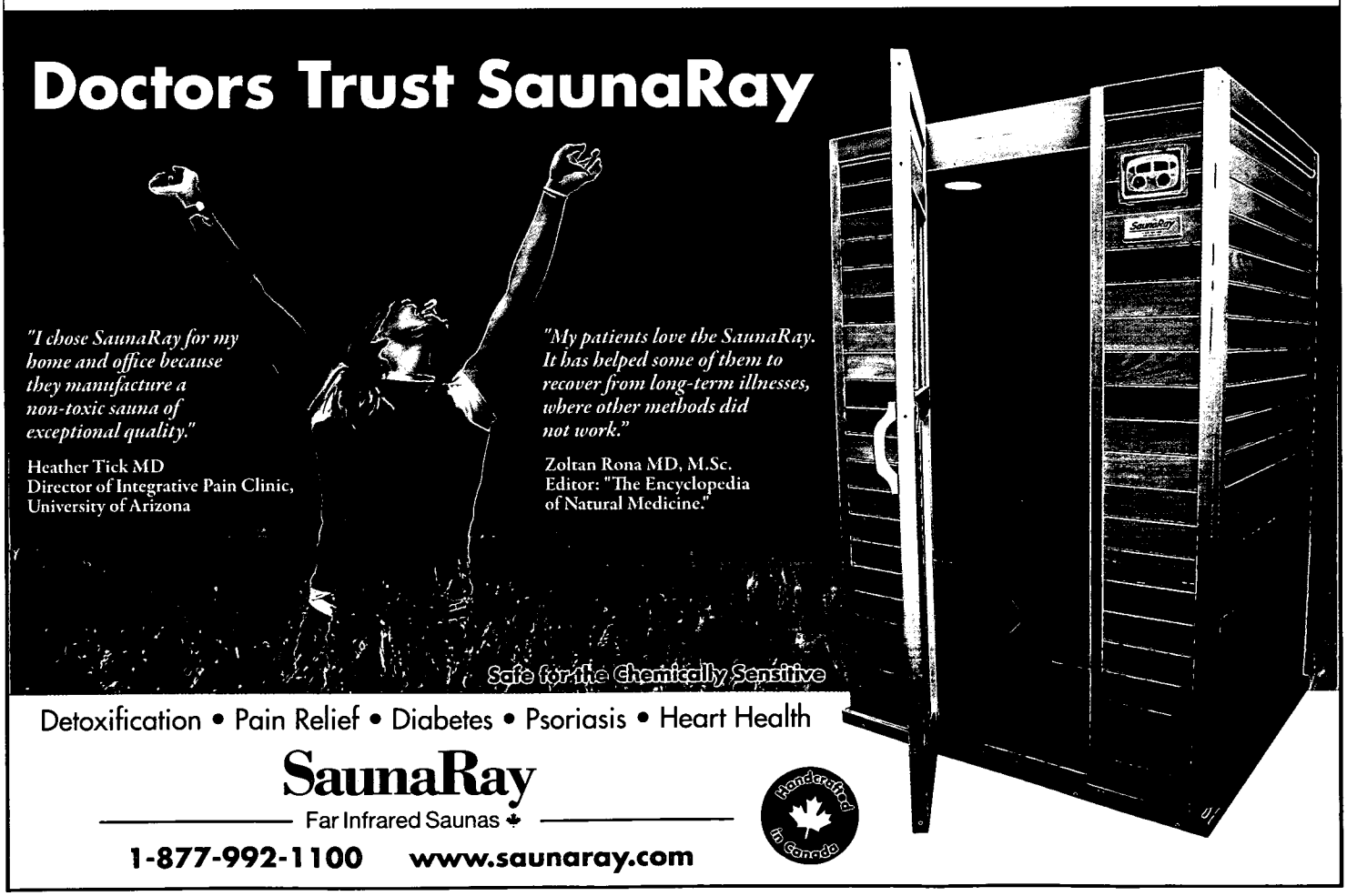
Navas-Acien A, Silbergeld EK, Pastor-Barriuso R, et al. Arsenic exposure and prevalence of type 2 diabetes in US adults. *JAMA*. 2008;300(7):814–822. Available at: http://jama.ama-assn.org/cgi/content/full/300/7/814. Accessed November 19, 2009.

Navas-Acien A, Guallar E. Arsenic exposure and diabetes mellitus in the United States – reply. *JAMA*. December 17, 2008; 300(23). Available at: http://jama.ama-assn.org/cgi/content/extract/300/23/2728-a. Accessed November 19, 2009.

Alcoholic Cirrhosis Alternative Treatment

Chronic alcohol consumption is a primary cause of cirrhosis, a degenerative liver disease. As the liver breaks alcohol down, acetaldehyde, a free radical that can be neutralized by glutathione and cysteine, is produced. Without a vibrant antioxidant system, liver degeneration will occur. In addition, alcohol inhibits methionine synthase, an enzyme that remethylates homocysteine into methionine. (High levels of homocysteine have been linked to cardiovascular disease.) The amino acid methionine provides methyl groups necessary for normal liver function. It also is used to create the antioxidant glutathione. Without methionine and antioxidants, the liver degenerates as fibrous connective tissue and fat permeate it. Some species, including humans, have an alternate methionine pathway that uses hepatic betaine (via the enzyme betaine homocysteine methyltransferase) to remethylate homocysteine during alcohol consumption. However, betaine must be available for this pathway to continue working.

Methionine's importance in liver health caused researchers to investigate SAM (S-adenosylmethionine) supplementation. SAM is the bioactive form of methionine. People with liver disease are unable to transform methionine into SAM effectively. Human studies during the 1990s, such as one by Jose M. Mato et al. (June 1999), reported that "longterm treatment with ADoMet [SAM]



may improve survival or delay liver transplantation in the patients with alcoholic liver cirrhosis, especially in those with less advanced liver disease." More recently, Chinese researchers reported: "SAM prevents alcohol-induced liver injury in rats by reducing liver lipid peroxidation, anti-inflammation, and antihyperplasia ... it does not affect the plasma [total homocysteine] levels."

Instead of using SAM, researchers at the Department of Veterans Affairs Alcohol Research Center (Omaha, NE) are testing supplemental betaine. A March 2005 in vitro study with rat liver cells found that both SAM and betaine increase the ratio SAM:SAH (S-adenosylhomocysteine, a toxic metabolite) and reduce fat accumulation. However, unlike SAM, betaine methylates homocysteine into methionine. "Betaine, by virtue of aiding in the remethylation of homocysteine, removes both toxic metabolites (homocysteine and S-adenosylhomocysteine), restores S-adenosylmethionine level, reverses steatosis, prevents apoptosis and reduces both damaged protein accumulation and oxidative stress," writes K. K. Kharbanda.

While betaine and/or SAM may lessen damage caused by alcohol abuse, supplementation should not be used as a rationalization to continue drinking. Alcohol abstinence – possibly with the help of orthomolecular medicine and Alcoholics Anonymous – is the best way to stop damaging the liver.

Addolorato G, Russell M, Albano E, Haber PS, Wands JR, Leggio L. Understanding and treating patients with alcoholic cirrhosis: an update [abstract]. *Alcohol Clin Exp Res.* 2009 Jul;33(7):1136–1144. Available at: www.ncbi.nlm.nih.gov/pubmed/19389182. Accessed December 4, 2009.

Gong Z, Yan S, Zhang P, Huang Y, Wang L. Effects of S-adenosylmethionine on liver methionine metabolism and steatosis with ethanol-induced liver injury in rats [abstract]. *Hepatol Int.* 2008 Sep;2(3):346–352. Available at: www.ncbi.nlm.nih.gov/pubmed/19669264. Accessed December 4, 2009.

Kharbanda KK. Alcoholic liver disease and methionine metabolism [abstract]. *Semin Liver Dis.* 2009 May;29(2):155–165. Available at: www.ncbi.nlm.nih.gov/pubmed/19387915. Accessed December 4, 2009.

Kharbanda KK, Rogers DD 2nd, Mailliard ME, et al. A comparison of the effects of betaine and S-adenosylmethionine on ethanol-induced changes in methionine metabolism and steatosis in rat hepatocytes [abstract]. *J Nutr.* 2005 Mar;135(3):519–524. Available at: www.ncbi.nlm.nih.gov/pubmed/15735087. Accessed December 4, 2009.

Mato JM, Camara J, Fernandez de Paz J, Caballeria L, Coll S et al. S-adenosylmethionine in alcoholic liver cirrhosis: a randomized, placebo-controlled, double-blind, multicenter clinical trial [abstract]. *J Hepatol.* June 1999:30(6); 1081–1089. Available at: www.jhep-elsevier.com/article/S0168-8278(99)80263-3/abstract. Accessed November 19, 2009.

LifeExtension. SAMe Part 3: The liver super-nutrient. *LE Magazine.* June 1997. Available at: www.lef.org/LEFCMS/aspx/PrintVersionMagic.aspx?CmsID=33045. Accessed November 19, 2009.

Coffee Enemas and the Liver

Coffee enemas, used in the Gerson, Kelley, and Gonzalez cancer therapies, produce physiological effects that aid liver function and detoxification. The coffee enema, a common medical treatment during the early 20th century, was included in *The Merck Manual* from 1899 to 1977. Like other enemas, this one induces peristalsis and promotes evacuation of the intestine; but compounds in coffee have additional effects. Caffeine stimulates bile production in the liver and dilates the bile ducts. (Bile breaks down dietary fat and is a means by which the liver removes toxins.) The compounds kahweol and cafestol enhance glutathione S-transferase action. This detoxification system neutralizes a large variety of toxic compounds. When mice eat green coffee beans as part of their diet, their glutathione S-transferase activity increases 600% in the liver and 700% in the small intestine, according to the National Research Council (*Diet, Nutrition, and Cancer.* National Academy Press; 1982:15–7,15–8). Roasted coffee has about 50% less glutathione-S-transferase-stimulating effect than green coffee, according to research by Lam, Sparnins and Wattenberg (*Cancer Res.* 1982;42:1193–1198).

So why not just drink lots of coffee? Drinking coffee is, after all, associated with reduced hepatic injury and cirrhosis in humans. Coffee enemas appear to be a more efficient way to get the benefits without getting a caffeine buzz. Most people, even those who tend to get jittery from drinking coffee, report relaxation after a coffee enema. (However, I do not know how someone with caffeine allergy would respond.) Chemical compounds in the gut enter the blood, which then goes directly to the liver via the portal vein. Gar Hildenbrand, of Gerson Research Organization (San Diego, CA), says: "Because the stimulating enema is retained for 15 minutes, and because all the blood in the body passes through the liver nearly every three minutes, these enemas represent a form of dialysis of blood across the gut wall."

Dr. Max Gerson viewed the coffee enema's detoxification activity as the reason that this treatment eases pain in many cancer patients. A clinical study performed by Dr. Peter Lechner and colleagues showed that coffee enemas, performed twice a day, "reduced the need for pain medications by 71.3%, 59%, and 22% respectively in cancer patients with WHO cancer pain level 1 ($n = 91$, $p < 0.001$), level 2 ($n = 68$, $p < 0.05$) and level 33 ($n = 19$ not significant due to small sample)." Anecdotal cases also suggest that coffee enemas can relieve migraine headaches. Doctors who recommend coffee enemas to their cancer patients view the enemas as an important part of their protocols. None of them, however, claim that coffee enemas cure cancer.

People who choose to use coffee enemas to enhance liver detoxification and/or reduce pain should take the same precautions as in any enema: use an enema bag with appropriate lubricated nozzle to avoid damaging the rectum or bowel; thoroughly clean the equipment after each enema to avoid reintroducing pathogens to the colon; and do not perform too many enemas within a short time. Ralph Moss reports that the US Office of Technology Assessment "cites the case of the two Seattle women who died following excessive enema use. Their deaths were attributed to fluid and electrolyte abnormalities. One took 10 to 12 coffee enemas in a single night and then continued at a rate of one per hour. The other took four daily. As OTA points out, 'in both cases, the enemas were taken much more frequently than is recommended in the Gerson treatment.'"

As Moss says: "In general, coffee enemas are an important tool for physicians who try to detoxify the body. This is not to say they are a panacea. They certainly require much more research. But coffee enemas are serious business: their potential should be explored by good research – not

➤

Copyright of Townsend Letter is the property of Townsend Letter Group and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.