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the FELIX Letter

A COMMENTARY ON NUTRITION

1997

TILTING AT *LANCETS*

In contrast to most U.S. medical journals, *The Lancet* , published in London, has so few ads for prescription drugs I *actually can locate its medical articles.* I subscribe to it in order to see what the allopathic world is up to---to gauge which alternative breezes are wafting its way. The answer: not too many, but more than I find, say, in *JAMA,* the American Medical Assoc.'s house organ. Scalpel at hand, I'll be probing some *Lancet* pieces that are full of missed opportunities; after which, I'll describe some that give us hope.

Atrial Fibrillation:

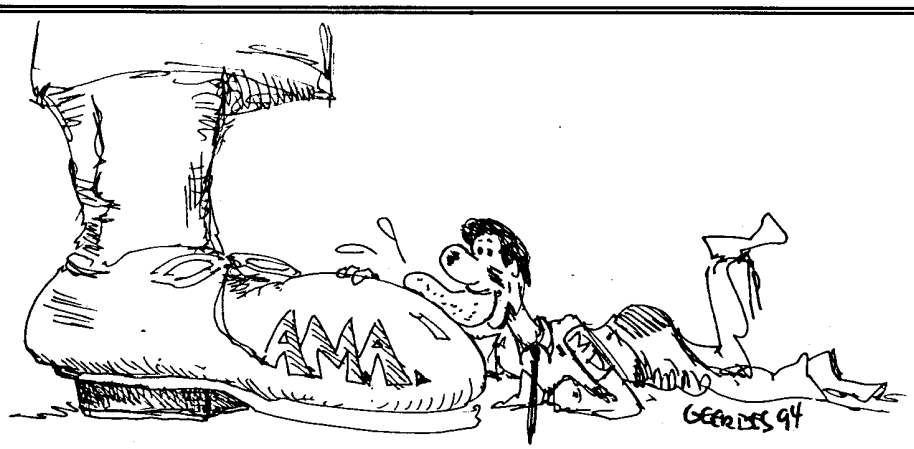
Sometimes the atrium composing the upper chambers of the heart foregoes strong, steady beats for wild episodes of arrhythmic quivering. *Lancet's* Sept. 27 review by S.M. Narayan et al. describes the potentially life-threatening ailment and its treatments. Drugs (mainly anti-coagulation ones) and a variety of invasive surgical options, including implants to regulate the heartbeat, are described in profuse detail. *Nowhere* is a connection made to nutritional factors.

Enter Clara's beloved omega 3's! John S. Charnock[1] in Australia, and Jing X. Kang and Alexander Leaf[2] in Massachusetts, have shown that intravenous infusion of omega-3 polyunsaturated fatty acids EPA and DHA from fish oils not only prevent cardiac arrhythmias in rats, dogs, and monkeys, *but also slow down the too-fast heartbeat.*

The beneficial actions arise because EPA and DHA *specifically decrease electrical excitability of heart muscle cells.* This is the opposite of the *increased* excitability of heart cells brought on by an episode of ischemia (not enough oxygen), which can then set off uncontrolled arrhythmia.

Many times it's not the heart attack (myocardial infarction) itself that kills, but the lethal fibrillation it can induce. The stabilizing effect of EPA and DHA on heart muscle will save lives. By my lights, it makes sense for cardiologists to recommend supplements of these omega 3s for arrhythmia problems. Although still experimental, the studies fall in line with the steady stream of cheering news, clinical and anecdotal, about the effects of omega 3's, including alpha-linolenic acid, on the heart. Not a word about this in the numbingly detailed *Lancet* review.

1. JS Charnock. "Dietary Fats and Cardiac Arrhythmia in Primates." *Nutrition* 10:161, 1994.
2. JX Kang & A Leaf. "The Cardiac Antiarrhythmic Effects of Polyunsaturated Fatty Acid." *Lipids* 31:Supplement 1996.



Osteoarthritis

In their extensive Aug. 16 *Lancet* review, Drs. Paul Creamer and Marc Hochberg of the rheumatology division in Baltimore's U of Maryland School of Medicine offer no hope of cure for osteoarthritis patients but only temporary drug-induced pain relief. That's nice for pharmaceutical firms but lousy news for about *one out of five persons in the U.S* who suffer from this, the most common kind of arthritis. (By contrast, rheumatoid arthritis affects one in a hundred, which is bad enough.) We're talking of millions of folks in this country alone, and it's a worldwide ailment.

Their *only reference to nutrition is* the ho-hum suggestion to patients to lose weight when extra poundage bears too heavily on sore joints. Yet, a disorder of tissues of the knees, hips, elbows, shoulders, wrists, fingers, ankles, feet, and/or spinal column is bound to be affected by nutrients--how can it not? For instance, cartilage--the body's main supporting structure (along with bones), and the foundation of most joint tissues--is made up largely of collagen, *and our bodies can't make collagen unless we take in enough vitamin C.* That's why blood vessels disintegrate and teeth fall out of their sockets in the deadly vitamin C deficiency disease, scurvy.

The health and strength of bones themselves, the authors say, will have an effect on the arthritic process. "It is known, for example, that the integrity of overlying cartilage depends on the mechanical properties of its bony bed," they write. (But nowhere do they imply the importance of nutritients for bone health.)

"The role of inflammation in the pathogenesis of osteoarthritis remains controversial. An inflammatory component may be present in osteoarthritis, at least in some patients at some phases of the disease," they write. (They offer nothing on how nutritional components can affect the inflammatory process, either to set it off or set it right. More about that later.)

They suggest a "pyramid approach to the management of osteoarthritis," with a base of "patient education, physical and occupational therapy, weight reduction, exercise, and assistive devices." (Solid, needed stuff--but unless "patient education" emphasizes nutritional keys to integrity of joint tissues, the base will be shaky.) Layers above the base begin with painkillers: first, acetominophen (e.g. Tylenol); if that doesn't work, next are over-the-counter NSAIDs; if these don't control the pain, try prescription NSAIDs. The tip of the pyramid--the doctor's last resort--is surgery.

Without an understanding of how nutritients control the playing field, doctor and patient both have lost the game, as witness the reviewers' defeatist statement:

"Current treatment of osteoarthritis is purely to control symptoms *because as yet there are no disease-modifying osteoarthritis drugs.*" [Emphasis mine.]

A Different Approach

How about "disease-modifying" *diet and supplements?* I have news for the two arthritis specialists: the ailment *can* be "modified." In some cases, the term "cured" applies. Most of the double-blind placebo controlled studies come from Europe--not enough reason for medical practitioners in the U.S. to ignore them, with today's access to medical stuff on the Internet. A wonderful guide for anyone, doctors too, looking into effective alternatives is the 1995 book ***Pain Free*** by Luke Bucci, Ph.D. (Summit Group, 1227 W Magnolia #500, Fort Worth TX 76102). Bucci tells us what cartilage is made of, how its components can be reinforced, and how actual *healing and renewal can take place.* Even though cartilage is a bloodless tissue, it is remodeled throughout life, i.e., its worn out parts are replaced, just as happens in bones. The process is very slow, slower than bone remodeling but, luckily for us, cartilage's components depend on and respond to nutrient intake.

How does this happen?

"Subchondral bone," the bone just underneath cartilage in joints, is slightly spongy. It *contains blood vessels that deliver oxygen and nutrients to cartilage.* Thick bundles of **collagen**, the most abundant protein in the body, form cartilage's structure. Other components include **proteoglycans, hyaluronan** (for joint lubrication), and **glycosaminoglycans** (GAGs), the most important GAG being **chondroitin sulfate**.

Chondrocytes, the only cells in cartilage, are little biochemical factories that make GAGs and collagen. They do the breaking down and rebuilding. In osteoarthritis, they may overproduce enzymes that initiate the tearing down. Bucci writes: "...certain nutrients have the ability to shift chondrocytes into the repair mode, and tone down the enzymes that tear down cartilage."

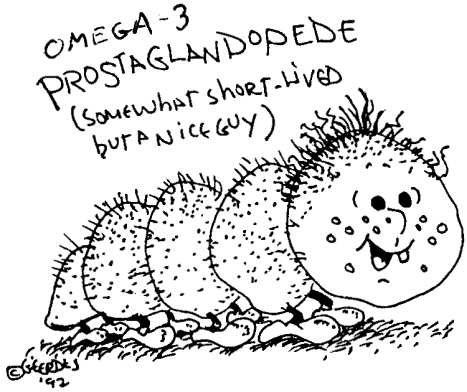
For cartilage to repair, GAG synthesis has to take place before synthesis of proteoglycan and collagen can happen, he says. How can we use this information in arthritis?

One way is to take **glucosamine** as a dietary supplement. **Glucosamine**, made by chondrocytes in cartilage from blood glucose and the amino acid glutamine, *"is the single most important component and precursor for GAGs"* [emphasis mine].

He asks, since our joint cells can make glucosamine, "why do we need to take extra amounts? Can't our chondrocytes simply make more glucosamine when they need to repair cartilage? No. During joint degeneration and arthritis, chondrocytes have been 'told' to destroy cartilage. Manufacture of new cartilage cannot keep pace with the destruction. In severe joint damage, chondrocytes have been told to stop making glucosamine."

Why is that? Certain prostaglandins gone "bad" can act as "biochemical traitors" that lead to cartilage degradation.

"The advantage of taking glucosamine as a dietary supplement is that it can be grabbed by chondrocytes and used to build more cartilage. Perhaps even more importantly, there is good evidence that extra glucosamine can flip a switch and convince chondrocytes to stop destroying cartilage, and even rebuild it....More glucosamine, more cartilage repair."



Bucci's Recommendations

The other substance that directly stimulates cartilage renewal is **chondroitin sulfate**. Heartening case histories and studies, mostly from Europe, back up Bucci's theme. Toxicity would appear to be nonexistent for either it or glucosamine. (They both qualify as "orthomolecular" remedies, i.e., giving the body its own familiar molecules rather than drugs.) Incidentally, veterinarians in the U.S. use them as treatment for joint problems in animal patients.

On a radio program recently, I heard Bucci upping his recommendations from those in the book (1500 milligrams glucosamine and 1000 milligrams chondroitin sulfate daily) to 2000 milligrams of each, divided into morning and evening doses for adults. He said results can be expected within two months--it's not a quick fix. Dosages are to be reduced as healing continues. (He recommends glucosamine hydrochloride over glucosamine sulfate for reasons of economy and dosage sureness, but either will do the job.)

NSAID Caution

Aspirin and all other nonsteroidal anti-inflammatory drugs (NSAIDs) stop the body from making certain prostaglandins that trigger inflammation and pain. But they also keep us from making "good" prostaglandins and may encourage proliferation of a destructive bunch known as "leukotrienes." It may be one of the reasons **NSAIDs *prevent cartilage repair.*** Yes, my medicinal chemistry text confirms this: NSAIDs stimulate production of collagenase, an enzyme that *breaks down collagen.* Think of it: the very drugs doctors and patients rely on for help and pain relief in arthritis actually undermine the repair process! No wonder doctors offer a bleak outlook on any chance of true healing in arthritis.

Antioxidants vs Arthritis

Bucci and many progressive health workers stress the usefulness of a very long list of antioxidant nutrients and herbs--too long to list here--beginning with vitamin C, vitamin E, and selenium, all working to slow down or halt the oxidative damage to body cells that can set off inflammation and pain. Two common spices from the herbal world that I've used are ginger and turmeric. Boswellia--another herb--is an ancient Asian remedy for arthritis. The omega 3s (in fish oils and flaxseed) do yeoman's work by improving circulation in general (including to the subchondral bones in joints), and by quelling in a natural way excess prostaglandins (from omega-6 arachidonic acid) that stir up destructive inflammatory reactions, *including leukotrienes.*

I urge readers who suffer the slings and arrows of arthritis not to resign themselves to the limitations of allopathic treatment but do themselves the favor of exploring reasonable options. Seek out books, pamphlets, practitioners; ever-expanding literature on complementary or "integrated" medicine can be found in many libraries and most healthfood stores. Bucci's[1] book is a good way to start.

One More Thing!

Many moons ago in *FL#30* I wrote about nasty little homemade critters that can cause mischief by clustering around internal tissues, including joints. These are **immune complexes** (IC)--antigen plus antibody--that we make as a way of clearing from the blood undigested proteins and other foreign thingamajigs,

If, however, we routinely do something that, I fear, is all too common such as consuming, day after day, month after month, certain *foods* we're convinced are indispensable, the resulting buildup of IC overwhelms our body's ability to metabolize them out of our system. "The concept of injury caused by IC was somewhat theoretical, until the new tools of the electron microscope and immunofluorescence made it quite real. The IC have been captured in the act of invading and disrupting human tissues," I wrote in 1986. In any and all tissues, by the way, including the brain.

I can attest to the power of IC to raise havoc, in my case, in knee joints. Suddenly, both knees started hurting. Exercise, dancing, made the pain worse. Bending my knees, squatting, etc. caused teeth-gritting. I tried compresses, anti-inflammatory nutrients, magnets, hot packs--nothing helped for long. Mind you, this was less than three years ago, when I had been off gluten foods for a number of years (gluten in wheat, rye, and barley can cause "rheumatism" in gluten-intolerant folks), and had an internal body well-greased with fish oils and flaxseed! (I had not yet learned about glucosamine and chondroitin sulfate as healers--I'll never know if they might have helped.)

On a routine visit to my nutritionally oriented MD, he mentioned that an ELISA/ACT™ test ("Enzyme-linked immunosorbent assay") would determine my reactions to a long list of foods and environmental substances. It's an expensive test, but at that time Medicare picked up my tab. "Why don't you find out for sure what you're allergic to?" he asked. In trying to figure this out yourself, the tough ones to ferret out are foods, etc. that don't seem to bother you at all, but *days* later may trigger a headache, malaise, etc., leaving you clueless. These *delayed hypersensitivity* ones are the kind Serramune's ELISA/ACT™ can uncover. The test of my blood (conducted and interpreted by Serramune Physicians Lab, 1890 Preston White Dr, Suite 201, Reston VA 22091. 703/758-0610 or 800/553-5472) had some surprises for me, such as antibody reactions to carrots, cucumbers, green and red peppers, sulfites used as preservatives including sulfur dioxide, and white (but not unrefined) cane sugar. But the antibody reaction to *milk products* was, to me, the strongest signal of all. Whereas I've eaten the other foods sporadically, cow's milk products have been everyday edibles throughout my life. I was sick a lot, too, as a youngster. One of the reasons I became a middle-aged university reentry in nutrition science was to tap into sources of what had always eluded me: unflagging energy!

1. He's also written one for health professionals: *Nutrition Applied to Injury Rehabilitation and Sports Medicine.* 1994, CRC Press, Boca Raton, FL. 800-272-7737.

So I abstained conscientiously from all designated antibody-makers I didn't notice any benefits, but I persisted. My knees still hurt. Then one day, a full *three months later,* my knees began to feel better. Soon, they were flexible and painfree again. Halleluja!--no residual effects.

I occasionally eat the other no-no foods, although they're easier to avoid than dairy which I've always craved--milk, cheeses, yogurt, ice cream, etc. I'm happy to give them up, though, to keep my knees feeling fine. I haven't captured that elusive Unflagging Energy yet, but I'm enjoying the pursuit.

Women, Hormones, & Bones

In *Lancet's* "Women's Health" supplement (March, Vol. 349), a brief review of bone density in relation to female hormones allows two *male* experts (from a Geneva hospital research center on bone disease) to serenely pinpoint *estrogen lack alone* as the major cause of bone loss leading to osteoporosis. They are expressing the standard view in western medicine that estrogen replacement alone can improve "a woman's quality of life by preventing spinal deformity and hip fracture." (Not true, folks. Estrogen therapy slows down bone loss and decreases incidence of spinal fractures up to 50%, but only for a few years around menopause. It does not itself rebuild bone.)

Oddly, one of the references they give to support their view is by Jerilynn C. Prior, MD, of U. of British Columbia in Vancouver, who as early as 7 years ago showed instead that *progesterone deficiency* was the pivotal factor in bone loss. Her studies proved bone loss can take place even in young women whenever they have anovulatory cycles, a fairly common occurrence that leads to progesterone deficiency along with *normal estrogen levels.*

She describes progesterone as a bone-building hormone in its own right, one that binds to receptors on the cells that build bone (osteoblasts). Estrogen can't do this, but can slow down bone resorption by the wrecking crew (osteoclasts). I wouldn't be surprised if nature meant estrogen and progesterone to work in tandem. Menopausal women still make a good bit of estrogen, while progesterone levels dip quite low--but the authors of the review unperturbably call for estrogen replacement therapy to stop osteoporosis. In the U.S. most doctors still are stuck in a medical groove playing one tune: give the ladies Premarin™. Unfortunately, it contains an estrogen from pregnant mares that's different from the kind women make. When doctors add progesterone to the prescription, especially in women who still have a uterus, they do so reluctantly as a way of preventing uterine cancer, *which is known to be a 'side effect' of estrogen replacement therapy.* Again, they don't add a real progesterone but a patented synthetic, e.g. Provera™, that can perform only a few of progesterone's functions.

In *FLs 76* thru *80, 83/84, & 86* I've reported on the newer information that's coming to light, much of it through the work of John R. Lee, M.D.,[1] about real progesterone's role in rebuilding bone and maintaining health. Dr. Lee has been speaking at many medical meetings here and in Europe and U.K., but I think a big push for change will come from the women who've benefited from his concepts, who then will start to re-educate their MDs!

Omega 3s, Bones, & Cartilage

Whether applied to osteoporosis or to osteoarthritis, a piece of good news about bones comes from Bruce A. Watkins, Ph.D.,[2] of Purdue U. who reminds us that bone "is a dynamic connective tissue consisting of living cells embedded within or lining surfaces of a mineralized organic matrix," and as such is responsive to hormones, prostaglandins, nutrients, among a host of other growth regulating factors. Prostaglandin E_2 (PGE_2), made in our body from omega-6 arachidonic acid, has a "biphasic" effect on bone modeling, "stimulating bone formation at a low concentration but inhibiting it at higher concentrations." Excess production of PGE_2 in general is a well-known troublemaker; now they're finding it to be a factor in bone loss, too.

Omega 3s to the rescue! *EPA and DHA from menhaden fish oil stopped overproduction of PGE_2 in bones of experimental animals.* Omega 3s, by moderating PGE_2 produced locally in bone, can help to "optimize bone formation and perhaps prevent excessive bone resorption," Watkins writes. (I expect when we consume EPA and DHA, they work the same way in our bones, since they have this effect in general in our systems.)

Wait, there's more. Too much of the same PG is linked to pathology in *joints;* it may be one of the signals that sets off *cartilage* breakdown in arthritis! So now we have one more clue on how omega 3s in everyday diet guard against pesky ailments.

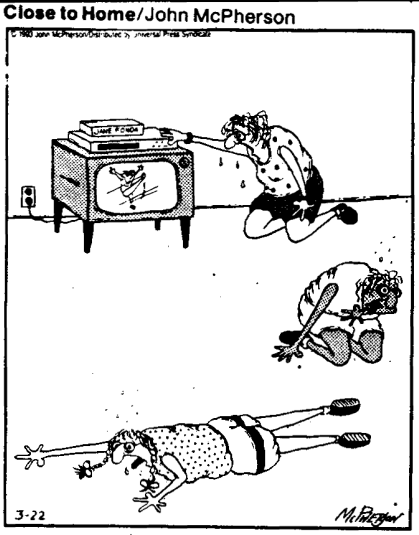
Watkins' research group has done seminal work on another nutrient: **vitamin E.** He says it protects their laboratory animals from oxidative damage to bones as well as to cartilage cells (chondrocytes). Since oxidized-derived free radicals increase both cartilage breakdown and bone resorption, vitamin E plus omega 3s should be considered as safe dietary weapons against *both* arthritis and osteoporosis.

By the way, a guide for women *and* men concerned about osteoporosis is the excellent pamphlet-sized book by Stephen E. Langer, M.D. and James Scheer, ***Solved: The Riddle of Osteoporosis*** (1997, Keats Publishing, New Canaan CT), at health-food stores or from Keats: 800/858-7014).

1. John R. Lee, M.D. with Virginia Hopkins. *What Your Doctor May **Not** Tell You About Menopause.* New York, NY, Warner Books, Inc., 1996.

2. Bruce A. Watkins, Ph.D. "Fatty acids modulate bone formation and cartilage function." *ISSFAL Newsletter (International Society for the Study of Fatty Acids and Lipids),* Vol 4 No 1, Winter 1997.

Close to Home/John McPherson



"Here's the problem! The workout tape has been on fast-forward the whole time!"

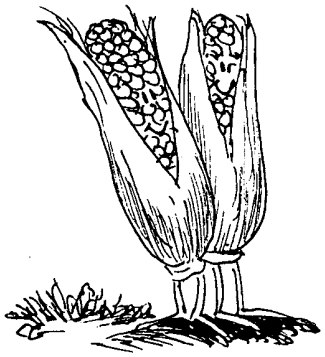
Now for some good stuff in Lancet!

The same "Women's Health" supplement (Vol 349, March) that offers effusive support for estrogen as primary bone-saver gives us "Women's hearts are hard to break" by two Australian MDs who, although also male (!), offer a more measured view of the new widely-touted panacea to prevent heart attacks: hormone replacement therapy (HRT) for most of a woman's mature years. First of all, they say, women who don't have diabetes, nor a family history of early coronary heart disease (CHD), and don't smoke, are *not* at risk until very late in life (when we have to die of *something*). Besides, they say "lifestyle modification with smoking cessation, increased physical activity, and healthy nutrition" should be the cornerstone of preventive efforts. "Because the absolute risk of CHD in women remains low until the seventh or eight decade, the reduction in risk with HRT cannot yield great absolute benefits."

They go on to describe how some of the supposed cardiovascular benefits of HRT (estrogen, with a synthetic progesterone-like drug added to prevent uterine cancer *if* a woman still has her uterus) are hard to separate out from effects that can be achieved without the added hormone, such as antioxidant protection from vitamin E, or certain steps to improve a woman's blood lipid profile. The Aussie doctors are not thrilled with the vast new marketing ploy that urges doctors to put mature women on HRT for a lifetime--i.e, "those in the medical profession and the pharmaceutical industry who aggressively promote HRT for cardioprophylaxis, exploiting fear of CHD. We question the propriety of this approach, in view of studies suggesting adverse psychological effects from informing symptom-free individuals of increased risk status and treating them with pharmaceutical agents."

I might add there are other known effects of prolonged HRT as well, including 30-50% higher risk of breast cancer---excess estrogen is by its nature a cell proliferator. Postmenopausal women who are comfortably *zoftig* , i.e., well-padded, make an impressive amount of estrogen in their fatty cells. In menopause, Dr. Lee explains, a healthy woman still makes enough

estrogen for normal needs, *but not for fertility and pregnancy.* (Thank goodness.) For many such women, extra HRT may set them up for trouble.



Clues to Abnormal Mental States:

(1) Antioxidants & dementia

British psychiatrists Rosemary Lethem and Martin Orrell in the April 26 *Lancet* say that "recent research has suggested an intriguing link between dietary factors and dementia....oxidative damage may be central to the neurodegenerative process in both vascular dementias and Alzheimer's disease."

Low vitamin E levels have been found to be associated with dementia both in older people and in young people with Down's syndrome. Certain key neurons in the brain of Alzheimer patients seem to be especially vulnerable to oxidative damage by free radicals. "The suggested protective effects of fruit and vegetables against stroke and vascular dementia may also be related to their antioxidant content." The authors hint at possible preventive or delaying effects on these dementias through the use of supplements of vitamins C and E. Good show, Brits!

(2) Solvents & neurotoxicity

The same *Lancet* issue has a superb piece on "Solvents and neurotoxicity" by Drs. Roberta F. White and Susan P. Proctor of Boston Environmental Hazards Center. Organic solvents reach into every aspect of our lives, but millions of people are exposed relentlessly, e.g., those in paint manufacturing, industrial cleaning, electronics industry, metal-degreasing, etc. Carbon tetrachloride, methanol, toluene, gasoline, and benzene comprise a few of the "estimated 49 million metric tons of solvents" produced per year in the USA alone. Main routes of exposure are through inhalation and skin contact; fortunately, effects of short exposures usually are fleeting.

With chronic exposure, however, organic solvents may accumulate in "lipid-rich tissues, such as the brain, myelin, and adipose." What do they do to the nervous system? They can create such an array of symptoms that it's a wise doctor who is able to pin them down as "solvent-induced nervous-system dysfunction," even with the help of a slew of tests designed for that purpose. *Cognitive deficits, depression, motor slowing or incoordination, muscle weakness, and short-term memory loss head the list.* Certain symptoms may be hard to distinguish from multiple sclerosis, dementia, and chronic fatigue syndrome!

Treatment options are limited, and most affected workers have to stay away permanently from the toxicants. A case study is of a self-employed glazier who worked for many years with benzene, toluene, etc., never using a respirator or gloves. At the Boston Environmental Hazards Center, the doctors learned about his chronic sadness, impotence, headaches, dizziness, and irritability. Neuropsychological testing showed significant loss of cognitive function. Several years after stopping work, his depression had improved but he still had deficits in short-term memory, etc., "consistent with moderate residual solvent-induced encephalopathy [brain dysfunction]."

Readers, let's be careful out there!

(3) Depression and tryptophan

"Although much is known about the social and personal antecedents of depression, the neurobiological basis...remains poorly understood," say three Oxford psychiatrists in March 29 *Lancet.* Clinicians see major depression responding well to drugs that increase brain activity of serotonin, a neurotransmitter made in the brain from the essential amino acid tryptophan.

What would happen if a person who had recovered completely from several episodes of major depression were given a tryptophan-free diet *for one day?*

Actually, the psychiatrists gave a tryptophane-free but otherwise balanced amino acid drink to 15 volunteers and kept them resting in the lab for 7 hours. The same group (of women, ages 21-45) got the same tasting drink, this time containing tryptophan, a week apart from the other test. The groups were juggled around and didn't know whether they were getting the tryptophan drink or not.

An observer who also didn't know which drink was being given administered the Hamilton rating scale for depression (HAM-D) to each participant, before they drank the amino acid mixture and shortly before they left the lab at the end of 7 hours.

Blood tests showed that even one tryptophan-free day *caused a fall of about 75% in plasma tryptophan.*

"At baseline on the test days, before the mixtures were drunk," the writers say, "HAM-D ratings were low, consistent with subjects' recovered state." No depressive symptoms developed, either, in the hours following the balanced drink. "However, after ingestion of the tryptophan-free mixture, HAM-D ratings significantly increased." Thus, at the end of a no-tryptophan day the tests showed that most of the 15 volunteers suffered a sharp increase in depressed mood, agitation, irritability, loss of insight, and loss of interest!

Mercifully, "the changes associated with tryptophan-free mixture were temporary and all participants were symptom-free the following day."

The experiment suggests that patients who've had major depressions "are unusually vulnerable to recurrence of symptoms after plasma tryptophan depletion." The hazards are all too readily found; for instance, "a standard 1000 kcal carbohydrate-restricted diet can decrease plasma tryptophan sufficiently to alter brain serotonin function in healthy women. Even modest changes in serotonin activity of the type produced by dieting could have adverse effects in those vulnerable to clinical depression."

The good news: "Equally, it is possible that dietary and other environment manipulations that enhance brain serotonin function might exert protective effects in those at risk of depressive episodes."

Over-the-counter sales of tryptophan were banned in the U.S. by the FDA because of an outbreak of illness that finally was traced to contaminated batches from a single company in Japan. Pure, safe tryptophan has remained available to makers of animal foods and infant and diet formulas. Isn't it time to make it available to the public again? ❑

Illustrations by the late Clay Geerdes and other artists as noted.

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