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## Mercury falling

By Michleen Collins

For more than a year, Springfield radiologist David Ayoub has immersed himself in the noisy politics of a silent disease. He's familiar with the characteristic blank stares of autistic toddlers and the quiet panic of parents wandering uncharted medical, financial, and emotional territory.

He's equally familiar with the quiet panic of pharmaceutical giants who can read the writing on the wall.

The big drug companies, according to recent reports, may have known for years of the potential risks of thimerosal, a mercury-based preservative used in many common vaccines. Mercury exposure has been linked in several studies to neurodevelopmental disorders that afflict children, including autism and attention-deficit/hyperactivity disorder.

Ayoub has plunged into the scientific literature — and emerged fully convinced that the case against the preservative is “unequivocal.” He's helping lead the push in Illinois to ban mercury from vaccines, an effort that's gaining momentum even though it has yet to be embraced by much of the medical and public-health community.

Not the sort to put much faith in the establishment, Ayoub says that trust in government and mainstream medicine can be badly misplaced.

“The debacle with Vioxx and other drugs should be a warning,” he says. “The system can fail. Sometimes it can fail spectacularly.”

Ayoub, 45, isn't one to seek the limelight, but it often finds him. At Peoria High School, he set a state track record that still stands. At the University of Illinois, the two-time All-American in



Springfield radiologist David Ayoub is helping lead the push in Illinois to rid vaccines of a mercury-based preservative  
PHOTO BY NICK STEINKAMP

track and field earned a Big Ten title. In the honors program there, he was thinking fast, too. He critiqued scientific studies weekly for two years and says it helped him hone his ability to spot flawed research.

As an undergrad, in 1983, he broke another record when his work was published in the elite journal *Science*. The coup led to a flurry of national media coverage, and Ayoub recalls being teased for being “sex-obsessed” by a Peoria newspaper reporter because the study he co-authored was focused on differences between neurons in the brains of male and female juvenile macaque monkeys. “Sex differences in the brain was a hot topic at the time,” Ayoub says.

Since then, Ayoub’s been teaching and practicing radiology. He’s lived in Springfield 14 years and works part-time at Memorial Medical Center in addition to carrying out the duties of his post as director of the Prairie Collaborative for Immunization Safety.

In 2003, while reading medical journals, Ayoub decided to investigate breakthrough biomedical treatments at a Defeat Autism Now! conference in Washington, D.C. “Once you attend a DAN conference, you don’t come back the same,” he says.

Now he’s begging physicians to take a closer look at new treatments and old problems. He’s summarized his exhaustive research on an extensively documented CD, which he’s titled *The Science and Politics of Vaccine-Induced Autism*. He says that physicians can no longer afford to blindly trust the literature.

Ayoub has joined forces with others, such as Springfield lobbyist Laura Cellini, whose son Jonathan is autistic. They’re pushing the Illinois General Assembly to pass legislation banning the use of vaccines containing thimerosal. The effort is similar to last year’s unsuccessful push in neighboring Missouri, where a filibuster in the state Senate killed the bill.

Illinois’ version, the Mercury-Free Vaccine Act, is sponsored by Rep. Kurt Granberg, D-Carlyle. The bill specifies that no one in Illinois under the age of 3 years or who is pregnant may be given a vaccine containing more than 0.5 micrograms of mercury per 0.5-milliliter dose, or an influenza vaccine containing more than 1.0 microgram of mercury per 0.5 milliliter dose. The bill was approved in the House Feb. 16 by a vote of 115-0, and moved on to the Senate, where it was set for first reading on Wednesday, Feb. 23. The Senate bill is sponsored by Senator Mattie Hunter, D-Chicago.

Even if the bill becomes state law, Illinois could be trumped by Congress, which is considering Senate Bill 3, the Protecting America in the War on Terror Act of 2005. The proposed federal legislation, which increases benefits for the families of U.S. soldiers who die in Iraq, also includes language protecting vaccine makers from product liability under the guise of

bioterrorism protection.

According to the Coalition for SafeMinds (Sensible Action for Ending Mercury-Induced Neurological Disorders), a nonprofit advocacy group based in Cranford, N.J., the federal legislation would block civil claims for injuries caused by mercury in vaccines. Lujene Clark of St. Louis, president of nomercury.org, which serves as an information clearinghouse for advocates of a thimerosal ban, says the legislation would also prevent states from banning mercury, regulating drugs, or warning citizens that mercury-containing vaccines or other drugs may be dangerous. Clark says it includes sweeping changes in pharmaceutical-product liability, research, and the Vaccine Injury Compensation Act, which already gives drug companies unprecedented protection.

With federal bills pending, states are moving fast to pass mercury bans. Last year, Iowa and California passed laws restricting the use of mercury in vaccines. Nine states — including Illinois — are considering similar legislation. The anti-mercury effort also extends to the dental profession.

In Arizona, a bill to warn parents and pregnant women that mercury fillings can harm the developing brain of a child or a fetus has garnered bipartisan support. Another bipartisan effort in New Mexico resolves to study the health and environmental impact of mercury amalgam fillings.

This flurry of legislative action provokes reactions ranging from skepticism to fear among many health professionals. They contend that thimerosal's critics are alarmists, that an outright ban risks the return of dreaded diseases.

Dr. Lawrence Frenkel, professor of pediatrics and microbiology at the University of Illinois College of Medicine at Rockford, says people are being needlessly frightened.

“It’s the bogeyman,” says Frenkel.

“The level of thimerosal, or the ethylmercury [in pediatric vaccines], is very, very low,” he says. “Yes, it reaches the safety margin for methylmercury, but that’s not been proven to be an issue or a problem.”

Frenkel says the risk doesn’t outweigh the consequences of not getting children immunized.

“I’m old enough to have seen children suffer and die with many vaccine-preventable diseases,” says Frenkel. “The vaccines are better than the disease.”

Mercury occurs naturally in the environment, in either inorganic or organic forms. According to

the federal government's Agency for Toxic Substances and Disease Registry, organic forms of mercury, such as ethylmercury and methylmercury, have "a significantly greater toxic effect than other mercury compounds." Federal regulatory agencies have set limits to the exposure from ingestion of methylmercury — found in fish — but not ethylmercury, found in vaccines.

That doesn't mean, however, that state and federal agencies have failed to limit exposure to thimerosal. In 1982, FDA officials said that thimerosal was "not safe for over-the-counter topical use." Thimerosal has also been on California's Proposition 65 list of known reproductive and developmental toxins for more than a decade. It was removed from animal vaccines in the '90s.

U.S. Rep. Dan Burton, R-Ind., chaired the oversight committee that in 2003 produced a report on the use of mercury-based vaccines titled *Mercury in Medicine*. The committee heard expert testimony and examined research from leading universities. Burton concluded: "It should be crystal-clear by now that mercury is a toxic substance that does not belong in pediatric vaccines."

Drugmaker Merck & Co. Inc., still contending with the Vioxx controversy, is one of the companies embroiled in the thimerosal dispute. According to an internal memo obtained by the *Los Angeles Times*, thimerosal was on Merck's radar as early as 1991. Merck executives expressed concern that babies could be exposed to dangerously high thimerosal levels. The memo noted that some 6-month-old children would get a mercury dose "up to 87 times higher than guidelines for the maximum daily consumption of mercury from fish."

Eli Lilly and Co. introduced thimerosal around 1930 with minimal safety testing. According to the Burton committee report, a 1935 internal document noted that Merthiolate, the brand name for thimerosal, was unsatisfactory as a serum for use on dogs.

Mercury foes don't like GlaxoSmithKline, either. The pharmaceutical giant hired Dr. Thomas Verstraeten, a Centers for Disease Control and Prevention scientist and lead author of a controversial study published in *Pediatrics* in 2003. Activists criticized the journal for failing to disclose that Verstraeten was now employed by GSK, a vaccine-maker named in thimerosal litigation.

In June of 2000, Verstraeten had presented the results of his review of vaccination data, which suggested a link between thimerosal and neurological disorders. However, after several drafts, the version published in *Pediatrics* indicated that a link could not be confirmed.

National media headlines trumpeted that thimerosal had been cleared, fueling the anger of parents who had seen the original data showing a link. After much public outcry, Verstraeten wrote to *Pediatrics* to say that the results were inconclusive and more research was needed.

The controversy heightened when activists obtained transcripts from an off-site meeting convened by the CDC in 2000. Vaccine experts — including pharmaceutical company representatives — gathered to discuss Verstraeten’s findings. According to the transcripts, Verstraeten said that when he saw the literature, he was stunned because he thought a link was plausible.

Advisory-committee member Dr. David Johnson said that he was concerned enough that he did not want his grandson to get a thimerosal-containing vaccine.

After analyzing the Verstaeten data, researchers at SafeMinds found strong evidence of a link. A SafeMinds release reports that Verstaeten’s initial analysis indicates that CDC officials were aware in 1999 of an 11-fold increase in autism risk among children who received thimerosal-containing vaccines. Noted impairments included “an unspecified developmental delay,” ADHD, tics, language and speech delays, and “the entire category of neurodevelopmental delays.”

In 2001, the CDC commissioned the Institute of Medicine to examine the thimerosal-autism evidence. The IOM’s first analysis found the hypothesis “biologically plausible” and called for further research. A 2004 reanalysis rejected any link.

According to nomercury.org’s Lujene Clark, IOM committee-meeting transcripts were leaked and turned over to authorities. The transcripts suggest that CDC officials pressured committee members.

“The CDC contracted and paid for this series of reports from the IOM,” says Clark. “They made it very clear that they wanted the IOM to give the nod, to say that ‘We see no problems.’ That’s very, very frightening.”

Emerging evidence suggests that mercury was the last biochemical straw for some kids — especially those who got 187 micrograms of mercury during the first six months of life. Autism may be caused by a genetic predisposition triggered by heavy metal or pesticide insults that damage metabolic pathways.

Dr. Jill James, a University of Arkansas biochemist, recently published a study showing that kids with autism have a highly abnormal metabolic profile. “They have very low levels of ... glutathione,” says James. “Glutathione is well established to be the major mechanism of mercury detoxification and excretion.

“Given an equal exposure to heavy metals — and we’d want to focus on any of them; mercury could be one, arsenic, lead — if you’ve got less glutathione around, it’s going to be more toxic.”

Scientists have found heavier body burdens of mercury in autistic kids, implying an impaired ability to get rid of the heavy metal. Additional research has found that thimerosal induces DNA breakage, membrane damage, and cell death in human neurons. Inherited DNA breakage could leave each subsequent generation more vulnerable to heavy-metal damage.

Replicated studies of baby hair and teeth have shown that autistic kids have lower mercury levels, again implying that these children's bodies retain mercury.

"These kids with autism have three times as much mercury in them," says Dr. James Adams, chemical-engineering professor at Arizona State University. "You know there's something very wrong with their mercury metabolism."

Other findings include evidence of brain inflammation, gastrointestinal inflammation, and autoimmune activation in autistic kids. The authors of a breakthrough Columbia University study reported that they induced autism in mice with the suspected genetic predisposition by giving them vaccine-comparable doses of thimerosal.

With all of the mounting evidence, David Ayoub wonders why vaccine makers are still putting 25 micrograms of thimerosal in flu vaccines given to babies, pregnant women, and senior citizens.

For the first time, the CDC recommended this year that babies get flu shots earlier, at 6 months of age. Pregnant women were also encouraged to get flu shots.

The package insert for Fluzone — an influenza vaccine distributed by Aventis Pasteur — states, "It is not known whether Influenza Virus Vaccine can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity."

"The EPA's allowable daily exposure limit is 0.1 micrograms per kilogram of body weight," Ayoub says. "To meet this guideline, those who receive a flu vaccine must weigh at least 550 pounds. The fetus would receive a dose exceeding federal limits by several hundredfold."

In 2000, an FDA neurotoxicology study found that thimerosal crosses the placental and blood-brain barriers. According the CDC, one in 12 women of childbearing age has an unsafe level of mercury in her body, putting newborns at risk.

"There is as far as I know no definitive plan . . . to remove mercury from flu shots," Ayoub says.

According to an Aventis Pasteur spokesman, the world's largest flu-vaccine producer, supply is not an issue.

“This is the third year that we’ve produced the preservative-free formulation,” says spokesperson Len Lavenda. “We have never sold out — even this year, or last year, when we had a shortage.

“They [healthcare providers] have a choice. Both formulations are approved by the FDA for people aged 6 months and older . . . I think the preservative-free is a little more, but we’re not talking dollars more — it’s cents more.”

Ayoub says that shows why voluntary removal doesn’t work.

“A law banning thimerosal is necessary,” Ayoub says. “Voluntary removal or reduction doesn’t assure safety.”

Parents say the best way to restore public confidence is to “come clean” and fix a broken system.

“Get the mercury out,” says Lujene Clark, “and reassure parents that you are finally starting to make decisions in the best interests of the citizens.”

Ayoub agrees: “The autism epidemic is largely the result of heavy pharmaceutical industry influence. To prevent future tragedies, we need major reform.

“Exposure of the truth is the first step.”

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