

Let's Talk Real Health with Mark Schauss

Interview with Andrew Cutler, Ph.D.

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Schauss: Welcome to Laboratory Medical Update. I'm Dr. Mark Schauss, and joining me today is Dr. Andrew Cutler. Dr. Cutler received his Bachelor of Science in Physics from the University of California and his Ph.D. in Chemistry from Princeton University. He's a patent agent and a professional engineer. His research experience covered everything from alternative energy to space manufacturing, prior to him becoming involved in health care. He's written two books: *Amalgam Illness: Diagnosis and Treatment* and *Hair Test Interpretation: Finding Hidden Toxicities*, both of which can be found at his website www.noamalgam.com, or on Amazon. Welcome Dr. Cutler!

Cutler: Hi. Thank you.

Schauss: OK, let's get started. Dr. Cutler, the issue of the link (or lack thereof) between thimerosal in vaccines and autism has had a lot of media attention recently. The authors of a number of studies have claimed that there was no link between the two. Care to comment?

Cutler: Many other studies show a link. The most recent example is DeSoto and Hitlan in the *Journal of Child Neurology*, November 2007, showing the data on blood mercury and diagnosis of autism conclusively proves mercury causes autism. Also, medicine has basically become a liberal art and if you look at places like University of Washington Medical School web page, they very clearly state they do not want technical people. They want liberal arts majors. This leads to a lot of the people doing the research simply being incapable of doing research on dangerous chemicals and their effects on human beings. It's not the kind of thing you would expect a liberal arts major to know how to do. You wouldn't really expect him to know how to use statistics right, understand what the statistics mean. So, if you actually read a

lot of these papers, the abstracts and conclusions just don't follow from the data.

Schauss: Another important question I have is, how can there be journal papers on both sides of an issue like this especially?

Cutler: It's actually very easy. Research is what you do when you don't know what you're doing. Most physicians really haven't had that experience; Ph.D.s get to go through it. Also, when I was doing my dissertation research, I like most of my buddies redid experiments about ten times and figured out what we did wrong the first nine and hoped to God we did it right the tenth time! Generally, in human subject research, you only get one bite at the apple for ethical reasons and it's very, very easy to end up with a data set that seems really nice but, if you really went through it, it just isn't what happened – it just doesn't hang together – there was some systematic error. And then, people take these data sets that may or may not have meaning and beat them to death with statistical tools. But statistical tools only deal with random error and your measurements and your sample size. They don't deal with the systematic error of “did you recruit from the wrong group?” – “did you have the bad luck that the people you picked for the control group just happened to be atypical of the control population?” – things like that. And then you also have, again, the liberal arts problem. The paper (DeSoto) that I mentioned was some psychologists, who did actually know statistics, who read the original paper by Ip, Wong *et al.*, which was in 2004, which claimed that they'd proven that mercury doesn't cause autism. In fact, they had misreported their data, then miscalculated statistics from their reported data, and just had wrong numbers in the paper. And the psychologists were enough of non-liberal arts majors to recalculate the numbers and realize the paper couldn't be right – the conclusions didn't follow from the data – and contacted the authors. And I don't want anybody to think I'm being critical of Ip and Wong because, unlike most authors in this area whom I've often contacted, they didn't just blow off the contact and say “oh we published it, go jump in a lake,” they were like, “oh yes of course we'll provide our data [to] anybody so they can verify our research.” And [DeSoto and Hitlan] found out basically that there were typos. They recalculated their results and then discussed what the original numbers as reported meant, what the actual results were. And the results have been that one of the papers that's very widely cited showing that mercury does not cause autism actually showed it *did*, and people just didn't read it carefully!

So, what you have is a bunch of people playing “blind man and the elephant,” funding agencies all of which have agendas, not just in medicine. In medicine, of course you have the NIH, CDC, and FDA who, if it turns out thimerosal caused autism, take a big political hit. So they want to fund people that find the contrary. Grant recipients in all areas – this was true while I was on contracts – know what they are supposed to prove. It’s not unique to medicine. Most of them prove what they’re supposed to. Sometimes the data supports it, sometimes it doesn’t. In most areas, a three-foot-high stack of contradictory journal articles turns into a page or two in a textbook, after the controversy dies down in a generation or two. In the mean time, one has to read the actual articles rather than just the abstracts and also compare that to one’s experience and that of reliable sources you personally know [who] accurately report what they saw, in order for you to decide which of these giant stacks of journal papers to believe. And reading the journal papers is an art. You need a lot of technical background to really read the experimental section of the data and understand – “Does this hang together?” – “Could this have really happened?” – “Do I just ignore this paper” – [if] you just can’t figure out what they did. And based on that, the thing physicians are criticized the most for – relying on anecdotal evidence – is actually what they should be doing. Anecdotal evidence, the basis of all science, is observation: “I saw this.” It’s just like evidence in court: “I saw this” trumps “somebody told me that they saw.”

Given this, we will probably see another three or four feet worth of journal articles appear arguing about whether or not thimerosal causes autism even when, at this point, the proof is utterly conclusive that it does. That’s typical of the history of science and medicine: it takes a long time for these debates to settle down.

Schauss: Mercury toxicity seems to be a big focus of your research and writing. Why mercury, Dr. Cutler?

Cutler: People get toxic with all kinds of things. And all the heavy metals are represented among the clinical cases that a doctor will see. Due to the combination of mercury’s unique properties, choices to use it for certain medical and technological things, and a lack of understanding of individual variations of biochemistry, it is the most likely metal for people to get toxic with today. Also, due to what can only be characterized as irrational, unscientific dogma in medical practice, people with mercury problems don’t get diagnosed early so they tend to get very sick before they present to the

doctor who does diagnose them correctly. Also, of all the metals, mercury has the most variation in its possible clinical effects, depending on the person's biochemistry. This not only makes diagnosis difficult, but also makes treatment challenging since a very wide suite of interventions is needed to be able to control the various impairments one or another patient may be experiencing when mercury toxicity is the cause. Other relatively common toxins are lead and arsenic; relatively uncommon ones are bismuth, beryllium, thallium, and platinum. Someone in practice for a while will see them all. Toxins that people often get confused about are antimony and aluminum, which are frequently elevated in people with mercury toxicity but are seldom the primary toxin, and clear out on their own once the mercury is taken care of.

Schauss: In your book, *Hair Test Interpretation: Finding Hidden Toxicities*, which I think all of our listeners should get at www.noamalgam.com, you talked about a statistical methodology that helps with the interpretation of hair tests from Doctor's Data called "the counting rules." My question is, why do you have these rules, what are they, how do they work, and what do they tell us?

Cutler: Mercury is unique among the toxic elements in causing a derangement of mineral transport across cell membranes for all of the elements. This means there are many people with mercury poisoning [whose] hair, blood or urine levels of mercury will be normal or low. You can't just naively look at the mercury level and say whether someone's toxic. If you could, they'd all get treated by HMO doctors. The counting rules are a way to identify the derangement of mineral transport characteristic of mercury poisoning. They consist of a few simple rules for counting where the bars go on a hair test [report]. For example, on the Doctor's Data Hair Elements test, if five or fewer of the bars in the "essential elements" section go to the right, that indicates a high probability of deranged mineral transport. Another rule is if four or more of the "essential elements" bars go into red. And the most difficult rule is whether eleven or less of the essential elements bars stay within the "green plus white" middle band. I always have to count this one rather than just eyeball it. How to do the counting is spelled out step-by-step with examples in my book on hair test interpretation. (You can find out about the book at www.noamalgam.com/hairtestbook.html.) When mineral transport is deranged due to mercury, then the levels of other elements don't mean anything in and of themselves, [although] low ratios still have their typical meanings. Thus it's very common for people with mercury poisoning to be misdiagnosed with something else, based on a naïve interpretation of the hair test results. If

all you had to do to interpret a hair test was to look at what was “high” and “low”, there would be no need to train licensed health care practitioners because anybody could do it. When mineral transport is orderly, then the other elements *do* mean something and one should pay attention to very elevated values of anything that may be toxic. The book also discusses how to handle the situation where the hair test results are somewhat ambiguous. It gives a detailed discussion of what each mineral does in the body, what results on the hair tests mean. For example, zinc and calcium tend to go up in hair when the body is deficient. And the signs and symptoms of excess and deficiency or of toxicity for all of the elements tested for.

Laboratory tests are not some magic means of getting ultimate truths. They’re just more information to add to what the health care provider can gather from history, physical exam and clinical presentation. Since mercury is so easily confused with other problems due to its protean clinical presentation, the hair test is very helpful. Also, some toxicities can be quite similar. For example, people with copper versus mercury are almost indistinguishable, save the women usually have horrible PMS if they have copper, but less so with mercury. A hair test will distinguish copper from mercury from a mixed copper/mercury toxicity, and all of these are treated differently. Precisely because thirty-nine elements are determined, the hair test is a great screening tool. It allows very quick rule-outs for diagnoses in situations where it’s clear that there appears to be some sort of toxicity problem, but where it would take hours to sort out which one clinically if it could be done at all.

One of the situations where rule-outs are important is sudden-onset illness with myriad symptoms, sometimes apparently consequent to an event like a motor vehicle accident. Some of these people have post-hit injuries, soft tissue injury, mild spinal injury. Others have toxicity that was sub-clinical until unmasked by the stress of the accident. Another situation of course is where the patient can’t give a good history or discuss their symptoms, such as psychiatric illness or developmental disorders.

It’s important to remember the statistical definition of “normal” in lab tests: one person in twenty is high or low on any analyte. Thus, in interpreting a hair test with thirty-nine analytes, you need to use some statistical approach like the counting rules to avoid inappropriate treatment of what are in fact normal results in some individuals.

Schauss: I understand that you often state that using urine challenges for testing heavy metal burden in people is inappropriate and should not be done routinely. Why is that?

Cutler: We'll support reasons that have no diagnostic utility. Nobody actually reads the literature on challenge tests; they just read the abstracts in PubMed. If you actually read the literature, you see dozens of people who were perfectly healthy, who had dramatically high scores compared to anything you ever see clinically in an alternative doctor's office. If you get challenge test results from normal-healthy and toxic people, they are not well distinguished; you cannot say, based on a number that "those above this number are toxic, those below are not." And, coupled with this lack of real diagnostic utility, all the popular challenge test protocols have very substantial risk. There's no reason to accept risk and not get information back. So the only reason I think people should use challenge tests is when the insurance company will actually provide coverage if they have a challenge test result and won't otherwise. It's not diagnostically useful. It has risk. There are lots of other ways to get more diagnostically useful information.

Schauss: In your book *Amalgam Illness*, which I also highly recommend, you lay out a mercury detoxification protocol that you're very adamant about. You call for low-dose use of alpha lipoic acid and oral DMSA on an every-four-hour dosing schedule. Others have suggested that an every-eight-hour schedule is easier and just as effective. Why your protocol over the other?

Cutler: Because mine leads to the people getting better, and theirs leads to the people often becoming horribly, permanently, untreatably worse. This is based on the fundamental laws of nature, as they govern the properties of the chemicals you're using. It's not based on whether people like me or like the other people. It's not based on how big a stack of credentials we have. Actually, the most lucid presentation of exactly how to chelate is in the back of the hair test book. What *Amalgam Illness* covers that the hair test book doesn't is what to do for nine million other symptoms. The hair test book is – very basic description – chelation, a few other things, lots of hair test examples.

Alpha lipoic acid is the most powerful chelator available. This is unfortunately not well discussed in the English-language literature and requires some knowledge of chemistry or an ability to read the Russian-language literature. And the kinetics of alpha lipoic acid, DMSA, DMPS are

very well established in human subjects (for DMSA, in pediatric subjects). If you look at any standard medical booklet (Goodman and Gilman's *The Pharmacological Basis of Therapeutics*; or Harrison's [*Principles*] of *Internal Medicine*; or Goetz' *Textbook of [Clinical] Neurology*), you find discussion [of] how do you decide how often to give a drug. The way you decide is: you find out what its half-life is and you give it about once every half-life. And the more fluctuations in drug level matter, the more rigidly you have to adhere to that. The less fluctuations in drug level matter, the more you can pick dosing because it's convenient. So the basic pharmacologic properties of alpha lipoic acid require it be given every three or four hours. It must be done that way: doing it that way clears mercury *from* the internal organs and CNS. Giving it *less* frequently concentrates mercury *into* the internal organs and the CNS.

One of the things not well appreciated in medicine because of the lack of technical and quantitative study (in favor of liberal arts study so that people will have a good bedside manner) is the ability to do a mass balance and really appreciate where all of the mercury is (or lead or whatever) in a toxic person. In fact, when you have somebody [who] has mercury poisoning, they have mercury throughout their body, and most of their body is not very sensitive to the effects of the mercury. So you have a situation where somebody may have five or ten milligrams of mercury in them and only have 100 micrograms in the parts of the brain that are sensitive. If you give them alpha lipoic acid, or DMSA, or DMPS on an inappropriate schedule (such as alpha lipoic acid or DMSA three times a day, or DMSA every other day, or DMPS by monthly injection or every other day), you in fact enhance urinary excretion of mercury and clear a lot of it out of ligaments, connective tissue, the extra-cellular space, muscles, but *concentrate* it into the brain and liver. So you take a person and, by moving the mercury around where it is in them, make them clinically much more toxic even while you reduce their overall body burden. In order to prevent that redistribution, you have to give the chelators every half-life, or more often. For alpha lipoic acid, that's every three or four hours. For DMSA, it's every four hours or so. For DMPS it's every eight hours. There's a little bit of individuality there; every once in a while, you'll find someone who has a very hard time on that and if you make the administration more frequent they do better – if you make it less frequent, they do worse. That appears to be counter-intuitive to physicians.

Most of the people who say every eight hours or three times a day say it for physician convenience rather than because they care about the patients,

because the physicians who don't really understand why you have to do this, or who don't have a good bedside manner, end up arguing with the patients for a long time about "yes, you really have to get up at night." And that's expensive because they can't really charge extra for this time [spent] arguing with people. But in fact, if the physician really understands – you have to do it and learn some simple pattern – then the people do it and it's never an issue. The doctors I work with very routinely say something like "do you get up to pee at night?" People say "yeah" and they say "well, you're going to have to get up to do this too but you don't even have to sit up, you just have a pill and a glass of water on your nightstand, swallow the pill, roll back over – no big deal." The people will do it.

The thing that [is] inflexible and dictated by the laws of nature is how often you have to give each chelator. It's a specific number for each chelator and there is no intervention that changes that number. If you hear people claiming different half-lives for these things, then ignore everything those people say – they're so clueless they don't even know what "half-life" means! It's the fundamental law of nature what the half-life of that in a mammal is.

The things that are flexible [are]: exactly which chelator you use; how much of it you use; how often you use it, or how long a period of time you do these cycles for (it's every three hours, or every four hours, or every eight hours – *for how long*). So, empirically it's been found if you go three days or longer the people tend to do a lot better than if you go short cycles. In theory, one could start from the morning, go the evening, stop, repeat, skip the nighttime doses – in practice the people who do that get very, very, very sick. In practice, the people who get up one morning, start and don't stop until at least evening of Day 3 do fine. And a lot of how long you take it and skip is really just empirical based on each person: how well they tolerate it. A lot of why I say to do it in these cycles (take it for a few days, skip, and so on) is because almost all experience with chelators has been that way and I don't think it's a great idea to innovatively change everything, [as] there's not a lot of human experience with continuous chelation. In cases where it seems to be indicated, such as when people feel much better on chelation and it's relieving symptoms, generally I have not heard problems from them doing that. But that's not a common protocol in the literature and in clinical experience, so I don't recommend doing it routinely.

As I said, the alpha lipoic acid is what clears the brain and the organs. DMPS, DMSA only access the extra-cellular compartment. They're not effective in

clearing the brain. They may relieve a lot of symptoms, because a lot of symptoms are due to mercury in the rest of the body in a fairly toxic person. But to get full, complete relief you have to use alpha lipoic acid. Alpha lipoic acid is the most effective chelator – it is not essential to use DMPS or DMSA, though it's very helpful, often.

If you have something other than mercury, you have to look at which chelator for which thing. You may notice that I haven't mentioned the most common chelator of all, EDTA. That's because it's actually not helpful for mercury and often harmful. However, for other uses it's fine; it's very helpful for vascular disease but, when you have someone with a mercury problem, you don't want to use it for the mercury problem or otherwise if you can help it. If someone has lead, you want to use DMSA, because DMPS is completely worthless for clearing lead. But DMPS is otherwise very helpful for everything else. It generally leaves the best subjective sensation. Also, it does have the convenience of eight-hour dosing. It's very important to remember, timing is a law of nature: every eight hours is *not* three times a day, it's every eight hours *by the clock*. Every three hours is not eight times a day; every four hours is not six times a day, it's every so many hours by the clock.

Schauss: Having heard you say this, you talk mostly about oral chelators, why not I.V.?

Cutler: [Sigh.] Two very good reasons, the first of which is: oral absorption of all of these chelators is very good, there's no reason to inject them. The other is actually very interesting as what you're trying to do by giving them frequently is prevent the blood concentration from going up and down too much. When you give them by mouth, they absorb over an hour or two and that necessarily spreads out the peak of absorption and prolongs the effective lifetime (versus the theoretical half-life). And if you inject them, you get a very high peak in blood concentration right when they go in, and then it falls rapidly and, unless you want to inject them every three, four, six, eight hours, which nobody's going to want to do, then you also have the issue of not giving them frequently enough. So it's actually preferable that they be administered by mouth (or transdermally if you want although there tends to be more adverse reactions there) instead of through a needle. And even people with very impaired digestion do very well taking them by mouth.

Schauss: And finally, what other tests do you find helpful in working with mercury-toxic individuals?

Cutler: Aside from any tests that may be relevantly indicated, I find a complete blood count with differential is the most likely to be informative. [There are] very, very common issues with either iron deficiency anemia or methylation anemia – sometimes other issues, sometimes a little bit of neutropenia. Ferritin is pretty useful. I suggest, in men who complain of any kind of achiness, lethargy, lack of drive or motivation, to check testosterone levels. Compare them to age-appropriate norms, not to the lab norms that are usually for eighty-five-year-old men. In women, their hormones are almost always messed up: reasonable female hormone panel. Anything reasonable to help the hormones be in balance makes them feel much better. It's relatively common [that] the people have thyroid axis derangement, so a free T3/free T4/TSH is really helpful. If they don't want the free T3/free T4, then T3/T4/TSH. Serum uric acid is very, very helpful. It tends to go low with most heavy metals, but high with lead. So when you have someone with mercury, you'll typically see it below 4 [mg/dL]; they'll feel a lot better if you give them a bunch of molybdenum. If they have some lead, you'll see it up above 6 – it may not be frankly high but then you don't want to give them molybdenum, you want to suspect lead and make sure you use DMSA.

The standard Chem panel, SMA 28, stuff like that I find so seldom useful that I really encourage people not to bother but, for historical reasons, physicians almost all order those. Other than that, the testing tends to be really very much on indication. My experience has been that physicians, having a realistic view of the ambiguity of their clinical skills, tend to rely on the laboratory too heavily because they don't have realistic appreciation for how often a laboratory can goof and how little laboratory results can mean [laughs]... So I spend a lot of time encouraging physicians to rely on their clinical skills and, when they see something clinically that contradicts the lab tests, believe what they're seeing. (Aside from the hair test which I think is just a marvelous place to start – great screening tool – remember you can't use it on perm'ed or dyed hair – you can alienate people with long hair by insisting on following the lab instructions of snipping it close to the scalp – you can use distal hair if it's not perm'ed or dyed and you just have to remember to account for when it was grown; you can use pubic hair – pubic hair works fine – I've seen lots of pubic hair tests that come out just the same as head hair tests. I haven't seen enough axillary hair tests to know whether or not those work the same but I would expect them to.)

But otherwise, it's really very straightforward simple stuff: CBC, thyroid test, serum uric acid, and hormone panel as indicated. If you have like thin, anxious people, then a hemoglobin A1c where you're looking whether it's *low* is helpful to determine if they really are getting pretty close to the edge of adrenal insufficiency. But when you have thin, anxious, self-involved people, you don't really need to test to know that they need adrenal support.

Schauss: I just thought of one other question that I think our listeners would be very interested in – the issue of urinary porphyrins and mercury.

Cutler: It's truly an interesting issue. It's one I am very aware of. It's one that has some very fascinating literature. So, I'll give you kind of a long answer, but I'll start with the short answer and then chase it around. The short answer is: very limited clinical utility because of the very high rate of false negatives. And that flows from the fact that, in a laboratory test, the real "chain of analysis" starts while the urine is still in the urethra. Once it comes out as a free stream in the air, the lab test has started, and from that point until the final measurements [are] made, everything can affect the result. Now, for most things like a reflex urinalysis, blood in the urine, it really doesn't matter very much until it gets to the lab. The problem is that porphyrins are very, very sensitive to air oxidation and to light oxidation (photo-oxidation) so, if you pee into a bucket in a room with fluorescent light, by the time you get the container and pour it into the collection container in the refrigerator, half the analyte is gone! And that's not under the laboratory's control – there's nothing they can do about that, there's no way they can check, they can't know that happened. If you bring it to a laboratory and the technician hasn't done the test before, they're supposed to make sure that the urine's well mixed. If they shake the container, instead of gently rock it back and forth, shaking it can destroy half the analyte. If they do this in a room with fluorescent lighting, that can destroy another half of the analyte. So, you can be sitting there with someone who has a very high level and shows up with a perfectly normal test and that's not uncommon. So, it's a really useful test if you always have this very great suspicion that normal results, even repeated normal results can be incorrect – they can be false normals – it's like false positives or false negatives, this is simply a test with a dramatically high false negative rate.

You have the work of Woods *et al.* on the 5-carboxyporphyrin being specific to mercury that's now a test done at Laboratoire Philippe Auguste in France that – presumably this is a relevant test, presumably this is specific for

mercury – it's not clear to me what their reference ranges actually mean which raises some questions... However, as a more general rule, all the mainstream laboratories have always offered fractionated urine porphyrins and, if you look at those, while they're not specific for mercury, if you get elevation of coproporphyrin, then there's a rare genetic porphyria you can easily rule out. Or it's toxic porphyria if you get elevation of uroporphyrin and coproporphyrin then it can only be toxic porphyria. There are about four diseases that are easily ruled out that can cause it, plus maybe 30-40 toxins and most of them are heavy metals. So, if you used that test, and found toxic porphyria, there's a very short rule-out list and you can get there pretty quickly. The problem is you can't use it diagnostically or for rule-out or for screening because of the very high false-negative rate. And I have a lot of discussion in the book *Amalgam Illness* about if people want to do this test, what you have to do for sample handling and how to try to lead a laboratory into it. The best thing is really for the physician to take personal responsibility to learn how to do this himself and then teach every patient and write orders for the laboratory to give them all the stuff and have the patient themselves prepare the sample. Even with that you'll get some false negatives. It does lead to one of the most – you know if you do like, whole blood porphyrins, a lot of these people will show slightly high in those who will also show toxic porphyria in urine – you just don't really get the fractionation of the whole blood porphyrins as a common lab test. If you're worried about a genetic porphyria, the important thing to remember is: [in] genetic porphyrias, typically the elevations are ten times the upper normal limit or higher. And typically, the people are *very* symptomatic episodically and do pretty well in between. They have very well understood triggers. In toxic porphyria you're usually seeing two, three, four times the upper normal limit all the time, every time you test – it doesn't go up and down. Symptoms are not particularly episodic.

The really interesting thing about this is that if you look in the literature you find... I believe it's a Swiss study where they looked at urine porphyrin levels in children from birth through age eighteen. And what they saw is, in the first twenty-four months, the porphyrin levels went up and down in lockstep with the amount of mercury in their vaccines. And they simply attributed that to natural variation and development but it seems a lot more likely that it's being driven by the vaccine-induced toxicity affecting the whole population.

So, while it's a very useful test in some sense, it has pretty sharp clinical limitations due to the pretty high likelihood of getting back false negatives

and getting very confused. And the doctors have to remember – and I'm sure most of them are aware that – if you start to use a lot of things like you tell the patient "oh, do this test, it might come back normal but that doesn't necessarily mean anything" and then it comes back normal, the patient is going to say "well this test proves I don't have mercury" even though it does no such thing. So, while it may be useful for the doctor, it can impair his ability to get that patient treated by having the patient say "you know, all these tests don't mean anything and I really don't have mercury." Because all these tests say is that, even when you knew there were a lot of false normals, that patient got one of them.

Schauss: Well Dr. Andrew Cutler, I'd like to thank you for sharing all the information you have today and look forward to working with you in the future.

Cutler: Alright. Thank you very much.

Transcribed by Michael Ross
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