Dr. Robin A. Bernhoft, MD
FOR CHRONIC ILLNESS & ALLERGY

1200 Maricopa Hwy • Suite A • Ojai, CA 93023 • 2128 Pico Blvd • Santa Monica, CA 90405 • Tel 805-640-0180 • Fax 805-640-0181

What Is Chelation?

By Robin A. Bernhoft, MD, FACS, DABEM, FAAEM

According to the National Health and Nutrition Examination Survey IV, metal toxicity is quite common. It is not easy to diagnose. The half-life of metals in the blood stream is short - hours to days - so blood levels of Pb, Hg, etc are not actually helpful. They only show recent exposure (in weeks) and tell nothing about body burden of metal. Neither do hair or urine, which correlate with each other and with blood (reflecting recent exposures) but not with deposited body burden. This has been known to metal researchers since the 1960s. Most MDs are unaware.

Different metals and different chemical states (metallic polar, neutral, attached to organic chemical, etc) are deposited differently in the body and cleared via different mechanisms and at different half lives. (see my peer-reviewed papers on **Mercury** and **Cadmium**).

The most reliable (my personal estimate 85%) index of body burden is the Urine Metals Provocation test, which we do according to the protocols of the American Board of Clinical Metal Toxicology. Provocation is considered by the World Health Organization and ATSDR to provide a reliable estimate of body burden. We get a baseline urine for comparison's sake (and to rule out contamination in food or drink), insert an IV and give a small dose of DMPS over 45 minutes, followed by a small dose of EDTA over the next 45 minutes, and a dose of glutathione IV (size determined by Glutathione Transferase). The patient goes home with a bucket for collecting urine for a total of 6 hours, and a kit for Fed Ex to deliver to Drs Data in Chicago. Results are back in 2 - 3 weeks.

Interpretation can be complex. Minimal elevations above the reference range (which is based on NHANES random urine testing, not on provoked samples) may or may not be significant. For that reason, comparison is made with the patient's own baseline values. Very high values are meaningful, minimal elevations are probably not, but patients with impaired Glutathione Transferase (GST) activity may have false negatives.

It is useful to become familiar with the clinical presentation of the main metals: Pb, Hg, Cd, As, and to a less extent Al, Ni, U. Many metals, such as Ba or Gd,

1200 Maricopa Hwy • Suite A • Ojai, CA 93023 • 2128 Pico Blvd • Santa Monica, CA 90405 • Tel 805-640-0180 • Fax 805-640-0181

are chiefly leftovers from XRAY procedures, and (not having been studied extensively) are assumed to be benign.

When chelation is indicated, it is done via protocols from ABCMT, which are conservative, to minimize complications, but effective (more so than enteric or transdermal chelation). Our maximum dose of DMPS is conservative, given in a bag free of air (DMPS oxidizes easily) over about 45 minutes. Our maximum dose of EDTA is also proven safe, given at 1 g/hr maximum rate. We do comprehensive metabolic and ferritin, iron panel every five sessions.

Dosage and timing are critical. There are three ways chelation can hurt a patient: 1) too large a dose; 2) too rapid administration of a dose of any size; 3) failure to replace beneficial minerals. If these are taken into account, chelation is quite safe, done according to ABCMT or ACAM protocols.

There is a rhythm to chelation. Early on, Pb seems to come out more quickly than Hg or Cd or Al in most people. This is particularly true of people with GST SNPs. Later in the course, there is a lot of dumping of Al and Cd, and Hg output tends to increase until late in the course, at which time Al drops suddenly, and Pb and Hg gradually fizzle out. (It is possible on that basis to prognosticate somewhat on the number of remaining sessions.)

I generally do a provocation every ten chelations (bearing in mind DMPS should not be given two weeks in a row - 14 days between doses is ideal) to keep fairly tight rein on progress. I get (or hope to get) a Comprehensive Metabolic and Iron panel every five chelations, and review that and clinical progress with the patient the following week.

Chelation potentially can treat a wide range of conditions, as the ++ heavy metals have great affinity for –SH groups, which are everywhere, and compete as cofactors to enzymatic reactions with Mg++, Zn++, and all the other beneficial trace metals. Consequently, they are capable of producing a wide range of symptoms, different metals having a different range of symptoms based on their distribution and biological behavior.