

November 29, 1966

Dr. Antonio Pavia
Pavia Hospital
Europa Street
Santurce, Puerto Rico

Dear Doctor Pavia:

I have received a request from Mr. Allan Dooley to send certain containers to you for the collection of specimens of urine, these to be returned to us for analyses. These have been dispatched to you via air mail.

It is my understanding that two men who have been engaged in filling tank cars or tank trucks with gasoline containing tetraethyllead have been suspected of having lead poisoning, and that their urine is to be analysed to determine whether or not they have absorbed lead in the course of their work. I have no information concerning any clinical evidences of illness that may have been so interpreted.

We can, of course, have the analyses made, and the results reported to you, with an interpretation. I think, however, it would be well to comment, briefly, on the information now at hand, concerning the potential hazard of the work in which these men are said to have been engaged. I should also say something about the clinical characteristics of poisoning by tetraethyllead and other alkyl lead compounds.

First, as to the potential exposure to lead associated with the handling of gasoline containing tetraethyllead. It has been established beyond question that the handling of leaded gasoline in the customary manner at loading racks and gasoline service stations involves no risk of the absorption of measureable quantities of lead. In the first place, the concentration of the lead compound in the gasoline is too low to be absorbed through the skin. (This was demonstrated experimentally in animals, and verified by human experience. I can supply you with the documentary evidence if you require it.) Secondly, the vaporization of the lead compound from the gasoline is too slight, because of the low concentration and the low vapor pressure of the lead compound, as compared with the gasoline, under the prevailing conditions, to be of significance. (The investigation of gasoline handlers under a wide variety of conditions has demonstrated the truth of this statement. Here again, published articles are available to demonstrate the facts.)

Cases of tetraethyllead poisoning have been seen by only a few physicians, because the disease has been prevented from occurring to any considerable extent in most of the world, through great precision and care in the manufacture of tetraethyllead and in mixing the concentrated antiknock compound with gasoline. (Cases have occurred in connection with the cleaning of leaded-gasoline storage tanks, when the proper precautions have been neglected.)

The disease, as described early in the development of the antiknock industry, bears little resemblance to classical lead poisoning. It is an intoxication of the central nervous system, primarily, so that the presenting pattern of the disease is that of mental aberration (somewhat like alcoholic intoxication but by no means the same), in association with tremors, hyperflexia, lowered blood pressure and temperature. There are no hematological manifestations, and there is little or no elevation of the lead content of the blood*; the lead content of the urine, on the other hand, is elevated somewhat in proportion to the severity of the poisoning, and may be much higher than it is usually found to be in inorganic lead poisoning.

I cannot go into further detail in these matters but if you have reason to be concerned, I can supply you with certain reprints of published articles on both types of lead poisoning, i.e., that due to the alkyl lead compounds and that due to inorganic lead poisoning. It may well be that you are familiar with the literature on the subject, or that you have access to it. I shall await for a word from you, therefore, before sending you any publication.

Cordially yours,

Robert A. Kehoe, M.D.
Professor Emeritus of
Occupational Medicine

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* This is why lead content of the urine instead that of the blood, is important when tetraethyllead poisoning is suspected.

P.S. Six (6) containers are being sent in order to enable you to obtain three (3) specimens of urine, at different times of the day, from each of the men. This can be done best in the early morning (so as to obtain the first voiding), then next around mid-day, and then again in the late afternoon or early evening. By such means, the inherent variability of the excretory process can be neutralized, so as to learn its general level.

R.A.K.

cc: Dr. Lerner
Mr. Allan Dooley
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