

November 20, 1950

Mr. Frank T. Plattner,
Suite 223 Goldman Building,
East St. Louis, Illinois.

Dear Mr. Plattner:

In response to your letter of November 16 concerning the significance of the analytical results on the blood and urine of [REDACTED], as reported by us on 10-3-50 (50A-10697-8) and on 10-30-50 (50A-11319-20), I am pleased to reply, and to compare these results with the values obtained and obtainable on normal individuals unexposed to lead in the occupational sense, through the use of the analytical methods of high precision employed in this Laboratory.

Serial analyses of the blood of normal healthy individuals in our population, exclusive of those employed in lead trades or otherwise exposed abnormally to lead compounds, yield results which range from slightly under 0.01 up to and including 0.06 milligram of lead per 100 grams of whole blood. This degree of variability, therefore, is normal or physiological, and any one result on the blood of one person which falls within this range must be interpreted as within normal limits. The mean and median value for normal individuals is approximately 0.03 milligram per 100 grams of whole blood, which means, simply, that the preponderance of the results on normal individuals cluster around this value. Thus if a series of results of sufficient number on one individual yield a significantly higher mean value - say 0.05 or 0.06 milligram per 100 grams, there is evidence of unusual or abnormal exposure to, or absorption of, lead.

In certain industrial establishments, or in certain occupations, the exposure to lead is such as to yield elevated values for lead in the blood, but no cases of poisoning occur. We have learned by experience that these industries or occupations are safe. The mean values in such trades or occupations run up to 0.06, 0.065, and occasionally 0.07 milligram per 100 grams.

Other industries or occupations have been found to be unsafe, in that persons who work therein develop lead poisoning. It is found that individuals and groups working under these conditions have blood values of 0.08 milligram or more, per 100 grams of whole blood. They range up to 0.60 or 0.70 milligram per 100 grams under the worst conditions.

To summarize then, the results of one or two analyses may be interpreted as normal if they fall within the range up to 0.06,

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abnormal, but not indicative of hazard, if they fall within 0.06+ and 0.08-, and abnormal and indicative of hazard if they are above 0.08 milligram of lead per 100 grams of whole blood. The higher they go the greater is the hazard and, therefore, the likelihood of illness.

The range of the urinary values is much greater, and the variability is correspondingly great. Thus normal values for samples of urine of small volume (the type of sample obtained in the case of Ruben Rodgers) range from 0.001 (or slightly less) milligram of lead per liter, up to 0.14 milligram per liter. Abnormal values range upward within safe limits to 0.20 milligram (or slightly more) per liter, and within dangerous limits up to 0.6 or 0.7 milligram per liter. There is overlapping here in the values, so that in practice, we require samples of both blood and urine in order to make an interpretation in the individual case. If then the results appear to be ambiguous, we require additional samples so as to arrive at a proper interpretation.

There are two ever-present and highly serious problems:

1. the possibility that the samples may be contaminated in their collection,
2. the possibility of an unusual error in the analytical procedures, which are of an highly specialized type.

It is for this reason also, that we require both blood and urine, since errors of handling samples and of making analyses will reveal themselves in ambiguous results. For example, we obtained the result 0.65 milligram per liter in a sample of this patient's urine at a time when two blood samples gave the results 0.05 and 0.07 milligram per 100 grams. The two blood samples check each other within the limits of a reasonable analytical precision, but the lead in the urine was so far divergent from the expected values (probable range 0.04 to 0.18) as to be almost certainly in error, the likely cause, in our experience, being that the sample was contaminated in the process of its collection. We so stated. A subsequent pair of results were in physiological agreement with each other, all results being within the normal range.

You will recognize from this discussion, which I have gone into in order to clarify the problem, that the interpretation of analytical results of this type is not as simple as it might be thought, since one is dealing, in this, as in practically all physiological matters, with the phenomenon of individual variability. Our problem is not to find or give a single value, but rather to measure the factor of physiological variability over a large enough number of cases and situations so as to define normal and abnormal ranges of values. This has been done for the lead in human blood and urine by thousands of observations made under a very large variety of conditions, by means of methods of the highest precision presently obtainable.

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The chance of an erroneous interpretation of results is, therefore, quite small.

Very truly yours,

Robert A. Kehoe, M. D.

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FRANK T. PLATTNER
ATTORNEY AT LAW
SUITE 223 GOLDMAN BLDG.
EAST ST. LOUIS, ILLINOIS

November 16, 1950

Dr. Robert A. Kehoe
Metterring Laboratory
University of Cincinnati
Cincinnati 19, Ohio.

Re: Analyses #50A-10697 and
#50A-10698

Dear Doctor:

A copy of your report submitted to Dr. Edward W. Cannady of East St. Louis, Illinois, has been forwarded to me by Robert L. Broderick, attorney, who originally requested Dr. Cannady to make a physical examination of [REDACTED]

I would appreciate a statement from your office as to the normal levels of lead in the blood and urine as determined by the methods of analysis used in this specific case.

Thanking you in advance for a reply at your earliest convenience, I am

Very truly yours,

Frank T. Plattner

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