October 20, 1969

Robert J. M. Horton, M.D.
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Dear Bob:

With regard to Dr. Tepper's letter of February 4, 1969, I am enclosing some comments of Dr. John R. Barnes who is in charge of our Chemistry Section. I agree with his observations and believe that ALA is a good guide in detecting persons or groups who have an exposure to lead which is too high, but that there is a level of blood lead below which ALA is not affected and therefore a poor correlation would be expected.

Yours sincerely,

ORIGINAL SIGNED BY
G. J. STOPPS

G. J. Stopps, M.B., B.S.
Assistant Director

GJS/bjd
Encls.(2)

cc: Lloyd B. Tepper, M.D.

JAZ

TO: G. J. STOPPS DATE: OCTOBER 16, 1969

FROM: J. R. BARNES

COMMENTS ON THE KETTERING LABORATORY Pb/ALA STUDY

Using the criteria that all urine ALA's 5.7 mg/L or higher are abnormal (Haeger-Aronson and DuPont), and all blood Pb's 0.04 mg/100 g or higher are abnormal (Goldwater and Hoover) then:

all 39 specimens had "abnormal" blood Pb's
24 times all three urine ALA's would predict an excessive exposure
28 times two of three urine ALA's would predict an excessive exposure
33 times one of three urine ALA's would predict an excessive exposure

The prediction is loaded in favor of the blood Pb being the more accurate estimate since only one blood Pb is reported. From M. E. Maxfield's analysis of blood Pb determinations, a lab classed as capable of doing "precise" analyses could report, on subsequent analyses of the same sample, values varying as much as 0.02 mg Pb/100 g blood.

If 0.08 mg Pb/100 g blood is a minimum effect level, that is the level at which some manifestation of interference with biological activity occurs - interference with heme synthesis - then only 17 of the 39 specimens showed an excessive exposure to Pb. All but one of these (#23) would have been detected by the urine ALA. The question might then be whether one has more confidence in repeated ALA measurements or a single blood Pb to predict an excessive exposure.

The very large swings in a given subject during the day are quite surprising and far greater than might be explained by variation in urine concentration. This needs to be resolved more than the challenge that urine ALA's frequently fail to identify persons with high blood lead levels.

JRB:sfs