

May 20, 1968

M. J. Packovich, M.D.
4616 Jeanne Street
Virginia Beach, Virginia 23462

Dear Doctor Packovich:

In reply to your further letter of May 10 (to which my reply is delayed because of a week's absence from my desk, while attending the Annual Industrial Health Conference of A.I.H.A. and A.C.G.I.H. in St. Louis), I shall give you my present view of occupational screening by means of the output of delta-aminolevulinic in the urine.

I must say, in addition, that your reference to complete dependence upon a method based on atomic absorption for the analysis of lead in the blood finds me skeptical. If your people have had experience with the method and know whereof they speak, as to its usefulness and its limitations, I have nothing more to say. However, if they have not had such experience, they should employ the method with due critique to test it, for the method per se is not the answer to the problem. In proper hands, and with proper care, the method will yield satisfactory results, but recent comparisons between a wide range of laboratories have shown that there are extensive opportunities for large errors.

Now, as to the screening test, I cannot view it enthusiastically. So far as my experience goes, the satisfactory differentiation between safety and danger in the occupational exposure of individuals to lead (where it cannot be ascertained that no real danger exists under a well maintained set of occupational conditions), lies in the quantitative determination of the extent of the absorption of lead, as revealed by the output of lead in the urine (which is difficult to ascertain with accuracy) or by the level of the concentration of lead in the blood (which is comparatively easy to learn). I would be entirely willing to depend on the latter for its reasonable certainty, and to check the capability of the determination of A.L.A. along with it, over a period long enough under variable conditions to demonstrate its efficacy. I should be unwilling, however, to abandon a method of demonstrated precision, in dealing with the safety of workmen, for any method that appears to be satisfactory, but has not yet demonstrated its essentially unfailing capability. One's responsibility, as a physician, in these matters, is too great, in my opinion, to depend solely upon an incompletely tested method. What we are doing, under the latter condition, is to indulge in a "short-cut." As a supplementary procedure for wider and quicker application and, hopefully, for an ultimately satisfactory application, I have only commendation to offer.

Sincerely yours,

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

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May 10, 1968.

Robert A. Kehoe M.D.,
Kettering Laboratory,
Univ. of Cincinnati,
Cincinnati, Ohio.

Dear Doctor Kehoe:

Thank you very much for your fine letter of April 29, 1968 and for the separate enclosures. It has been very helpful for me.

Since our last communication, circumstances have transpired so that in the next four months our industrial medical facility in the Norfolk Naval Shipyard, Portsmouth, Virginia, shall have the capability for performing blood lead analysis utilizing the atomic absorption spectrophotometer method. It has been found to be economically feasible to purchase said equipment.

Despite this forward step, I would beg your indulgence to inquire of another screening method. I would appreciate your opinion regarding the value of urinary delta-aminolevulinic acid levels as a screening procedure on a mass basis. I particularly refer to the article by Davis and Andelman (Arch. Environ Health, 15:53-59, July, 1967.)

Once again, thank you very much for your remarks and for the helpful reprints.

Respectfully yours,

M. J. Packovich M.D.
MJ Packovich M.D.
4616 Jeanne Street
Virginia Beach, Virginia.

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April 29, 1968

M. J. Packovich, M.D.
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Dear Doctor Packovich:

In my view, the matter of the degree of risk associated with the work in shipyards with which I am somewhat familiar, as well as the status of individual employees with respect to their safety in the continuance of their work, should be determined by very much better criteria than that of the determination of porphyrins in the urine. The latter is considerably better than nothing, and also better than the crude device of counting "stippled" erythrocytes, but it is hardly to be commended as reasonably adequate.

The determination of the actual rate of the urinary excretion of lead by the groups and individuals in various occupations, when done properly and with sufficient frequency (in relation to the degree of risk), is certainly very much better than the survey of the porphyrins, both because of the non-specific character of the latter, as well as the physiological and analytical variables. There is no doubt, however, that the best method now available for determining the status of individuals, and for judging the safety of the operations through consideration of the composite results, is that of determining the concentration of lead in the blood, by a precise analytical procedure. The reasons for the superiority of the latter procedure arise from 1) the relation of the lead in the blood to the "effective body burden of lead," and 2) to the fact that the concentration of lead in the blood varies primarily with the amount of lead in the body and not to a wide range of physiological variability. For example, the urine obtained from the same man on the same day, may range from 70 micrograms to 210 micrograms simply because of the throughput of water, i.e., a dilute specimen will be low in lead, while a concentrated specimen will be high. There are other variables as well, so that from a purely statistical viewpoint, the analysis of one sample of blood is worth at least five samples of urine.

I should warn you, however, that in my opinion, purely analytical "screening," while helpful, is not adequate as a means of medical surveillance in the lead-using trades. In order to convey my recommendation to you, I am sending a reprint of a chapter in Patty's "Industrial Toxicology and Hygiene," which I wrote for the last edition. It is my opinion that we physicians have been party, for much too long, to the use of make-shifts in industrial hygiene. I am fully aware of the difficulties with which we are presented, in the form of shortage of help, facilities, funds and authority, but these are the reasons why the practice of Occupational Medicine is so poor in performance that cases of lead poisoning abound in industry, despite our definitive knowledge as to how to prevent all of such cases.

You will, I hope pardon my critical remarks, above, which are not directed at yourself. However, as it happens, I've been trying for many years to wake up both industrial management and our own profession to some of the facts of life

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concerning the need for the protection of the men who do the work of the country. Some progress has been made, but it is deplorably slow. For our own part, as physicians and medical scientists, we have developed methods of research and practice, without regard to cost, in relation to non-occupational disease, but we are still "pinching pennies" and struggling along with a totally inadequate supply of trained people, in a field which is the source of the productive (economic) wealth of our entire population. It is indeed a strange phenomenon in the wealthiest country in the world.

Sincerely yours,

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

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