

February 4, 1960

AIR MAIL

Gilbert M. Halpern, M D.
251 Alexander Young Building
Honolulu 13, Hawaii

Dear Doctor Halpern:

Clark Bridges, Managing Director of the Industrial Medical Association addressed your inquiry concerning lead to my associate Frank Princi, who passed it on to me, since this is a matter of primary concern to me within our staff. Unfortunately I have been out of the country for a time and my reply has been delayed.

Getting now to your questions, let me say that their satisfactory answer depends upon a number of matters that are not actually involved in the questions themselves. What you need is not one or two answers, but a genuine understanding of the problem.

For example, if your plant and its operations are properly designed there should be very little real hazard. If it is not so designed then the real problem is that of so modifying it as to make it safe. This is essentially an engineering problem, and in order to get it solved, a capable industrial hygiene engineer should make a complete survey, determine where the hazards are and their extent or severity, and then, with the help of production people, make the necessary changes in design to control the contamination of the air. The concentration of finely divided lead (respirable lead) in the air that should be regarded as the maximum is 0.2 mg. (as Pb) per cubic meter of air. However, this, in itself, is not enough for the general hygienic conditions, including the indoctrination of the men, should be such that they avoid all ingestion of lead. Unless they have excellent facilities for washing, bathing, changing clothes, and eating while within the plant, they will, inevitably, swallow lead because of dirty hands and contamination of food, tobacco, etc. This can be avoided, but a great deal of care and attention must be devoted to the matters of which I have spoken if it is to be achieved.

The periodicity and character of the physical examination are determined by the extent of the hazard. If the hazard is under sufficient control examinations at intervals of a year may be sufficient, but otherwise the frequency depends upon the risk. There is no rule that can be made to apply. Whatever is needed must be done. On the other hand, as I said before, the engineering control should be good enough to handle the job, and if it is, then the examinations can be scheduled accordingly.

The analysis of samples of blood is by far the best means of determining

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the extent of the absorption of lead by the workmen, but this requires real precision of sampling and analysis. I would hope you could get this done properly, but there are few laboratories that can be trusted to provide reliable results on either blood or urine. When this is done properly one can always remove men from exposure in time to prevent poisoning. Again the periodicity depends upon the hazard, for the idea is that of recognizing the level of lead absorption in a man or a group before it reaches a critical level. No man will become ill if his blood level is not permitted to exceed 0.07 or 0.075 mg. pb. per 100 grams (if the methods of sampling and of analysis are sufficiently precise).

The examination of blood films for stippling will not be of any special benefit in anticipating lead intoxication if you can make proper use of an analytical regimen. The latter is entirely equal to the task while the former is not and never can be since stippling of the erythrocytes is not a specific result of lead absorption and also it is not quantitatively related to the extent of the absorption of lead. It is, in fact, a very much over estimated procedure, and in modern industrial medical practice it is obsolete as a measure of control. (Its value for diagnostic purposes, is something else again, but even here it is a weak medical tool, to be used only as a subsidiary procedure.)

Because of your request and its indication of your interest I am sending under separate cover two booklets, one on methods of sampling and analysis, and the other on the medical aspects of lead absorption and lead poisoning. The latter is somewhat out of date, particularly with respect to its manner of handling the problem of lead in the blood, and also its reference to specific (deleading) therapy. However, it deals well with the general principles and the general problem, and if you will supplement it with current information on the significance of lead in the blood, you will find the means of informing yourself quite well in general. The (second) booklet is being rewritten now to bring it up-to-date, but it will be some time before it is out. Meanwhile, if I can be of further assistance to you let me know. You may not receive a prompt reply for I am short of time, but I'll do my best to get around to an answer without undue delay.

Cordially yours,

Robert A. Kehoe, M. D.

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