



COLLEGE OF MEDICINE, EDEN AND BETHESDA AVENUES
KETTERING LABORATORY
DEPARTMENT OF ENVIRONMENTAL HEALTH

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Dear Dr. King:

Your recent article in the American Journal of Diseases of Children on intake of lead by children has been read with interest. It is an excellent idea to have accumulated in one article the available information pertinent to this subject.

This letter is intended, however, to raise several questions about the article which may be misleading to some people and which are, I believe, scientifically in error.

1. "Intake is defined as the amount of lead ingested in the diet and nonfood substances, and the amount retained in respiratory exchange." Using the assumptions in the article that "90% of the ingested lead and 50% of the retained inspired lead are excreted", one can readily calculate that a DPI of 300 micrograms of lead could range from one extreme of ingestion of 300 micrograms with 30 micrograms being absorbed into the blood, to the other extreme of inhalation and retention of 300 micrograms with 150 micrograms being absorbed into the blood. This latter extreme would arise from a 24 hour exposure to 100 micrograms of lead per cubic meter of air and by the wording of the article would be a permissible intake. The point of

this is so obvious that it, perhaps, was considered to be unnecessary to state it in the article, i.e., two intake rates with differing absorption factors cannot be simply summated to establish a significant exposure. Clearly a significant exposure is related to the amount of lead absorbed into the body, not the amount potentially available for absorption. It appears to me that the committee must either carefully define the basis for limits to the permissible combinations of ingestion and inhalation exposures or it should use a statement such as "three hundred micrograms of elemental lead is considered to be the maximum daily permissible amount of lead in the diet and nonfood substances ingested by children, with the contingency that the 30-day average concentration of lead in air inhaled by the children does not exceed 2 micrograms of lead per cubic meter, and that there are no other significant sources of exposure to lead".

2. The abstract to the article states that "As the average intake increases above this value, the entire amount cannot be excreted and accumulation in the body begins. This will increase progressively as long as undue ingestion continues". I may be underestimating the readers but I believe that most readers will interpret this as meaning that the intake of lead up to 300 micrograms per day will be excreted, but that intake above this value cannot be excreted and will be absorbed into the body and that this absorption will continue for as long as the intake remains above this value. Almost everyone seems to agree, however, that the body burden of lead (primarily skeletal lead) increases at least up to age 20, if not beyond. I believe that the scientific facts would support the view that the body burden of lead increases with a continuing normal intake of lead, but that this increase is progressively less and less as the body approaches a steady state relationship with the continuing intake. If the intake is increased, the body burden will increase, again approaching a now elevated steady state level with a progressive decrease in absorption with continuing uptake. A confusion may exist because it would appear that the accumulation and increased body burden that, in fact, must occur when intake increases from 120 to 300 micrograms of lead per day is small enough so that no effects are observed and the increase in lead in blood is small enough to be within the error of measurement. However body burden of lead must not be confused with the actual health effects of lead in the body or the concentration of lead in blood.

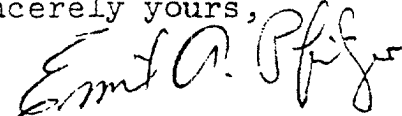
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There appear to me to be some small inconsistencies in the calculations related to data in Table 2. However these are not serious problems. My only other reaction to the article is that the last three paragraphs seem to be out of phase with the rest of the article. They appear to be an attempt to justify the Surgeon General's use of 40 micrograms/100 ml of blood as an indication of excessive exposure. I do not dispute the facts, but their presentation left me with an uncertain conclusion as to their significance to the facts in the rest of the paper.

I hope that these comments are clear to you and that you might consider them to be as significant as I do. In this age of rapid public response, sometimes even panic, to the expression of concern for health hazards, it is increasingly important that the scientific facts be presented in a way that they cannot be easily misinterpreted by readers, including newspaper reporters. To the extent that this article may be considered to be an official statement from a body of recognized scientific experts, it is even more important that its wording have scientific rigor. I am taking the liberty of sending copies of this letter to my acquaintances on the committee, Drs. Chisolm, Stokinger and Tepper, as well as to Dr. Weech, the Journal editor, in the hopes that you all might consider an addendum to the report that would address itself to the points raised here.

My office phone at the University is 872-5747. I would be pleased to hear from you and meet with you at your convenience to discuss this as well as other activities of your Bureau that are of mutual interest.

Sincerely yours,



Emil A. Pfitzer, Sc.D.
Professor of Environmental
Health

cc: Dr. Chisolm
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