

23.12.70

Der Staatliche Gewerbearzt, 463 Bochum, Marienplatz 2

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Dear Professor Kehoe!

Many Thanks for your kind letter of 15 dec. 1970. A copy of the final communique' of the Amsterdam-conference is added. In this paper you may see the recommended limit values being for ALA 10 mg/l and for CPU 300 μ g/l. The limits should not be exceeded but for short periods. As they are only slightly higher, than upper normal limits ($M+3s = 8$ mg ALA and 250 μ g CPU/l) the matter will lead to extreme difficulties in factory inspection.

A report on the Amsterdam- conference including the "final Paper" ^{was} ~~is~~ published in Arbeitsmed. Sozialmed. Arbeitshygiene 4, 56, 1969

With best wishes for the new year

Sincerely yours

U. Apper

Letter forwarded to Mr. Bice for typing Feb 24

1. The width of possible bioc. parameters provide insight the effects of lead on biological systems. Relatively few of them have been used up to now frequently enough to provide data for their use as biol. permissible limits.
2. Epidemiological study should be promoted, if possible on an international basis, in those parameters that have a
 - relatively high specificity
 - relatively high sensitivity
 In regard to
 - beginning exposure
 - current exposure and long-term exposure
 - post exposure.
3. The cybernetic approach should be promoted in the study of industrial toxicology; it may increase the understanding of functional behaviour of biological systems.
4. The combined increase of ALA and CP in urin and P.P. in erythrocytes is highly specific for the action of lead.

Concept of poisoning

1. Poisoning is present if physical, mental and/or social well-being has been impaired; it supposes the presence of clinical symptoms and signs.
2. The diagnosis of lead poisoning should be based upon well informed clinical judgement; the use of the term poisoning should be restricted to the above definition.
3. One should distinguish between parameters indicating absorption and parameters indicating response. The response can be classified into three phases:
 - acceptable: exposure below permissible limits
 - excessive: exposure beyond permissible limits, where poisoning may occur
 - dangerous: Exposure beyond permissible limits, where poisoning is likely to occur.

4. Medical experts should study the establishment of the relationship between exposure - absorption - response; they should lay down acceptable medical criteria. The practicability of this in different societies and cultures may depend on socio-economic factors and other non-medical criteria, but should always be considered in the light of expert medical advice.
5. There is sufficient correlation between certain parameters to permit calculation of interrelationships and hence permissible limits.

Chronic effects

1. Present evidence suggest that industrial standards which prevent cases of lead poisoning, even after many years of exposure, also prevent long term sequelae. Further understanding of this problem may follow from epidemiological studies in groups of workers under less satisfactory conditions, particularly by following up known cases of poisoning.

Prevention of intoxication

1. In establishing permissible limits for lead in air most reliance should be given to data bases upon personal sampling. Results should be qualified by particle size and composition of the dust.
2. If absorption is to be acceptable the blood lead concentration should be below 70 $\mu\text{g}/100 \text{ ml}$, which will prevent any untoward effect of lead. This corresponds to values for:

ALA	$\sim 10 \text{ } \mu\text{g}/1$	CPU	$\sim 300 \text{ } \mu\text{g}/1$
PbU	$\sim 130 \text{ } \mu\text{g}/1$	Pb in air	$\sim 150 \text{ } \mu\text{g}/\text{m}^3$

3. These values are solely guides. Because of the wide confidence limits of the calculations no undue emphasis should be placed upon a single parameter.
4. Where there is adequate medical supervision above mentioned values may be slightly exceeded for short periods.
5. Above mentioned values only apply for a population at work not being treated with chelates.