

THE RECOGNITION, MEASUREMENT AND CONTROL OF OCCUPATIONAL LEAD EXPOSURE

Recognition of Lead Exposure

Inspection of plant - balancing sources of exposure against methods of control

Sources of exposure

Inhalation

Fume - melting, soldering, burning, cutting painted or coated metals

Dust - origin, deposits permitted to collect on rafters, ledges, etc.

Spray - molten metal, paint

Adequacy of removal - return from stacks, etc.

Use of masks, type, and uniformity of use supervision

Housecleaning

Janitor personnel

Equipment - brooms, vacuum cleaners

Supervision

Ingestion

Facilities for workmen

Clothing, locker rooms, wash rooms, lunch room

Adequacy, convenience, cleanliness

Instructions and regulations for workmen

By whom given? How?

Placards? Repetition - safety meetings

Supervision of workmen in matters of cleanliness

Inquiry into medical facilities, personnel, practice, records to determine availability and reliability of information

Survey of information in relation to health and disease

Employment records - labor turnover - lost time

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Survey of status of plant population - if medical information inadequate

Medical examination of representative persons - search of effects

→ none unless poisoning occurs

Slides 1, 2, 3, 4, 5, 6, 7 Subjective, objective and laboratory signs of lead absorption

Signs having special significance

Lead line - occurrence, differentiation and significance

Slide 3, 9 - Slide 10 Stippling - significance in relation to lead exposure

Measurement of Lead Exposure

By air analyses

or

Which? or Both?

By analytical studies on blood and excreta

Dependent upon facilities available in equipment and personnel

Dependent upon information desired

Air Analyses Role - advantages and disadvantages - technique

Advantages of air analyses

Information can be obtained by non-medical man

May be interpreted within limits of experience by non-medical man

Can be done without cooperation of workmen and without disturbing them

Methods not too difficult - facilities and equipment available

Can be used to identify changes in environmental conditions promptly

Disadvantages

Information is limited in its application

- (a) Applies only to the time and place of sampling and is only as representative as the sampling will allow

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- (b) Makes no allowance for effects of use of masks, or lack of cleanliness on part of men
- (c) Conditions not necessarily those to which the workmen are exposed
- (d) Includes no time factor in the measurement

Precautions in use of air analysis

Careful technique

Sampling

Analytical methods

Repetition in relation to any and all changes

Analysis on Blood and Excreta

Role - advantages or disadvantages - technique

Selection of subjects

Representation of occupation

Representation or basis of long exposure

Numbers required

Frequency of repetition

Significance of results on feces

Physiologic mechanism and technique

Disadvantage - in relation to absorption

Disadvantage in relation to fume

Disadvantage in roughness of measurement

Advantage in locating foci of exposure

Advantage in recognizing ingestion

Significance of results on blood

Physiologic significance - index of absorption

low variability

Technique of collection - Contamination

Advantage of requiring no cooperation from patient

Disadvantage of (1) narrow range of variation
(2) slight change in response to exposure

Slides 11

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→ 15 Repeat as 3 p

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Slides 18

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Significance of results on urine

Physiologic factors

Slides 25	Variation in relation to lead absorption
26	Variation in ^{Severity} Time water output
27	
28	Variation in renal threshold
29	Variation in renal concentration
30	
31 <i>transf. MR</i>	Technique of collection
32 " " <i>EB</i>	
33 " " <i>plant</i>	Large samples - no need for 24-hr. samples
34 <i>water output</i>	Spot samples - Variable concentration - Contamination
	Advantage of collection in presence of attendant
	Advantage as diagnostic procedure
	Need for comparison with blood or with other samples

Control of Lead Exposure

By design of plant

By installation of proper ventilating and safety equipment

By adequate sanitary facilities

By careful maintenance of operating and safety equipment

By critical and continuing examination of facilities and practices

By critical medical study of workmen - Clinical - Laboratory

By supervision of safety procedures

Cleanliness of men

Cleanliness of plant

Maintenance and supervision of condition and use of masks if required

In emergencies

Special attention to matters of housekeeping and sanitation to avoid unnecessary exposure

Special attention to supervision of operating procedures and safety practices

Rotation of workmen to avoid lengthened hours of exposure
Special care in medical supervision to recognize incipient
intoxication.