LEAD INDUSTRIES ASSOCIATION, INC.

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OR 9-0080

December 8, 1964

To All Members of the Health and Safety Committee:

Through the courtesy of Morgan Davies of the Lead Development Association in London we have a copy for you of the new British Ministry of Labour Regulations pertaining to medical examinations that now apply to all industries using lead.

In a discussion recently with Dr. Buchanan of the British Ministry of Labour I gained the impression that the main reason for selecting the hemoglobin estimation test, which is outlined in this attached communication, was that it is easy and quick to perform. Frankly, I am not much impressed with their test selection and would be interested in having your comments either for or against.

This is for your information.

Very truly yours,

Don O. Fowler
Secretary

DOF:md

Look Ahead with Lead

COPY

F. 2146

Ministry of Labour

THE LEAD PROCESSES (MEDICAL EXAMINATIONS)
REGULATIONS 1964

Introduction

Lead poisoning is an industrial health hazard whose seriousness has been widely recognised for many years. The principal processes involving exposure to lead in factories are covered by a number of Codes of Regulations under the Factories Act. These Regulations are listed in the Schedule to the Lead Processes (Medical Examinations) Regulations.

Under existing Regulations, employers are required to arrange for the periodic medical examination of persons employed in lead processes. These examinations are carried out by Appointed Factory Doctors, who have power to suspend persons whom they consider unfit for work in lead processes, and who are responsible for entries in the Health Registers required by the Regulations. These Health Registers are open to examination by H.M. Factory Inspectors.

It has been known for a long time that these precautions are not as effective in detecting cases of lead absorption as is desirable. The main reason for this is that the symptoms of lead intoxication, which include constipation, colic, weakness or paralysis of the muscles, occur only when poisoning is established. There are no premonitory signs of lead intoxication which can be detected in clinical examination. Hitherto, the periodic examinations of lead workers carried out by factory doctors in accordance with Regulations have normally been clinical examinations only.

Haemoglobin Estimation

The Lead Processes (Medical Examinations) Regulations have been made with the object of providing a more exact method of diagnosis of lead intoxication. The Regulations require that once in every period of three months, the medical examination carried out in pursuance of existing regulations shall include a haemoglobin estimation by an approved method.

Although the clinical symptoms of lead absorption are not usually obvious to clinical examination until actual lead poisoning develops, the absorption of dangerous quantities of lead into the blood stream can be detected at a much earlier stage by means of biological tests. There are several methods of doing this, some of which require special laboratory facilities and are therefore not suitable for use in the many small factories where lead processes are carried out. However, estimation of the haemoglobin content of the blood can be carried out by simple and inexpensive means, and it is because it has these advantages that its use is required by the present Regulations. Haemoglobin is the oxygen-bearing element present in the red blood cells, and deficiency in the haemoglobin content of the blood is a sure indication of anaemia. One of the most important effects of lead absorption is to interfere with the formation of haemoglobin, resulting in anaemia. Estimation of the haemoglobin content of lead workers is therefore a reliable way of screening them for exposure to lead. If the presence of anaemia is discovered, further investigations are needed to determine whether this is due to lead or to another cause.

Therefore, the Regulations provide that if the haemoglobin content of the blood of any person examined is found to be below a specified level, the appointed doctor may require a further haemoglobin estimation at any time.

As stated above, the haemoglobin estimation is a screening method, intended to supplement clinical examination. If anaemia is discovered, further investigations must therefore be made to decide whether an anaemic person has actually suffered lead poisoning. However, a person suffering from serious anaemia, from whatever cause, cannot be safely employed in a lead process, and a periodic haemoglobin test is therefore the most comprehensive as well as the most practical way of protecting lead workers.

Haemoglobin may be estimated by any reliable method, which is approved by the Chief Inspector of Factories, but a convenient and accurate method which does not require elaborate equipment is the copper sulphate method. This is based on the fact that the haemoglobin content of a drop of blood can be co-related, for practical purposes, with the drop's specific gravity as measured in a solution of copper sulphate. A co-relation table facilitating this is set out in the Schedule to the Chief Inspector's Certificate of Approval under Regulation 3(2).

Investigation and Treatment of Lead Poisoning

Under the Regulations, Appointed Factory Doctors will regard a haemoglobin concentration of 13 grams or less per 100 millilitres of blood (12 grams in the case of women workers) as evidence of anaemia, which in a lead worker is likely, in the absence of any other obvious cause and pending further investigation, to be due to lead. At this point, it is recommended that the affected person should be referred to his general practitioner with appropriate information about the nature of the person's work. The G.P. may either undertake investigations himself or refer the person to hospital. The Ministry of Health have therefore made arrangements for hospitals to carry out any special test which may be needed. The cost of such further examination, investigation and treatment will be borne by the National Health Service.

Workers found to be suffering from lead poisoning, or to be unfit for other reasons for employment involving exposure to lead, may be temporarily, suspended by the Appointed Factory Doctor from employment in lead processes. However, provided that there is a sufficiently early diagnosis, modern clinical methods usually make speedy recovery from lead poisoning certain. There is, therefore, every reason for confidence that the introduction of haemoglobin estimation as a first step towards diagnosis and cure will result in a decrease in the incidence of industrial lead poisoning.

Health Registers and Notification to District Inspectors

The Regulations require that factory occupiers shall send to the District Inspector copies of every entry made in the Health Register by the appointed doctor within seven days after the end of the month in which the entry is made.

The diagnosis and treatment of lead poisoning is not in itself sufficient to eliminate lead poisoning without measures to control the working conditions which give rise to it. To facilitate this, it is important that H.M. Factory Inspectorate are fully and promptly informed of all cases of lead poisoning, actual or suspected. This is why it is required that Health Register entries shall be forwarded to the District Inspector, so that he may be informed of the position in each factory in his district. When it appears necessary, he will arrange, in consultation with the Medical and other specialist branches of the Inspectorate as appropriate, for any investigation which may be necessary into environmental conditions and into the standard of compliance with the relevant provisions of the Factories Act and Regulations.

National Insurance Benefits

Lead poisoning is a prescribed disease for Industrial Injuries Benefit, and persons found to have suffered lead poisoning by reason of their work are therefore entitled to it. The introduction of the haemoglobin test may lead to a few people being suspended from work in lead processes, who are anaemic but have not suffered outright lead poisoning. If, as a result, they lose earnings, this will be the result of non-industrial sickness, and such people will be entitled to Sickness Benefit rather than Industrial Injuries Benefit. Entitlement to National Insurance Benefit depends, however, on a wide range of individual circumstances outside the scope of this pamphlet and those seeking more detailed information are advised to apply to their local office of the Ministry of Pensions and National Insurance.