

# **TOXIC HEAVY METALS TASKFORCE TASMANIA**

## **The Need for Expert Clinical Assessments in Diagnosis Of Heavy Metal Poisoning**

With considerable research and advice from several medical and specialist experts the Toxic Heavy Metals Taskforce Tasmania has developed an understanding of the importance of the need for thorough expert clinical assessments with patients to confirm the diagnosis of heavy metal poisoning.

Many elements and heavy metals are quite toxic to humans even in low doses. However, the "metabolism" of the element or heavy metal in the human body depends on the type of element or heavy metal. In particular some metals are "excreted" mostly by the kidney whereas others are metabolized (or detoxified) mostly by the liver.

In the case of arsenic, there is evidence that this element passes "through" the body on a single exposure reasonably quickly (i.e. 1 -4 days). So in the case where there has been low dose but repeated exposures, simply measuring the urine (usually the most successful option) or blood measurement, does not necessarily tell the full story unless the exact time of exposure is "available".

In the case at Rosebery, the problem is that, whilst it is probable that there is repeated exposure of low to moderate dose metals such as arsenic, the exact time of the exposure is difficult to ascertain in the individual case.

Hair analysis is helpful in identifying whether there has been exposure to a particular metal or element but the time of the exposure is more difficult to interpret.

The clinical signs of arsenical poisoning also have a peculiar feature in that some people react in different ways despite very similar exposures. This may well account for the fact given similar exposure some patients appear to show more advanced clinical signs.

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The term 'toxicologist' is often used in problems where there has been pollution in the environment which is effecting human health. Unfortunately this term 'toxicologist' is in fact quite confusing because there is always a tendency to assume that the 'toxicologist' has experience and training in the medical and clinical aspects of poisoning in humans. This is not always the case. For example, many toxicologists have training in non medical fields such as pure chemistry or pharmacology. Whilst the analysis of chemicals from a scientific point of view is important, the disease pattern, or more specifically the effect on human health, must have input also from an expert in clinical medicine with hands on experience with heavy metals.

However, clinical medicine can be just as important if not more important in diagnosing the type of poisoning that has occurred in Rosebery. In this instance clinical medicine would include: taking a careful history of "occupational exposure and lifestyle history", past history of previous medical conditions, a careful, thorough and full examination of the patient and where required further examination of the patient eg general tests such chest xrays, non specific blood tests such as full blood counts and where appropriate to refer the patient to a specialist such as a neurologist, dermatologist or gastroenterologist.

At the end of the day, long term clinical effects of metals such as arsenic are known to have specific and identifiable clinical manifestations eg with arsenic the patient may show a peculiar staining of the skin and patterns of tumors some of which are cancerous. Damage to the nerves also shows a typical pattern of injury to the sensory and motor components of the nerve.

***Without doubt, a specialist doctor with hands on experience with heavy metals is absolutely required to recognise these signs and symptoms.***

Even then, that specialist may have to rely on a sophisticated examination such as a nerve biopsy. In overseas cases, especially when many people have been shown to have exposure to a toxic heavy metal such as arsenic it was not possible to carry out full chemical testing for each patient. Despite this the doctors involved were confident of the diagnosis. The pattern of exposure, the history of the onset of the symptoms in the person and the signs observed by the doctor are then "diagnostic" in themselves.