10. Arsenic in Urine

Introduction

The main exposure to arsenic in New Zealand occurs in the timber treatment industry. The preservation of timber (tanalising) is carried out using a mixture of salts of copper sulphate, potassium dichromate and arsenic pentoxide. The timber is pressure injected with the preservation liquid in large pressure cylinders, after which it is stacked in the yard while still wet with preservation chemicals. Arsenic may also be encountered in the plating industry and in foundries and glassworks, and is found in some fruit tree sprays. To ensure accurate assessment of exposure to arsenic, urine samples must be collected at the end of the working shift or at the end of the working week if the exposure is continuous. As the method used does not measure the organic arsenic compounds present in dietary fish, samples can be collected without dietary restrictions.

Sample requirements

A 20 mL random urine sample is taken into a sterile container at the end of the shift at the end of the working week. Ensure that hands are washed and clothes are free of contamination. The testing method used measures only inorganic arsenic levels in the urine, so it is not necessary to exclude seafood (organic arsenic) from the diet prior to urine collection. Urine chromium can also be measured in the same sample.

Frequency of biological monitoring

The concentration of arsenic in urine generally reflects very recent exposure. The frequency of biological monitoring is thus dependent on whether the work is seasonal. For example:

Seasonal timber treatment

Initial testing should be made in the first few weeks of timber treatment. If the results are normal and adequate precautions are being taken, the tests need not be repeated until a change occurs in work patterns or environment.

Regular timber treatment
Workers should be tested at least yearly. If the results are normal and adequate precautions are being taken, the tests need not be repeated until a change occurs in work patterns or environment.

**Interpretation**

Non exposed levels \(< 0.5 \mu\text{mol/L}\)

Workplace Exposure Standards (1994)\(^2\)

- Biological Exposure Index \(1.3 \mu\text{mol/L (100 µg/L)}\)

- *Biological Exposure Index (BEI) - levels above which excessive exposure has occurred.*