



24.11 Biological Monitoring: A Guide for Employees

What is Biological Monitoring?

Biological monitoring is a way of assessing chemical exposures by measuring the chemical or its breakdown products in a biological sample (usually urine, blood, or breath).

Biological monitoring is particularly useful where chemicals can be significantly absorbed through the skin and where controls rely upon the use of personal protective equipment, such as gloves and masks.



Why might Biological Monitoring be helpful?

Biological monitoring has several roles in exposure assessment. Some situations where it might prove useful include checking that control measures are working, checking that work practices are protective, or to ensure that training is understood and followed.

What sort of sample may be required?

In most cases, urine samples are the best way to determine if an individual has been exposed to a chemical or compound. Occasionally, a blood, breath or hair sample may be the best way to take a sample.

Why should I provide a sample?

Your employer will explain why and when a sample is required. It may only be taken with your informed consent. If you have a concern about the use to which a sample might be put, please raise it with your employer or your OH advisor.

You should note that no additional test should be made on that sample without your specific agreement. This includes drug or alcohol testing.

When is the best time to provide a sample?

Some chemicals need to be sampled within a specific time frame after you have been exposed, however this is quite unusual. For most chemicals, the general guidance is that a sample should be provided near the end of a shift and near the end of a working week (or work period).

This is because chemicals are usually absorbed over time so that levels rise through the day. Once you go home, those levels gradually reduce as you excrete the substance. Chemicals may be changed by the body as they are metabolized. For this reason, we may need to look for the metabolite, rather than the original chemical.



How should I go about providing a sample?

In the case of a urine sample, you will be told when it is required (usually near the end of a shift). You should be given a clean container that you will need to write your name and date of birth on. This should be provided in a resealable plastic bag.

It is important that the sample is not contaminated by accident. You should remove any protective clothing (including gloves and/or overalls) and thoroughly wash your hands.

Fill the container to around $\frac{3}{4}$ full and screw on the cap firmly before replacing the container in the resealable plastic bag. The sample should then be returned to the collecting officer.

What happens next?

The sample will be sent to the laboratory for analysis. This can take some time (sometimes several weeks). Once the results have been received by your OH provider, they will be reviewed by an Occupational Health Physician who will decide if they are within safe limits and when they should be checked again. The physician will then write to both the company and the individual informing them of the result along with what action, if any, needs to be taken.

I have been asked for another sample. Should I be concerned?

Despite care, a sample might sometimes get accidentally contaminated and result in an unusual result. If this happens, you may be asked to provide another sample so that it can be re-checked.

Doesn't the amount of fluid that I drink affect the result?

Yes. If you drink a lot of fluids on the day of sampling, it might dilute the amount of chemical in the sample, resulting in an unusually low result. Not drinking enough on test day may lead to a result that is abnormally high. To ensure that the results are accurate, your sample might also be checked for a naturally occurring substance such as Creatinine. This substance is excreted by the body at a known rate. Measuring it helps to determine how dilute or concentrated the urine sample is. An adjustment can then be made to your test result, so that an accurate representation of the amount of chemical in your body is obtained.

If you take creatinine supplements, it is a good idea to refrain for a few days prior to sampling, so that it does not affect the result of your test.

What do the actual numbers mean?

Your employer or OH advisor should explain how to interpret your results and what action should be taken as a result.

Further information regarding Biological Monitoring may be found on the HSE website:

<https://www.hse.gov.uk/pubns/books/hsg167.htm>

A copy of this & other documentation can be found from <https://mohs.co.uk/resources> or using the QR code at the top of this page.