WATCH COMMITTEE

Evaluation of Biological Monitoring

Issue

1. Proposal to conduct a study to evaluate the impact of HSE’s work on biological monitoring and to help assess the potential contribution biological monitoring might make in the Disease Reduction Programme (DRP).

Timing Considerations

2. Routine

Recommendation

3. WATCH is asked to help to formulate the proposals for the study.

Background

4. Biological monitoring has been a feature of the occupational health field for many years, initially in the form of compulsory monitoring of workers exposed to lead but gradually expanding to voluntary assessment of exposure to other metals and organics such as aromatic amines and solvents.

5. Policy development on the control of exposure to hazardous substances was initially focussed on the threat posed by inhaling substances and the setting of airborne standards. Biological monitoring was only briefly mentioned in COSHH as part of Health Surveillance; a role for biological monitoring in the assessment of exposure and control was not formally recognised. Nevertheless particularly for substances that could be absorbed through the skin, biological monitoring was used for exposure assessment. Guidance values produced by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Deutsche Forschungsgemeinschaft (DFG) were used to aid interpretation of biological monitoring results.

6. In the mid 1990’s HSE’s policy was developed to formalise the role for biological monitoring in exposure assessment (as well as health surveillance), one intention being to make this tool more accessible to occupational hygienists. The framework for Biological Monitoring Guidance Values (BMGVs) was developed and integrated into the ACTS/WATCH review process (WATCH/23/94 and ACTS/43/94). The possibility of establishing a BMGV was now considered as part of the WATCH substance assessment process for substances with systemic toxicity and where dermal absorption could contribute significantly to total absorption or where control of exposure relied on PPE. Uniquely, the framework allowed not only for the recommendation of “health-based” BMGVs [Health Guidance Values] for the proposal of BMGVs based on the 90th percentile of values from surveys of workplaces with good control of exposure [Benchmark BMGVs]. In both cases there was a requirement for good data from well-validated methods and a preference for non-invasive sampling (urine or breath) where possible.

7. To promulgate the framework and use of biological monitoring HSE produced a booklet for employers and another for workers (HSG167 & INDG245) and BMGVs were published in EH40. There was no formal publicity campaign but presentations were made to conferences held by professional societies such as BOHS and SOM.

8. In 1996 HSE developed the Biological Monitoring Database and since then all biological
monitoring data generated by HSL has been stored. HSL receives about 8000 biological monitoring samples a year for analysis. In the past, many biological monitoring samples were collected by HSE inspectors but now about 80% of samples are collected by Occupational Health Providers, occupational hygienists and small firms directly. The samples rarely have any contextual information about exposure or controls but the biological monitoring data does give a ‘snap-shot’ of occupational exposure.

9. In terms of interpreting biological monitoring results, for substances for which there is not a UK BMGV the guidance values produced by ACGIH (n=41) and DFG (n=66) are used as an aid to interpreting biological monitoring results. In addition, some companies have developed their own biological standards based on good occupational hygiene practice.

10. HSL now has analytical methods for over 100 analyte-matrix combinations and participates in 4 international QA schemes for around 50 substances.

11. In 2001 and 2002 WATCH reviewed the framework for BMGVs (WATCH/12/2001 & WATCH/13/2002) and concluded that the criteria applied in developing BMGV proposals (particularly for Benchmark Values) should be loosened, to facilitate a more flexible case-by-case approach. There are currently BMGVs for 15 substances published in EH40.

Argument

12. As a crucial step towards ensuring that HSE’s policy towards biological monitoring reflects the needs of UK industry and fits HSE’s priorities, HSE needs to evaluate the work so far on biological monitoring. We therefore propose to carry out an evaluation study of biological monitoring to establish:

- The impact of HSE’s current biological monitoring policy and guidance values (how useful is the current guidance, what role biological monitoring currently plays in exposure assessment, how useful biological monitoring is perceived to be, what is its uptake and what are the barriers to use?); and
- The potential for biological monitoring to contribute to the Disease Reduction Programme

Proposed study

13. We propose to seek an unbiased range of professional views; given the historical and current specialist nature of biological monitoring we intend to target independent but informed users of biological monitoring who are likely to be aware of the issues.

14. This study will be limited to voluntary biological monitoring carried out under the COSHHRegs; it will not cover biological monitoring of lead because this is a legal requirement.

15. We propose to carry out a 2-stage study:

16. Stage 1 will be a scoping baseline study to establish the scale and nature of biological monitoring across industry - to tell us who is doing what on biological monitoring. We want to establish a measure of:

- Which laboratories are carrying out biological monitoring measurements, on how many samples and, for what substances;
- How many occupational hygienists and physicians (in-house and consultant) carry out biological monitoring and for what substances. We plan to use BOHS, SOM and Occupational Health Providers to help identify relevant people.
- Which companies carry out biological monitoring surveys of their workforce and for what substances. Much of this information could follow from both of the above (subject to confidentiality issues)
- Which sectors of industry tend to carry out biological monitoring and whether the size of the company has any bearing on the use of BM [This may be an issue to explore in Stage 2].

HSL will carry out this work.

17. Stage 2 will be to seek more detailed views from people who carry out and use biological monitoring. Views will be sought from a random selection of people in the following target groups:
• People who carry out biological monitoring (occupational hygienists and physicians as above);
• Companies who have a biological monitoring programme as part of their management of hazardous substances;
• Companies who use substances which have BMGVs, but who don’t carry out biological monitoring as part of their management of hazardous substances
• Trade Union representatives involved in biological monitoring programmes.

18. Much of the target audience for this stage will have been established from Stage 1 above. Information on who has purchased the current HSE biological monitoring leaflets and book might also be used to identify people who may be using or considering biological monitoring.

19. We propose that this work be conducted through a targeted telephone survey (but with an initial contact being made by letter) carried out by market research consultants. This work will be put out to tender.

20. Clearly the four groups to be covered in Stage 2 will require slightly different questionnaires. Questionnaires will be developed by a working group from HSE in conjunction with the market research consultants. The range of questions will cover the areas listed below:

• Current guidance and BMGVs
  ➢ knowledge/awareness
  ➢ how they found out about it,
  ➢ usefulness (including BMGVs)
  ➢ could the guidance be improved to better meet needs and, if so, how (eg would they like more BMGVs and/or a simpler system)
  ➢ how is biological monitoring and BMGVs best developed and promulgated
• Views on the role of biological monitoring & the current framework
  ➢ awareness of biological monitoring generally
  ➢ is biological monitoring a useful tool, if so for what, in what circumstances and if not why not
  ➢ usefulness of standards/ limits and the benchmark concept
  ➢ do they understand and know what to do with the results
  ➢ how much has the use of biological monitoring as a tool for occupational hygienists (as a indicator of control) been embraced, or is it still seen as largely as a health surveillance tool to be used by occupational physicians & if so why
  ➢ the potential future use/role of biological monitoring in controlling hazardous substances.
• Are there barriers to wider use of biological monitoring and, if so, what are they, eg
  ➢ awareness
  ➢ understanding
  ➢ cost
  ➢ access to correct expertise
  ➢ willingness of participants
  ➢ other

**Disease Reduction Programme (DRP)**

21. The information we get from our Evaluation Study will help to inform us whether or not HSE has got right its message on the role and utility of biological monitoring; who knows about biological monitoring and uses it; whether we need to do more to publicise/train/advise and what improvement we can make /lessons we can learn from the last few years.

22. We need to take this information forward in the context of the DRP and its focus on three priority areas:

• Respiratory Disease
• Skin Disease
• Cancer
Link to HSC Strategy

23. The results from the Evaluation Study will be considered in the evolution of plans for the DRP to assess how biological monitoring can help in delivering the outcomes sought.

Consultation

24. There has been no wider consultation on the content of this paper beyond HSE.

European Context

25. In the Chemical Agents Directive the only provision is for the setting of binding biological limit values; little or no activity surrounding the proposing of EU biological limit values is anticipated in the near future. The values adopted by Germany and other EU countries are either health-based or biological values equivalent to airborne OELs, there is no equivalent of the benchmark or good occupational hygiene approach to proposing guidance values.

Action

26. WATCH is invited to consider the issues in this paper and comment on:

- HSE’s proposal to carry out an evaluation of biological monitoring as described in para 12
- the proposed study outlined in paras 13–20 and
- the proposed question areas outlined in para 20

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