IAEA
International Atomic Energy Agency

Occupational Radiation Protection (GSG7)

10. Worker's Health Surveillance

GSG7 Section 10

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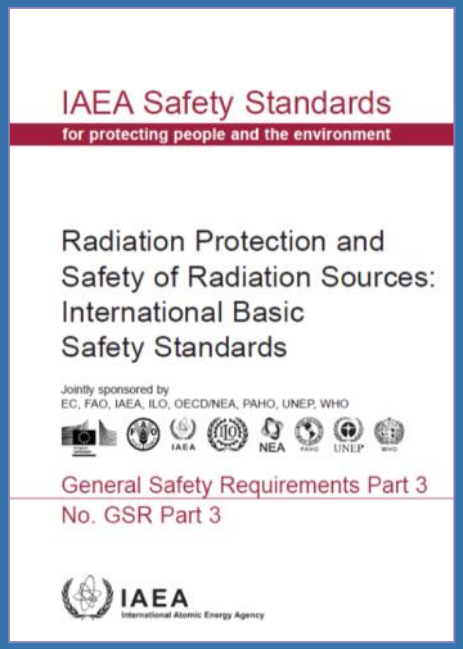
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RESPONSIBILITIES

IAEA Basic Safety Standards

3.76 - Employers, registrants and licensees shall ensure, for all workers engaged in activities in which they are or could be subject to occupational exposure, that

(f) Necessary workers' health surveillance and health services for workers are provided



IAEA Basic Safety Standards

3.108 - Programmes for workers' health surveillance as required in paragraph 3.76(f)

a) Shall be based on the general principles of occupational health
b) Shall be designed to assess the initial fitness and continuing fitness of workers for their intended tasks

IAEA Basic Safety Standards

3.109 - If one or more workers are to be engaged in work in which they are or could be exposed to radiation from a source that is not under the control of their employer, the registrant or licensee responsible for the source shall, as a precondition for the engagement of such workers, make with the employer any special arrangements for workers' health surveillance that are needed to comply with the rules established by the regulatory body or other relevant authority.

Responsibilities of Management

- Ensure that all workers engaged in activities in which they could be subject to occupational exposure are provided with the necessary workers' health surveillance and services
- Make arrangements for itinerant workers and contractors who are exposed to a source under the control of the facility management, so that those workers also have the necessary health surveillance
- Make available suitable facilities for medical examinations

Responsibilities of Occupational Health Services

- Assess the health of workers
- Ensure initial and continuing compatibility between workers' health of workers and their conditions of their work
- Provide and keep records which can
  - be useful when dealing with accidental exposure or occupational disease
  - allow statistical monitoring of diseases that may relate to the working conditions (including public health considerations)
  - support medical–legal inquiries
- Provide counselling to workers on radiation risks
- Provide an advisory and treatment service in the event of personal contamination or overexposure

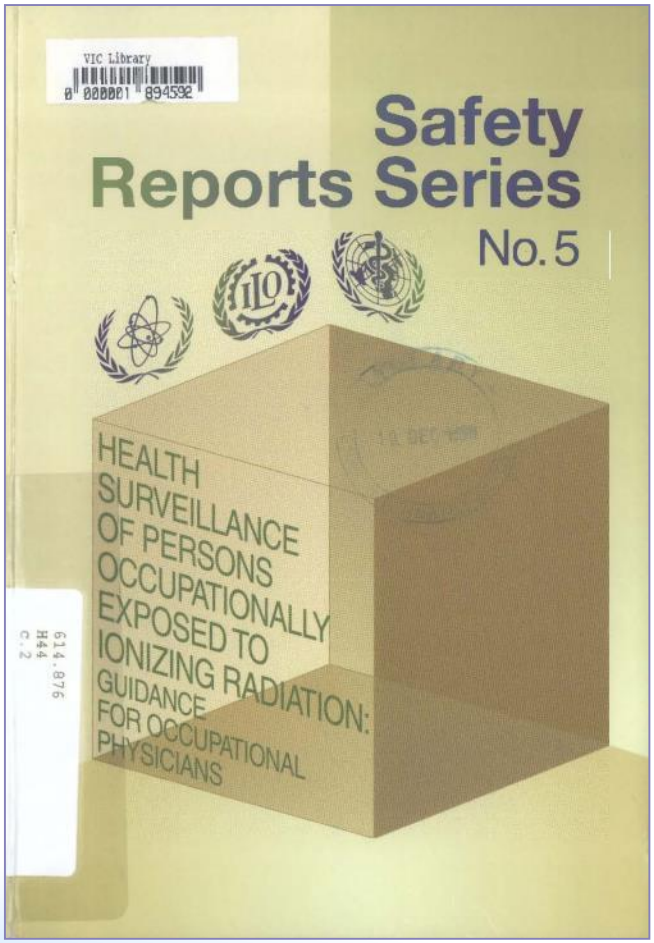
Responsibilities of Occupational Health Services

- Carry out medical examinations of workers
- Advise management on the fitness of workers to undertake their tasks on a periodic basis (*requires knowledge of the workers' state of health and the conditions of work*)
- Give clearance on "return to work" after previous removal from work on medical grounds
- Advise on hygiene at work and on decontamination of wounds
- Case management in the event of a suspected overexposure (in consultation with others)

Responsibilities of Occupational Health Services

- Need to be trained on radiation protection issues (and maintain their training) but may still need support from other specialists
- Need to understand radiation protection control measures and dosimetry, etc. and may need to visit the workplace in some situations to familiarise themselves with working conditions
- May need to provide counselling to
  - any worker worried about radiation exposure
  - worker representatives
  - female employees including those who are pregnant or who are nursing infants
  - workers who have significantly exceeded dose limits

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Guidance for occupational physicians

WORKERS HEALTH SURVEILLANCE PROGRAMME

Workers Health Surveillance Programme

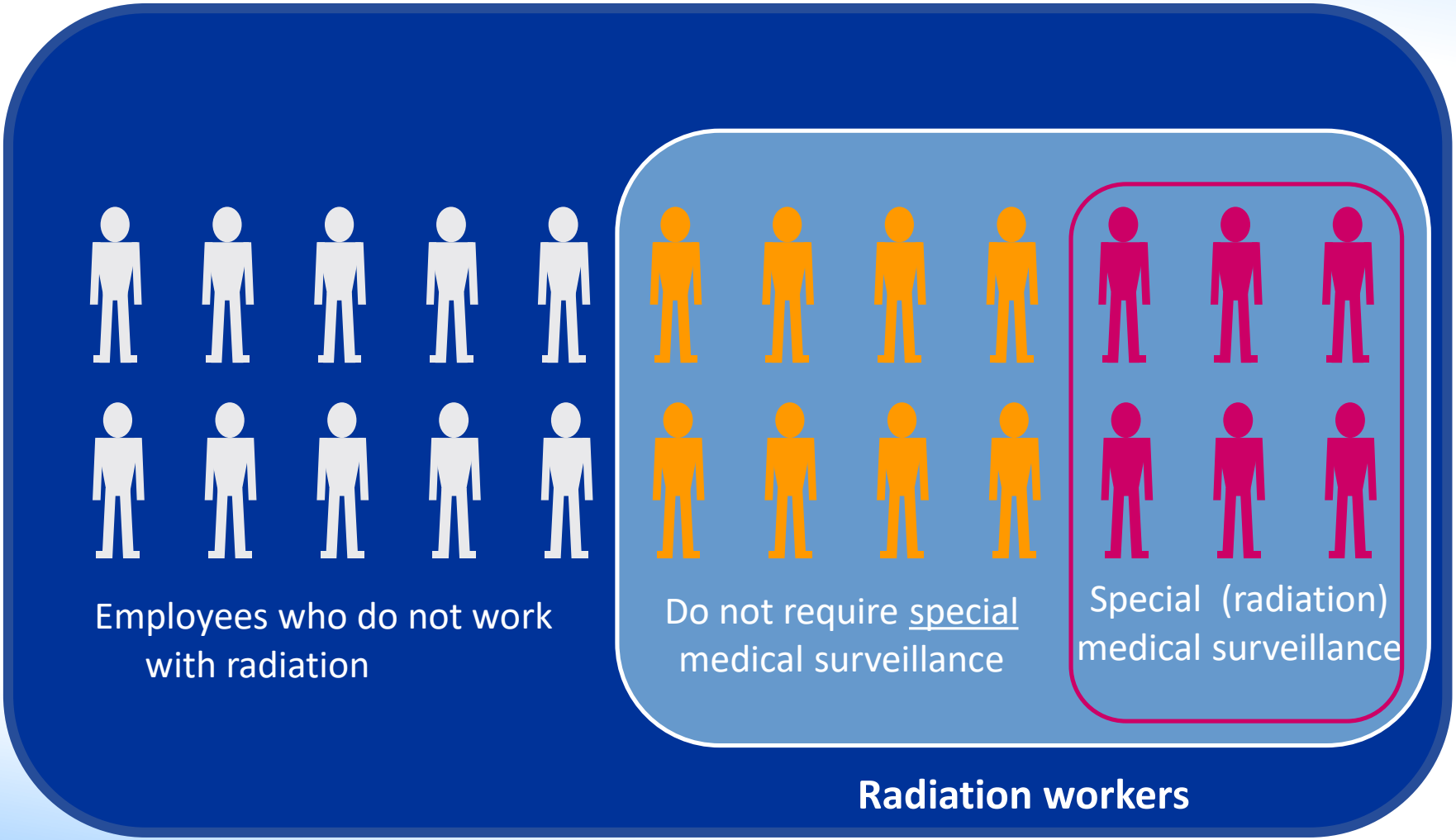
- Based on general principles of occupational health
- Designed to assess initial and continuing fitness
- Provide a 'baseline' that can be used when dealing with accidental exposure including counselling of the worker
- Key elements of the programme
  - health assessment of workers – are they fit to undertake the tasks assigned to them?
  - establishing and maintaining confidential health records
  - arrangements for dealing with accidental exposures including overexposures and follow up surveillance
  - medical advice (to management and workers)

MEDICAL EXAMINATION OF WORKERS

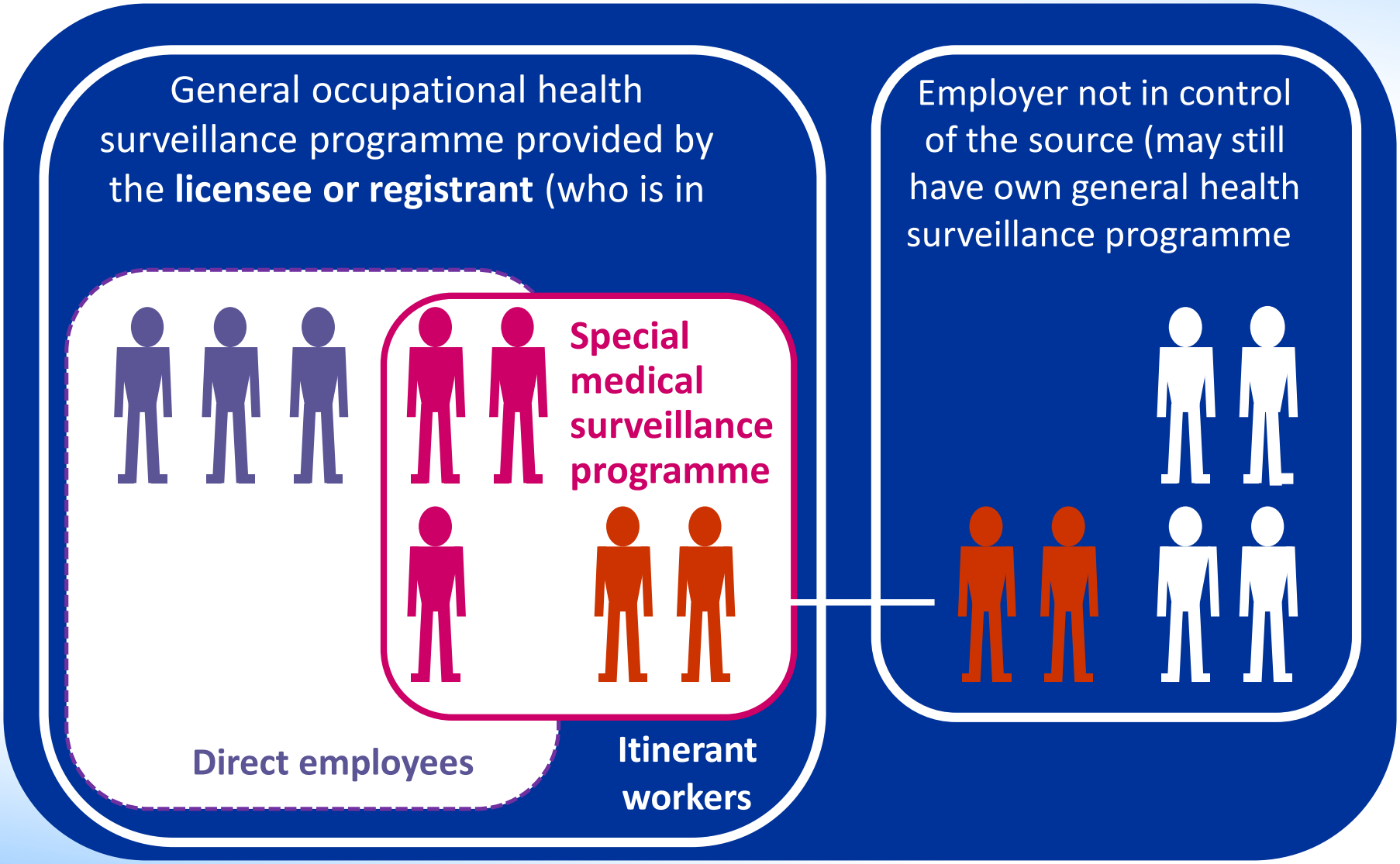
Medical examination of workers

- Medical examinations of occupationally exposed workers should follow the general principles of occupational medicine.
- Are expected to be undertaken within an organised occupational health surveillance programme
- Undertaken by suitably trained occupational health physicians
- May be undertaken for a range of reasons e.g. workplace hazards such as noise, dust and chemicals (*exposure to ionising radiations is only one reason*)
- Medical examinations specifically related to the ionising radiation hazard should be commensurate with nature and level of radiation risk

Categories of workers and medical surveillance



Itinerant workers and medical surveillance



Medical examination of workers

Medical examinations should be undertaken

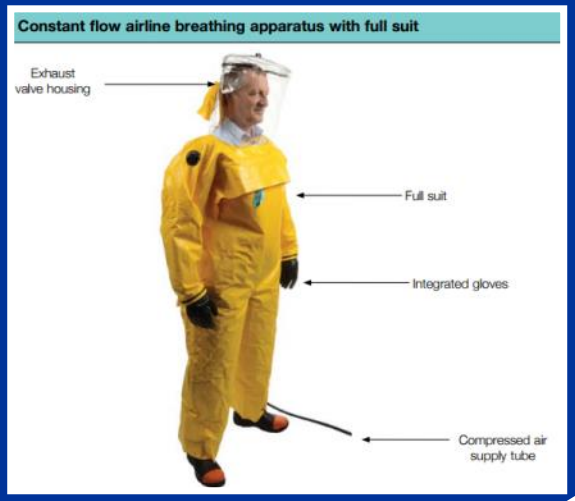
- before the start of employment
- periodically thereafter
- at the termination of employment

Initial assessment should determine

- fitness for specific work
- baseline to use when considering future changes to work practices
- baseline to use in assessing occupational diseases or overexposures

Medical examination of workers

- The scope of the initial examination is determined by the qualified occupational health physician
- The examination should determine
  - the fitness of the worker for the specific work for which the worker is to be employed
  - specific restrictions or precautions appropriate to the individual
- Consider for example
  - ability to use and wear PPE
  - ability to hear alarms
  - ability to use specialized equipment



Medical examination of workers

- Fitness for work depends on both the worker's health and the type of work to be undertaken
- For example:
  - If RPE is required, check fitness to wear including lung function integrity
  - If handling unsealed sources, consider skin diseases (*may still be fit for work if levels of activity are low and appropriate precautions taken*)
  - If working with radiation sources, consider psychological disorders and whether the worker could be a danger to themselves or co-workers
- No inherent reason why a worker who has undergone radiotherapy should be excluded from work with radiation

Medical examination of workers

- Subsequent periodic examinations should confirm that no new clinical conditions that could affect work with radiation have developed
- Nature of examination depends on type of work and health status of the worker, for example:
  - Skin should be examined where there is a potential for localised skin damage from radiation
  - Workers who have received, or have potential to receive significant eye doses may need an ophthalmological examination
- Any observed ailment likely to have been caused by working conditions should be reported to management (*unlikely with ionizing radiations*)

Medical examination of workers

- Frequency of periodic medical reviews and examinations should be determined by the occupational health physician taking into account:
  - the state of health of the worker and nature of the work
  - regulatory specifications
- After absence due to injury or illness, occupational health physician should confirm that a worker is fit to resume work

Medical examination of workers

At the medical examination at termination of employment, the occupational health physician should:

- identify any work related impairment
- make arrangements for further examinations after employment has ceased, if necessary

NOTIFICATION OF AILMENTS AND OVEREXPOSURE

Notification of ailments and overexposure

- Workers should be encouraged to report any significant ailment to occupational physician
- Workers should report any suspected accidental intake of radioactive substances to RPO
- Occupational physician should be:
  - informed when it is suspected that such an intake exceeds a limit specified by regulatory authority
  - advised of the outcome of any investigation (*and may be involved in the investigation*)
- When a worker has received a dose in excess of an investigation level, notification to regulator may be required

MEDICAL RECORDS

Medical records

- All medical examinations must be recorded in writing (*medical report put on the medical record*)
- Conclusions should be communicated to worker and the employer
- Conclusions should not include personal medical information but should state whether the worker is:
  - Fit for the specific work
  - Fit for such work subject to certain restrictions
  - Unfit for such work

Medical records

- Medical record should include:
  - records of all medical assessments
  - lab reports
  - sickness reports
  - medical history reports
- Medical records should be:
  - confidential
  - preserved in a manner approved by regulators
  - retained at least for the lifetime of the worker

MANAGEMENT OF OVEREXPOSED WORKERS

Management of overexposed workers

- Management should have plans on how to deal with situations of suspected or actual overexposure
- Adequate resources should be available
- An investigation must be undertaken promptly for any suspected overexposure
  - finding out what actually happened (including dose reconstruction)
  - rapid processing of dosimeters
  - may require biological dosimetry
  - may require in vivo/in vitro testing where intakes are involved

Early assessment of the likely dose is important

Management of overexposed workers

- Detailed investigations of accidents should involve all relevant specialists, including the occupational physician
- If the effective dose is below or not much above the legal dose limits no special medical investigations or treatment are required
- The investigation of the incident or event must include analysis of causes so that lessons can be learned
- The occupational physician may be required to counsel the exposed worker (explain the significance of the assessed dose)
- The investigation and the assessed dose must be recorded

Management of overexposed workers

- If the initial assessment of the effective dose is much higher than the dose limit (e.g. 0.1 - 0.5 Sv or higher), or if there is sign of early radiation injury/effects eg. acute radiation syndrome
  - special dose investigations are expected (e.g. chromosome dosimetry techniques)*
  - for intakes, in-vivo and/or in-vitro (excreta) monitoring*
  - ongoing medical surveillance will be required, including to check for onset of acute radiation effects
  - acute radiation effects will require medical treatment

* These are special techniques that may require support from other facilities. Sampling can be time critical.

Management of overexposed workers

- Where significant intakes of radionuclides have occurred medical intervention to reduce the committed dose may be required, for example:
  - chelation therapy (e.g. Ca-DTPA for plutonium)
  - thyroid blocking for iodine
  - forced diuresis for tritium
- These are special medical procedures requiring careful judgement by experienced physicians of benefits versus side-effects
- Workers must be pre-warned of the possibility of medical intervention

If these scenarios are foreseeable management must be prepared!

Key messages

- Management should ensure that all workers engaged in activities in which they could be subject to occupational exposure are provided with the necessary workers' health surveillance and services
- Workers' health surveillance programme should be based on general principles of occupational health
- Medical examinations specifically related to the ionizing radiation hazard should be commensurate with nature and level of radiation risk
- Medical records should be confidential and preserved in a manner approved by regulators
- Conclusions should be communicated to worker and the employer but not include personal medical information
- Management should have plans and arrangements to deal with situations of suspected or actual overexposure

QUESTIONS AND DISCUSSION