UNIVERSITY
OF WOLLONGONG
AUSTRALIA

WHS UNIT

AIR AND HEALTH MONITORING GUIDELINES

Contents

1 Introduction

These guidelines provide information on health monitoring requirements for University of Wollongong (UOW) workers if they are potentially exposed to hazardous chemicals or other hazards that require health monitoring through the course of their employment. Some examples of the types of work which may require health monitoring include:

- hazardous chemicals - including carcinogens
- outdoor working e.g. sun exposure
- radiation - including x-ray, sealed and unsealed sources
- lasers
- biological
- noise
- asbestos
- working with laboratory animals
- working with risk group 3 and 4 human pathogens
- SCUBA diving
- performing hazardous manual tasks

2 Scope

These guidelines apply to all UOW workers undertaking work on or off campus where the need for health monitoring is identified either by legislation or through a risk assessment. Appendix 1 lists the health monitoring requirements for common tasks and hazards.

3 Definitions

Health monitoring	Monitoring of a person to identify changes in the person's health status because of exposure to certain substances or hazards.
Exposure standard	An exposure standard in the publication *Workplace Exposure Standards for Airborne Contaminants*.
Scheduled chemical	A chemical listed in Schedule 14 of the WHS Regulation that requires health monitoring
Tests	Investigative techniques that can be used in the periodic assessment of individual workers to assist in determining their degree of exposure to or effect from hazardous chemicals.

4 Responsibilities

4.1 Workers

Workers are responsible for:

- following the requests to undergo health monitoring requirements relevant to their employment
- participating in the UOW risk management process which includes the reporting of hazards that are identified in their workplace which may require health monitoring to be implemented.

4.2 Supervisors

Supervisors are responsible for:

- the identification and assessment of activities that require the implementation of a health monitoring program
- consulting with workers on matters directly affecting their health and safety including notification of health monitoring needs for any hazardous chemical listed in Appendix 1
- ensuring that all potential or new workers receive appropriate health monitoring prior to employment as required.

- ensure that all workers receive appropriate health monitoring during the course of their employment and at the termination of employment as required
- early and effective implementation of injury management process following an incident
- identifying and implementing corrective action/s following adverse health monitoring results
- ensuring that worker confidentiality is always maintained.

4.3 WHS Unit

The WHS is responsible for:

- the development, communication, review and monitoring of these guidelines
- advising Faculties and Divisions of the process for undertaking risk assessments to determine the need for health monitoring
- assisting with the analysis of health monitoring reports from health monitoring providers
- co-ordination of all health monitoring issues/matters including medical appointments and liaison with health monitoring providers
- maintaining the confidentiality of workers undergoing health monitoring including the appropriate keeping of all health monitoring records
- ensuring the implementation of injury management processes when required
- the review of pre-employment medical assessments with preferred health monitoring providers.

5 Air Monitoring

The WHS Regulation 2017 requires that no worker is to be exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for that substance or mixture. The Regulation also requires that air monitoring be carried out:

- if it is not certain on reasonable grounds whether the exposure standard is being exceeded or not, or
- if it is necessary to determine whether there is a risk to health.

Following a risk management approach as outlined in the WHS Risk Management Guidelines the completion of a risk assessment will identify the hazards present and the means by which they can be best controlled. This is the most effective method for identifying whether a risk to a workers health exists or not. For example, ways to minimise the risk of chemicals could include:

- using smaller quantities
- substituting the chemical with a lower hazard category chemical
- using in diluted form
- using in enclosed systems
- using effective extractions systems
- training staff about the hazards and risks of the chemicals they use
- using PPE that is well maintained and its use well enforced.

Such risk control measures are likely to keep the airborne concentration to well below the exposure standard. However if such controls do not reduce the exposure to workers, air monitoring may be required. For airborne contaminants, air monitoring involves the sampling of workplace atmospheres to establish a quantitative measure of exposure to hazardous substances through inhalation. The result is then compared to the Workplace Exposure Standards for Airborne Contaminants to assess if the exposure is above the recommended threshold.

Monitoring should only be carried out by a competent person. The WHS Unit should be contacted to organise any air monitoring required. The school, research centre or divisional unit requesting the monitoring meets the cost of any air monitoring required.

Gas monitoring may also be required if the potential for a hazardous atmosphere could exist for example if:

1. Oxygen levels could fall to unsafe levels (e.g. because of an asphyxiate gas leak)
2. an Oxygen leak could increase the risk of a fire
3. the concentration of a flammable gas (or vapour, mist or fume) exceeds 5% of the LEL for that gas
4. combustible dust is present in a form and quantity that could ignite.

In all such cases gas monitoring equipment must be inspected, calibrated and maintained. Records of the equipment to be inspected, calibrated and maintained should be listed on the Local WHS Monitoring Equipment form.

6 Health Monitoring

6.1 Determining the Need for Health Monitoring

The WHS Regulation 2017 states that health monitoring must be provided to a worker if the worker:

- is carrying out ongoing work using, handling, generating, or storing hazardous chemicals and there is a *significant risk to the worker's health* because of exposure to a scheduled chemical or asbestos.

Appendix 1 outlines the scheduled chemicals, other hazardous chemicals and tasks (e.g. using lasers or radiation) which have been identified as potentially requiring health monitoring.

6.1.1 General Risk Assessment Process

There are many other job roles that involve tasks other than the use of hazardous chemicals that may require baseline assessment and potential ongoing monitoring. Some examples include:

- medical examinations for persons that may be at risk from animal allergens
- general physical assessments for workers undertaking manual tasks i.e. heavy or frequent lifting
- eye tests for workers using lasers
- radiation monitoring for staff working with sealed and unsealed sources of radiation.
- hearing tests for workers working in noisy environments
- medical examinations for workers undertaking SCUBA diving

The risk assessment process outlined in the WHS Risk Management Guidelines should be followed to identify and job roles that may involve these types of tasks or activities that may require health monitoring.

6.1.2 Hazardous Chemicals Risk Assessment Process

In order to identify that a worker is exposed to a 'significant risk' to their health, a risk assessment must be undertaken. The Hazardous Chemicals Risk Assessment must be completed to determine the level of risk of a chemical and subsequently, what action must be taken in regards to any health monitoring.

From a risk management perspective, it is important to reinforce that health monitoring is not to be used as an alternative to the implementation of other more effective control measures such as those outlined in the WHS Risk Management Guidelines. However, health monitoring must still be considered in situations where:

- the risks to health are largely controlled through the lower order controls, e.g. PPE or administrative controls
- symptoms have been reported which are likely to be related to the use of a workplace substance
- an incident or near miss has occurred
- control measures have deteriorated significantly as a result of poor maintenance.

6.2 Types of Health Monitoring

There are different types of health monitoring procedures used to assess exposure to hazardous chemicals including:

6.2.1 Interview Questions

This involves asking the worker questions about previous occupational history, medical history, lifestyle (e.g. dietary, smoking and drinking habits), and about symptoms related to exposure. It may also involve simple questions about how workers carry out their work, their personal hygiene at work or where they eat in the workplace. All of these questions provide information to assess current or previous exposure to hazardous chemicals.

6.2.2 Medical Examination

This involves the use of standard clinical and medical assessments, tests and techniques to assess the presence of early or long-term health effects, often at set intervals. It can include an assessment of medical

history, occupational and previous exposure history, and a clinical examination. This can also include tests like spirometry (for testing lung function) and radiography, e.g. chest X-ray.

6.2.3 Biological Effect Monitoring

This is the measurement and assessment of early biological effects before health impairment occurs in exposed workers, for example measurement of reduction of cholinesterase activity levels in workers exposed to organophosphate pesticides.

6.2.4 Biological Exposure Monitoring

This involves measurement and evaluation of the levels of a hazardous chemical or its metabolites (break-down products) in body tissues, body fluids like urine or blood - for example blood lead levels, urinary cadmium - or in exhaled breath of an exposed person.

6.3 Frequency of Health Monitoring

Health monitoring should be provided:

- before commencing work with the hazardous chemical or the termination or undertaking the hazardous task. This is known as baseline monitoring and it is done so changes to the worker's health can be identified during periods of potential exposure
- during periods of exposure to the hazardous chemical or hazardous task, particularly where excessive exposure occurs, e.g. following spills or loss of containment of a hazardous chemical
- where the worker has concerns that may relate to exposure to the hazardous chemical, e.g. where relevant symptoms are identified
- at termination of work with the hazardous chemical or the termination or undertaking the hazardous task.

7 Health Monitoring Providers

Health monitoring must be carried out by or be done under the supervision of a registered medical practitioner with experience in health monitoring. UOWs preferred providers for health monitoring are:

Type of Health Monitoring	Preferred Provider
▪ Interview questions: - Collection of demographic data - Work history - Medical history ▪ Medical and physical examination (including hearing tests) ▪ Biological effect and exposure monitoring ▪ Pre-employment assessments	Injury and Occupational Health (IOH) 32 Swan Street, Wollongong 2500 02 4229 6111
▪ Sun exposure	Australian Skin Cancer Clinic Shop 3001, Stocklands Shellharbour Shopping Centre, 211 Lake Entrance Road, Shellharbour NSW 2529
▪ Laser (eye examinations)	NIB Eye Care Centre, Wollongong 104 Crown Street Mall Wollongong NSW 2500 1300 345 300

7.1 Costs of Health Monitoring

Any costs associated with health monitoring for any worker or student is to be paid for by the respective Unit.

8 Responding to Health Monitoring Reports

Once a health monitoring report is received from the registered medical practitioner, relevant action will be taken where the health monitoring report has any of the following:

- test results indicating the worker has been exposed to the chemical and has an elevated level of the chemical or its metabolites in his or her body for that hazardous chemical
- advises the worker is suffering a disease, injury or illness as a result of exposure
- recommends you take remedial action
- advises medical counselling is required.

Any actions taken will be reported through SafetyNet in accordance with the Incident Management and Reporting Guidelines.

9 Health Monitoring Records

Any health monitoring report is to be treated as a confidential medical record and not released to any other individual without the individual's consent. Health monitoring records shall be stored in accordance with the University Record Management Policy and associated guidelines.

10 Related Documents

- WHS Regulation 2017
- Workplace Exposure Standards for Airborne Contaminants
- Health Monitoring for Exposure to Hazardous Chemicals – Guide for persons conducting a business or undertaking
- Radiation Safety Guidelines
- Biological Safety Manual
- Noise Management and Hearing Conservation Guidelines
- Laser Safety Guidelines
- Working with Hazardous Substances Guidelines
- Incident Management and Reporting Guidelines
- WHS Risk Management Guidelines
- Records Management Policy
- Local WHS Monitoring Equipment Form

11 Version Control Table

Version Control	Date Released	Approved By	Amendment
1	January 2007	Manager WHS	New version
2	August 2010	Manager WHS	Document updated to incorporate the Personnel name change to Human Resources Division.
3	March 2012	Manager WHS	Rebrand.
4	January 2013	Manager WHS	Scheduled review – no significant changes. Requirements updated with WHS Regulation amendments.
5	September 2013	Manager WHS	Document updated to include greater details on when health monitoring should occur, details on air monitoring included.
6	November 2013	Manager WHS	Update noise assessment requirements
7	October 2015	Manager WHS	Added Hazardous manual tasks, Risk group 3 and 4 human pathogens, working with laboratory animals, Diving to the requirements for health monitoring to Appendix 1
8	April 2016	Manager WHS	Reference made to Local WHS Monitoring Equipment.
9	March 2024	Manager WHS	Rebrand and updated and corrected broken links

12 Appendix 1: Requirements for Health Monitoring

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
SCHEDULED HAZARDOUS CHEMICALS				
Acrylonitrile	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination - emphasis on central nervous system (CNS), respiratory system and skin, only if work and medical history indicates this is necessary.	▪ Medical examination.	▪ Final medication examination – emphasis on CNS, respiratory system and skin.	▪ WHS Regulation 2017.
Arsenic (inorganic)	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination - emphasis on peripheral nervous system and skin ▪ Investigation – a baseline level of arsenic in urine will be determined.	▪ Monitoring exposure to inorganic arsenic through urinary inorganic arsenic testing.	▪ Final medication examination – include skin and neurological checks. ▪ Continuing medical surveillance – people with skin or neurological signs due to arsenic should be advised to seek continuing medical surveillance.	▪ WHS Regulation 2017.
Benzene	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – only if indicated by work and medical history ▪ Investigation – blood sample for haematological profile to test the workers baseline.	▪ Biological exposure – a spot urine test at the end of the shift to determine levels of S- Phenyl mercapturic acid (S-PMA) relative to creatinine. ▪ If spot urine testing demonstrates exposure to benzene is consistent with occupational exposure, a blood sample should be taken and compared to the haematological profile with the worker's baseline	▪ Final medication examination – A blood sample should be taken and results compared with the worker's baseline haematological profile. ▪ Workers with haematological abnormalities should be advised to seek continuing medical monitoring	▪ WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
		haematological profile determined at the beginning of the health monitoring process ▪ Confounding factors – as tobacco smoke contains benzene, inhalation of tobacco smoke will cause elevated background values of S-PMA		
Cadmium	▪ Collection of demographic data ▪ Work history ▪ Medical history – administration of a standardised respiratory questionnaire ▪ Physical examination – emphasis on respiratory system ▪ Investigation – I. Standardised respiratory function tests II. A spot urine for cadmium with the results corrected for creatinine III. A urine ß2-microglobulin test will be conducted and the results will be corrected for creatinine.	▪ Monitoring exposure to cadmium - Work-related exposure to cadmium can be assessed by monitoring urine. Two methods can be used: I. measurement of cadmium in urine as µg/g of creatinine II. assessment of ß2-microglobulin as µg/g of creatinine. ▪ A spot urine for cadmium and urine ß2-microglobulin will be conducted annually and compared against the worker's baseline levels measured at the start of the health monitoring process.	▪ Final medical examination – A final medical examination will be conducted and workers with a history of raised ß2-microglobulin should be advised to seek continuing medical monitoring.	▪ WHS Regulation 2017
Chromium (inorganic)	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – emphasis on respiratory system and skin	▪ Workplace skin care program ▪ Respiratory symptoms – any symptoms should be reported to a medical practitioner ▪ Monitoring exposure to chromium - The registered medical practitioner may also	▪ Final medical examination - The final medical examination will include urinary chromium testing and a physical examination by a medical practitioner.	▪ WHS Regulation 2017

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
		choose to monitor a worker's exposure to chromium via urinary chromium level		
Creosote	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – emphasis on neurological system and a thorough examination of skin.	▪ Photosensitivity – if a worker develops photosensitivity, they should see a medical practitioner. ▪ Physical examination – annual physical examination with emphasis on neurological system and skin. Evidence of skin sensitisation should be recorded. ▪ Data for inclusion in health records - Records of photosensitivity which a worker has had, indicating specific processes involved should be included in the worker's health monitoring report.	▪ Final medical examination - A final medical examination will be conducted and will include a physical examination with emphasis on the neurological system and skin, noting abnormal lesions and evidence of skin sensitisation. ▪ Continuing medical monitoring - Workers with a history of skin disease due to contact with creosote should be advised to seek continuing medical monitoring.	▪ WHS Regulation 2017.
Crystalline Silica	▪ Collection of demographic data ▪ Work history ▪ Medical history - administration of a standardised respiratory questionnaire ▪ Physical examination – emphasis on the respiratory system ▪ Investigation – I. standardised respiratory function tests to be performed II. chest X-ray, full size PA view.	▪ Monitoring exposure to crystalline silica - A medical examination should be conducted annually and will include: I. work history II. medical history III. physical examination IV. lung function investigation consisting of standardised respiratory function tests and, V. if required, a chest X-ray.	▪ Final medical examination - A final medical examination will be conducted and will include: I. medical history II. physical examination III. investigation.	▪ WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
Isocyanates	▪ Collection of demographic data ▪ Work history ▪ Medical history - administration of a standardised respiratory questionnaire ▪ Physical examination – emphasis on the respiratory system and skin ▪ Investigation – I. standardised respiratory function tests to be performed.	▪ Medical examination - A medical examination should be performed at six weeks and then at six monthly intervals during continued exposure. Where monitoring after 12 months shows no adverse health effects the medical practitioner may choose to carry out annual monitoring. The medical examination will include: I. physical examination for work-related dermatitis II. standardised respiratory function tests.	▪ Final medical examination - A final medical examination will be conducted and will include: I. physical examination for work-related dermatitis II. standardised respiratory function tests.	▪ WHS Regulation 2017.
Lead (inorganic)	▪ Baseline health monitoring: I. Before the worker starts lead risk work II. One month after the worker first starts the lead risk work ▪ Collection of demographic data ▪ Work history ▪ Medical history - The following details about the worker's medical history will be collected by the medical practitioner: I. presence of symptoms with an emphasis on reproductive history including current pregnancy or breast feeding, neuropsychologic problems, haematological disorders and renal disorders II. prior history of non-work-	▪ Monitoring exposure to lead - Biological monitoring must be arranged for each worker who carries out lead risk work at the following times: 1. For females not of reproductive capacity and males: • six months after the last biological monitoring of the worker if the last monitoring shows a blood lead level of less than 30µg/dL (1.45µmol/L); or • three months after the last biological monitoring of the		WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
Lead (inorganic) cont.	related lead exposure e.g. hobbies like shooting (exposure to gun powder) and fishing (exposure to lead sinkers) III. history of medication or medical treatment including recent chelating agent therapy e.g. EDTA IV. smoking history ▪ Physical examination - A physical examination will be conducted, with an emphasis on the gastrointestinal, haematopoietic, renal, cardiovascular, reproductive and neurological systems ▪ Investigation - The following tests may be conducted to test the worker's baseline exposure: I. full blood examination II. blood lead in whole blood or packed red cells III. serum creatinine IV. routine urinalysis V. pulmonary function test in cases where respiratory protection is likely to be required ▪ Counselling: Counselling for lead risk work should include the following health and personal hygiene advice: I. Health effects of lead II. Family planning III. Pregnancy	worker if the last monitoring shows a blood lead level of 30µg/dL (1.45µmol/L) or more but less than 40µg/dL (1.93µmol/L); or • six weeks after the last biological monitoring of the worker if the last monitoring shows a blood lead level of 40µg/dL (1.93µmol/L) or more. 2. For females of reproductive capacity: • three months after the last biological monitoring of the worker if the last monitoring shows a blood lead level of less than 10µg/dL (0.48µmol/L); or • six weeks after the last biological monitoring of the worker if the last monitoring shows a blood lead level of 10µg/dL (0.48µmol/L) or more ▪ Removal of worker from a lead risk - A worker must be		

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
	IV. Personal hygiene V. Eating, drinking and smoking	immediately removed from carrying out lead risk work if: • biological monitoring of the worker shows that the worker's blood lead level is, or is more than: ○ for females not of reproductive capacity and males—50µg/dL (2.42µmol/L); or ○ for females of reproductive capacity—20µg/dL (0.97µmol/L); or ○ for females who are pregnant or breastfeeding—15µg/dL (0.72µmol/L); or ▪ following a medical examination of the worker, the medical practitioner who supervised the health monitoring recommends that the worker must be removed from carrying out the lead risk work; or ▪ there is an indication that a risk control measure has failed and as a result, the worker's blood lead level is likely to reach the relevant level for the worker		

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
		mentioned above ▪ Return to work - The frequency of repeat blood lead level tests after removal from lead risk work is at the discretion of the medical practitioner supervising the health monitoring but should be done at least every three to six weeks until the appropriate fall in blood lead levels has occurred. ▪ The worker should be examined periodically to determine whether the worker is suitable to return to carrying out lead risk work. ▪ A worker must not return to lead risk work until the worker's blood lead level is less than: o for females not of reproductive capacity and males—40µg/dL (1.93µmol/L); or o for females of reproductive capacity—10µg/dL (0.48µmol/L); AND o they have been assessed as medically fit to return to lead risk work by the medical practitioner supervising the health monitoring		

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
Mercury (inorganic)	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – emphasis on the dermatological, gastrointestinal, neurological and renal systems ▪ Investigation – spot urine to test to determine workers baseline exposure.	▪ Monitoring average exposure to inorganic mercury – urinary mercury tests ▪ After acute exposure – blood samples to be taken.	▪ Final physical examination – to determine any neurological or renal dysfunction due to inorganic lead exposure.	▪ WHS Regulation 2017.
4,4'-Methylene bis(2-chloroaniline) (MOCA)	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – only if indicated by work history ▪ Investigation – The following tests will be used to test the worker's baseline exposure: I. dipstick urinalysis for haematuria II. urine cytology may be required depending on the medical history and previous exposure.	▪ Monitoring exposure to MOCA – The following tests will be conducted twice annually at the time of peak exposure/use: I. urinary total MOCA II. spot creatinine corrected urine for total MOCA III. dipstick urinalysis for haematuria. ▪ Dipstick urinalysis results will be compared with the worker's baseline dipstick urinalysis. Urine cytology will also be conducted annually	▪ Final medical examination – A final medical examination will be conducted and will include: I. urine cytology for haematuria II. dipstick urinalysis III. a medical review of health monitoring records. ▪ Continuing medical monitoring – The worker should be reminded of the need for continuing urine cytology and dipstick urinalysis.	▪ WHS Regulation 2017.
Organophosphate Pesticides	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – only if indicated by work and medical history ▪ Investigation – The following tests will be used to test the worker's baseline exposure:	▪ Monitoring exposure to organophosphate pesticides – Periodic testing of workers during organophosphate pesticides use is desirable. The medical examination will include: I. work history II. medical history III. physical examination	▪ Final medical examination.	▪ WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
	I. Estimation of red cell and plasma cholinesterase activity levels by the Ellman method. A venous blood sample is recommended. At least one, and ideally two, pre-exposure tests should be performed at least three days apart and the baseline obtained by averaging these tests. The results of these tests should be within 15 per cent to be regarded as reliable.	including look for evidence of dermatitis on the hands and forearms—this may indicate advice is required on work practices IV. estimation of red cell and plasma cholinesterase activity levels by the Ellman method. It is preferable the estimation be done in the latter half of the working day when organophosphate pesticides are used. If a 20 per cent depression of cholinesterase activity is seen the worker should be re-tested.		
Polycyclic Aromatic hydrocarbons (PAH)	▪ Work history ▪ Medical history – The following details about the worker's medical history will be collected by the medical practitioner: I. records of personal exposure, including photosensitivity II. presence of symptoms, see supplementary information in this Guide III. smoking history. ▪ Physical history – conducted if indicated by work and medical history.	▪ Photosensitivity – Where workers report photosensitivity, an appointment should be arranged with the medical practitioner and workers should receive additional counselling on the potential health effects of PAH on the skin. ▪ Monitoring exposure to PAH – The assessment of work-related exposure to PAH is difficult because workers are exposed to a mixture of compounds. However, the metabolite of pyrene, 1-hydroxypyrene (1-HP)	▪ Final medical examination	▪ WHS Regulation 2017

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
		in urine, is most often used as the biomarker for PAH exposure as pyrene is a very thermodynamically stable compound and therefore most abundant in a PAH mixture.		
Pentachlorophenol (PCP)	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – emphasis on the skin, noting abnormal lesions or effects of irritancy ▪ Investigation – The following tests will be used to test the worker's baseline exposure: I. A spot urine test for total PCP will be conducted and the result will be corrected for creatinine. Where there is 1 mg or more of total PCP per gram of creatinine, repeat spot urine for total PCP should be performed at the same time of the day II. A dipstick urinalysis for haematuria and proteinuria will also be conducted.	▪ Monitoring exposure to PCP – A spot urine for total PCP corrected for creatinine and a dipstick urinalysis for proteinuria and haematuria will be conducted every 180 days and compared with the worker's baseline levels. Tests should be conducted preshift towards the end of the working week.	▪ Final medical examination – A final medical examination will be conducted with emphasis on the skin, noting abnormal lesions or effects of irritancy.	▪ WHS Regulation 2017
Thallium	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – only if indicated by work and medical history ▪ Investigation – A spot urine test for thallium will be used to test the	▪ Monitoring exposure to thallium – A spot urine test for thallium will be conducted every 90 days and compared with the worker's baseline levels.	▪ Final medical examination – A final medical examination will be conducted and will include a spot urine for thallium.	▪ WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	During Exposure or After Excessive Exposure	At Termination of Work	Requirement
	worker's baseline exposure. The result is corrected for creatinine that is the thallium concentration in micrograms per gram of creatinine. Where there is 50 µg thallium or more per gram creatinine, a repeat spot urine test should be performed at the same time of the day.	Where there is 50 µg thallium or more per gram of creatinine: I. a repeat spot urine for thallium should be performed at the same time of the day to confirm results II. a physical examination should be performed with particular attention to the nervous system and noting hair loss III. the person conducting a business or undertaking must review control measures and carry out recommended remedial action IV. the worker must be informed of the results of the health monitoring.		
Vinyl Chloride	▪ Collection of demographic data ▪ Work history ▪ Medical history – There are many non-work factors associated with hepatocellular carcinoma, including excessive alcohol consumption and viral hepatitis that the medical practitioner needs to be aware of. The following details about the worker's medical history will be collected by the medical practitioner: I. presence of symptoms	▪ Monitoring exposure to vinyl chloride – Medical examinations should occur every two years, with laboratory tests repeated annually where required. ▪ Medical examination – The person conducting a business or undertaking should arrange an appointment with the registered medical practitioner for workers who are excessively exposed to vinyl chloride, are suspected of being excessively exposed to	▪ Final medical examination – A final medical examination will be conducted and may include tests used by the registered medical practitioner to assess exposure including: I. full blood count including mean cell volume and platelets II. liver function tests including AST, ALT, GGT, alkaline phosphatase and bilirubin.	▪ WHS Regulation 2017.

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
Vinyl Chloride cont.	II. smoking history III. alcohol consumption IV. viral hepatitis – hepatitis B or C V. haemachromatosis VI. other liver disease ▪ Physical examination – A physical examination will be conducted only if work and medical history indicates this is necessary, for example if the symptoms of vinyl chloride exposure are present. Investigation – In addition to medical history and physical examination, there are several test methods that can be used to assess exposure to vinyl chloride. These are: I. full blood count including mean cell volume and platelets II. liver function tests including aspartate transaminase (AST), alanine transaminase (ALT), gamma glutamyl transpeptidase (GGT), alkaline phosphatase and bilirubin. The registered medical practitioner may choose to conduct these tests to assess the worker's exposure to vinyl chloride. The medical practitioner should consider testing for viral markers for hepatitis B and hepatitis C after pre-test counselling.	vinyl chloride or have concerns about vinyl chloride exposure.		

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
RADIATION				
Sun (ultra-violet) radiation	▪ Collection of demographic data ▪ Work history ▪ Physical examination – emphasis on skin			
Sealed and unsealed sources and x-ray	▪ Collection of demographic data ▪ Work history.	▪ Personal dosimetry every 3 months.	▪ Final dosimetry.	▪ Radiation Control Act 1990
ASBESTOS				
Asbestos	▪ Collection of demographic data ▪ Work history ▪ Medical history ▪ Physical examination – only if indicated by work and medical history ▪ Investigation – standardised respiratory function tests to determine baseline respiratory function.	▪ Monitoring exposure to asbestos.	▪ Final medication examination – emphasis on the respiratory system.	▪ WHS Regulation 2017
LASER				
Persons working with laser equipment	▪ Collection of demographic data ▪ Work history ▪ Medical examination – emphasis on eyes.	▪ Medical examination – emphasis on eyes.	▪ Final medical examination – emphasis on eyes.	▪ AS2211.1 2004
SCUBA DIVING				
Scuba diving	▪ Certificate of medical fitness before diving work or before diving training commences.	▪ Comply with conditions of the certificate.	▪ n/a	▪ WHS Regulation 2017

Hazard	Type of Health Monitoring			
	Baseline	**During Exposure or After Excessive Exposure**	**At Termination of Work**	**Requirement**
BIOHAZARDS				
Working with laboratory animals	▪ Pre-employment medical questionnaire for all ▪ Health monitoring / lung function tests for persons at risk.	▪ Monitoring for symptoms of allergens.	▪ n/a	▪ AS2234.3 2010
Work with risk group 3 and 4 human pathogens	▪ Initial health examination for all. ▪ Base line serum sample from at risk persons.	▪ Additional serum samples collected periodically depending on the risk of exposure to the laboratory agents handled.	▪ n/a	▪ AS2243.3 2010
GENERAL				
Noise	▪ Collection of demographic data ▪ Work history ▪ Audiometric Testing – when a need for testing, as described in the Noise Management and Conservation Guidelines, has been identified it must be provided within three months of the worker commencing work.	▪ Audiometric Testing – Follow up test need to be carried out at least every two years. Should be carried our well into the work shift so that any temporary hearing loss can be picked up. ▪ More frequent audiometric testing may need to be provided if exposures are equal or greater than 100 Db(A),	▪ Follow up testing to be provided in line with “During Exposure or After Excessive Exposure” requirements. No additional testing is required once employment has been terminated.	▪ WHS Regulation 2017.
Hazardous manual tasks	▪ Pre-employment medical questionnaire/ medical assessment for persons assessed as at risk.	▪ Ongoing monitoring of any symptoms and frequency determined by initial medical examination.	▪ n/a	▪ n/a