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Less risk, safe people, better business

NEBOSH IDIP: DI2
WEBINAR 2

nebosh

LEARNING PARTNER
GOLD 685

Webinar Agenda

- Catch-up/Looking back
- Feedback - Activities
- DI2 Element 3 & 4
- DI2 Element 3 & 4 Activities


LIVE
BREAKING
NEWS

Catch-up

- What recently changed or is news in the public media that we can learn from?
- The first psychosocial prosecution in Australia was a WorkSafe bullying prosecution. The prosecution found that culture was the root cause of the bullying, rather than work design or ISO.

Landmark Prosecution for Psychosocial Hazards

Prosecution for psychosocial harm in West Australia

The Western Australian Department of Justice has become the first employer in WA to be charged for failing to meet its obligations to manage employee psychosocial hazards in the workplace.

These are the opening words in an online report about the work-related disease that is affecting many countries, including New Zealand. In NZ we have yet to legislate for engineered stone and silicosis but psychosocial harm is on the agenda for many businesses.

Catch-up

Here are some other recent psychosocial court cases in Australia:

- Kozarov v Victoria
  - In this 2022 High Court case, the court ruled that employers have a duty to protect the mental health of their employees if the nature of the work puts them at risk of psychiatric injury. The court found that the employer was aware of the risk and should have taken reasonable steps to manage it.
- State Department of Justice prosecution
  - In this 2024 case, the State Department of Justice was prosecuted for failing to manage psychosocial hazards in the workplace. The department was accused of failing to provide a safe working environment, which led to serious psychological harm to a prison officer.

Catch-up

- What recently changed or is news in the public media that we can learn from?

Saferooms in MSD's $65m security improvements

Nearly 10 years after two Ministry of Social Development (MSD) workers were killed at their office in Ashburton, 1News can reveal that $65 million has been spent on improving the safety of sites.

The September 2014 incident saw two workers at the WINZ Ashburton office murdered by homeless man Russell John Tully.

In the aftermath, WorkSafe made several recommendations to the ministry to improve security measures for staff and clients.

Inside each of the revamped offices are saferooms, where staff and clients can shelter when lockdowns occur.

"The events in Ashburton changed us forever as a ministry," MSD deputy chief executive, operational assurance and communication, Melissa Gill, said.

Since then, the ministry has spent nearly $65 million on revamps to all MSD sites across the country.

Catch-up

- What recently changed or is news in the public media that we can learn from?
- Lone worker:

Harrowing detail after meter reader Kane Minion mauled to death by dogs in Queensland

The meter reader who entered a property and was set upon by two dogs has been pictured. He was days away from celebrating a major milestone.

Kane Minion, 42, was mauled to death just after 10.45am on Saturday after a routine meter check went horribly wrong.

A Bandog Bullmastiff and a Rhodesian ridgeback cross attacked the Energex worker in the front yard of the home on Ison Road at Greenbank — a rural suburb about 40km south of Brisbane.

He was found unconscious in the front yard of the property with critical injuries. He died at the scene despite efforts to save him.

Mr Minion had spent seven years working for Downer's Skilltech and was working as a contractor for Energex when he was killed.

ACTIVITIES

Activity Feedback

1. Use your own examples from your workplace to apply the handbook theory into reality. We need to see that you can apply more than just using the handbook examples.
2. Do not repeat the same information but in different words in multiple paragraphs. It leads to duplication and a possibility that you will use more words than the limit.

Activity Feedback

3. Structure your answers. E.g., “The role and benefits of pre-placement assessments”. Key words include “role”, “benefits”, and “pre-placement assessments”. These words will have to be clarified or discussed in your answer. It helps you to not “forget” answering any part of the assignment. Break your answers into paragraphs. Each paragraph is a new discussion. It makes it easier for the reader/marker to understand your approach and content.

Activity Feedback

4. Be specific in answering your questions. E.g., do not use “several” or “some”. State “benefits will include but are not limited to the following three …”. Use words such as “to summarise” or “lastly” or “to conclude”. Each answer is a story, and you need to guide the reader.

5. ONLY answer the question. You do not have time for niceties. It will also not give you marks.

6. Be careful of too short answers. ☺

DID YOU KNOW?

Did you know?

Why is under-reporting a problem?

Under-reporting poses significant challenges beyond the accurate recording of safety data: it hinders organisations from properly investigating and learning from incidents (Petitta et al, 2017; Reason, 2000), presenting a serious risk to workers and organisations (Noort et al, 2019; Bellamy, 2015).

If under-reporting occurs, organisations which examine the frequency of incident reporting to understand safety levels within an organisation (as one of many measures) may not be seeing the full picture.

Low levels may actually be an indication of low reporting, as opposed to an indication that the organisation is performing well from a safety perspective.

Did you know?

Why are workers reluctant to report incidents?

Workers often face a dilemma between, on the one hand, adhering to company policies and procedures and, on the other, reporting those same policies and procedures that have not been followed.

This tension is known as the ‘double bind’ (Argyris, 1977). Historical research has shown that workers may avoid reporting incidents due to fear of job loss, loss of reputation, reprisal or other negative consequence (Byrd et al, 2018; Brinsfield, 2013; Probst et al, 2013; Sexton et al, 2000).

Additionally, threats to self-esteem have been associated with social motivation (Baumeister, 1997), with individuals failing to report due to a fear of being seen as unprofessional or incompetent (Karadeniz and Cakmakci, 2002).

To address these issues, psychologists suggest improving levels of psychological safety (Leroy et al, 2012; Edmondson, 1999) and levels of leader behavioural integrity for safety.

Did you know?

How does psychological safety work and how does it impact incident reporting?

Psychological safety refers to a shared belief held by members of a team that one can speak up or take interpersonal risks without fear that they will be embarrassed, rejected or punished for doing so (Edmondson, 1999).

Psychological safety has also been defined at an individual level, as the sense that one can ‘show and employ oneself without fear of negative consequences to self-image, status or career’ (Kahn, 1990).

In a psychologically safe workplace, workers feel confident that reporting incidents will be received without judgement or punitive action (Edmondson, 1999).

This leads to more open communication, where workers can raise concerns and seek feedback (Hirak et al, 2012; Pearsall and Ellis, 2011).

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DI2 Syllabus: Element 3


Worker Health Surveillance
Improve worker safety and health by monitoring workplace injury and illness trends

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DI2 Syllabus

Element 3: Health and medical surveillance

Assessment Criteria & Content:

- You should be able to understand the requirements for health surveillance.

DI2 Syllabus

- Explain the requirements for health assessment.
- Explain the requirements for health surveillance.
- Explain the requirements for biological monitoring.
- Explain the processes for alcohol and drug assessment and surveillance.
- Explain the processes for managing health and medical records.

DI2 Syllabus

Health assessment versus health surveillance:

Assessment: establishing an employee's health, prior to being employed, engagement on a task or exposure to a hazard.

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Why is a Health Assessment important?

- It allows you to encourage preventative action.
- It decreases absenteeism.
- It gives you an understanding of your exposure to future health risks.
- It helps to increase staff morale.
- It provides your employees with clear information about their health.
- It raises health awareness in the workplace.

DI2 Syllabus

Health Screening assessments can cover any of the following:

- Disabled workers
- Display screen equipment
- Drivers
- Food handling
- Forklift truck
- Home workers
- Lone workers
- New and expectant mothers
- Pre-placement
- Working at heights
- Young workers

DI2 Syllabus

Health assessment versus health surveillance:

Surveillance: any activity which involves obtaining information about employees' health and which helps protect employees from health risks at work OR

the ongoing, systematic collection, analysis, and interpretation of data about employees' health for use in the planning, implementation and evaluation of a programme to manage any identified issues.

DI2 Syllabus

Why is Health Surveillance important?

- It enables employees to raise concerns about how work affects their health.
- It can detect ill-health effects at an early stage, so employers can introduce interventions. These could be better controls to prevent further harm.
- It can provide data to help employers evaluate health risks.
- It highlights lapses in workplace control measures, providing invaluable data for risk assessments.
- It can provide opportunities to reinforce training and education of employees (e.g., on the use of protective equipment and the impact of health effects).
- Finally, it provides a record of an employee's health during their employment as evidence to defend a claim of damages, especially if incorporating a baseline on employment and an exit medical when leaving.

DI2 Syllabus

Health surveillance assessments can cover any of the following:

- Audiometry
- Confined spaces
- Drivers (eyesight)
- HAVS (Hand Arm Vibration Syndrome)
- Hazardous material exposure (asbestos, lead, ionising radiation)
- Lung function
- Night worker
- Skin

DI2 Syllabus

HSG 256 Managing Shift Work Guidance

This guidance aims to improve safety and reduce ill health by:

- making employers aware of their duty under law to assess any risks associated with shift work;
- improving understanding of shift work and its impact on health and safety;
- providing advice on risk assessment, design of shift-work schedules and the shift-work environment;
- suggesting measures employers, safety representatives and employees can use to reduce the negative impact of shift work;
- reducing fatigue, poor performance, errors and accidents by enabling employers to control, manage and monitor the risks of shift work.

DI2 Syllabus

HSG 256 Managing Shift Work Guidance

Definition of shift work:

- A work activity scheduled outside standard daytime hours, where there may be a handover of duty from one individual or work group to another
- A pattern of work where one worker replaces another on the same job within a 24-hour period.

DI2 Syllabus

HSG 256 Managing Shift Work Guidance

Examples of shift work:

- Work during the afternoon, night, weekend, typically with periods of the work schedule outside standard daytime hours
- Extended work periods of 12 hours or more, often associated with compressing the working week.
- Rotating hours of work.
- Split shifts, where work periods are divided into two distinct parts with several hours break in between.
- Overtime.
- Standby/on-call duties.

DI2 Syllabus

HSG 256 Managing Shift Work Guidance

Risks of shift work:

- Fatigue
- Disruption of their internal body clock
- Sleeping difficulties
- Disturbed appetite and digestion
- Reliance on sedatives and/or stimulants
- Social and domestic problems
- Performance issues
- Increase in errors
- Long-term health problems such as gastrointestinal; cardiovascular and increased susceptibility to minor illnesses

DI2 Syllabus

HSG 256 continues with assessing the risks associated with shift work; actions to reduce risks and checking and reviewing work arrangements.

Read please.

DI2 Syllabus

Fatigue:

- Considered to be a decline in mental and/or physical performance that results from prolonged exertion, sleep loss and/or disruption of the internal clock.
- Fatigue can result in slower reactions, reduced ability to process information, memory lapses, absent-mindedness, decreased awareness, lack of attention, underestimation of risk and reduced co-ordination.

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Managing Fatigue:

- Fatigue management policy
- Fatigue risk assessment
- Fatigue risk reduction
- Fatigue management training
- Management of sleep disturbances
- Fatigue reporting system
- Fatigue incident investigation
- Auditing the fatigue management process

DI2 Syllabus

What data have we found?

- Average sleep duration prior to a workday is just 6 hours 28 minutes;
- 64% of managers sleep for less than seven hours a night prior to a workday (27% less than six hours);
- Total average sleep duration over a working week is six hours 50 minutes;
- 88% of managers are carrying a sleep debt and failing to achieve the sleep they need over the week;
- 32% of managers have either been diagnosed with or are at risk of insomnia;
- 62% of managers do not feel as though they achieve enough sleep with work worries, personal worries and not having enough time being the most common reasons.

Insufficient and poor-quality sleep has a major impact on our physical and mental health. It impairs our cognition, thinking and executive functioning.

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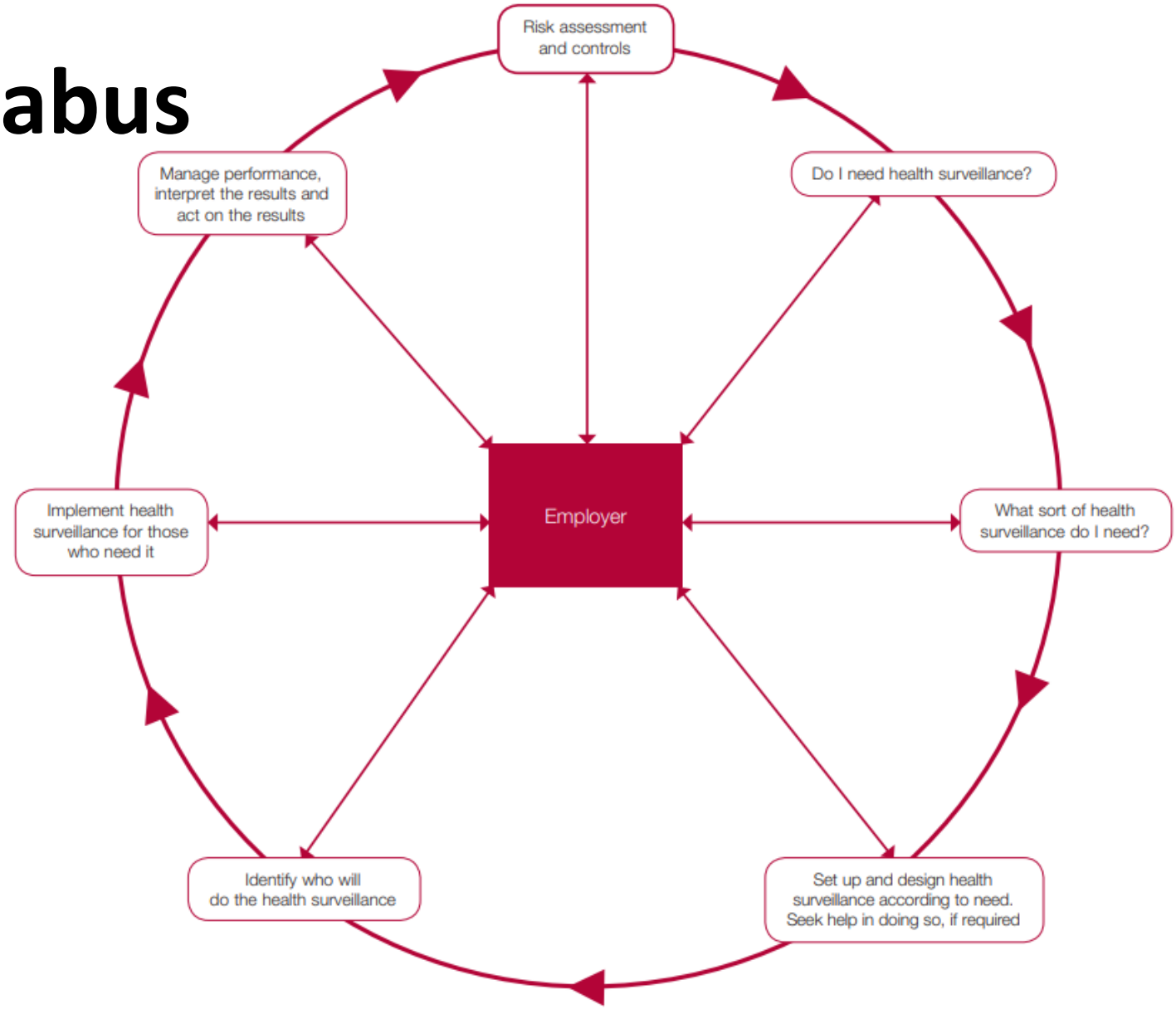
Health surveillance cycle:

<u>Stage 1:</u>

Do a risk assessment



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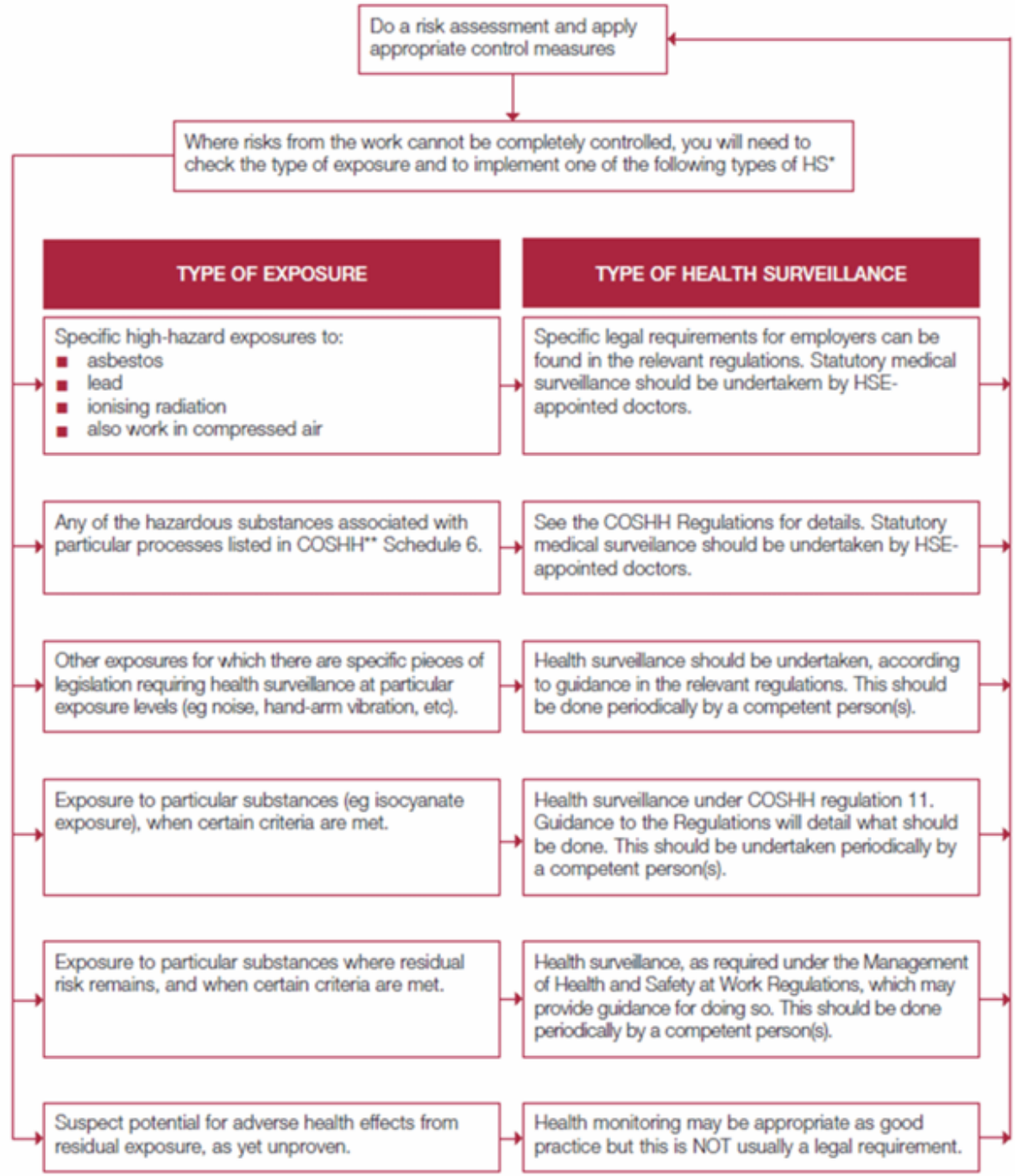
Stage 2:

Do I need health surveillance?

Source: UK, HSE – Decision-making map



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Stage 3: What health surveillance do I need?

Health surveillance is required for high-hazard substances/agents including:

- Particular types of work with asbestos
- Work with lead
- Work with those substances hazardous to health
- Work with ionising radiation
- Work in compressed air.

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Stage 4: Set up and design health surveillance according to need

- ID who will lead and manage the health surveillance programme (ISO 45001 compulsory interview)
- Take advice from an occupational health professional
- Agree roles, responsibilities and communication arrangements
- Consider the practicalities of performing health surveillance, e.g., shift and remote workers
- Appoint someone to make sure findings are fed back to management to use in reviewing risk assessments and control measures to manage health risks.

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Stage 5: Identify who will do the health surveillance

Stage 6: Implement health surveillance for those who need it

Stage 7: Manage performance and act on results

- Closing the loop!
- Lessons learnt.

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Noise health surveillance:

The reading material is very old – 1999 in your resource section.

Rather read: https://www.hse.gov.uk/noise/healthsurveillance.htm

AND

https://www.hse.gov.uk/research/rrpdf/rr966.pdf

AND Watch

https://www.bohs.org/media-resources/videos/detail/listen-up-lets-make-noise-about-hearing/

Tip – set videos at 1.5 or 2 speed.

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Vibration health surveillance:

Read:

https://www.hse.gov.uk/vibration/hav/advicetoemployers/havocchealth.pdf

AND

Watch - https://www.workareltd.co.uk/hand-arm-vibration-syndrome/ AND https://www.outsource-safety.co.uk/safety-news/hand-arm-vibration-syndrome-havs-and-health-surveillance/

How to Approach **Biological Monitoring**

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Biological monitoring:

- Defined as the measurement and assessment of chemicals or their metabolites (substances the body converts the chemical into) in exposed workers.
- Biological monitoring measurements reflect the total absorption by an individual of a chemical, by all routes (inhalation, ingestion, through the skin or by a combination of these routes).

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Biological monitoring/biomonitoring:

- Defined as the method for assessing human exposure to chemicals or their effects by measuring these chemicals, their metabolites or reaction products in human specimens.
- Biomonitoring involves measurements of biomarkers in bodily fluids, such as blood, urine, saliva, breast milk, sweat, and other specimens, such as faeces, hair, teeth, and nails.

DI2 Syllabus

Biological monitoring/biomonitoring:

- In the area of occupational medicine or occupational hygiene, biomonitoring is to be understood as the examination of biological materials of employees for the quantitative determination of hazardous substances, their metabolites or their biochemical and/or biological parameters.
- Within the occupational context, biomonitoring may help assess actual worker risk, where air monitoring alone may seriously underestimate the total uptake of certain substances.

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Biological monitoring:

Role of biological monitoring guidance values:

- Two types of biological guidance values:
  - Health Guidance Values (HGV): health guidance
  - Benchmark Guidance Value (BGV): hygiene guidance
    - Read the information in the handbook

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Biological monitoring:

Forms of health surveillance that are a good idea to carry out although there is no legal requirement:

- Workers with known mental ill-health conditions
- Workers working at height
- Driving occupations
- Alcohol/substance abuse at work


GETTING HELP
STARTS HERE
Alcohol & Drug Assessments

DI2 Syllabus

Processes for alcohol and drug assessment and surveillance:

- When should testing be carried out?
- Benefits of pre-employment health screening for alcohol/drugs – what are they?
- Disadvantages of alcohol/drugs testing – what are they?

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Processes for alcohol and drug assessment and surveillance:

- When should testing be carried out?
  - When required by law, e.g., in railway, aviation or mining industries.
  - Driving occupations.
  - When workers are involved in incidents.
  - As per the requirements of the organisation – e.g., zero tolerance and random testing.

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- Benefits of pre-employment health screening for alcohol/drugs – what are they?

- As pre-employment alcohol/drug testing is conducted after selecting an applicant for a job, it helps to identify potential workers who are desirable, but may need assistance in managing their alcohol/drug use, which could be provided by the employer when recruited.
- It helps employers to manage health and safety risks that could arise from workers' misuse of alcohol/drug, by providing an opportunity to place them in suitable work.
- It illustrates and emphasises the employers view on drug/alcohol misuse in the workplace.
- It actively encourages the establishment of a safe working environment.
- It reduces workplace conflict and violence.
- It prevents applicants who misuse alcohol/drug being recruited to carry out high risk/safety critical work.
- It discourages applications from potential alcohol/drug misusers, preventing them entering the workplace.
- It meets specific legal requirements for the rail and aviation transport industry.
- It supports the prevention of workers driving road vehicles under the influence of alcohol/drug.
- It avoids learning that workers have a alcohol/drug problem from their involvement in incidents that occur in the workplace.
- It reduces potential legal liability for incidents involving workers under the influence of drugs/alcohol.

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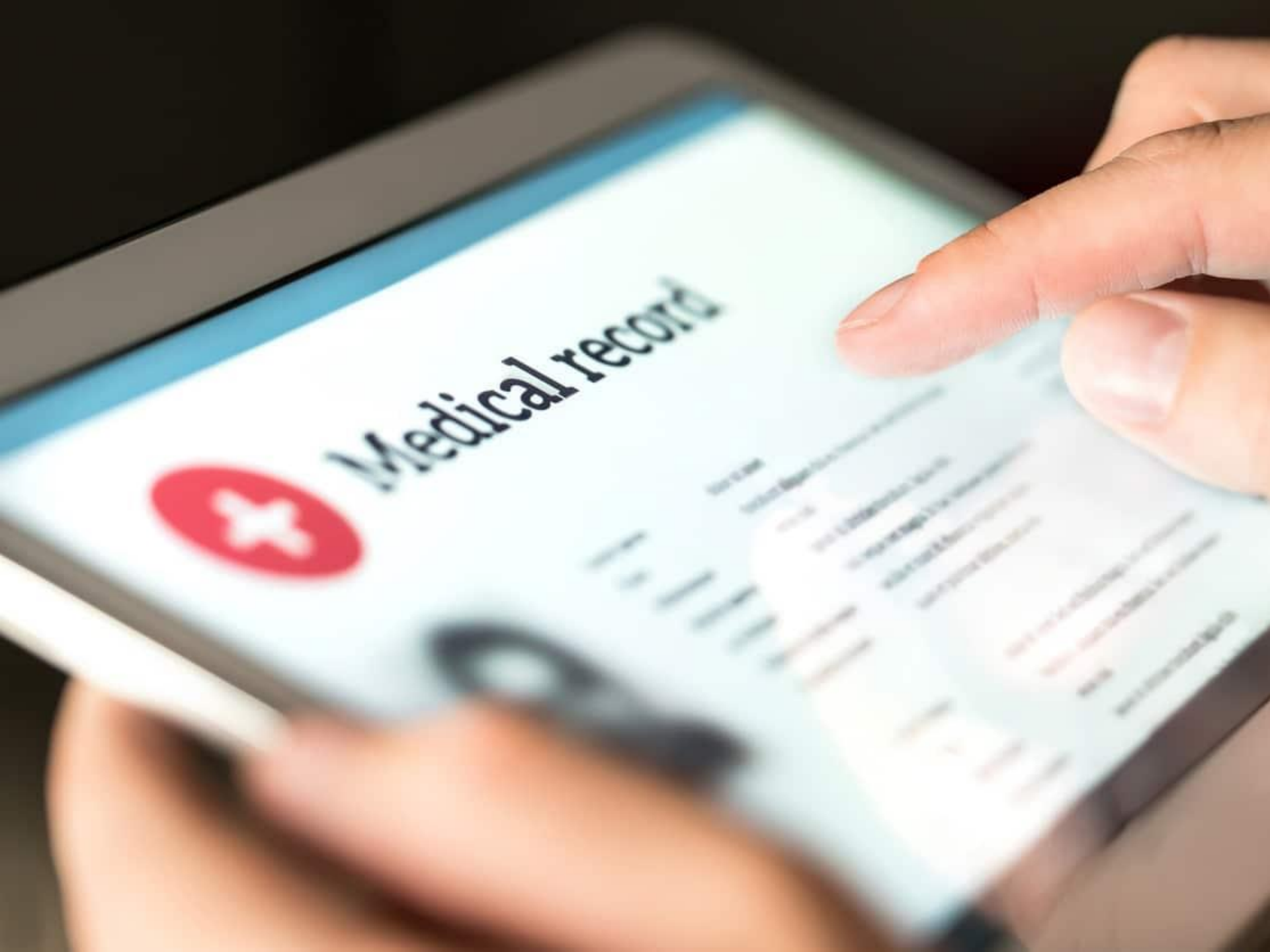
- Disadvantages of alcohol/drugs testing – what are they?

  - Costly investment – as most organisations would have to use an outside specialist drug/alcohol testing organisation the testing may require a lot of ongoing investment. Various drug-testing kits come at different prices; however, their performance might differ according to the rate. Moreover, these kits cannot be stored for a long period; hence, wholesale import would not be beneficial. Further collecting various samples may also be a headache, with some lab tests being very expensive. Thus, there is a lot of investment in drug testing.
  - Privacy intrusion – drug/alcohol tests may be seen as an intrusion by some workers at all levels, perhaps because they do not believe in the need for them as they do not feel they are affected by their personal use.
  - Worker human or data rights violation - if a worker files a case against their employer based on rights violation this could be bad for publicity as well as costly and time consuming to defend.
  - Confidentiality – individual health data related to alcohol/drugs testing must be processed confidentially, which can require additional efforts and safeguards to ensure this.
  - Can create an adversarial climate – workers may resent the tests and argue against them, if employers respond negatively to tests that show use of alcohol/drugs it could lead to grievances or cases of unfair (including constructive) dismissal.
  - Inaccuracy of results – tests show if there are drug residues present, but may not be able to determine if the worker was under influence of drugs while at work. Instant drug tests range between 97-99% accuracy and some legally consumed medicines can provide a positive result.


Medical record

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Health and medical records:

- *Health record could be a legal record and does not necessarily include confidential medical information*.
- Health records include information about the worker's details, where they work, hazards they have been exposed to and their fitness to continue to be exposed to the hazards.

DI2 Syllabus

Health and medical records:

- *Medical records are confidential records and may be used to make decisions on fitness of work*.
- They may include confidential clinical notes, test results and more general information about the worker's health.
- They must be kept in medical confidence by the occupational health professional responsible for the health surveillance scheme.
- Employers can only access this information with the written consent of the worker.

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Health and medical records:

ILO code of practice “Safety in the use of chemicals at work”:

Section 13.3. Keeping of medical records

13.3.1. The conditions under which, and the time during which, records resulting from medical surveillance of workers should be kept, the conditions under which they may be communicated or transferred and the measures necessary to keep them confidential, in particular when the information they contain is placed on computer, should be in accordance with national laws or practice, governed by recognised ethical guidelines. Where there are no recognised national laws or practice, a period of 30 years is recommended for keeping medical surveillance records.

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Health and medical records:

ILO code of practice:

13.3.2. Workers should have access to their own medical records, either personally, or through their own physicians.

13.3.3. Workers and their representatives should have access to the results of studies prepared from medical records, where individual workers cannot be identified.

13.3.4. The results of medical records should be made available to prepare appropriate health statistics and epidemiological studies, provided anonymity is maintained, where this may aid in the recognition and control of occupational diseases.

13.3.5. The competent authority should make arrangements in accordance with national practice to ensure that medical records are maintained for establishments that have closed down.

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Activity 14

The occupational hygienist has recommended health surveillance including biological monitoring for people potentially exposed to diesel particulate and manganese from welding fumes.

- *Explain to the HR manager the difference between general health assessment and health surveillance.*
- *Use the HSE health surveillance cycle to illustrate how it works.*

(400-500 words approx.)

DI2 Syllabus

Activity 15

You are creating a business case for widening the scope of the current audiometry program to include seasonal workers, and overseas temporary workers. Writes notes on the following to include in your business case:

- *The circumstances when it may be required (pre-employment, periodically based on findings of workplace assessments, following complaints etc.).*
- *The use of audiometry to measure hearing loss; method, interpretation of audiograms and how the results should be used.*
- *The advantages and disadvantages of audiometry programmes, including legal implications. (200 - 300 words approx.)*

DI2 Syllabus

Activity 16

You have read an article recently about the damaging effects of vibration in the workplace.

Use the ILO CoP Ambient Factors in the Workplace (Section 10.4) to make some notes on what your organisation (XYZ Growers) may need for vibration health surveillance.

(200 - 300 words approx.)

DI2 Syllabus

Activity 17

Biological monitoring is a specific form of medical surveillance. With reference to ILO CoP Occupational exposure to airborne substances harmful to health (section 4) write a brief email to the senior management team explaining:

- *What biological monitoring is*
- *The role of biological limits*
- *How it compares to airborne monitoring (environmental monitoring).*

(200 - 300 words approx.)

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Activity 18

Concerns have been raised about the general health of shift workers at XYZ Growers. You need to do some research and present back to the senior management team key points on the following:

- *How shift working can be managed with reference to the British HSE's HSG256*
- *What is fatigue (reference to the British HSE's Human factors: Fatigue website).*
- *Managing fatigue*

(200 - 300 words approx.)

DI2 Syllabus

Activity 19

The current alcohol and drug policy is only a paragraph and is vague. Prepare notes for your meeting with the HR team to create a new policy on:

- *How to establish and maintain the policy*
- *How the policy will tie in with other relevant policies/procedures e.g., disciplinary procedures*
- *Benefits of pre-employment health screening for alcohol and drugs (especially in high-risk roles and organisations)*
- *When testing should be carried*
- *The disadvantages and limitations of alcohol and drug testing.*

(200 - 300 words approx.)

DI2 Syllabus

Activity 20

Keeping health and medical records confidential is essential and has also recently been linked to the development of legislation in some countries.

Explain this statement with reference to:

- *ILO Code of practice – specifically section 13.3 Keeping of medical records*
- *Differentiating between health and medical records*
- *Confidentiality and access*
- *Applicable local legislation*

(800 - 1000 words approx.)

DI2 Syllabus

EXTRA: ISO 45003 – psychosocial hazards

The organization should identify hazards of a psychosocial nature. These can include:

a) aspects of how work is organized (for examples, see Table 1);

b) social factors at work (for examples, see Table 2); and

c) work environment, equipment and hazardous tasks (for examples, see Table 3).

Table 1 — Aspects of how work is organized

Examples	
roles and expectations	— role ambiguity — role conflict — duty of care for other people — scenarios where workers do not have clear guidelines on the tasks they are expected to do (and not do) — expectations within a role that undermine one another (e.g. being expected to provide good customer service, but also to not spend a long time with customers) — uncertainty about, or frequent changes to, tasks and work standards

DI2 Syllabus

EXTRA: ISO 45003 – psychosocial hazards

Table 1 *(continued)*

Examples	
job control or autonomy	— limited opportunity to participate in decision-making — lack of control over workload — low levels of influence and independence (e.g. not being able to influence the speed, order or schedule of work tasks and workload)
job demands	— underuse of skills — continuous work exposure to interaction with people (e.g. the public, customers, students, patients) — having too much to do within a certain time or with a set number of workers — conflicting demands and deadlines — unrealistic expectations of a worker's competence or responsibilities — lack of task variety or performing highly repetitive or meaningless tasks — requirements for excessive periods of alertness and concentration — working with aggressive or distressed people

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EXTRA: ISO 45003 – psychosocial hazards

organizational change management	— lack of practical support provided to assist workers during transition periods — prolonged restructuring — consultation and communication about workplace changes is lacking, of poor quality, untimely or not meaningful
remote and isolated work	— working in locations that are far from home, family, friends and usual support networks (e.g. isolated working or 'fly-in-fly-out' work arrangements) — working alone in non-remote locations without social/human interaction at work (e.g. working at home) — working in private homes (e.g. providing care or domestic roles in other people's homes)
workload and work pace	— work overload or underload — high levels of time pressure — continually subject to deadlines — machine pacing
working hours and schedule	— lack of variety of work — shift work — inflexible work schedules — unpredictable hours — long or unsociable hours — fragmented work or work that is not meaningful

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EXTRA:

ISO 45003 –

psychosocial

hazards

Table 1 *(continued)*

Examples	
job security and precarious work	— uncertainty regarding work availability — non-standard employment that is low paid and/or insecure — working in situations that are not properly covered or protected by labour law or social protection

Table 2 — Social factors at work

Examples	
interpersonal relationships	— poor communication — poor relationships between managers, supervisors, coworkers, and clients or others that workers interact with — interpersonal conflict — harassment, bullying — third party violence
leadership	— lack of clear vision and objectives — management style unsuited to the nature of the work and its demand — failing to listen or only casually listening to complaints and suggestions — withholding information — providing inadequate communication and support — lack of accountability — lack of fairness — inconsistent and poor decision-making practices

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EXTRA: ISO 45003 – psychosocial hazards

organizational/workgroup culture:	— poor communication — low levels of support for problem-solving and personal development — lack of definition of, or agreement on, organizational objectives — inconsistent and untimely application of policies and procedures, unfair decision making
recognition and reward	— an imbalance between workers' effort and formal and informal recognition and reward — lack of appropriate acknowledgement and appreciation of workers' efforts in a fair and timely manner
career development	— career stagnation and uncertainty, under-promotion or over-promotion, lack of opportunity for skill development
support	— lack of support from supervisors and coworkers, lack of access to support services, lack of information/training, to support work performance

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EXTRA: ISO 45003 – psychosocial hazards

Table 2 *(continued)*

Examples	
supervision	— lack of constructive performance feedback and evaluation processes — lack of encouragement/acknowledgement, — lack of communication, — lack of shared organizational vision and clear objectives — lack of support and/or resources to facilitate improvements in performance — lack of fairness
civility and respect	— lack of trust, honesty, respect, civility, and fairness., lack of respect and consideration in interactions among workers as well as with customers, clients, and the public
work/life balance	— work tasks, roles, schedules or expectations that cause workers to continue working in their own time

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EXTRA: ISO 45003 – psychosocial hazards

violence at work	Incidents involving an explicit or implicit challenge to health, safety or well-being at work. Violence can be internal, external or client initiated, e.g.: — abuse — threats — assault (physical or verbal) — gender-based violence
harassment	Unwanted, offensive, intimidating behaviours (sexual or non-sexual in nature) which relate to one or more specific characteristic of the targeted individual, e.g.: — race — gender — religion — sexual orientation — disability — age

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EXTRA: ISO 45003 – psychosocial hazards

bullying	Repeated (more than once) unreasonable behaviours which can present a risk to health, safety and well-being at work. Behaviours can be overt or covert, e.g.: — social or physical isolation — assigning meaningless or unfavourable tasks — name-calling, insults and intimidation — undermining behaviour — undue public criticism — withholding information or resources critical for one's job — malicious rumours or gossiping — assigning impossible deadlines

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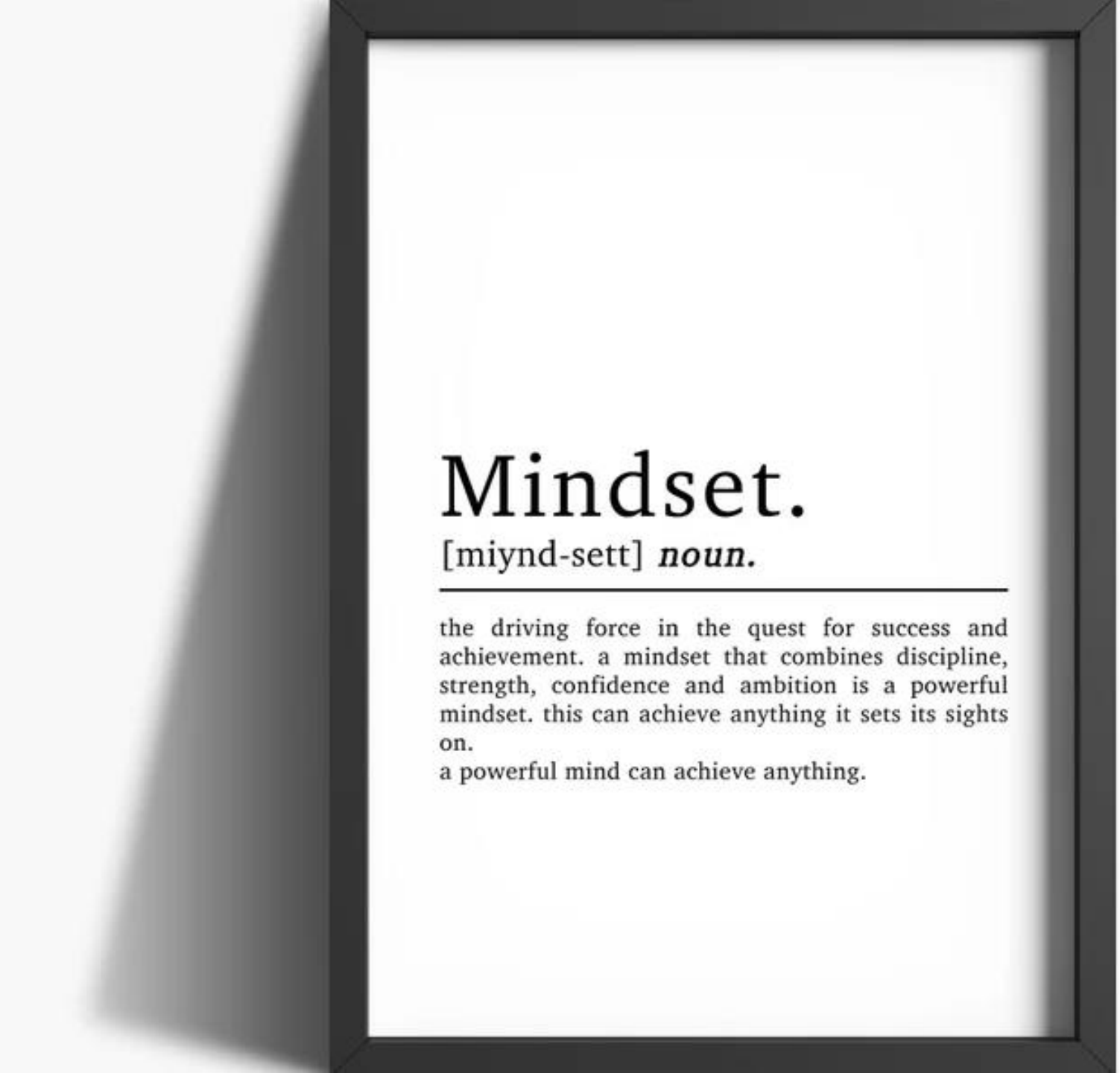
EXTRA: ISO 45003 – psychosocial hazards

Table 3 — Work environment, equipment and hazardous tasks

Examples	
work environment, equipment and hazardous tasks	— inadequate equipment availability, suitability or maintenance — poor workplace conditions such as lack of space, poor lighting, excessive noise — lack of the necessary tools, equipment or other resources to complete work tasks — working in extreme conditions or situations, such as very high or low temperatures, or at height — working in unstable environments such as conflict zones


Mindset.
[miynd-sett] noun.
the driving force in the quest for success and achievement. a mindset that combines discipline, strength, confidence and ambition is a powerful mindset. this can achieve anything it sets its sights on.
a powerful mind can achieve anything.

+IMPAC
Less risk, safe people, better business

DI2 SYLLABUS: ELEMENT 4

DI2 Syllabus

Learning Outcome & Content:

- You should be able to demonstrate an understanding of how hazardous substances can affect the human body.
- Focus: Hazardous substances.

DI2 Syllabus

Assessment Criteria:

- Explain the structure and function of human anatomical systems and special sensory organs.
- Describe the main routes and methods of entry of hazardous substances into the human body.
- Outline the concepts of target organs and target systems in relation to attack by hazardous substances.
- Explain the body's defensive responses, with particular reference to the respiratory system.
- Explain the distinction between inhalable and respirable dust.

DI2 Syllabus

Cross reference with assessment criteria 9.7 – asbestos and lead

- *The structure and function of human anatomical systems: respiratory, digestive, circulatory, nervous system and the special sensory organs (skin, eyes and nose)*
- *The concept of target organs and target systems in relation to attack by hazardous substances; local and systemic effects*
- *The body's defensive responses (innate and adaptive) with particular reference to the respiratory system*
- *The distinction between inhalable and respirable dust*

DI2 Syllabus

Explain the structure and function of human anatomical systems and special sensory organs.

- This section is a pure theoretical and studying section.
- Pure biology.
- I suggest you look at the video clips.

DI2 Syllabus

Describe the main routes and methods of entry of hazardous substances into the human body. *(New syllabus)*

DI2 Syllabus

Describe the main routes and methods of entry of hazardous substances into the human body. *(New syllabus)*

- Eyes: through the mucous membrane or tear duct of the eyes (Covid, Hepatitis B, ammonia gas, etc.)
- Nose: airborne particles breathed in – dusts, fibres, gases, vapours, etc. Travel to lungs or get absorbed in blood stream.
- Mouth: through contaminated hands, food, drinks, smoking, etc. Absorbed directly through mouth and travel to stomach and be absorbed there. Airborne substances can be breathed in through mouth and travel to lungs.

DI2 Syllabus

Describe the main routes and methods of entry of hazardous substances into the human body. *(New syllabus)*

- Skin: direct contact with hazardous substance can cause dermatitis or burns, e.g., cement . Other substances such as solvents can be absorbed through the skin into the blood stream. Harmful micro-organisms can also get into the body through cuts and wounds.

DI2 Syllabus

The main methods of entry of hazardous substances:

- Inhalation (nose and mouth)
- Ingestion via the digestive tract (mouth)
- Skin pervasion (absorption)
- Injection
- Aspiration (the accidental breathing in of food or fluid into the lungs - breathing in a foreign object)

DI2 Syllabus

Outline the concepts of target organs and target systems in relation to attack by hazardous substances.

- Target organ or system is an organ or system within the human body on which a specified toxic substance exerts its effects, e.g., lungs, liver, kidneys, brain, skin, bladder or eyes.

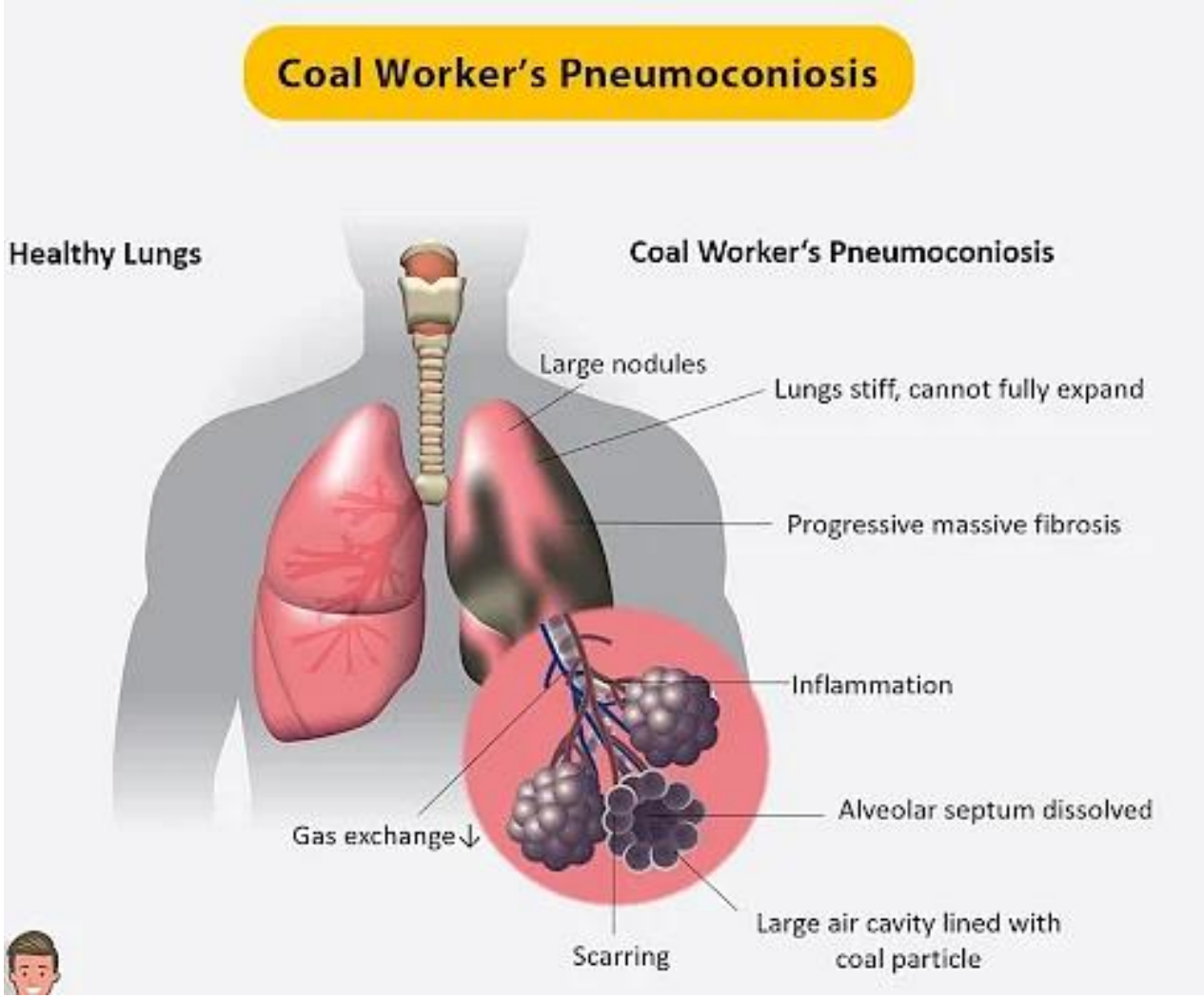
DI2 Syllabus

Outline the concepts of target organs and target systems in relation to attack by hazardous substances.

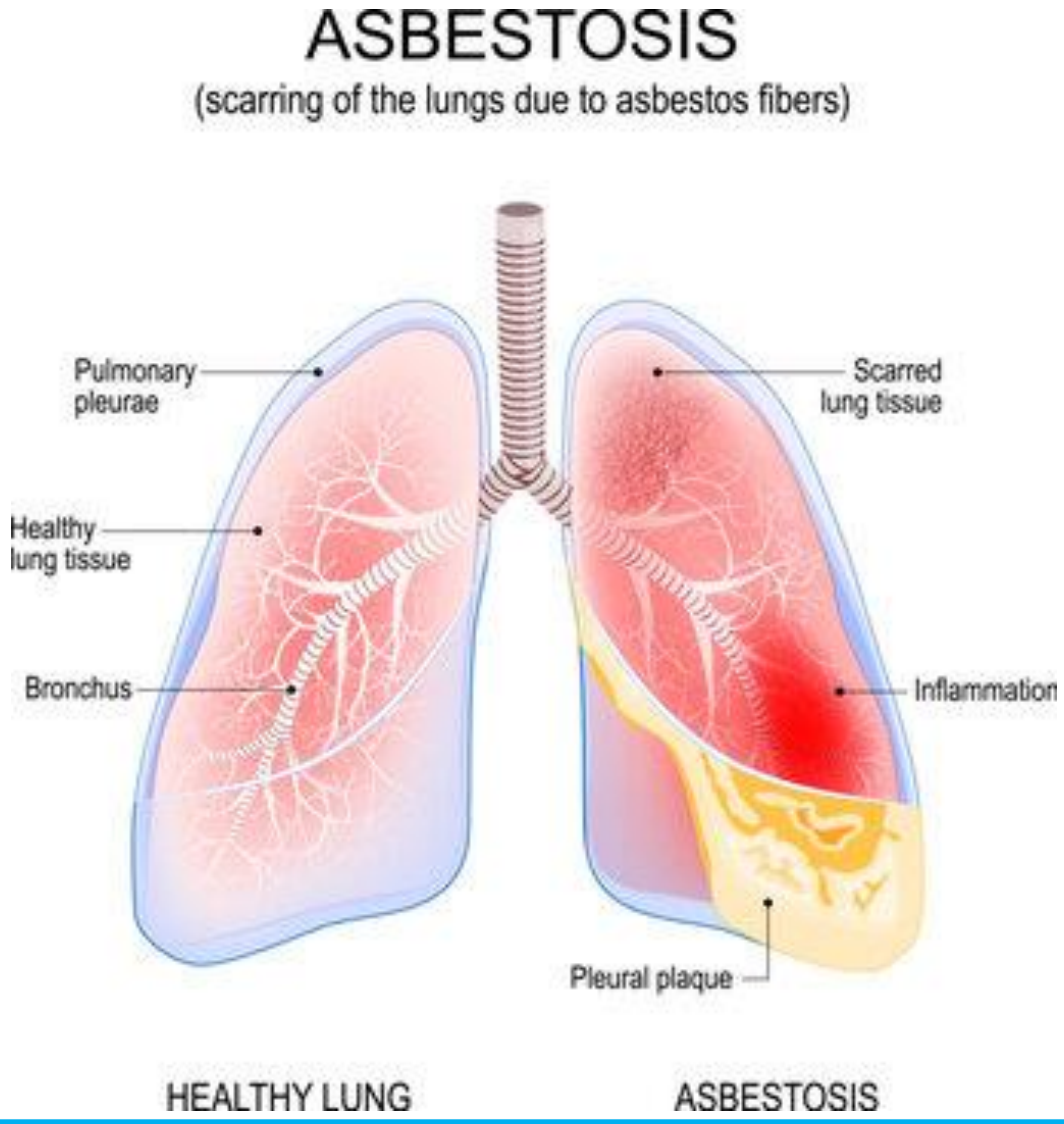
Effect on organs:

- Coal dust – lungs (pneumoconiosis); Asbestos fibres – lungs (asbestosis); Silica dust – lungs (silicosis)
- Mineral oils – skin
- Benzidine – bladder

DI2 Syllabus



DI2 Syllabus



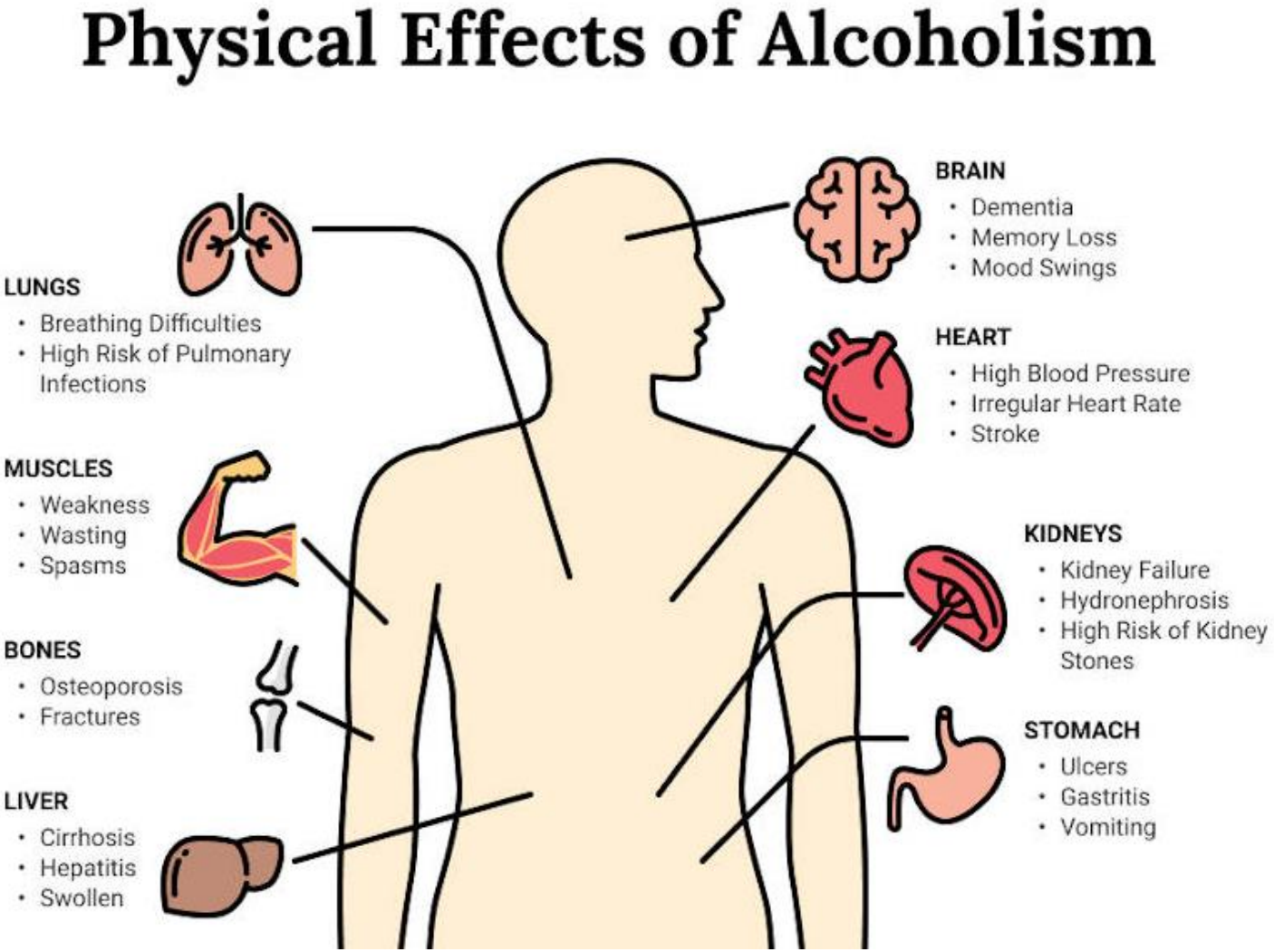
DI2 Syllabus

Outline the concepts of target organs and target systems in relation to attack by hazardous substances.

Effect on systems:

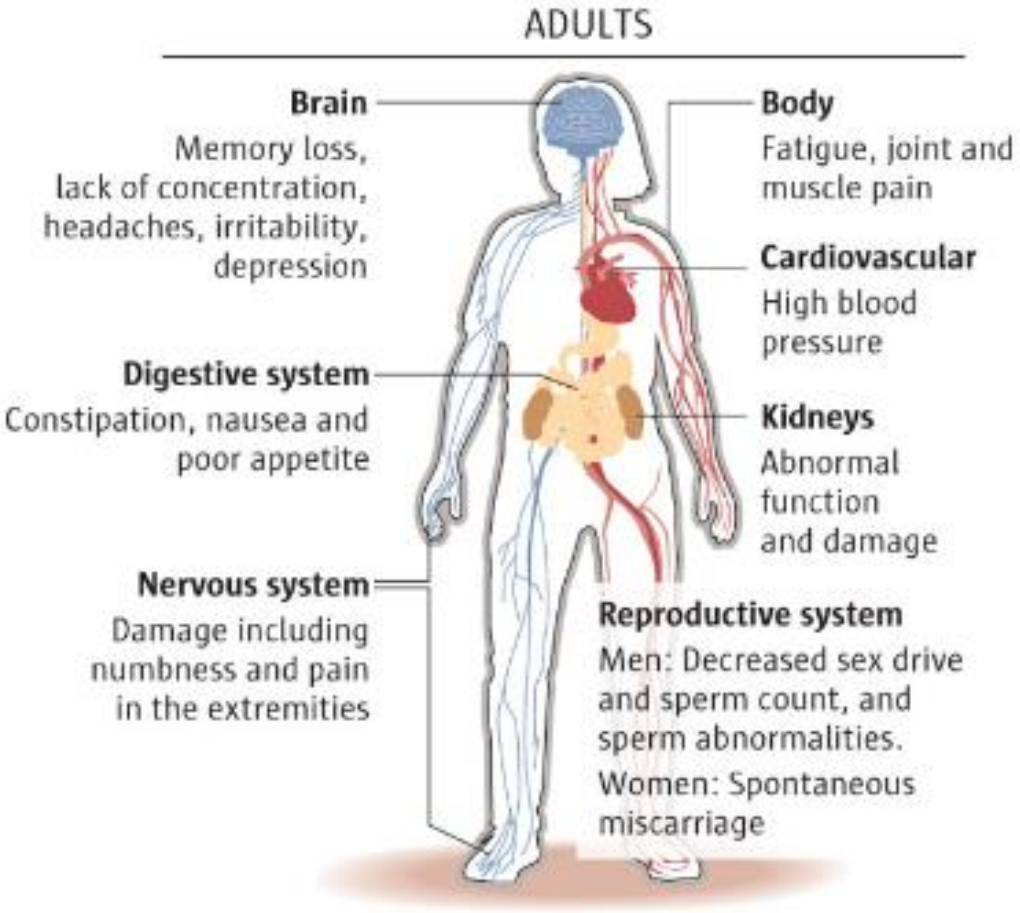
- Alcohol – central nervous system, liver
- Lead – bone marrow and brain
- Mercury – central nervous system

DI2 Syllabus



DI2 Syllabus

Lead:



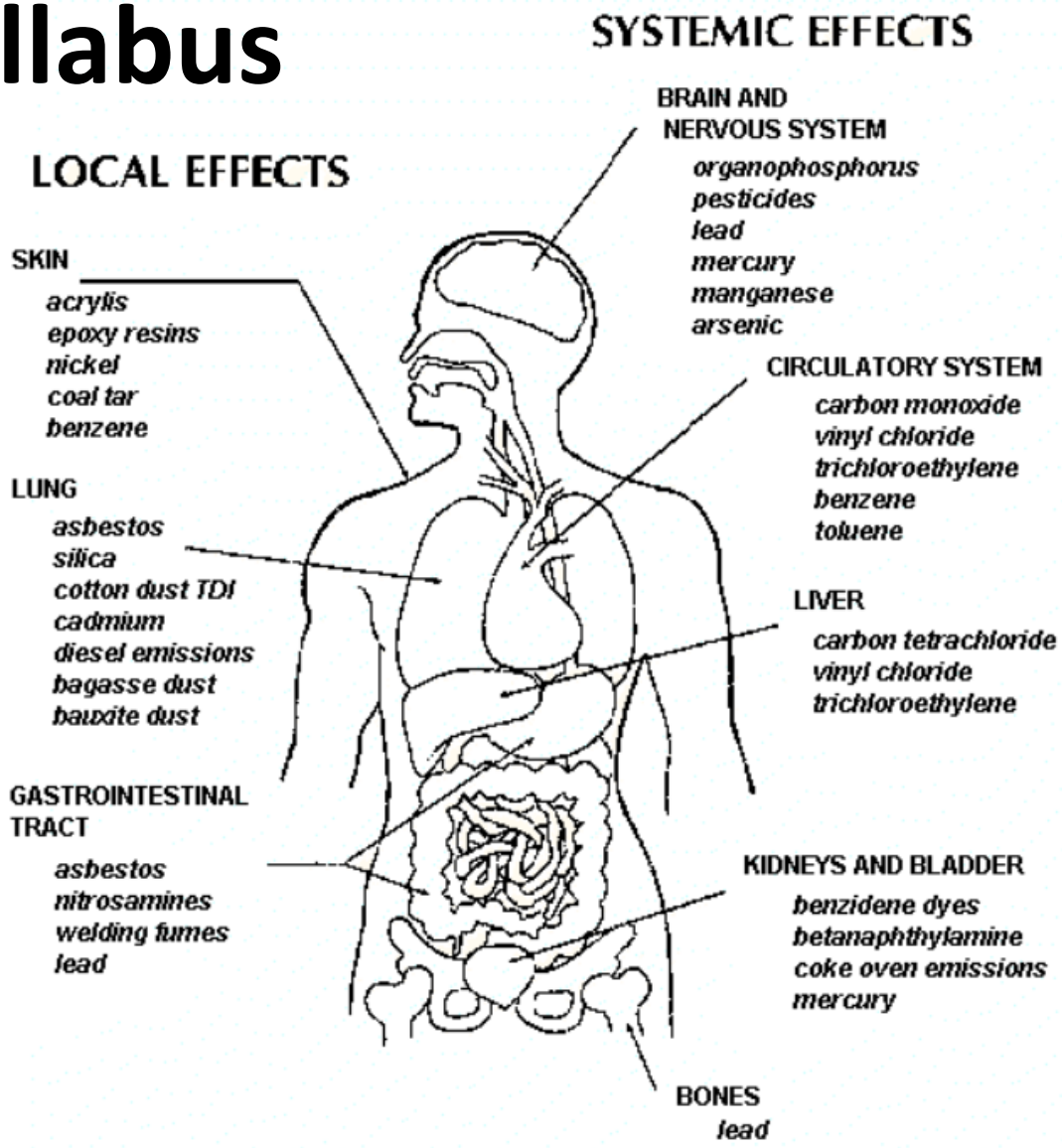
DI2 Syllabus

- Effects of hazardous substances
  - Local & systemic effects
    - Local: where a hazardous substance causes harm at the point of first contact with the body, e.g., if a substance caused direct harm to the lungs when it was breathed in it would be said to have a local effect on the lungs.
    - E.g., Some substances like ammonia, chlorine, welding fumes and exhaust fumes can cause local irritation to the lungs when they are inhaled.

DI2 Syllabus

- Effects of hazardous substances
  - Local & systemic effects
    - Systemic: when a hazardous substance enters via a route, such as the lungs, and has an effect on the body elsewhere than its point of first contact.
    - E.g., if carbon monoxide is inhaled it has no direct effect on the lungs, however, it acts as a systematic poison by replacing oxygen in the bloodstream thereby affecting cellular respiration.

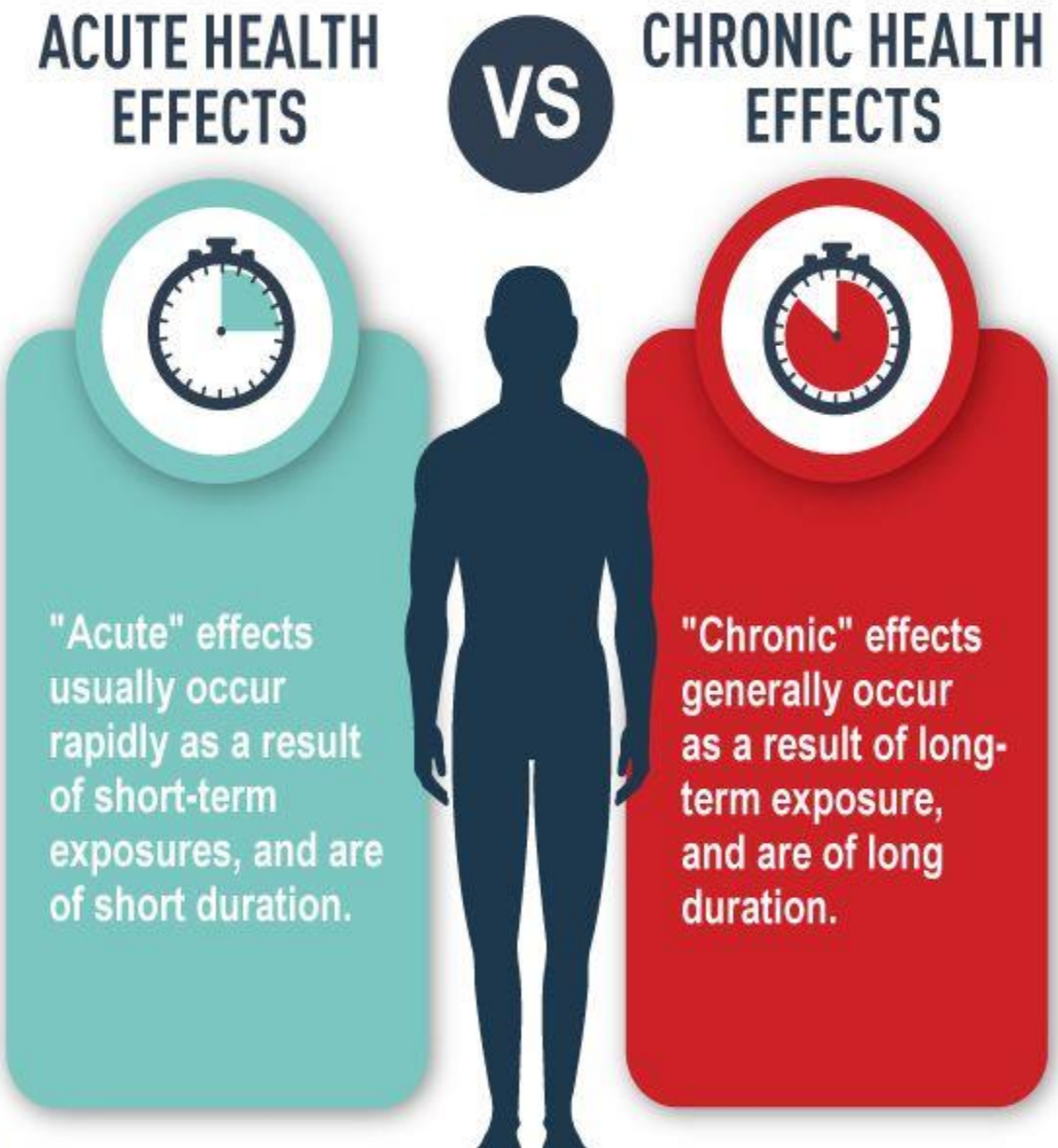
DI2 Syllabus



DI2 Syllabus

- Acute versus chronic health effects:
  - The effect of the substance on the body not only depends on the substance, but also the dose and the susceptibility of the individual.
  - No substance can be considered non-toxic – there are only differences in the degree of effect.
  - Many hazardous substances today can have both an acute and chronic effect.

DI2 Syllabus



DI2 Syllabus

Acute effect:

- An immediate, or rapidly produced, adverse effect, following a single, or short-term, exposure to a hazardous substance, which is usually reversable (the obvious exception is death).
- E.g., noticeable symptoms like fainting, dizziness, lack of coordination, skin rashes, itching, coughing, wheezing, or sneezing.

DI2 Syllabus

Acute toxicity:

- Acute toxicity refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.
- Acute toxicity is generally thought of as a single, short-term exposure where effects appear immediately and are often reversible. An example of acute toxicity relates to the over consumption of alcohol and “hangovers”.

DI2 Syllabus

Chronic effect:

- An adverse health effect produced as a result of prolonged or repeated exposure to an agent.
- The gradual or latent effect develops over time and is often irreversible.
- The effect may go unrecognised for a number of years.
- E.g., lead or mercury poisoning, cancer and asthma.

How Stress Effects The Body

CENTRAL NERVOUS SYSTEM

Stress starts the fight-or-flight response to prepare your body to react to stress. As a result, your body's immune system prepares for injury instead of maintaining health or attacking pathogens or mutations.

RESPIRATORY AND CARDIOVASCULAR PROBLEMS

When you're stressed, the need for oxygen becomes greater. The muscles around the lungs tense and breathing becomes faster and more shallow.

CARDIOVASCULAR SYSTEM

Stress increases heart rate, blood pressure, and the blood's ability to clot in case of injury. Over time, this can damage your arteries and increase your chance of heart attack and stroke.

REPRODUCTIVE SYSTEM

Stress can interfere with the reproductive system in both males and females, making it hard to conceive. It can also lead to problems with erectile dysfunction, low sex drive, and missed periods.

DIGESTIVE SYSTEM

Stress can lead to a rush of hormones being released into your body, which can upset your stomach and lead to heartburn, indigestion, nausea, diarrhea, and stomachache.

ENDOCRINE SYSTEM

When you're stressed, extra sugar (glucose) can be released into the body and hormones can become unbalanced, increasing your chances of developing diabetes.

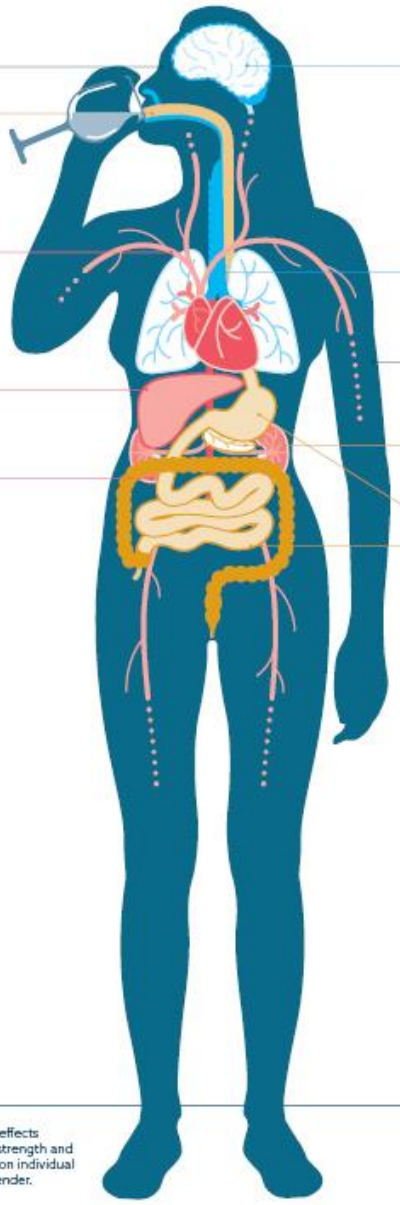
MUSCULOSKELETAL SYSTEM

When you're stressed, you tend to tense up your muscles, which can lead to body aches, headaches, and pain. Stress can also induce inflammation and flare-up old injuries.

DI2 Syllabus

- Some hazardous substances can have both acute and chronic effects:
  - Lead and alcohol
  - Refer to next slide.

Short-term effects of drinking alcohol*



Eyes
- blurred or double vision

Mouth and throat
- slurred and confused speech

Blood and circulation
- alcohol levels in the blood rise
- alcohol moves rapidly to all parts of the body, including to an unborn baby

Liver
- breaks down alcohol at an average rate of one standard drink per hour

Kidneys and fluid balance
- more urine is made
- loss of minerals and salts
- dehydration

Bones and muscles
- clumsiness and difficulty walking
- broken bones, sprains, cuts, bruises and internal injuries (from falls, assaults and traffic crashes)

Whole of body
- coma and death from alcohol poisoning
- death from injuries
- existing health conditions made worse
- interactions with other drugs/medicines
- alcohol breakdown products used for energy

Brain and nervous system
- thought processes, judgement and concentration are impaired
- mood changes
- loss of memories (blackouts)
- disrupted sleep

Lungs
- alcohol levels in the breath rise

Skin
- flushing and sweating

Pancreas and sugar balance
- sugar levels in the blood lower

Stomach and intestines
- alcohol is absorbed from the gut into the blood
- indigestion
- diarrhoea
- nausea and vomiting
- inflamed lining

Sex organs and pregnancy
- sexual performance reduces (in men)
- chance of unsafe sex, sexual assault and unplanned pregnancy
- potential miscarriage, stillbirth or long-term damage to an unborn baby

For more information, go to alcohol.org.nz

* The likelihood of experiencing these effects varies depending on the amount, the strength and how quickly alcohol is consumed, and on individual factors, such as body type, age and gender.

Te Whatu Ora
Health New Zealand

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Long-term health effects of drinking alcohol*

Whole of body
- existing health conditions made worse, such as mental illness and diabetes
- death from injury or disease

Mouth, throat and voicebox
- cancer

Lungs
- inflammation, usually from infections

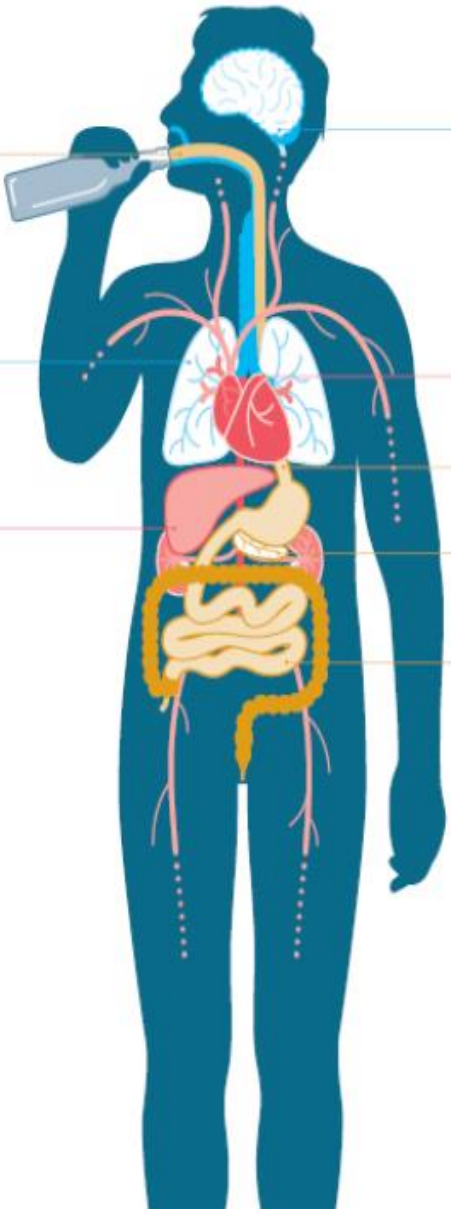
Breasts
- cancer (in women)

Liver
- swelling and pain
- alcoholic liver disease, such as cirrhosis
- cancer

Blood and immune system
- changes in red and white blood cells
- anaemia
- less ability to fight off infections

Skin and fat
- yellowing of skin and spider veins
- potential weight gain

Bones and muscles
- weakness
- muscle wasting



Mental health and addiction
- mood disorders, such as depression and anxiety
- alcohol dependence

Brain and nervous system
- brain damage
- memory loss
- disrupted sleep
- stroke (bleeding on the brain)
- nerve damage

Heart and circulation
- cardiovascular disease
- high blood pressure

Stomach and food pipe
- inflamed lining and bleeding
- cancer of the food pipe

Pancreas
- inflammation and damage
- pancreatitis

Intestines
- inflamed lining
- cancer

Sex organs
- impotence and loss of sex drive
- wasting of testicles
- reduced fertility (both sexes)

DI2 Syllabus

Explain the body's defensive responses, with particular reference to the respiratory system.

- Innate defense response provides early defence from hazardous substances.
- These are biomechanical and cellular defence mechanisms that are in place before a hazardous substance is encountered causing the body to respond promptly to any hazardous substance encountered.

DI2 Syllabus

The body's innate defensive response to hazardous substances include:

- Physical and chemical defences offered by the skin and mucus membranes
- Defensive cellular response provided by phagocytic cells (A type of immune cell that can surround and kill microorganisms, ingest foreign material, and remove dead cells. It can also boost immune responses. It is a type of white blood cell).
- Defensive proteins (antibodies), e.g., Immuniglobulins.

DI2 Syllabus

Respiratory system:

- Nose and mouth:
  - Particles of substances small enough to stay airborne may be inhaled through the nose (nasal route) or the mouth (oral route).
  - Probability of inhalation depends on particle size, air movement and breathing rate.
  - The nasal route is a more efficient particle filter than the mouth.
  - E.g., wood and cement dust particles, gases such as carbon monoxide.

DI2 Syllabus

Muco-ciliary clearance:

- Particles not deposited in the nose or mouth progress further into the respiratory system.
- These lower passages are lined with mucus and well supplied with fine hair-like cells, which sweeps rhythmically towards the outside and pass along particles.
- Particles between 10 and 5 micron in size are typically dealt with at this stage.

DI2 Syllabus

Gastrointestinal (ingestion):

- Mouth – saliva in the mouth provides a useful defence against hazardous substances that are not excessively acid or alkaline or present in large quantities.
- Gastrointestinal tract: Acid in the stomach also provides a useful defence similar to saliva. Vomiting and diarrhoea are additional reflex mechanisms which act to remove substances that the body is not equipped to deal with.

DI2 Syllabus

Skin:

- The body's largest organ
- Outer part of the skin is covered in an oily layer preventing some substances from entering the body
- The outer part of the epidermis is made up of dead skin cells – these are often sacrificed to substances without harm to the newer cells underneath.

DI2 Syllabus

Skin:

- When attacked, the skin may blister to protect the layers beneath.
- Openings in the skin (sweat pores, hair follicles, cuts) can allow entry to substances.
- The skin may be permeable (allowing liquids or gases to pass through) to some chemicals (e.g., toluene).
- Toluene is found naturally in crude oil and is used in oil refining and the manufacturing of paints, lacquers, explosives (TNT) and glues. In homes, toluene may be found in paint thinners, paintbrush cleaners, nail polish, glues, inks and stain removers.

DI2 Syllabus

Skin:

- Workers in the sewage industry or agriculture (animals) can come into contact with Leptospira bacteria, which can also pass-through breaks in the skin.
- A bacterial disease spread through the urine of infected animals.
  - Humans can get leptospirosis through direct contact with urine from infected animals or through water, soil or food contaminated with their urine.
  - It's most common in warm climates.
  - High fever, headache, bleeding, muscle pain, chills, red eyes and vomiting are some symptoms.
  - Without treatment, leptospirosis can lead to kidney and liver damage and even death. Antibiotics clear the infection.

DI2 Syllabus

Skin:

- Other blood-borne viruses, such as Hepatitis, may defeat the skin by being injected into the blood stream.
- Hepatitis means inflammation of the liver. The liver is a vital organ that processes nutrients, filters the blood, and fights infections. When the liver is inflamed or damaged, its function can be affected. Heavy alcohol use, toxins, some medications, and certain medical conditions can cause hepatitis. Viral infections are the most common cause of hepatitis.
- The five main viral classifications of hepatitis are hepatitis A, B, C, D, and E.

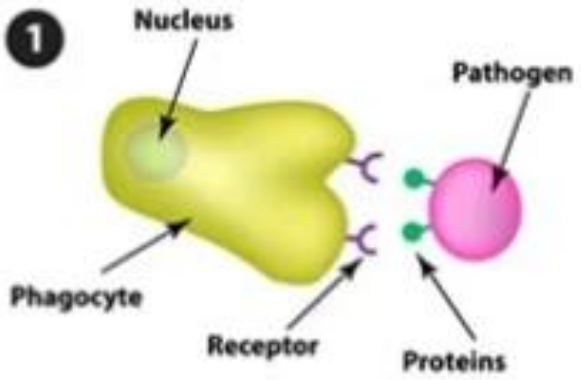
DI2 Syllabus

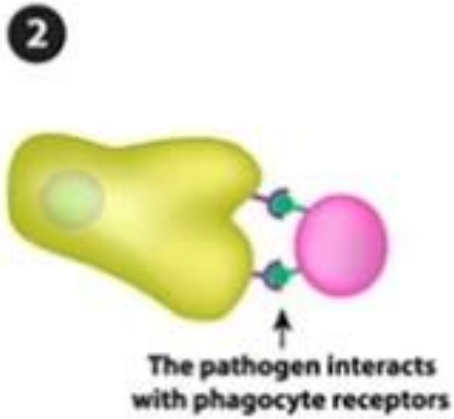
Cellular Defences:

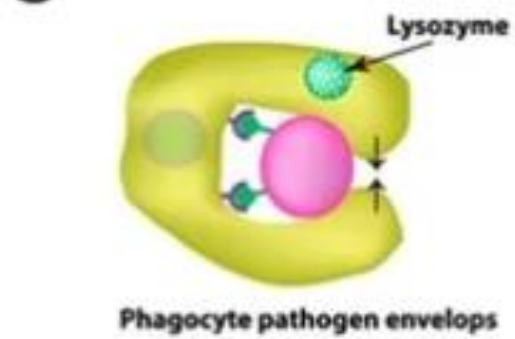
- Phagocytosis:
  - The process by which invading particles, including insoluble solids and particulate matter like bacteria or viruses, are engulfed by phagocytes, primarily in order to destroy them with digestive enzymes or render them harmless.
  - Phagocytosis is the process by which a cell uses its plasma membrane to engulf a large particle, giving rise to an internal compartment called the phagosome.
  - Phagocytosis is a cellular process for ingesting and eliminating particles larger than 0.5 μm (micrometer) in diameter

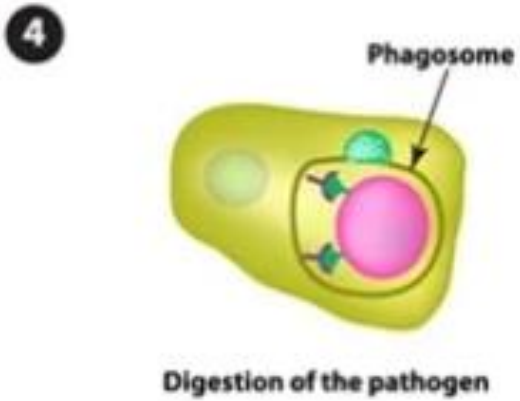
PHAGOCYTOSIS

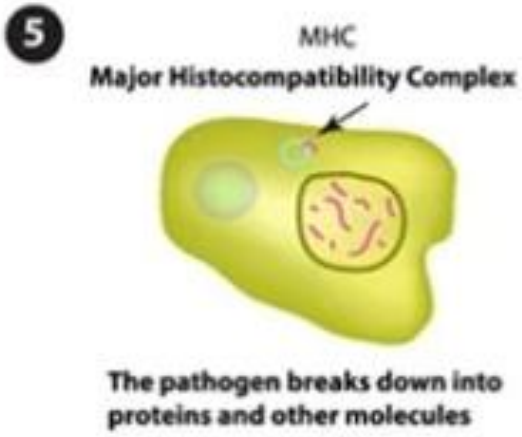
INNATE (NONSPECIFIC) IMMUNITY

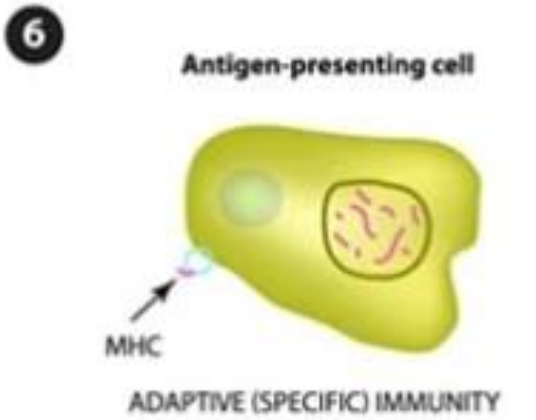












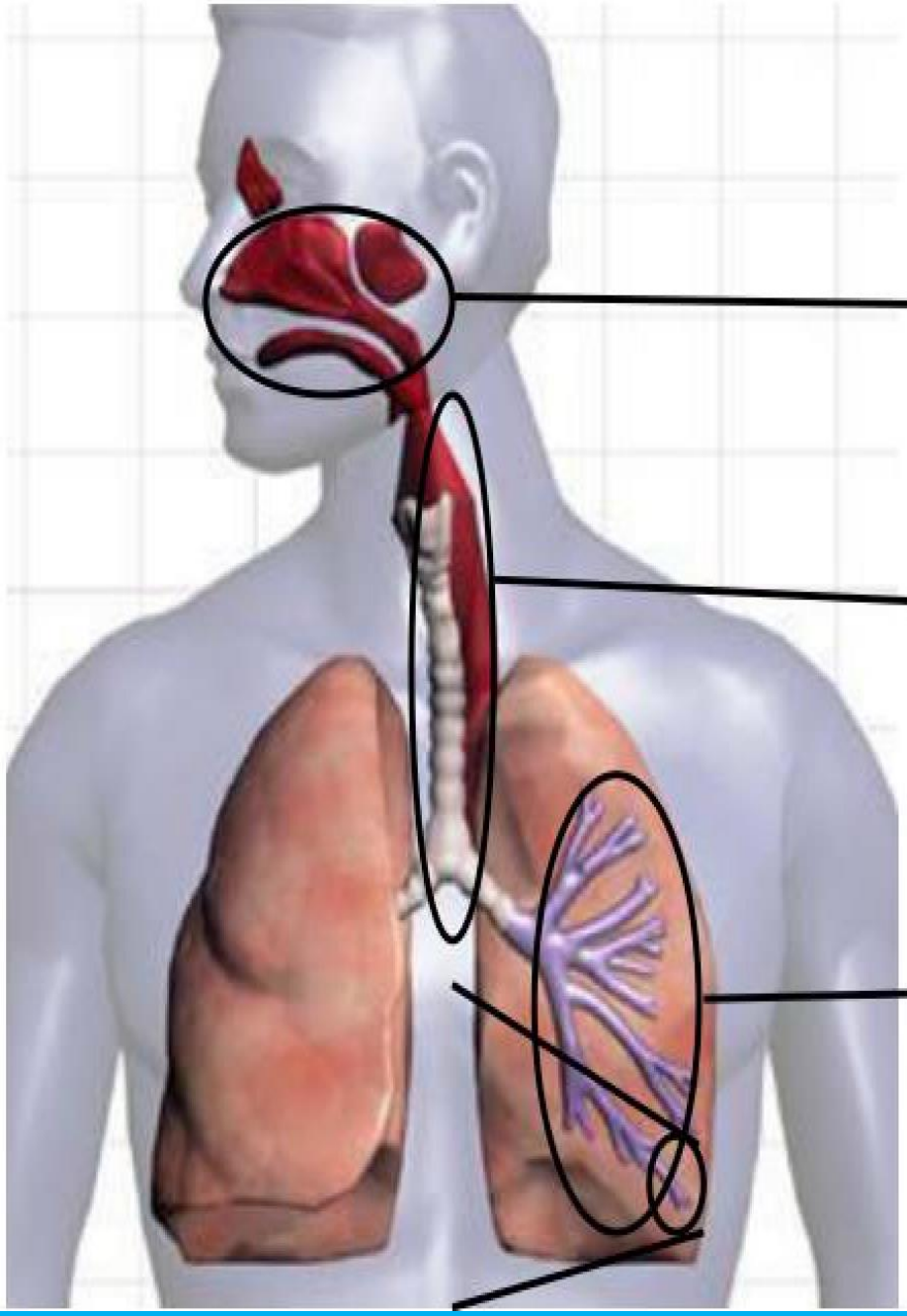
DI2 Syllabus

Explain the distinction between inhalable and respirable dust.

- As defined by the World Health Organization, inhalable dust refers to a particle “that can be breathed into the nose or mouth.”
- Respirable dust is a sub-set of inhalable dust, covering any “fraction of dust which penetrates to the gas-exchange region of the lungs – the alveoli.”
- This classification is determined by particle size.

DI2 Syllabus

- Inhalable dust examples:
  - Certain hardwood dust (which may cause nasal cancer), dusts from grinding lead containing alloys, and earth-moving activities involved in construction and remediation.
- Respirable dust examples:
  - Dusts containing free crystalline silica, and quartz, silica, and various hazardous metals, made airborne via grinding or drilling processes. Also, coal dust from coal mining and transportation.



Types of dust

Inhalable dust

Gets into the mouth and nose

Thoracic dust

Reaches the upper respiratory area

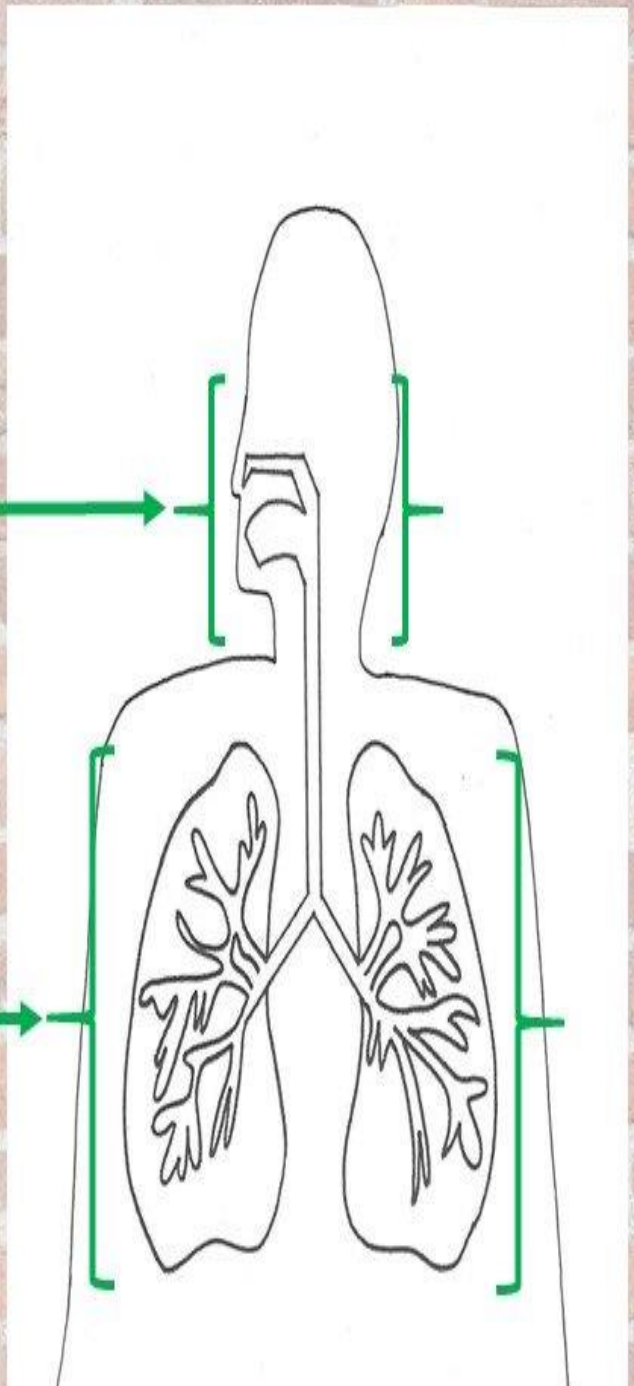
Respirable dust

Reaches the finest parts of the lungs (alveola)

General nuisance dust is made up of particles which are usually larger and heavier and these fall to the floor or onto surrounding work surfaces.

Inhalable dust is made up of particles which are small enough to be inhaled, where they can settle in the nose and throat. The majority of these particles are caught in the nasal hairs and are removed by blowing your nose, spitting or coughing.

Respirable dust is made up of particles so small that they will bypass the natural protection in the nose and throat and are inhaled deep into your lungs where they can settle and remain. Respirable dust particles are sometimes too small to see.



DI2 Syllabus

You are preparing an awareness raising initiative for staff and contractors on the human body and how it can be affected by hazardous substances.

Explain the important facts in a simple but compelling way, using examples, under the following main headings: (2000 – 2500 words)

- *Human anatomical systems: respiratory, digestive, circulatory, nervous system and the special sensory organs (skin, eyes and nose)*
- *The main routes (eyes, nose, mouth, skin) and methods of entry (inhalation, ingestion, skin pervasion, injection, aspiration) of hazardous substances into the human body*
- *Target organs and target systems, local and systemic effects*
- *The body's defensive responses (innate and adaptive), with particular reference to the respiratory system.*

The Iceberg Illusion

Success is an iceberg

WHAT PEOPLE SEE

WHAT PEOPLE DON'T SEE

Persistence

Failure

Sacrifice

Disappointment

Dedication

Hard work

Discipline

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COURSE