

Biological Agents at Work

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What is a Biological Agent

- A biological agent is a micro-organism, including those that have been genetically modified
- A biological agent may be able to provoke any infection, allergy or toxicity
- Can be bacteria, fungus, virus, parasite or the toxins produced by those organisms

Work Activity and Biological Agents

- Work in biotechnology, including the production of some pharmaceutical products
- Work activities where there is contact with animals or products of animal origin
- Work in health care
- Work in clinical, veterinary and diagnostic laboratories
- Work in refuse disposal plants
- Work in sewage purification installations
- Foreign travel

Transmission of Biological Agents

- Biological agents can be transmitted by:
 - Direct contact between an infected source and another person
 - Indirect contact e.g. touching a surface
 - Droplet spread- sneezing/coughing
- Different agents have different routes of transmission e.g. TB germs can only pass form direct contact with infected respiratory secretions, for example coughing or sneezing

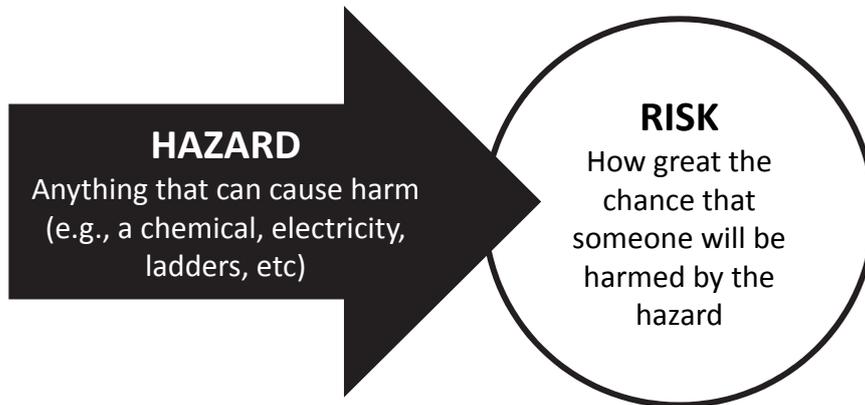
Legal

- There is a legal obligation on the employer to conduct a risk assessment
- Risk assessment must be kept in written form
- Risk assessment must be reviewed regularly or when there is a change in conditions at the place of work which may effect any employee's exposure to a biological agent

Legal

- It is the duty of every employer, under Section 19 of the Safety, Health and Welfare at Work Act 2005 to carry out a risk assessment.
- In addition to this requirement under the 2005 Act, the Biological Agents regulations require that the employer:
 - Assesses any risk to the safety and health of employees resulting from any activity at that employer's place of work likely to involve a risk of exposure of any employee to a biological agent.
 - It is the employer's duty to determine the nature, degree and duration of any employee's exposure to a biological agent and to lay down the measures to be taken to ensure the safety and health of such employees.
 - Keeps the risk assessment in written form

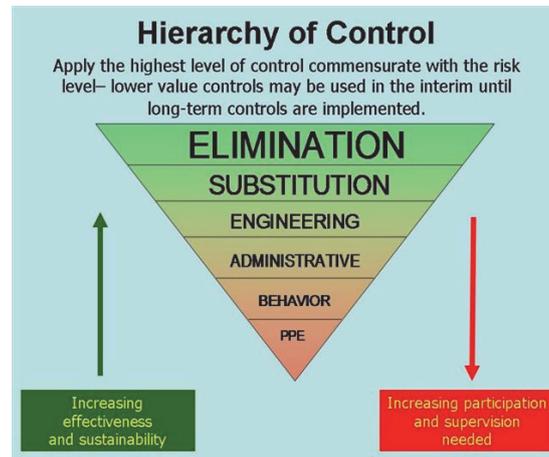
Hazard and Risk



Risk Assessment

- Hazard- something that may cause harm
- Risk- likelihood of that harm occurring
- Risk Assessment- 3 Steps
 - Recognition
 - Evaluation
 - Control

Hierarchy of Control



Preventing Exposure to Biological Agents in the Workplace

- Standard Operating Precautions
- Standard Precautions
- Blood borne virus (BBV) exposure policy

Preventing Exposures to Biological Agents at Work

- In the case of any activity in relation to which there is a risk to the safety or health of employees caused by working with a biological agent, the employer must take appropriate measures to ensure that:
 - Employees do not eat or drink in any location within a place of work where there is a risk of contamination by a biological agent
 - Employees are provided with suitable washing and toilet facilities, which may include eye washes and skin antiseptics (or both)
 - Employees are provided with suitable personal protective equipment (PPE)

Preventing Exposures to Biological Agents at Work

- Any necessary PPE is:
 - i. properly stored in a designated place
 - ii. checked and cleaned if possible, before, and in any case after each use
 - iii. repaired, where defective, or replaced, before further use
- Procedures are specified for taking, handling and processing samples of human or animal origin
- Procedures are specified for management of potential exposures to blood or body fluids

Preventing Exposures to Biological Agents at Work

- Working clothes and PPE, which may be contaminated by a biological agent, are removed on leaving the working areas and, before taking measures for cleaning/decontaminating/destroying, kept separately from other clothing
- The working clothes and PPE are decontaminated and cleaned or, if necessary, destroyed
- Vaccination

Risk Assessment

- If the risk assessment reveals that there is a risk to the safety and health of employees due to their exposure to a biological agent for which effective vaccines exist, the employer must offer them vaccination, free of charge.

Vaccination

- There is no legal obligation for employees to receive any vaccination- but it must be offered by the employer if the risk assessment deems it necessary
- In most cases, there is no need to delay commencement of employment until the vaccine series has been completed

Vaccine Preventable Diseases in the Workplace Setting

- Most Commonly:
 - Hepatitis A
 - Hepatitis B
 - Tetanus, polio, diphtheria
 - BCG (TB)- health care workers

May include:

- MMR
- Varicella
- Influenza
- Pneumococcal vaccine

Vaccination- what to expect at your visit

- The decision to vaccinate depends on the requirements of your job and the risk involved of exposure to biological agents
- You should receive information about the vaccines recommended for you and you will be asked to sign a consent form to receive the vaccination
- You have the right to refuse vaccination, but you will still be expected to attend the visit, be advised regards the vaccines recommended for your job and the risks/benefits of receiving the vaccination
- If you decide not to have the recommended vaccinations, you will be asked to sign a declination form; you may change your mind at any stage in the future

Side Effects of Vaccination

- For the most commonly used vaccines, side effects include
 - Pain and redness at the injection site (very common)
 - Headache
 - Nausea
 - Irritability
 - Fever

- Anaphylactic (serious allergic reactions) are very rare

Hepatitis A

- Viral infection
- Effective vaccine available
- Transmitted in humans through faecal-oral route
- Risk groups include
 - Workers who handle human faeces
 - Waste workers e.g. waste water treatment facilities, contact with raw sewage
 - Some health care workers or creche workers

Hepatitis B

- Viral infection
- Effective vaccine available
- Transmitted through contact with human blood or body fluids
- Risk groups include
 - All health care workers
 - Emergency services
 - Laboratory workers who handle blood or body fluids
 - Workers at risk of sharps or needle stick injury

Tetanus

- Bacterial toxin
- Effective vaccine available
- Tetanus spores are widely found in soil as well as the intestine and faeces of sheep, horses, cattle, dogs, cats, rats, guinea pigs and chickens; may also be found in human intestine
- Tetanus spores can persist for years

Blood Borne Viral Infections

- Risk of contracting BBV if exposed to blood or body fluids e.g through needlestick injury
- Hepatitis B (vaccine available)
- Hepatitis C (no vaccine available, but early treatment effective)
- HIV no vaccine available, treatment improving all the time)

Risk Assessment for BBV Transmission

- Prevalence of Hepatitis B virus infection in the general population is low (<1%)
- Higher prevalence in injection drug users, prisoners, homeless, asylum seekers

Risk Assessment for BBV Transmission

- HIV prevalence in Ireland 0.2-0.4% in age 15-49 age group
- 377 new diagnoses in 2014- 77% male, 23% female
- Men who have sex with men (MSM) commonest route of transmission (49%), followed by heterosexuals (33%) and injecting drug users (7%)

Risk Assessment for BBV Transmission

- Hepatitis C
 - Prevalence of chronic HCV infection in Ireland 0.5-1.2%
 - Higher in injecting drug users and prisoners (1998 study of prisoners showed anti-HCV in 37% of prisoners and 81% in prisoners who were injecting drug users)
 - Estimated global prevalence 2-3%, highest in Africa and Asia

Blood Borne Viral Infections

- Every area/department should have a policy addressing the prevention of transmission of blood borne infections
- Will include measures to prevent exposure e.g. staff training/awareness, risk assessment and control measures to prevent infection and measures for follow up in the event of a possible exposure

Blood Borne Pathogens

- Risk of seroconversion after sharps injury from positive source:
 - HBV 6-30%*
 - HCV ~ 2%
 - HIV 0.3%
 - (*Risk for HBV applies if not HB vaccinated)
- For all blood borne viruses, the percutaneous route of exposure (for example, a needlestick injury) carries the greatest risk for transmission of infection.

Factors Increasing the Risk of Transmission of BBV Infection

- Deep percutaneous injuries
- Visible blood on injuring device
- Hollow needle from source patient artery or vein
- Large bore needle
- Blood containing a high viral load of HBV, HCV or HIV
- Higher volume of material
- Personal protective equipment, eg gloves, goggles, not worn

Safe Use and Disposal of Sharps

- Specify and implement procedures for the safe use and disposal of sharp instruments and for the safe storage and disposal of contaminated waste.
- Workers must be made aware of the correct procedures and the procedures should be regularly assessed to ensure they are effective

Other Measures

- Access to competent advice with regard to the management of sharps injuries should include access to competent occupational health advice
- Post exposure management
- Reporting

Post Exposure Management

Post-exposure-rule of 3's

1. Initial First Aid
2. Rapid Assessment and Treatment
 - Hepatitis B (Hepatect)
 - HIV (Prophylaxis)
3. Appropriate Follow up
 - Usually 6 weeks, 3 months