GENERAL LABORATORY SAFETY

Summary of the Main Factors

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WHY DOES IT MATTER?

- Safe working protects:
  - You
  - Other lab workers
  - Cleaners
  - Visitors
  - Your work

WHAT DOES THE LAW SAY? (1)

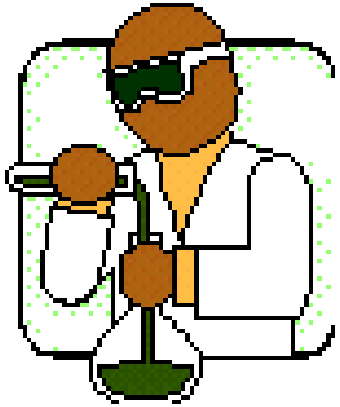
- Health Safety at Work etc Act 1974
  - You must work safely
  - You must not endanger others
  - You must not misuse safety equipment
- Penalty – up to 2 year in prison &/or an unlimited fine

WHAT DOES THE LAW SAY? (2)

- The Management of Health and Safety at Work Regs 1999
- Control of Substances Hazardous to Health Regs 2004
- You must perform RISK ASSESSMENTS

HOW TO DO A RISK ASSESSMENT?

- Determine hazards and evaluate risks
- Use all relevant available data
- Determine controls needed to minimise those risks
- Document the assessment
- Agree it with your supervisor
- Use those control measures



You will receive specific training on how to do this in your department

PRACTICAL VIROLOGY

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LABORATORY SAFETY

- It is important to remember that whenever one works with an infectious agent there is the possibility of infection to oneself or to others by **negligence**
- Furthermore, organisms that are referred to as "nonpathogenic“ are still potential pathogens
  - For example, certain "non-human“ viruses, such as Newcastle disease virus (NDV), have been known to cause conjunctivitis when inadvertently introduced into the human eye

LABORATORY SAFETY

- Cell cultures can also be potentially hazardous since they can infect the laboratory worker with an endogenous or a latent virus
- One should adopt the same precautions when working with cell culture as when working with a virus

GENERAL LABORATORY SAFETY PROCEDURES

- There must be NO EATING, DRINKING, SMOKING, OR APPLYING OF COSMETICS IN THE LABORATORY.
- Unauthorized persons, particularly children and infants, should NOT be allowed in the laboratory.
- NO MOUTH-PIPETING should be permitted due to the Possibility of accidental ingestion of virus-contaminated materials, cell-contaminated products, or toxic chemicals. Automatic pipetors or pipeting bulbs must always be used.
- Hands should be washed when coming in the laboratory, after handling cells or virus, and before leaving the laboratory.

GENERAL LABORATORY SAFETY PROCEDURES

- One should NOT walk around touching door knobs and surfaces with contaminated gloves. Contaminated gloves should be discarded in the decontamination pan.
- Avoid touching the eyes, nose, mouth, or face while working in the laboratory.
- Laboratory coats should be worn when doing cell culture or virus Work. Laboratory coats should NOT be worn while eating or outside of the laboratory.

GENERAL LABORATORY SAFETY PROCEDURES

- Whenever working with syringes and needles, special containers (that are sealed and autoclavable) should be provided for their disposal.
- DONOT replace the cap on the needle (this is where many accidental injections occur). Drop the uncapped syringe into the disposal container immediately after use. These containers are then autoclaved prior to disposal.
- Viruses, cells, or their products, should NEVER be disposed of in the drainage system.

CONTROL MEASURES (IN ORDER OF PREFERENCE)

1. Use a less risky substance
2. Use a safer form of that substance (eg solution instead of powder)

CONTROL MEASURES (IN ORDER OF PREFERENCE)

3. Totally enclose the process (eg a glove-box)
4. Partially enclose the process (eg with a fume cupboard)
5. Ensure good general ventilation

CONTROL MEASURES (IN ORDER OF PREFERENCE)

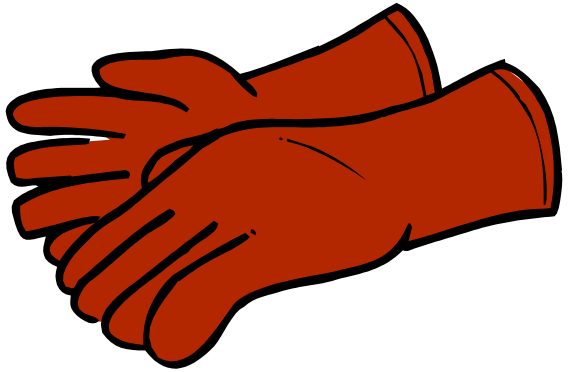
6. Safe systems of work
7. Reduce exposure times, increase distance, reduce volumes
8. Personal protective equipment
   (as a last resort for primary protection)

PROTECTING YOURSELF

- Wear the clothing and protective wear identified in your risk assessment
- Laboratory coats must be kept fastened
- Don’t wear sandals or open shoes
- Long hair must be tied back

PROTECTING YOURSELF - GLOVES

- There are many different types of protective glove
- Use the correct ones for the job you will be doing
- Remember that you need to select chemical protection gloves according to the materials and/or substances with which you will be working
- Remove your gloves before using instruments, telephone, and leaving the laboratory



LABORATORY HYGIENE

- Never eat, drink or smoke in a laboratory
- Never apply cosmetics
- Never touch your face, mouth or eyes
- Never suck pens or chew pencils
- Always wash your hands before you leave and especially before eating

WHAT ARE THE GENERAL HAZARDS IN A LABORATORY?

- Fire
- Breakage of glassware
- Sharps
- Spillages
- Pressure equipment & gas cylinders
- Extremes of heat & cold
- Chemical hazards
- Biological hazards
- Radiation

And many more!

AVOIDING FIRES

- Flammable substances
  - Use minimum quantity
  - Store in special storage cabinet
  - Use temperature-controlled heating sources

    (eg water-bath rather than hot-plate or Bunsen burner)

MINIMISE FIRE DAMAGE

- Make sure corridor fire doors and laboratory doors are kept shut at all times

FIRE SAFETY

- Make sure that you know what to do:
  - If you have a fire
  - If you hear a fire alarm

- If you are a member of staff you must attend fire training annually. Post graduates should also seriously consider doing so.

GLASSWARE

- Use correct techniques for the insertion of tubing onto glassware
- Never use glassware under pressure or vacuum unless it is designed for the job and suitably shielded
- Dispose of chipped or broken glassware – it is a risk to you and others
- Always dispose of broken glass in a glass bin or sharps bin and not in a general waste bin

SPILLAGES

- Clear up spillage promptly
- You will already have determined how to do this as part of your risk assessment
- Dispose of any hazardous material as toxic waste

Messy workers are usually poor workers!!

GAS CYLINDERS

- Never use without formal training
- Minimise the number in a laboratory
  - Store externally whenever possible
- Cylinders are heavy and can do serious damage to you if they fall
  - Ensure that they are chained when in use
  - Move only with a cylinder trolley
- Use regulators & control equipment suitable for the gas concerned
- Consider the consequences if your cylinder leaks

CRYOGENICS

- Liquid gasses are extremely cold and can cause burns
- Liquid gases evaporate and many can cause asphyxiation
- If you need to take cryogens in a lift, there are special procedures to follow – speak to your supervisor or a senior member of technical staff
- You must have special training to use them

ELECTRICAL EQUIPMENT

- Always do a visual check on electrical equipment before use, looking for obvious wear or defects
- All portable electrical equipment must have a current "PAT test" sticker
- NEVER use defective equipment

GENERAL TIDINESS

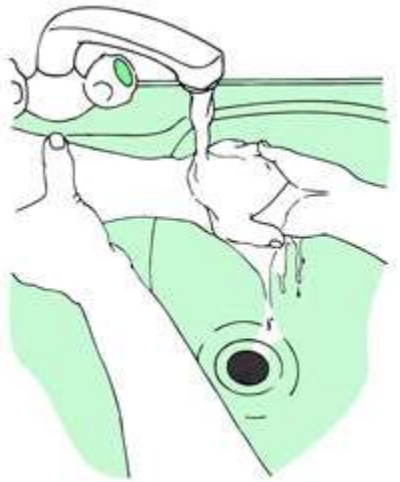
- Keep your workplace tidy
- Clear up waste, deal with washing up and put things away as you finish with them
- Make sure everything is safe before you leave things unattended
- A tidy laboratory avoids accidents to everyone

LABORATORY EQUIPMENT

- Never use any laboratory equipment unless you are trained & have been authorised to do so
- As well as injuring yourself you may cause very costly damage

FIRST AID

- All laboratory workers should undergo simple first aid training
  - For ALL chemical splashes, wash with plenty of water for 10 minutes
  - Control bleeding with direct pressure, avoiding any foreign bodies such as glass
- Report all accidents to your supervisor or departmental safety officer



PROTECTING YOUR HEALTH

- If you have an allergy to lab materials or suffer from a medical condition which may affect you in the laboratory (eg diabetes or epilepsy), ensure that your supervisor knows

WASTE MATERIALS

- Part of your risk assessment will be to determine how to dispose of waste lab materials safely
  - Solvents and oils must be segregated into the correct waste bottle or drum
  - Your department will help you determine what to do with chemical or biological materials
- Do not put materials down the drain or in with normal waste unless authorised to do so

WORKING OUTSIDE NORMAL HOURS AND AT WEEKENDS

- You will need to attend training courses and have permission from your Head of Department before working outside normal hours
- Most experimental work is not permitted
- Your supervisor will explain the requirements in more detail

WHEN IN DOUBT – ASK!!!

- Do not carry out a new or unfamiliar procedure until you have been fully trained & understand the precautions necessary for safe working
- DO NOT GUESS!!!!