Personal Protective Equipment (PPE)

Key Points

The term Personal Protective Equipment (PPE) refers primarily to disposable gloves, aprons, masks, eye protection and other face protection.

PPE should be readily available wherever it is used; e.g. both in the clinical environment and in the community setting.

Know how to put on and take off PPE (see website)

Make a risk assessment of the procedure and choose your PPE according to:

- **The nature of the procedure**
- **The risk of exposure to blood or body fluids**
- **The risk of exposure to pathogenic micro-organisms**
- **The risk of contamination**

Health and Safety Executive PPE Definition

- The Health and Safety Executive definition of PPE indicates that 'all equipment (including clothing affording protection against the weather) which is intended to be worn or held by a person at work and which protects him against one or more risks to his health or safety'.

- The health and Safety Executive advises that uniforms (including scrubs) are covered by the definition of PPE where they are 'to protect against a specific risk to health and safety' but not where the primary purpose is to present e.g. a corporate image. In such situations staff will additionally need to use PPE, for instance disposable aprons.

- Trusts will, therefore, need to determine locally the circumstances in which uniforms are or are not be classed as PPE and take action accordingly as dictated by risk assessment and subsequent control measures.

Gloves

Disposable Gloves

Remember: Wearing gloves is not a substitute for hand hygiene

The Role of Gloves

1. To protect the wearer and minimise contamination; generally using non-sterile gloves.
2. To reduce the risk of transmission of infectious microorganisms to patients during aseptic procedures; generally using sterile gloves.

Appropriate Glove Use

- Gloves are a single use item and should be worn once and then discarded.
- After gloves have been removed, hands should then be washed and dried or decontaminated with alcohol handrub.
- Gloves should be worn when it is anticipated that there may be exposure to body fluids, secretions and excretions, and as recommended for patients who are having standard and transmission based infection control precautions.
- Gloves must be changed between patients. They may also need to be changed between different procedures on the same patient.
- Gloves should be put on immediately before commencement of the procedure and removed promptly on completion of the procedure, followed by hand hygiene.
- Once removed, immediately discard into yellow clinical waste bag.
- Powdered gloves are not recommended.
- If gloves cause irritation staff should consult the Occupational Health service or seek medical advice.

Aprons

Disposable Plastic Aprons

- Disposable plastic aprons may be worn to protect the healthcare workers' clothing from moisture or soiling.
- Aprons must be changed between patients. They may also need to be changed between different procedures on the same patient.
- Aprons used for patients who have transmissible infection, or have been contaminated with blood or body fluids, should be discarded immediately into a yellow clinical waste bag.
- Aprons must be removed and discarded appropriately. Hands should then be washed and dried or decontaminated with alcohol handrub.
- Disposable plastic aprons should be worn as recommended for patients who are having standard and transmission based infection control precautions. In some units (eg some ICU's), all staff may be asked to wear aprons but they should be changed when attending to another patient or for different procedures on the same patient.

Face Protection

Eye protection, visors or full face protection must be worn when there is risk of splashing of body fluids into mucous membranes e.g. eyes/nose.

Types of masks

Surgical masks

- protect the patient against possible aerosol production from the healthcare worker. The surgical mask may also be worn by the patient to reduce the release of infectious organisms into the environment; when the patient has tuberculosis, for instance.

Fluidshield masks

- protect the patient against possible aerosol production from the healthcare worker. Also protects the Healthcare worker from splashes and droplets.

Visi-mask (fluid shield mask with eye visor)

- like the fluid shield mask above but with added eye protection.

FFP3 respirator masks

- for healthcare workers caring for patient with TB, SARS pandemic or avian influenza(1). This is particularly important within 3 feet of the patient or during aerosol generating procedures.

Glove Types

Recommended Glove Types

Activity	Choose	Alternative
All surgery	Sterile Nitrile or polypropylene	Sterile Latex
All aseptic procedures **Sterile pharmaceutical procedures**	Sterile Nitrile or polypropylene	Sterile Latex
Non aseptic procedures with exposure to blood **Handling sharps** **Handling cytotoxics** **Handling disinfectants**	Non-sterile Nitrile or polypropylene	Non-sterile latex
Short-lived and non-manipulative tasks **Low risk of contact with blood** **Cleaning with detergent**	Non-sterile vinyl	
Food handling	Non-sterile polythene	
Cleaning	Domestic quality (eg Marigold)	

Glove Materials

Natural rubber latex NRL

- Suitable for Long standing use.
- Close fitting.
- Established impermeable to blood borne viruses.
- Can reseal.
- Comfortable.
- Contain many chemicals and >200 proteins which may cause sensitisation.

NRL with hydrogel

- Easy to put on.
- Nitrile (acylonitrile)
- Good biological barrier and resistant to glutaraldehyde.
- Similar chemical range as NRL.
- Occasional sensitivity seen.
- Difficult to sterilise.
- Release cyanide on incineration.

Tactylon (multipolymer synthetic styrene-ethylene-butadine-styrene)

- Similar elasticity and strength to NRL.
- No NRL proteins and chemicals.
- Rapidly broken down with non-solid methacrylates (eg bone cement).
- Neoprene (polychloroprene)
- Good alternative to NRL

Vinyl (polyvinyl chloride)

- Lower strength than NRL.
- Increased permeability to viruses.
- Leakage rate up to 63%.
- Inflexible.
- Cheap.
- Reserve for activities with no blood contact, brief activities with no glove stress.
- Incineration leads to vinyl chloride (carcinogenic).

Polythene (ethylene co-polymer)

- Heat sealed seams likely to split.
- Ill-fitting.
- Thin.
- Tear easily.
- Do not resist stress.
- 85% permeable within 10' of use.
- No indications for clinical use.

Cornstarch powder

- Replaced talc.
- But may also cause peritonitis and granulomas.
- When airborne as dust may carry chemicals from NRL.
- May contaminate prosthetic materials and act as a nidus of infection.
- Must not be used.

NOTE: Polythene gloves are not recommended for clinical practice.

References

1. NICE TB Guidelines [Available at http://www.nice.org.uk/CG033]

2. HSENI: Health & Safety at Work (Amendment) (Northern Ireland) Regulations 2006. [Available at http://www.hseni.gov.uk/index/information_and_guidance/general_health_and_safety_guidance.htm]

3. CDC Guideline for isolation precaution for diagrams etc pp 129-30. [Available at http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf]

4. ICNA / Infection Prevention Society document on PPE