Introduction

This unit looks at the different types of Personal Protective Equipment (PPE) and their contribution to controlling and preventing infection.

The principles and issues addressed are:
- Assessing the risk of infection
- Taking correct measures to protect yourself and your patients
- The choice of PPE and promoting good practice

PPE is important in reducing the transmission of infection to patients and protecting healthcare workers from healthcare associated infection.

PPE is one of the 10 Standard Infection Control Precautions (SICPs).

Learning Outcomes and Competencies

Learning Outcomes

The outcomes for this unit are that on completion, you will be able to:
1. Determine the risk of contamination to clothing, skin and mucous membranes from patients’ blood, body fluids, secretions and excretions
2. Explain the importance of protection with gloves, aprons, gowns, protective face wear and footwear
3. Discuss the correct donning, removal and disposal of PPE
4. Explain the actions to be taken if skin or mucous membranes are contaminated with blood/body fluids
Competencies

The Core Competencies related to this unit are that on completion, you will be able to:

A Select personal protective equipment on the basis of assessment of risk of contamination by blood/body fluids
B Act as role model in promoting best practice in the selection and use of appropriate PPE
C Discuss the correct action to be taken in the event of contamination occurring with blood/body fluids

Legislation

PPE is a requirement of health and safety legislation. Healthcare workers are also governed by their respective professional codes of conduct, which influence professional accountability.

Your employer has a legal responsibility to provide you with the appropriate PPE, but the employee is legally required to wear it appropriately and correctly.

The Choice of PPE

PPE is normally worn on top of, or in addition to, normal work clothes, such as a uniform or tunic, to protect you and your patients from cross-infection.

Key Points

As a Standard Infection Control Precaution (SICP), the choice and type of PPE worn depends on the risk of exposure to blood and body fluids, and the risk of transmitting micro-organisms to your patient.

The selection of PPE must be based on an assessment of the risk of transmission of micro-organisms to the patient or to the carer, and the risk of contamination of the healthcare practitioner’s clothing and skin by patients’ blood, body fluids, secretions or excretions.

Correct use of PPE

The PPE items covered on the following pages are:

- Gloves
- Gowns and aprons
- Protective face wear, including:
  - Full-face shields
  - Visors
  - Goggles
  - Masks
- Headwear
- Footwear.
Gloves are probably the most frequently used item of PPE, but they are often used inappropriately and not changed as often as they should be.

Stop and Think
In your daily activities, when might you wear gloves and why?
How often do you change them?
Do you explain to the patient why you are using gloves?
When are gloves not required?

Wearing Gloves

When Should You Wear Gloves?

Key Points
The following list is a guide as to when gloves should be worn:

- When there is a possibility that your hands will be contaminated with blood, body fluids such as urine, saliva, or organic matter such as faeces or vomit
- For contact with mucous membranes, for example in the mouth, and non-intact skin such as wounds, burns and eczema
- For handling contaminated items
- To protect vulnerable patients from micro-organisms present on hands, for instance during surgery and aseptic procedures and when the patient’s immunity is very low
- Gloves may also be worn for looking after patients in isolation, or those with certain infections to reduce the chance of infection being spread by hands.

When are Gloves Not Required?

Gloves are not required for procedures where there is a low risk of cross infection between patients and staff and no blood/body fluid exposure, e.g.:

- Basic care procedures without contact with blood or body fluids
- Making beds or removing patients clothing
- Taking recordings (BP, temperature, pulse)
- Closed endotracheal suction.
Gloves provide a ‘greenhouse’ in which the bacteria on your hands can multiply. You should, therefore, perform hand hygiene before putting on your gloves.

Once you remove your gloves, you should again perform hand hygiene as they can become contaminated when taking gloves off or puncture may have occurred. It is important to avoid contaminating your hands when removing your gloves.

Do not wear jewellery, with the exception of a plain metal band, under your gloves.

Do not apply hand hygiene solutions to gloves.

Key Points

Gloves are not a substitute for performing hand hygiene. Contaminated gloves can spread infection just like contaminated hands.

When Should Gloves be Changed?

Disposable gloves are single-use items and should be changed between patients and between dirty and clean tasks on the same patients.

Gloves should also be changed if perforation or leakage has occurred or is suspected.

Gloves must be changed after contact with cleaning chemicals which may compromise the barrier integrity of the glove.
How to Put On and Remove Non-Sterile Gloves

Select according to hand size
Extend to cover wrist

Outside of gloves are contaminated
Grasp the outside of the glove with the opposite gloved hand; peel off
Hold the removed glove in the gloved hand
Slide the fingers of the ungloved hand under the remaining glove at the wrist
Peel the second glove off over the first glove
Discard into an appropriate lined waste bin


Which Type of Gloves?

Once you have decided that gloves should be worn, you need to consider which type of gloves to use.

Stop and Think

Ask yourself some key questions:
- Who is at risk - your patients and/or yourself?
- Is there a high risk of contact with blood?
- Is manual dexterity important?
- Does the procedure or care you are about to undertake require sterile or non-sterile (clean) gloves? Sterile gloves will be used to carry out aseptic procedures.
- Are staff or patients allergic to latex?
- Are your gloves fitting correctly?

Latex, Nitrile and Neoprene Gloves

Where there is a high risk of contact with blood/body fluid and/or where manual dexterity is required - for example, during venepuncture – latex, nitrile or neoprene gloves should be worn, because these fit closely, stretch on movement, and provide high protection against blood-borne viruses.

Additional Information about Latex Gloves

The Control of Substances Hazardous to Health Regulations 2002 ask you to undertake an assessment of any substances used at work that are hazardous to health. Natural rubber latex is hazardous to health.

What Can You Do?

You or your employer should undertake an assessment around the use of latex gloves:

- Eliminating the risk where appropriate - gloves should only be worn where there is a risk of infection
- Substituting to other glove materials where appropriate, e.g. nitrile, vinyl, neoprene
- Limiting exposure - HSE’s policy for this is: ‘Single use, disposable natural rubber latex gloves may be used where a risk assessment has identified them as necessary. When they are used they must be low-protein and powder-free.’
- Conducting surveillance of staff health (e.g., allergies, dermatitis).

Further Information – HPS and Health and Safety Executive

Should you wish to explore this further, you can find more information on these websites:

Health and Safety Executive (HSE) - Work-related contact dermatitis in the health services

HPS - Latex allergy: occupational aspects of management
Vinyl gloves

Vinyl gloves, where available, are suitable in other situations where there is a low risk of contamination with blood/body fluids such as:

- Cleaning with detergents.

Plastic gloves

Plastic gloves are not recommended in clinical areas, but may be used for handling food.

**Activity 1**

Choose the correct gloves from the options provided for the different procedures. Tick the correct answer.

**Question 1**
Choose the correct gloves for specimen handling.

- [ ] Non-sterile vinyl
- [ ] Non-sterile latex/nitrile/neoprene
- [ ] Sterile latex/nitrile

**Question 2**
Choose the correct gloves for cleaning an examination couch with detergent.

- [ ] Non-sterile vinyl
- [ ] Non-sterile latex/nitrile/neoprene
- [ ] Sterile latex/nitrile

**Question 3**
Choose the correct gloves for taking a blood sample.

- [ ] Non-sterile vinyl
- [ ] Non-sterile latex/nitrile/neoprene
- [ ] Sterile latex/nitrile

**Question 4**
Choose the correct gloves for inserting a catheter.

- [ ] Non-sterile vinyl
- [ ] Non-sterile latex/nitrile/neoprene
- [ ] Sterile latex/nitrile
Question 5
Choose the correct gloves for cleaning a blood spillage.

- Non-sterile vinyl
- Non-sterile latex/nitrile/neoprene
- Sterile latex/nitrile

Answers to the questions can be found at the end of this unit.
Think of a few more examples relevant to your setting.

Check these against the chart from the National Infection Prevention & Control Manual - Part 1 SICPs, which is a helpful tool for deciding which type of glove to use.

The exact type of gloves you use will depend on your local policy and what is available locally. Other issues may need to be taken into consideration, e.g. occasions when different types of gloves should be worn. You may be able to think of others directly related to your work practices and role.

**Housekeeping staff using household gloves**

Different types of gloves may be required due to:

- Possible exposure to chemicals, disinfectants or chemotherapy agents
- Latex allergy of the healthcare worker or patient - synthetic alternatives such as nitrile/neoprene must be used
- Guidance - current guidance recommends that gloves containing powder should not be used
- Task being carried out - some decontamination, housekeeping and portering tasks requiring thicker or household gloves.

**How Gloves are Fitting**

Well-fitting gloves have no excess material at the fingertips and are not tight across the palm. Gloves too large may cause lack of dexterity and leakage, whereas gloves too small may cause skin irritation and may tear.

Anyone developing skin problems they think are related to glove use should seek advice from their occupational health advisor.
During your daily work it is likely that the front of your body will be exposed more often to direct contact with your patients, e.g. when moving patients. This close contact with patients or their environment may lead to clothing/uniform becoming contaminated with micro-organisms; therefore disposable plastic aprons should be worn.

Key Points
Whenever you might be exposed to blood or body fluid you must wear a disposable plastic apron to reduce the risk of your uniform or clothing being splashed or contaminated, e.g. when:
- Removing bedpans or commodes
- Cleaning up body fluids
- Taking blood
- Decontaminating instruments.

This also applies when in direct contact with patients in isolation or their environment, or those with a known infection for which additional precautions are being taken.

Disposable plastic aprons are single-use items and, as well as protecting you, reduce the possibility of you spreading micro-organisms from one patient to another.

Aprons must be changed between patients and/or following completion of a clinical procedure or task.

They should be available in accessible places in the workplace, and community staff should carry their own supply.

Check your local policies to see if different coloured aprons are used for specific tasks.

Removing an Apron

It is important not to contaminate your uniform or hands when removing your apron:
- Apron front is contaminated
- Unfasten or break ties
- Pull apron away from neck and shoulders lifting over head, touching inside only
- Fold or roll into a bundle
- Discard into an appropriate lined waste bin.

Full Body Gowns

Full body gowns must be worn when there is a risk of extensive splashing of blood or body fluids, e.g. in the operating theatre.

They should be changed and removed in the same way as plastic aprons.

Eye and Face Protection

Key Points

Blood-borne viruses can enter the body through the mucous membranes of the eyes and mouth.

Eye and face protection is worn to protect healthcare workers’ eyes, nose and mouth from contamination with blood or body fluids, or from chemicals such as disinfectants.

PPE should be worn whenever there is a risk of splashing or aerosols of blood or body fluids reaching the eyes, nose or mouth.

This is particularly likely when working in operating theatres, emergency departments and labour wards. Protective face wear - e.g. safety glasses or goggles and a mask, or full-face shields or visors - should be worn in these situations.

Masks should also be worn to ensure that beards are adequately covered in these situations.

Goggles and Masks

Goggles

Goggles should be worn when there is a risk of splashing or aerosols from blood or body fluids to your eyes.

Goggles should also be worn when using disinfectants, e.g. on a blood spillage.

Regular corrective spectacles are not adequate eye protection.
Masks
Masks are rarely required to protect patients outwith the operating theatre or dental surgeries.

A surgical mask is advised when clearing up faeces or vomit where Norovirus is suspected.

A special type of filter mask may be advised by the infection control team when looking after some patients with tuberculosis or other high-risk infections as part of transmission-based precautions and for carrying out some aseptic procedures.

Change or remove the mask at the end of a clinical procedure/task and if the integrity of the mask is breached (e.g. if wet) in accordance with manufacturer’s instructions.

Headwear
As well as protecting the eyes and face you need to ensure that you are not a vehicle for spreading infection. This can be minimised by wearing headwear, where it is necessary to reduce the dispersal of hair and skin scales that carry bacteria.

Examples are:
- Operating theatre
- Pharmacy
- CDU (central decontamination unit)
- During food preparation.

Headwear must be well fitting and completely cover the hair. It is not generally required in other clinical areas.

Footwear
Wearing the correct footwear can also help protect you.

Everyday footwear should support and cover the foot and be robust enough to protect against spillage of blood or body fluids and from potential injury from dropped sharps.

Footwear – right choice
Footwear – wrong choice eg. Crocs
Read this health and safety alert to find out more about the importance of choosing the correct footwear:

Estate and Facilities Alert - Crocs Style Clogs (E) -
www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_122585.pdf -
accessed 7 December 2011.

Footwear must be non-slip, clean and well maintained.

Where shoes must be kept clean to reduce the transmission of micro-organisms or where contamination with blood or body fluids is anticipated, dedicated footwear such as theatre shoes, safety shoes or Wellington boots should be provided.

Key Points of PPE

We have looked at specific PPE; now let us recap on the main points.

As a Cleanliness Champion these key points will be useful for you to bear in mind when working closely with staff in preventing and controlling infection through being a good role model.

- PPE is not a substitute for safe ways of working.
- Employers have a legal responsibility to ensure appropriate, well fitting, PPE is readily available.
- Healthcare workers have a legal responsibility to request and wear PPE appropriately.
- PPE should be worn only when necessary, not for the whole shift. Over-wearing of gloves can increase skin problems.
- Remember patients’ feelings and be prepared to explain why you are wearing PPE. Some may feel offended at being handled with gloves.
- Gloves are not a substitute for hand hygiene.
- PPE should be changed between patients and between different care activities on the same patient.
- PPE should be changed when moving to a different clinical area.
- Be aware of any colour coding in use.
- Disposable gloves, aprons and masks are single use and should never be re-used or washed.
- All PPE should be stored in a clean and dry area to prevent surface contamination.
- PPE should not be a source of further contamination by, for example, being left on environmental surfaces after being removed or by removing inappropriately and contaminating hands.
- Gloves, aprons and masks should be discarded as healthcare (including clinical) waste in clinical settings and high-risk situations. They may be disposed of as household waste in a patient’s home if not soiled or high risk. Check your local policy.
- Reusable protective face wear should be decontaminated after each use.
- Any reusable PPE should have a clearly documented cleaning/laundering schedule.
Managing Contamination Incidents

You should be aware that even with precautions it is still possible to have a contamination incident.

Key Points

There will be a procedure for reporting occupational exposure incidents. Make sure you know and follow the policy for your area.

Be aware of your own hepatitis B vaccination status.

Contaminated Clothing or Intact Skin

In the event of your work clothing becoming contaminated with blood or body fluids it should be changed immediately, before care is to be provided for another patient.

Some healthcare staff, e.g. those working in the community, need to change the contaminated clothing back at base as soon as possible after the incident and, depending on the extent of the contamination, a shower may be required.

If your skin is contaminated you should wash it thoroughly with soap and water.

The risk of infection from these incidents is low as long as they are managed correctly.

All contamination incidents must be reported.

Stop and Think

Do you know of any contamination incident that has occurred?

Why did the contamination happen?

How was practice changed after the incident?

Occupational Exposure Incidents

Contamination of eyes, nose, mouth or non-intact skin are significant occupational exposure incidents as there is a danger of transmission of blood-borne viruses. Perform first aid immediately after contamination occurs, then inform your manager or appropriate staff member.

Non-intact skin, e.g. abrasions, cuts and eczema, should be encouraged to bleed and washed under warm running water with soap and water or antimicrobial soap. Do not scrub the area. Cover with a waterproof dressing.

If your eyes, nose or mouth become contaminated they should immediately be rinsed/irrigated very thoroughly with water (do not swallow!) or for eyes with a special eye bath solution. Contact lens wearers should remove the lenses before irrigation and consider disposal.

Report/document the incident and ensure that corrective actions or interventions are undertaken.

You may be required to attend your occupational health service or accident and emergency department for treatment and follow-up for contamination of eyes, mouth and broken skin.
Activity 2

We now want you to identify examples of **poor practice** in the use of PPE in two scenarios.

**Emptying a Catheter Bag**

We have discussed the importance of using PPE in the prevention and control of infection.

Take a few minutes to look at the photograph of a patient care practice related to a urinary catheter drainage system.

Identify where you think PPE is not being used correctly or where correct infection control procedures have not been followed.

There are four areas you should notice – write down what you think these are and compare your answers with those at the end of this unit.

1. 
2. 
3. 
4. 

**Clearing up a Blood Spillage**

We have discussed with you the importance of using PPE in the prevention and control of infections. Take a few minutes to look at this photograph of practice related to a blood spillage.

Identify where you think PPE is not being used correctly or where correct infection control procedures have not been followed.

There are four areas you should notice – write down what you think these are and compare your thoughts with the answers at the end of this unit.

1. 
2. 
3. 
4.
Activity 3

Select the correct PPE you would need for different activities.

Physical Patient Contact

Which PPE do you need to wear when undertaking the three activities below? Tick all that apply.

<table>
<thead>
<tr>
<th></th>
<th>Assisting a patient with direct physical contact</th>
<th>Handling infectious linen</th>
<th>Cleaning up a blood splash</th>
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<tbody>
<tr>
<td><strong>Gloves</strong></td>
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<td>☐</td>
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<tr>
<td><strong>Gown</strong></td>
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<tr>
<td><strong>Cap</strong></td>
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<tr>
<td><strong>Face Shield</strong></td>
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<tr>
<td><strong>Apron</strong></td>
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</tbody>
</table>
Check Your Learning

Please answer these questions to check your learning for this unit. You can find the answers to the questions at the end of this unit.

**Question 1**
Is this statement true or false?
PPE is important in reducing the transmission of infection to patients.
- [ ] True
- [ ] False

**Question 2**
Is this statement true or false?
PPE is important in protecting healthcare workers from healthcare associated infection.
- [ ] True
- [ ] False

**Question 3**
Is this statement true or false?
PPE is a requirement of health and safety legislation.
- [ ] True
- [ ] False

**Question 4**
When should hand hygiene be performed? Tick all that apply.
- [ ] Before wearing gloves
- [ ] Whilst wearing gloves, between patients
- [ ] After removing gloves
- [ ] Gloves are a substitute for hand hygiene

**Question 5**
Which of the following is an occupational exposure incident? Tick the correct answer.
Blood/body fluid contamination of:
- [ ] Intact skin
- [ ] Mouth
- [ ] Clothing

**Question 6**
When should PPE be changed? Tick all that apply.
- [ ] Between patients
- [ ] Between different care activities on the same patient
- [ ] When moving to a different clinical area
- [ ] Before handling food
Summary and Conclusion

Summary

Key Points

PPE is important in reducing the transmission of infection to patients and protecting healthcare workers from occupationally acquired infection.

This unit explored:
- The risks of contamination
- Types and selection of PPE
- Correct donning and removing of PPE
- Actions to be taken in the event of contamination.

Conclusion

The main principle of PPE is to protect yourself and your patients from the spread of micro-organisms by assessing the risk of exposure and then using protective equipment appropriately.

Assessment

Your next step is to complete the Folder of Evidence for Unit 4. Please remember that you could complete several Content Units in one session, before perhaps undertaking a block of Folder of Evidence activities.
The following web resources and articles are those referred to within this unit. They have been grouped together for your convenience.

You can find the full list of web links for the Cleanliness Champions Programme on the NHS Education for Scotland HAI web site under Educational Programmes within the Cleanliness Champion section at:

www.nes-hai.info

Department of Health (2010) Toffeln Qwirki’s 800 Crocs Style Clogs sold as personal protective equipment (PPE).


www.hse.gov.uk/coshh/ - accessed 7 December 2011

Health & Safety Executive - Work-related contact dermatitis in the health services.
Activity 1

Choose the correct gloves from the options provided for the different procedures.

Question 1
Choose the correct gloves for specimen handling.
Correct answer: Non-sterile latex/nitrile/neoprene - this is a procedure with a high risk of exposure to blood or body fluids.

Question 2
Choose the correct gloves for cleaning an examination couch with detergent.
Correct answer: Non-sterile vinyl - this is a task where there is a low risk of contamination with blood or body fluids.

Question 3
Choose the correct gloves for taking a blood sample.
Correct answer: Non-sterile latex/nitrile/neoprene - this is a procedure with a high risk of exposure to blood or body fluids.

Question 4
Choose the correct gloves for inserting a catheter.
Correct answer: Sterile latex/nitrile - this is a procedure where a sterile field is required.

Question 5
Choose the correct gloves for cleaning a blood spillage.
Correct answer: Non-sterile latex/nitrile/neoprene - this is a procedure with a high risk of exposure to blood or body fluids.
Activity 2

Identifying examples of poor practice in the use of PPE in two scenarios.

Emptying a Catheter Bag

Correct answers

The four areas you should have noticed are:

- A plastic apron should have been worn for this procedure, as there is a risk of splashing of urine when emptying the urinary catheter bag.
- Disposable latex/nitrile/neoprene gloves should have been worn for this routine procedure, as there is a risk of hands being contaminated with urine.
- A non-sterile jug was used to empty the catheter bag. This raises questions about shared patient equipment and decontamination.
- A wristwatch was worn. Healthcare workers should be bare below the elbow to facilitate hand hygiene.

Correct procedure

Clearing up a Blood Spillage

Correct answers

The four areas you should have noticed are:

- A plastic apron should have been worn to prevent contact with blood or the chemicals used to deal with the spillage.
- Non-sterile latex/nitrile/neoprene gloves should have been worn to prevent contact with blood or the chemicals used to deal with the spillage.
- Facial/eye protection should have been worn to prevent contact with blood or the chemicals used to deal with the spillage.
- The correct procedure for dealing with a blood spillage was not being followed as decontamination with a chlorine-releasing agent is required.

Correct Procedure
Activity 3
Selecting the correct PPE you would need for different activities.

Physical Patient Contact
Correct answer:
You need an apron. An apron is required when there is the risk of splashing of blood or body fluids, or close contact with patients or their environment that may lead to clothing/uniform becoming contaminated with micro-organisms.

Infectious Linen
Correct answers:
You need gloves and apron. Gloves are required where there is a high risk of cross infection between patients and staff or blood/body fluid contamination. An apron is required when there is the risk of splashing of blood or body fluids, or close contact with patients or their environment that may lead to clothing/uniform becoming contaminated with micro-organisms.

Blood Splash
Correct answers:
You need gloves, face shield and apron. Gloves are required where there is a high risk of cross infection between patients and staff or blood/body fluid contamination. Face protection is required where there is a risk of splashing or spraying into the eyes, nose or mouth. An apron is required when there is the risk of splashing of blood or body fluids, or close contact with patients or their environment that may lead to clothing/uniform becoming contaminated with micro-organisms.

Check Your Learning

Question 1
Is this statement true or false?
PPE is important in reducing the transmission of infection to patients.
Correct answer: True

Question 2
Is this statement true or false?
PPE is important in protecting healthcare workers from healthcare associated infection.
Correct answer: True

Question 3
Is this statement true or false?
PPE is a requirement of health and safety legislation
Correct answer: True

Question 4
When should hand hygiene be performed?
Correct answers:
Before wearing gloves
After removing gloves
Hand hygiene should not be performed whilst wearing gloves. Gloves are not a substitute for hand hygiene.
Question 5
*Which of the following is an occupational exposure incident?*

Correct answer: Blood/body fluid contamination of the mouth is an occupational exposure incident.

Contamination of intact skin or clothing is not a risk of bloodborne infection so is not considered an occupational exposure incident.

Question 6
*When should PPE be changed?*

Correct answers:
- PPE should be changed:
  - Between patients
  - Between different care activities on the same patient
  - When moving to a different clinical area
  - Before handling food.

All of these are indications to change PPE.