

Preventing Cross-infection

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Preventing cross-infection is an essential activity for all nurses in their everyday practice. Nurses have an ethical and legal duty to protect patients against infection (Cochrane 2000; Department of Health [DH] 2006a) but within hospital and residential situations, where many nurses work, the risk of cross-infection is high. In any healthcare setting, unless adequate care is taken, nurses can unwittingly transmit microorganisms from one person to another. The media regularly report concerns about lack of cleanliness and associated infection rates in hospitals and other healthcare settings.

Hospital-acquired infection, sometimes referred to as ‘nosocomial infection’, is a serious problem, causing as many as 5000 patients’ deaths each year in the UK (Pratt *et al.* 2001). With the increasing emphasis on community care, including GPs’ surgeries and care homes carrying out invasive procedures, and earlier patient discharges from hospitals, hospital-acquired infection often first becomes evident in the community. The term ‘healthcare-associated’ infection (HCAI) is therefore used more often now, defined as: ‘infection acquired as a result of the delivery of healthcare either in an acute (hospital) or non-acute setting’ (Pratt *et al.* 2007, S62). The Nursing and Midwifery Council (2007) specified infection-control Essential Skills Clusters for student nurses, all of which are incorporated in this chapter.

This chapter includes:

- Principles for preventing healthcare-associated infection: an introduction
- Hospital environmental hygiene and multi-use equipment
- Hand hygiene
- Use of personal protective equipment including gloves, aprons and gowns
- Aseptic technique
- Specimen collection
- Isolation procedures
- Sharps disposal
- Healthcare waste disposal and linen management

Recommended biology reading

These questions will help you to focus on the biology underpinning the skills required to prevent cross-infection. Use your recommended textbook to find out:

- What are microorganisms? Where are they found? Are all microorganisms harmful?

- Identify some of the beneficial roles of microorganisms.
- How do microorganisms enter the body?
- How are microorganisms classified?
- What are the structure and properties of bacteria, viruses, prions, fungi, yeasts and protozoa?
- How do bacteria grow and multiply?
- What factors influence the proliferation of microorganisms?
- What is meant by the terms 'commensal', 'pathogen' and 'normal flora'?
- Distinguish between endogenous and exogenous sources of infection.
- What mechanisms does the body employ to defend itself from infection? Think about non-specific defences, e.g. secretions, reflexes, barriers etc., as well as specific mechanisms. Review the structure of the skin.
- How does the body fight infections?
- What are the clinical signs of infection? What role does histamine play?
- Which cells are involved in the specific immune response? Where are they found?
- What is the difference between humoral and cell-mediated immunity?
- What are antibodies? How do they help protect us from infection?
- How do we achieve an immunological memory?
- What factors can affect an individual's immune system?

Rheumatoid arthritis

An inflammatory disease often affecting a number of joints (initially smaller ones), causing pain, swelling, stiffness and deformity. It is often accompanied by systemic ill-health.

Type 2 diabetes

Type 2 diabetes develops when the body makes insufficient insulin, or when the insulin that is produced does not work effectively (known as insulin resistance). See www.diabetes.org.uk.

Infection

The successful invasion, establishment and growth of microorganisms within the tissues of the host.

MRSA

A strain of *Staphylococcus aureus* which is highly resistant to many commonly used antibiotics.

PRACTICE SCENARIOS

As discussed above, prevention of cross-infection is part of the nurse's role in all practice settings. The following scenarios will be referred to throughout the text, when discussing the practical skills covered in this chapter.

Adult

Mrs Winifred Lewis, aged 87, was widowed many years ago and lives in wardened accommodation. She has a history of **rheumatoid arthritis** and **type 2 diabetes**, and recently fell and fractured her hip. This was operated on in hospital but the wound developed an **infection**, which grew **MRSA**. She was discharged home, under the care of the district nursing team and intermediate care, but her wound deteriorated and the surrounding skin showed signs of infection. Mrs Lewis appeared unwell and dehydrated, so her GP requested readmission. She is now being isolated in the side room of a surgical ward, and an intravenous infusion and intravenous antibiotics have been commenced. She has a commode in the room and can transfer with help.

Learning disability

James Smith is a 59-year-old man with a learning disability who lives alone in a farm cottage and works on the adjacent farm. Following an accident, James has an open wound on his lower left leg that shows signs of infection. There is a large amount of exudate, which has an offensive odour. The district nurse has been visiting the farm to carry out dressings and a wound swab has been taken. James is

Health Action Plan

A personal plan developed for each individual who has a learning disability, detailing their health interventions, medication, oral health, nutrition, etc. (DH 2001).

keen to carry on with his usual work on the farm. The district nurse is liaising with the community nurse for learning disabilities to help to teach James how to care for his leg in between dressings. This information is now included in James' **Health Action Plan**. As the district nurse runs a clinic at the local GP's surgery, James is being encouraged to attend this for dressings instead of receiving visits at his home.

Mental health

Stacey is 28 years old and has been addicted to opiates for six years. She is living with her parents who are very supportive. Recently Stacey began a community-based detoxification programme with support from her local drug and alcohol team. During detoxification, Stacey experienced severe withdrawal symptoms, including very high blood pressure and vomiting. As a result she was admitted as an emergency to the acute mental health admission unit. She arrived feeling very unwell, and soon after arrival vomited over her bed. She was prescribed intramuscular metoclopramide (an antiemetic) to stop her vomiting. Stacey is known to have hepatitis B.

PRINCIPLES FOR PREVENTING HEALTHCARE-ASSOCIATED INFECTION: AN INTRODUCTION

Many microorganisms exist but not all cause infection in individuals. Those that cause disease are called **pathogens**. When pathogens are acquired from another person, or from the environment, they are described as **exogenous**. The transmission of pathogens, between people and across environments, is termed **cross-infection**. When microorganisms **colonise** one site on the host and enter another site on the same person causing further infection, this is called self-infection or **endogenous** infection.

Colonise

The establishment of pathogenic microorganisms at a specific body site with little or no host response. This can lead to a large number of microorganisms, forming a reservoir for infection and cross-infection.

In the third national prevalence survey (DH 2007a), the prevalence of HCAI in England was 8.2 per cent, compared with 7.6 per cent for the UK and Ireland collectively (excluding Scotland). The most common types of infections were gastrointestinal system infections (22 per cent), urinary tract infections (19.7 per cent), pneumonia (13.9 per cent) and surgical site infections (13.8 per cent).

LEARNING OUTCOMES

On completion of this section you will be able to:

- 1 discuss key policies influencing infection control practices;
- 2 identify the composition and role of infection control teams;
- 3 understand the chain of infection including the routes by which microorganisms are spread.

Learning outcome 1: Discuss key policies influencing infection control practices.

Concern about HCAI has led to many government publications, providing recommendations for infection control. *Clean, Safe Care: reducing infections and*

saving lives (DH 2008) provides an overview of initiatives in England. Key publications are mentioned below.

- *Saving Lives: Reducing infection, delivering clean and safe care* (revised edition, DH 2007b). This provides evidence-based ‘high impact interventions’ (HIIs) or ‘care bundles’ for key clinical procedures which can increase the risk of infection if not performed appropriately. The HIIs highlight the critical elements of particular procedures, the key actions required, and a means of demonstrating reliability using compliance measurement. The HIIs aim to minimise unwarranted variation in practice by identifying where compliance needs to be increased and measuring how often all elements are performed for a given procedure. The tool enables results to be quickly fed back to staff, actions can be agreed and implemented and progress can be tracked.
- *The Health Act: Code of Practice for the Prevention and Control of Health Care-associated Infections* (DH 2006a). This aims to assist National Health Service providers to plan and implement how they can control HCAs. It led to a legal requirement for acute hospitals and other care providers to prevent infection. Failure to observe the Code may result in an ‘improvement notice’ or ‘special measures’.
- *National Evidence-based Guidelines for Preventing Healthcare-associated Infections in NHS England* (Pratt *et al.* 2007). In these updated DH-commissioned evidence-based infection control guidelines (referred to as EPIC2), the authors noted that standard infection control precautions need to be applied by all healthcare practitioners to the care of all patients. It is planned that revised guidelines will be published in 2011.

The other UK countries’ administrations also provide guidance and policy on infection control: for Scotland see www.hps.scot.nhs.uk; for Wales see www.wales.nhs.uk; and for Northern Ireland see www.dhsspsni.gov.uk.

Standard infection control precautions relevant to all areas of practice are:

- hospital environmental hygiene;
- hand hygiene;
- the use of personal protective equipment;
- isolation of patients;
- the use and disposal of waste and sharps.

In this chapter you will encounter each of these precautions and focus on the skills that are associated with them. These precautions are consistent with – and build on – the ‘universal precautions’ that were established in the 1980s in response to the growing problems of blood-borne infections. In the 1990s, the terminology changed to ‘standard precautions’. Universal/standard precautions recognised a few simple practices that could be used to care for all patients to minimise the risk of cross-infection to patients and staff alike. The National Institute for Health and Clinical Excellence (NICE) (2003) produced guidelines for preventing HCAs in primary and community care. These apply the standard precautions of hand hygiene, use of personal protective equipment and sharps disposal to various aspects of community-based care.

Standard precautions combine the major features of universal precautions and Body Substance Isolation (BSI) and are based on the principle that all blood, body fluids, secretions, excretions except sweat, non-intact skin and mucous membranes may contain transmissible infectious agents. Standard precautions include infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered.

Learning outcome 2: Identify the composition and role of infection control teams

As you read above, there are many national infection control policies. These are implemented at local level by an **infection control team (ICT)**.

ACTIVITY

When next in the practice setting, find out who the members of the local infection control team are and where they are located. Also, find out where your local infection control policy is kept and familiarise yourself with its content.

The ICT generally comprises an infection control nurse (ICN) and an infection control doctor. Their roles include planning, implementing and monitoring the infection prevention and control programme. They are available to offer advice on all matters relating to infection control. They also provide education to healthcare personnel and develop local policy. An infection control committee from a variety of hospital departments provides advice and support for the ICT.

Many community healthcare trusts also employ ICNs who work closely with the consultant for communicable disease control. The consultant is responsible for monitoring and controlling the spread of infection in the community, as well as other environmental hazards (Wilson 2006). Many hospitals also use infection control link nurses (or 'champions') to improve awareness of infection control in clinical areas. They receive basic training and help provide education, training, audit and surveillance in clinical areas. There should also be close liaison between the occupational health department and the ICT to ensure the health and safety of patients and staff alike (Wilson 2006).

Learning outcome 3: Understand the chain of infection including the routes by which microorganisms are spread

The 'chain of infection' can help you to understand how to prevent spread of infection (see Fig. 3.1). Prevention of cross-infection is about breaking the chain of infection. Each link in the chain will now be discussed.

Infectious agent

An infectious agent is a microorganism with the ability to cause disease. This includes bacteria (most common in hospitals), viruses (more common in the community) and fungi (e.g. *Candida*, which causes 'thrush'). To identify the specific infectious agent, specimens are collected and sent to the laboratory for microscopy,