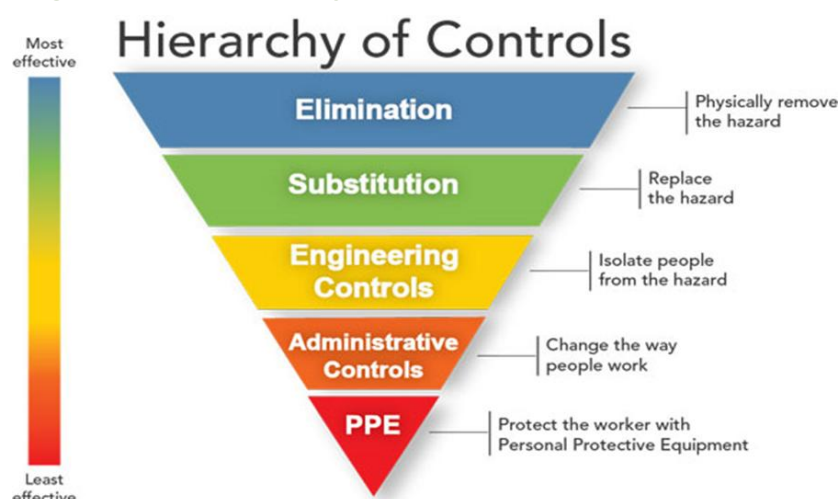


Appendix 16 – Risk Assessment Principles for Health and Care Settings: Hierarchy of Controls

Controlling exposures to occupational hazards, including the risk of infection, is the fundamental method of protecting staff and users of a health and care facility or workplace. Below is a graphic specifying the general principles of prevention legislated in the Management of Health and Safety at Work Regulations 1999, Regulation 4, Schedule 1. It details the most to the least effective hierarchy of controls (HoC) and is applied across a wide range of occupational settings to support and optimise staff and service user safety. It should also be used within health and care settings to help prevent the transmission of infection. An [SBAR detailing evidence](#) in support of its inclusion within health and care settings is available.

For the purpose of this document the term 'service user' refers to individuals being cared for in health and care settings.

Figure 1: Hierarchy of controls



Centers for disease control and prevention. [The National Institute for Occupational Safety and Health. Hierarchy of Controls. 2015.](#)

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When applying infection prevention and control precautions (IPC) at organisational, local clinical or care level and individual level, the HoC should be considered when applying Standard Infection Prevention and Control Precautions (SICPs) and Transmission Based Precautions (TBPs) recognising that the most effective method of control (elimination) is employed first.

This inherently results in safer control systems. It is recognised that elimination of risk may be challenging within health and care settings due to the nature of the services provided. Where that is not possible, all other controls must be considered in sequence.

Personal protective equipment (PPE) is the last in the HoC and may be the only mitigating control when caring for a service user.

Elimination

The most effective controls involve physically removing hazards where possible. It is important to take reasonable preventative actions to eliminate the risk of exposure to infectious agents. Examples in practice may include, but are not limited to:

- Consideration of telephone or digital consultations where possible. Services may adopt a hybrid approach whereby they choose to see some service users face to face and others via digital consultation – this should be determined locally by means of a risk assessment.
- Regular symptom vigilance must be always in place and arrangements made for staff to leave the health and care setting if they become unwell during a shift.
- Visitors should not enter a health or care facility if they have a suspected or confirmed transmissible infection, or have been advised to self-isolate, unless exceptional circumstances have been agreed with clinical and infection prevention and control or health protection teams.
- Consider the potential risk to health and care workers who may have personal risk factors that increase the risk of severe health outcomes. It may be necessary to provide reasonable adjustments within their workplace to ensure

they are not exposed to an individual with a suspected or confirmed transmissible infection.

Substitution

Substitution involves replacing a process or a practice where possible, aiming to remove the identified hazard. Examples in practice may include, but are not limited to:

- consider the use of an alternative venue to reduce risk wherever practicable, for example use a non-shared, large, well-ventilated room near front door of the facility
- rearrange non-urgent appointments (if possible)
- arrange a home visit (if possible)

Engineering Controls

Engineering controls isolate people from the identified hazard, by removing or containing the hazard. Examples in practice may include, but are not limited to:

- take steps to prevent overcrowding
- utilise mechanical ventilation where available and improve natural ventilation by opening doors and windows if safe to do so (following a local risk assessment)
- ensure optimal bed and chair spacing throughout health and care settings
- ensure effective equipment and environmental cleaning is in place

Patient or service user placement

Recognising that many service users with a transmissible infection require to be admitted to health and care settings, placement is an important factor in preventing onward transmission coupled with the other elements of SICPs and TBPs.

Health and care settings must seek to identify and prepare the most suitable clinical or care area for planned placement of service users with a known or suspected infection or colonisation. Best practice patient placement considerations are laid out in [appendix 11](#) of the National Infection Prevention and Control Manual (NIPCM). Where possible, this process should form part of organisational IPC planning undertaken for each clinical or care area in advance rather than at the time of service user admission or attendance. Health and care facilities should assess clinical or care areas considered most to least optimal for placement of service users with transmissible infection which also needs to take account of clinical need and service access and take the form of a structured risk assessment.

Ventilation in health and care settings

This section is not intended to contain technical detail on ventilation but rather provide over-arching advice on the considerations for health and care settings in the context of respiratory infections and risk reduction. The content below should be read in conjunction with the relevant national guidance relating to ventilation in the built environment.

Ventilation provision to a room reduces the number of infectious particles in the air by dilution. It helps reduce the risk of exposure to infectious agents that are transmitted through the air– the risk of exposure is greater in areas that are poorly ventilated.

Following discharge of an individual with suspected or confirmed respiratory infection (R1, R2, R3) from a room, potentially infectious respiratory particles may remain in the air for a period of time. It is not possible to determine how long it takes for infectious particles to dissipate however, higher ventilation rates will support faster clearance. As an example, if the ventilation rate is 1 air change per hour (ACH) a period of 60 minutes will replace the room air volume once.

Several studies have linked transmission of respiratory viruses to recirculating air conditioners, with the high velocities created by these units potentially allowing larger viral aerosols to remain airborne over longer distances. It is also possible that

directional flow from desk fans could have a similar effect however the evidence of this is weak. Fans should be avoided as much as possible and should not be used without prior local risk assessment. [An SBAR details the considerations for risk assessing fan use.](#)

Service users with confirmed or symptoms of a transmissible respiratory infection must not be placed in a positive pressure room.

Mechanically ventilated areas

NHS Scotland board and health and care organisations should seek assurance that their ventilation systems comply with guidance to which they were designed, including:

- [Best practice guidance for healthcare engineering policies and principles \(SHTM 00\)](#)
- [Ventilation for Healthcare - Design and validation \(SHTM 03-01 Part A\)](#)
- [SHPN 36 Part 2 NHS Dental Practices in Scotland](#)

Ensure ventilation systems are well maintained ensuring functionality of air handling units and correct delivery of assigned air change rates.

Naturally ventilated areas (No mechanical ventilation)

Areas should be ventilated as much as and as frequently as possible by opening windows if a local risk assessment permits. Where local risk assessments do not allow for windows being opened (for example, weather conditions, service user safety concerns), consider if other mitigations within the HoC can be applied to reduce risk. Consideration should be given to any other safety risks associated with opening the windows where adjacent building works are in progress – this should be recorded in a relevant risk assessment (for example, [HAI SCRIBE](#) documentation

associated with building works). If possible, open windows at different sides to get a cross flow of ventilation. Where it is safe to do so, doors may be opened.

Note: fire doors must **never** be propped open.

Administrative Controls

Administrative controls are about changing the way people work. Suggested controls include, but are not limited to:

- try to limit movement of service users with known or suspected infection where possible, by undertaking procedures in their room, rather than transferring to another department or area.
- try to reduce staff numbers where possible, for example consider reducing numbers involved in ward rounds and utilise digital methods for meetings.

Personal Protective Equipment (PPE)

PPE is the last level of control in the hierarchy.

Use PPE, when a risk assessment indicates this is required.

Ensure PPE is used as per the National Infection Prevention and Control Manual and Care Home Infection Prevention and Control Manual.

Ensure all staff required to wear respiratory protective equipment (RPE) have been fit tested. This is a legal requirement for employers.

Ensure adequate stock and availability of PPE to protect staff, service users, and visitors.

Although used for source control rather than personal protection, it is also important to ensure the use of face coverings where they are indicated.