

Literature Review:

**Healthcare infection incidents and outbreaks in
Scotland**

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Literature Review:
Healthcare Infection Incidents and Outbreaks in Scotland

| HPS ICT Document Information Grid | |
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| Purpose: | To inform the Incidents and Outbreaks chapter of the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in NHSScotland healthcare settings. |
| Target audience: | All NHSScotland staff involved in the prevention and control of infection in Scotland. |
| Circulation list: | Infection Control Managers, Infection Prevention and Control Teams, Public Health Teams |
| Description: | This literature review examines the extant professional literature relating to the recognition, assessment and management of healthcare infection incidents and outbreaks in Scotland. |
| Update/review schedule: | Updated in real time with changes made to recommendations as required. |
| Update level: | Practice – <i>Significant change to practice</i> Research – <i>Initial review therefore currently not applicable</i> |

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1. Objectives

The aim of this review is to examine the extant professional literature relating to the recognition, assessment and management of healthcare infection incidents and outbreaks in Scotland. **For the purpose of this literature review, the terms 'incident' and 'outbreak' are used synonymously.**

The specific objectives of the review are to determine:

- What is the definition of a healthcare infection incident?
- How can healthcare infection incidents be recognised/detected?
- How should potential healthcare infection incidents be assessed?
- How should healthcare infection incidents be investigated and managed?
- When should staff screening be considered?
- Should deaths associated with healthcare infection incidents be reported?
- How should healthcare infection incidents be communicated?
- When would the CNO National Support Framework be invoked in relation to a healthcare infection incident?

2. Methodology

This targeted literature review was produced using a defined methodology as described in the [National Infection Prevention and Control Manual: Development Process](#).

3. Recommendations

This review makes the following recommendations based on an assessment of the extant professional literature on the recognition, assessment, investigation and management of healthcare infection incidents.

What is the definition of a healthcare infection incident?

A healthcare infection incident may be:

An **exceptional infection episode**, defined as a single case of an infection that has severe outcomes for an individual patient OR has major infection control/public health implications e.g. infectious diseases of high consequence such as extensively drug-resistant tuberculosis (XDR-TB).

A **healthcare infection exposure incident**, defined as an exposure of patients, staff or the public to a possible infectious agent, as a result of a healthcare system failure or near misses e.g. ventilation, water or a decontamination incident.

A **healthcare associated infection outbreak**, defined as two or more linked cases associated with the same infectious agent, within the same healthcare setting, over a specified time period; or a higher than expected number of cases in a given healthcare area over a specified time period.

Mandatory requirement therefore no recommendations can be made

A **healthcare infection data exceedance**, defined as a greater than expected rate of infection compared with the usual background rate for the place and time where the incident has occurred.

Good Practice Point (GPP)

How can healthcare infection incidents be recognised/detected?

An early and effective response to an actual or potential healthcare infection incident is crucial. The Infection Prevention & Control Team (IPCT)/Health Protection Team (HPT) should be aware of and refer to the national minimum list of alert organisms/conditions, which will aid in incident recognition.

Mandatory requirement therefore no recommendations can be made

How should potential healthcare infection incidents be assessed?

On recognition of a potential healthcare infection incident, an initial assessment using the Healthcare Infection Incident Assessment Tool (HIIAT) should be conducted by the Infection Prevention and Control Team (IPCT)/Health Protection Team (HPT) within the NHS Board.

Mandatory requirement therefore no grade of recommendation can be made

It may be necessary to convene a Problem Assessment Group (PAG)/Incident Management Team (IMT) meeting, depending on the status of the HIIAT.

Mandatory requirement therefore no grade of recommendation can be made

NHS Boards are required to report all HIIAT assessed Green (non-norovirus), Amber and Red reports to HPS.

Mandatory requirement therefore no grade of recommendation can be made

NHS Boards should monitor the ongoing impact of the incident by escalating and de-escalating as appropriate, using the HIIAT assessment. The HIIAT should remain Amber or Red only whilst there is ongoing risk of exposure, identification of new cases or until all exposed cases have been informed.

Good Practice Point (GPP)

How should healthcare infection incidents be investigated and managed?

It is the responsibility of the NHS Board to establish whether an IMT is necessary to further investigate a healthcare infection incident.

Mandatory requirement therefore no grade of recommendation can be made

As part of the IMT, a case definition(s) should be established. In addition ongoing data relating to epidemiological and microbiological investigations should be received and discussed, as well as any necessary control measures.

Mandatory requirement therefore no grade of recommendation can be made

NHS Boards are required to communicate HIIAT Amber and Red assessments to HPS (and through HPS, to the Scottish Government Health and Social Care Department (SGHSCD)), by completing a Healthcare Infection Incident and Outbreak Reporting Template (HIIORT) within 24 hours of HIIAT assessment.

Mandatory requirement therefore no grade of recommendation can be made

When should staff screening be considered?

The IMT may decide that staff screening is necessary to identify carriage or infection among staff groups. The decision to screen should be based on the need of one or more of the following:

- To characterise the epidemiology of the outbreak in terms of time, place and person;
- To identify the likely source and index case, with a view to control;
- To assist with interrupting the chain of transmission of an outbreak;
- To confirm eradication of an outbreak.

Staff screening is undertaken by local Occupational Health Services and is a confidential process requiring staff consent.

Mandatory requirement therefore no grade of recommendation can be made

Should deaths associated with HAI incidents be reported?

Deaths associated with HAI should be recorded on the Medical Certificate of the Cause of Death (MCCD) and reported to the Infection Control Manager (ICM). A death which is considered to pose an acute and serious public health risk should be reported to the Procurator Fiscal when it has occurred as a result of an infection acquired while under medical/dental care, while on NHS premises.

Mandatory requirement therefore no grade of recommendation can be made

How should healthcare infection incidents be communicated?

NHS Boards should have a communications plan which encompasses the HIIAT and HIIORT and indicates how information will be provided about the incident and its control.

Following the incident, the IMT will decide on the most appropriate format for a report to communicate incident management/lessons learned. The final report should be submitted to the NHS Board and relevant organisations with responsibility for taking forward report recommendations.

Mandatory requirement therefore no grade of recommendation can be made

When would the CNO National Support Framework be invoked in relation to a healthcare infection incident?

The CNO National Support Framework may be invoked by the SGHSCD or by a NHS Board to optimise patient safety during or following any HAI incident/s.

Mandatory requirement therefore no grade of recommendation can be made

4. Discussion

For the purpose of this literature review, the terms ‘incident’ and ‘outbreak’ are used synonymously.

What is the definition of a healthcare infection incident?

The following definitions have been adapted from UK guidance;^{1;2} making these applicable to healthcare settings.

An **exceptional infection episode** is defined as a single case of an infection that has severe outcomes for an individual patient OR has major infection control/public health implications e.g. infectious diseases of high consequence such as extensively drug-resistant tuberculosis (XDR-TB).

A **healthcare infection exposure incident** is defined as an exposure of patients, staff or the public to a possible infectious agent, as a result of a healthcare system failure or near miss e.g. ventilation, water or a decontamination incident.

An **HAI outbreak** is defined as two or more linked cases associated with the same infectious agent, within the same healthcare setting, over a specified time period; or a higher than expected number of cases in a given healthcare area over a specified time period.

Mandatory requirement therefore no grade of recommendation can be made

A **healthcare infection data exceedance** is defined as a greater than expected rate of infection compared with the usual background rate for the place and time where the incident has occurred.

Good Practice Point (GPP)

How can healthcare infection incidents be recognised/detected?

An early and effective response to an actual or potential healthcare infection incident is crucial. Healthcare Associated Infection Standards, 2015³ state that a healthcare organisation must implement local surveillance of infections and alert organisms. This system should make use of ‘triggers’ allowing prompt detection and response to any variance from normal limits, including those caused by possible outbreaks. The Infection Prevention & Control Team (IPCT)/Health Protection Team (HPT) should be aware of and

refer to the [national minimum list of alert organisms/conditions](#), which will aid in incident recognition.

Mandatory requirement therefore no grade of recommendation can be made

How should potential healthcare infection incidents be assessed?

The HAI Standards 2015 state that where a potential/actual incident has been identified, an assessment should be undertaken by staff using an infection incident assessment tool.³ On recognition of a healthcare infection incident it is recommended that the IPCT/HPT within the affected NHS Board should undertake an assessment using the [Healthcare Infection Incident Assessment Tool \(HIIAT\)](#).^{2;4-6}

Mandatory requirement therefore no grade of recommendation can be made

The HIIAT has been adapted from the Infection Control Outbreak/Episode Risk Matrix, developed as part of the Watt Report.⁷ It is a tool for assessing healthcare infection incidents and communicating these, both internally within a NHS Board/care organisation and externally to Health Protection Scotland (HPS) and following this, the Scottish Government Health and Social Care Department (SGHSCD).

Based on this assessment a member of the IPCT/HPT may decide to convene a Problem Assessment Group (PAG) meeting, depending on the status of the HIIAT.²

Mandatory requirement therefore no grade of recommendation can be made

NHS Boards are required to report all HIIAT Green (non-norovirus), Amber and Red assessments to HPS.^{2;4;6}

Mandatory requirement therefore no grade of recommendation can be made

The ongoing impact of an incident should be monitored and escalated/de-escalated as appropriate using the HIIAT assessment. The HIIAT should remain Amber or Red only whilst there is ongoing risk of exposure, identification of new cases or until all exposed cases have been informed.

Good Practice Point (GPP)

How should healthcare infection incidents be investigated and managed?

It is the responsibility of the NHS Board (specifically the infection control doctor (ICD)/Consultant Microbiologist and/or consultant in public health medicine (CPHM)) to establish if an IMT is required. This is deemed to be the case if a potential/actual risk to public health is identified. In the NHS hospital setting, the ICD will usually chair the IMT, as well as lead the investigation and management of healthcare infection incidents. Where there are significant implications for the wider community e.g. due to outbreaks of TB, measles, or rare events such as variant CJD or a Hepatitis B virus/HIV look back, or where there is an actual or potential conflict of interest with the hospital service, the CPHM may chair the IMT.

The membership of the IMT will vary depending on the nature of the incident, but will normally include a NHS Board Chair, HPT representatives, IPCT representatives, other relevant clinical staff, a communications officer and administrative support.²

Mandatory requirement therefore no grade of recommendation can be made

Where appropriate, NHS Boards must brief SGHSCD, HPS, local health care staff, and partners in local and national agencies, in relation to incidents/outbreaks.²

Mandatory requirement therefore no grade of recommendation can be made

Specifically, following the IMT, the NHS Board is required to communicate HIIAT Amber and Red assessments with HPS (and through HPS, the SGHSCD),⁵ by completing a [Healthcare Associated Infection Incident and Outbreak Template \(HIIORT\)](#)⁴ within 24 hours of HIIAT assessment.

Mandatory requirement therefore no grade of recommendation can be made

During an IMT; a case definition(s) for the purpose of the incident should be agreed. Case definitions should include the following: the individuals involved (e.g. patients, staff), the place (e.g. care area(s) involved) and a time limit. The case definition(s) should be regularly reviewed and refined (if required) throughout the incident investigation as more information becomes available. To ensure that necessary control measures are implemented, the incident investigation should aim to establish how cases were exposed to the infectious agent and assess ongoing epidemiological and microbiological results. The IMT should also aim to identify any change(s) in the system e.g. staffing, procedures/processing, equipment, suppliers. A step-by-step review of procedure(s) may be helpful.^{1:2}

Mandatory requirement therefore no grade of recommendation can be made

When should staff screening be considered?

The IMT may decide that staff screening is necessary to identify carriage or infection among staff groups. The aim of this is to protect patients, visitors, staff and the wider public from on-going transmission of infection. The decision to screen should be based on the need of one or more of the following:

- To characterise the epidemiology of the outbreak in terms of time, place and person;
- To identify the likely source and index case, with a view to control the incident/outbreak;
- To assist with interrupting the chain of transmission of an outbreak;
- To confirm eradication of an outbreak.

Staff screening is undertaken by local Occupational Health Services and is a confidential process requiring staff consent. It involves collection of specimens from areas of the body where the particular type of organism(s) being looked for are most likely to be found. If an employee is found to be infected with the identified organism(s) they may be sent home (if appropriate) by Occupational Health (with the authority of the IMT). If necessary, appropriate treatment may be prescribed.⁸

Mandatory requirement therefore no grade of recommendation can be made

Should deaths associated with healthcare infection incidents be reported?

The SGHSCD has outlined a process for the reporting of deaths associated with HAI incidents. Specifically, deaths associated with HAI should be recorded on the medical certificate of the cause of death (MCCD) and reported to the Infection Control Manager (ICM). In addition, one of the indications for reporting a death to the Procurator Fiscal (PF) is where the death occurs as a result of an infection acquired while under medical/dental care while on NHS premises.⁹ Only HAI deaths, which pose an acute and serious public health risk, must be reported to the PF.¹⁰

Mandatory requirement therefore no grade of recommendation can be made

How should healthcare infection incidents be communicated?

NHS Boards should have a communications plan which encompasses the HIIAT and HIIORT and indicates how information about the incident and its control will be provided.

The following groups should be included within relevant communications:

individuals/agencies involved in managing the incident/outbreak, professionals involved in treatment/diagnosis of cases, the general public, HPS and the SGHSCD.²

Once the incident is over, the IMT/NHS Board should evaluate and report on the effectiveness and efficiency of incident management (debrief). This information should be shared so that the whole service can learn from the experience of others. The IMT Chair, in discussion with the IMT, should determine the most appropriate format for reporting the incident i.e. full IMT report or Situation, Background, Assessment, Recommendations (SBAR) format. The final report should be submitted to the NHS Board and relevant organisations with responsibility for taking forward report recommendations.²

Mandatory requirement therefore no grade of recommendation can be made

When would the CNO National Support Framework be invoked in relation to a healthcare infection incident?

The [CNO National Support Framework](#) sets out the roles and responsibilities of national agencies including HPS and Health Facilities Scotland (HFS) to optimise patient safety during healthcare infection incidents or when surveillance data suggests a NHS Board may need support to reduce healthcare infection risks.

The CNO National Support Framework may be invoked by the SGHSCD or by a NHS Board to optimise patient safety during or following any healthcare infection incident.⁵

Mandatory requirement therefore no grade of recommendation can be made

Reference List

- (1) Public Health England. Communicable Disease Outbreak Management: Operational Guidance. 2014.
- (2) The Scottish Government. Management of Public Health Incidents: Guidance on the Roles and Responsibilities of NHS led Incident Management Teams. 2016.
- (3) Health Improvement Scotland. Healthcare Associated Infection (HAI) Standards. 2015.
- (4) The Scottish Government. DL (2015)19: Healthcare Associated Infection and Antimicrobial Resistance Policy Requirements. 2015.
- (5) The Scottish Government. CNO(2010)1: National Support Framework for NHS Boards. 2010.
- (6) The Scottish Government. HAI- Reporting of Incidents and Outbreaks and Norovirus Guidance. 2009.
- (7) The Scottish Government. The Watt Group Report. 2002.
- (8) Scottish Executive. HDL (2006) 31: HAI Human Resources Policy for Staff Screening during Incidents and Outbreaks. 2006.
- (9) The Scottish Government. SGHD/CMO(2011)13: Accurate Recording of Deaths from HAI and Action. 2011.
- (10) The Scottish Government. SGHD/CMO(2014)27. Guidance for Doctors Completing Medical Certificates of the Cause of Death (MCCD) and its Quality Assurance. 2014.