Chapter 27

Risk Management

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Key points
• The Infection Control Team must identify infection prevention and control practices which are unsafe and hazardous.
• Unsafe practices must be assessed for their severity, frequency, and likelihood of recurrence.
• Priority must be given to hazardous practices that have high adverse effects, occur more frequently, and have lower cost to prevent.
• Effectiveness of these measures should be monitored by regular audits and/or outcome surveillance and the information must be provided to front-line clinical staff, relevant managers, and key decision makers.

Introduction[1-2]

The delivery of an effective infection prevention and control (IPC) programme requires trained IPC practitioners whose job, amongst other things, is to identify unsafe and hazardous IPC practices, recommend cost-effective preventive measures, and help health care facilities set priorities both in high and low resource settings. These objectives can be achieved by applying the concepts of risk management. This skill is essential for IPC practitioners to perform their job effectively.

Risk Management

Risk is defined as the possibility of incurring misfortune and loss. Risk management is a *proactive approach* and its aim is to prevent or minimise harm. This process identifies potential problems and the potential for harm is assessed. Actions are then planned to reduce the likelihood of the problem arising or to limit the harm caused. In IPC the risks can be biological agents that have the potential to cause infection or a mechanism that allows the transmission of an infectious agent to occur. The risk management process can be divided into four key stages. (See Figure 27.1)
1. Risk identification
2. Risk analysis
3. Risk control
4. Risk monitoring

Risk Identification

The process of risk management starts with risk identification and involves:
- identifying the activities and tasks that put patients, healthcare workers, and visitors at risk;
- identifying the infectious agent involved; and
- Identifying the mode of transmission.

The aim is to identify common problems/practices that have impact on a large number of patients or rarer problems which can cause severe infection or death. Once a problem is identified, it is essential to obtain evidence through an investigation, which usually requires the expert knowledge of the IPC Team and can involve observational or experimental studies.
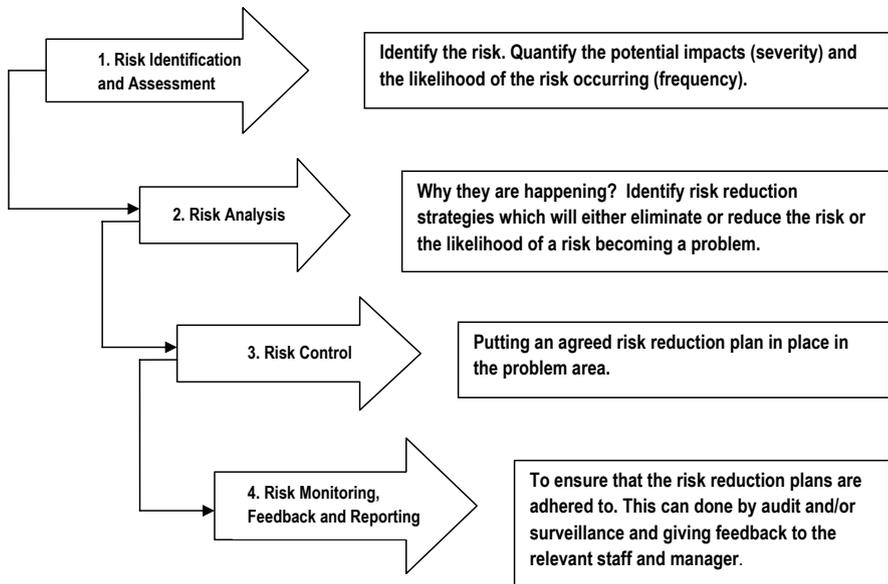
Figure 27.1 Risk management processes.

Risk Analysis

Once the risk has been identified, the likely consequences to patients must be estimated. This can be achieved by analysing four key questions:
- *Why* are infections happening?
- How *frequently* are they happening?
- What are the likely *consequences* if the appropriate action is not taken?
- How much is it going to *cost* to prevent it?

Why are infections happening?
A range of system failures can result in patients acquiring healthcare-associated infections and it is important to analyse these failures in detail.

Type I error
These occur due to an act of omission, e.g., failure to comply with current professionally accepted practice. The basic cause of a Type I error is lack of knowledge; it is typically common in health care institutions where there is inadequate provision of education, training, and supervision. In a low resource setting, a scarcity of goods can also contribute to this type of error. Regular education and competence-based training, good communication, and availability and regular supplies of goods are necessary to address this issue.

Type II error

These occur due to an act of commission, i.e., an act should not have been committed. These are due to lack of commitment or consideration for others. This type of error is more complex and amongst other things may also require management reinforcement.

Type III error

This mainly occurs due to a failure to understand the true nature of the problem. Real solutions are adopted to deal with the wrong problems, rather than incorrect solutions to real problems. This is often due to lack of communication, or misinterpretation of information as a result of inadequate research or information.

How frequently are they happening?

This information is quantitative and can be obtained by ongoing surveillance data (if available) or by performing a point prevalence study. The information can be gathered from other sources, e.g., as part of an outbreak investigation, local prevalence data, data published in the literature, or clinical evidence. Frequency can be measured as the percentage or rate of persons who developed infection following either a clinical procedure or exposure to a pathogen. If surveillance data are not available, probability can be used instead. See Table 27.1.

Table 27.1. Risk probability

Rating	Probability	Comments
4	1:10	Almost certain or very likely to occur.
3	1:100	Highly probably that they will occur.
2	1:1000	It is possible that they may occasionally occur.
1	≥1:10000	They are rare and do not believe/expect to occur.

What are the likely consequences?

Severity can be measured in terms of morbidity (disability or increased length of stay) or mortality experienced by persons who had the procedure or exposure. Severity of the adverse effects can be ranked as in Table 27.2 and Figures 27.2 and 27.3.

Table 27.2. Severity rating

Rating	Description		Comments
20-30	High or major	Major impact on patient which may lead to death or long term consequences	Urgent action is required
10-19	Moderate	Moderate impact which may lead to short term consequences	Action required
1-9	Low risk or minor	Minimum impact with no or minor consequences	Keep under review

High severity	2 - High severity Low frequency (bloodstream infections caused by contamination of intravenous feed/solution)	1 - High severity High frequency (blood-borne infections from re-use of syringes and needles)
Low Severity	4 - Low severity Low frequency (infections from hospital linen)	3 - Low severity High frequency (urinary tract infections)
	Low Frequency	High frequency

Figure 27.2. Severity and frequency of events.

How much is it going to cost to prevent it?

It is also important to estimate the cost of prevention of each risk. Estimated costs are acceptable, as the exact cost may be difficult to obtain. The cost of prevention of infections is important because it helps IPC practitioners target resources where they will deliver the greatest advantage in terms of preventing harm to patients.

LIKELIHOOD	IMPACT				
	Insignificant	Minor	Moderate	Major	Extreme
Almost Certain	MODERATE RISK	MODERATE RISK	HIGH RISK	CRITICAL RISK	CRITICAL RISK
Likely	LOW RISK	MODERATE RISK	HIGH RISK	CRITICAL RISK	CRITICAL RISK
Possible	LOW RISK	MODERATE RISK	MODERATE RISK	HIGH RISK	HIGH RISK
Unlikely	LOW RISK	LOW RISK	MODERATE RISK	MODERATE RISK	HIGH RISK
Rare	LOW RISK	LOW RISK	LOW RISK	MODERATE RISK	MODERATE RISK

Required action, level of involvement and action timeline will be based on the risk level

Critical Risk: STOP ACTIVITY!

- Risk management must be informed to initiate senior administrative notification
- Requires **immediate** written recommendations presented in person to Director and Manager
- Written action plans with timelines must be set
- **ACTION TIMELINE: Immediate action required**

High Risk: STOP ACTIVITY!

- Risk management must be informed to initiate senior administrative notification as required Requires written recommendations, preferably presented in person to Director and Manager within 48 hours
- Written action plans with timelines must be set
- **ACTION TIMELINE: 48 hours**

Moderate Risk:

- Written recommendations to Director and Manager
- Written action plans with timelines set
- **ACTION TIMELINE: 3 months**

Low Risk:

- Written recommendations to Manager
- Written action plans with timelines set
- **ACTION TIMELINE: 6 months or longer**

Figure 27.3. Action planning risk level matrix. Adapted from Bialachowski A, et al [3]

Risk Control

Once the risk analysis has been completed, review the possible solutions. Ideally, the risk should be completely eliminated; if this is impossible then it should be reduced to a minimum/acceptable level. In some situations, it may be more cost-effective to transfer the risk to a third party such as a private contractor. For example, if there is a problem with the supply of sterile goods it may be more cost-effective to purchase these items from another source.

If resources are severely constrained, then it may be possible to accept the risk in both the short and possibly long term. Willingness to tolerate known risks in a health care institution differs in various parts of the world and is based mainly on the availability of resources and the fear/level of litigation.
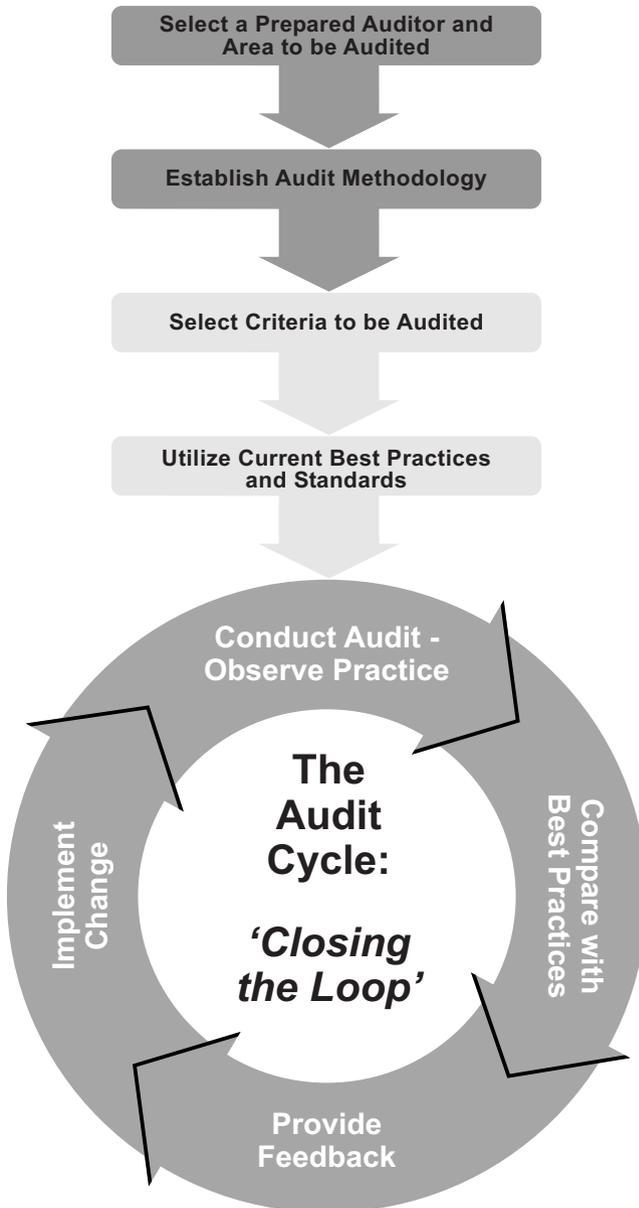
Monitoring and Feedback

Once appropriate measures are in place to reduce the risk, it is essential to monitor their effectiveness. Depending on resources available, this can be achieved by regular audit, process monitoring, and outcome surveillance of healthcare – associated infections. Timely feedback must be given to front line healthcare workers and senior management.

The Audit Process[3]

Identifying and analysing infection risks can be performed using an audit process. The process helps to identify new risks, analyse risks against evidence-based practices, and identify any gaps in practice so that appropriate action is taken. The key elements to the success of this process are communication, consultation, and timely feedback of information to all the key stake holders and making sure that the audit loop is closed. See Figure 27.4.

This can be achieved by:
1. Review of documentation to establish whether written guidance relating to certain procedures or practices exists. Are these guidelines in line with current evidence-based practice? This process may also involve review of documents of previous audits and other relevant reports, etc.

Select a Prepared Auditor and Area to be Audited

Establish Audit Methodology

Select Criteria to be Audited

Utilize Current Best Practices and Standards

Conduct Audit - Observe Practice

The Audit Cycle:

'Closing the Loop'

Implement Change

Compare with Best Practices

Provide Feedback

Figure 27.4 The Audit Cycle: 'Closing the Loop'. Adapted from Bialachowski A, et al[3]

2. Interviews with staff to assess their knowledge and practical application of IPC policies and procedures are also crucial. This is completed through questionnaires, face-to-face discussions, or group interviews.

3. Depending on the resources available, observational visits can be conducted to assess whether practice is actually followed or not. This can be achieved by using a validated audit tool.

Priorities for Action

Once all information is available on the severity, frequency of occurrence, and cost of prevention, priorities for action can be developed by calculating a risk rating as follows:

Risk rating =   Severity x Frequency (probability) of disease x Cost of prevention

A risk rating with the highest score would merit immediate attention. Calculation of the risk rating helps to understand the true consequences of adverse incidents and helps the IPC Team set priorities in the most effective way.

References

1. Roberts G. *Risk management in healthcare*. 2nd ed. London: Witherby & Co., 2002.
2. NHS Management Executive. *Risk Management in the NHS*. London, Department of Health, 1993.
3. Bialachowski A, Clinker K, LeBlanc M, et al. The Audit Process: Part I - Pre-preparation, I –Setting the audit criteria and III - Closing the Loop. *Canadian J Infect Control* 2010; spring issue: 68-70; summer Issue: 109-111; and fall issue: 161-165. http://www.chica.org/inside_cjic_past_issues.html [Accessed July 26, 2011]

Further Reading

1. How is risk managed in the NHS? NHS Educational Resources. http://www.clinicalgovernance.scot.nhs.uk/section3/riskmanaged.asp [Accessed July 26, 2011]
2. Healthcare risk assessment made easy, 2007. National Patient

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