Chapter 28

Risk Management

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

Introduction

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 healthcare 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* to identify potential problems/harms. The best way to manage risk is to *avoid* it in the first place, if possible. For example, avoid use of urinary catheter in patients if it is not clinically indicated. If avoidance is not possible, then every effort must be made to reduce risk to an absolute minimum by reviewing the need for catheterisation daily and monitoring for signs of infection to reduce catheter-associated infections (CAUTI).

The risk management process can be applied to healthcare-associated infections (HAI) and can be divided into four key stages. (See Figure 28.1)

1. Identify risks
2. Analysis risks
3. Evaluate risks
4. Treat risks

Fig 28.1. Example of risk management applied to healthcare associated infections[1]

Identify risks

The process of risk management starts with risk identification and involves:

- Identifying activities and tasks that put patients, healthcare workers, or visitors at risk, e.g., inadequate decontamination of items/equipment, inadequate disposal of sharps, reuse of needles and syringe between patients;
- Identifying the infectious agent involved, e.g., type of microbes, infective dose, and virulence; and
- Identifying the mode of transmission, e.g., contact, droplet, airborne, or inoculation.

The aim is to identify common problems/practices that have an impact on a large number of patients or rarer problems which can cause severe infection or death. This can be performed by the IPC team by 1) analysing laboratory data (blood stream infections, positive tuberculosis patients, identifying multidrug resistant bacteria, etc.) and clinical signs and symptoms of patients admitted to the ward with suspected/confirmed infections during IPC rounds or 2) getting information from the clinical team and observing failures in IPC practice on a day-to-day basis and during outbreaks. Once a problem is identified, it is essential to obtain evidence through an investigation.

Analyse risks

Once the risk is identified it can be managed using a step-by-step approach for identifying possible failure. While performing the risk analysis, it is essential that the likely consequences to patients must be estimated. This can be achieved by analysing four key questions:

1. *Why* are infections happening?
2. How *frequently* are they happening?
3. What are the likely *consequences* if the appropriate action is not taken?
4. How much is it going to *cost* to prevent it?

Why are infections happening?

A range of system failures can result in patients acquiring a HAI and it is important to analyse these failures in detail. There are three types of errors to consider.

Type I error

These occur due to an act of omission, mainly due to failure to comply with current professionally accepted practice, e.g., failure to implement standard IPC precautions or failure to triage and/or isolate patients with suspected/confirmed transmissible infections. The basic cause of a Type I error can be lack of knowledge; it is typically common in health care institutions where there is inadequate provision of education, training, or 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, e.g., failure to perform hand hygiene as per the *WHO '5 Moments* for *Hand Hygiene' indications, even when appropriate products are available.* These errors are due to lack of commitment or consideration for others. This type of error is more complex and, amongst other issues, may also require management reinforcement.

Type III error

These mainly occur due to a failure to understand the true nature of the problem. This is often due to lack of communication or misinterpretation of information as a result of inadequate research or information. In practice, this may occur through information provided by a sales representative. Another possibility is lack of IPC staff looking for evidence to support manufacturer's claims before purchase of a product.

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 of data 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 28.1.

Table 28.1. 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 due to HAI) or mortality experienced by persons who had a procedure or exposure. Severity of adverse effects can be ranked as outlined in Table 28.2. Severity and frequency of events can be prioritised as outlined in Table 28.3. An action planning risk level matrix can be developed as outlined in Fig 28.2.

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. Consider applying for grants to non-governmental organisations (NGO) to secure funding to prove that IPC interventions can be cost effective by performing surveillance during pre- and post-interventions periods.

Table 28.2. 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

Table 28.3. Severity and frequency of events

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 linen)	3 - Low severity High frequency (urinary tract infections)
	Low Frequency	High frequency

Evaluate risks

Once the risk analysis has been completed, review 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.

Treat risks

Once appropriate measures are in place to reduce the risk, it is essential to regularly review and monitor their effectiveness. Depending on resources available, this can be achieved by regular audit, process monitoring, and outcome surveillance of HAIs. Timely feedback must be provided to front line healthcare workers and senior management to ensure that measures are implemented. A person should be nominated for all follow-up actions and feedback on the progress of improvements.

The Audit Process[2]

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 key stake holders. In addition, it is important to make sure that the audit loop is closed. See Figure 28.3.

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. It is essential that key stakeholders are involved. Once finalised, this information *must be* communicated to relevant staff both in writing and by reviewing appropriate documentation.
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.

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 28.2. Action planning risk level matrix.[2]

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 (also see Table 28.3). Calculation of the risk rating helps to understand the true consequence of adverse incidents and helps the IPC Team set priorities in the most effective way.

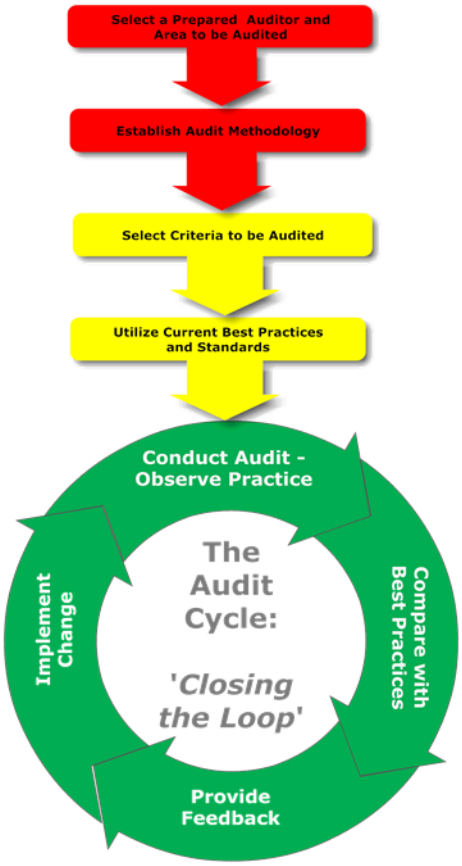

Figure 28.3. The Audit Cycle: 'Closing the Loop' [2]

References

1. Clinical Educators Guide for the prevention and control of infection in healthcare. Commonwealth of Australia; National Health and Medical Research Council, 2010. https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cd33_icg_clinical_ed_guide_web.pdf [Accessed 18 February 2016]
2. 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.

Additional Reading

1. Risk Assessment for Infection Prevention and Control. Illinois: Joint Commission Resources, 2010. http://www.jointcommissioninternational.org/assets/1/14/rahs10_sample_pages.pdf [Accessed 17 February 2016]
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