CANCER PEDIA

GOVERNANCE AND QUALITY

# QUALITY

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CHAPTER
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# QUALITY




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# A. INTRODUCTION

Quality of care is defined by the Institute of Medicine (2013) as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge".[1] High-quality care should provide appropriate services to patients in a safe and competent manner, and ultimately do no harm to the patient. A centre that delivers high-quality cancer care is cost-effective and enables the most desirable outcomes for the patient population that it serves.

A well-developed and resourced cancer centre does not guarantee higher-quality care.[2,3] Quality can be achieved in centres with lesser resources. The key is a commitment to and unrelenting focus on quality, and systematic quality improvement practices that are intrinsic to the ongoing operations of the cancer centre.

This chapter provides an overarching discussion of quality in cancer care. Requirements relating to specific clinical and core services can be found in other *Cancerpedia* chapters.

# B. OVERVIEW

## 1. QUALITY IN HEALTHCARE

Quality in healthcare gained public prominence with the release of the groundbreaking report, *To Err is Human: Building a Safer Health System*.[4] Focusing on safety, the report concluded that 98,000 hospitalized Americans die annually due to errors in their care, and that hundreds of thousands suffer from non-fatal injuries that a high-quality care system would largely prevent. In addition to the cost in human lives, preventable medical errors cost an estimated $17 to $29 billion per year in terms of additional care needs, lost income, lower household productivity and increased disability. A follow-up report – *Crossing the Quality Chasm: A New Health System for the 21st Century* – observed that patient safety is only a small part of quality, that "other defects" are widespread and that improvements are needed in all quality dimensions.[5]

Studies from other countries have reported similar findings and made similar observations. For example, the Canadian Adverse Events Study estimated that 7.5 per cent of all hospitalizations in Canada included an adverse event that harmed patients, and suggested that almost 70,000 of the approximately 185,000 adverse events that occurred during the study period were potentially preventable.[6]

These major studies have highlighted healthcare safety issues and galvanized significant quality improvement efforts across North America. In 2015, two follow-up reports assessed the impact of these safety efforts. *Free from Harm: Accelerating Patient Safety Improvement Fifteen Years After To Err Is Human* noted that although current evidence about overall improvements in patient safety in the United States and globally was mixed, healthcare appeared to be safer than in the past.[7] Regardless, patients frequently continued to experience harms (i.e., mortality, morbidity, quality of life) that could be prevented or mitigated. The study concluded that advancements in patient safety need an overarching shift from reactive, piecemeal interventions to a total systems approach to safety. *Beyond the Quick Fix: Strategies for Improving Patient Safety* found that the harm experienced by patients in Canada, and its impact on families, staff and organizations, continues despite better measures of the number and impact of these events, and efforts to change unsafe practices.[8] The study concluded that improving safety is more complex than identifying effective interventions and spreading the word to practicing clinicians. It requires creating healthcare environments that support safer care, which include: team practices and awareness; shared responsibilities; adaptability to changing patient needs and staff responses; standard clinical processes, with responsive and appropriate customization; and the necessary equipment, supplies, information and staff to provide care. The National Patient Safety Foundation also identified a safety culture as one of its eight recommendations for total healthcare system safety.

Hospital-based healthcare has risks related to the overuse, underuse and misuse of invasive and non-invasive procedures and medications, inappropriate infection prevention and control practices, poor communication, improper patient identification processes, and other reasons. Quality healthcare both benefits from, and is challenged by, research and advances in new drugs, therapies,


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procedures and predictive medicine (i.e. genomics, proteomics, metabolomics, epigenomics), which make it difficult to maintain expertise. In addition, relying more on technology and mechanized processes without stringent checks may give a false sense of security about quality and safety.

Many organizations have increased their focus on quality. Evidence-based standards, guidelines and expectations for quality have been developed by:

- International organizations (e.g., World Health Organization's High 5's project)[9]
- Governments (e.g., Ontario, *Canada's Excellent Care for All Act*, which legislates healthcare quality requirements)[10]
- Professional regulatory bodies (see information about specific clinical services in other Cancerpedia chapters)
- Healthcare accreditation bodies for general accreditation standards and service-specific standards to guide operations (e.g., Accreditation Canada; Econex; The Joint Commission)[11-13]

In addition, open access to a wide range of healthcare information has spurred public demand for transparency, the active involvement of patients in their care and quality treatment. Many healthcare organizations have responded with patient-centred and patient-directed care initiatives. For more information about patient-centred care, see the *Cancerpedia: Patients* chapter.

The drivers for focusing on improved quality and safety are multifold. Common incentives for quality improvement include: an improved patient experience; improved employee engagement; the minimization of reputational risk to the healthcare institution; and financial impact. A report entitled *The Economics of Patient Safety in Acute Care* estimated that the economic burden of preventable adverse events to the Canadian healthcare system was $397 million in 2009-10 alone.[14] Preventable adverse events often result in increased patient complications that require an increased length of stay in the hospital or early, unplanned readmissions. These factors, in turn, result in an increased use of resources (e.g. medications, staff time, bed occupancy). Improved safety and quality has a positive impact on efficiency, allowing institutions to optimize their use of resources.

### 2. QUALITY IN CANCER CARE

Studies of quality in cancer care mirror the results of studies of quality in healthcare. For example, *Ensuring Quality Cancer Care* concluded that for many Americans with cancer, there is a wide gulf between the ideal versus the real experience of cancer care.[15] More recently, a quality study concluded that cancer care is often not as patient-centered, accessible, co-ordinated or evidence-based as it could be, all of which have a detrimental impact on patients.[16]

Cancer has the same quality risks and requirements as all healthcare settings, including positive patient identification, medication reconciliation, hand hygiene, the prevention and control of nosocomial infections, clear communication and an environment that supports the raising of concerns and questions, regardless of a person's level of authority. Independent double checks are especially pertinent to safety in the cancer therapy environment and can eliminate 95 per cent of errors.[17] In addition, there are quality risks specific to cancer care. Many cancer patients require multiple therapies (i.e., surgery, chemotherapy, radiotherapy). Decisions must be made regarding the optimal timing and order of these treatments. As well, most cancer patients receive care from many healthcare providers who need to co-ordinate care, and communicate and share information with each other and the patient. For more information, see the *Cancerpedia: Healthcare Team* and *Cancerpedia: Patients* chapters. Finally, patients who receive complex chemotherapies are taking agents with a low therapeutic index that are individualized, act quickly and are difficult to reverse if an error occurs. See the *Cancerpedia: Chemotherapy* chapter for more information.

## C. KEY COMPONENTS

### 3. CULTURE OF QUALITY

The culture of quality in healthcare is a balance between individual and systems accountability, which has evolved over the last three decades.


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Before the 1990s, perfect performance was expected and individual healthcare providers were held fully accountable for patient outcomes. The view was that errors were caused by bad practitioners and individual weakness, and safety could be maintained through the discipline and weeding out poor performers. Improvement strategies tended to be goal-oriented, with little direction on how to achieve the goals. Rather than improving safety, this punitive name-shame-blame approach had the opposite effect, in that: i) the fear of embarrassment, job loss and discipline drove errors underground; ii) fewer errors, near misses and hazards were reported; iii) staff developed workarounds by circumventing, rather than addressing safety issues, which masked concerns or created new and unexpected risks; and iv) the belief that "no news is good news" led to missed opportunities to learn about risks and how to reduce error.

The mid-1990s saw the development of the no-blame or blame-free culture and a focus on systems thinking. This was a step in the right direction, acknowledging human fallibility and recognizing that most unsafe acts are a result of mental lapses or mistakes rooted in system, process, technical or environmental weaknesses. It was generally agreed that workers who made honest errors were not truly blameworthy, and there was little benefit in punishing them for unintentional acts.

A key drawback of the no-blame culture was that it failed to confront individuals who wilfully made unsafe behavioural choices and knowingly disregarded risks. Experts agreed that the blame-free approach needed to be balanced with accountability in certain circumstances.[18] The "just culture" recognizes that although humans are fallible, they have control over their actions. Quality and safety is the result of shared accountability for good system design and good behavioural choices. The just culture encourages and may even reward reporting so that risks can be addressed. Reason's algorithm is a standard approach that uses the following five dimensions and questions to help managers assess an incident and determine a person's culpability within the just culture.[19]

- ***Deliberate harm***: Were the actions and adverse consequences intended? If yes, then the worker is culpable and disciplinary action needs to be taken.
- ***Physical/mental health***: Were the actions influenced by substance abuse? If yes, disciplinary action should be taken. Where substance use is related to a medical condition, the person should be referred to employee health services.
- ***Foresight***: Were safe working practices adhered to? This test separates a possible reckless violation from one in which system factors played a role.
- ***Substitution***: Given similar conditions, would peers have taken the same action? This assesses whether the variation in behaviour reflects deficiencies in training and selection, experience or negligence.
- ***Precedent***: Is there a history of unsafe acts, corrective training or counselling?

See the Unsafe Acts Algorithm for at tool adapted from Reason's work.[20]

## 4. GUIDING QUALITY FRAMEWORK

A broad, guiding quality framework identifies the areas or dimensions in which the cancer centre will focus its quality improvement efforts. There are many ways to frame quality. The following, most commonly used quality dimensions in healthcare were identified through a review of conceptual quality frameworks in six countries (i.e., Australia, Canada, Denmark, the Netherlands, the United Kingdom and the United States) and quality frameworks from the European Community Health Indicators project, the Commonwealth Fund, and the World Health Organization.[21]

- ***Effectiveness or improving health or clinical focus***: the degree of achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit and not to those who would not benefit; the extent to which attainable improvements in health are attained; the degree to to which processes result in the desired outcomes and are free from error.
- ***Safety***: the degree to which healthcare processes avoid, prevent and ameliorate adverse outcomes or injuries that stem from the processes of healthcare. Note that safety is closely related to effectiveness, but distinct due to its emphasis on preventing unintentional adverse events.


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- ***Responsiveness or patient-centredness or patient focus***: how a system treats people to meet their legitimate non-health expectations; the degree to which a system places the patient or user at the centre of its delivery of healthcare. This is often assessed in terms of the patient's experience of their healthcare (e.g. caring, communication, understanding in the clinician-patient relationship). For more information, see the *Cancerpedia: Patients* chapter.
- ***Accessibility***: the ease with which health services are reached – physically, financially and psychologically – and the availability of health services.
- ***Equity***: the extent to which a system deals fairly with all concerned; the distribution of healthcare and its benefits. Note that equity is closely related to access, but differs in that it assesses health system financing and outcomes or health status.
- ***Efficiency***: the system's optimal use of available resources to yield maximum benefits or results; the system's ability to function at lower costs without diminishing attainable and desirable results.

Quality dimensions that were used less often and tended to be related to or subsumed by more commonly used dimensions included: acceptability (related to patient-centeredness); appropriateness (related to effectiveness); competency or capability (related to effectiveness); continuity (related to patient-centeredness); and timeliness (related to patient-centeredness and accessibility).

The quality dimensions noted above are widely recognized and used. Recent studies that emphasize the importance of a total systems approach to safety and creating healthcare environments that support safer care, suggesting the possibility of additional quality dimensions.[7,8] These could include quality teams and staff or collaborative partnerships.

The guiding quality framework provides a foundation for the cancer centre's quality plan. Centres need to develop a framework by selecting and defining the quality dimensions that make the most sense for their organization.

## 5. QUALITY PLAN

The quality plan must align with and support the cancer centre's strategic goals and priorities, be actionable and doable, and provide sufficient latitude for the organization to address important quality issues that may arise. The development of a robust quality plan should follow the below steps.

***Identify quality risks and translate these into strategic quality goals***: Using the quality framework as a guide, the cancer centre must identify all current and future risks to quality in each of its quality dimensions. Risks are then prioritized as being most pertinent to the cancer centre, and requiring targeted attention and resources to enable improvement. Top priority risks should be developed or worded as broad strategic quality goals or aims for the cancer centre.

***Identify initiatives to achieve the quality goals***: Meaningful initiatives should be identified for each strategic quality goal. Various approaches can be used to identify these initiatives. For example, driver diagrams are logic charts that include the following levels: i) a quality goal; ii) factors that have an impact on the goal (i.e., high-level factors are primary drivers, which may in turn be influenced by other factors or secondary drivers); and iii) specific initiatives that have an impact on the factors.[22] For example, if a cancer centre's quality goal is to improve access to chemotherapy, high-level factors might include improving the efficient flow of patients, increasing resources (e.g., staff, physical infrastructure) and reducing the number of patients being treated at the centre. Initiatives would then be identified to address each factor. Driver diagrams help maintain a focus on the centre's larger quality goals, enable staff to identify and connect the factors that need to be addressed to achieve each goal, and link each factor with actionable and doable initiatives that are relevant to staff.

***Select indicators to track progress and improvement***: Measureable performance indicators must be selected for each initiative to track progress and improvements in quality. Indicators are necessary to determine whether changes have led to improvement.

Typically, indicators fall into three areas: structures, processes and outcomes.[23] *Structures* refer to the settings in which care takes place and their related supports (e.g., the cancer facility, equipment, human resources, administrative structures, program operations and policies). *Processes* refer to the care process, which


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includes the full range of care the patient receives, whether it was good care and how it was provided (e.g., appropriate, complete, technically competent, co-ordinated, acceptable). Values and standards affect the assessment of process indicators, which question whether healthcare was properly practiced. *Outcomes* refer to the patient's recovery, restoration of function and survival. Indicators may be categorized as: leading *indicators*, proactive and predictive measures focused on incident and harm prevention; lagging indicators, retrospective measures of incidents or harm used to evaluate the overall effectiveness of current safety practices; or *real time indicators*, process measures that reveal how effectively leadership and front line staff have embedded safety processes into their daily work.

Ideally, quality improvement measurement should be linked to patient outcomes, but this may not always be possible for various reasons (e.g., outcomes may occur after discharge or may not be easily linked to specific initiatives). In many cases, process measures are used to assess whether a quality initiative was successfully implemented.

The type of indicators selected vary depending on the level of analysis within the organization. The board of directors and senior executive leaders may focus on "big dot" indicators, which are system-wide measures used to evaluate overall organizational performance and the effectiveness of strategies.[24] At the director, manager and staff levels, big dot indicators cascade down into more specific "small dot" indicators, which measure the success of quality initiatives.

Once indicators have been identified, performance improvement targets must be selected. If the cancer centre's activities are significantly different from other facilities, it may be most appropriate to set improvement targets in relation to the facility's current performance. Where possible, it is preferable to set targets in relation to best-in-class institutions or top-performing peer facilities. Cancer centres should consider setting targets that represent what the organization aspires to, and stretch targets for high-priority areas.

## 6. RESOURCES

An effective infrastructure is needed to support quality at all levels.

From a ***physical facilities and equipment*** perspective, quality refers to a physical infrastructure that meets all safety design, building and maintenance codes, as well as the assessment, ongoing inspection and maintenance of all equipment, including prior to purchase. Human factors engineering is critical for quality physical facilities. This relatively new field focuses on how people interact physically and psychologically with each other, products, tools, procedures and their environment. Intuitive and user-friendly physical environments must be designed with the active participation of staff. For example, in many healthcare facilities, staff advise on the most effective layout of departments, rooms and equipment. As well, facilities management professionals conduct human factors assessments in simulation labs to allow staff to test out potential new equipment (e.g., IV pumps) prior to purchasing. See the *Cancerpedia: Physical Facilities and Support Services* chapter for more information about the design, building and maintenance of the cancer centre's physical infrastructure.

In terms of ***human resources***, cancer centres should consider education, credentialing and training for healthcare professionals in quality practices as a key part of their infrastructure. Organizations must identify specific educational and experiential requirements in their hiring processes, and incorporate ongoing assessments of competency and a commitment to continuing professional education into their practices; for example, an organization may randomly examine clinicians or have them conduct standard patient interviews. Many countries and professional colleges provide for voluntary maintenance of continuing education and quality assurance programs. For more information, see the *Cancerpedia: Education* chapter.

There is growing recognition of the importance of clinician competencies and training in quality. For example, the Canadian Patient Safety Institute collaborated with the Royal College of Physicians and Surgeons of Canada to develop a safety competencies framework that can be incorporated into an organization's education programs and professional development activities. The framework includes six core competency domains, 20 key competencies, 140 enabling competencies, 37 knowledge elements, 34 practical skills, and 23 essential attitudes that can lead to safer patient care and quality improvement.[25] The six core competency domains are:


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- Contribute to a culture of patient safety
- Work in teams for patient safety
- Communicate effectively for patient safety
- Manage safety risks
- Optimize human and environmental factors
- Recognize, respond to and disclose adverse events

For more information, see the *Cancerpedia: Education* chapter.

In terms of ***information systems***, cancer centres need systems to capture and generate data about quality performance over time. These data form the basis of standard reports, and are used to track improvements and highlight areas that need to be addressed. Innovations in technology support the standardization of documentation and shared databases, which in turn facilitate data sharing and benchmarking across institutions and countries. Shared information systems also support safety and quality by allowing for the easy transfer of patient health information across the continuum of care, the inclusion of built-in alerts for healthcare providers, and the provision of standard dosage calculators for medication ordering and administration. All of these factors can increase the availability of reports to support decision-making related to safety and quality. See the *Cancerpedia: Clinical Management* chapter for more information about systems and tools that support clinical decision-making and quality care.

## 7. LEADERSHIP

Governance of the cancer centre is usually provided by a board of directors, who set strategy and policy for the organization. Management is provided by staff with leadership training, who operationalize the board's directions. Senior executive managers in a cancer centre usually include leaders with both clinical and non-clinical training. For more information, see the *Cancerpedia: Governance and Management* chapter.

In their study of leadership engagement in quality improvement, Vaughn et al. found that better quality outcomes were associated with hospitals in which the board of directors spent more than 25 per cent of its time on quality issues, and received a formal quality performance measurement report.[26] Better quality outcomes were also associated with hospitals that had a high level of interaction between the board and medical staff when setting the quality strategy, where the chief executive officer or chief operating officer was identified as the person with the greatest impact on quality improvement, and where senior executive compensation was based in part on quality improvement performance. The study supported greater engagement of hospital boards and senior executives in risk identification and mitigation, education about teamwork training, team interventions and communication, and accountability to close safety and quality performance gaps through performance reviews or compensation incentives.

Boards in particular need to be educated about quality so they can understand and critically monitor quality performance at a high level, identify and discuss problem issues and mitigating strategies, and set quality strategy and policies. Resources are available to help boards and senior leaders effectively govern and manage healthcare quality.[27]

## 8. STANDARD REPORTING

Cancer centres must develop formal quality improvement measurement tools – such as performance scorecards or dashboards – that allow for reporting on quality to the board of directors, leadership and staff, and the identification of areas where quality needs to be improved. Quality scorecards or dashboards link the quality plan to measurement through the careful selection of key quality indicators, which are presented simply in graphic and numerical format. There appears to be a link between greater hospital quality and well-designed dashboards (i.e., shorter, more focused dashboards), the active use of dashboards for operational management, and the strong influence of board quality committees in determining dashboard content and implementation.[28]

## 9. PATIENT ENGAGEMENT

Patients perform important work that helps to ensure quality cancer care. For example, patients provide their own health histories when notes are missing, relay information between clinicians, remind clinicians of tests that should be done, follow-up on test results, and may detect errors in procedures.[29,30]


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Unruh et al. note that patients use their intimate knowledge of their changing health status to intervene when problems arise in their care.[29] Patients are uniquely qualified to identify medical errors or adverse events, since they observe almost the entire process of care and, in doing so, observe inconsistencies in care, errors and harm.[30]

Research has shown that patient-reported adverse events were highly predictive of real events. Zhu et al. found that 71.2 per cent of patient-reported negative effects were classified as adverse events by physician reviewers.[31] These patient reports provided additional information that was regarded as credible and not available from other sources. Patients were also able to identify process failures, including problems in diagnosis, medication administration, operative or procedure-related services, other clinical services and overall service quality, which were later validated by medical review.[32] The researchers noted that many patients are aware of errors and iatrogenic injuries that affect their care, and engaging patients as partners to identify and prevent medical errors is promising for advancing patient safety.

In their study of recently discharged patients, Weissman et al. suggested that both health record reviews and patient interviews are necessary for a reasonably complete picture of hospital adverse events.[33] The researchers found that 11 per cent of patients had at least one adverse event identified by a health record review and 23 per cent of patients had at least one adverse event detected by an interview, with little concordance between the events detected by the two methods. In fact, the inclusion of patient reports tripled the rate of detecting adverse events.

Health literacy – which is the ability to read, understand and use health information to make appropriate health decisions and maintain basic health – has a significant impact on quality and safety. Individuals with low health literacy may have problems with medications, appointment slips, consent forms, discharge instructions, health education materials and insurance applications. They may also have trouble understanding information, following treatment plans or seeking follow-up care, and may be unwilling or unable to ask questions. Cancer centres must consider general principles to increase health literacy, such as the following:

- Keep information simple and focus only on key points, with an emphasis on the actions the patient should take
- Use plain language (i.e., simple words and sentence structure, only as many words as needed)
- Minimize medical jargon
- Use simple, realistic and culturally-appropriate drawings and pictures to illustrate points and support the text
- Ensure appropriate translation
- Slow down to give patients ample time to ask questions

For more information about health-literate approaches, see the *Cancerpedia: Patients* chapter for more information.

The teach-back method can be used to confirm a patient's level of understanding. This involves providers asking patients to repeat – in their own words – the key ideas, decisions or instructions that were just discussed. A variation is the return demonstration or show-back method, in which the patient demonstrates to the caregiver how they will do what was taught.

## D. USEFUL APPROACHES AND TOOLS

Cancer centres can use a wide range of quality approaches and tools. A selected number of these are described briefly below.

### 10. IMPLEMENTATION OF INITIATIVES

The Canadian Patient Safety Institute's *Improvement Frameworks Getting Started Kit* includes information on the following standard quality improvement frameworks.[34]

- The Model for Improvement
- Liberating Structures


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- Positive Deviance (PD)
- Seven (to Eleven) Step Problem Solving Models
- Lean Improvement
- Six-Sigma, including: Define, Measure, Analyze, Improve, Control (DMAIC); Design for Six-Sigma (DFSS); and Lean Six-Sigma
- Quality Function Deployment (QFD)
- Social Marketing
- Highly Adoptable Improvement (HAI)

## 11. INCIDENT PREVENTION AND ANALYSIS

Selected incident prevention and analysis approaches are described below.

***High-reliability organizations*** have cultures and processes that reduce incidents (i.e., system failures) and respond effectively when problems do occur.[35] High-reliability organizations follow five core concepts, listed below:

- Organizations need to be preoccupied with their failures, rather than with their successes. This requires an unrelenting focus on performance failures, including near misses: where they happen, why they happen, how to correct them, and how to make sure they do not happen again.
- Organizations need to avoid oversimplifying the interpretation of what is going on and what has gone wrong. Problems in complex organizations have complex explanations and solutions.
- Organizations need to be aware of operations at the front line, where patient care is most affected.
- Organizations need to be resilient and agile, which includes detecting, containing and bouncing back from system failures.
- Organizations need to defer to the expertise of staff at the front line.

***Failure mode and effects analysis*** proactively assesses a current or potential process in terms of the steps that have the greatest likelihood of error and highest negative impact. This helps to focus the organization on the most important areas of risk to build a risk-free system. See the Institute for Safe Medication Practices or the Institute for Safe Medication Practices Canada for more information.[36,37]

The ***Canadian Incident Analysis Framework*** is a resource for those involved in managing, analyzing or learning from patient safety incidents in any healthcare setting.38 Methods and tools are provided to answer the following questions:

- What happened?
- How and why did it happen?
- What can be done to reduce the likelihood of recurrence and make care safer?
- What was learned?

The ***Institute for Healthcare Improvement Global Trigger Tool*** uses known triggers or clues to identify adverse events and measure their overall level of harm in a healthcare organization.[39] Rather than depending on voluntary reporting and tracking of errors, trained assessors conduct retrospective reviews of patient records using triggers to identify events that do cause harm to patients. Based on the findings, changes that may reduce harm are selected and tested.

***Root cause analysis*** is a retroactive assessment to determine what happened, why it happened and what can be done to reduce the likelihood of a recurrence. It has been recommended that root cause analysis be undertaken by a multidisciplinary/interprofessional team, to ensure that all perspectives are represented.[40] Staff involved in an incident are interviewed, a sequence of events is developed, the root causes of the incident are identified and concrete actions for improvement are developed. Diagrams should be used, especially to focus attention on systemic issues.[40]


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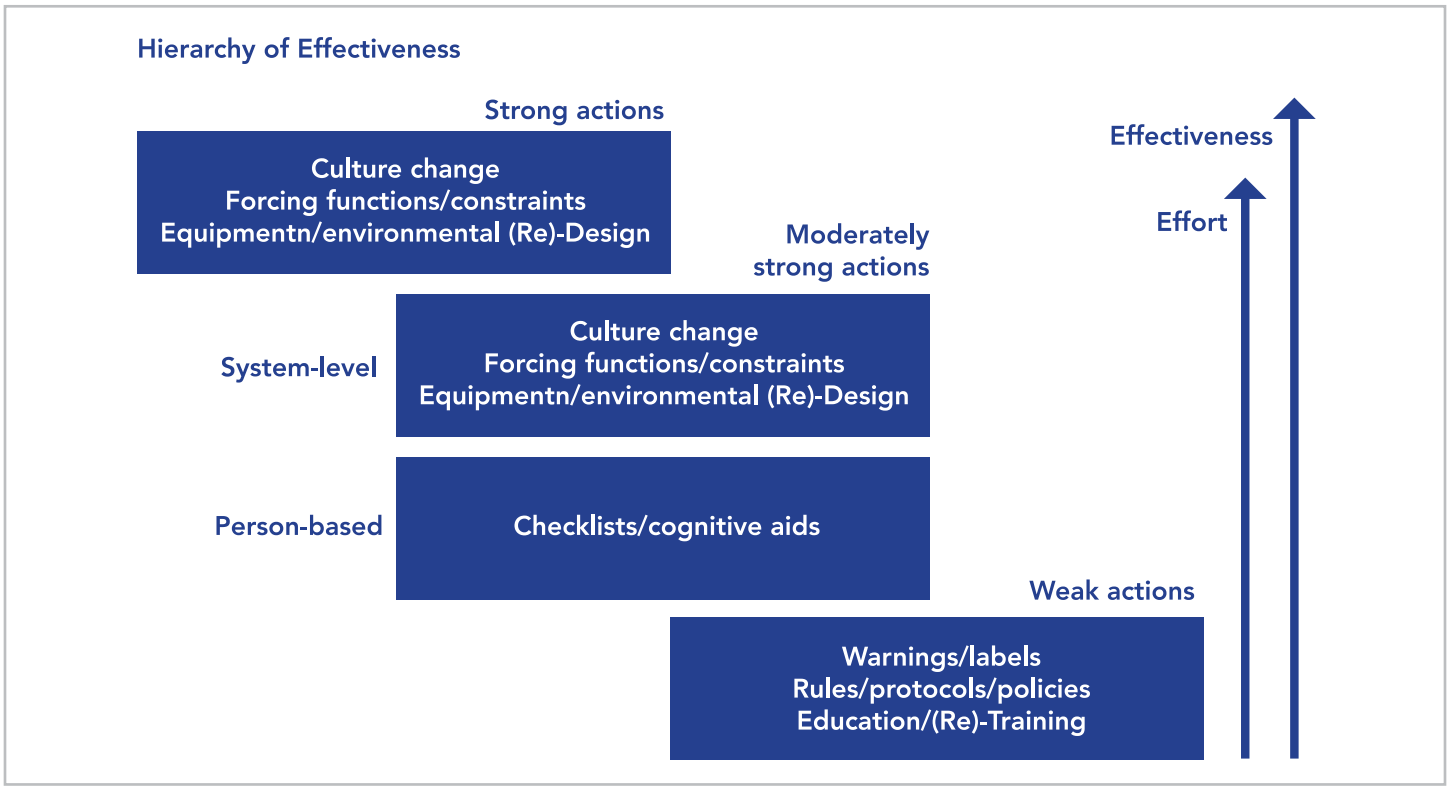
## F. THE FUTURE

Quality improvement is an enduring issue faced by all healthcare organizations, requiring continuous investment, adjustment and attention to new evidence. Over the past decade, human factors engineering has been instrumental in better understanding the comparative efficacy of quality interventions.[41] Research has demonstrated a hierarchy of effectiveness, ranging from interventions related to human behaviour change at the low end of the scale to technological and system design interventions at the high end of the scale, as illustrated in Figure 1.

Figure 1: Hierarchy of Effectiveness of Quality Interventions[42]




While most organizations currently employ at least some of these interventions, few have integrated the full range of interventions available, particularly those that require more advanced technological capabilities and investments. Cancer centres must continue to build competence across this scale to achieve the optimal quality of care; however, it is important to remember that even simple interventions can have a positive impact on quality. For more information about specific quality interventions, see the *Cancerpedia: Clinical Management*, *Cancerpedia: Equipment and Technology* and *Cancerpedia: Education* chapters.

The growing connectivity between healthcare organizations is another factor that is transforming the quality landscape. Traditionally, quality has been measured largely in isolation at an institutional level. Increasingly, organizations are working together to establish common quality priorities, indicators and targets, and sharing information between institutions for broader comparisons of performance. This approach is revealing institutional blind spots, allowing for cross-institutional learning, and creating a standard for the expected quality of care across settings and providers. Examples of cross-institutional efforts to improve quality include the Cancer Quality Council of Ontario and Health Quality Ontario's Ontario Surgical Quality Improvement Network.[43,44]

Finally, patient engagement has become a mainstay of quality care. The crucial role that individual patients play in identifying adverse events and errors has long been recognized. Today, the importance and value of patient engagement in quality is being extended to the broader quality agenda. It is recommended that patient representatives be included on all quality committees, where they may not only raise patient-related issues, but provide valuable input into cancer centre priorities and participate in operational decision-making. For more information about patient engagement, empowerment and education, see the *Cancerpedia: Patients* chapter.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