
Common Definitions

within Health

**Understanding the processes that
support research, innovation, and
evidence-informed decision making
in the health system**

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Introduction

The health system in Alberta is a complex industry strategically responsible for providing quality care and equitable access for all, striving for the best health outcomes, and ensuring prudent stewardship of resources. These goals are vital for sustaining a publicly-funded health system.

Meeting these goals requires partnerships among organizational sectors situated inside and outside of Alberta Health Services. For these partnerships to work, shared capacity is required to impact the current system, identify and address areas for improvement based on evidence, envision the ideal system, be open to innovation and change, and know where to obtain the best value for investment.

Having access to the right information to inform decision making is the key to success. This knowledge is generated along various process steps in the continuum, including analytics, evaluation, health technology assessment and reassessment, health research, innovation, knowledge translation, performance measurement and management, quality management (planning, control, assurance, and improvement), and research impact assessment. All activities must be grounded in ethics practice of the highest standard.

Common Definitions is a resource that promotes a shared understanding of the knowledge-generating continuum for those in partnership in creating new knowledge and for those who will use it. Multiple definitions from various sources currently circulate with few of them being definitive. Definition statements often lack sufficient context for readers to clearly

understand what a process does under specific circumstances. This resource grounds process descriptions within the broader context. In doing so, it helps to improve understanding and build capacity for appropriate planning, successful application, and appreciation of the contributions made by each part of the continuum.

We intend this resource to be used by anyone in the healthcare system, specifically those who engage in generating new knowledge (researchers, evaluators, quality practitioners, data analysts, innovators), use new knowledge (executives, managers, health service providers), and commission the work (government ministries, executives, managers).

We use some terms in this resource more broadly than others. For example, **initiative** is a common reference for many types of activities: study, project, program, service, intervention, treatment, or policy. The term **participant** broadly refers to anyone who is affected in some way by the initiative: patient, resident, client, research subject, family member, caregiver, and employee. We provide a glossary at the end of this resource.

This resource is the result of a long-term and fruitful collaboration between subject matter experts from Alberta Health Services (AHS), Alberta Innovates, and the University of Calgary. Our appreciation and thanks go to all involved for generously offering their knowledge, experience, and time.

Ongoing refinement of this resource is planned as our collective expertise in knowledge generation work evolves further. We welcome and encourage feedback from anyone who uses this resource.

Common Definitions is a resource that promotes a shared understanding of the knowledge-generating continuum for those in partnership in creating new knowledge and for those who will use it.

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Analytics

Analytics refers to the use and synthesis of pertinent data through accepted methods, approaches, and related business insights that can drive evidence-based planning, decisions, execution, management, measurement, improvement and learning (Cortada, Gordon, & Lenihan, 2012, p. 2).

Analytics can provide the healthcare system with accurate measures of performance for a wide range of decision making purposes. The process of analytics can contribute expertise on planning; developing process, outcome, and benchmark measures; identifying and managing a multitude of different information systems and data sources within the health sector; and modelling and analyses to support improvement. Along with Data Governance and Information Management (the departments and those responsible), AHS Analytics plays a key role in addressing the five dimensions of data quality to ensure accuracy, timeliness, comparably, usability, and relevancy of data assets

(Canadian Institute for Health Information, 2009; Alberta Health Services [AHS], 2013; Alberta Health Services [AHS], 2016b).

Analytics also helps to support ongoing monitoring to provide a consistent, broad view of initiatives focused on organizational performance, health and health services research, patients, quality improvement, and evaluation (Alberta Health Services [AHS], 2015b).

Organizations and industries (including healthcare) need to understand the following to be able to act, respond, or change:

- What has happened in the past and why?
- What is happening now?
- What is likely to happen next?
- What actions should be taken to deliver high-quality and cost-effective services to their customers?

Table 1: Key questions addressed by an analytics process

Known information and data	What happened? (Reporting)	What is happening now? (Alerts and monitoring)	What will happen? (Extrapolation, forecasting)
New insights	How and why did it happen? (Modelling, experimental design)	What's the next best action? (Recommendation)	What's the best or worst that can happen? (Prediction, optimization, simulation)

(Source: Davenport, Harris, & Morison, 2010)

The value of analytics in providing answers to these questions is well documented across industries and the need for analytics support applies equally to the healthcare industry. In fact, it is an essential component of having a top-performing healthcare system. Sophisticated and

efficient information technology, mechanisms for performance measurement, and easy access to information and supporting systems are essential parts of that plan (McMurphy & Canadian Health Services Research Foundation, 2009, pp. 2 & 12).

Strong analytics capacity provides a means of:

- Forecasting capacity and service requirements in light of predicted demand.
- Finding ways to enhance operational efficiency.
- Dealing with the complexity of increasing patient demand for enhanced healthcare quality.
- Targeting and implementing initiatives that deliver the best outcomes for patients.
- Using quality data to determine value for investment and how to achieve better health outcomes.
- Supporting exploration, discovery, design, and planning of policy and programs.
- Gaining insights on how to better educate Albertans and help them become more accountable for their own health.
- Expanding access to healthcare, aligning pay with performance, and helping reduce the growth in healthcare costs (Cortada et al., 2012, p. 3; Kealey & Dean, 2014).

Common Approaches in Analytics

- **Descriptive reporting** describes current situations and problems.
- **Predictive reporting** uses simulation and modelling techniques to identify trends and predicted or unpleasant outcomes of actions taken (e.g., using queuing theory to predict wait times for surgery).
- **Prescriptive reporting** optimizes clinical, financial, and other outcomes (Adams & Klein, 2011).

Common Methods or Tools Used in Analytics

- Metadata, relational databases, data visualization

- Tableau, STATIT and other business intelligence tools
- Statistical software programs (e.g., SAS, R, SPSS, Stata)

Outputs

Outputs are products of analytical work.

EXAMPLES

- Indicators
- Performance measures
- Input measures
- Process measures
- Output measures
- Outcome measures
- Dashboards
- Reports
- Analyses
- Models

(Alberta Health, 2013, p. 10; AHS, 2015a; Azzam & Evergreen, 2013)

Who Benefits from Analytics?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- Systems planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Evaluation

Evaluation refers to a process that includes the systematic collection and analysis of information about the development, activities, implementation, characteristics, and outcomes of an initiative (Patton, 2008).

Evaluators typically ask value-oriented questions on the merit and worth of an initiative. The process strives to make results useful to users and develop strategies for knowledge construction linked to the needs of the evaluation client. In the healthcare setting, evaluations provide evidence that informs decision making by providing an objective understanding of what is working well, what isn't working well, and what can be improved.

Evaluation is recognized as a critical component to improving service delivery and achieving a high-quality healthcare system (McMurchy & Canadian Health Services Research Foundation, 2009, p. 9; Owen, 2006, p. 9).

Common Approaches and Methods in Evaluation

Evaluation approaches are the rules, prescriptions, and guiding frameworks that specify how to conduct an evaluation. An evaluation can be designed in different ways; generally, it tends to be structured according to the type of initiative and the purpose for the study. For example, formative evaluations may focus on improvements early in the lifespan of an initiative while summative evaluations may focus on overall accountability after a longer period and provide proof of the extent to which

the initiative had accomplished what it set out to do. Developmental evaluations support and guide innovations and new initiatives as they transform and mature.

CATEGORIES OF EVALUATION APPROACHES

Evaluation approaches can be categorized into four branches.

Methods approach focuses primarily on quantitative designs and data, but may also use qualitative data. This approach evolved from traditional schools of scientific methods of inquiry (such as quantitative research, measurement, and statistical analysis) that emphasizes detached, objective inquiry to avoid or limit bias.

Examples: randomized control, experimental and quasi experimental designs, cost analysis, time series, and theory-based studies

Use approach is pragmatic and focuses on data that would be the most useful to the evaluation clients. This approach advocates for close collaboration with clients to ensure a clear focus for the evaluation and produce useful and useable results. This approach commonly combines the use of qualitative and quantitative data.

Examples: utilization-focused formative, developmental and summative, process, empowerment, and participatory methods

Values approach focuses on identifying and assigning value to an initiative. This leads to a depth of understanding about the intrinsic value of the initiative and its worth in a particular context. Often, this approach involves assessing and comparing different sets of criteria.

Examples: goal-free, responsive, narrative evaluation, case studies, observational studies, and participatory methods

Social Justice approach is transformative and focuses primarily on the viewpoints of marginalized groups to further social justice and human rights. This approach commonly uses a mixed methods approach.

Examples: deliberative democratic, indigenous, culturally responsive, feminist, and gender analysis (Mertens & Wilson, 2012, p. 54)

In addition to the type of approach used for an evaluation study, the following methods define the way the evaluative data is effectively collected and managed.

Quantitative methods focus on collecting numerical data. Depending on stakeholder needs and available resources, evaluation studies may focus on smaller sub-populations embedded in the local context without the large volume of data required for generalizations. Unlike research, the primary intent of evaluation is not necessarily to produce generalizable results to other populations or locations.

Qualitative methods focus on collecting non-numerical data. These methods are generally used to explore and increase understanding of the social or human condition or the social

interactions from a theoretical or exploratory lens. The process involves emerging questions, collecting data in written format, oral communication, non-verbal actions, and/or participant observation. Data tends to be collected in the participant setting or through various textual sources (e.g., internet, government or legal documents, and news feeds). Qualitative data identifies and explains common themes, actions, observations, occurrences, patterns, or trends.

Qualitative and quantitative approaches should not be regarded as distinct processes, but rather opposite ends of a continuum. Studies can commonly combine both approaches, but may be more one than the other.

Mixed methods incorporate elements of both qualitative and quantitative methods. Drawing from both approaches capitalizes on the strengths of each and provides the potential for a greater understanding of the topic of interest to the investigation. For example, qualitative data can help to provide context and deeper understanding of quantitative data (Creswell, 2014, pp. 18–21).

Common Tools Used in Evaluation

- Evaluation frameworks
- Logic models
- Literature reviews
- Benchmarking
- Surveys
- Interviews
- Focus groups
- Needs assessments

- Research synthesis for evidence-based practice
- Evaluability assessment
- Performance monitoring and assessment
- Document reviews
- Business and analytical software (SPSS, Tableau, SAS, NVivo)
- Audits
- Participant observation
- System analysis
- Social network analysis
- Cost-benefit analysis
- Data extraction from existing sources
- Primary and secondary data analysis
- Triangulation of data from multiple sources
- Production of actionable recommendations for practice improvement
- Design and implementation of knowledge transfer plans

Who Benefits from Evaluation?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership)
- System planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Ethics

Ethics involves distinguishing between right and wrong to determine appropriate behaviour. In the context of knowledge-generating activity in healthcare, ethics involves ensuring these activities uphold the respect for an individual's dignity and autonomy while treating them fairly and equitably.

While conducting a knowledge-generating activity, an ethics analysis at its best is not a rote or check box exercise. An ethics analysis sincerely examines the work being considered to ensure it is unlikely to unintentionally harm others and is conducted in ways that respects people's dignity, protects the vulnerable, and maximizes potential benefit to individuals, their families, and communities.

Engaging in such ethics review involves moral reasoning, which is identifying and analyzing an ethics question to reach a reasonable recommendation for action. Ethics is systematic in its approach and the process helps to justify final decisions.

Guiding Ethical Principles

The following principles help to illustrate how ethics decision making can be applied to practice (Canadian Institutes of Health Research [CIHR], Natural Sciences and Engineering Research Council of Canada [NSERC], & Social Sciences and Humanities Research Council of Canada [SSHRC], 2014, pp. 6–9; Beauchamp & Childress, 2012).

- **Respect for free and informed consent** involves the assurance that participants (who have decision making capacity) are provided with the necessary information to make an informed decision about undertaking, or agreeing to, a given action. This would include full disclosure of all reasonably foreseeable harms and benefits in a way that the participant can understand. Participants also need to understand that their involvement is voluntary and that they have the right to withdraw or refuse at any time.
- **Respect for confidentiality** ensures that the individual's ownership and preferences of personal information they entrust to others is respected in the access, control, and dissemination of identifiable information.
- **Respect for privacy** honours individual and community expectations of bodily modesty, intimacy, bodily integrity, and self-ownership.
- **Respect for justice and inclusiveness** treats participants in similar situations similarly. As such, justice and inclusiveness is linked to fairness, entitlement, equitable treatment, and the fair distribution of benefits and burdens of participation as well as application of outcomes. Equitable treatment is of particular importance in relation to specific groups, such as vulnerable populations (e.g., children, the socioeconomically disadvantaged, those lacking capacity).

- **Minimizing harm** involves protecting participants from unnecessary or avoidable risks and ensuring that risks are minimized or mitigated when unavoidable. A limit of autonomy arises when self-determined choices will cause serious harm to other persons.
- **Maximizing benefits** ensures that on balance, initiatives produce overall benefits against the risks and costs involved. Benefits are for participants, society as a whole, or the advancement of knowledge. When initiatives do not directly benefit participants, participation may be altruistic, providing an opportunity for the individual to contribute to the greater societal good.
- Debrief all parties involved in situations causing moral distress; for example, supportive review of a case of medical assistance in dying for unit staff involved in the patient's care.
- Ensure that the autonomy of stakeholders is respected and they:
 - Have the capacity and information necessary to be able to understand the nature, risks, benefits, and alternatives to a decision and appreciate the impact on their choices, relationships, and life plans.
 - Are free to make decisions without coercion, undue pressure, inducements, threats, or force.
 - Can maintain personal integrity so they may hold true to their own life plans and commitments.
- Assist in developing, reviewing, and implementing policies, guidelines, and organizational initiatives that have significant ethical dimensions.

Customizing Ethics

Within health, the approach to ethics is customized to particular groups.

Clinical ethics is a systematic process to determine the right thing to do when there is uncertainty, conflict, or distress in the clinical setting. The practice of clinical ethics helps to identify ethically justifiable options and to weigh the risks and benefits of these options to determine an appropriate course of action. This process may focus on individual patients, collectively on groups of patients, or members of health care teams.

Clinical ethics services can:

- Provide practical guidance and education based on widely accepted standards of practice.
- Facilitate discussion between care providers and patients in attempt to achieve consensus about possible courses of action.

Research ethics is the application of ethics principles to the research setting and helps to identify the risks and benefits of study protocols and interventions. Research ethics standards provide guidance for the design and implementation of research studies involving human participants, their tissues, and their data (Government of Canada, 2016).

Research ethics in Canada is guided by the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (CIHR, et al, 2014). This is a joint policy of Canada's three federal research agencies: the Canadian Institutes of Health Research (CIHR), Natural

Sciences and Engineering Research Council of Canada (NSERC), and the Social Sciences and Humanities Research Council of Canada (SSHRC). Within Alberta, researchers wanting to use health information must comply with the provincial privacy statute, the Health Information Act (HIA) (Province of Alberta, 2016a, RSA 2000, c H-5, Part 5, Division 3, sections 49, 53(2) (a), 54, 55 and 56, pp. 35–39).

Organizational ethics involves a process to support an agency or institution in acting consistently with its values or with widely accepted norms. Organizational ethics involves the relationship that such an entity has with all stakeholders, including employees, physicians, volunteers, affiliates, contractors, communities, and society broadly. The organization has responsibility to ensure that employees understand the organization's ethical expectations so that employees can practice in accordance.

Professional ethics involves developing and applying standards of behaviour and values to help guide the personal and business behaviour of those practicing in the profession. Codes of professional ethics are often established by professional organizations to help guide members in performing their job functions according to sound and consistent ethical principles. Formal codes of ethics are mandated by governing professional bodies and individuals are expected to follow set principles. For example:

- The Code of Ethics, Standards of Practice and Code of Conduct for Physicians and Surgeons provides expectations for Albertan physicians by the College of Physicians and Surgeons of Alberta (College of Physicians and Surgeons of Alberta [CPSA], 2016).
- Canadian nurses are governed by a Code of Ethics that helps support their ethical practice and work through ethical challenges (Canadian Nurses Association, 2008, pp. 1–2).
- The Health Professions Act of Alberta (HPA) regulates a number of health professions by providing standards to respective professional colleges. HPA is a legal rather than ethical requirement; it articulates a code of conduct for physicians, psychologists, nurses, dentists, pharmacists, chiropractors, and other health professionals. Licensing of practice and adherence to ethical conduct is governed by those professional bodies (Province of Alberta, 2016b, RSA 2000, c H-7, Schedules 1–28).
- The Canadian Evaluation Society (CES) provides guidelines for ethics practice for evaluators (from all fields of evaluation). CES also provides a professional designation and credentialing process for evaluators who apply. It does not, however, act as a governing body to enforce ethical code of conduct (Canadian Evaluation Society, n.d., p. 1).

Ethics Practice for Initiatives Requiring REB Review

Any research involving human participants or human biological material requires review and approval from a Research Ethics Board (REB). Alberta has several designated REBs (Alberta Health Services [AHS], 2016b):

- Conjoint Health Research Ethics Board (CHREB) at the University of Calgary
- Health Research Ethics Board (HREB) at the University of Alberta

- Health Research Ethics Board of Alberta (HREBA) housed at Alberta Innovates. This board has three committees:
 - Cancer Committee (HREBA-CC) for cancer researchers in Alberta
 - Clinical Trials Committee (HREBA-CTC) for Alberta physicians conducting research involving humans
 - Community Health Committee (HREBA-CHC) for multidisciplinary research from both rural and urban communities within Alberta

The role of REBs is to validate the research proposal and ensure that the initiative conforms to widely accepted ethics practices and principles. The REB may also confirm that access to health information is required to perform the study. According to the HIA, REBs can require a researcher to obtain consent prior to accessing a health record. Approval from an REB allows the researcher to approach a custodian and request access to the required health information which is then at the custodian's discretion to grant.

According to the HIA, REB review is only required for research, not other types of initiatives deemed to be non-research.

Ethics Practice for Studies Not Requiring REB Review

Research and non-research processes often employ similar methodologies, making it difficult to determine when an initiative is required to seek an REB review. The Tri-Council Policy Statement 2 (TCPS 2) defines non-research activities in the following ways:

- Processes used exclusively for assessment for management or improvement purposes.

Cited examples include quality assurance and improvement studies, evaluation, performance reviews, and data collection for internal and external organizational reports (CIHR et al., 2014, p. 18).

- Creative practice activities not used to generate data to answer a research question (CIHR et al., 2014, p. 18).

Other non-research processes, such as health technology assessment/reassessment, innovation, performance measurement and management, and research impact assessment, could also be included in the TCPS list of non-research activities.

The TCPS 2 warns, however, that activities or studies outside the scope of research subject to REB review may still involve ethical issues requiring careful consideration. It recommends that those studies could benefit from independent guidance by a capable individual or body other than an REB (CIHR et al., 2014, pp. 66–67).

The TCPS 2 states that a key way to determine whether an initiative requires ethics review by an REB or not is based on the initiative's intended purpose. If the intended purpose is research, then an REB review is required. In some cases it can be difficult to make this distinction, underscoring the need to have reviewers or ad hoc advisors who can assist with this assessment. It is important to note that choice of methodology or intent or ability to publish findings are not factors that determine whether or not an initiative is research requiring REB review.

Finally, if any doubt exists as to the intent of a particular initiative, project leads are directed to seek the opinion of an REB. It is

the REB that makes the final determination on exemption from research ethics review (CIHR et al., 2014, Article 2.1, TCPS 2).

Non-Research Ethics Strategy

Beginning in 2003, the former Alberta Heritage Foundation for Medical Research (AHFMR), now Alberta Innovates (AI), initiated a collaborative process among a broad stakeholder group to help address the gap in available ethics support for non-research project managers within the health system. The resulting development and deployment of a Project Ethics Community Consensus Initiative (ARECCI) resources helped to launch a culture of ethics practice within AHS for this sector of practitioners.

The continued evolution of ethics supports within the health sector has resulted in the Non-Research Ethics Strategy (NRES) for AHS. Sanctioned in November 2016, this strategy is customized to meet the needs of AHS by ensuring a standard approach to providing support as well as building capacity through equitable access to available resources, up-to-date information, and training (AHS, 2016a).

Legal and Policy Frameworks Governing the Collection and Use of Personal and Health Information

Policies regarding access and use of information are informed by both the HIA and Freedom of Information and Protection of Privacy Act (FOIP).

Within health, AHS has the authority to collect, use, and disclose health information in accordance with the HIA. This legislation provides authority for AHS to use health information in its custody and control for

secondary purposes that relate to knowledge-generating processes mentioned in this resource. The HIA is explicit in regard to usage when conducting research or providing internal management processes, such as planning, resource allocation, policy development, quality improvement, monitoring, audit, evaluation, reporting, health service billing, and human resource management (Province of Alberta, 2016a, RSA 2000, c H-5, Part 4, Section 27, pp. 24–25).

FOIP applies to government agencies and schools at all levels, including health authorities. This act addresses the appropriate use of personally identifiable information (a subset of that includes health information). If the agency or school is not identified as a custodian under HIA, it must follow FOIP to protect personal information. Private organizations in Alberta that have personally identifiable information are required to protect the information under the Personal Information Protection Act (PIPA). Private organizations that span multiple provinces must protect the information under the Federal legislation, PIPEDA.

In addition to legislation, provincial and local data governance councils and frameworks exist to provide consistent practice standards around the collection and use of health system data. Some of the entities that exist within AHS include Cancer, Lab Information System, Diagnostic Imaging (DI), Emergency Medical Services (EMS), Corporate Services, and AHS Data Repository for Reporting (AHSDRR).

Researchers wanting to access personal or health information for research purposes must first submit their protocols for review to an REB consistent with TCPS and HIA requirements.

Common Resources

AHS Annual Continuing Education (ACE): Code of Conduct	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): HIA Awareness	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): Privacy Breaches: Prevention and Reporting	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): AHSecure – Collect It Protect It (Prerequisite for HIA Specialized Training for Managers)	AHS MyLearningLink	http://www4.albertahealthservices.ca/Privacy%26ITSecurity/index.html
HIA Specialized Training for Managers (AHSecure – Collect It Protect It must be completed prior)	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): Conflict of Interest Bylaw	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): Ethics Governance Documents, Policies and Procedures	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
AHS Annual Continuing Education (ACE): Respect in the Workplace	AHS MyLearningLink	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp
ARECCI Level 1 (Non-Research Ethics) (Prerequisite for ARECCI Advanced)	AHS MyLearningLink Non-AHS	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp http://www.aihealthsolutions.ca/initiatives-partnerships/arecci-a-project-ethics-community-consensus-initiative/
ARECCI Advanced (Non-Research Ethics) Second Opinion Reviewer training (ARECCI Level 1 must be completed prior)	AHS MyLearningLink Non-AHS	http://mylearninglink.albertahealthservices.ca/elearning/bins/course_list.asp http://www.aihealthsolutions.ca/initiatives-partnerships/arecci-a-project-ethics-community-consensus-initiative/
CITI Canada Training • GCP: Good Clinical Practice • CRC: Clinical Research Coordinator • RCR: Responsible Conduct of Research • Health Canada Division 5 • Social and Behavioural Research Ethics Boards	Several of the CITI Canada courses are currently available online for free to all AHS staff requiring clinical research training	http://www.aihealthsolutions.ca/initiatives-partnerships/acrc-alberta-clinical-research-consortium/
Freedom of Information and Protection of Privacy Act (FOIP)	Publicly Available	http://www.servicealberta.ca/foip/training-for-public-bodies.cfm
National Institute of Health (NIH) Protecting Human Research Participants	Publicly Available	https://phrp.nihtraining.com/users/login.php
TCPS 2 Tutorial Course on Research Ethics (CORE)	Publicly Available	http://www.pre.ethics.gc.ca/eng/education/tutorial-didacticiel/

Who Benefits from Ethics Practice?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- Funders; AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- System planners
- Project managers
- Project leaders
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Health Technology Assessment and Reassessment

Health Technology Assessment (HTA) and Health Technology Reassessment (HTR) are types of systematic evaluation of health-related technology with respect to its properties, effects, and consequences of use. These assessments are used to inform decision making about adopting a new technology or discontinuing its use within the health system (International Network of Agencies for Health Technology Assessment [INAHTA], n.d.).

The primary purpose of both HTA and HTR is to provide evidence to support clinical and policy decision making.

Health technology assessment (HTA) and Health Technology Reassessment (HTR) are closely related multidisciplinary fields that address the clinical, economic, organizational, social, legal, and ethical impacts of a health technology. Health technologies include prescription drugs; diagnostic tests; and surgical, medical, or dental devices and procedures. HTA and HTR, however, do not include broad health system issues, such as information technology, program delivery, staffing, and finance (Canadian Agency for Drugs and Technologies in Health [CADTH], n.d.). The processes and methods used in HTA and HTR should be transparent, systematic, evidence-based and rigorous (Health Technology Assessment international [HTAi], n.d.). Both processes are central to supporting the discrete decision making process to accept or reject a health technology (McKean, Noseworthy, Leggett, & Clement, 2012; Rye & Kimberly, 2007, p. 241).

HTA focuses on the direct and intended effects of a technology, indirect and unintended consequences, and the specific healthcare context in which the technology will be employed and available alternatives.

HTR focuses on the medical, economic, social, and ethical impacts of a health technology currently used in the healthcare system to inform its optimal use in comparison to its alternatives (Noseworthy & Clement, 2012).

Common Approaches in HTA and HTR

ACCESS TO NEW TECHNOLOGIES FOR THE PURPOSE OF EVIDENCE DEVELOPMENT

Newly developed technologies do not always emerge with the support of solid research evidence. HTA can contribute to the required evidence to support decisions about adoption by supporting field trials, pilot projects, or clinical trials. Final decisions are made in context and collaboration with key stakeholders.

ASSESSMENT AND APPRAISAL

HTA helps gather the necessary evidence to support decision making about whether or not to adopt a new health technology. The assessment and appraisal approach may focus on the extent to which the technology can improve access to services, quality of care, and sustainability of healthcare delivery. As with decisions around new technology, final decisions involving assessment

and appraisal are also made in context and collaboration with key stakeholders.

REASSESSMENT

HTR includes a reassessment of health technologies currently used in the system, ideally at pre-determined times, but more often after acquisition and toward the end of the life cycle to determine appropriate use, safety, efficacy, cost effectiveness, or obsolescence.

DE-ADOPTION

When a technology or clinical practice is determined to have limited impact on improving health given its cost, is inappropriate in other ways, or is deemed obsolete, the HTR gathers the necessary evidence to support decision making about the de-adoption of a device or discontinuation of a clinical practice. The term *disinvestment* may also be used interchangeably, but especially when the focus is on the withdrawal of allocated resources supporting the technology (Elshaug, Hiller, Tunis, & Moss, 2007, p. 2; Rogers, 2003, pp. 168–218).

Common Methods or Tools Used in HTA and HTR

While the process of HTA and HTR are distinct, they both share the same types of methods and tools.

- Horizon scanning – systematic process to identify new and innovative technologies
- Rapid reviews – streamlined review of the safety and effectiveness of technologies completed on an accelerated timeline
- Systematic reviews – structured literature review that summarizes all available knowledge related to a specific question
- Social, Technological, Economic, Policy (STEP) reports – produced for Alberta Advisory Committee by HTA partners (University of Alberta,

University of Calgary, and the Institute for Health Economics) (Alberta Health, 2016; Alberta Health, n.d.)

- Health economic analysis – economic evaluation of new or existing health technologies within the context of health system resources and the principles of equity and value for money
- Operational financial impact analysis – identifying and evaluating the impact of the introduction or removal of a new technology/innovation on operational budgets
- Important resources used for HTA – Canadian Agency for Drugs and Technologies in Health (www.cadth.ca), Emergency Care Research Institute (www.ecri.org), Institute of Health Economics (www.ihe.ca), Health Technology Assessment International (www.htai.org), and the academic communities within University of Alberta and University of Calgary

Who Benefits from Health Technology Assessment and Reassessment?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership)
- System planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Health Research

Health research is an undertaking intended to extend knowledge and establish facts or principles through a disciplined inquiry or systematic investigation (Abbott et al., 2008, p. 3). The primary purpose of health research is to contribute to a body of knowledge and, through the accumulation of knowledge over time, to influence healthcare policy and practice.

High-quality health research:

- Ensures a systematic, rigorous, and objective process.
- Gathers data to answer specific and measurable questions.
- Addresses one of the Canadian Institute of Health Research (CIHR) pillars of research:

Pillar 1 Biomedical involving cellular, body system, therapies, or devices used to improve health

Pillar 2 Clinical-including diagnosis and intervention through treatment, prevention, and health promotion

Pillar 3 Health services focusing on health systems and services

Pillar 4 Social, cultural, environmental, and population health including factors that affect the health of populations

(Alberta Health Services [AHS], 2014, p. 23)

Forms of Health Research

- **Basic Research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular application or use in view. Basic research typically addresses Pillar 1 or 2.
- **Translational Research** includes two areas of translation. One is the process of applying discoveries generated during research in the laboratory and, in preclinical studies, to developing trials and studies in humans. The second area of translation is research aimed at enhancing the adoption of best practices in the community. Cost effectiveness of prevention and treatment strategies is also an important part of translational science (National Institutes of Health [NIH], 2007, Part II, Section I). Translational research typically addresses Pillar 2, 3, or 4.
- **Health Systems Research** addresses health system and policy questions that are not disease specific but concern systems problems that have repercussions on the performance of the health system as a whole (Remme et al., 2010, Section: Defining Research Domains: Health System). Health systems research typically addresses Pillar 3 or 4.

Common Approaches in Health Research

Research questions are best explored using the appropriate methodology and approach. While historically it has been common to rank research study types according to rigour and methodology, doing so does not account for appropriateness, feasibility, or quality.

Quantitative and qualitative approaches should not be regarded as distinct processes, but rather opposite ends of a continuum. Studies can commonly combine both approaches, but may be more one than the other.

QUANTITATIVE METHODS

Quantitative methods focus on collecting numerical data. These methods test objective theories deductively and can be used to generalize and replicate findings.

Quantitative Designs

- Randomized controlled trials
- Quasi-experimental
- Experimental
- Non-experimental
- Causal-comparative
- Correlational
- Cohort
- Case control
- Cross sectional studies
- Case series
- Case reports

(CIHR, 2016, Section R; Creswell, 2014, pp. 18–21)

QUALITATIVE METHODS

Qualitative methods focus on collecting non-numerical data. These methods are generally used to explore and increase understanding of the social or human condition or the social interactions from a theoretical or exploratory lens. The process involves emerging questions, collecting data in written format, oral communication, non-verbal actions and/or participant observation. Data tends to be collected in the participant setting or through various textual sources (e.g., internet, government or legal documents, and news feeds). Qualitative data identifies and explains common themes, actions, observations, occurrences, patterns, or trends.

Qualitative Designs

- Narrative
- Phenomenology
- Grounded theory
- Ethnography
- Case studies
- Thematic analysis
- Discourse/conversation analysis

(CIHR, 2016, Section R; Creswell, 2014, pp. 18–21)

MIXED METHODS

Mixed methods incorporate elements of both qualitative and quantitative methods. Drawing from both approaches capitalized on the strengths of each and provides the potential for a greater understanding of the research problem. For example, qualitative data can help to provide context and deeper understanding of quantitative data (Creswell, 2014, pp. 18–21).

Mixed Methods Designs

- Convergent
- Explanatory sequential
- Exploratory sequential
- Transformative
- Embedded
- Multiphase
- Evaluative research

(CIHR, 2016, Section R; Creswell, 2014, pp. 18–21)

Common Methods or Tools Used in Health Research

- Systematic reviews
- Quantitative: administrative data analysis, surveys, meta-analyses, secondary data analysis
- Qualitative: focus groups, (non) participant observation, surveys, interviews
- Mixed: treatment manipulation, random assignment, concept mapping

Who Benefits from Health Research?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership)
- System planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Innovation

Innovation is a process whereby economic and social value is extracted from knowledge or intellectual property through the generation, development, and implementation of ideas to produce new or improved strategies, capacities, products, services, or processes (Advisory Panel on Healthcare Innovation, 2015a). The primary purpose of innovation is often to drive change and redefine healthcare's economic or social potential.

Within an organizational context, the term *innovation* can be used to describe a more effective action or process involved in creating and introducing positive change. Innovation can involve a novel idea, product, process, service, or technology. An innovative change may result from implementing a single novel process or device. More often, innovation is a process that gathers multiple novel ideas, processes, or devices because a host of complementary changes need to occur to achieve the desired positive effect.

For something to be called an innovation, it must be novel to the specific field in which it is applied, have intentional application to address a certain need, and create beneficial change for the user or organization (Innovation, 2016). Applying an innovation to a different field would also be considered innovative. For example, if a novel process created for the energy sector finds successful application within the health sector, the process is considered innovative in both sectors. However, adapting a new process to meet the subtle cultural nuances of the local environment is often a necessary part of

application and is not considered innovative. For example, when the same novel energy-sector process is applied to another location within the same energy-sector field, that application is considered part of a spread strategy.

Innovation is a catalyst for growth and linked to efficiency, productivity, and quality. Everyone within the healthcare sector has a responsibility to be innovative by collaborating to bring forth improvements to patient care and to contain the cost for providing care. Healthcare organizations also need to maintain a vision for innovation with respect to procurement of products, or pioneering or piloting new products and procedures that will help to contribute to maintaining lower costs.

Types of Innovation

Product innovation is a new or significantly improved good or service. This may apply to technology, including software user friendliness or other functional characteristics.

Process innovation is a new or significantly improved production or delivery method. This may apply to techniques, equipment, or software.

Marketing innovation is a new or significantly improved marketing strategy that makes changes to product design; packaging; or placement, promotion, or pricing. While health is not commonly the initiator of marketing innovation, it does support industry by evaluating innovation in the field and sharing results. Industry then uses that information to develop marketing strategies to other users.

Organizational innovation is a new method within an organization related to business practices, workplace organization, or external relations (Organization for Economic Cooperation and Development [OECD], n.d.; OECD & Eurostat, 2005, p. 51).

Health innovation is the ability to change care setting conditions that positively impact effectiveness, efficiency, or delivery of care. Within Alberta Health Services, innovation is understood as any intervention that may be used to promote health and to prevent, diagnose, or treat disease. Innovation varies from a focus on simple tongue depressors, to clinical treatments, up to system-level processes (Alberta Health Services [AHS], 2011, p. 6).

The Importance of Innovation

An innovation can be developed within a healthcare system or procured from outside. Innovations deemed as valued-added are those supported with high-quality evidence that clearly demonstrate a positive impact on health outcomes or healthcare system performance (Alberta Health Services [AHS], n.d.). Innovation is a key driver of productivity by turning ideas into improved practices, improved efficiency, and sustained high performance (Tether, 2003, p. 3).

Critical areas for innovation within the Canadian healthcare landscape include:

- Patient engagement and empowerment
- Health systems integration with workforce modernization
- Technological transformation via digital health and precision medicine

- Better value from procurement, reimbursement, and regulation
- Industry as an economic driver and innovation catalyst (Advisory Panel on Healthcare Innovation, 2015a, p. 120; Advisory Panel on Healthcare Innovation, 2015b, pp. 1–2)

Promoting innovation in these broad areas is necessary to enhance quality, sustainability, and cost containment. When creativity and innovation worthy of emulation occurs, those new processes can be scaled up and spread across the greater healthcare system (Advisory Panel on Healthcare Innovation, 2015a, p. 120).

COMMERCIALIZATION

Canadian governments and industry add another dimension when considering innovation. Early in the project's lifespan, each innovation—especially those developed and validated internally—should be considered for its potential to be commercialized. There should be a mechanism for explicitly identifying new intellectual property with potential commercial value in cost savings (Alberta Health Services [AHS], 2012a, p. 13).

INTELLECTUAL PROPERTY

Intellectual property (IP) refers to any original creation of the human intellect of an artistic, literary, technical, or scientific nature for which exclusive rights are recognized and protected. Intellectual property is an important part of the commercialization process of innovation, which includes patents, databases, copyright, trademarks, design rights, expertise, and trade secrets.

Alberta Health Services has a strong commitment to enhancing and nurturing innovation as a way to be “fit for the future”

(AHS, 2011, p. 7). Strategic partnerships and relationships with researchers, inventors, commercialization interests, and industry are key to facilitating health innovation uptake (AHS, 2011, pp. 7–14). As a strategy to balancing sustainably, costs, and quality, involvement in innovative endeavours helps AHS to be engaged in pioneering, trialling, and validating new products or processes. This involvement also promotes earlier adoption and contributes to evolving the health system so it can be proactive and prepared to address the needs of the future.

Common Approaches in Innovation

Invention refers to newly generated or novel ideas.

Testing and piloting is a process of putting a new innovation into practice and learning from a trial. Depending on what is being tested, the extent of the trial may vary from rapid Plan-Do-Study-Act cycles, to evaluation studies, up to large multiphase research investigations.

Adoption and diffusion occurs when new, proven ideas are adopted into additional appropriate areas (AHS, 2011, p. 7).

Common Tools Used in Innovation

Single portal for industry engagement

(Industry Portal) is an intake process to manage requests, screen, prioritize, and guide health innovations within AHS. This portal is owned by AHS. The Health Technology Assessment and Innovation Department of the Research, Innovation and Analytics portfolio acts as a custodian and broker and maintains responsibility for innovation management when there is an implication for Intellectual Property, as in accordance with the organization's policy

and procedures on Intellectual Property (Alberta Health Services [AHS], 2012b).

Who Benefits from Innovation?

- Academic and scientific communities (academic institutions, researchers)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership)
- System planners
- Project managers

Knowledge Translation

Knowledge translation (KT) is a dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically-sound application of knowledge. KT happens between researchers and those who use knowledge. Their interactions depend on the kind of research being done, the knowledge produced, and the specific needs of those intended to use it. Ultimately, KT is focused on enhancing quality of care by improving patient outcomes, health services delivery, health systems sustainability, and health system products (Canadian Institutes of Health Research [CIHR], 2016).

The following are types of KT, many of which can be combined within a single initiative.

KT or implementation science is the systematic study of methods to promote the uptake and use of research findings in clinical, organizational, or policy contexts (Implementation Science, n.d.).

KT or implementation practice is the use of strategies to adopt and integrate evidence-based interventions and change practice within specific settings (National Institutes of Health [NIH], 2009, Part II, Section I.1).

Integrated knowledge translation (iKT) is a collaborative research approach that takes place between researchers and those who use the knowledge. iKT is focused on questions of mutual interest in an effort to produce research findings that are more relevant to those who will use them (Graham, Tetroe, & Pearson, 2014, Ch. 1, p. 11).

End of grant knowledge translation is the development and implementation of a plan to help knowledge users become aware of the knowledge generated during a project or initiative. End of grant KT may include a variety of activities, ranging from dissemination and communication to more intensive, tailored, and deliberate plans involving changes in behaviour or decision making at individual, group, organization, policy, or systems levels (CIHR, 2016).

Canada is a global leader in the rapidly-expanding field of KT. Within Alberta Health Services, KT is guided by the literature and by the approach to KT adopted by the Canadian Institutes of Health Research (CIHR, 2016).

KT is both a framework and a process that can aid in the design and execution of improving quality of care. It can occur at the individual, team, organizational, policy, and/or systems level (CIHR, 2015).

Common Approaches, Methods, and Tools Used in KT

A KT plan is a systematic strategy designed before or early in the lifespan of an initiative to describe specifically how new knowledge arising from the work will be shared with others or disseminated. There are many templates for end of grant KT plans (CIHR, 2015). High-quality KT plans ensure a strong link between KT goals, targets, and strategies. Every initiative should have a KT plan that can range from being a simple checklist to a complex strategy

matrix focused on the project's objectives and intended outputs. In partnership, researchers and knowledge users work together to interpret findings, decide on key messages, and determine how to tailor and deliver findings using evidence-based strategies, where possible.

Within healthcare settings, KT plans should be developed in collaboration with knowledge users, particularly if the intent of the KT plan is to implement knowledge to change behaviour or decision making. This type of activity requires a different level of rigour, detail, resourcing, and planning to succeed. Finally, it is important to note that the ethical application of knowledge is at the core of KT planning; that is, all plans should be firmly grounded by the strength and significance of the findings.

Implementation

Implementation is a deliberate set of process steps used to close evidence-practice or evidence-policy gaps (i.e., measurable gaps between what evidence says should be done and what is happening). An example of an implementation framework is the Knowledge to Action Framework (Graham et al., 2006, p. 20; Straus, Tetroe, & Graham, 2013, Section 3).

Well-designed implementation brings together high-quality evidence from two sources:

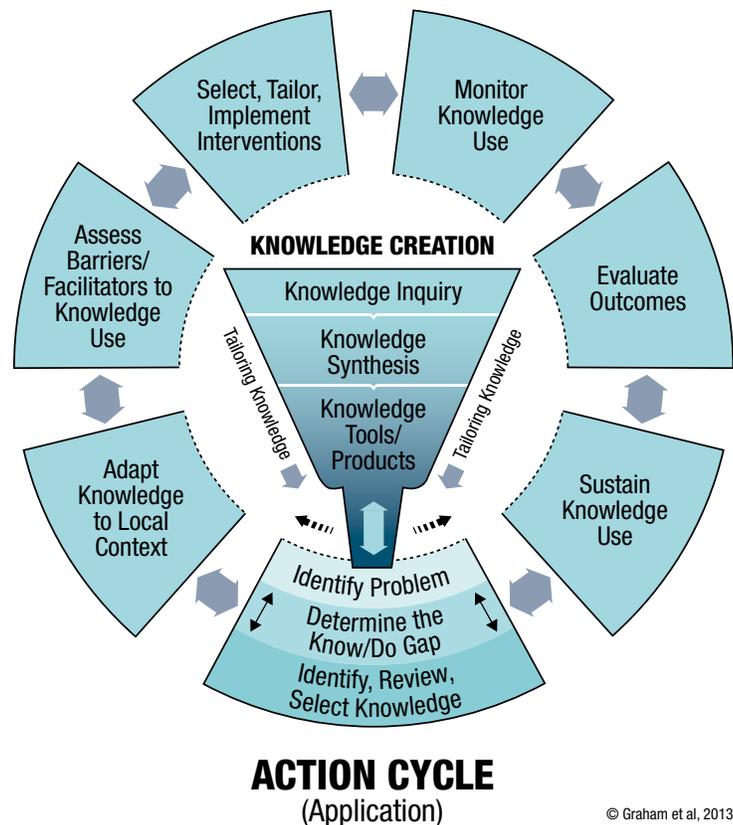
- The evidence underlying a clinical practice or policy
- The evidence underlying the implementation strategy

(Grol, 1997, p. 420)

Implementation strategies should be designed using high-quality evidence and change theory to help discover the “active ingredients” that bring about change and establish proven effectiveness.

For example, implementation strategies may help to determine the appropriate time to scale-up or spread a practice or support recommendations for policy changes.

Figure 1: Knowledge to Action Framework



© Graham et al., 2013

Synthesis

Synthesis is the contextualization and integration of research findings of individual research studies within the larger body of knowledge on the topic. They are well-structured, replicable, and transparent. Synthesis methodology is determined in advance and can involve both qualitative and quantitative data. Syntheses are a core part of knowledge translation for two key reasons. First, they help overcome the challenges related to interpreting and applying findings from single studies that may be biased. Second,

syntheses help distill the most important messages from the body of evidence in a given area, which can accelerate research use, and can also be used to inform decision making and establish research directions.

COMMON FORMS OF SYNTHESIS

- Consensus conferences/expert panels
- Systematic review (with or without meta-analysis)
- Rapid reviews
- Realist syntheses
- Narrative syntheses
- Meta-syntheses
- Practice guidelines

(Grimshaw, 2010, Background Section)

Dissemination

Dissemination is a deliberate process of sharing results and information that focuses on tailoring messages for the audience and medium used to enhance understanding and usability. A critical component of successful dissemination is using evidence to inform the strategies used to share knowledge.

COMMON FORMS OF DISSEMINATION

- Summaries or briefings to stakeholders
- Elevator speeches
- Educational sessions for patients, practitioners, or policy makers
- Engagement of knowledge users in developing and executing a dissemination plan
- Reports and traditional publications
- Presentations (lectures)

- Multimedia (e.g., video, infographics, podcasts, social media)

(CIHR, 2016)

Exchange

Exchange is collaborative problem-solving between researchers and the users of new knowledge. This linkage and exchange process results in mutual learning through collaborative planning, producing, disseminating, and applying existing or new knowledge to change behaviour or influence decision making (Canadian Foundation for Healthcare Improvement [CFHI], n.d.; CIHR, 2016).

Ethical Application of Knowledge

Ethical application of knowledge is applying knowledge that is ready for translation. It also involves activity that is consistent with ethical principles, norms, social values, legal, and other regulatory frameworks, including rigorous monitoring and evaluation of KT activities, processes, and initiatives as a core part of the translation process (CIHR, 2016).

Who Benefits from Knowledge Translation?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership)
- Professional regulatory bodies
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Performance Measurement

Performance measurement is a process of designing and implementing quantitative and qualitative measures that involve routine and continuous data collection and its synthesis and presentation as information. The measures can be used as a basis for an assessment of performance in the context of standards of practice, monitoring, or goal setting.

Performance measurement provides organizations with the necessary evidence to make more informed decisions in areas including quality, improvement opportunities, allocating resources, and planning for the future. It can be applied at local and global organizational levels to support the ongoing monitoring or evaluation of performance. The process may provide a mechanism to track and report on the progress of an initiative or support operations to understand how their achievements compare to best practices or organizational expectations.

Performance measurement can, in full deployment, establish an overarching web of metrics to monitor identified processes and outcomes. And both can be used to understand performance and effect positive change (Adair et al., 2006, p. 92). A performance management approach can also support achieving organizational objectives through integrating measurement into oversight, planning, and change management.

In AHS, strategic performance measurement sets are being developed across the continuum of care for a range of clinical services and populations. As related to the domains of quality as outlined in the Alberta Quality Matrix for Health, these measurement systems focus on the desired health outcomes, both

clinical and patient reported, and link these outcomes to clinical processes with an aim to increasing clinical process reliability (Alberta Health Services [AHS], 2015, p. 1; Health Quality Council of Alberta [HQCA], 2005).

Performance measurement may seem unattainable to some, but as long as the information has been developed and augmented to ensure full understanding, this type of information can be of value and foundational to managers at any level of the organization.

Measurement Types

Outcome measures are often focused on high-level clinical or financial outcomes. Outcome measures can demonstrate the impact of a new initiative or an established treatment protocol or service.

Examples of clinical outcomes: mortality and readmission rates; use of emergency departments for patients with chronic diseases; patient experience; improved access to service; and changes in clinical markers as a result of a specific intervention (Burton, n.d.).

Examples of financial measure: direct cost per inpatient (IP) weighted case which examines staffing and supply costs that are easily attributed to inpatient or outpatient care. Financial metrics may also include identification of managed or reduced waste or inefficiencies without a value attribution such as the percentage of Alternate Level of Care (ALC) days.

Process measures focus on different activities performed, either positively or negatively, to achieve an outcome.

Examples: determining the outcome measure of Length of Stay (LOS) requires factoring in a number of process measures, one being the turnaround time from discharge order to actual discharge. Other process measures can include the percentage of hand hygiene compliance or patients screened for a particular condition. Process measures enable oversight of the patient journey and care delivery details in support of organizational best practice and in compliance with the Required Organizational Practice (ROP). It also provides an understanding of fluctuation in outcomes and identifies quality improvement opportunities.

Composite measures combine two or more performance indicators into one measure or index to offer a wider scope of overall performance when the concept being measured is too complex to be measured by one indicator. While constructing composite measures can be challenging, they can offer a more comprehensive assessment of performance and the “big picture” in a way that individuals working within the health system and the public can understand.

Example: the National Health Service (NHS) Star Ratings were the first published composite index for acute care hospital trusts (National Health Service, 2016; Jacobs, Smith, & Goddard, 2004, pp. 15–26).

Balancing measures ensure that changes made to one part of the system do not cause problems to another part of the system.

Example: balancing measures can monitor the impact of implementing a strategy to increase compliance with regular visits and the required testing on the system’s ability to accommodate this demand for increased service (Health Resources and Services Administration [HRSA], n.d., p. 3).

Common Methods or Tools Used in Performance Measurement

- Logic models
- Balanced scorecards
- Baseline data comparison
- Benchmarking
- Interviews
- Document reviews
- Data monitoring
- Focus groups
- Case studies
- Qualitative and quantitative analysis
- Surveys
- Dashboards
- Plan-Do-Study-Act (PDSA) cycles

Who Benefits from Performance Measurement?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- Systems planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Performance Management

Performance management is a set of self-correcting processes for monitoring, measuring, and analyzing achievements. The primary purpose is to learn from current work and make tactical and strategic adjustments to achieve goals and objectives (Hunter & Nielsen, 2013, p. 10).

Performance management is a broad, umbrella concept that supports the practices of analytics operations, evaluation, and quality improvement. Such practices increase an organization's ability to achieve set goals and objectives through measuring, monitoring, and analyzing routinely collected data. Through the process of data feedback, the organization learns from its work and can make tactical and strategic adjustments.

Performance management is the follow-up action to performance measurement. While an outcome of performance measurement is improved availability of routine information, performance management deliberately uses that data to analyze the effects of activities or initiatives on change in performance. Performance management remains the responsibility of program leadership to utilize performance measurement results to make good decisions to address efficiency, effectiveness, and sustainability.

Organizational performance management occurs at many different levels within healthcare and each level has a distinct focus.

For example:

- System performance measures are typically owned by the Ministry of Health. These measures inform the development of an overall provincial health plan.
- At the organizational level, performance management processes establish operational plans that align with the Provincial Health Plan. These plans set desired fiscal and long-term goals and establish a level of accountability.
- Unit level operations rely on clinical performance management to monitor, make improvements, and support operational decision making. Evaluation and quality improvement processes often support clinical performance management.

Key Components of Performance Management

MEASUREMENT WITH ASSESSMENT

Ideally, performance measures and indicators used in knowledge generation are best validated through sound scientific approaches (e.g., psychometrics, econometrics, decision theory), robust content (evidence supported), and expert knowledge. In organizational performance management, measures with less research evidence supporting their development can be selected if they have very high face validity and more direct linkage to an organization's goals or objectives.

PERFORMANCE LEADERSHIP

Performance management is a team effort. Organizational leaders play a key role because they are responsible for achieving goals and objectives to improve organizational performance. Managers are important because they implement and run supporting processes and ensure that the front lines have the competencies and resources required to do quality work.

MANAGEMENT STRUCTURES

Accountability systems set operational standards, cost parameters, and self-correction processes that ensure that results are delivered as promised.

Performance budgeting links financial appropriations and allocations required to grow and sustain the organization.

Information and knowledge production collect data that is essential to an organization for managing performance effectively, reliably, and accountably. The key is to convert that data into actionable information that supports decision making.

Measuring and monitoring systems track performance and compare against targets to determine to what extent the organization is meeting expectations. Monitoring is best done through a continuous process of collecting and analyzing routinely available data.

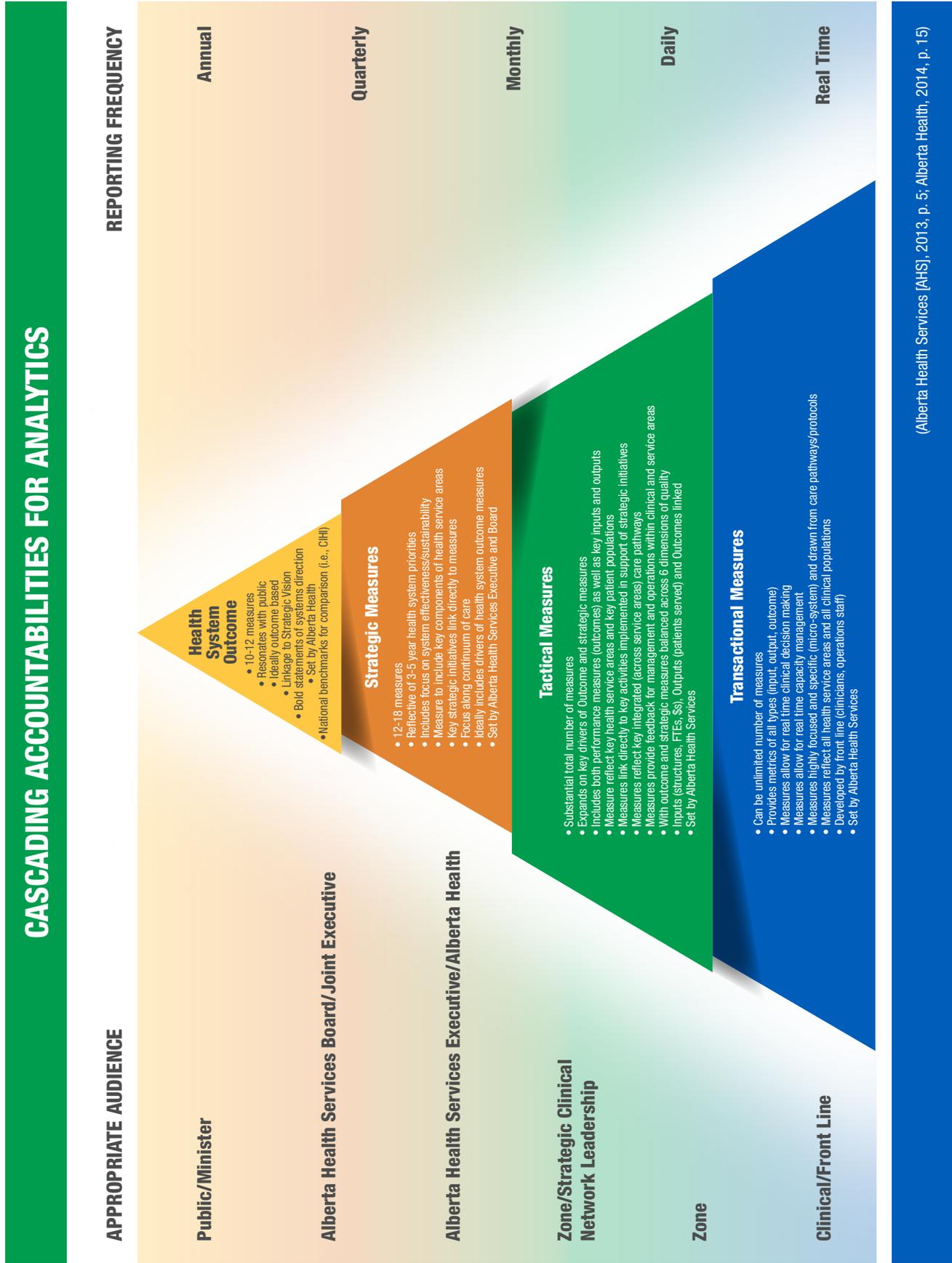
Evaluation, used in performance management, focuses on a systematic assessment of planned, ongoing, or completed interventions to determine

fulfillment of set objectives and goals, efficiency, effectiveness, impact, and sustainability (Hunter & Nielsen, 2013, p. 14). Evaluation is also used to test assumptions related to expected relationships between leading and lagging measures.

Common Methods or Tools Used in Performance Management

- Deliberate linkage to key planning and accountability documents (Health Plan, Performance Agreements, Operational Plans)
- Benchmarking (comparisons to top-performing or top-quartile peer groupings)
- Assessment of performance against standards developed through evidence or through content-expert consensus
- Development of performance targets (incremental improvements to standards or benchmarks)
- Identification of leadership accountability
- Alignment to an identified conceptual framework (e.g., Balanced Scorecard, Triple Aim, Quadruple Aim, Quality Matrix)
- Identification of cascading accountabilities
- Testing of potential causal relationships between key performance measures and key drivers of these measures

Figure 2: Cascading Accountabilities for Analytics



Who Benefits from Performance Management?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- Systems planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Quality Management

Quality management is an overarching term that includes all the activities that organizations use to direct, control, and coordinate quality. The process of quality management can focus on products, quality of service, and the means to achieve quality to ensure that an organization, product, or service is consistent. A framework of quality management tends to consist of four main components (International Organization for Standardization [ISO], 2015):

- Quality planning
- Quality control
- Quality assurance
- Quality improvement

Establishing quality management frameworks is an indicator of organizational maturity. Currently within Alberta Health Services, several customized quality management frameworks are in development. Some focus at the zone level and others are provincial in scope. All frameworks encapsulate the six dimensions of quality of health as described by the Health Quality Council of Alberta.

ALBERTA QUALITY MATRIX FOR HEALTH

1. **Acceptability.** Health services are respectful and responsive to user needs, preferences, and expectations.
2. **Accessibility.** Health services are obtained in the most suitable setting in a reasonable time and distance.
3. **Appropriateness.** Health services are relevant to user needs and are based on accepted or evidence-based practice.
4. **Effectiveness.** Health services are based on scientific knowledge to achieve desired outcomes.
5. **Efficiency.** Health system resources are optimally used in achieving desired outcomes.
6. **Safety.** Efforts are made to mitigate risks to avoid unintended or harmful results.

(Health Quality Council of Alberta [HQCA], 2005)

Quality Planning

Quality planning is the process by which action and high performance is created through the use of a logic model planning process. Planning for quality is a strategic imperative of health system organizations. The focus of quality planning is to create long-term measurable and sustainable changes in quality of services and patient outcomes (Collaborative for Excellence in Healthcare Quality [CEHQ], 2012, pp. 1 & 4). Several customized quality management frameworks have been designed and implemented within AHS, including certain Health Quality Councils (at the health zone level) and in the Continuing Care and Quality and the Healthcare Improvement portfolios at the organizational level.

Quality Control

Quality control is a routine, linear, and scheduled process that is often integrated in quality management work. Quality control includes activities such as monitoring, calibration, and maintenance of biomedical equipment and practice standards. Regular policy review is an example of a quality control activity.

Quality Assurance

Quality assurance (QA) is a planned or systematic activity with the purpose to study, assess, or evaluate the level of safety in the provision of health services. The practice of QA maintains a view of the continual improvement of the quality of service and level of skill, knowledge, and competency of those who provide care (Province of Alberta, 2015, RSA 2000, c A-18, Section 9, pp. 6–7).

Quality assurance reviews (QARs) are focused on identifying system deficiencies and generating recommendations to improve care and are appropriate when it is necessary to interview individuals and engage in speculative discussions surrounding the facts of an event. Section 9 of the *Alberta Evidence Act* was created by the Alberta legislature to provide healthcare providers with a safe forum where speculative discussions and opinions could take place following adverse events. Specifically, Section 9 prevents participants in a QAR from being called to disclose any information discussed during the course of a QAR in a subsequent legal or administrative proceeding. Quality Assurance Records created by or for a Quality Assurance Committee are also protected under Section 9 and cannot be produced in a subsequent proceeding. It is important to note, however, that factual information surrounding an event is not protected by Section 9, nor is the patient's health

record. To fall within the protection of Section 9, a QAR must be conducted by a duly appointed Quality Assurance Committee which has as its primary purpose the carrying out of Quality Assurance Activities as defined by Section 9. This assurance of protection from legal proceedings comes from the *Alberta Evidence Act* (Section 9). Quality Assurance Committees can be established by the Minister of Health, AHS Board, nursing home operators, or another enactment of Alberta.

Although the term *quality assurance* may be used in conjunction with other processes (such as scheduled monitoring of equipment by clinical engineering or performing routine audits of clinical practice), it is important to note that these activities do not carry with them the protections afforded by the *Alberta Evidence Act* given they are not conducted by a board-appointed committee of Alberta Health Services.

The QA process:

- Evaluates identified patient safety hazards, adverse events, and close calls.
- Ensures that patient safety hazards, adverse events, and close calls are systematically analyzed and that recommendations are developed that will lead to system improvements.
- Assesses the level of skill, knowledge, and competence of both physician and staff service providers to help identify systemic issues. Analysis is based only on de-identified aggregate or amalgamated physician and staff conduct and performance data.

COMMON APPROACHES IN QUALITY ASSURANCE

Quality Assurance Committees (QAC) provide governance for all quality assurance activities as defined in the *Alberta Evidence Act*, at the

provincial, zone, and program levels. Within AHS, the QACs are appointed by the AHS Board of Directors.

Quality Assurance Reviews (QAR) are processes that focused solely on identifying system deficiencies and generating recommendations to make care safer (Alberta Health Services [AHS], 2016, p. 3). It is inappropriate to use a QAC or QAR to review individual performance issues.

Systems Analysis Methodology (SAM) is a standardized approach to retrospectively review adverse events and close calls. Using an approach such as SAM, the complex interactions of all the components within the health system are considered, not the individual contributions of healthcare providers that have or may have led to harm. This creates opportunities to identify vulnerabilities in structures, processes, and practices that can be improved and will ultimately make care safer (Alberta Health Services [AHS], 2014).

COMMON METHODS OR TOOLS USED IN QUALITY ASSURANCE

- Internal audits
- Peer reviews (evaluation by a peer group on a decision or diagnosis)
- Medical audit
- Claims review
- Checklists
- Risk assessments

Quality Improvement

Quality Improvement (QI) is a science-based and systematic process involving iterative cycles of intervention and assessment to provide

evidence that supports decision making.

Within the healthcare setting, QI focuses on improving clinical processes, developing and testing best practices, and the productivity and cost effectiveness of a very specific population or intervention (Kring, 2008, p. 164). The QI process often engages and enables providers, teams, patients, and family members to make positive changes. For example, QI teams are multidisciplinary who work collaboratively to facilitate the involvement of front-line service providers to identify issues and to design and implement solutions. QI teams also provide the structure for patients and families to do the same through the establishment of patient advisor councils, or enabling patient advisor participation on committees such as Quality Counts and improvement teams.

The QI process:

- May occur at various levels of the organization, including investigations at single units to system-wide initiatives.
- Aims to improve internal clinical practices, processes, cost-effectiveness, or productivity.
- Is a theory-driven science that:
 - Applies theory from multiple disciplines.
 - Incorporates the System of Profound Knowledge including appreciation for a system, human side of change, understanding variation, and building knowledge (Demining Institute, 2016).
- Works with a cycle of continual improvement, adapting evidence to local context. This process continuously informs the system in order to identify problems and improve the quality of care.

- Employs ongoing monitoring as well as evaluation.

Alberta Health Services had developed a branded improvement approach, the AHS Improvement Way (Alberta Health Services [AHS], 2015, p. 6).

COMMON APPROACHES IN QUALITY IMPROVEMENT

Collaboratives are multiple teams learning and improving together focused on same/similar issues.

Model for Improvement (Institute for Healthcare Improvement) is a small-scale improvement plan that assesses expected and unexpected effects. Data analysis informs changes for the next improvement cycle.

Six Sigma is a statistical process to eliminate defects and decrease process variations and cost.

Lean Methodology is a process that determines non value-added activities, eliminates waste, and tests improvements.

AHS Improvement Way is a branded improvement approach that incorporates elements from Six Sigma and Lean methodologies to define opportunity, build understanding, act to make improvements, and sustain results.

COMMON METHODS OR TOOLS USED IN QUALITY IMPROVEMENT

- Scoping documents (charters, A3) which include aim statements
- Visual data displays – time-sequenced data (statistical process control charts, run charts), balanced scorecards
- Cause-and-effect diagrams
- Fishbone diagrams

- Flowcharts
- Value stream/process mapping
- Radar charts
- Pareto charts
- Box plots
- Rapid improvement events
- Plan-Do-Study-Act (PDSA) cycles
- Logic models

Who Benefits from Integrated Quality Management Processes?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- AHS decision makers (including but not limited to executive, directors, and managers and teams interested in making improvements)
- Funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- Systems planners
- Project managers
- Participants (patients and their families, physicians, healthcare clinicians, other service providers)

Research Impact Assessment

Research Impact Assessment (RIA) is a form of outcome evaluation that assesses the net effect (or true effectiveness) of a particular research project or program of research by comparing the observed outcomes to an estimate of what would have happened in the absence of the program. While outcome measures can be incorporated into ongoing performance monitoring systems, evaluation studies are usually required to assess program net impacts (United States Government Accountability Office [GAO], 2012, pp. 52–53).

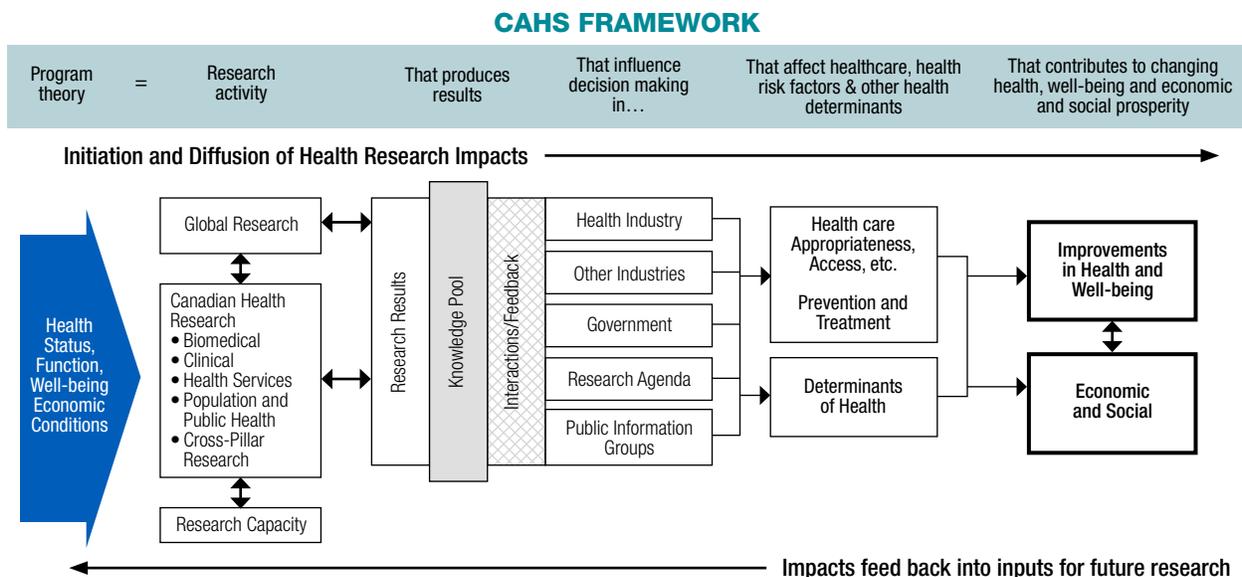
Many impacts of research programs are influenced by external factors, including other national, regional, and local programs and policies, as well as economic or environmental conditions. Thus, the impacts observed typically reflect a combination of influences. Correspondingly, the central challenge in carrying out effective impact evaluations is to identify the causal relationship between the

project, program, or policy and subsequent impacts (Gertler, Martinez, Premand, Rawlings, & Vermeersch, 2011).

Common Approaches in Research Impact Assessment

Most impact assessments begin with a logic model to identify the intended and unintended impacts to be measured. A logic model is a road map that describes and illustrates the logical relationships among program elements and the problem to be solved. It can be used for planning, monitoring, and assessing impact. It is also a tool for communicating to stakeholders and can be used to define indicators of success. The Canadian Academy of Health Sciences (CAHS) provides a model for evaluating the impact of health research (Canadian Academy of Health Sciences [CAHS], 2009, p. 18).

Figure 3: Canadian Academy of Health Sciences (CAHS) Evaluation Framework



Common Methods or Tools Used in Research Impact Assessment

- Case studies
- Questionnaires
- Econometric analysis
- Peer review
- Interviews
- Document review
- Bibliometrics

Who Benefits from Research Impact Assessment?

- Academic and scientific communities (academic institutions, researchers, Strategic Clinical Networks, trainees, and students)
- Research funding sources (government ministries, competitive granting agencies, foundations, healthcare leadership, philanthropy)
- Healthcare leadership

Glossary of Terms

Knowing the terminology and common language used within health-related knowledge-generating activities is key to comprehending the complexity of the work as well as the similarities (common usage) or uniqueness. The following glossary provides an abbreviated description of most processes discussed in this resource.

ABBREVIATION KEY

AN = Analytics

EVAL = Evaluation

HR = Health Research

HTA = Health Technology Assessment

HTR = Health Technology Reassessment

IN = Innovation

KT = Knowledge Translation

PM = Performance Management

PMT = Performance Measurement

QA = Quality Assurance

QC = Quality Control

QI = Quality Improvement

QP = Quality Planning

RIA = Research Impact Assessment

Process	Description	Used by
Accountability documents	Health-related documents used to plan and analyze service. Examples: Health Plan, Performance Agreements, Operational Plans.	EVAL, PM, QA, QI
Adoption and diffusion	Process that occurs when new, proven ideas are adopted into additional appropriate areas.	IN
Adverse event	Any untoward medical occurrence in patient or clinical investigation participant administered a pharmaceutical product and which does not necessarily have a causal relationship with this treatment. An adverse event can be any unfavourable and unintended sign, symptom, or disease temporally associated with the use of a medical (investigational) product whether or not related to the medical (investigational) product (Alberta Clinical Research Consortium [ACRC], 2015, p. 13).	QA
AHS Improvement Way	A branded improvement approach that incorporates elements from <i>Six Sigma</i> and <i>Lean methodologies</i> to define opportunity, build understanding, act to improve, and sustain results.	QI
Audit	Audit. A systematic and independent process to determine the extent to which a protocol, standard operating procedure (SOP), good clinical practice (GCP), or applicable regulatory requirements has been implemented into practice (ACRC, 2015, p. 15).	EVAL, QA, QI
	Chart audits. An examination of medical records for the purpose of quality improvement. Records can be electronic or hard copy. Chart audits can also contribute to performance measurement, justify billing charges, support evaluation processes, and measure prevalence of symptoms or diseases for research (QI Patient Safety – Quality Improvement, 2016).	EVAL, QI
	Internal audits. A form of inspection or testing conducted by the internal management system. Audits provide a realistic perspective on how processes are functioning in comparison to how those processes are expected to be. For example, internal audits may appraise how professional responsibilities conform to set standards as well as provide analysis and recommendations for improvement (AuditNet, 2016).	QA, QI
	Medical audits. A process that reviews coding practices, policies, and procedures to determine efficiencies and levels of accuracy and completeness of clinical documentation. This process can identify areas requiring improvement and contribute to better delivery and overall quality of care (American Academy for Professional Coders [AAPC], 2016).	EVAL, QA, QI

Process	Description	Used by
Balanced scorecard (BSC)	A strategy performance management tool used to align business activities to the vision and goals of an organization. BSCs present a semi-standard structured report, supported by design methods and automation tools that can be used by managers to keep track of the execution of activities by the staff within their control and to monitor the consequences arising from these actions (Alberta Health Services [AHS], 2016a; Balanced Scorecard Institute, 2016).	PMT, QI
Baseline data	The initial capture of data based on key points of interest at the outset of a new initiative that will serve as a reference or basis for comparison to comparable subsequent data collected. Baseline data serves as a reference and enables the scientific analysis of the impact of change over time (ACRC, 2015, p. 15).	EVAL, HR, PM, PMT, QI
Benchmarking	The establishment of a standard that can be used as a way to judge the quality or level of other comparable items (Benchmark, 2016). In health, benchmarking is used to do comparisons to top-performing or top-quartile peer groupings.	AN, EVAL, PM, PMT
Cascading accountabilities	Strategic plan to establish and articulate the appropriate dissemination of data type and reporting frequency to different levels of decision makers within the health system.	PM
Cause-and-effect diagrams	An established tool to visualize the root causes of business problems. Categories for analysis include people involved, methods, machines or materials used, and measurements to evaluate quality and environmental conditions. Also called <i>fishbone</i> , herringbone, Fishikawa, and Ishikawa diagrams (Ishikawa Diagram, 2016).	QI
Collaborative QI	A process involving multiple teams learning and improving together, and focused on the same or similar issues.	QI
Commercialization	A process of introducing a new product or method into a general or mass market. In early stages, new technologies or inventions begin as prototypes and are not practical for commercial use. The process of commercialization helps to bring the product to commercial success through production, distribution, marketing, and consumer support.	IN
Concept map	A graphics tool to show suggested relationships between concepts (ideas or information) centred on a focus question to organize and structure knowledge. Concepts are commonly represented as boxes or circles and hierarchical relationships between concepts are indicated through the use of arrows (Concept Map, 2016).	EVAL, HR
Conceptual frameworks	A technique used to develop an understanding of a program and process to facilitate program planning (Owen, 2006, p. 185). Conceptual frameworks used within AHS include Triple Aim, Quadruple Aim, Quality Management Frameworks, Knowledge to Action Framework, and the Health Quality Matrix. <i>Balanced scorecards</i> and <i>evaluation frameworks</i> are also conceptual frameworks customized to the needs of a particular area of focus or study.	AN, EVAL, HR, HTA, IN, KT, PM, PMT, QA, QC, QI, QP
Dashboards	See <i>Data visualization</i> .	
Data analysis	Bibliometrics. A set of analytics used to derive new insight from existing databases of scientific publications and patents. Bibliometrics analyze citations to determine the links between scholars, the development of areas of knowledge over time, and the impact of scholarly publications (Alberta Innovates-Health Solutions [AIHS], 2015).	RIA
	Cost analysis (CA). Examines a complete accounting of related expenses for a policy, program, or service. CA includes direct costs (salaries, equipment costs), indirect costs (overhead expenses), capital costs (investments, debts payments), and future costs (projected increases for salaries, other escalating costs) (Cost-benefit Knowledge Bank for Criminal Justice [CBKB], 2016).	EVAL
	Cost-benefit analysis (CBA). A systematic approach that examines the effects, gains, and sacrifices in terms of financial cost to justify or determine the feasibility of an investment decision, or to compare total expected costs and benefits of two or more options (British Medical Journal [BMJ], 2016a). A characteristic of CBA is that all benefits and costs are expressed in monetary terms so that a direct comparison is possible (CBKB, 2016).	HR, HTA, HTR, IN
	Cost-effective analysis (CEA). Helps to determine if a policy, program, or service is providing the desired results at the lowest cost. CEA examines the effective use of resources and questions if less expensive resources can produce equivalent results to more expensive options (CBKB, 2016).	HR, HTA, HTR
	Discourse analysis. A general term referring to a process that examines and deconstructs underlying meanings in written, vocalized, or signalled language intended to reveal underlying messaging, context, and meaning. It is used with qualitative data and is similar to narrative analysis (Linguistic Society of America, 2016; Quality Research International, 2016).	HR

Process	Description	Used by
<i>Data analysis continued</i>	Economic analysis. (health-related) The comparison of alternative courses of action in terms of their costs and consequences, with an intention of making a choice (BMJ, 2016).	HTA, HTR, RIA
	Financial (Fiscal) impact analysis. A comprehensive examination that considers the related revenues, expenses, and savings that could result from a proposed policy or program. The breadth of this examination may look across government ministries or organizational portfolios (CBKB, 2016). The related Operational financial impact analysis identifies and evaluates the impact of introducing or removing a new technology/innovation on operational budgets.	HTR
	Meta-analysis. A formal evaluation of the quantitative evidence from two or more studies bearing the same question. The analysis most often combines summary statistics from various trials, but can also involve the combination of raw data (ACRC, 2015, p. 39). Meta-analysis is often, but not always, important to the systematic review process (Cochrane, 2016).	HR, HTA, HTR
	Mixed methods analysis. The use of both qualitative and quantitative data collection methodologies to answer an evaluation or research question (Stufflebeam & Shinkfield, 2007). Also see <i>Study Designs</i> or <i>Methodologies: Mixed methods</i> .	EVAL, HR
	Narrative analysis. The use of stories as the investigative focus using a variety of narrative methods. Stories can be oral, written, biographical, or auto-ethnographies. In health, stories are investigated to understand the experience of healthcare, illness, and the meaning of disease from the patient's perspective (Robert Wood Johnson Foundation, 2008).	EVAL, HR
	Qualitative analysis. Involves data that is not expressed numerically. Qualitative data is collected in the form of written text, oral communication, non-verbal actions, or participant observation.	AN, EVAL, HR, PMT, QA, QI
	Quantitative analysis. Involves data that is expressed numerically.	
	Systems analysis methodology (SAM). A standardized approach to reviewing adverse events retrospectively. All the components within the health system are considered, not the individual contributions of healthcare providers that have or may have led to harm (AHS, 2014).	QA
	Thematic analysis. A commonly used approach to analyzing qualitative data related to a research question. It involves identifying patterns using a rigorous process of becoming familiar with the data, coding, theme development, and revision (University of Auckland, 2016).	EVAL, HR
Data governance	A process that requires the integration of the necessary people, processes, and technology for an organization to manage the quality, consistency, usability, security, and availability of the data housed in its data repository for reporting. Within AHS, data housed in the AHSDRR (Alberta Health Services Data Repository for Reporting) is managed by the Data and Data Governance Services team (AHS, 2016a).	AN, EVAL, HR, HTA, HTR, PM, PMT, QI, RIA
Data measures	Balancing measures. Monitoring the impact of newly introduced initiatives to ensure that changes made to one part of the system do not cause problems to another part of the system (Health Resources and Services Administration [HRSA], n.d., p. 3).	PMT
	Composite measures. Combination of two or more performance indicators into one measure or index to provide a wider scope of overall performance when a concept being measured is too complex.	EVAL, PMT
	Impact measures. Values used to help factor economic value of an initiative focused on long-term consequences. Ascertaining the exclusive impact of one initiative is difficult because other initiatives that are not similar in nature may lead to the same impact.	EVAL, HR
	Indicators. Type of measure that demonstrates how effectively an initiative or operation is achieving set business objectives. Indicators are commonly known as key performance indicators (KPI).	AN, EVAL
	Input measures. Values used to help factor productivity and economic value of an initiative. Input measures quantify the required resources to achieve goals (human resources, budget, supplies, infrastructure) (M&E Blog, 2016).	AN, EVAL
	Performance measures. Values used by an organization to monitor performance. Performance measures in health provide a balanced view across the spectrum of care and may focus on specific areas of interest where improved outcomes are desired. These measures may align with national benchmarks and conceptual frameworks (AHS, 2016a).	AN, EVAL
	Process measures. Values used for the primary purpose of monitoring specific activities. The values may also be repurposed and contribute to determining overall outcomes. Process measures provide evidence that is granular to the immediate environment and are essential to assessing where improvements are required and monitoring change over time (M&E Blog, 2016).	AN, EVAL, PMT

Process	Description	Used by
<i>Data measures continued</i>	Outcome measures. Provide program information toward desired results in key areas. These types of measures often focus on high-level clinical or financial outcomes. For example, a high-level clinical outcome would focus on changes in health status or a health determinant attributed to health services and programs. Financial-type measures may focus on a direct cost per inpatient (IP) weighted case which examines staffing and supply costs that are easily attributed to inpatient or outpatient care (AHS, 2016a; Burton, n.d.).	AN, EVAL, HR
	Output measures. Values used to help factor productivity and economic value of an initiative by describing the short-term results (M&E Blog, 2016).	AN, EVAL, PMT
Data monitoring	A technique often used for ongoing and well established programs to determine whether program processes are achieving specified goals or targets. The term can also include the process by which data is examined for completeness, consistency, and accuracy (Owen, 2006; ACRC, 2015, p. 24).	AN, EVAL, PMT, QC
Data quality	The degree to which information and data can be a trusted source for required uses. This requires having the right information, at the right time, in the right place for the right people to use to make decisions, run the business, serve the stakeholders, and achieve the organizational goals.	All
Data types	Administrative data. Consists of health information routinely collected and related to operational activities, cost, and service provision that is used to document a person's encounter with the healthcare system. Administrative data may also contain limited clinical information, such as codes for diagnosis and intervention. While administrative data is often collected and maintained at the local level, the Alberta Health Services Data Repository for Reporting (AHSDRR) organizes and governs a substantial volume of databases related to operations. This data is routinely analyzed by different types of knowledge-generating initiatives as secondary data (AHS, 2016a).	AN, EVAL, HR, HTA, HTR, IN, PM, PMT, QA, QI
	Clinical data. Data related to the medical well-being or status of a patient or participant (ACRC, 2015, p. 19).	
	Primary data. The use of information collected for the purpose of answering questions within a knowledge-generating initiative.	
	Secondary data. The use of information originally collected for a purpose other than the current study to which it will be applied. For example, information collected for an evaluation project may be useful to future research (CIHR et al., 2014, p. 64). The use of administrative health data collected for the purpose of operational monitoring may be repurposed to answer research questions.	
Data visualization	A process based on qualitative or quantitative data; results in an image that is representative of the data; is readable by the reviewer and supports exploration, examination, and communication of the data (Azzam & Evergreen, 2013, p. 9). The list of data visualization examples is extensive; however, the following examples are related to what has been identified in this resource.	AN, EVAL, HR, HTA, HTR, IN, KT, PM, PMT, QA, QC, QI, QP
	Box plots. A two-dimensional graphical method that uses boxes to encode values. Distribution of high, median, and low values is represented. Vertical lines (whiskers) extending through the quartiles indicate variability outside the upper and lower quartiles. Outliers are also indicated (Few, 2012, pp. 92–93).	EVAL, QI
	Dashboards. Graphic presentations of the most important information needed to meet specific goals relevant to a business process captured on a single screen. Effectively designed dashboards are monitoring tools that can be understood at a glance. They are usually web based and linked to databases, allowing for continue refreshing of data reporting (Azzam & Evergreen, 2013, p. 21).	EVAL, PMT, QI
	Pareto charts. A two-dimensional graphical method that combines both bar and line charts in the same visualization to assess the most frequently occurring defects by category. Pareto charts are one of the basic tools used in quality control (Few, 2012, p. 223; Pareto Chart, 2016).	QI
	Radar charts. A two-dimensional graphical method of displaying multivariate data of three or more quantitative variables. Also known as web or spider charts (Few, 2012, p. 42).	QI
	Time-sequenced control and run charts. Two process improvement tools that are often used interchangeably. A run chart determines if a process is changing by tracking and observing data for trends and patterns. A control chart helps to monitor process stability. Time sequencing displays quantitative values that feature how something has changed over time. Both tools are used in <i>Six Sigma</i> processes (Berardinelli & Yerian, 2016; Few, 2012, p. 102).	QI
	De-adoption	Systematic process that supports evidence-informed decisions about discontinuing the use of a device or clinical practice (Elshaug, Hiller, Tunis, & Moss, 2007).

Process	Description	Used by
Econometrics	The unified study of economic models, statistics, and economic data and the application of statistical methods to the study of economic data and problems (Hansen, 2016).	RIA
Evaluability assessment	A method of assessment to determine the feasibility and readiness of an initiative for evaluation (Stufflebeam & Shinkfield, 2007, p. 698). An evaluability assessment would look at such items as the maturity of the initiative and consider if the time is right to measure impact or outcomes, client expectations, available resources to meet expectations, and timelines available to conduct a study and produce reliable results.	EVAL
Evaluation	Developmental evaluation. A basic purpose distinction in evaluation that supports innovation, radical program redesign, and complex issues by guiding adaptation and dynamic realities to complex, unpredictable environments or situations. The developmental approach differs from traditional evaluations by becoming an integrated part of the function of the innovation rather than maintaining degrees of separation; providing rapid, real time feedback and nurture learning rather than focusing on measuring outcomes; being responsive to what is unfolding instead of trying to control the design and implementation of the evaluation process (Better Evaluation, 2016).	EVAL
	Formative evaluation. A basic purpose distinction in evaluation that typically occurs early in the implementation of an initiative. It often gives an early picture of process toward desired goals and unanticipated outcomes as they emerge. This approach can also be applied to assessing the operational processes of an initiative to better understand strengths, weaknesses, and changes that occur over time. Formative evaluations may include needs assessment, evaluability assessment, and process evaluation (Patton, 2008, p. 120; Research Method Knowledge Base [RMKB], 2016a).	EVAL
	Outcome evaluation. Considers both short- and long-term impacts as a result of an initiative. Outcome evaluation is a summative approach and measures the extent to which the initiative achieves expected outcomes or has been effective in producing change. Within dynamic and complex environments, initiatives may also produce outcomes that were not listed as goals. An outcome evaluation attempts to also capture those unanticipated or important interim outcomes (Kellogg, 1998, p. 28; Linnell, 2014).	EVAL
	Process evaluation. A formative approach that helps to explain how outcomes are achieved by documenting the implementation of an initiative. The focus is on the types and quantities of activities delivered and who benefited from those activities; the required human, physical, and financial resources and barriers to implementation and problem resolution (Linnell, 2014).	EVAL
	Summative evaluation. A basic purpose distinction in evaluation that typically assesses implementation process and reports on what was accomplished. It may look at outcomes, overall impact of the causal factor, and estimate relative overall costs. Outcome, impact, cost-effective evaluations, and meta-analysis can be considered summative evaluations (Patton, 2008, p. 120; Stufflebeam & Shinkfield, 2007, p. 715; RMKB, 2016a).	EVAL
Evaluation framework	A systematic plan outlining the work plan of an evaluation project. A framework may be designed as a high-level overview of the evaluation project, or a detailed plan of outcomes, evaluation questions, indicators, sources of data, methods, accountability, and timelines.	EVAL
Face validity	A simple form of validity that employs a superficial and subjective assessment of whether an instrument or strategy can do what it is intended to do. For example, does an instrument (questionnaire, assessment scale) measure what it is intended to measure (Patton, 2008)?	EVAL, QI
Fishbone diagrams	See <i>Cause-and-effect diagrams</i> .	QI
Flowchart	A diagram of an algorithm, workflow, or process demonstrating progressive steps to provide a solution model to a problem or new procedure. A flowchart uses conventional symbols, text boxes, and connecting lines to demonstrate relationships and is used in designing, analyzing, and managing a process or program (Flowchart, 2016).	EVAL, HR, QI
Focus groups	A guided discussion with a group of participants that is facilitated by a moderator (e.g., an evaluator or researcher). The purpose of a focus group is to draw out information from participants who collectively discuss and share opinions on issues of interest to the evaluator or researcher (Berg, 2000, p. 111).	EVAL, HR, PMT, QI
Funders	Organizations or individuals who provide financial support for knowledge-generating initiatives. Common funding sources within health include granting agencies, government ministries and programs, and project managers.	AN, EVAL, HR, HTA, HTR, IN, KT, PM, PMT, QA, QC, QI, QP

Process	Description	Used by
Health economics	The study of the allocation of health-related resources in comparison to alternate uses in providing care, promotion, maintenance, and improvement of health. Health economics also examines the distribution of health-related services, the costs and benefits, and health itself among individuals and populations (BJM, 2016).	AN, HR
Horizon scanning	A systematic process to identify potentially important developments or to monitor target technologies and innovations through examining potential threats and opportunities as a way of gaining lead time. This technique is commonly applied to new and innovative technologies and focuses on what is constant, what changes, and unexpected issues. The healthcare technologies and innovations of interest for horizon scanning are those that have yet to diffuse into or become part of established healthcare practice. These healthcare innovations are still in the early stages of development or adoption except in the case of new applications of already diffused technologies (Agency for Healthcare Research and Quality [AHRQ], 2016; Organization for Economic Co-operation and Development [OECD], 2016).	HTA
Industry Portal for Health Innovation	A centralized intake process to manage requests, screen, prioritize, and guide health innovations within AHS.	IN
Interview	A process that involves asking questions and getting answers from participants of a study for the purpose of understanding the participants' lived experience. Interviews may be conducted one-on-one with individuals or in small groups.	EVAL, HR, PMT, RIA
Invention	Something newly generated or novel idea or the activity of designing or creating new things (Invention, 2016).	IN
Knowledge translation	Dissemination. A deliberate process of sharing results and information that focuses on tailoring messages for the audience and medium used to enhance understanding and usability (Canadian Institutes of Health Research [CIHR], 2016).	AN, EVAL, HR, HTA, HTR, IN, KT, PM, PMT, QA, QI
	Exchange. Collaborative problem-solving between researchers and the users of new knowledge. This linkage and exchange process results in mutual learning through collaborative planning, producing, disseminating, and applying existing or new knowledge to change behaviour and/or influence decision making (CFHI, n.d.; CIHR, 2016).	EVAL, HR, HTA, HTR, KT, QA, QI
	Implementation practice. The use of strategies to adopt and integrate evidence-based interventions and change practice within specific settings (National Institutes of Health [NIH], 2009, Part II, Section I.1).	KT
	Implementation science. A deliberate set of process steps that can be used to close evidence-practice or evidence-policy gaps (i.e., measurable gaps between what evidence says we should do and what is happening) (Graham et al., 2006, p. 20; Straus, Tetroe, & Graham, 2013, Section 3).	EVAL, HR, KT
	Integrated Knowledge Translation (iKT). A collaborative research approach that takes place between researchers and those who use the knowledge. iKT is focused on questions of mutual interest in an effort to produce research findings that are more relevant to those who will use them (Graham, Tetroe, & Pearson, 2014, Ch. 1, p. 11).	HR, KT
	KT Plan. A systematic strategy designed before or early in the lifespan of an initiative to describe specifically how new knowledge arising from the work will be shared with others. There is a variety of end of grant KT plans available (CIHR, 2015).	EVAL, HR, KT
	Synthesis. The contextualization and integration of research findings of individual research studies within the larger body of knowledge on the topic (Grimshaw, 2010, Background Section).	HR, KT
Lean methodology	A quality improvement methodology for improving efficiency and controlling costs by determining non value-added activities, eliminating waste, testing improvements, and adding value from the patient's perspective and without compromising patient safety. Lean methodology originated within the Toyota Motor Company and has been successfully adapted to the healthcare setting (SaferHealthcare, 2016; Patient Safety Institute [PSI], 2015, p. 53).	QI
Logic models	A diagram and text that describes and illustrates the program theory through a diagrammatic representation of program elements, logical (causal) relationships among elements that indicate progressions, and linkages (Alkin, 2011, p. 72).	EVAL, PMT, QI
Model for improvement	A small-scale improvement plan that assesses expected and unexpected effects. Data analysis informs changes for the next improvement cycle.	QI

Process	Description	Used by
Needs assessments	A study conducted often before a program or project is implemented to determine whether there is a need or desire for the program or project based on input from those who will be impacted by the initiative (Owen, 2006, p. 42).	EVAL, HR, HTA, QI
Participant observation	Involves observing the population under study while systematically gathering evidence on the ways in which the population interacts by taking field notes and completing interviews. This methodology is often used in ethnography (Berg, 2000, p. 117).	EVAL, HR
Performance monitoring and assessment	An assessment and reporting method to describe the achievements or performance of professionals or employees (Owen, 2006, p. 37).	AN, EVAL, QA, QI
Performance targets	A predetermined, predicted, or accepted measure of success in respect to performance. Performance targets may relate to incremental or periodic improvements or progress in achieving operational goals, standards, or benchmarks. This term is synonymous with key performance indicators (KPIs) (Performance Indicator, 2016).	AN, EVAL, PM, PMT
Plan-do-study-act (PDSA)	A systematic series of deliberate steps to generate knowledge and learning that supports continual process or product improvement. Steps include determining the details of a test including predictions and theories (Plan); collecting data on a small scale (DO); comparing results against plans and predictions (Study); and transforming the learning into action (Act) (PSI, 2015).	QI
Process mapping	A graphic representation of the flow of tasks and decisions in a process.	QI
Quality assurance committees (QAC)	A governance structure appointed by the AHS Board of Directors to oversee QA activities at all levels of operation and to conduct <i>Quality Assurance Reviews (QAR)</i> (AHS, 2016c, p. 3).	QA
Quality assurance reviews (QAR)	A process focused solely on identifying system deficiencies and generating recommendations to make care safer (AHS, 2016c, p. 3).	QA
Questionnaire	See <i>Surveys</i> .	
Random assignment	A technique in respect to how a sample of participants are assigned to difference groups or treatments in a study to help ensure that participants assigned to a treatment group are similar to each other prior to treatment (RMKB, 2016b).	EVAL, HR
Rapid improvement events (RIE)	A structured event that gathers members of a multidisciplinary team who are subject matter experts in the area of focus for improvement to develop approaches for enhancing work processes for the team. A RIE varies in length from 4 hours to several days, and is context specific, identifying changes that will improve processes in the context of the multidisciplinary team (unit, program, service area). Most successful RIEs include facilitators external to the team, usually individuals with expertise in quality improvement.	QI
Recommendations	Concise statements related to the results of a knowledge-generating initiative that are designed to support the use of those findings. Recommendations typically are supported by the findings within the study; are thoughtful and deliberate; exercise political sensitivity; discuss costs, benefits, and challenges of implementing the recommendation; and are constructed in collaboration with individuals who will use the new knowledge to inform decision making (Patton, 2008, pp. 503–506). In evaluation, providing recommendations is a key strategy to support the uptake and use of the evaluation results into practice.	EVAL, QA, QI
Relational databases	A collection of data, which can organize multiple datasets into formally described tables, records, and columns. Data can then be accessed and reassembled without having to reorganize the original table. The use of relational databases improves access to information by improving searchability, organization, and reporting. The standard application program used to create relational databases is SQL (structured query language) (Tech Target Network, 2016; Techopedia, 2016).	AN
	Chart review. A retrospective method of collecting data from medical records. This process may involve electronic and paper records (ACRC, 2015, p. 18).	EVAL, QI
	Claims review. An examination or review within an organization to ensure that provider billings are accurate, reasonable, and appropriate for provided services (Healthcomp, 2016).	QA
	Document review. A way of collecting data by reviewing existing documents. The purpose of the review determines the type of document used. For example, project or program charters are commonly used in designing evaluation plans.	EVAL, PMT, QI, RIA

Process	Description	Used by
<i>Relational databases continued</i>	Literature review. A structured review of existing evidence on a given topic and often completed at the start of the design of an initiative with the intent to refine study questions and seek opportunities to add to what is already known about the topic in the literature.	AN, EVAL, HR, HTA, HTR, IN, KT, PM, PMT, QA, QI
	Peer review. Uses peers to evaluate the scientific, academic, or professional work by others working in the same field.	HR, QA, RIA
	Rapid review. A streamlined review of the safety and effectiveness of technologies completed on an accelerated timeline. This term can also pertain to a review of literature that is limited by time and restrictions on scope of the search for literature.	HTR
	Systematic review. A process that identifies, appraises, and synthesizes all existing evidence related to a specific question through the use of systematic and explicit methods. For example, the Cochrane Collaborative, a global independent network of researchers, professionals, patients and others, provide in-depth systematic reviews of literature on primary research in human healthcare and health policy. The Cochrane Library manages the extensive database of these reviews. It is considered to be of the highest standard and reliable source of evidence to inform decision making in health (Cochrane, 2016; Cochrane Archive, 2016).	HR, KT (produces and uses) AN, EVAL, HTA, HTR, IN, PM, PMT, QA, QI (uses)
Scoping documents	A3. A template for structured problem solving formatted on 11 x 17 paper (A3) that clearly defines the problem and key steps of the improvement effort in a concise manner.	QI
	Visual data displays. Time-sequenced data (e.g., statistical process control charts, run charts).	
Six Sigma	A statistical process to eliminate defects, decrease process variations, and cost. Six Sigma usually consists of five steps: refine, measure, analyze, improve, and control (or verify). From a statistical measure, Six Sigma has morphed into a management system that also incorporates <i>Lean</i> tools. Six Sigma originated at Motorola and has been successfully adapted to the healthcare setting (PSI, 2015, p. 53).	QI
Social network analysis	Analysis of stakeholder relationships and activities and their strength in a certain context.	EVAL, HR
Software: Business Intelligence and Statistical Software	Access. A database management application often used to develop the front-end application software for data capture. Access is part of the Microsoft Office suite of applications.	AN, EVAL
	Excel. A spreadsheet application for analyzing and visualizing quantitative data. Excel is part of the Microsoft Office suite of applications.	AN, EVAL, HR, QI
	NVivo. A qualitative data analysis computer software designed for practitioners working in text-based and multimedia data. NVivo is used in a diverse range of fields including social sciences and health as well as forensics, tourism, criminology, and marketing (QSR International, 2016; NVivo, 2016).	EVAL, HR
	R. A programming language and a software environment for computing and graphics used in developing statistical software and analysis. Under GNU's General Public License, R is freely available to statisticians, data miners, and data analysts.	AN, EVAL, HR
	SAS (Statistical Analysis System). A system designed for advanced analytics, multivariate analyses, business intelligence, data management, and predictive analytics.	AN, EVAL, HR
	SPSS (Statistical Package for the Social Sciences). A system designed for statistical analysis, data management, and data documentation. Initially designed for the social sciences, SPSS is now used broadly in health sciences and marketing.	AN, EVAL, HR
	STATIT. A statistical software package designed to support continuous performance improvement solutions through integration of multiple data sources and visualizing results into scorecards; automation of spreadsheets; and analytical reporting and performing in-depth statistical analysis (Midas Statit Solutions Group, 2016).	AN, EVAL
	Tableau. A business intelligence and reporting application used for designing and publishing visually-appealing dashboards used to communicate results with stakeholders.	AN, EVAL, QI
Statistical model	A class of mathematical model that uses a set of assumptions involving the generation of sample data and similar data from a larger population. Models deal with such processes as probability distributions and random variables. Statistical hypotheses and estimators are derived from statistical models (Statistical Model, 2016).	AN, EVAL, HR

Process	Description	Used by
Study Designs or Methodologies: Mixed methods	Concurrent Nested. A strategy that uses a dominant method for collecting data to guide the project, but uses another method to address secondary questions and seek information from a different level or sources (Research Rundowns, 2016; Terrell, 2012, p. 270).	EVAL, HR
	Concurrent Transformative. A strategy that uses both quantitative and qualitative methods simultaneously while being guided by a specific theoretical perspective driven to initiate social change or advocacy (critical theory, advocacy, participator research, or theoretical frameworks). The purpose is to provide support for various perspectives (Research Rundowns, 2016; Terrell, 2012, p. 272).	EVAL, HR
	Convergent (or Sequential Explanatory). A strategy that uses qualitative results to provide better understanding of quantitative results. Typically, quantitative data collection and analysis occurs first, followed by the selective collection and analysis of qualitative data. Both methods are used in the interpretation of the data (Research Rundowns, 2016; Terrell, 2012, p. 261).	EVAL, HR
	Sequential Exploratory. A strategy used to study a phenomenon by testing a theory, generalizing qualitative findings to different samples, or developing a new instrument. Qualitative data collection and analysis is followed by a study of quantitative data (Research Rundowns, 2016; Terrell, 2012, p. 264).	EVAL, HR
	Sequential Transformative. A strategy that uses both qualitative and quantitative data, but there is no structured sequence to the order of collection and application. The results of both data types are integrated in the interpretation phase of the study. The order of application is determined by what best serves the theoretical perspective (Research Rundowns, 2016; Terrell, 2012, p. 266).	EVAL, HR
Study Designs or Methodologies: Qualitative	Case studies. A detailed and contextual study of a person, group, or situation over time to bring a better understanding of a limited number of events or conditions and their relationships. Case studies are used broadly and are common in psychology, anthropology, sociology, political science, education, and clinical science.	EVAL, HR, PM, PMT, RIA
	Ethnography. Systematic study and documentation of human groups or cultures that often utilizes participant and non-participant observation techniques and field notes analysis. Ethnography originates from the field of anthropology.	EVAL, HR
	Phenomenology. A theory-based approach to data collection that focuses on the subjective reality of an event as perceived by individuals involved in the study. Phenomenology has a long history of use in psychology, sociology, and social work (Stufflebeam & Shinkfield, 2007, p. 708; SRM, 2016).	EVAL, HR
Study Designs or Methodologies: Qualitative or quantitative	Concurrent Triangulation. A strategy that uses the results of two or more data collection methods to confirm, cross validate, corroborate, or refute study findings. Data collection may be concurrent. Multiple methods help to overcome a weakness of using a single method (Research Rundowns, 2016; Terrell, 2012, p. 268).	EVAL, HR
	Grounded theory. An inductive methodology that systematically generates theory through rigorous analysis of data from variety of sources. Instead of starting with a theory as is the case in traditional research, this approach allows ideas, concepts, and categories to emerge from the data into conceptual hypotheses. Grounded theory uses both quantitative and qualitative data, so this method can be categorized as a general method (Glaser, 2016).	EVAL, HR
Study Designs or Methodologies: Quantitative	Clinical trial. A type of clinical health research designed to assess the effect of a biomedical intervention (including drug, device, cognitive-behavioural, process, diagnostic test, etc.). Clinical trials can be prospective cohort studies, case-control studies, or randomized controlled trials (ACRC, 2015, p. 19).	HR
	Cohort study. Examines a group of individuals over time, some of whom are exposed to a variable of interest. Cohort studies can be either prospective or retrospective (ACRC, 2015, p. 21).	EVAL, HR
	Correlational study. The degree to which two or more variable are related. The linear relationships of variables are typically measured with Pearson's correlation or Spearman's rho (ACRC, 2015, p. 23).	EVAL, HR
	Cross-sectional study. Uses a group chosen from a larger population (may be by random sampling), observes the impact of exposure to an intervention, and measures outcomes of interest (ACRC, 2015, p. 24).	EVAL, HR
	Experimental study. Tests a theory in laboratory settings or within a controlled clinical trial. The extent to which control within the research setting is maintained is related to the degree of confidence that the findings are accurate (Brink & Wood, 1989, p. 18).	HR

Process	Description	Used by
Study Designs or Methodologies: <i>Quantitative continued</i>	Non-experimental study. A type of study which does not manipulate or control variables, but rather seeks to understand processes through correlational, comparative, and longitudinal designs. Non-experimental designs do not use random assignment, control group, or multiple sources of measurement. An example would be a one-shot survey design (RMKB, 2016b).	EVAL, HR
	Quasi-experimental designs. A study used to estimate the causal impact of an intervention on its target population. While similar to a randomized control trial that uses multiple groups or multiple sources of measurement, quasi-experimental designs lack the element of random assignment to treatment or control (Alkin, 2011, p. 18; Brink & Wood, 1989, p. 20; RMKB, 2016a).	EVAL, HR
	Randomized controlled trial (RCT). A prospective experiment in which eligible samples of participants are randomly assigned to one or more treatment groups and a control group. The study follows the outcomes of intervention on selected groups (ACRC, 2015, p. 50).	EVAL, HR
Surveys	A commonly used process of collecting information about a particular group using a list of questions for the purpose of extracting new information. Surveys can be conducted face-to-face; by phone, mail, and internet; or on the street. Survey methods are guided by all aspects of a research process (design, tool construction, sampling method, data collection, and response analysis). A questionnaire is a data collection tool used within a survey process (Fluid Survey University, 2016; Creswell, 2014).	EVAL, HR, RIA, PMT, QI
Test, pilot, trial	Tests, pilots, and trials are administered completed when the outcomes of project implementation or data collection methodology are unknown or not well understood. For example, a newly developed questionnaire tool may be tested on a small sample of the target population to gauge reliability and validity. A newly designed process may be piloted and tested within a local environment to assess function and feasibility of the design and address areas for improvements before the process is spread and adopted to other locations.	EVAL, HR, IN, QI
Triangulation	A validation process through comparing and contrasting data from multiple sources within an initiative by examining evidence from those sources and using it to justify and improve the robustness of the results (Creswell, 2014). Sources of triangulated knowledge can come for gathering data from different informant groups (such as the practice wisdom and experience of practitioners, participants, and expert opinion), evaluation and basic and applied research findings; and cross-disciplinary findings (Patton, 2008).	EVAL, HR
Value stream	An end-to-end collection of activities that create or achieve a result for a customer of the enterprise.	QI

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