



INNOVATION PIPELINE

Intent to Scale for Impact PRIMER 2.0

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Helping people turn good ideas into changes that positively impact patients and the healthcare system

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<u>Authors</u>

Arianna Waye, Health Economist, System Innovations and Programs, AHS

Barbara Hughes, Senior Consultant, Innovation Evidence, Evaluation and Impact, AHS

Kelly Mrklas, Knowledge Translation Implementation Scientist, Research Priorities and Implementation, AHS

Nancy Fraser, Lead Innovation & Evidence Funding Programs and Senior Provincial Director, Critical Care Strategic Clinical Networks, AHS

Collaborators

- BELT Resource Allocation Framework Technical Working Group (AHS) including Anderson Chuck, Arianna Waye, Barbara Hughes, Basil Elyas, Tracey Geyer; Christine Kennedy; Nancy Fraser, Tom Mullie; Kelly Mrklas; Thanh Nguyen; Kevin Osiowy; Michael Sidra; Duncan Steele; Mahmood Zarrabi; Selene Tash
- Health Evidence and Innovation (AHS) including Kathryn Ambler, Marc Leduc, Daniela Robu and Patty Wickson.
- Implementation Scientists including Daniel Niven and David Johnson.
- Strategic Clinical Network Leadership (AHS) including Tracy Wasylak and Braden Manns.
- Alberta SPOR SUPPORT Unit Learning Health System Team (AbSPORU LHS Team) including Laura McAlpine and Gabrielle Zimmermann.

In our pursuit to achieve service clinical excellence, this living document will be evaluated, assessed and modified to improve methods and processes for developing and testing innovation.

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01 Value Based Decision Making

Value Based Decision Making is the discipline of basing decisions on evidence that aligns to organizational definitions of value which can be measured, validated and is reflective of real world settings.

AHS has made significant strides to operationalize value based decision making through two mechanisms:		
AHS Sustainability Program	Serves as the mechanism of producing the pool of resources from	
(former ARIO Sustainability	which the existing system and budgets to be able to be re-invested	
Structure)	through the resource allocation decision process [*] .	
Resource Allocation Framework	Serves as the mechanism for prioritizing investment initiatives	
(Budget Executive Leadership	to support allocation decisions to maximize organizational	
Team, BELT)	value.	

In concert, these mechanisms support AHS as a thriving health system that constantly improves health outcomes for Albertans at lower or equal costs; reinforcing AHS as a a high performing adaptive health care system.

There is a comprehensive suite of tools, protocols and decision criteria that are aligned and designed to maximize organizational definitions of value.

The Innovation Pipeline is one such tool that provides a framework for the generation of evidence, at the various stages of innovation development, to measure value. This evidence helps to identify and support investment along the pipeline with the ultimate goal of assisting AHS to make value based health care decisions on initiatives that are mature and supported by a foundation of evidence of value.*

* Refer to the Sustainability Program Office Guidance document for additional detail.

AHS' Definition of Value

There are four components of value according to AHS's organizational definition of value, that need to be measured, validated and reflect Alberta real world evidence (Lewanczuk et al., 2020):

i) An improvement in quality of health care services, using one or more of the Dimensions of Quality to demonstrate an improvement in one or more Quadruple Aim; AND

ii) An economic benefit, using clinical and economic data to demonstrate cost effectiveness and a positive return on investment;

AND

iii) Implementation feasibility, using implementation outcomes to demonstrate an initiative has been and can be feasibly implemented with demonstration of sustained uptake, and an understanding of what affects uptake;

AND (when relevant)

iv) Health equity improvement using data to demonstrate patients with a lower baseline health caused by inequitable systemic factors have improved health outcomes and/or access to care, as relevant



The AHS definition of value is operationalized in the following AHS Value Framework - as created within AHS based on consultation with AHS Executive Leadership and published here: Lewanzuk, Chuck, Todd and Yiu. 2020, Value in Healthcare: Designing an Integrated Value-Based Healthcare System. *Healthcare Papers* 19(1): 59-64.

AHS Value Framework

Dimension of	Quadruple Aim	Category	Principle
Quality	Improve patient and population health outcomes	Effectiveness	Value placed on initiatives that have demonstrated a positive impact on clinical* (patient) outcomes
	Improve financial health and value for money	Appropriateness	Value placed on initiatives that provide the right service to Albertans at the right place and right time.
	Improve patients' and families experiences	Acceptability	Value place on initiatives that are found to be acceptable to Albertans
	Improve patients' and families experiences	Accessibility	Value place on initiatives that improve access to healthcare services in Alberta
	Improve patient and population health outcomes	Safety	Value place on initiatives that improve the safety of patient and families receiving care
	Improve the experience and safety of our people		Value place on initiatives that improve safety of AHS staff
Economic Value	Improve financial health and value for money	Efficiency	Value place on initiatives that are clinically efficient
	Improve financial health and value for money	Efficiency	Value place on initiatives that provide good value for money (i.e. return on investment or cost effective)
Equity	Improve patient and population health outcomes Improve patients' and families experiences	Equity	Value place on initiatives that are expected to improve the health outcomes of groups with known lower baseline health or life expectancy, or with greater severity of condition
Feasibility/	All	Leadership Support	Value place on organizational strategic priorities
Implementability			
		Stakeholders	change are identified and engaged and the drivers for change
		Implementation Effectiveness	Value place on initiatives that are most likely to implement successfully to generate and sustain anticipated impact for patients, families and AHS staff
*Non-Clinical outcon	mes need to show effectiveness		Value placed on initiatives that have demonstrated a positive impact on non-clinical outcomes

Modified from Lewanzuk. Chuck. Todd and Yiu. 2020.

As you will see in the next sections, the Innovation Pipeline OPERATIONALIZES the AHS definition of value to support value based decision making.

02 Innovation Pipeline

In the past, when someone had a promising idea to introduce into healthcare, there wasn't a commonly understood path to follow. There were no common criteria to help identify and choose which good ideas to invest in. This lack of guidance led to a number of different ways to introduce innovations into daily operation, leading to variable degrees of value for the healthcare system.

The Innovation Pipeline operationalizes the ELT endorsed definition of value by creating a standardized set of evidence requirements to support value based decision making in our health system and allow the most effective and efficient delivery of solutions.

Early, rigorous and ongoing testing of solutions in partnership with the health system, allow poorly performing solutions to fail fast while ensuring that only those solutions with demonstrated value advance throughout the Pipeline.

Origins

The Innovation Pipeline has evolved into its current form since the beginning of the Strategic Clinical Networks (SCNs). In 2012, through the dawn of the SCNs, Dr. Cy Frank and his team first conceptualized the pathway for innovation and building of evidence through stages of implementation within the health care system. These concepts have since been incubated and tested within the health care system to reach their current form.

Benefit to Innovators

The Innovation Pipeline helps innovators judge the maturity of their idea and provides information about the evidence needed to safely move a good idea into action, in partnership with researchers, patients and health care teams that will provide the service.

Benefit to the Health System

The Innovation Pipeline serves as a framework for our Learning Health System; investing in the generation of evidence for ideas that will drive change. Supporting AHS as a high performing health system that invests in ideas that are safe, that demonstrate benefits and positive outcomes for patients and improvements in delivery of care that maximize organizational value.

Innovation Pipeline:

Guiding how to test and collect evidence that demonstrates value at each step of innovation development

The Innovation Pipeline guides the testing of innovation to generate standardized evidence that aligns to organizational definitions of value and that can be measured, validated and reflect real world settings. This evidence supports the most effective, efficient delivery of solutions in our health care system, ultimately driving long term sustainability of AHS as a learning health system.



Go to Section 3 - Steps in the Innovation Pipeline for additional detail.

03 Steps of the Innovation Pipeline



Start with a Defined Problem

STEP 1 Idea Generation - Solution Discovery

Identify solutions to address defined priority system challenges (i.e. problems) within the health care system.

The identified solution(s) needs to be supported by evidence suggesting that it has the potential to address the identified problem and its root cause(s). Knowledge about the key mechanisms of the proposed solution might be hypothesized and not yet tested in the health care system.

STEP 2 Proof of Concept in the Health System

At this step, the solution is in a 'test state' and little is known about efficacy and/or effectiveness; the potential impact is conceptually understood and requires further validation. This preliminary test of effectiveness and confirmation of safety (i.e. adverse outcomes and/or balancing measures) should be done in one (or more like sites) of the health care system.

Reminder: To Be Ready for Testing Through the Innovation Pipeline

Any solutions that Impacts Health will need:

- Evidence to demonstrate efficacy and/or effectiveness;
- Evidence of safety (including Health Canada Approvals as needed);
- Understanding how to deliver and sustain the solution in different contexts.

Regardless of impact on health or not, technological solutions will also need:

- Evidence of functionality that meets our users requirements to generate desired outcomes.
- Be available to purchase for proof of concept testing in the health care system.

Examples include an initial attempt at improving a surgical intervention in a single site; initial test of commercially available product (with Health Canada approval); initial test of the blood pressure wearable device on patient health outcomes; initial application of clinical practice guidelines in a clinical setting.

Involves testing the implementation of a promising solution(s) to demonstrate clinical effectiveness in Alberta. To be placed at Step 3, preliminary evidence of effectiveness should have been collected through a pilot test in Alberta (AB) *or* through evidence from another jurisdiction outside of AB.

A test of implementation can be carried out ideally at multiple contexts in AB.

It is typically accompanied by rigorous pre-planned evaluation to demonstrate clinical *and* implementation real world effectiveness, impact and value, and solving the problem.

Examples include implementation of best practice, models of care, or service delivery design that has been clinically validated outside of Alberta; and deployment of a new technological solution into practice in a zone following a successful proof of concept trial.

STEP 4 Implementation Work to Scale

The deliberate and planned adaptation/tailoring of solutions to local settings within Alberta, with known evidence based care gaps, to inform improvement and/or optimization of the solution and strategy for implementation scale and spread into other areas of the health system.

Note, the solution must have a strong body of evidence, including evidence of adoption in Alberta, and has demonstrated a quantifiable improvement in some key value metric associated with the defined performance gap, as well as knowledge of the conditions required for implementation success.

Examples include spread of a practice, successfully implemented in one Zone to the other four Zones; deployment of a new device across the province following a successful deployment in one city; and scaling a clinical pathway or certain components of the pathway across different disease conditions (i.e. cancers).

STEP 5 Implement to Sustain Care

Sustaining implementation and maintaining the value achieved through implementing the solution at the desired level of deployment within Alberta.

These projects will have or be nearly complete with province wide or multi-zone implementation (as appropriate); opportunity may still exist to achieve greater gains through further spread/scale.

Solutions advancing to Stage 5 must demonstrate quantitative evidence of value when implemented broadly in Alberta.

Examples include permanent funding for additional personnel to continue the application of a new model of care that has been successfully adopted in the province and ongoing funding for consumables and maintenance related to a new device that has been successfully broadly deployed in Alberta.

Precursors to Testing Innovations in the Health System at Any Stage of the Pipeline -

Well Defined Problem & Well Described Solution

Start with a Well Scoped Problem

The Innovation Pipeline is **driven by priority health system challenges (problems)** that are supported by Alberta data to demonstrate:

- The magnitude/severity of the problem
- The root cause(s) of the problem
- The people affected by the problem
- The broad context in which the problem exists
- · Factors inhibiting or facilitating behaviour change

There should also be a clear rationale for why it is important to solve the problem; including consideration of: what is currently being done to address the problem?; Why is the status quo no longer acceptable?; What is the impact of not finding a solution (including impact on mortality and/or morbidity, service delivery, cost of not addressing the problem, etc.?); Is there a particular reason why the problem needs to be solved now?; Who in AHS leadership and other stakeholder groups been engaged to address the problem and implement a solution?

Refer to Appendix B for additional information on 'Defining the Problem'.

Find a Solution

Solutions that logically address the problem and its root causes are discovered and tested through the Innovation Pipeline. This early, rigorous and ongoing testing of a solution in partnership with the health system, allows poorly performing solutions to fail fast while ensuring that only those solutions with demonstrated value advance throughout the Pipeline.

Solutions will be either:

Non-technological solutions	A novel practice, service or approach
Technological solutions	New invention, technology, commercialized product, or a technology-enabled approach or intervention

Understanding of the solution should evolve with each step of innovation development.

Descriptions of the solution should become more specific and detailed including: Who does what? To whom? How often? With what? What resources and/or technology is needed? In what setting(s)? How is the solution provided by what means, medium and/or process? For how long?

A detailed understanding of the solution will inform how to implement and the stakeholders that will be directly or indirectly affected by the uptake of the solution that will need to collaborate and change to ensure successful implementation.



i) Solutions logically address the defined problem: Available evidence is needed to suggest that the chosen solution is expected to address the reason(s) for why we are seeing the problem (i.e. root causes). See Appendix B for additional details for 'Defining the Problem'.

ii) Evidence of Clinical Effect: Available evidence that demonstrates an improvement in patient health outcomes^{*} (e.g. treatment efficacy/effectiveness; diagnostic accuracy, etc.)

Examples of Demonstrated Clinical Effect

Demonstration of Clinical Effect:

- Statistically significant reduction in deaths
- Statistically significant reduction in morbidity (i.e. stroke; AMI; injuries)
- Statistically significant improvement in function or health indicator (i.e. blood pressure)
- Statistically significant reduction in health service utilization
- (ED visits; hospitalizations; procedures; physician visits; etc.)

Insufficient Demonstration of Clinical Effect:

- Clinician uptake or favored a particular solution. This
- demonstrates acceptability, but not clinical effect.
- Patient experience this is also demonstration of acceptability, not clinical effect.

*Note: For problems unrelated to patient health, non-clinical effectiveness should be demonstrated through improvements in process outcomes that show a reduction in the extent of the problem identified.

Evidence of Safety: Evidence that the solution will do no harm; this includes approval by Health Canada for technological/devices as needed.

iii) Current level of Implementation: Determined using existing evidence of Implementation Effectiveness (i.e. there is best available evidence of clinical effect for the target population, but further evidence is needed to understand implementation in relevant Alberta settings/context.)

Examples of demonstrated current level of implementation:

None/Small scale/Scope only:

- Ontario pilot project (not yet tested in Alberta) that has been shown to improve patient health outcomes
- •Alberta pilot at one clinic that has been shown to improve patient health outcomes

Broad Scale/scope - not yet at full deployment or ready to be sustained :

•A test of implementation has been conducted IN ALBERTA and shown that the solution improves patient health outcomes AND it is known how to implement in those contexts/settings

Solution is at Full deployment and ready to be sustained:

• A solution is at full deployment and shown to be of value. This typically requires the solution has been tested and is in a steady state in terms of well defined target population and refined solution.

Readiness for Testing in the Innovation Pipeline*

To be ready for testing, any solutions that Impact Health will need:

- Evidence to demonstrate efficacy and/or effectiveness;
- Evidence of safety (including Health Canada Approvals as needed);
- A stakeholder group has prioritized the need for this innovation; often requires understanding the benefits for stakeholders who are directly impacted by the solution.

Regardless of impact on health or not, technological solutions will also need:

- Evidence of functionality that meets our users requirements to generate desired outcomes
- Be available to purchase for proof of concept testing in the health care system.

Both types of innovative solutions will undergo the same early, rigorous and on-going testing in partnership with the health system to generate the **same kinds of evidence including effectiveness (clinical or non-clinical); economic benefits and any relevant equity impacts associated with the solution.** This approach ensures the alignment of AHS definition of value with evidence available to make value based decisions.

Go to Section 4: Measures Needed to Demonstrate AHS' Definition of Value for additional detail

* For technological solutions that are pre-commercial and not ready for proof of concept testing in the health care system, contact the Innovation Evidence & Impact team at: innovation@ahs.ca.

O4 Evidence Requirements Needed to Demonstrate AHS' Value

- A. Improvement in Quality of Health Care Services
- **B. Economic Benefit**
- **C. Implementation Effectiveness**
- D. Health Equity Improvement

What are the Evidence Requirements at Each Step of the Innovation Pipeline

			Step 1: Idea Generation	Step 2: Proof of Concept Testing	Step 3: Implementation Test in Alberta (AB)	Step 4: Implementation Work to Scale	Step 5: Implement to Sustainment in Care
Problem	Problem Priority health system challenges (problems); needs AB data to demonstrate: magnitude/severity, root cause(s), the people affected, the broad context in which it exists & factors impacting behaviour change.					g behaviour change.	
	Solution		Solution(s) that will logically addres	Solution(s) that will logically address the problem; needs to be supported by evidence suggesting it has the potential to address the problem and its root causes.			
	Effectiveness: Evidence that the solution will	Clinical	Conceptual understanding of how the solution will work clinically to impact patient health outcomes	Clinical efficacy/ effectiveness impacting patient health outcomes	Clinical effectiveness impacting patient health outcomes in AB	Clinical effectiveness impacting patient health outcomes in AB on a broader scale/full deployment	Monitor and maintain the clinical gains
	work.	Non-Clinical	Requirements for solution to work	Solution works in a proof of concept study	Solution works AB	Solution works at full deployment	Monitor and maintain the desired results
Improvement	Safety: evidence that the s and does not harm	solution is safe patients	The solution is expected to be safe	Solution is safe			
Health Care (using <6 Dimensions of	Acceptability: evidence th is acceptable to patients, providers.	at the solution , families and			The solution is acceptable and improves experience (or at least maintains) in AB	The solution is acceptable and improves (or maintains) experience in AB at full deployment	Monitor uptake/satisfaction by key stakeholders (including patients & providers)
demonstrate an improvement	Access: evidence that p receiving care in the most s within a reasonable tin distance.	oatients are suitable setting me and/or			The solution improves (or at least maintains) access in a controlled scale	The solution improves access (or at least maintains) at scale	Monitor and maintain access outcomes
Aim) Appropriateness: evidence that current care is suboptimal (can be more appropriate) or not appropriate			Improved health outcomes due to the solution or where there is a reduction in unwarranted care there should be no change in health outcomes		Monitor use of unneeded service		
	Program Efficiency: evider care resources are being of within program (system le considered in economic b	nce that health optimally used vel efficiency is benefit below)		Description of health care resources (i.e. staff, space, etc.) required to implement	Evaluation of changes to health care care	resources to provide same level of e	Monitoring use of health care resources and compare across settings
Economic	Evidence of the impact of the solution on patient	Return on Investment	Conceptual understanding of how the solution will improve health &	Preliminary Analysis of Return on Investment	Analysis of Return on Investment	Refined Analysis of Return on Investment	Monitoring performance
Benefit	health & net health care resources	Cost Effectiveness	therefore change system utilization		Cost Utility Analysis (with probabilistic sensitivity analysis)	Refined Cost Utility Analysis	economic value
Implementati on Feasibility	Understanding uptake (in much & under which c and what affects uptake of the practice (i.e. facilitators/bc why change occurred	n whom, how conditions) e innovation in arriers, context, d or not)	Preliminary evidence suggesting that stakeholders find the solution to be functional, feasible, acceptable and appropriate.	Preliminary evidence of 1) the context (i.e. setting) where the innovation was tested and 2) that stakeholders find the solution to be functional, feasible, acceptable and appropriate during testing.	Description of factors that affect uptake and the targeted strategies used to improve uptake (including context, adaptations, facilitators and barriers). Evidence of relevant implementation outcomes (dependent on type of implementation)	Evaluation of factors that affect uptake and targeted strategies that improve uptake (including context, adaptations, facilitators and barriers). Evidence of relevant implementation outcomes (dependent on type of implementation)	Monitoring to ensure sustained uptake and fidelity of implementation.
Health Equity Improvement	Evidence that patients w baseline health caused b systemic factors have imp outcomes and/or acce	with a lower by inequitable proved health ess to care.	Understanding the gap in health between the general population & a group with known lower baseline health.	Evidence the solution impacts health and/or access to care;	patient groups with known lower base evidence the gap in health inequity na population	eline health in terms of improved arrows for this group relative to	Monitoring the equity impact to ensure improvements are maintained.

Refer to Section 5: Evidence Checklists for Each Step of the Innovation Pipeline for additional detail

A. Improvement in Quality of Health Care Services

To show an improvement in any of the dimensions of quality you would ideally **compare outcomes with and without the solution**. To do this, you will need to **define a comparator group** or a group that will not receive the intervention.

This can be done in one of two ways: 1) collect outcomes from the same group before and after the initiative is implemented (i.e. pre/post controls), or 2) collect outcomes from two different but similar groups (e.g. those that received the solution and those that could have received the intervention but refused).

It is strongly advised that you consult a methodologist for support in identifying the most appropriate comparator *before* you start. Missing this step at the beginning may mean that you will not be able to demonstrate evidence that your solution works (is effective) or impacts economic value.

The Six Dimensions of Quality

Use the most relevant to measure the improvement to AHS' Quad Aim

Clinical Effectiveness

Health services are provided based on scientific knowledge to achieve desired clinical outcomes.

There are a number of types of analyses that can be used to evaluate effectiveness. For example: multivariate regressions. Each type of analysis requires:

- Identifiers MUST be tracked for those that receive the solution (ie. collect PHNs or Physician Practice ID's) and the date each individual received the solution. Identifiers are then often used to link to health system service and resource use.
- If implementation is deployed widely across Alberta, it may be possible to evaluate impact without specific patient/provider identifiers (i.e. difference in effectiveness outcomes over time for areas where the solution is offered).

NOTE:

- Every solution that impacts health must demonstrate that it works better than no solution.
- Other dimensions of quality are irrelevant if the solution doesn't work.
- Initiatives that do not impact health (i.e. non-clinical) should measure an improvement in performance or a process outcome to demonstrate effectiveness (i.e. time saved).

Safety

Mitigate risks to avoid unintended or harmful results.

Evidence of safety is a precursor for testing a solution in the Innovation Pipeline. Demonstrating the solution is safe requires Health Canada Approval (as needed).

There are a number of ways to evaluate safety impacts. Each way of assessing requires:

- Monitoring safety outcomes (i.e. morbidity/mortality).
- Identifying and monitoring balance measures when service changes may impact patient health outcomes to evaluate whether that initiative results in unintended adverse events on patient health outcomes. Examples of balancing measures include earlier discharge from hospital leading to increased return visits to Emergency Departments and readmissions to hospital).

The Six Dimensions of Quality (Continued)

Appropriateness

Health services are relevant to user needs and are based on accepted or evidence based practice. Clinical appropriateness focuses on individual patient needs, ensuring patients receive the tests, treatments, and clinical procedures that have been demonstrated to improve their health outcomes.

There are a number of ways to evaluate appropriateness. Each way of assessing requires:

- In order to demonstrate that a test or treatment is needed, it is necessary to show that the absence of the test or treatment results in an adverse impact on patient health or experience.
- In order to show that there is little to no value for a test or treatment demonstrate that after withdrawing a currently provided service, there is no adverse impact on patient health or experience.

NOTE: Implementation of appropriateness initiatives should improve or maintain health outcomes while either making care more appropriate or removing unwarranted or low valued care.

Program Efficiency

Program resources are optimally used in achieving desired health outcomes. Initiatives that focus on program efficiency aim to produce services with the least amount of necessary resources; resulting in savings to the system in terms of time and/or expenditures.

There are a number of types of analyses that can be used to evaluate program efficiency. Each type of analysis requires:

• Comparing resource requirements for service provision with other providers or jurisdictions, in order to identify potential efficiencies that could be realized in service delivery. These comparisons could also be made relative to benchmarks such as Operational Best Practice.

NOTE: Efficiency initiatives must maintain health outcomes while changing service models or process in order to optimize care.

Acceptability

Health services are respectful and responsive to user needs, preferences and expectations.

There are a number of ways to evaluate acceptability. Each way of assessing requires:

• Collection of information directly from the relevant target populations (i.e. patients, providers, etc.) to understand acceptability of a solution.

NOTE: It may also be relevant to assess accessibility from an equity perspective.

Accessibility

Health services are obtained in the most suitable setting in a reasonable time and distance.

There are a number of types of ways to evaluate accessibility. Each way of assessing requires:

• Comparing wait times between status quo and the initiative is necessary to provide evidence that the initiative has improved accessibility OR demonstrating new access (where it was previously not available). Assessing accessibility may require mapping services across locations.

NOTE: It may be relevant to assess accessibility from an equity perspective: Did implementation focus on the easier areas (low hanging fruit) at risk of missing the patients or populations who are most in need (i.e. equitable access to good care)?

Table 1: Improvement in Quality of Services- Sample Outcomes and Data Sources

Sample Outcomes	Potential Data Sources
Effective	eness
For Initiatives Impacting Health:	Track PHNs for all patients receiving the solution.
 Final health outcome measures: Rates of morbidity and/or mortality Intermediate health outcome measures: Clinically meaningful change in clinical indicator (i.e. blood pressure; functional status; hypoglycemia; etc.) Emergency department visits Re-admissions Hospital length of stay For initiatives that impact patient health, ideally we would measure final outcomes (e.g. mortality), however, this is not always possible, and intermediate outcomes should be used to model the impact on final outcomes Refer to Section 4: Evidence of Implementation	 Potential data sources include: Program specific data (ideally tracked and linked for each patient): Changes in clinical status Participation/uptake Administrative data sources: Enterprise Data Warehouse (DIMR Analytics) i.e. DAD/NACRS/ Vital Stats ConnectCare Clinical management databases including Sunrise Clinical Manager, eClinician, Netcare
Effectiveness for initiatives that do not impact health	
Safe	ty
 Percent of patients who report feeling safe when receiving care and/or percent of providers who report feeling safe when providing care Patients' perceptions of safety when receiving care and/or providers' perceptions of safety when providing care Number of adverse outcomes (by type) Percent of patients screened for injury risk Percent of healthcare providers with an injury-prevention strategy Change in indicators over time (e.g., from baseline) 	Safety data is available from various sources including RLS and FACT. Safety can also be tracked using specific balancing measures such as adverse events in administrative or program data.

Appropria	iteness
 Percent of eligible patients who received the intervention Percent of patients who received inappropriate services Patient-reported outcome measures Percent of providers agreeing the intervention will work for their patients Percent of providers agreeing that delivering the intervention fits within their role Change in indicators over time (e.g., from baseline) 	Understanding how to withdraw inappropriate services most often requires tests of implementation and generating evidence about how to de-adopt a service in the system, which can then be used to replicate the service withdrawal across our system. Potential data sources include: • As above
Efficie	ncy
 Operational activity metrics including hours of work, FTE, and workload (i.e. the number of minutes in-house clinical staff spend performing clinical activities for a patient/client). Cost of expendables required to perform an activity 	Comparing resource requirements across different processes or models of care and identifying potential efficiencies that could be realized in service delivery. These comparisons may be relative to benchmarks such has Operational Best Practice or other jurisdictions.
Accepta	bililty
 Patient or staff experience (or satisfaction) ratings Patients' adherence to their care plans Patient-reported experience measures (PREMs) Patient's perceptions of collaborative decision-making Change in indicators over time (e.g., from baseline) 	Demonstrate that the solution is acceptable to the intended target population by interviewing or surveying this group and by examining patterns of uptake.
Accessi	bility
 Average wait time per patient Patients' connections to community resources Patients' experiences accessing services Percent of patients seen through different mediums (e.g., online vs in-person) Change in indicators over time (e.g. from baseline) 	Availability of a service generally requires mapping by location. Timeliness considers waitlist data often tracked by the program implementing the solution; in some cases administrative data systems may also contain data to understand waitlists and timeliness of service delivery.

Sample outcomes from the EQUIP (Evaluating Quality and Implementation) provided by the Alberta SPOR SUPPORT Unit. For more information refer to <u>theequiptool.com</u>.

B. Economic Benefit

Return on Investment (ROI)

Measurement of the amount of the financial return (i.e. money gained/saved or money lost) on a particular investment, relative to the investment's cost

There are a number of types of analyses that can be used to evaluate ROI. For example: Budget impact, cost benefit, and operational and financial impact analyses.

- Each type of analysis will:
 - Estimate the operational & financial impact and associated ROI by evaluating the change in effectiveness outcomes (from section above i.e. health service utilization, workforce impacts, activity, or quality) with and without the solution.
 - The changes in effectiveness outcomes are then used to estimate net resource impact of the solution for AHS; if costs/benefits external to AHS are included in the analysis, report these separately.
 - This net impact on health system resources, along with the budget required to implement and/or sustain the initiative, will provide the ROI.

NOTE:

- An ROI is not sufficient to fund a project if there is a negative impact on patient health outcomes. Costs alone will only be considered when making decisions if there is sufficient data to demonstrate that patient health is equally affected (or not affected) with and without the solution. This is an important consideration for appropriateness, disinvestment, or de-adoption activities.
- Comparing effectiveness outcomes with and without the solution is always required to calculate the ROI.

Cost Effectiveness

Cost effectiveness analyses **compare the investment required** to implement the solution with **'what is being purchased'**.

Where "what is being purchased" is either:

a) Patient health outcomes: impact on patient health (morbidity &/or mortality), ideally measured in terms of health related quality of life (when health related quality of life measures are available, the cost effectiveness analysis is called a "cost utility analysis").

b) Health service utilization impact: impact on health system resources associated with the improvement in patient health outcomes due to the solution.

NOTE:

- A cost-effectiveness analysis is fully dependent on having evidence of clinical effectiveness.
- Any initiative that impacts patient health outcomes should be evaluated for costeffectiveness
- Results from this type of economic evaluation support efficiency decisions by allowing decision makers to compare across proposals to determine which solution generates the greatest amount of health for dollars invested. A more efficient, cost-effective, solution should have equal or better health outcomes at a lower net cost to the system.

Table 3: Economic Benefit – Sample Outcomes and Data Sources

Outcomes	Required Data			
Return on Investment Measurement of the amount of the financial return (i.e. money gained/saved or money lost) on a particular investment, relative to the investments cost.				
 Return on Investment - Improvement in the net cost of health service utilization divided by the required investment to implement the solution. Cost savings - Improvement in the net cost of health service utilization minus the required investment to implement the solution. 	The expected/forecasted performance of the solution is tracked and compared to its performance without the solution. This analysis starts in Step 2 and is refined over time using new data at each stage of the pipeline. This includes an itemized budget outlining the cost of implementation (Appendices C), along with a list of the health care resources (Appendices D) used and key success measure (i.e. one of the 6 dimensions of quality) (Appendix E).			
Cost Effective All relevant patient health outcomes and costs are pro (with and witho	Cost Effectiveness Analysis All relevant patient health outcomes and costs are predicted over time for the target population of interest (with and without the solution)			
 Cost to achieve an improvement in health (called the Incremental Cost-Effectiveness Ratio (ICER)); AHS health economics team generate this outcome through a cost-utility analysis. Net system resource utilization and cost If patient health (morbidity &/or mortality) is not thought to be affected (or equally affected) by the solution relative to no solution, then the net cost of health service utilization is compared with and without the solution. *Note: It is important that this assumption be validated with data (again comparing health outcomes with and without the solution). Examples where this assumption needs to be considered include appropriateness, disinvestment, or deadoption initiatives. 	 Quality of life impacts - collected from patients at various frequencies using the EQ-5D5L (survey). If health related quality of life cannot be measured using EQ-5D5L, other measures of health could be used. Rationale for using alternative measures of health will be required when seeking ongoing funding within AHS. The EQ-5D5L has been integrated into Connect Care in acute care settings. Health system resource impacts of the solution - Collected above in ROI. Budget - Collected above in ROI, based on past implementation, with new line items estimated by Analysts with Business Analytic Services (BAS). 			

C. Implementation

Evidence shows that it may take 17 years for research findings to be taken up into practice (Balas & Boren, 2000). This has led to a growing urgency in health services research to address the seemingly intractable research-to-practice gap which has fueled the development of implementation science (Lane-Fall, 2019); defined as the "scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services and care" (Eccles & Mittman, 2006).

Implementation science seeks to "continue the job" of biomedical research by testing proven innovations in ways that move them into clinical practice. Given this, the goal of implementation science is not to assess the health impact of clinical innovations but to identify what affects their uptake into routine use (Bauer, 2020).

Implementation Effectiveness

Implementation outcomes are used to determine what affects initial and sustained uptake. If an innovation failed, teams need to be able to demonstrate if the innovation itself failed, or if implementation failed (meaning there was no sustained uptake).

If an innovation was successful (meaning the innovation worked clinically to improve patient health outcomes AND there was sustained uptake), teams need to document 1) what was implemented, 2) how it was implemented and 3) the level of sustained uptake (and by whom) in order to support value based decision making by identifying initiatives that can be feasibly implemented and successfully spread to other sites

A commonly used framework used to select and evaluate implementation outcomes is **Proctor et al.'s taxonomy of implementation outcomes:**

Implementation Outcome	Definition	Implementation Stage
Acceptability	Satisfaction with what is being implemented	Early for adoption (uptake) Ongoing for penetration Late for sustainability
Appropriateness	Compatibility of what is being implemented	Early (prior to adoption)
Adoption	Intention or attempt to use or implement an innovation	Early to mid
Feasibility	Practicality of what is being implemented	Early (during adoption)
Fidelity	Degree to which an innovation was used or implemented as intended	Early to mid
Implementation Cost	Resources and costs required to implement an innovation	Early for adoption and feasibility Mid for penetration Late for sustainability
Penetration (Reach)	Willingness to participate in an innovation	Mod to Late
Sustainability	Extent to which the innovation is maintained or institutionalized	Late

Choose the highest rigor method to reveal clinical and implementation effects. Prioritizing the outcomes strike a balance between the importance of the clinical and implementation outcomes within the context of the study. The qualitative and quantitative methods for data collection will depend on which outcome is being considered.

Evaluating Implementation

It's not always feasible to assess all of the implementation outcomes listed in Proctor et al.'s taxonomy. To select the most relevant implementation outcomes, teams can refer to the logic model describing their program (see Logic model resources for more details) specifically the outputs and short-term outcomes included the logic model. These will tell you what is worth measuring and what can be left out, especially if resources are limited. Refer to Appendix C for examples of sample indicators for each implementation outcome.

Similarly, the qualitative and quantitative methods for data collection will depend on which outcome is being considered. **Qualitative methods** can be especially helpful when assessing implementation outcomes because they can **tell you why an outcome was or was not achieved**.

For example, why are healthcare providers not using the innovation, or why is the innovation being modified in practice? This information helps inform the context, including facilitators, barriers, team composition and roles, etc. for which the innovation worked or did not work – influences uptake - monitor and measure outcomes to determine trends – then use qualitative methods to assess why the trends are what they are – this is used to inform the context under which the initiative (best) works.

Planning to Evaluate Implementation

Data collection, including what implementation outcomes to collect and when, must be planned in advance of implementation. Expect some implementation outcomes to be collected throughout (e.g., acceptability and implementation cost) or at the end of various implementation stages (e.g., appropriateness, adoption, penetration, fidelity, sustainability). Refer to Table 1 (above) for more information on timing.

Implementation outcomes are typically included as part of a process evaluation, which determine if an innovation has been implemented as intended. **Process evaluations** are often incomplete by themselves and should be **included as part of a larger summative evaluation**, which determine if an innovation is achieving intended outcomes. Together, these evaluation approaches can inform future work by assessing who the program worked for (or didn't work for) and why, how the program rolled out, as well as the program's context, including barriers and facilitators.

How to Implement Well

It is beyond the scope of this primer is to instruct teams on how to implement well. However, a few key resources have been included in Appendix G for those seeking additional supports when planning and executing implementation.

D. Health Equity Improvement

The principle that some people need (and deserve) more resources to raise them up to a level that is fair with others in our community.

It is importantly different to equality (giving everyone the same thing), and is a core value in Canadian and Albertan healthcare. We do not merely take the annual health budget, divide it by population, and say 'this is how much each person is allowed to cost the system' (equality). Instead, as is current standard practice, funding should be allocated based on need. With more funding/resources going to people who have been systematically disadvantaged, leading to them having greater health needs; with the worst off getting priority in the pursuit of broad equality of health and wellbeing.

Not all initiatives will have an equity improvement. For those that do, evidence is needed to demonstrate that the solution impacts patients or groups with lower baseline health in terms of: improved health; and/or access to care; and/or acceptability.

Measuring to assess health equity improvement

- For non-targeted solutions implemented within the general population with an equity component, it is necessary to compare relevant health/access/acceptability outcomes with and without the solution. This analysis should be done for each group (for both the general population and the population with known health inequity) and then compared.
- For targeted solutions implemented only within a population with a known health inequity, it is necessary to compare their outcomes (e.g. pre/post health outcomes/access/acceptability).

To be able to generate this evidence of equity improvement, a strong evaluation plan is necessary.

Table 4: Equity – Sample Outcomes and Data Sources

Sample Outcomes	Potential Data Sources
	Equity
Difference between the general population and a systematically disadvantaged population in terms of health, accessibility, and/or acceptability	Evidence related to health outcomes/access/acceptability can be collected as suggested in the Quality Section above - use this data to demonstrate health equity impacts. For solutions without program specific data, a literature review should be conducted to understand whether a colution would be expected to
inequity; in terms of health outcomes, accessibility, and/or acceptability compared to	have an impact on health equity by considering the following questions:
baseline (without the solution)	 Which patient's and families' experiences have been improved, and how good is their status quo experience of care? (i.e. patient and provider experience/acceptability)
	 Where was the implementation targeted? Was the implementation targeted to those most at risk? Did implementation specifically target the patients or populations who are most in need (i.e. equitable access to good care)?
	 Which patients and population health outcomes the solution targets, and compare the baseline of each patient group (equal opportunity for good health)?

Sample Table: Targeted solution aimed at improving accessibility, and/or acceptability in a group with known health		
inequity, compared to baseline (without the solution)		
	Group with Known Lower Equity – At Baseline	Group with Known Lower Equity – Post Implementation
Incidence of Cases		
Health Access (wait times or distance to service)		
Acceptability of proposed solution		
Cost of care to patient (paid outside of insurance)		
Burden to unpaid caregivers		

05 Evidence Checklists for Steps of the Innovation Pipeline

Step 1 - Idea Generation - Solution Discovery



Step 2 - Proof of Concept in a Health Care Setting



Step 3 - Test of Implementation in Alberta



Step 4 - Implementation Work to Scale



Step 5 - Implement to Sustained Care



Glossary

Evidence	Information derived from a range of sources that has been subjected to testing and is found to be credible. Types of evidence include: research, data and information, and experience. (Alberta Health Services Knowledge Management, 2019)
Health Equity	Means that all people have the opportunities they need to reach their full health potential and are not disadvantaged due to social, economic and environmental circumstances. (AHS Health Equity Impact Assessment User Guide, 2019)
Health Learning	Leveraging developments in health information technology and a growing health data infrastructure to access and apply evidence in real time, while simultaneously drawing knowledge from real-world care-delivery processes to promote innovation and health system change on the basis of rigorous research (Greene, et al. 2012).
Innovation	A process in which value is extracted from new or improved products, services and/or processes. In healthcare, the innovation leads to improving care and to a positive impact on the health of patients or a target population. (AHS – Common Definitions in Health, 2017) Innovation is a disciplined process grounded in an understanding of need, based on close observation. (Institute for Healthcare Improvement, 2018)
Strategic Clinical Networks™ (SCNs)	Networks of people who are passionate and knowledgeable about specific areas of health, that have been challenged to find new and innovative ways of delivering care to provide better quality, better outcomes and better value for every Albertan. (AHS – Strategic Clinical Networks, 2021).
Quadruple Aim in Healthcare	A framework for healthcare that consists of measures related to: 1) patient experience, 2) improving health of population, 3) improving work life of clinicians, and 4) decreasing per capita cost of care. (Institute for Healthcare Improvement, 2014)
Value Based Decision Making	The discipline of basing decisions on evidence that aligns to organizational definitions of value which can be measured, validated and is reflective of real world settings.

Attributions: Key Sources of Evidence for the Innovation Pipeline

Innovation Pipeline

- Greene S, Reid R, Larson E. Implementing the Learning Health System: From Concept to Action. Annals of Internal Medicine 2012;157:207-210.
- Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O: Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q 2004, 82:581-629.
- Harris C, Allen K, Brooke V, Dyer T, Waller C, King R, Ramsey W, Mortimer D. Sustainability in Health care by Allocating Resources Effectively (SHARE) 6: Investigating methods to identify, prioritise, implement and evaluate disinvestment projects in a local healthcare setting. BMC health services research. 2017 Dec 1;17(1):370.
- Hull L, Goulding L, Khadjesari Z, Davis R, Healey A, Bakolis I, Sevdalis N. Designing high-quality implementation research: development, application, feasibility and preliminary evaluation of the implementation science research development (ImpRes) tool and guide. Implementation Science. 2019 Dec 1;14(1):80. https://implementationscience.biomedcentral.com/track/pdf/10.1186/s13012-019-0897-z
- Hull L, Goulding L, Khadjesari Z, Davis R, Healey A, Bakolis I, Sevdalis N. Guide. http://www.kingsimprovementscience.org/ImpRes
- Implementation Guide from Veterans Affairs: https://www.queri.research.va.gov/implementation/implementationguide.pdf
- LHIN Priority Setting & Decision Making Framework Toolkit. http://Northwestlhin.on.caDecision Making Framework. CE LHIN Board of Directors. www.centraleastlhin.on.ca
- Mrklas et al, 2019. Development, Monitoring, Measurement and Sustainment/Sustainability of Health Research Partnerships: Key Recommendations for Researchers, Research Funders and Academic Institutions
- Mrklas, K., Waye, A., Chuck., A. Enhancing Evidence Use in Executive-Level Budgetary Decision Making Within a Large Provincial Healthcare Organization. Knowledge Utilization Conference (2019)
- Mrklas, K. Intervention Design & Implementation Process. 2016
- Nguyen T, Graham ID, Mrklas KJ, Bowen S, Cargo M, Estabrooks CA, Kothari A, Lavis J, Macaulay AC, MacLeod M, Phipps D, Ramsden V, Renfrew MJ, Salsberg J, Wallerstein N. How does integrated knowledge translation (IKT) research compare to other collaborative research approaches to generating and translating knowledge? Learning from experts in the field. Implementation Science, 2019, *under review*).
- NHS England Clinical Priorities Advisory Group (CPAG) Decision Making Framework. http://qna.files.parliament.uk/qnattachments/170838/original/CPAG%20Decision%20Making%20Frame work.pdf
- NHS. Prioritisation: Clinical Priorities Advisory Group (CPAG). https://www.birmingham.ac.uk/Documents/collegesocial-sciences/social-policy/hsmc-library/Priorities2016/Judith-Bell.pdf
- Noseworthy T. Innovation in the Canadian health system. InHealthcare Management Forum 2020 Jul 23 (p. 0840470420936709). Sage CA: Los Angeles, CA: SAGE Publications.
- Technology readiness level: <u>https://www.ic.gc.ca/eic/site/080.nsf/eng/00002.html</u>\
- Understanding Technology Readiness Level for Medical Devices Development: https://www.tempoautomation.com/blog/understanding-technology-readiness-levelfor-medical-devices-development/

Key Resources for Evidence Generation for the Innovation Pipeline

Quality of Care Measurement & Evaluation

- Alberta Quality Matrix for Health: https://www.hqca.ca/about/how-we-work/the-alberta-quality-matrix-for-health-1/
- Appraisal of Guidelines for Research and Evaluation, and Resources https://www.agreetrust.org/agree-research-projects/agree-rex-recommendation-excellence/
- Brown et al 2015 An overview of research and evaluation designs for dissemination and implementation. Ann Rev Pub Health. 2017, 38:1-22
- Curran et al, 2012 Effectiveness-implementation Hybrid Designs: Combining Elements of Clinical Effectiveness and Implementation Research to Enhance Public Health Impact. Med Care, 2012 March; 50(3): 217–226. doi:10.1097/MLR.0b013e3182408812.2.
- NIH Collaboratory Section 1 Introduction of Study Designs in Health: https://rethinkingclinicaltrials.org/chapters/design/experimental-designs-randomization-schemestop/experimentaldesigns-and-randomization-schemes-introduction/
- Ross T. A survival guide for health research methods. McGraw-Hill Education (UK); 2012 May 1.

Economic Evaluation

- CADTH Economic Evaluation Guidelines: https://www.cadth.ca/sites/default/files/pdf/guidelines_for_the_economic_evalua tion_of_health_technologies_canada_4th_ed.pdf
- Drummond, Michael F., et al. Methods for the economic evaluation of health care programmes. Oxford university press, 2015.
- Edlin R, McCabe C, Hulme C, Hall P, Wright J. Cost effectiveness modelling for health technology assessment: a practical course. Springer; 2015 Aug 11.
- EQ5D-5L Resources -- APERSU: https://apersu.ca/ and https://youtu.be/qhZ6goeTSLI
- NIH Intro Health Economics: https://www.nlm.nih.gov/nichsr/edu/healthecon/03_he_01.html
- NICE Incorporating Health Economics: https://www.nice.org.uk/process/pmg4/chapter/incorporating-health-economics
- US Health Economics Resource Centre: https://www.herc.research.va.gov/include/page.asp?id=home

Implementation Evaluation

- Balas EA, Boren SA. Managing clinical knowledge for health care improvement. Yearb Med Inform. 2000;(1):65–70.
- Bauer MS, Damschroder L, Hagedorn H, Smith J, Kilbourne AM. An introduction to implementation science for the nonspecialist. BMC Psychology, 2015, 3:32. DOI 10.1186/s40359-015-0089-93.
- Harrison and Graham 2021, Knowledge Translation in RN and Health Care' road map to evidence in informed practice Wiley Blackwell.
- Lane- Fall, 2019 https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-019-0783-z Bauer & Kirchner, 2020 doi: 10.1016/j.psychres.2019.04.025
- Lewis et al, 2020 implementation outcomes (systematic review) https://implementationscience.biomedcentral.com/articles/10 .1186/s13012-015-0342-x
- The ISAAG manual (chambers) https://cancercontrol.cancer.gov/IS/docs/NCI-ISaaG-Workbook.pdf.
- **CAN-IMPLEMENT** https://www.nursingcenter.com/evidencebasedpracticenetwork/canimplement.aspx?id=1917711
- Consolidated Framework for Implementation Research (CFIR): www.CFIRguide.orgImplementation Science, 2012, 7:50. http://www.implementationscience.com/content/7/1/50
- Curran et al, 2012 Effectiveness-implementation Hybrid Designs: Combining Elements of Clinical Effectiveness and Implementation Research to Enhance Public Health Impact. Med Care, 2012 March; 50(3): 217–226. doi:10.1097/MLR.0b013e3182408812.2.
- Eccles MP, Mittman BS. Welcome to implementation science. Implement Sci. 2006;1:12.
- Grimshaw JG, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge Translation of Research Findings. Implementation Science, 2012, 7:50. http://www.implementationscience.com/content/7/1/50
- Implementation Outcomes Measurement: Proctor E, Silmere H, Raghavan R, Hovmand P, Aarons G, Bunger A, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. Adm Policy Ment Health Ment Health Serv Res. 2011;38:65–76.
- Implementation Strategies: Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting. Implement Sci. 2013;8:139.
- Implementation Guide from Veterans Affairs: https://www.queri.research.va.gov/implementation/implementationguide.pdf
- Guide to Guideline Solution Adaptation ADAPTE 2.0 https://www.g-i-n.net/document-store/working-groups-documents/adaptation/adapte-resource-toolkit-guideline-adaptation-2-0.pdf
- Guideline Implementability Assessment GLIA 2.0 http://nutmeg.med.yale.edu/glia/login.htm;jsessionid=178D7F36D6AECF2079F9F6C14A010B19 IAP2 website: https://www.iap2.org/CIHR Integrated KT website: http://www.cihr-irsc.gc.ca/e/45321.html
- Proctor, E., Silmere, H., Raghavan, R. *et al.* Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda. *Adm Policy Ment Health* **38**, 65–76 (2011). https://doi.org/10.1007/s10488-010-0319-7
- Straus E, Tetroe J, Graham ID. 2013. knowledge translation in health care: moving evidence to practice, 2nd ed, Oxford, John Wiley and Sons.

Equity Evaluation

- Assasi N, Tarride JE, O'Reilly D, Schwartz L. **Steps toward improving ethical evaluation in health technology** assessment: a proposed framework. BMC Medical Ethics. 2016 Dec 1;17(1):34.
- Droste S, Dintsios CM, Gerber A. Information on ethical issues in health technology assessment: how and where to find them. International journal of technology assessment in health care. 2010 Oct;26(4):441-9.
- Health Equity Checklist for Program Planning: https://www.mchip.net/sites/default/files/Checklist%20for%20MCHI P%20Health%20Equity%20Programming_FINAL_formatted%20_2_.pdf
- Ontario Health Equity Assessment tool: http://www.health.gov.on.ca/en/pro/programs/heia/tool.aspx
- Scott AM, Bond K, Gutiérrez-Ibarluzea I, Hofmann B, Sandman L. QUALITY ASSESSMENT OF ETHICS ANALYSES FOR HEALTH TECHNOLOGY ASSESSMENT. International journal of technology assessment in health care. 2016;32(5):362-9.

Performance Gap Identification and Measurement

- AHS (internal) Data Request: https://extranet.ahsnet.ca/teams/AHSRA/News%20%20Annoucements/DIMR%20RMT% 20Fillable%20and%20Savable%20Request%20Form.pdf
- AHS (Internal) Data Dashboards: https://tableau.albertahealthservices.ca
- Decision making matrix:
 - Mager & Pipe Model informs decision making related to performance problems (<u>https://slideplayer.com/slide/7999091/</u>)
 - Baxter Efforts/Benefits Matrix informs decision making related to the actions that you need to take first to have high impact/low effort (<u>https://slideplayer.com/slide/14334788/</u>)
 - Gilbert Behaviour Engineering Model informs how optimize the behavioral and environmental factors that
 management can control, in pursuit of cost-effective, worthy achievements. <u>https://hptmanual.weebly.com/gilberts-</u>
 behavioral-engineering-model.html
 - Human Performance Technology- informs decision making related to strategic interventions and solutions to address a gap (<u>https://sites.google.com/a/nau.edu/learning-theories-etc547-spring-2011/theory/human-performance-technology</u>)
- ESCAN:https://insite.albertahealthservices.ca/assets/km/tms-km-kmpse-environmental-scan-guide.pdf
- **Economic Surveillance**: https://www.ihe.ca/advanced-search/economic-surveillance-for-chronic-obstructive-pulmonary-disease-copd-in-alberta
- James Lind Alliance Approachhttp://www.jla.nihr.ac.uk/
- Journey Mapping Tools:
 - https://bcpsqc.ca/wp-content/uploads/2019/01/Journey-Mapping-Cancer-interactive.pdf
 - McCarthy A, O'Raghallaigh P, Woodworth S, Lin Lim Y, Kenney LC, Frédéric A. An integreated patient journey mapping tool for embedding quality in healthcare service reform. Journal of Decision Systems. 2016; 25 (S1): 354-368.
 - Trebble T, Hansi N, Hydes T, Smith M. Process mapping the patient journey: an introduction. BMJ. 2010; 341: 4078
- Performance Improvement Framework: Dessinger JC, Moseley JL, Van Tiem DM. Performance improvement/HPT model: Guiding the process. Performance Improvement. 2012 Mar;51(3):10-7.SPOR Data support: https://albertainnovates.ca/programs/strategy-for-patient-oriented-research/
- Storytelling: PatientEngagementHIT.com

Appendices

Appendix A	Original Innovation Pipeline (Mrklas and Fraser, 2018)
Appendix B	Identifying Problems - possible process and tools
Appendix C	Sample Indicators for Implementation Science
Appendix D - F	SPO Intake Form; Health System Resource Impact Template; Benefits Realization Template
Appendix G	Planning to Implement
Appendix H	Funding Opportunities
Appendix I	AHS Resources to Support Generating Evidence

Appendix A: Original Innovation Pipeline

The Innovation Pipeline - Intent to Scale with Impact



Mrklas KJ and Fraser N. (December 11, 2018). Pipeline: Intent to Scale with Impact. Co-Design in a Learning Healthcare System. Critical Care Strategic Clinical Network Core Committee Meeting. Leduc, Alberta (publication in draft).

Initially conceptualized as an evidence mapping and translation planning tool by Kelly Mrklas in October 2015, the innovation pipeline was developed to help teams situate the evidence base underlying their research, and to inform plans for ethical research use in the healthcare system. The current rendering was drawn by Mrklas in December 2018 to adjoin the concepts of co-design, emergent translational outcomes and impacts, and importantly, to map a clear path for intraorganizational evidence translation - or the intent to scale for impact. The pipeline image was graphically rendered by Alberta Innovates in May 2019 and introduced to the global research community at research impact assessment and knowledge utilization research symposiums in June 2019. The pipeline image received AHS Board approval in September 2019.

Appendix B: Identifying Problems - possible process and tools

Developing and advancing innovation in the health system should be targeted to addressing priority health system challenges. This requires: identification of quantitative measurable gaps within the Alberta health system (services, infrastructure, policy, etc.); qualitatively understanding why the problem is occurring (typically involves asking questions about why we are quantitatively seeing what we are); understanding the complexity of the health care system that influences desired performance; and exploring best practice organizations and related practices.



Appendix C - Implementation Outcomes - Sample Questions and Indicators

See <u>www.theequiptool.com</u> for more examples

	Sample Questions	Sample Indicators					
	Adoption (Uptake)						
	Intention	or attempt to use or implement an innovation					
•	Who is using the innovation? (Perspective – Healthcare Providers) Alternative - What is preventing healthcare providers from using the innovation? (Perspective – Healthcare Providers)	 Percent of eligible healthcare providers using the innovation (by type) Characteristics of healthcare providers declining to use the innovation Providers' perceptions of barriers and facilitators to using the innovation Evidence-Based Treatment Intentions (EBTI) Scale Ruzek Measure of Adoption 					
•	What sites are implementing the innovation? (Perspective – Organizations)	 Percent of eligible sites implementing the innovation Characteristics of sites implementing the innovation Characteristics of sites declining to implement the innovation Perceptions of barriers and facilitators to sites implementing the innovation 					
	Di	Feasibility					
•	Do healthcare providers have the resources and supports they need to use the innovation? (Perspective – Healthcare Providers) Alternative - What is preventing healthcare providers from using the innovation? (Perspective – Healthcare Providers)	 Percent of providers who indicate the innovation is ready to use in their context Number of times providers are unable to use the innovation (and reasons why) Providers' perceptions of barriers and facilitators to using the innovation Feasibility of Intervention Measure (FIM) Technology Acceptance Survey 					
		Fidelity					
	Degree to which	an innovation was used or implemented as intended					
•	Are healthcare providers using the innovation as intended (or planned?) (Perspective – Healthcare Providers)	 Percent of providers using the innovation as intended (or planned) Changes made to the innovation by healthcare providers (and reasons why) Providers' descriptions of how they're using the innovation Providers' perceptions of barriers and facilitators to using the 					
•	Alternative - How are healthcare providers using the innovation? (Perspective – Healthcare Providers)	 Framework for Reporting Adaptations and Modifications Expanded (FRAME) St. George Fidelity Measure 					

Sample Questions	Sample Indicators
	Yale Adherence and Competence Scale
 Is the innovation being implemented as intended (or planned)? (Perspective – Support Teams) Alternative - Are implementation strategies achieving their objectives? (Perspective – Support Teams) 	 Can be considered for each type of implementation strategy (e.g., training, learning collaboratives, audit and feedback, etc.): Percent of implementation activities carried out as intended (or planned) Changes made to implementation activities (and reasons why) Differences in participants' scores (e.g., self-efficacy, knowledge, awareness) between groups or over time (e.g., from baseline) Perceptions of barriers and facilitators to delivering implementation activities as intended (or planned) <u>Framework for Reporting Adaptations and Modifications Expanded - Implementation Strategies (FRAME-IS)</u> Stages of Implementation Completion (SIC) Measure
	SIC Measure Adaptation Process
	Penetration (Reach)
V	/illingness to participate in an innovation
 Who is participating in implementation activities? (Perspective – Healthcare Providers) Alternative - Are providers willing to use the innovation? (Perspective – Healthcare Providers) 	 Can be considered for each type of implementation strategy (e.g., training, learning, collaboratives, audit and feedback, etc.): Percent of providers participating in implementation activities Percent of providers who indicate they are ready to use the innovation Characteristics of providers participating in implementation activities Characteristics of providers declining to participate in implementation activities Providers' perceptions of barriers and facilitators to participating in implementation activities
	Sustainability
Extent to wh	ich the innovation is maintained or institutionalized
 To what extent are healthcare providers using the innovation one year later (or other defined time period)? (Perspective – Healthcare Providers) Alternative - What resources and supports do healthcare providers need to maintain the innovation? (Perspective – Healthcare Providers) 	 Changes in Adoption/Uptake one year later (or other defined time period) Percent of providers who indicate they will be able to maintain the innovation Required resources and supports identified by providers Perceptions of barriers and facilitators to providers maintaining the innovation Normalization Measure Development Questionnaire (NoMAD)
 What are sites doing to maintain the innovation? (Perspective – Organizations) 	 Percent of eligible patients who received the innovation one year later (or other defined time period) Modifications made to the innovation by sites Ways the innovation has been incorporated into site workflows

Sample Questions	Sample Indicators				
	 Perceptions of barriers and facilitators to sites maintaining the 				
	innovation				
	Long Term Success Tool				
	 Measurement instrument for sustainability of work practices in long- 				
	term care				
	 Program Sustainability Assessment Tool 				
Acceptability					
Health services that are respe	Health services that are respectful and responsive to user needs, preferences and expectations.				
Refer to Acceptability: Sample Outcomes provided in Table 1					
	Appropriateness				
Health services that are rele	evant to user needs and are based on accepted or evidence based				
	practice.				
Refer to Appropriateness: Sample	e Outcomes provided in Table 1.				

Appendix D -

AHS Investment Request Intake Form:

For Innovation Pipeline Value Assessment



Instructions for completing:

Type directly into this form, following the word limits for each section.

Formatting: 11 point font; Calibri, Arial or New Times Roman; 1.0 or 1.15 spacing.

Submit the completed form as a word document (other formats will not be accepted) to Arianna Waye (arianna.waye@ahs.ca)

List and append all references

Note: See the Innovation Pipeline Primer for detailed descriptions of information required in the sections below https://www.albertahealthservices.ca/assets/about/scn/ahs-scn-so-innov-pipeline-primer.pdf

PROJECT TITLE:

Click or tap here to enter text.

Section 1: DESCRIBE THE PROBLEM (500 words)

- Based upon best available evidence, describe the problem in Alberta (including magnitude in terms of prevalence, target population, cost and/or equity considerations). Also, describe the root cause(s) of the issue why is the problem occurring?
- Why is this problem important to solve now? Why is the current state not acceptable? What are the implications the status quo on the delivery of care and services, and on patients, relatives and caregivers (including mortality, morbidity, quality of life based upon best available Alberta information)?
- Describe whether the issue is present at a local (defined region) and/or provincial level.
- Describe any equity considerations, including whether the target population is of lower baseline health due to systemic inequities.

Example -Instructions Insert References



AHS Investment Request Intake Form

Section 2: DESCRIBE THE SOLUTION (3500 words excluding diagrams)				
2A. Briefly summarize the solution, and supporting evidence demonstrating the solution works to address				
the identified problem (provide evidence of clinical effectiveness and other 6 dimensions of quality,				
implementation effectiveness, & economic benefit, as well as equity improvement as relevant)				
(please populate Table A1 with supporting evidence). (1000 words)				
AHS Investment				
Fill in and insert Appendix 1: Evidence Table A1 Form APPENDIX 1.doc				
2B Describe the current health care service trajectory (status quo) targeted by the solution, including the				
technological and human resources required at each health service touchpoint. Include a diagram for				
clarity as needed (1000 words)				
 How many nations are currently served under the status quo? 				
• Now many patients are currently served under the status quo:				
2C Describe the health care service trajectory following introduction of the solution including the				
technological and human resources required at each service touchpoint. Include a diagram for clarity, as				
needed (1000 words)				
• Who does what? To whom? How often? What recourses (technology is needed? In what setting(s)? How				
is the solution provided (by what means/process)? For how long?				
2D. What are the measureable outcomes (benefits) of the initiative as proposed? (100 words)				

Section 3: WHAT IS THE PROPOSED LEVEL OF DEPLOYMENT? (500 words)

- Is the requested funding for additional spread or for sustaining existing operations?
- Which step does the solution sit on in the Innovation Pipeline? Where (in what setting, zone, and population(s)) has it been tested?



Section 4: PROJECTED IMPACT & ASSOCIATED ECONOMIC BENEFIT						
Section 4A	Section 4A: Describe and Quantify Target Population					
	Target Population Count					
	Description	[Annual] population to be served by proposed solution with this				
	funding request					
Target						
population						
served						

Section 4B: Quantify Impact and Economic Benefit

Table 1: Projected Impact Summary (As proposed)

Using Table 1, summarize the estimated economic benefits of this initiative to be realized by AHS (be explicit on comparators used in analysis – i.e. standard of care). Append the spreadsheet used to generate estimates Include all impacts relevant to your initiative.

There are 3 categories of outcomes (Clinical Impact, activities (Copy from PID), and patient health outcomes). Populate only those categories relevant to your initiative

Exclude activities/costs that are accounted for in the budget (included in Table 2).

Type of Outcome	Notes	Total Requireme nts Per Fiscal Year	Change in activity from baseline			Total	
		BASELINE *	2022 -23	2023- 24	2024- 25		
Clinical In	npact (select measures	s relevant to re	equest)			·	
Cases detected (number or cost) Patients treated (number or cost) False positives (number or cost) Cases prevented (number or cost)	**Add rows as needed						
Activity In	npact (select measures	s relevant to r	equest)				
Bed Days						-	
Clinic Visits						-	
Ambulatory Procedures						-	
Day Surgeries						-	
In-patient Surgery						-	
Emergency Visits						-	
Patient Health Outcomes Impact (select measures relevant to request)							
QALYs							
Deaths							
Note: Increases are positive amounts; decreases are	e (negative) amounts.						
Baseline or "Without solution" meaning under status	quo or current standard of car	e.					
Summarize Projected Impact Findings							





Insert Spreadsheet, Notes, and Assumptions about method of calculation: Intake APPENDIX 2_M

Section 5: BUDGET

Based upon the Project Initiation Document (PID) (generated by Business Analytic Services), use Table 2 to summarize the estimated total investment required by AHS to support this initiative. <u>Append the PID used to generate estimates</u>

TABLE 2: Financial INVESTMENT Summary:

Initiative Description	Operatin g/ Capital (drop	Ongoin g or one	Annual ized costs	Total Requireme nts Per Fiscal Year (\$)				Total (\$)
	down)	ume		2021-22	2022-23	2023-24	202 4-25	
								\$-
								\$-
								\$-
								\$-
								\$-
								\$-
								\$-
Total				\$	\$	\$	\$	\$-

Note: Increases in Expenses are shown as positive amounts. Decreases in Expenses are shown as (negative) amounts.

Describe need for each budget item and costs used:

Insert <u>Spreadsheet</u>, Notes, and Assumptions about method of calculation



Section 6: IMPLEMENTATION STRATEGY (1000 words)

- Discuss details of past implementation:
 - Where was the implementation tested? What population?
 - What was the deployment strategy?
 - What proportion of the intended adopters adopted the solution?
 - Who adopted the solution, and why? What facilitators, context, team engagement/governance structures helped make this work?
 - Who did not adopt/implement the solution, and why? What barriers, context, lack of team engagement/governance etc. affected this not working?
 - To what extent was adoption sustained?
- For initiatives requesting funding to support further deployment (as opposed to sustaining existing operations), describe the planned implementation strategy for this initiative. Will the strategy be different than the previous implementation test? If yes, how and why?
- How will implementation be adapted to the local context(s) based on evidence and work to-date (i.e. change strategy; facilitators/barriers; teams etc.)?

Section 7: SUSTAINABILITY (300 words)

- What are the plans for sustaining the intervention (training, infrastructure, process, data collection/analysis for monitoring, etc)?
- Will future investment be needed to sustain existing service (if so, how much and for what?)?
- Following the proposed investment, will there still be further reach (if so, what would be remaining)?

<u>APPEND OR HYPERLINK KEY DOCUMENTS</u> (e.g. Reports, publications, economic forecast & evaluations)

Appendix E: Health System Resource Impact Template

1. Use the following table to summarize the resource, workload and capacity impacts of the project on the health system during the period. It will help reviewer assess the feasibility of adopting/deploying your proposed solution within existing health system resources.

• This table is intended to include all <u>increases</u> or <u>decreases</u> in operational resources, staff workload, or health system capacity that result from the intervention, *excluding costs covered by the project budget.*

• Changes in resources, workload, or capacity may occur in the site(s) or unit(s) that are directly implementing the change, or in services, units, or sites that support the implementing unit(s) (e.g. lab services) or units that treat the patient after the point where the intervention is applied (e.g. a recovery ward after the intervention is applied during surgery).

Describe System Resource Impact (K)	Financial Value per Unit of Health System Resource (L)	Total Increase (Decrease) in Resource Demand During the 3- Year Project Period (M)	Total Increase (Decrease) in Health System Resource During the 3-Year Project Period (N) = (L x M) (in dollars)	Cost Avoidance or Cost Savings? (O)

Explanation and Instructions:

K: Briefly describe the operational resource, workload, or capacity impact associated with the deployment of your proposed solution. In the notes section, please very briefly explain why the change in the resource, workload, or capacity will result from the implementation of the proposed solution. Include as few or as many system resources as are relevant, and add lines as required. Some types of resources that could potentially be affected:

 Labour/ personnel: changes in staff time required. For example, hours of lab technologist time to process a new test, or FTE of nursing staff for a unit changing its patient mix. Costs per time unit in column M should include both salary and benefits

- Medications and/or consumables
- o Medical equipment and/or devices, or any other major capital expenditures
- Diagnostic imaging tests
- Lab tests
- Non-medical costs, including administrative and procedural costs
- Service utilization episodes, including ED visits or inpatient bed days

L: Define the unit and the cost per unit of the resource. Unit costs should include all direct and indirect costs excluding overhead

M: The change in the demand for the resource during the course of the project period (i.e. 5 year period). For example, total number of inpatient days saved

N: The total increase (decrease) in health system resources during the 3-Year Project Period is calculated as L x M.

O: Does the resource demand change result in cost savings or cost avoidance?

Appendix F: Benefits Realization Template

Key Measure of Success:	<u>Directions for measures</u> : Replace gray text in this table with project-specific labels		Actual Current Baseline Level (A)	Forecast Expected Level during Year 5 (B)		
	PART	1: No. of people who will be exposed to your p	roposed intervention			
	Provin	cial Summary Statistics				
Describe/ name the	С	Total Provincial Sites (e.g. units, clinics, etc.)				
targeted metric that will be improved as a	D	Potential Total Target People (e.g. patients or staff)				
result of your initiative	Scope	of Solution Deployment				
	E	Number of Sites Where Solution is Deployed				
	F	Number of Target People at Deployment Sites				
	Solutio (i.e. Fo	on Impact precast of Expected Improvement)	Actual Current Baseline Level (A)	Forecast Expected Level during Year 5 (B)		
	PART 2: HYPOTHESIZED/FORECAST IMPROVEMENT (Per Patient)					
	G	Baseline Performance Level (i.e. measure level without the solution)				
	н	Forecasted Performance Level (i.e. measure level with the solution applied)	n/a			
	1	Forecasted Performance Improvement with Solution Deployment (I=absolute value of G-H)	n/a			
	PART 3: ESTIMATED CLINICAL/OPERATIONAL IMPACT					

Data Source for Key Measure:

Explanation and Instructions:

A: Level of the measure for the most recent time period available. Information in this column should be actual data

B: Level of the measure you in the last year (i.e. Year 3) of the PRIHS grant period.

C: Number of facilities, units, clinics, communities, etc., in the province where the solution could potentially be implemented. Indicate NA if this is not applicable to your project, and explain in the 'Notes' section.

D: Number of people in the province, across all sites in (C) who could potentially be targeted by the solution. May be Albertans within a specific demographic, patients with a specific condition, healthcare professionals eligible for training, etc.

E: Number of sites where the solution has been or will be deployed at a given point in time.

F: The number of people (from D) who could be affected by the solution at sites where the solution has been or will be deployed at a given point in time. Can be either calculated from site-level volume data, or estimated as D*E/C

G: Expected performance on the key metric if the solution is not deployed. In other words, this is the counterfactual, against which improvement will be measured. Unit can be either per patient (e.g. EQ5D, probability of complication, ALOS, etc.) or per site (e.g. median wait time). Please specify the unit of measure when writing the description. For column B, the Year 3 forecast should be the expected level of the measure if the project <u>were not</u> implemented. It could be the same as the current baseline level, or higher or lower if it is expected that there will be a trend without the intervention.

H: Expected performance on the key metric at sites where the solution has been deployed, with the same units as row G

I: Difference between (G) and (H). This change quantifies the improvement that is expected to be realized.

J: Multiply the change in performance (J) by either the number of sites where the solution is deployed or the number of subjects affected, whichever is more appropriate, to indicate the magnitude of the project's total impact.

Appendix G: Considerations for Implementing Well

Planning (Before	Describing who needs to do what differently (i.e. who needs to change and what changes
Implementation)	they need to make)
	Engaging with these stakeholders to assess their readiness and to understand how this
	change impacts their daily work (assessing context, barriers and facilitators); clarifying
	roles and responsibilities of the implementation team
	Using a logic model for change and/or any relevant implementation frameworks, models
	or theories to help stakeholders understand how implementation will unfold and how
	change is expected to create the outcomes of interest
	Selecting/developing strategies (implementation/integration/change strategies) that
	support stakeholders in making the necessary changes (i.e. strategies that address specific
	barriers or leverage facilitators) (can use implementation theories or frameworks to help
	identify/select appropriate strategies)
Executing (During	Ongoing monitoring (and feedback) to ensure that the strategies chosen are addressing
Implementation)	actual barriers and to continue assessing for any new or unintended barriers that emerge
	once implementation begins
	Measuring implementation quality/fidelity (i.e. process/formative evaluation to ensure
	that implementation proceeds as intended).
	*Testing changes in your strategy (how you deliver your program based upon lessons learned) in the future
	can help optimize and deliver the program more efficiently

Implementation information to collect	Purpose	Tools
Individuals, groups or stakeholders directly or indirectly affected by the implementation of the solution	To ensure all relevant stakeholders are/will be engaged	Stakeholder mapping
Stakeholder readiness	To ensure all relevant stakeholders are ready to implement the change; to understand issues impacting readiness	Readiness assessment survey and/or focus group
Barriers and facilitators to implementing the solution in a given setting/ context	To understand the factors that may impact implementation/uptake	Barrier and facilitator assessment survey and/or focus group
Selected strategies based on B&F assessment	To ensure strategies are targeted to overcome known/perceived barriers to implementation	Determinant framework and change theory or model
Implementation outcomes	To ensure that implementation proceeds as intended; to understand and respond to implementation challenges in a timely fashion	Process evaluation

Appendix H: Funding Opportunities

Source Name	Funder	Amount	Duration (years)
Innovation Development and Trialing		(CAD)	
AICE (Accelerating Innovations into CarE)	Alberta Innovates (Health)	≤ \$250,000	≤ 1.5
	University of Coloremy	¢25.000	
Innovation4Health	University of Calgary	\$35,000	
Choosing Wisely Alberta	AMA/AHS/AH/CPSA/UofC/U ofA/AI/ACFP/IHE/	≤ \$100,000	≤ 2
Health Evidence Reviews (HERs)	Alberta Health	Flexible	rapid reviews: 6
			months
			Comprehensive
DRING (Partnership for Recearch and	Alberta Innovator (Health) /	flovible	
Innovation in the Health System)	Alberta Health Services	nexible	20
Quality Innovation Fund	AHS	flexible	unsure
SPOR ICT	CIHR	≤\$3,000,000	≤ 4
Project Grants			
Project Grant Program	CIHR	varied	varied
Operating Grants		1	
CIHR:POR Impact Assessment	CIHR/SPOR	≤ \$50,000	≤1
Data Analysis Using Existing Databases	CIHR and ICR/IHDCYH/HCRI	between	≤1
and Cohorts	Institutes	\$75,000 -	
al lashin languations laitistics. Active and	CIUD ask funding	\$100,000	< 2
Assisted Living (AAL) Programme	collaborative projects	≥ \$ 353,000	2 3
Planning and Discomination Cronts			
Catalyst Crant: Analysis of Canadian	CIUD and	< \$70,000	< 1
Longitudinal Study in Aging (CLSA) Data		≤ \$70,000	51
CIHR Catalyst Grant: Patient-Oriented	CIHR	≤ \$100,000	≤1
Research			
Campus Alberta Health Outcomes and	Campus Alberta HOPH	\$2,500 - \$	single meeting
Public Health		5,000	
Planning and Dissemination GrantsICS		≤ \$15,000	≤ 1
Implementation Funding	•	• 	
CIHR Team Grant: Personalised Health	CIHR	≤ \$2, 000,000	≤ 4
HIIS (Health Innovation, Implementation and Spread fund)	Alberta Health/AHS	flexible	≤ 3

Appendix I: AHS Resources to Support Pipeline

Evidence Outputs Required at Each Step		AHS Support Teams Available	External Support Teams Available (For Hire)
Performance Gap	Quantification of the Problem	DIMR Human Factors (root cause of human change) Clinical Workforce Planning Reporting & Learning System Services ARES Clinical support services (if problem is related to appropriateness) Alberta precision labs analytics Pharmacy analytics SCNs Innovation Evidence & Impact (evidence synthesis, qualifying problem and room for opportunity) KRS (literature search) Guideline support (Eddy Lang) Clinical Quality Metrics	The Evidence Alliance (regional support avail) CADTH KT/SPOR Platform HQCA (good data repository) ECHO (Evidence synthesis at UofA)
	Clinical Effectiveness & Safety	Peter Farris SCNs (SD/ASD) Clinical Quality metrics (safety under Kevin Garrets) DSERT (Pediatrics under Stephen Friedman)	Research Community (Department of Biostatistics/Community Health Sciences/UofA/possibly faculty nursing) DSERT (Pediatrics under Stephen Friedman)
	Acceptability	Kelly Mrklas Sandra Johanson (PPIH) ARES HSEE AMH Decision Support Team SCNs (consultative)	Research Community (Department of Sociology/)
Impact on Quality	Access	Clinical Ethics Team Kelly Mrklas Sandra Johanson (PPIH) ARES HSEE AMH Decision Support Team SCNs (consultative)	Research community with DIMR data
	Economic Value/ Efficiency (includes appropriateness)	Virtual BELT Team PPIH (Raymond Lee) ASD Digestive (Susan) ASD MNCY (Seija) DIMR (Allan Ryan)	IHE UofC Health Economists (Eldon Spackman; Fiona Clement) UofA Health Economists (Mike Paulden; Arto Ohinmaa; Phil Jacobs; Jeff Johnson) APERSU (Arto Ohinmaa; Jeff Johnson)
Implementation	Implementation	Kelly Mrklas (SCNs) Sandra Johanson (PPIH) ARES Health System Evidence & Evaluation AMH Decision Support Team SCNs (consultative)	KT/SPOR Centre for Implementation Science (Julia Moore) HQCA (audit feedback support) EnACT (under Lee Green) ECHO (QI/KPI) – epi of chronic disease Dean Eurich & Lisa Wasniak (Faculty of medicine and dentistry)
Project Management Support	Project management of implementation	Lab project management Pharmacy iHOT Richard Sullivan Change management (PROSCI through HR) Quality and healthcare improvement Zone level – Integrated Quality Management	
Co-Design	Engagement	Patient engagement consultants & patient advisors within AHS Kelly Mrklas	Physician learning program (physician related programs) SPOR PACER (O'Brien institute)
Equity	Equity	Clinical Ethics team	Ken Bond (IHE) Research Community

THANK YOU!

The innovation pipeline is built on principles of quality, safety and the use of the best research evidence to help patients, healthcare providers and the healthcare system work at its very best.

For questions please contact:

Arianna.Waye@ahs.ca or Barbara.Hughes@ahs.ca