PHASE 1 EVALUATION OF THE
ADOPTING RESEARCH TO IMPROVE CARE
(ARTIC) PROGRAM

COUNCIL OF ACADEMIC HOSPITALS OF
ONTARIO

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EXECUTIVE SUMMARY

Background and context

The Council of Academic Hospitals of Ontario (CAHO) launched the ARTIC program (Adopting Research to Improve Care) in 2010 to assist in the adoption of research into practice more quickly, more effectively, and on a broader scale.

In the absence of ARTIC, the diffusion of an innovation across the hospital sector might take up to 17 or more years (Brownson, Kreuter & Arrington, 2006). Through ARTIC, CAHO intends to spread carefully-selected innovations across Ontario's research hospitals in only two to three years.

The ARTIC Program is in its third round of funding, and has supported six projects. The majority of the projects have focused on practice changes, with the exception of one that focused on technology adoption. The program provides funding, expertise and support to selected projects/innovations to address implementation barriers, strengthen enablers (i.e., factors that support the uptake of innovation) and facilitate a faster and more focused implementation process.

In 2013, CAHO engaged Cathexis Consulting Inc. to carry out Phase I of an evaluation of the ARTIC Program. ARTIC Program leadership will draw on learning from the evaluation to help shape the future of the program and ensure that it is providing the right mix of supports to effectively facilitate the rapid movement of evidence to practice.

Phase II of the evaluation (planned for 2014) will focus on assessing the impact, sustainability and system value of the ARTIC Program.

Evaluation design

The evaluation was structured to maximize CAHO's learning about how best to support the implementation of evidence-based innovations across hospitals. The evaluation included two broad components: 1) collection and analysis of **program-level data**, and 2) collection of **project-level data** (from the six funded projects) that was rolled up into a summary for each project. An analysis of themes emerging across the six projects was combined with the program-level data to identify emergent themes and implications for the structure and supports of the ARTIC program.

Project-level data collection methods included:

- **Interviews with project central team members and 6 site leads/champions** from each ARTIC project to gain understanding about how the projects were being implemented,

the challenges encountered, how the ARTIC program components were supporting the projects' success, ways those components could be improved, and the perceived impacts of the projects.

- **Survey of site-level champions/leads** for each project to determine how widespread certain issues were, to determine the extent of the projects' impact, and to assess patterns across hospitals and projects. Across projects, the response rate for the survey was 59%.

- **Review of project documents** to gain in-depth understanding of the purpose, design, and implementation process of each of the funded ARTIC projects.

Program-level data collection methods included:

- **Interviews with 15 system/program stakeholders** (ARTIC staff, Task Force members, P&E Committee members, and Council members) to gain insight about their experiences with the ARTIC program overall.

- **Review of ARTIC program documents** to gain in-depth understanding of the ARTIC program, its design and intent as well as it processes and operation

Summary of key evaluation findings and their implications

Reflecting on the totality of the program, ARTIC appears to be an exceptionally well designed program. It raises awareness and uptake of sound evidence-based innovations, and creates ideal conditions for their successful implementation in CAHO hospitals.

The following provides a more detailed breakdown of key evaluation findings.

Project Selection

Identification of system priorities

In its first two rounds of funding, ARTIC was open to evidence-based innovations addressing any topic area. In its third round of funding (2012), ARTIC (in consultation with the MOHLTC, HQO and hospitals) selected a theme based on current system priorities. The 2012 call for applications focused on projects that address the challenge of *Transitions in Care*, either within hospitals or across service providers.

Key findings:

- Identifying a theme that is aligned with provincial priorities helps engage MOHLTC, makes it more likely that hospitals will be interested, and makes it more feasible for the hospitals to implement the projects.

- The process for identifying system priorities is simple and effective.

Implications for ARTIC:
- Continue to identify and focus the program on a system priority each year.
- Continue to use a simple and pragmatic process, but keep an eye out for any concerns that emerge.

Selection criteria

ARTIC applications (both LOIs and full submissions) are assessed based on four key criteria: 1) Potential Impact, 2) Robust Research Evidence, 3) Implementation Plan/Feasibility, and 4) Evaluation Plan. Submissions receive a rating for each criterion on a scale of zero to five.

Key findings:
- Most of the current selection criteria are perceived to be important, though some are seen as more important than others.
- Some of the criteria have multiple interpretations.
- Stakeholders involved in the selection process feel criteria have been applied effectively.

Implications for ARTIC:
- Keep all four selection criteria, but consider weighting them based on importance.
- Clarify operational definitions of criteria and train panel members on their application.
- Monitor for future issues or patterns indicative of inconsistent or ineffective application of selection criteria.

Peer review process

Selection of ARTIC Projects is carried out using a peer review process (following the CIHR merit review process). The review process is carried out by the *ARTIC Program Selection Panel*: a skills-based multidisciplinary task force including clinical practice and research leaders, knowledge translation experts and representatives from Health Quality Ontario and the Ministry of Health and Long Term Care. Only a small fraction of submissions are accepted as ARTIC projects.

Key findings:
- A good peer review process must balance equity, effectiveness and efficiency. The ARTIC process is perceived to be equitable and effective, but a bit complicated.
- The broad cross-section of expertise on the selection panel allows for submissions to be considered from a variety of perspectives.

Implications for ARTIC:

- Identify opportunities to simplify the project selection process so that it is less onerous for reviewers and ensures the impact of stronger voices is moderated.
- Update the documentation of the process as changes are made.

Readiness Assessment process

Once full submissions have been reviewed and a small number of finalists selected, the members of the P&E committee complete a Readiness Assessment for each finalist project, with reference to their own hospital. Completed Readiness Assessments are submitted to CAHO. The purpose of the Readiness Assessment is twofold: 1) to allow hospitals to determine the relevance of the project to their own setting and whether they have (or can mobilize) the required resources to implement a particular project, and 2) to contribute to the final project selection process, ensuring there is a sufficient number of hospitals able and willing to participate.

Originally framed as a barriers assessment, there were significant changes made to the structure of the Readiness Assessment in 2012. The Readiness Assessment is now structured as a checklist of critical resources and success factors that need to be available within the participating hospital prior to implementing the project.

Key findings:

- The Readiness Assessment is brief and focused, and helps to clarify what the hospitals would need to commit to (when used as intended).

- Issues related to content and P&E committee members' commitment to process contributed to some of the challenges experienced by 2012 projects.

Implications for ARTIC:

- Some additional content may strengthen the Readiness Assessment (e.g., ongoing human resource needs, need to change existing materials/processes, potential union issues, etc.), as would the full involvement of all P&E committee members.

Project Implementation

Key implementation factors

ARTIC was intentionally designed to support, enhance and accelerate the implementation of new innovations by helping to address barriers and strengthen enablers (i.e., factors that support the uptake of innovation). CAHO's understanding of key implementation factors has been informed by both the knowledge translation/implementation literature and past experience with the ARTIC program. By looking across implementation-related successes and challenges identified by the hospitals, it was possible to identify key project characteristics and factors that appeared to be enabling of smoother implementation.

Key findings:

- ARTIC systems and structures effectively attend to many of the key implementation factors established in the literature (e.g., strong evidence base, resources, compatibility with hospital/system priorities, leadership support and effective champions).

- Some key project characteristics that may not have been intentional to ARTIC's design were observed to contribute substantially to implementation success, including:
    o Individualized supports from the central project team (e.g., coaching)
    o Designated responsibility for implementation (internal facilitation)
    o Clearly articulated implementation roadmap
    o Pragmatic performance monitoring and reporting

Implications for ARTIC:
- Ensure the identified characteristics above are intentionally built into ARTICs design and supports (e.g., refine selection criteria, provide additional direction to applicants and/or project teams)

Composition of central project teams

The roles of the central project teams are multi-faceted, requiring a mix of characteristics and competencies to provide effective support for hospital implementation. Site leads at the hospitals and central team members themselves were able to identify several central project team characteristics that were particularly important in supporting implementation.

Key findings:

- The key characteristics of central project teams that contribute to successful implementation include:
    o Expertise and credibility
    o An appropriate mix of professions/disciplines (representative of implementers)
    o Communication skills
    o Approachability
    o Flexibility

Implications for ARTIC:
- Continue funding projects where the project lead and/or other members of the central project team have a reputation for being experts in their field, and have been involved in the development and implementation of their innovation.
- Encourage project leads to assemble teams with the requisite skills and other characteristics.

Communities of practice

ARTIC encourages the central project teams to share best practices and facilitate collaboration across participating sites. Five of the six funded projects chose to do so by forming communities

of practice among the implementation leads and/or project champions at all of the participating hospitals.

Communities of practice were formed in the early stages of project implementation. All of the communities of practice were supported by regular teleconferences between participating hospitals and the central project team. The frequency of the teleconferences varied across projects (e.g., bi-weekly, monthly, quarterly, or as required). Many also included digital forums for sharing ideas and resources.

Key findings:

- Participants appreciate the opportunity to learn from and problem solve with their colleagues, particularly through teleconferences and face-to-face meetings.

- Once project implementation is well on its way, participants do not require as much contact with their peers from other hospitals. However, occasional teleconferences may still be valuable, even after ARTIC funding ends.

- A successful community of practice requires that issues/topics discussed are relevant to the majority of participants and that meetings are well prepared in advance.

Implications for ARTIC:
- Devise guidelines for the communities of practice, drawing on the lessons learned (e.g., decrease the frequency of teleconferences as implementation progresses).
- Project websites may offer opportunities to sustain the communities of practice after projects are completed.

ARTIC Supports

Supports from the ARTIC program

CAHO plays an active role in supporting the funded ARTIC projects. In addition to providing funding, the ARTIC program - mainly through the program manager - provides advice to the central project teams, assistance with project management, and assistance in moving past barriers within individual hospitals.

Key findings:

- All of the supports provided by the ARTIC program are helpful. No additional supports are needed. Assistance in clearing barriers with participating hospitals is particularly important.

- Providing funding for resources that are integral to ongoing implementation of the innovation could undermine sustainability after the funding ends.

Implications for ARTIC:

- Continue to provide the current mix of supports.
- Continue to staff the ARTIC program with people who are diplomatic and familiar with decision-making in Ontario's research hospitals.
- When ARTIC staff provide hands-on support, be sure to clarify roles and areas of authority, and ensure that any decisions are communicated to all relevant stakeholders.
- Only provide ARTIC funding for *temporary* implementation resources.

Executive sponsorship

In addition to providing higher level strategic guidance to the ARTIC program, each P&E committee member acts as the Executive Sponsor to ARTIC Projects at their respective hospital. This includes responsibility for completing the Readiness Assessments and providing support (as needed) to the implementation of projects that their hospital is participating in.

Key findings:

- Executive sponsorship from P&E committee members is important to raising the profile of projects and providing a high level of escalation to resolve implementation issues.

- However, P&E members may not always have the capacity to fully support assessment and/or implementation (due to levels of engagement, time and/or role constraints).

Implications for ARTIC:

- It may be beneficial to encourage more structured and early delegation of the executive sponsorship role to another, more appropriate, member of the hospital's senior leadership team.

Program Governance

ARTIC is governed by three distinct bodies: The CAHO Council, the CAHO Practice and Education committee (P&E committee), and the ARTIC Oversight Task Force (Task Force), which reports to the Practice and Education committee.

- **CAHO's Council** comprises the CEOs of all CAHO member hospitals. This group provides strategic oversight to the ARTIC program and approves all funding decisions, as well as decisions about the program's strategic direction.

- The **P&E committee** is made up of clinical practice leaders from each CAHO hospital. This group directs the Task Force and provides strategic guidance for ARTIC. Its members provide "sober second thought" on the Task Force recommendations before sending them to Council. In addition, the P&E committee members act as Executive Sponsors to ARTIC Projects at their hospitals.

- The **Task Force** was originally convened to determine the most appropriate shape and design for the ARTIC program. Since then, it has become responsible for hands-on program

management and for refining the program over time. This group also reviews proposals and chooses which projects to recommend for funding. The Task Force includes representation from CAHO's P&E committee, CAHO's research committee, the MOHLTC, and HQO, as well as experts in knowledge translation.

Key findings:

- ARTIC has three levels of governance. The structure is a bit complex, but there are clear benefits to engaging each of the three groups.

- The roles and responsibilities of each level of governance are not fully documented.

Implications for ARTIC:
- Evolve the Task Force into a more permanent structure.
- Document the roles, responsibilities and decision-making authority of each governing body, as well as CAHO staff.

Evidence of Impact

Monitoring and Evaluation

All six funded projects monitored their project's implementation and impact at participating hospitals on an informal and formal basis. Informal monitoring generally occurred through ongoing communication with the central project team and/or through the activities supporting the communities of practices, such as the teleconferences, face-to-face meetings and online discussion forums. This provided the central project team with a general sense of how one or more hospital was doing and what issues needed to be addressed.

Formalized approaches to monitoring and evaluation, as required by the CAHO ARTIC Program and outlined in project proposals, provided a more focused understanding of implementation and impact at each participating hospitals. Approaches tended to vary from project to project based on the availability and type of information required.

Key findings:

- Monitoring and evaluation can support project implementation, if hospitals have ongoing access to reports of their progress.

- Some hospitals in each project needed significant support in overcoming challenges related to the project monitoring/evaluation.

- Performance indicators differed across projects, however, it may be possible to develop some higher-level common indicators of ARTIC impact.

Implications for ARTIC:
- Introduce a small number of common indicators for all future ARTIC projects to enhance consistency and measure broader collective program impact.
- Ensure that the monitoring and evaluation requirements of the funded projects are 1) feasible for participating hospitals and 2) include a timely feedback mechanism. This will minimize burden and maximize value of evaluation activities.

Sharing lessons learned

Since ARTIC's launch in 2010, CAHO has gained many insights about how to support knowledge translation in Ontario's research hospitals. Much of this learning has resulted from the day-to-day experiences of the ARTIC staff and the Task Force. In addition, there have been two formal evaluations (an interim evaluation in 2011/12, as well as the evaluation described in this report).

ARTIC shares lessons learned across the projects by 1) presenting to the CAHO Council and the various CAHO committees, 2) making ongoing changes to the ARTIC program based on the lessons learned, and 3) providing direct advice to the central project teams.

Key findings:

- CAHO's commitment to continuous quality improvement has strengthened the ARTIC program year over year.

- ARTIC staff members' advice to the central project teams contributes to successful project implementation.

- Updates to the CAHO Council and committees provide only a high-level understanding of the issues and the lessons learned.

- CAHO has not formally shared lessons learned beyond the CAHO community.

Implications for ARTIC:
- Continue to engage in critical reflection and active program improvement.
- Compile lessons learned in a single, user-friendly document.
- Share lessons learned more broadly through publications and presentations at provincial and national forums.

Perceived impact of ARTIC

Site level champions/leads were asked, through an online survey, to indicate the impact of ARTIC on their adoption of the innovations. The results varied by project, but overall ARTIC was perceived to have a positive impact on uptake of the innovation.

Key findings:

- ARTIC was perceived to have:

a) A positive impact on the uptake of the funded innovations.
b) Benefits for the hospitals (due to adoption of the innovations).
c) Benefits for CAHO and the broader Ontario healthcare system.

Implications for ARTIC:
- Continue the ARTIC program.
- Confirm the perceived benefits through a more rigorous outcome evaluation.

Opportunities for spread outside CAHO hospitals

ARTIC is currently designed to support implementation of the funded innovations in CAHO hospitals. However, there is interest in spreading the innovations to other hospitals.

Key findings:

- There is strong support for the spread the ARTIC projects beyond CAHO hospitals.

- Additional resources and/or coordination will likely be needed to facilitate deliberate spread to other hospitals.

Implications for ARTIC:
- Identify potential partners/sponsors to support a "Phase 2" ARTIC initiative that would spread suitable ARTIC-funded innovations to non-CAHO hospitals.
- If a Phase 2 ARTIC initiative is not feasible, support spread by:
  a) Communicating the benefits of the ARTIC innovations in a compelling way.
  b) Encouraging project teams to prepare and disseminate refined implementation materials that will make it easy to adopt the innovations.
  c) Encouraging project teams to secure resources that would allow them to continue to provide implementation support/coaching to hospitals.

Considerations for ARTIC going forward

Looking forward, CAHO may want to consider the following suggestions identified based on the evaluation findings:

1. It is worthwhile to continue ARTIC as a flexible, multifaceted initiative as a means to accelerate the use of evidence-based practice within CAHO hospitals.

2. ARTIC should not be scaled up beyond two to three funded projects per funding cycle. This will allow the program to continue to be extremely selective, maintaining quality, minimizing burden, and containing program costs.

3. Regardless of whether ARTIC is officially housed within CAHO, it would be advisable to continue to engage CAHO in a meaningful way. There is tremendous value in the credibility these very senior-level hospital personnel bring to the program.

4. ARTIC should continue to be refined on an ongoing basis through critical reflection and incremental improvement, so that it is able to respond to dynamic changes in the system. The detailed suggestions and implications identified throughout the full version of the evaluation report should be considered as part of this process.

5. ARTIC has amassed a wealth of knowledge about knowledge translation, going beyond what exists in the published literature. This information would no doubt be extremely valuable to the broader health community. It would be advisable for CAHO to share its accumulated expertise about knowledge translation through publications and/or presentations at provincial and national forums.

6. The spread of ARTIC projects beyond CAHO hospitals has been limited due to the extensive resources that seem to be required for effective implementation (particularly individualized coaching from a central project team with innovation-specific expertise). It could be valuable for CAHO and its partners to consider an additional ARTIC program component to develop and pilot more feasible mechanisms to facilitate spread of past funded innovations beyond the CAHO hospitals. This could provide an opportunity to generate new, innovative models of moving evidence into practice on a wider scale. An initial step may be to convene a think tank made up of KT experts, ARTIC funding recipients, representatives of hospitals who have implemented the innovation, and representatives from community hospitals.

1   INTRODUCTION

The Council of Academic Hospitals of Ontario (CAHO) is the non-profit association of Ontario's 24 research hospitals and their research institutes. CAHO provides a focal point for strategic initiatives on behalf of its members.

CAHO hospitals are fertile grounds for developing research-based innovations in patient care, with their emphasis on research and their academic affiliations. They are also in a good position to pilot those innovations to determine how effective and feasible they are. In an ideal world, this would result in best practices being identified, shared and used broadly across the hospital system. Unfortunately, this is challenging in practice for a variety of reasons, ranging from the mundane to the systemic.

CAHO launched the *Adopting Research to Improve Care* (ARTIC) Program in 2010 "to move research evidence into practice from one hospital across the CAHO community in order to drive quality improvement and benefit the health care system as a whole."[1] In 2011, recognizing the power of this platform to test systematic implementation of new evidence and the ARTIC Program's alignment with the goals of the *Excellent Care for All* Strategy, the Ministry of Health and Long Term Care (MOHLTC) also invested in the CAHO ARTIC Program.

The ARTIC Program is in its third round of funding, and has supported six projects. The majority of the projects have focused on practice changes, with the exception of one that focused on technology adoption.

In 2013, CAHO engaged Cathexis Consulting Inc. to carry out Phase I of an evaluation of the ARTIC Program. ARTIC Program leadership will draw on learning from the evaluation to help shape the future of the program and ensure that it is providing the right mix of supports to effectively facilitate the rapid movement of evidence to practice. The guiding questions for the evaluation are listed on the following page.

Phase II of the evaluation (planned for 2014) will focus on assessing the sustainability and system value of the ARTIC Program.

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[1] ARTIC website. Retrieved September 2013 from: http://caho-hospitals.com/partnerships/adopting-research-to-improve-care-artic/.

Guiding Questions for the Evaluation

Project selection

1. Is the ARTIC project selection process objective and robust? How could it be improved?

2. Is the ARTIC project selection process effective in selecting the most appropriate projects for spread and scale-up? How could it be improved?

3. Is the approach to identifying system priorities effective? How can it be improved?

4. What characteristics of the Project leads and team members contribute to the successful implementation of ARTIC projects? What characteristics detract?

Supports for project implementation

5. What Centralized Implementation Office supports are helpful / not helpful in supporting the adoption of the projects? How could the mix of supports be improved?

6. Is the Practice and Education committee representative the most appropriate person within the individual hospitals to provide executive support to these projects? How is this working at the program level, project level, and hospital level? How could this be improved?

7. What is the added value of communities of practice in supporting implementation within the participating hospitals? What characteristics make a community of practice effective?

8. How are projects implemented at the hospital level? What supports/interferes with full implementation?

Program governance

9. Is the governance structure of the program appropriate?

Evidence of Impact

10. How are implementation and impact being monitored at the hospital and project levels?

11. Is CAHO efficiently and effectively sharing lessons learned across projects?

12. What impact is ARTIC perceived to have had to date?

13. What are the early lessons regarding the adoption of new evidence into practice?

2 ABOUT ARTIC

2.1 BACKGROUND

The Council of Academic Hospitals of Ontario (CAHO) launched the ARTIC program (Adopting Research to Improve Care) in 2010 to assist in the adoption of research into practice more quickly, more effectively, and on a broader scale.

The need for focused and intentional support to move research evidence into practice stems from system wide barriers in the uptake of innovation. For example:

- Health care providers need to juggle competing priorities with limited time and resources, and may not be able to devote attention to implementing several innovations at once.

- Many organizations have silos that interfere with good communication; they may not hear of innovations that are developed by their immediate neighbours, never mind a distant hospital.

In the absence of ARTIC, the diffusion of an innovation across the hospital sector might take up to 17 or more years (Brownson, Kreuter & Arrington, 2006). Through ARTIC, CAHO intends to spread carefully-selected innovations across Ontario's research hospitals in only two to three years.

As an association of 24 research hospitals, CAHO is well positioned to address this problem by providing a focal point for strategic initiatives. The ARTIC program also aligns with CAHO's mission to harness collective research and innovation strengths to advance world-leading patient care and a sustainable health care system.

2.2 DESIGN

Spread and adoption of evidence-based practice can take substantial time. *Figure 1* shows the general steps that need to happen for an evidence-based innovation to spread to, and be adopted by, other hospitals in the system (in the absence of ARTIC).

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Figure 1: Steps in the uptake of innovation
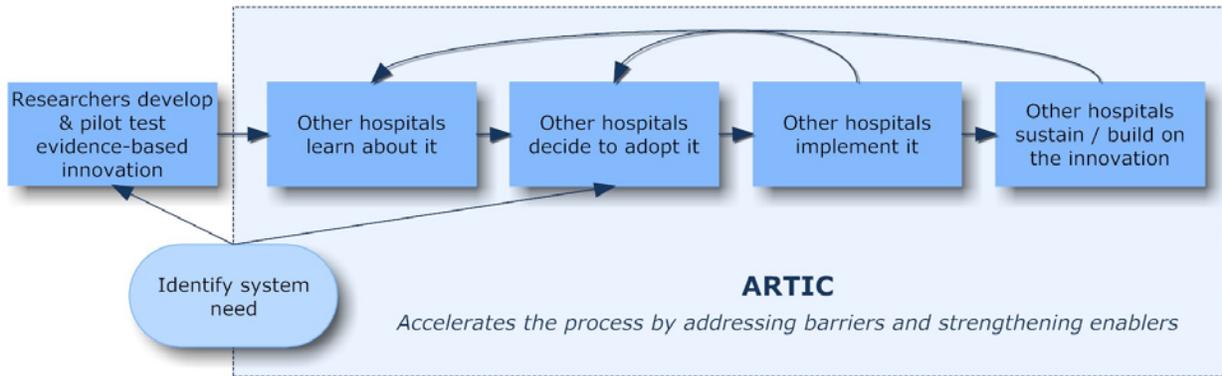
Drawing on a synthesis of planned action theories set out in Graham's Knowledge-to-Action (KTA) cycle (Graham, 2006), ARTIC has been designed to accelerate the uptake and spread of innovation across Ontario's health care system. The program provides funding, expertise and support to selected projects/innovations to address implementation barriers, strengthen enablers (i.e., factors that support the uptake of innovation) and facilitate a faster and more focused implementation process.

Figure 2 shows a visual representation of ARTIC's activities. Each step in the path requires coordinated and collaborative engagement at the CAHO, project team and hospital level.

Figure 2: ARTIC activities to support rapid movement of innovation to practice

Identify Theme	Select Projects	Support Implementation	Sustain Innovation

ARTIC/CAHO			
• Monitor current health care issues/priorities • Review health care publications • Identify system needs	• Call for proposals • Review/select projects • Coordinate readiness assessments	• Provide funding to projects • Provide tools, resources and coaching • Assist with issue resolution	

	Central Project Team		
	• Submit proposals • Adapt innovation to local context	• Provide tools, resources, supports and coaching • Continue to adapt innovation to local context • Create/coordinate communities of practice	• Document implementation at CAHO hospitals • Evaluate and document impact

	Hospitals		
	• Complete readiness assessments • Sign on for project(s)	• Identify and leverage champions • Generate buy-in and provide resources • Participate in communities of practice • Executive leadership support • Revise relevant policies, procedures and systems	• Continue practice/innovation • Spread to other units • Champion innovation across hospital system

2.3 FUNDING

In 2010 the CAHO community funded the implementation of ARTIC Projects directly. The Ministry of Health and Long-term Care has provided $7.5 million over four years for the ARTIC Program. For each project, participating hospitals share the cost of implementation by providing significant in-kind contributions (i.e. providing dedicated staff to support the projects' implementation).

2.4 OVERSIGHT AND GOVERNANCE

ARTIC is governed by three distinct bodies: The CAHO Council, the CAHO Practice and Education committee (P&E committee), and the ARTIC Oversight Task Force (Task Force), which reports to the Practice and Education committee.

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- CAHO's Council provides strategic oversight to the ARTIC program and approves all funding decisions as well as decisions about the program's strategic direction.

- The P&E committee provides strategic guidance and oversees program implementation. In addition, its members act as the Executive Sponsor to ARTIC Projects at their hospital.

- The Task Force was convened to take responsibility for more hands-on program management. The Task Force has representation from CAHO's P&E committee, CAHO's Research committee, the MOHLTC, and HQO, as well as experts in knowledge translation.

An ARTIC program manager (employed by CAHO) is responsible for the day-to-day operation and coordination of the program.

2.5 PROJECTS

To date, the ARTIC program has funded six projects, the majority of which have been focused on practice changes, with the exception of one that was focused on technology adoption. *Table 1* provides a brief description of each.

Table 1: ARTIC projects

Project	Description	Funding year	# participating sites
HandyAudit™ ARTIC Project	Innovative auditing tool that captures and tracks hand hygiene compliance data in a more effective and efficient way.	2010	16
Canadian C-Spine Rule ARTIC Project (CCR)	The Canadian C-Spine Rule is an innovative clinical decision rule that allows clinicians to "clear" potential cervical spine (c-spine) injuries without radiography. CCR extends the use of the C-Spine Rule to ED nurses via training, certification and medical directives.	2010	9
CAHO Antimicrobial Stewardship Program in ICU Project (ASP in ICU)	Interprofessional collaboration (via Stewardship Rounds) to optimize the use of antimicrobials in intensive care units.	2011	12
Mobilization of the Vulnerable Elderly in Ontario ARTIC Project (MOVE ON)	An interprofessional approach that focuses on early and consistent mobilization of older patients through their hospital stay.	2011	14

| Project	Description	Funding year	# participating sites
Transitional Discharge Model ARTIC Project (TDM)	Discharge model that supports more successful transition from hospital to the community for people diagnosed with a mental illness being discharged from psychiatric beds (acute and tertiary). The model formalizes and expands the discharge planning process, and ensures that it begins earlier and includes continuity of relationships (therapeutic and peer) bridging out into the community.	2012	9[2]
Enhanced Recovery After Surgery Guideline ARTIC Project (ERAS)	Implementation of an ERAS guideline to improve patient outcomes following colorectal surgery. The ERAS guideline includes a variety of interventions carried out by healthcare workers before, during and after surgery.	2012	15[3]

[2] Including 1 non-CAHO hospital
[3] Including 2 non-CAHO hospitals

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3 EVALUATION DESIGN AND METHODS

The evaluation was structured to maximize CAHO's learning about how best to support the implementation of evidence-based innovations across hospitals. As identified in *Figure 3*, the evaluation included two broad components: 1) collection and analysis of **program-level data**, and 2) collection of **project-level data** (from all six funded projects) that was rolled up into a summary for each project. An analysis of themes emerging across the six projects was combined with the program-level data to identify emergent themes and implications for the structure and supports of the ARTIC program.

Figure 3: Overview of evaluation methods
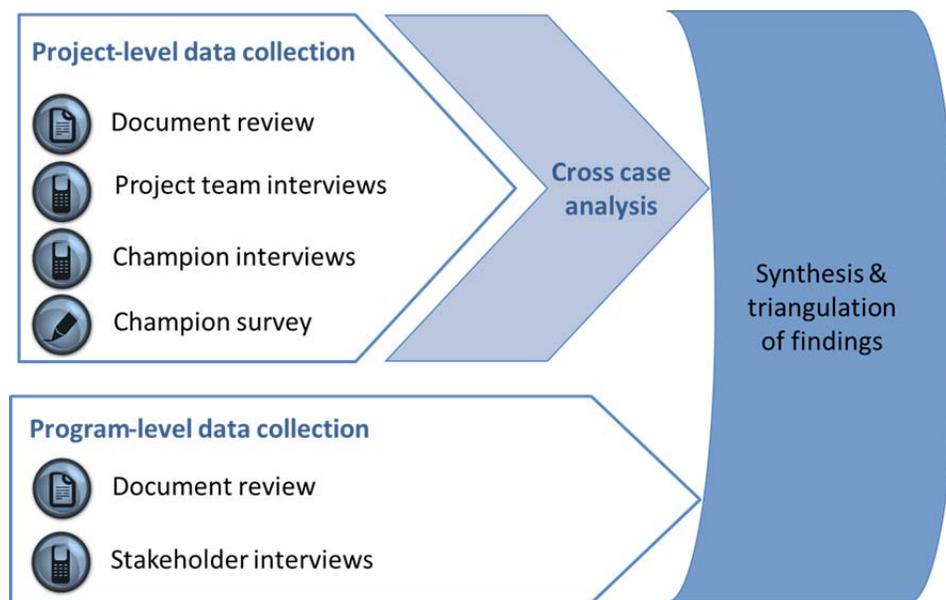
The following subsections provide additional detail about each of the data collection methods, as well as analysis and synthesis approaches.

Program-level data collection methods

Interviews with system stakeholders

Fifteen system-level stakeholders were interviewed in July and August, 2013 about their experiences with the ARTIC program overall (as opposed to specific funded projects). Interviews were conducted by phone or in person, and focused on program governance, the process for selecting projects, the perceived impact of the program, and ways to strengthen the program.

The 15 system stakeholder interviewees included:

- Three ARTIC staff/leaders;
- Five ARTIC Task Force members;
- Five P&E committee members; and
- Two Council members.

Separate semi-structured interview guides were used for each of the above respondent groups. Guides covered similar topics, but questions were tailored to the unique role and degree of involvement of each group. In order to validate accuracy, interview notes were shared with respective individual respondents, who were given the opportunity to correct or clarify their content.

Review of ARTIC program documents

ARTIC program documents were reviewed to gain in-depth understanding of the ARTIC program, its design and intent as well as it processes and operation. Program documents included:

- Application information packages,
- Selection process documents/materials,
- Updates to CAHO Council and briefing notes to the ARTIC Program Task Force and Practice and Education committee, and
- Past system level evaluation reports.

In addition, relevant published literature that had informed the development and design of ARTIC was also reviewed to support interpretation of findings.

Project-level data collection methods

Interviews with project central team members and hospital champions

Central project team members and site implementation leads/champions involved in each of the six ARTIC projects were interviewed via telephone or in person between May and July, 2013. Interviews focused on how the projects were being implemented, the challenges encountered, and the perceived impacts. Interviews also explored how the ARTIC program components were supporting the projects' success, and ways those components could be improved.

While all available members of central project teams were interviewed, six site leads/ champions were also selected purposefully from each project (with the assistance of central project teams) so that different types of hospitals were represented. Central project teams were asked to identify three hospitals that had experienced relatively smooth implementation and three that had faced more significant challenges.

Table 2 indicates the number of individuals interviewed, by role, for each project.

Table 2: Project-level interview respondents

Project	Central project team members	Site leads /champions
HandyAudit™ ARTIC Project	3	6
Canadian C-Spine Rule ARTIC Project (CCR)	2	6
CAHO Antimicrobial Stewardship Program in ICU Project (ASP in ICU)	2	6
Mobilization of the Vulnerable Elderly in Ontario ARTIC Project (MOVE ON)	5	6
Transitional Discharge Model ARTIC Project (TDM)	2	6
Enhanced Recovery After Surgery Guideline ARTIC Project (iERAS)	2	6
TOTAL	**16**	**36**

* Total number of hospitals participating in the project included to provide context for interview numbers.

Separate interview guides were used for each respondent group. Guides covered similar topics, but questions were tailored to the unique role and involvement of each group. They were also tailored to the language and stage of implementation of each project. In order to validate accuracy, interview notes were shared with respective individual respondents, who were given the opportunity to correct and/or clarify their content.

Champion Survey

All site-level champions/leads for each project (including those who had been interviewed) were invited to participate in a brief online survey between June and July, 2013. The survey sought information about the implementation and impact of the projects in their respective hospitals. While most survey questions were closed-ended, respondents were given the opportunity to describe any barriers to implementation or to suggest improvements in an open-ended format (that was optional).

A separate survey was used for each project. While the survey questions remained substantively similar, key terms were tailored to the language and stage of implementation of each project. The primary intent of the survey was to provide an opportunity to determine how widespread certain issues were, to determine the extent of the projects' impact, and to assess patterns across hospitals and projects.

The number of surveys completed by site champions/leads from each project was as follows:

- **HandyAudit** – Seven (response rate = 44%)
- **CCR** – Seven (response rate = 78%)

- **ASP in ICU** – 10 (response rate = 83%)
- **MOVE ON** – Six (response rate = 43%)
- **TDM** – Six (response rate = 67%)
- **iERAS** – Eight (response rate = 53%)

Review of project documents

Key project documents and materials were reviewed in order to gain in-depth understanding of the purpose, design, and implementation process of each of the funded ARTIC projects. Project-level documents included, but were not limited to:

- Project proposals,
- Project agreements,
- Participant information packages,
- Launch and/or training materials,
- Toolkits, resources and/or other project/implementation materials,
- Project monitoring reports, and
- Evaluation plans and reports.

The review of project documents contributed directly to the case summary descriptions prepared for each project.

Cross-Case Analysis, Synthesis and Interpretation

The approach to the evaluation was quite iterative. It included several opportunities, along the way, for the evaluation team, ARTIC staff, and Task Force members to interact with and interpret the emerging findings. These early explorations made it possible to refine the data collection tools and to undertake a more nuanced analysis.

A case study approach was taken, with each of the funded projects representing a single case. For each ARTIC project, a project summary was created based on interviews with project stakeholders, feedback from the champion survey and a review of project documents. This enabled more systematic and accurate interpretation of findings, taking into account contextual factors that might affect responses.

Qualitative data (e.g., interviews) was analyzed using an iterative descriptive approach in order to identify emergent themes, as well as unique but important ideas. NVivo (qualitative analysis software) was used to code key characteristics, themes and concepts such as hospital, role of interviewee, project and implementation successes and/or barriers. For quantitative data (e.g., survey), descriptive statistics (e.g., frequencies and/or averages) were calculated using MS excel. Analyses were initially carried out separately for each project, with the key findings included in the project case study summaries.

A cross-case analysis was then undertaken to explore the similarities and differences in experiences and themes across and between the projects. Project case study summary reports contained similar content and were organized in similar ways. The cross-case analysis process included the development of thematic matrices to explore relationships between themes and/or characteristics. The initial themes informed preliminary hypotheses about what worked, for whom, under what conditions, which were then tested against the project summaries.

The findings from the cross-case analysis were synthesized with ARTIC program level findings to gain a fulsome picture of the program and produce information that can be used to strengthen ARTIC.

4 KEY FINDINGS

This section describes the key findings along with their supporting evidence, and their implications for ARTIC. The findings are organized into four main sections:

- Project selection
- Supports for project implementation
- Governance
- Evidence of impact

4.1 PROJECT SELECTION

CAHO has selected and funded six ARTIC projects over three rounds of funding (two per year). Minor alterations to the selection process have been made year-over-year to improve the process. At this point, the ARTIC project selection process includes the high-level elements/steps shown in *Figure 4.*

Figure 4: Steps in the ARTIC project selection process

This section of the report explores the functioning/operation and effectiveness of the identification of system priorities, the selection criteria for screening and reviewing submissions, the peer review process and the Readiness Assessment. By all accounts, the selection process is functioning well, though there are some areas that could benefit from minor adjustments.

Identification of system priorities

Key findings:
- Identifying a theme that is aligned with provincial priorities helps engage MOHLTC, makes it more likely that hospitals will be interested, and makes it more feasible for the hospitals to implement the projects.
- The process for identifying system priorities is simple and effective.

Implications for ARTIC:
- Continue to identify and focus the program on a system priority each year.
- Continue to use a simple and pragmatic process, but keep an eye out for any concerns that emerge.

In its first two rounds of funding, ARTIC was open to evidence-based innovations addressing any topic area. In its third round of funding (2012), ARTIC introduced a theme based on current system priorities. The 2012 call for applications focused on projects that address the challenge of *Transitions in Care*, either within hospitals or across service providers.

Process for identifying the theme

The process for identifying the *Transitions in Care* theme was simple, straightforward and pragmatic. To begin with, ARTIC staff identified current priorities within the system. Government priorities were identified by consulting with Health Quality Ontario and the MOHLTC and reviewing ministry documents (e.g., the minister's action plan for health). Clinical practice priorities were identified by consulting with the clinical leaders on the P&E committee (e.g., explored the challenges that clinicians in their organizations were grappling with).

The P&E committee discussed the priorities emerging from the process, ultimately identifying three key themes: transitions in care, chronic disease prevention and management, and avoidable hospitalizations and readmissions. The committee recommended *Transitions in Care* as the 2012 theme because it was narrow enough to truly address a specific priority area, but sufficiently broad to attract submissions and to be applicable to all CAHO hospitals. This latter point was identified as particularly important by stakeholders, who emphasized that any theme selected must be, at least potentially, applicable to all CAHO hospitals and their respective sectors. These stakeholders indicated that *Transitions in Care* met this requirement well, and hoped that future themes would be equally relevant.

Satisfaction with the theme

All of the ARTIC program stakeholders that we interviewed were satisfied with the 2012 theme, and supported the use of a theme that aligned with provincial priorities.

<u>Benefits of aligning with system priorities</u>

A number of ARTIC stakeholders indicated that ensuring alignment of projects with current healthcare priorities enhances MOHLTC engagement in ARTIC, increases hospitals' interest in funded projects and would make it easier for hospitals to commit resources required for implementation.

> **There is something very positive about [identifying a system priority]. It fosters a good relationship with the ministry, and engenders interest.**
>
> - CAHO Council member

> **That is where the most bang for the buck is, is to link themes to what is going on in hospitals anyways.**
>
> - CAHO P&E member

ARTIC received fewer letters of intent in 2012 than in previous years (25 in 2012, compared with 55 in 2011), which eased the burden of peer review. The use of a theme may have contributed to the decrease in submissions[4]. According to ARTIC stakeholders involved in project selection, the use of a theme in 2012 also made it easier to comparatively assess and select projects, because the projects themselves were more similar.

Selection criteria

Key findings:
- Most of the current selection criteria are perceived to be important, though some are seen as more important than others.
- Some of the criteria have multiple interpretations.
- Stakeholders involved in the selection process feel criteria have been applied effectively.

Implications for ARTIC:
- Keep all four selection criteria, but consider weighting them based on importance.
- Clarify operational definitions of criteria and train panel members on their application.
- Monitor for future issues or patterns indicative of inconsistent or ineffective application of selection criteria.

ARTIC applications (both LOIs and full submissions) are assessed based on four key criteria: 1) Potential Impact, 2) Robust Research Evidence, 3) Implementation Plan/Feasibility, and 4) Evaluation Plan. Submissions receive a rating for each criterion on a scale of zero to five.

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[4] Another contributing factor may have been that, by 2012, hospitals may have had a better understanding of the ARTIC requirements.

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Criteria interpretation and weighting

Generally, all stakeholders who were familiar with the current selection criteria felt they were appropriate and useful, providing structure, guidance and consistency to the selection process. While there were no criteria that interviewees thought should be removed, some did question whether they were all equally important. It was suggested that having an *Evaluation Plan*, for example, may be less important than the other criteria and should therefore be weighted less heavily. Although interviewees seemed to appreciate the importance of evaluation, they felt that ARTIC staff could work with the projects to refine their evaluation plan if necessary. Weighting the criteria according to their relative importance (rather than equally) may result in more accurate overall project ranking.

Stakeholders also raised some concerns about inconsistencies in the interpretation and application of the criteria. *Table 3* provides a summary of the key interpretation questions related to each criterion. Although some ambiguity may contribute to richer selection panel discussion, ARTIC may want to define the meaning of some criteria more clearly in order to support greater consistency and efficiency. It may also be useful to provide (refresher) training to selection panel members about the meaning and application of criteria annually.

Table 3: Selection criteria interpretation questions

Criterion	Questions about interpretation	Perceived importance
Robust research evidence	How robust does it need to be? Evidence based or evidence informed? Is evidence needed of implementation in similar settings & populations?	Essential
Potential impact	Impact in terms of number of people or health care dollars?	Essential
Implementation plan/feasibility	Should sustainability of the innovation (beyond ARTIC) be considered?	Essential
Evaluation plan	How rigorous/robust an evaluation plan should it be? Should an evaluation plan that is too complex/complicating (less pragmatic) receive a lower score?	Nice to have

Effective application of criteria

Beyond stakeholder perceptions, it is difficult to determine how effectively the criteria are applied. While Task Force members felt that the process was rigorous, and that the decisions were, in the end, true to the four criteria, there were some red flags identified through the evaluation. These included:

- Some of the projects have had difficulty meeting milestones on time, and two have needed extensions (feasibility).
- In some cases, the timeline issues are due to data collection challenges (evaluation plan).

- One project lead indicated their project was "evidence informed" rather than "evidence based" (robust research).

- There have been some difficult implementation challenges (feasibility). Many of these challenges were in fact identified by the selection panel in the course of reviewing the applications, but there isn't evidence that the panel's feasibility concerns were fully addressed by the central project teams.

None of the red flags listed above is significant enough, on its own, to say the criteria are not being applied effectively, and most of those involved in the process are satisfied that criteria are well applied. It would however be advisable to monitor and remain alert to future issues or patterns indicative of inconsistent or ineffective application of selection criteria, similar to those listed above, so that remedial action can be taken if needed.

Peer review process

Key findings:
- A good peer review process must balance equity, effectiveness and efficiency. The ARTIC process is perceived to be equitable and effective, but a bit complicated.
- The broad cross-section of expertise on the selection panel allows for submissions to be considered from a variety of perspectives.
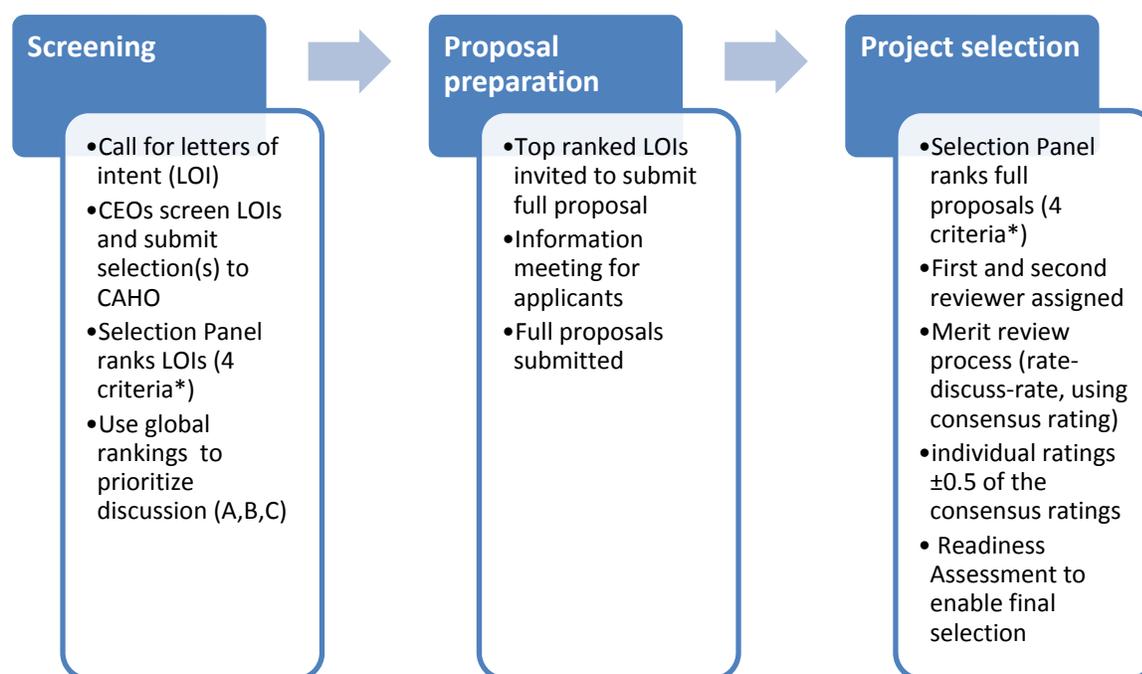
Implications for ARTIC:
- Identify opportunities to simplify the project selection process so that it is less onerous for reviewers and ensures the impact of stronger voices is moderated.
- Update the documentation of the process as changes are made.

The review process

Selection of ARTIC Projects is carried out using a peer review process (following the CIHR merit review process), detailed in *Figure 5*. Researchers have generally agreed that the peer review process may be imperfect, with limited and/or conflicting evidence of its effects, but is better than any currently-available alternative (Demicheli & Di Pietrantonj, 2007).

Figure 5: ARTIC peer review process

Screening	Proposal preparation	Project selection
•Call for letters of intent (LOI) •CEOs screen LOIs and submit selection(s) to CAHO •Selection Panel ranks LOIs (4 criteria*) •Use global rankings to prioritize discussion (A,B,C)	•Top ranked LOIs invited to submit full proposal •Information meeting for applicants •Full proposals submitted	•Selection Panel ranks full proposals (4 criteria*) •First and second reviewer assigned •Merit review process (rate-discuss-rate, using consensus rating) •individual ratings ±0.5 of the consensus ratings • Readiness Assessment to enable final selection

* 4 criteria: Robust Evidence, Potential Impact, Implementation Plan/Feasibility, Evaluation Plan

The review process is carried out by the *ARTIC Program Selection Panel*: a skills-based multidisciplinary task force including clinical practice and research leaders, knowledge translation experts and representatives from Health Quality Ontario and the Ministry of Health and Long Term Care. ARTIC stakeholders noted that the cross-section of expertise on the panel was valuable, as it allowed for rich discussion, and enabled the panel to consider the submissions from a variety of different perspectives.

Alignment with best practices

Current literature about peer review (Demicheli & Di Pietrantonj, 2007) suggests three elements of project selection that need to be conscientiously balanced: *equity*, *effectiveness*, and *efficiency*. The challenge is that the measures put in place to enhance equity and effectiveness often make the process more demanding (i.e., less efficient). Each organization must individually determine what trade-offs it is willing to make in its process so an acceptable balance can be struck. Mechanisms to control and monitor any potentially negative effects of peer review should be built in to the process. The literature recommends periodic audit for quality of peer review (Mayoa et al., 2006).

The ARTIC selection process incorporates several evidence-based practices that enhance equity and effectiveness, sometimes at the expense of efficiency (see *Table 4*). The process does also include some practices that enhance efficiency, which may help to provide some balance.

Table 4: Impact of selection practices on equity, effectiveness and efficiency of the process

ARTIC's selection practices	Equity	Effectiveness	Efficiency
Two levels of screening reduce the number and quality of full submissions: 1) hospital CEOs do an initial selection of their top projects, and 2) the panel **reviews letters of intent** before inviting full submissions.	-	-	↑
Global rankings (A, B, or C) are used to reduce the number of letters of intent that are considered further. Any submission that receives all Cs is not discussed.	-	-	↑
Conflict of interest is dealt with openly. There are guidelines about what constitutes a conflict; those with real conflicts remove themselves from the discussions.	↑	↑	↓
All reviewers read all submissions in less depth to familiarize themselves with the projects.	↑	↑	↓
Primary and secondary reviewers are assigned to each submission. The reviewers provide a brief summary of the submission, and give their ratings of the submission, prior to discussion and subsequent consensus rating. This can help control the impact of biases, but is not deemed to be as effective as all-panel review/rating.	↓↑	↓	↑
There is **discussion** about each submission, so that all panel members can raise questions and influence the final consensus rating. Discussion is always tied back to the selection criteria.	↑	↑	↓
End of meeting review/CQI. At the end of the meeting Panel members reflect on the process. If the Selection Panel believes there has been a significant drift in standards throughout the review, re-review of a few applications is considered	↑	↑	↓

↑ Increase   ↓ Decrease   - No apparent impact

Perceived effectiveness, equity and efficiency

Overall, ARTIC program stakeholders perceive the selection process to be fair, effective and rigorous. They felt that the process had resulted in the selection of "the right projects" for the most part. In particular, they pointed to the phased approach to project selection (with CEOs screening of letters of intent), the information session provided to applicants who were invited to make full submissions, and the broader panel discussion as contributing substantially to the efficacy of the process.

However, certain aspects of the process were noted by a few stakeholders as being overly complex or "harder than they needed to be." In particular, concerns were raised about the value and necessity of the consensus rating part of the process.

There was some concern that "stronger personalities" on the panel were particularly influential, and that some panel members based their judgements on extraneous criteria. Nonetheless, it was noted that all Panel members acted in good faith; they were committed to choosing the best projects for ARTIC, rather than promoting those they had a particular interest in.

> **It was a fair process. We attempted to be as rigorous as we could be.**
>
> - Task Force member

> **There is a lot of rigour to the process. I was impressed.**
>
> - P&E committee member

> **The gestalt that we come to through the discussion is something that everyone in the room agrees with.**
>
> - Task Force member

> **People do try to influence the process by ranking applications according to characteristics that have nothing to do with the criteria.**
>
> - Task Force member

Finally, according to both ARTIC staff and central project teams, the submission and selection process was felt to be a bit rushed (with three to four weeks for preparation of full submissions over the summer), though they also acknowledged that timelines and process have improved each year. Over time, the process, as well as the roles and responsibilities, have been better articulated.

Ideas for improvement

Recognizing that it is nearly impossible to strike the perfect balance, the concerns raised do indicate that there may be a need to reconsider the current balance of equity, effectiveness, and efficiency in the project review process, with an eye to identifying opportunities to simplify the project selection process so that it is less onerous for reviewers and ensures the impact of stronger voices is moderated. Some specific suggestions include:

- Simplify the consensus rating process (e.g., eliminate individual rating exercise).
- Consider using an external *fairness advisor* to help facilitate selection panel discussions.
- Have all panel members review and "bucket" full submissions pre-discussion (similar to global ranking of LOIs) to make discussion more efficient (but this may place greater burden on reviewers' time prior to the meeting).

- Consider options to reduce the number of full submissions (e.g., raise the bar at the LOI stage) to decrease review burden.
- Ensure that documentation of the process is updated as changes are made.

Readiness Assessment process

Key findings:
- The Readiness Assessment is brief and focused, and helps to clarify what the hospitals would need to commit to (when used as intended).
- Issues related to content and P&E committee members' commitment to process contributed to some of the challenges experienced by 2012 projects.

Implications for ARTIC:
- Some additional content may strengthen the Readiness Assessment, as would the full involvement of all P&E committee members.

Purpose and content

Once full submissions have been reviewed and a small number of finalists selected, the members of the P&E committee complete a Readiness Assessment for each finalist project, with reference to their own hospital. Completed Readiness Assessments are submitted to CAHO. The purpose of the Readiness Assessment is twofold: 1) to allow hospitals to determine the relevance of the project to their own setting and whether they have (or can mobilize) the required resources to implement a particular project, and 2) to contribute to the final project selection process, ensuring there is a sufficient number of hospitals able and willing to participate.

Originally framed as a barriers assessment, there were significant changes made to the structure of the Readiness Assessment in 2012. The new structure was well received by the P&E committee, who felt the instructions and expectations were clearer as a result of the changes.

The Readiness Assessment is now structured as a checklist of critical resources and success factors that need to be available within the participating hospital prior to implementing the project. This may include, but is not limited to, health human resources, IT, facility/space and/or data collection requirements. It also outlines key stakeholders within the hospital that should be consulted (i.e., individuals whose engagement is deemed a key success factor for the project's implementation). ARTIC staff work collaboratively with applicants to finalize the content of the Readiness Assessments.

Perceived utility

Generally, the Readiness Assessment is well received by stakeholders. The fact that it is brief and focused makes it a more manageable exercise for including P&E committee members. In addition, the stakeholder consultation aspect of the readiness assessment can help to raise

awareness about a project and generate buy-in and commitment to its implementation very early in the process.

> **By the time we give the response to CAHO, people are aware of the project and have an appetite for it.**
>
> — P&E committee member

> **The readiness assessment helped us to understand the gaps, and we set up mitigating strategies.**
>
> — P&E committee member

The Readiness Assessment works very well the majority of the time. Very few hospitals withdraw from the projects after indicating a willingness to participate at the Readiness Assessment stage. However, there were some issues the Readiness Assessment process did not avert in the 2012 projects:

- In one project, champions' support for the project was not assessed accurately during the Readiness Assessment. There was considerable champion turnover after the project started. There also had been no discussion of where the in-kind resources would come from, which may have contributed to the champion turnover and delays later on.

- In the other project, some hospitals did not realize what they were signing on for. The magnitude of the changes, and the ongoing staffing implications, came as a surprise to some hospitals. In addition, hospitals had not (as of July, 2013) dedicated a full-time staff person to coordinate the implementation, as indicated as a requirement in the Readiness Assessment (this may still change).

It is difficult to know whether these issues were attributable to the completeness and accuracy of Readiness Assessment content or the diligence with which P&E committee members completed the forms (in consultation with key stakeholders at their hospitals). It is more likely a combination of the two. Interviewees (including P&E committee members) did indeed indicate that some P&E representatives were more engaged and committed to the process than others. It was also found that a small number of hospitals that ultimately participated in a funded project had not completed or submitted a Readiness Assessment for that project.

> **It is a matter of who is taking it back to the hospital.**
>
> — P&E committee member

Ideas for improvement

While one wouldn't expect the Readiness Assessment to avert every issue, there are opportunities to learn from the 2012 project experiences that may help ARTIC head off similar challenges, making implementation smoother and easier in the future.

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For example, some additional content may need to be added to the Readiness Assessment. Currently, applicants are asked to identify critical success factors and resources such as: health human resources, facility/space, data collection requirements, and IT. They are also asked to outline key hospital stakeholders who should be consulted. Based on the types of challenges observed across the projects, the evaluation identified a few other enablers or success factors that ARTIC may want to encourage the central project teams to consider (for inclusion in the Readiness Assessment as appropriate):

- **Ongoing human resources** – New practices can have additional human resource implications, both during and after the ARTIC project. These should be made explicit at the outset (i.e., which resources will be temporary for implementation, and which will be ongoing due to the new practice).

- **Changes to existing materials and processes** – Any changes to existing materials or processes should be specified in the Readiness Assessment in some detail so that hospitals can determine whether they are willing and/or able to make requisite changes.

- **Other key materials or equipment** – If specific materials are critical to success, it would be worth identifying these, at a conceptual level, so hospitals can begin making arrangements to mobilize resources to fill any gaps.

- **Issues related to unions or volunteers** – Some projects require new, or different, types of work/duties that may have implications for existing collective agreements or volunteer policies. It may be worth identifying any anticipated union or volunteer issues at the Readiness Assessment stage.

- In addition, it might be helpful to add **criteria** for identifying key stakeholders, particularly champions, to help P&E members determine how to select an appropriate lead/champion.

Smoother implementation could also be supported by making some small changes to the Readiness Assessment format/process:

- **Encouraging full engagement among all P&E committee members -** One option may be to require the signature of P&E committee members on the completed Readiness Assessment, as a means to raise the perceived importance of the process.

- **Clarity regarding hospitals' contributions** - To reduce delays and frustration later on, CAHO may wish to add a column to the Readiness Assessment that asks hospitals to indicate which budget will cover specific expenses (e.g., corporate budget, departmental budget, special projects budget).

4.2 SUPPORTS FOR PROJECT IMPLEMENTATION

Key implementation factors

Key findings:
- ARTIC systems and structures effectively attend to many of the key implementation factors established in the literature.
- Some key project characteristics that may not have been intentional to ARTIC's design were observed to contribute substantially to implementation success, including:
  - Individualized supports from the central project team (e.g., coaching)
  - Designated responsibility for implementation (internal facilitation)
  - Clearly articulated implementation roadmap
  - Pragmatic performance monitoring and reporting

Implications for ARTIC:
- Ensure the identified characteristics above are intentionally built into ARTICs design and supports (e.g., refine selection criteria, provide additional direction to applicants and/or project teams)

ARTIC was intentionally designed to support, enhance and accelerate the implementation of new innovations by helping to address barriers and strengthen enablers (i.e., factors that support the uptake of innovation). CAHO's understanding of key implementation factors has been informed by both the knowledge translation/implementation literature and past experience with the ARTIC program.

Conceptualizing implementation factors

There exists a wide body of literature that documents implementation barriers and enablers. Historically, most have done so through single-factor theories (e.g., practitioner behavior change or organizational climate for implementation) (Chaudoir, Dugan & Barr, 2013). More recent multi-level frameworks enhance understanding of the barriers and enablers, since they perceive success as a function of multiple factors that can be hierarchically organized to represent the micro-, meso- and macro level factors, as seen in *Figure 6* (brief descriptions of each level follow). This more sophisticated multi-level framework is better aligned with the thinking behind ARTIC.

Figure 6: Multi-level framework predicting implementation outcomes (Chaudoir et al., 2013)
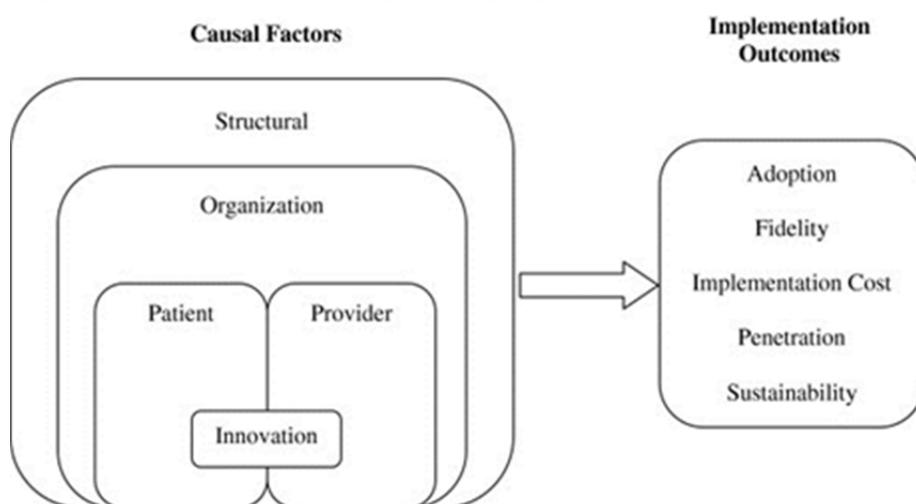
Structural-level factors include the broader sociocultural context. These constructs could represent aspects of the physical environment, political or social climate, public policies or economic climate.

Organizational-level factors include constructs that represent aspects of the organization in which an innovation is being implemented. These aspects could include leadership effectiveness, culture or climate, and employee morale or satisfaction.

Provider-level factors include constructs that represent aspects of the individual healthcare provider who implements the innovation with a patient or client. These aspects could include attitudes towards evidence-based practice or perceived behavioral control for implementing the innovation.

Patient-level factors include patient characteristics such as health-relevant beliefs, motivation, and personality traits that can impact implementation outcomes.

Innovation-level factors include aspects of the innovation that will be implemented. These aspects could include the relative advantage of utilizing an innovation above existing practices and quality of evidence supporting the innovation's efficacy.

Insights from project implementation experiences

The evaluation explored the implementation experiences of the participating hospitals across all six of the ARTIC projects through case studies and key stakeholder interviews. By looking across implementation-related successes and challenges identified by the hospitals, it was possible to identify key project characteristics and factors that appeared to be enabling of smoother implementation.

ARTIC systems and structures effectively attend to many of the well-known and established key implementation factors (primarily at the organization and innovation levels), including, but not limited to:

- **Strong evidence base** – It is well understood that recommendations based on strong research evidence are more likely to be followed (Castiglione & Ritchie, 2012). This is particularly true when physicians are a key target audience. ARTIC has ensured that all funded projects are evidence based through its selection criterion related to the existence of robust research evidence.

- **Resources** - Monetary support can be used for the purchase of new equipment, salary support for education days if necessary, and/or hiring of experts in the field for allocation of funds. ARTIC provides funds to support implementation.

- **Compatibility with hospital and system priorities** – The alignment of an innovation with hospital priorities and/or external requirements (e.g., ministry or health regulations or priorities) contributes to improved implementation outcomes (Castiglione & Ritchie, 2012). Those ARTIC projects that were well aligned with existing priorities and/or requirements (e.g., ASP in ICU, HandyAudit, MOVE ON) were experienced by hospitals as easier to implement due to relative ease in securing necessary resources and/or commitments. ARTIC's identification of an annual theme based on a system priority will contribute to ensuring that alignment is more likely in future projects.

- **Leadership support** – Senior leadership support and interest is very helpful in boosting morale, making it clear that the initiative is a priority, spreading the innovation to other parts of the hospital, and resolving higher-level issues (especially those related to communication and resources). Indeed, the literature indicates that formal leaders (such as program directors, managers and advanced practice leaders) have a critical role to play in creating a culture that is receptive to innovative change (Castiglione & Ritchie, 2012). CAHO has attempted to secure this leadership support for ARTIC projects through the roles and responsibilities assigned to P&E committee members, who are designated executive sponsors within their respective hospitals.

- **Effective champions (or opinion leaders)** – Champions are appointed individuals who promote the implementation process by encouraging, coaching and/or convincing others to accept the innovation (Castiglione & Ritchie, 2012). ARTIC does require the inclusion of champions (to promote the innovations) in project design. When the initiative targets large groups of people, it was even more important to have champions (formal or informal) who are respected by the target group(s). Effective champions should be enthusiastic about the initiative, present on the front lines (if applicable), persistent, and influential among their colleagues. It was observed that having physician champions was important for influencing other physicians. Champion turnover can be quite problematic, so ideally (formal) champions should be willing to commit to the role until implementation is complete.

There were a few key implementation factors observed in the projects that may not have been intentional to ARTIC's design, but that contributed substantially to successful project implementation. The following themes identified may provide valuable insights for the program in the future.

Individualized supports from the central project team (e.g., coaching)

Assessing and overcoming barriers are critical to successful implementation of a new practice. This is one part of the implementation cycle that cannot be standardized, since each setting faces slightly different challenges. Individualized supports from the central project team (such as hands-on coaching) can help hospital champions overcome unique barriers and adapt the innovation to their setting.

Across the six projects, the nature and intensity of individualized supports varied, but all indicated that the one-on-one supports they received from the central project teams were critical to successful implementation. While the hospital champions are intimately familiar with the hospital, the central team is intimately familiar with the innovation. By working collaboratively, they are better able to adapt/tailor the innovation appropriately to the setting.

The value of this type of hands-on expertise (provided by an *external facilitator*) is also supported by emerging implementation facilitation literature (Harvey et al., 2002). Correspondingly, the more general supports provided (e.g., through communities of practice) were experienced as less helpful, except in the very early stages of implementation.

Implications for ARTIC: Ensure that selected projects include strategies to provide individualized hands-on supports to hospitals (e.g., coaching).

Designated responsibility for implementation (internal facilitation)

The initial implementation of an innovation takes some extra time and careful coordination. It is helpful to have an individual who is assigned primary responsibility for making it happen, and who has dedicated time to devote to the coordination of the implementation. This does not mean that a single person should be responsible for making the change, but that there is a single person responsible for coordinating efforts (perhaps of a multi-disciplinary team) to make change happen. When responsibility for the change is too diffuse, implementation happens more slowly or doesn't happen at all.

All six ARTIC projects included one or more individuals at each hospital with designated responsibility for implementation (with expected time commitments ranging from 0.3 to 1.0 FTE). Site leads (or coordinators) indicated that having dedicated time for implementation activities was important for moving the innovation forward into practice.

Recent research on implementation facilitation confirms the importance of this role in the implementation of evidence-based practice, which it refers to as *internal facilitation* (Seers et al., 2012). According to this literature, the following characteristics are important to take into consideration when selecting an appropriate internal facilitator:

- o Has some knowledge and interest in the topic area
- o Knows co-workers
- o Knows the environment
- o Knows the organisation
- o Occupies a clinical leadership position

- o Possesses effective communication skills
- o Is self-aware and resilient
- o Is reliable and dependable (Seers et al., 2012)

Implications for ARTIC: Ensure projects include the explicit expectation that each participating hospital have a designated implementation coordinator. Hospitals should be encouraged to recruit implementation coordinators from within their existing staff pool.

Clearly articulated but flexible implementation roadmap

Knowing what to expect in the implementation process contributes to smoother implementation. The more hospitals are aware of what will happen and what needs to be done, the more likely they are to stay ahead of, and mitigate, any implementation issues before they become problems. Some flexibility in the implementation process is necessary, but too much can be overwhelming, leaving site coordinators uncertain about where to begin. For example, the design of one project was very flexible, and the steps in implementation were somewhat unclear, especially for acute care settings; this made implementation of this project more challenging for participating hospitals.

While some level of prescription makes the implementation process more manageable, too much can create a different set of implementation challenges. Another project was very prescriptive by necessity (due in part to the need to execute medical directives). Some challenges getting the necessary physician buy-in were encountered, which slowed down the implementation process.

Projects that had clearly articulated individualized implementation plans and/or detailed step-wise approaches were found to be easier to implement. The ability to strike the right balance in terms of flexibility and direction provided by an implementation action-plan requires that central project teams have sophisticated and concrete understanding of the implementation process related to their innovation in the targeted settings. Knowledge translation literature about implementation barriers and enablers confirms that "recommendations that are specific, not vague, are more likely to be followed" (Castiglione & Ritchie, 2012).

Implications for ARTIC: Project teams should be encouraged to provide a concrete but flexible implementation roadmap that identifies higher level implementation steps. This will require that central project teams have implementation experience and sophisticated understanding of their innovation.

Pragmatic performance monitoring and reporting

Seeing the benefits of an intervention is one of the most powerful ways to get resisters, or late adopters, on board. This important enabling factor is referred to as *observability* (the degree to which the outcome of the innovation is visible) within the knowledge translation literature (Castiglione & Ritchie, 2012). For some interventions, the benefits are immediately obvious to those involved. Collecting and reporting performance data can be extremely powerful if the benefits aren't as obvious or if they aren't observable by some members of the team (e.g., triage nurses or admissions might not see the impact on patient outcomes).

Champions in some projects reported using data to motivate staff, including benchmarking performance against other units and hospitals, which can be very helpful for encouraging late adopters to get in the game. However, the benefit of this kind of feedback loop is not being fully leveraged in all projects. In part, the complexity of research/evaluation designs associated with some of the ARTIC projects delays observability of benefits and increases project complexity (beyond implementation challenges associated with the innovation itself – e.g., need to collect and obtain new information using new systems, REB applications, data fed to and analyzed by central project team only).

Although one of the ARTIC selection criteria is the inclusion of an evaluation plan, the degree of rigour/complexity expected is not clearly articulated. It may be worthwhile to limit evaluation/research plans to ensure that they do not create additional implementation challenges and instead leverage the potential benefits of more pragmatic performance monitoring and staff feedback loops.

Implications for ARTIC: Projects should be encouraged to include pragmatic performance monitoring and reporting systems as opposed to complex evaluation and research designs.

Composition of central project teams

Key findings:
- The key characteristics of central project teams that contribute to successful implementation include:
  - Expertise and credibility
  - An appropriate mix of professions/disciplines
  - Communication skills
  - Approachability
  - Flexibility

Implications for ARTIC:
- Continue funding projects where the project lead and/or other members of the central project team have a reputation for being experts in their field, and have been involved in the development and implementation of their innovation.
- Encourage project leads to assemble teams with the requisite skills and other characteristics.

Site leads at the hospitals were able to identify several central project team characteristics that were particularly important in supporting implementation. Central team members also identified these as important characteristics within their teams.

Expertise and credibility: It was helpful that central project team members had expertise regarding their innovation, including personal experience with implementation. This expertise

contributed to the central teams' ability to identify potential challenges and offer concrete strategies for mitigating and/or overcoming them.

The credibility of the team was also important for gaining buy-in at the hospital level. The reputation of the project lead, in particular, was helpful in generating interest in the project.

An appropriate mix of professions/disciplines: It was helpful that the central teams included representatives of the professions that were required to work collaboratively and implement the project at the hospital level (e.g. doctors, nurses, pharmacists). Participants at the hospital level appreciated being able to learn from someone who had a strong understanding of their role, responsibilities and the challenges they were likely to encounter.

Communication skills: The ability to communicate effectively with the participating hospitals was critical. Project team members need to be able to clearly articulate project expectations, respond promptly to questions, and provide participating hospitals with regular updates on the project's status. They also need active listening skills and facilitation skills so they can respond effectively to issues within or across hospitals.

It was very much appreciated when central team members were responsive to the feedback they received from participating hospitals, and adjusted their communication methods or styles accordingly.

Approachability: Site leads really valued being able to approach the central project teams with any questions or concerns and knowing they would receive a timely, non-judgemental and helpful response. Central project teams were credited with working collaboratively with their respective hospitals and having a genuine interest in the successful implementation of their innovation.

Flexibility: It is important that central project teams understand that some hospitals may require some additional attention and support, and be willing to adjust their level of support as needed.

Other skills and knowledge: The following competencies were not mentioned as frequently, but may well be important to successful implementation: project management skills, IT knowledge, data collection and analysis skills, knowledge transfer expertise, leadership skills, and ability to resolve issues.

Communities of practice

Key findings:
- Participants appreciate the opportunity to learn from and problem solve with their colleagues, particularly through teleconferences and face-to-face meetings.
- Once project implementation is well on its way, participants do not require as much contact with their peers from other hospitals. However, occasional teleconferences may still be valuable, even after ARTIC funding ends.
- A successful community of practice requires that issues/topics discussed are relevant to the majority of participants and that meetings are well prepared in advance.

Implications for ARTIC:
- Devise guidelines for the communities of practice, drawing on the lessons learned (e.g., decrease the frequency of teleconferences as implementation progresses).
- Project websites may offer opportunities to sustain the communities of practice after projects are completed.

Development and structure of the communities of practice

ARTIC encourages the central project teams to share best practices and encourage collaboration across participating sites. Five of the six projects chose to do so by forming communities of practice among the implementation leads and/or project champions at all of the participating hospitals. Each central project team was responsible for coordinating their project's community of practice.

Communities of practice were formed in the early stages of project implementation. All of the communities of practice were supported by regular teleconferences between participating hospitals and the central project team. The frequency of the teleconferences varied across projects (e.g., bi-weekly, monthly, quarterly, or as required). One project also brought champions together at two annual meetings.

The central project teams for four of the funded projects developed a project website and/or online forum that would allow hospitals to access project materials/resources and/or communicate with one another through a discussion forum. While the discussion forums were considered to be underutilized as compared to the teleconferences, participants from several projects appreciated being able to access the project resources/materials online. Additionally, the central project teams for four of the funded projects provided opportunities for site visits to the hospital where their innovation was originally implemented.

While one project did not have a formal community of practice, champions were connected to one another through the project manager when they had an issue that the central project team could not answer or if there is another hospital that experienced the same issue and addressed it

successfully. This project was also one of the four projects that offered an online discussion forum and site visits.

Benefits of communities of practice

The communities of practice provide an opportunity for information-sharing and problem solving across participating hospitals. Project participants are able to discuss their challenges and lessons learned, and to provide each other with moral support. Among the five projects that supported a community of practice, the majority of participants felt that having the opportunity to learn from one another was useful, especially in the early stages of project implementation.

The teleconferences also provide the central project team with an opportunity to share updates or new information with all champions at the same time, and answer any questions they may have, thereby ensuring that everyone received the same information at the same time.

When communities of practice are most useful

The utility of communities of practice varies based on the type of project, the timing within the project, and the quality of the community of practice supports.

Similarity of experiences across hospitals: Communities of practice are considered to be useful when participants are likely to experience similar issues or challenges, and can therefore benefit from the ideas and experiences of their peers. When there is a lot of variation anticipated in project implementation, (i.e., when it is more likely that each hospital's experience with implementation would be unique to their situation/environment), a community of practice may be less helpful.

Timing within the project: Challenges are more common in the early stages of implementation. It is therefore at this time of the project that the community of practice is considered to be the most useful, as the lessons learned from other hospitals and the central project team are likely to have the greatest impact.

Quality of the community of practice supports: Participants found the communities of practice most useful when they were focused on resolving issues that were relevant for more than one hospital. Participants are generally very busy and do not see the value in attending a meeting that does not provide them with relevant information or ideas. When the central project team identified common issues for discussion, participants were more likely to find the discussions relevant and therefore useful.

Sustainability of communities of practice

As projects neared the end of implementation, project participants did not feel the need for frequent communication with their peers from other hospitals. Some project participants did still see value in having occasional teleconferences (e.g., bi-annual or annual) as a means of keeping in touch with their peers and sharing any lessons learned.

Some of the central project teams noted that they are unable to sustain their community of practice once the ARTIC funding period ends. In particular, they cannot continue offering regular teleconferences for project champions. It is however possible that project websites will be maintained so participating hospitals can continue to access project materials and resources, and post questions on the discussion forum. HandyMetrics, the company that supplies HandyAudit™, continued hosting teleconferences with the community of practice after the ARTIC funding period ended. As hospitals pay for ongoing use of the HandyAudit™ system, it is possible that it was more financially feasible for HandyMetrics to offer continued teleconferences.

Various hospitals have communicated with one another, outside the teleconferences, about common issues and to share strategies and resources. This communication generally occurs on an as needed basis. It is therefore likely that some form of ongoing communication may occur among (some) participating hospitals and that the communities of practice may continue. Should the project websites and discussion forums continue to be maintained, they may provide a means for such ongoing communication.

Supports from the ARTIC program

Key findings:
- All of the supports provided by the ARTIC program are helpful. No additional supports are needed. Assistance in clearing barriers with participating hospitals is particularly important.
- Providing funding for resources that are integral to *ongoing* implementation of the innovation could undermine sustainability after the funding ends.

Implications for ARTIC:
- Continue to provide the current mix of supports.
- Continue to staff the ARTIC program with people who are diplomatic and familiar with decision-making in Ontario's research hospitals.
- When ARTIC staff provide hands-on support, be sure to clarify roles and areas of authority, and ensure that any decisions are communicated to all relevant stakeholders.
- Only provide ARTIC funding for *temporary* implementation resources.

CAHO plays an active role in supporting the funded ARTIC projects. In addition to providing funding, the ARTIC program, mainly through the program manager, provides advice to the central project teams, assistance with project management, and assistance in moving past barriers within individual hospitals. The central project teams have found all of these supports to be extremely helpful[5]. None of the teams mentioned needing any additional supports from CAHO.

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[5] One team did indicate that ARTIC staff could have made it easier to negotiate timeline extensions.

This section describes the benefits of the four primary supports provided by ARTIC staff, as well as some minor challenges experienced and related opportunities for improvement.

ARTIC funding

The ARTIC funding (for central project team time and expenses, as well as select implementation needs at the hospitals) provides an incentive for organizations to participate, and reduces barriers to participation. It also enables the central teams to provide intensive supports to the hospitals.

- *Challenge*: For one project, the ARTIC funds have been used to support a 1.0 FTE position that will need to continue beyond the end of the ARTIC funding. This may undermine sustainability once the ARTIC funding ends.

- *Opportunity for improvement*: This challenge can be avoided in future by funding only temporary implementation needs that will not be required for sustaining the new practice (e.g., an implementation coordinator who is only needed until the innovation is integrated into the operations of the organization).

Assistance with project management

The project management supports provided by ARTIC varied based on the skill sets of the central project teams. For example, some teams had stronger content expertise than project management skills, and needed help keeping their projects organized; some had strong implementation and project management skills, but needed help preparing polished written communications, and so on. The ARTIC staff provided hands-on support and advice to fill these skill/knowledge gaps. This allowed for a smoother and more consistent implementation process.

- *Challenge*: Many of the central project teams are not accustomed to working in such a collaborative way with their funders. Over time, they do become more comfortable with CAHO's involvement, but at the outset there can be some confusion and frustration related to lines of communication (e.g., if ARTIC staff contact a member of the central team without going through the principal investigator) and levels of authority (e.g., if ARTIC staff provide a suggestion, is it really a suggestion or is it a directive?).

- *Opportunity for improvement*: This challenge can be mitigated through open discussion about role boundaries, lines of communication and decision-making authority at the outset of new project relationships.

Assistance in clearing barriers with individual hospitals

ARTIC staff intervened in circumstances where hospital champions and the central project teams could not overcome challenges within the hospitals (e.g., CAHO helped resolve procurement issues related to HandyAudit, and union/policy issues related to TDM). In these cases, ARTIC staff would raise the issue with the executive sponsor, and ask for their help resolving it. This support was identified as important by champions and central team members in all six of the projects. They noted that CAHO was able to "cut through the red tape" and "move things along very quickly." They also appreciated CAHO's "light touch," only stepping in where needed.

- *Challenge*: When ARTIC staff escalate an issue to the hospital's executive sponsor of the project, key stakeholders (e.g., site champions/leads) may be left out of the conversation, and may not be informed when the issue has been resolved, or what the resolution is.
- *Opportunity for improvement*: This challenge can be mitigated by more conscientious communication, ensuring that the site implementation leads know that CAHO has become involved, and reporting the outcome/resolution back to both them and the central project teams in a timely way.

> **CAHO is an excellent overseer. They intervened whenever asked, and did so appropriately, but were not on top of us.**
>
>   - Central team member

> **[The program manager] is able to connect the decision maker of the hospital to the project.**
>
>   - Central team member

Advice based on learnings from past ARTIC projects

ARTIC staff provide advice to the central project teams about the structure of their project (e.g., incorporating a community of practice, having a launch event to kick off the project). This helps the central project teams shape their projects to be consistent with evidence-based best practices, and increases consistency of structure and implementation across the projects.

- *Challenge*: Much of the advice is based on the accumulated wisdom of the individual ARTIC staff and is not consistently/centrally documented. The program is vulnerable if it loses this accumulated wisdom.
- *Opportunity for improvement*: This challenge can be mitigated in the future through more systematic and centralized documentation of ARTIC learnings.

Executive sponsorship

Key findings:
- Executive sponsorship from P&E committee members is important to raising the profile of projects and providing a high level of escalation to resolve implementation issues.
- However, P&E members may not always have the capacity to fully support assessment and/or implementation (due to levels of engagement, time and/or role constraints).

Implications for ARTIC:
- It may be beneficial to encourage more structured and early delegation of the executive sponsorship role to another, more appropriate, member of the hospital's senior leadership team.

In addition to providing higher level strategic guidance to the ARTIC program, each P&E committee member acts as the Executive Sponsor to ARTIC Projects at their respective hospital. This includes responsibility for completing the Readiness Assessments and providing support (as needed) to the implementation of projects that their hospital is participating in. Stakeholders generally agreed that executive sponsorship from P&E committee members is important, but also indicated some challenges they had observed or experienced with respect to the role.

P&E involvement in Readiness Assessment

P&E members are responsible for ensuring Readiness Assessments for each project are completed for their hospital. This may entail completing it themselves or enlisting assistance of others in their organization. Members are encouraged to consult with key stakeholders to both gather relevant information and test the waters for potential interest.

In most cases, it was beneficial to have P&E members complete the assessment because they have sufficient seniority to truly understand the implications of decisions for their organizations (e.g., resources, politics, policies). This approach also vests ownership for the process (and culminating decision) with someone at a very senior level, implicitly identifying it as a priority for the organization as a whole.

However, there were some challenges (both expressed and observed) with respect to this responsibility in practice. A number of different stakeholders observed that there were varying levels of engagement across P&E members, and that this extended to the attention members gave to the completion of Readiness Assessments. Some filled out Readiness Assessments completely and diligently, while it appeared others may not have always fully understood the project requirements and/or may not have consulted with the right people in the process. In some rare cases, Readiness Assessments were not completed at all, even among hospitals that subsequently participated in a particular project. This tended to result in surprises and delays later in the implementation process when unanticipated resources needed to be negotiated or unexpected barriers needed to be overcome.

While allowing some autonomy and flexibility in the process is consistent with CAHO's general approach and is beneficial to generating trust and goodwill among the hospitals, additional encouragement for P&E members to attend to due process when completing the Readiness Assessments may be warranted.

P&E involvement in executive support for implementation

As the official executive sponsors for ARTIC Projects in their respective hospitals, P&E members are called upon to help troubleshoot and move the implementation of innovations forward. This may include providing visible and vocal support for the innovation (to help generate buy-in) and/or negotiating resolution to issues as they arise.

Stakeholders observed that visible senior support for an initiative drives action, since it gives clout to the project and sends the message that it is a priority for the whole organization, not just and individual or unit. It tends to boost morale and enthusiasm about the project among staff, and

generally greases the wheels. P&E member involvement was also appreciated for providing a very high point of escalation to help expedite solutions when issues arose, which occurred at some point in each of the funded projects.

However, as with all things, some P&E members were able to provide more effective support than others. Factors that appear to contribute to the efficacy of P&E committee members' ability to fulfill their executive sponsorship role and resolve issues quickly included:

- **Competing priorities and busy schedules**: Senior hospital executives tend to be extremely busy and have many competing priorities (i.e., have many initiatives they are championing at their hospital). Some P&E committee members have larger portfolios than others, making the role harder for them to attend to. A few members did indicate that their ARTIC-related responsibilities are carried out off "the side of their desks." This limits their capacity to respond to issues quickly and completely. It was also observed that committee members who volunteered for the role (versus those who were assigned) appeared to make greater contributions to resolving issues quickly.

- **Alignment with *line responsibility***: If the P&E committee member doesn't have the *line responsibility* for the areas related to a particular project, it can be more difficult for them to provide effective support. It was observed that in such cases someone else in the hospital, one who has relevant line responsibility, might be better suited to provide leadership.

- **Distance from the front lines**: P&E members are a bit removed from the front line and may not fully understand the challenges staff face. In addition, due to the seniority of their position, site level champions/leads may be reluctant to communicate issues directly to the P&E committee member, as he/she may well be their "boss's boss". It was observed that this would be tantamount to circumventing the organizational ladder, something many employees are very uncomfortable doing. This issue is more pronounced in larger organizations with stronger hierarchical structures.

To mitigate these challenges, some P&E members actively delegated senior leadership of individual ARTIC projects to other, more appropriate, individuals in their organization very early in the process. They then only became involved when absolutely necessary. However, other P&E members indicated such delegation was not an option for them.

> **My role at the hospital is too big for me to be directly involved in the day to day of the ARTIC projects. I find out if there is interest…and find a key lead. Once I have the key people involved, I take a step back.**
>
> - P&E committee member

> **I'm not sure if I'm always the right person to support these projects in my organization, and my ability to delegate is a bit limited.**
>
> - P&E committee member

Ideas for improvement

It would appear that more structured and early delegation to another, more appropriate, member of the hospital's senior leadership team could help stem some of the challenges of P&E involvement identified in the preceding sections.

One option might be to encourage P&E committee members to engage a Most Appropriate Person (MAP) to be the executive sponsor for a particular project at the readiness assessment stage. The P&E committee member and the MAP could then jointly complete (and sign) the Readiness Assessment. This approach would have the benefit of decreasing the demand on P&E committee members, while maintaining their meaningful involvement. It is acknowledged, however, that this approach could diminish P&E member engagement further and/or add unnecessary complication to the process. It will be important for CAHO to carefully weigh the pros and cons of this approach before proceeding.

4.3 PROGRAM GOVERNANCE

Key findings:
- ARTIC has three levels of governance. The structure is a bit complex, but there are clear benefits to engaging each of the three groups.
- The roles and responsibilities of each level of governance are not fully documented.

Implications for ARTIC:
- Evolve the Task Force into a more permanent structure.
- Document the roles, responsibilities and decision-making authority of each governing body, as well as CAHO staff.

ARTIC is governed by three distinct bodies: The CAHO Council, the CAHO Practice and Education committee (P&E committee), and the ARTIC Oversight Task Force (Task Force), which reports to the Practice and Education committee.

- **CAHO's Council** comprises the CEOs of all CAHO member hospitals. This group provides strategic oversight to the ARTIC program and approves all funding decisions, as well as decisions about the program's strategic direction.

- The **P&E committee** is made up of clinical practice leaders from each CAHO hospital. This group directs the Task Force and provides strategic guidance for ARTIC. Its members provide "sober second thought" on the Task Force recommendations before sending them to Council. In addition, the P&E committee members act as Executive Sponsors to ARTIC Projects at their hospitals.

- The **Task Force** was originally convened to determine the most appropriate shape and design for the ARTIC program. Since then, it has become responsible for hands-on program management and for refining the program over time. This group also reviews proposals and chooses which projects to recommend for funding. The Task Force

includes representation from CAHO's P&E committee, CAHO's research committee, the MOHLTC, and HQO, as well as experts in knowledge translation.

An ARTIC program manager (employed by CAHO) is responsible for the day-to-day operation and coordination of the program.

<u>Appropriateness of the governance structure</u>

Having three governing bodies adds complexity to the ARTIC governance structure, since key decisions need to be discussed by three different groups, each of whom needs to be oriented to the issues. There are clear benefits to the involvement of all three groups (described in *Table 5*). Program stakeholders did not express any concerns about the complexity of the structure. If CAHO wished to simplify the governance structure, they could do so by making the Task Force a more permanent group that reports directly to council, and involving the P&E committee in an advisory role. However, this change may have little impact in practice, since the P&E committee will still need to be engaged in a meaningful way.

Table 5: Considerations re: involvement of Council, P&E committee, and Task Force in ARTIC governance

Group	Considerations
Council	▪ Council does not have time to consider the project recommendations in detail, so approvals are somewhat ceremonial. It was suggested that this role would be more meaningful if they were able to consider one or two alternatives to the recommended projects. ▪ Council approvals create an implied commitment, which is perceived to be worth the additional layer of approvals. Project success could be undermined without this implied commitment. ▪ Their involvement also brings caché/credibility to the program. ▪ Council is ultimately responsible for use of CAHO funds, so their involvement in approvals is appropriate.
P&E committee	▪ P&E committee has official responsibility for the ARTIC program, but has delegated most of the operational decision making to the Task Force, which limits the committee's role. ▪ P&E committee allows for input from clinical leaders in all CAHO hospitals, enabling the committee to raise issues that Council and Task Force might not be aware of. This is important in setting program direction, during project selection, and when issues arise in a project that might be relevant to multiple hospitals. ▪ Engagement of P&E committee members is critical to project success, since P&E committee members are executive sponsors to the projects in their hospitals. ▪ Not all members of the P&E committee are fully engaged in ARTIC discussions. It would be worthwhile to explore ways of engaging this group more fully.

Group	Considerations
Task Force	▪ The responsibilities of this group would be too onerous for the P&E committee or Council to take on; there is a need for a hands-on group in decision making. ▪ Most Task Force members are voluntary (vs. appointed), which makes for a high level of commitment and passion within the group. ▪ The diversity of backgrounds within the group is important (research, clinical practice, knowledge translation, system partners). ▪ A "task force" is usually a temporary structure. A more permanent structure would be appropriate if ARTIC continues into the future.

Clarity of roles and responsibilities

For the most part, program stakeholders seem clear about the roles and responsibilities of the governing bodies. There is some confusion about which groups are responsible for strategic and operational guidance, as these issues are brought to both the P&E committee and Task Force (sometimes based on which group is meeting when an issue arises, since meetings of each group are typically scheduled two to three months apart).

It would be helpful to clearly document the mandate, roles and responsibilities of all three of ARTIC's governing bodies, and to update these documents on a regular basis. This would help ARTIC staff determine which group to send particular decisions to (for example, which group should make decisions about project timeline extensions). The decision-making authority of ARTIC staff should also be clearly articulated and documented.

4.4 EVIDENCE OF IMPACT

Monitoring and Evaluation

Key findings:
- Monitoring and evaluation can support project implementation, if hospitals have ongoing access to reports of their progress.
- Some hospitals in each project needed significant support in overcoming challenges related to the project monitoring/evaluation.
- Performance indicators differed across projects, however, it may be possible to develop some higher-level common indicators of ARTIC impact.

Implications for ARTIC:
- Introduce a small number of common indicators for all future ARTIC projects to enhance consistency and measure broader collective program impact.
- Ensure that the monitoring and evaluation requirements of the funded projects are 1) feasible for participating hospitals and 2) include a timely feedback mechanism. This will minimize burden and maximize value of evaluation activities.

Approaches to monitoring

All six funded projects monitored their project's implementation and impact at participating hospitals on an informal and formal basis. Informal monitoring generally occurred through ongoing communication with the central project team and/or through the activities supporting the communities of practices, such as the teleconferences, face-to-face meetings and online discussion forums. This provided the central project team with a general sense of how one or more hospital was doing and what issues needed to be addressed.

Formalized approaches to monitoring and evaluation, as required by the CAHO ARTIC Program and outlined in project proposals, provided a more focused understanding of implementation and impact at each participating hospitals. Approaches tended to vary from project to project based on the availability and type of information required. *Table 6* shows the most common data collection sources used in the projects, as well as some sample indicators.

Table 6: Sources of monitoring and evaluation data, and sample indicators

	Example indicators	Interviews	Patient chart reviews	Hospital databases	Surveys/ standardized tools	Other source
ASP in ICU	Antimicrobial costs & resistance; *C. difficile* infections	✓		✓		Heat map
CCR	C-spine clearance rates by nurses; patient time in the ED	✓	✓			
Handy Audit	Time required for data collection, transcription, & analysis				✓	Cost-analysis; process mapping
iERAS	Length of stay; # of postoperative complications	✓	✓			Patient log
MOVE ON	Frequency of mobilization of patient; length of stay	✓	✓			Visual audits
TDM	Length of stay; readmission rates	✓		✓	✓	

The gathering of monitoring and evaluation data did require some staff time: between 0.1 FTE and 1.0 FTE was allocated to this, depending on the project. The site implementation lead/champion or a dedicated research coordinator was usually responsible for gathering the data and reporting to the central project team. In some hospitals, the project champion/site lead conducted a preliminary analysis of the data before reporting it to the central project team.

All of the projects developed a project-level database (or used an existing database) to compile information received from participating hospitals. The central project teams have analysed or plan to analyse implementation and impact data for individual hospitals and, in some cases, across all participating hospitals. In some cases, this analysis will include a comparison of pre and post-implementation data.

A few of the projects were designed to provide ongoing reporting of performance indicators at the hospital level. One team, for example, provided updates on key performance measures through weekly reports to the project team. In another project, the project database is being designed to produce quarterly reports for each participating site. In other projects, analysis of hospital level data will only be carried out at the end.

All central project teams kept/are keeping CAHO apprised of the implementation and impact of their projects, and of each individual hospital, through their quarterly reports. Once projects have ended the central project teams will provide CAHO with a final report, which they will also share with all participating hospitals. HandyAudit™ has already submitted its final report to CAHO and a final report for each participating hospital.

Challenges and enablers related to monitoring and evaluation

Each ARTIC project experienced challenges related to monitoring and evaluation. While some of these challenges had little impact on overall project implementation, others were more problematic. This section describes challenges that were experienced in more than one project, and ways these challenges were mitigated.

Research Ethics Board (REB) approval: The time required to prepare REB applications and obtain REB approvals was longer than anticipated. To mitigate this issue, the more recent projects have built the required time for REB approval into their planning phase. They also provided hospital champions with much-appreciated support in preparing the REB applications.

Confidentiality/access to patient records: Another challenge for some projects was gaining access to patient charts/records. In particular, concerns regarding confidentiality increased the time that it took to establish data sharing agreements between the central project team and some hospitals.

Completeness/accuracy of patient charts: Patient charts (whether paper or electronic) were not always designed to capture the specific pieces of information needed for the project evaluation. In addition, healthcare providers did not always enter the needed information, or did not enter it in the format needed. There is concern, in these cases, that the data will not provide an accurate reflection of implementation and impact. Projects have identified some ideas for addressing this. For example, one project provided a "care checklist" to place in the charts of qualifying patients. The site coordinator monitored completion of the checklists on a daily basis and followed up if any of the information was missing or unclear. This project also has patients fill out a log, to assess implementation from their perspective.

Inability to access required data: In one project, some hospitals experienced significant challenges accessing, compiling and reporting the data requested by the central project team, as the data were unavailable at the ICU level, or very difficult to acquire. Consequently, the project champion or site lead had to spend considerably more time compiling, analyzing and/or reviewing the data than was originally allocated within the project budget. The central project team worked closely with these hospitals to help devise strategies to address the challenges associated with the monitoring requirements. One strategy was to facilitate communication with the hospital's IT department to clearly articulate the data required and how they could be provided.

Benefits of monitoring implementation

Despite any challenges with the monitoring of implementation, most of the project champions and/or site leads indicated that they appreciated the monitoring component of the project as it provided them with information about what they were doing well during implementation, areas for improvement, the extent to which the new innovation/practice was implemented and what impact the project has had at their respective hospital.

Common measures of impact

As mentioned earlier, each project used different, project-specific indicators to measure implementation and impact. The following are some possibilities for common metrics that could be applied to future ARTIC projects:

- **Impact of ARTIC on innovation uptake:** Each hospital could be asked to indicate the likelihood of their having adopted the innovation in the absence of ARTIC, and whether ARTIC helped them adopt it more quickly and/or more comprehensively.

- **Extent of change in practice:** This may be defined slightly differently for each project, but could be rolled up across projects. For example, for projects like CCR or iERAS, the definition may be the percent of qualifying patients for whom the project protocols were followed. For projects like MOVE ON, it might be the percent of days the protocols were followed for qualifying patients.

- **Benefits to participating hospitals:** Some common benefits included:
  - **Improved patient outcomes:** such as decreased length of stay, decreased wait times, reduced mortality, improvement in mental and physical health, etc.
  - **Reduction in healthcare costs:** including the improved utilization of medications, more efficient use of human resources, improved technology, etc.
  - **Improved and increased collaboration among hospital staff:** opportunities for different professional groups to collaborate and learn from one another on an ongoing basis.
  - **Improved skills and knowledge of hospital staff:** new learning opportunities for hospital staff and changes to apply this knowledge on a regular basis.

Sharing lessons learned

Key findings:
- CAHO's commitment to continuous quality improvement has strengthened the ARTIC program year over year.
- ARTIC staff members' advice to the central project teams contributes to successful project implementation.
- Updates to the CAHO Council and committees provide only a high-level understanding of the issues and the lessons learned.
- CAHO has not formally shared lessons learned beyond the CAHO community.

Implications for ARTIC:
- Continue to engage in critical reflection and active program improvement.
- Compile lessons learned in a single, user-friendly document.
- Share lessons learned more broadly through publications and presentations at provincial and national forums.

Since ARTIC's launch in 2010, CAHO has gained many insights about how to support knowledge translation in Ontario's research hospitals. Much of this learning has resulted from the day-to-day experiences of the ARTIC staff and the Task Force. In addition, there have been two formal evaluations (an interim evaluation in 2011/12, as well as the evaluation described in this report).

ARTIC shares lessons learned across the projects by 1) presenting to the CAHO Council and the various CAHO committees, 2) making ongoing changes to the ARTIC program based on the lessons learned, and 3) providing direct advice to the central project teams.

Presentations to various CAHO groups

ARTIC staff have provided periodic updates (typically every two months or so) to the CAHO Council and the various CAHO committees. Updates typically include descriptions of recent or upcoming ARTIC program activity, and status updates for each funded project, including any major issues arising. ARTIC updates tend to represent a very small portion of the business addressed at the Council and committee meetings. Because of time constraints, it is not possible to explore the emerging issues in any depth. Consequently, Council and CAHO committee members' understanding of ARTIC lessons and issues tends to remain at a fairly surface level.

Highlights from the 2012 interim evaluation reports were shared with the P&E committee and ARTIC Program Task Force in April, 2012, which allowed for a more fulsome discussion.

Changes to the ARTIC program

Much of CAHO's learning has been incorporated into the design of the ARTIC program as it has evolved over the last three years. This allows new projects to benefit from the lessons learned from previous projects. *Table 7* provides a few illustrative examples of changes to the ARTIC program based on lessons learned from the Phase 1 Interim Evaluation Report (Dainty et al., 2011). It should be noted that the table shows only a small sample of ARTIC refinements, as there have been numerous changes made over the years based on lessons learned.

Table 7: Examples of changes made to ARTIC based on lessons learned from the interim evaluation

Learning	Change Made
Some hospitals had not understood what resources would be required to implement the innovation.	Barriers Assessment introduced in 2011, with a project summary that outlined the resource requirements. Readiness Assessment introduced in 2012, requiring more explicit assessment of resource availability.
It is important that ARTIC projects be aligned with hospital and MOHLTC priorities.	"Stakeholder alignment" added as an assessment criterion in 2011 project selection process.
Organizations expect ARTIC projects to have implementation evidence as well as scientific evidence.	"Research evidence" criterion expanded in 2011 to explicitly include evidence that supports the implementation of the innovation.

CAHO's commitment to continuous improvement has strengthened the ARTIC program year over year. It is strongly encouraged that this process of critical reflection and active improvement be continued into the future.

Advice to central project teams

Lessons learned are also shared through advice that the ARTIC program manager provides directly to the central project teams, on an as-needed basis. For example, the interim evaluation found that the hospital champions felt "a bit siloed within the project; that they would [have] liked to have had more contact with the other participating sites." The ARTIC program manager has since encouraged the central project teams to include a mechanism that allows key representatives of participating hospitals to meet one another (e.g., a formal project launch event) and to communicate on an ongoing basis (e.g., teleconferences).

This type of advice has been invaluable to the successful implementation of ARTIC projects and has ensured greater consistency in their quality. Consistency in quality and experience across projects contributes to positive stakeholder opinions about the program, and to the overall program reputation.

Sharing lessons outside CAHO

At this point, CAHO has not formally shared lessons learned beyond the CAHO community. There may be opportunities to do this that are not yet being leveraged. The wealth of experiential learning about effective knowledge translation practices being accumulated by the ARTIC program would no doubt be extremely valuable to the broader health community.

Other opportunities to share CAHO's expertise

There is documentation of many of the lessons learned through the implementation of ARTIC, however it is spread across a number of different documents. It would be worthwhile to compile the lessons from the various documents into a single, user-friendly document (that could be cumulatively updated going forward). This would make the program less vulnerable to the loss of organizational memory with key program staff (who know what lessons have been learned and where they are documented).

Moving forward, CAHO could share its accumulated expertise about knowledge translation through publications and/or presentations at provincial and national forums (e.g., OHA conference).

Perceived impact of ARTIC

Key findings:
- ARTIC was perceived to have:
  a) A positive impact on the uptake of the funded innovations.
  b) Benefits for the hospitals (due to adoption of the innovations).
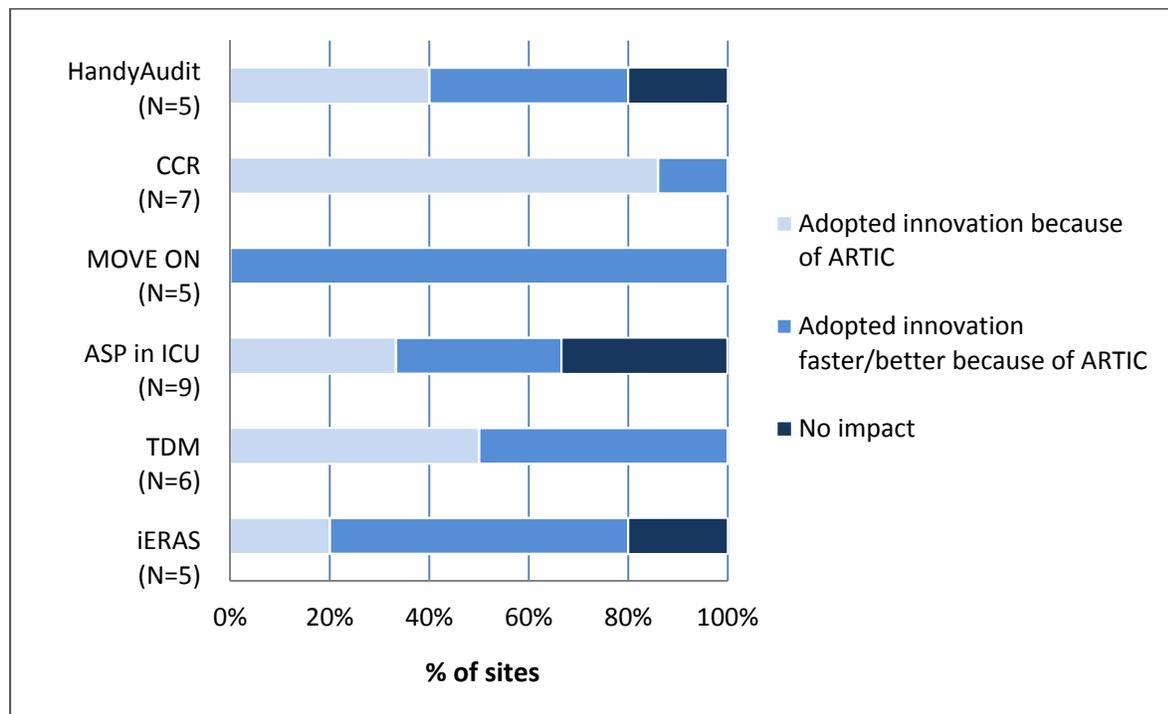 c) Benefits for CAHO and the broader Ontario healthcare system.

Implications for ARTIC:
- Continue the ARTIC program.
- Confirm the perceived benefits through a more rigorous outcome evaluation.

Impact on uptake of innovations

Site level champions/leads were asked, through an online survey, to indicate the impact of ARTIC on their adoption of the innovations. As shown in *Figure 7*, the results varied by project, but overall ARTIC was perceived to have a positive impact on uptake of the innovation.

Figure 7: ARTIC is perceived to facilitate uptake of innovations[6]

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[6] Note: some survey respondents did not answer the uptake questions.

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In some cases (e.g., CCR and TDM in particular), ARTIC was critical to the adoption of the innovations; many of the hospitals indicated they would not have adopted it without the program. In other cases, the hospitals may have had some of the pieces in place, but the ARTIC projects helped the hospitals to adopt a more comprehensive suite of strategies (e.g., MOVE ON, iERAS) or to renew their efforts (e.g., MOVE ON, ASP in ICU). In many cases where hospitals had an intention to implement the innovation, ARTIC helped them adopt these innovations more quickly, and in a more coordinated way, than they otherwise would have.

There were a few sites that indicated they would have adopted the innovations (e.g., HandyAudit, ASP in ICU and iERAS) without ARTIC. This was often due to an existing close working relationship some hospitals had with the developers of the particular innovation.

> **It would have taken us a lot longer to get there.**
>
> **We would have done some of these things piecemeal.**
>
> - Site implementation lead

Impact of the innovations

Site champions/leads mentioned a variety of benefits that arose from their hospital's implementation of the ARTIC-funded innovations (see *Table 8*). These benefits have not been verified, so we do not know the extent to which they are actually happening across all sites.

Table 8: Benefits to hospitals of adopting the ARTIC innovations

Benefits mentioned by site implementation leads	Projects in which the benefit was mentioned					
	HandyAudit	CCR	MOVE ON	ASP in ICU	iERAS*	TDM*
	2010	2010	2011	2011	2012	2012
Better communication and collaboration	✓	✓	✓	✓	✓	✓
Enhanced profile / credibility	✓	✓	✓	✓	✓	✓
Improved patient care	✓	✓	✓	✓	✓	✓
Increased capacity for change management		✓	✓	✓	✓	✓
Enhanced monitoring systems	✓		✓	✓	✓	
Better able to meet external commitments	✓		✓	✓		
Resource savings	✓			✓		✓

*Grey checkmarks indicate that the benefit is anticipated (innovation is not yet implemented)

The following provide more detail about the benefits that site champions/leads have noticed:

- **Better communication and collaboration:** The hospital teams in many of the projects have implemented regular team huddles, which provide an opportunity for the interdisciplinary team to communicate about specific issues or specific patients. Teams have also found other ways to improve their communication (e.g., whiteboards to indicate recent mobilization activities for each patient, clearer triage notes for patients with spinal injuries).

- **Enhanced profile/credibility:** ARTIC involvement gave profile to the lead hospitals for each project. It also enhanced the credibility of the participating hospitals, who could demonstrate they were adopting leading-edge, evidence-based practices.

- **Improved patient care:** Improved patient care was reported in all of the projects. Specific examples include better hand hygiene (HandyAudit), decreased Emergency Room wait times (CCR), and increased patient mobilization (MOVE ON).

- **Increased capacity for change management:** After participating in the CCR project, nurses in one emergency department felt empowered to make other changes to improve patient care in the department. In most projects, site implementation leads were (consciously or not) using evidence-based change management strategies to encourage late adopters to get on board, and to sustain the changes they had made.

- **Enhanced monitoring systems:** Many of the projects introduced monitoring and reporting systems that can remain in place after the project, assessing provider activities and patient outcomes.

- **Better able to meet external commitments:** This was the case for several of the projects. HandyAudit enabled the participating hospitals to fulfil their government reporting requirements more efficiently. MOVE ON aligned with the senior friendly hospitals strategy. ASPs are a required organizational practice for hospital accreditation.

- **Resource savings**: HandyAudit decreased the staff time required to audit hand hygiene compliance. The ASP in ICU project decreased antibiotic use, which will save costs. Some of the projects were associated with decreased length of stay; it wasn't clear that this would result in savings for the hospitals, but it is likely to net savings for the broader healthcare system.

Benefits for CAHO and the healthcare system

In addition to the cumulative benefits resulting from improved patient care, the following broader system-level benefits were identified by stakeholders:

- ARTIC is perceived to **strengthen CAHO's relationships** with the MOHLTC and HQO.

- It is also perceived to have **raised the profile of CAHO and of Ontario's research hospitals**. System stakeholders believe that ARTIC demonstrates the practical value of hospital-based research, and the importance of knowledge translation.

- Through the communities of practice, the projects are **building and strengthening relationships across hospitals**. There are more opportunities for people in different

hospitals to share resources and information with one another. Some of these relationships may outlast the ARTIC funding. Over time, the building of these relationships could potentially create a system in which it is easier to spread innovations.

- ARTIC projects are **gathering additional evidence about implementation** of the innovations. The central teams are learning what works and what doesn't in different settings, which should support further spread of these innovations in the future.

- One of the projects, HandyAudit, resulted in a **new commercial venture** that spread the innovation well beyond CAHO hospitals. HandyAudit is now used by 100 hospitals worldwide.

Opportunities for spread outside CAHO hospitals

Key findings:
- There is strong support for the spread the ARTIC projects beyond CAHO hospitals.
- Additional resources and/or coordination will likely be needed to facilitate deliberate spread to other hospitals.

Implications for ARTIC:
- Identify potential partners/sponsors to support a "Phase 2" ARTIC initiative that would spread suitable ARTIC-funded innovations to non-CAHO hospitals.
- If a Phase 2 ARTIC initiative is not feasible, support spread by:
  a) Communicating the benefits of the ARTIC innovations in a compelling way.
  b) Encouraging project teams to prepare and disseminate refined implementation materials that will make it easy to adopt the innovations.
  c) Encouraging project teams to secure resources that would allow them to continue to provide implementation support/coaching to hospitals.

Potential to spread ARTIC projects beyond CAHO hospitals

ARTIC's stakeholders believe there is considerable potential to spread the funded innovations beyond CAHO hospitals. All of the stakeholders strongly support broader spread, and many feel a sense of responsibility to spread successful innovations to Ontario's community hospitals.

> **If MOHLTC is going to fund this program, the expectation should be that this goes far beyond CAHO hospitals.**
>
> - CAHO Council member

> **Some of the non-academic hospitals have an appetite for this. If this [proves] successful, I would hope that it spreads to other hospitals.**
>
> - CAHO P&E member

Some stakeholders also noted that there is potential to spread the innovations to research hospitals outside Ontario, who could further develop and refine the innovations.

Non-CAHO hospitals have expressed interest in several of the ARTIC projects, which suggests that there is potential for broader spread. Indeed, spread has already happened for HandyAudit: over 100 hospitals worldwide are using HandyAudit to monitor their hand hygiene compliance rates. Non-CAHO hospitals are currently participating in iERAS and TDM. The leads of other projects have been contacted by non-CAHO hospitals about adopting these innovations.

Ways of supporting spread of ARTIC projects beyond CAHO hospitals

Although they wanted to see the innovations spread to other hospitals, most of the stakeholders acknowledged that there would be significant barriers, most of which have resource implications. Community based hospitals, which tend to be smaller than research hospitals, have fewer human resources, less infrastructure, and less funding. These hospitals may also have less flexibility (e.g., to allocate a portion of a staff member's time to champion or coordinate the implementation of a new innovation).

In the absence of additional funding, hospitals would need to draw on their core funding to support implementation, and they would need compelling reasons to do so. One way of supporting spread, then, is to **communicate the benefits** of adopting the ARTIC innovations. ARTIC stakeholders provided several ideas:

- Disseminate the evidence gathered about the benefits of the ARTIC projects, showing hospitals that their investment will provide good value-for-money.

- Demonstrate how the innovations can help hospitals meet their external requirements (hospital accreditation, ministry requirements, or commitments under the Senior Friendly Hospitals initiative).

Another way to support spread is to **make it easy** for hospitals to adopt the innovations, for example by encouraging them to "try out" the innovation on a small scale, or by providing ready-to-use materials, step-by-step implementation guidelines, and troubleshooting tips. These implementation supports could be developed and/or refined over the course of the ARTIC funding, and then posted on online portals.

> **Once we show how it can be implemented, it might be easier for smaller hospitals to implement as well**
>
> - ARTIC project team

> **They could result in products, which could be provided and disseminated within other hospitals across Ontario**
>
> - ARTIC Task Force member

Posting the materials will make it easier for hospitals to adopt the innovations, but they may still encounter barriers that derail implementation. Some level of **implementation support/coaching** will be important to support successful uptake on a wide scale. This support is best provided by

individuals who 1) are intimately familiar with the project and 2) understand the realities of Ontario hospitals. The central project teams are ideally suited to providing this type of support[7]. These teams would, however, need to secure resources to fund coordinators and/or coaches.

Stakeholders have reported that there is currently "not much funding" in the system to support the implementation of innovations. One option for supporting spread would be to **launch a "Phase 2" ARTIC initiative**, which would support implementation of past ARTIC projects in Ontario community hospitals. A Phase 2 ARTIC initiative would ideally incorporate all of the elements listed above. Stakeholders noted that CAHO does not have strong connections with the community hospitals, so it would be appropriate to partner with an organization like HQO or the Ontario Hospital Association (OHA).

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[7] Stakeholders also suggested that implementation support could be provided in other ways (e.g., through the LHIN network, or by hospitals that have already implemented the innovation). These options are less ideal, as the individuals will be less knowledgeable about the innovations, they will still need resources to support their time, and they may also require additional coordination.

5   DISCUSSION

Reflecting on the totality of the program, ARTIC appears to be an exceptionally well designed program. It raises awareness and uptake of sound evidence-based innovations, and creates ideal conditions for their successful implementation in CAHO hospitals.

ARTIC was designed to encourage uptake of carefully-selected innovations within CAHO hospitals

The intentional alignment of funded projects with current healthcare priorities has enhanced MOHLTC engagement in ARTIC, increased hospitals' interest in funded projects and made it easier for hospitals to commit the resources required for implementation.

ARTIC is very selective in the projects it chooses to fund, applying a rigorous selection process and widely-accepted selection criteria. Only a small fraction of submissions are accepted as ARTIC projects. This creates a level of prestige for both the broader program and selected innovations. If a project is selected for ARTIC funding, it is perceived to be a worthwhile endeavor. This enhances hospitals' willingness to participate and commit necessary resources.

By leveraging CAHO as a forum, ARTIC brings these carefully-selected projects to the attention of senior hospital leadership. Many hospitals have indicated that they would not have been aware of these projects otherwise. Furthermore, the implementation structures and resources provided through ARTIC make participation (and immediate uptake) more appealing to hospitals.

Finally, by agreeing to participate in an ARTIC project, the hospital CEOs are making a public declaration, among their peers, of their intent to implement the innovation. This public declaration increases the likelihood of follow-through, so the intent to implement does not get sidelined by other emerging opportunities.

ARTIC was designed to create the ideal conditions for implementation of the funded innovations

ARTIC was intentionally designed to support, enhance and accelerate the implementation of new innovations by helping to address barriers and strengthen enablers (i.e., factors that support the uptake of innovation). CAHO's understanding of key implementation factors has been informed by both the knowledge translation/implementation literature and past experience with the ARTIC program.

ARTIC provides a variety of supports that provide sufficient structure to facilitate implementation, while remaining flexible and able to respond to the myriad complexities of project implementation in different settings. These supports make it possible to assess, prevent, and overcome the barriers experienced in different settings and different projects. They also contribute to consistency in quality across projects, improving stakeholder experiences with the program, and enhancing the program's reputation.

By funding only 2 projects in each cycle, ARTIC is able to focus the attention and resources of its staff and of the participating hospitals, so that project implementation actually happens and hospitals are not overwhelmed.

The ARTIC program is continuously evolving as a result of accumulated wisdom about how to support knowledge translation.

Since ARTIC's launch in 2010, CAHO has gained many insights about how to support knowledge translation in Ontario's research hospitals. Much of this learning has resulted from the day-to-day experiences with the funded projects. CAHO's commitment to continuous improvement has put this learning to work and strengthened the ARTIC program year over year.

Conclusions: Considerations for ARTIC going forward

1. It is worthwhile to continue ARTIC as a flexible, multifaceted initiative as a means to accelerate the use of evidence-based practice within CAHO hospitals.

2. ARTIC should not be scaled up beyond two to three funded projects per funding cycle. This will allow the program to continue to be extremely selective, maintaining quality, minimizing burden, and containing program costs.

3. Regardless of whether ARTIC is officially housed within CAHO, it would be advisable to continue to engage CAHO in a meaningful way. There is tremendous value in the credibility these very senior-level hospital personnel bring to the program.

4. ARTIC should continue to be refined on an ongoing basis through critical reflection and incremental improvement, so that it is able to respond to dynamic changes in the system. The suggestions and implications identified throughout this evaluation report should be considered as part of this process.

5. ARTIC has amassed a wealth of knowledge about knowledge translation, going beyond what exists in the published literature. This information would no doubt be extremely valuable to the broader health community. It would be advisable for CAHO to share its accumulated expertise about knowledge translation through publications and/or presentations at provincial and national forums.

6. The spread of ARTIC projects beyond CAHO hospitals has been limited due to the extensive resources that seem to be required for effective implementation (particularly individualized coaching from a central project team with innovation-specific expertise). It could be valuable for CAHO and its partners to consider an additional ARTIC program component to develop and pilot more feasible mechanisms to facilitate spread of past funded innovations beyond the CAHO hospitals. This could provide an opportunity to generate new, innovative models of moving evidence into practice on a wider scale. An initial step may be to convene a think tank made up of KT experts, ARTIC funding recipients, representatives of hospitals who have implemented the innovation, and representatives from community hospitals.

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