

APRIL 2017

Adopting eHealth Solutions: Implementation Strategies

Quick Reference Guide



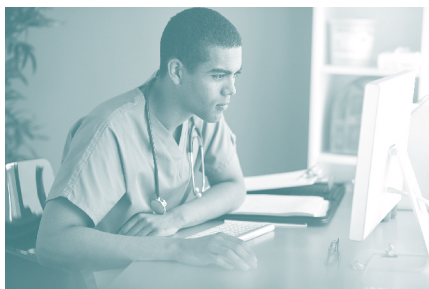
Introduction to the Quick Reference Guide

This Quick Reference Guide was created to support the uptake of the Registered Nurses' Association of Ontario (RNAO) Best Practice Guideline, *Adopting eHealth Solutions: Implementation Strategies*.

This Guideline was developed to enhance the capacity of:

1. Individual health care executives and clinical/non-clinical leaders; nurses and other health professionals in practice, education, administration and informatics; and health care organizations in general to optimize their involvement in the procurement, design, implementation, adoption, and optimization of an eHealth solution.
2. Health care executives and clinical/non-clinical leaders, educators, and administrators at the organization and system levels to effectively identify and address the eHealth education needs of the health care workforce.
3. Government agencies, administrators, and policy-makers to identify and implement relevant evidence-based policies that support health system transformation and nationwide health information exchange by addressing known barriers to eHealth adoption at the national and jurisdictional levels.

The full Guideline is available for free download from the RNAO website at: <http://rnao.ca/bpg/guidelines/ehealth-solutions>.



Purpose

The purpose of this Quick Reference Guide is to provide a brief overview of the Individual/Organization Recommendations that are published in the Guideline. It also includes indicators of success and tools to support the implementation of eHealth solutions.

Scope

The Individual/Organization Recommendations presented in this Guide will have relevance for everyone involved in the implementation of an eHealth solution within a health care organization, regardless of their role or practice setting.

Target Audience

More specifically, this Quick Reference Guide is intended for health care leaders, nurses and other health professionals in practice, education, administration and informatics who are involved in eHealth implementations.

We encourage users of this Quick Reference Guide to refer to the full Guideline for more complete and detailed information about implementation strategies that support successful eHealth adoption.



Definition of Terms

For the purposes of the Guideline and this Quick Reference Guide, the following definitions are used:

- a) “**eHealth**” refers to the use of electronic health information systems in the health care sector.
- b) “**eHealth solutions**” refers to various types of electronic health information systems used across the care continuum to support a variety of functions ranging from administration to health services delivery. Examples of eHealth solutions include (but are not limited to) the following:
 - electronic medical record (EMR) systems used in non-hospital sectors (e.g., primary care, long-term care and home care);
 - hospital information systems and their sub-systems (e.g., laboratory information systems, pharmacy information systems, computerized provider order entry [CPOE], electronic documentation systems, electronic medication administration records [eMAR]);
 - public health information systems; and
 - national or jurisdictional electronic health record (EHR) systems.

NOTE: As used in the Guideline and this Quick Reference Guide, the term “eHealth solutions” does not refer to personal health records, patient portals or remote patient monitoring systems.

- c) “**Person**” refers to individuals who are (or were) recipients of care and their families. An individual’s family includes people they identify as significant in their lives (e.g., parents, caregivers, friends, substitute decision-makers, groups, communities, and populations).

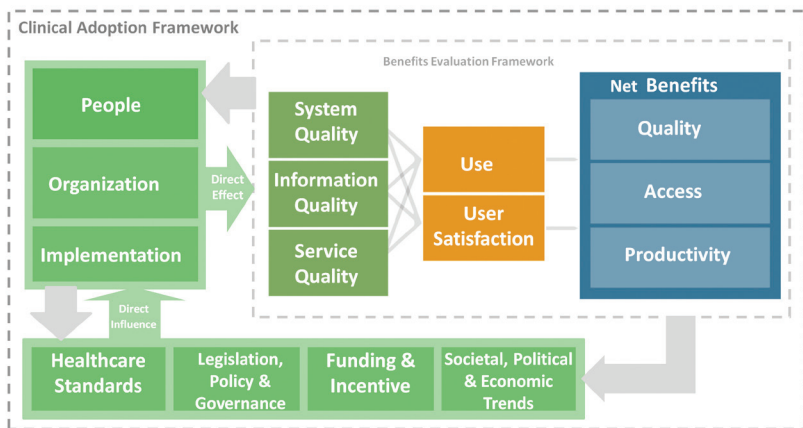
Guideline Frameworks

The following frameworks provide important context for the Individual/Organization recommendations.

Clinical Adoption Framework

The Clinical Adoption Framework (**Figure 1**) provides a conceptual model for understanding the micro, meso, and macro dimensions of the implementation context that influence health professionals' successful adoption of eHealth solutions in different settings.¹

Figure 1: Clinical Adoption Framework



Source: Reprinted with permission from F. Lau, M. Price and K. Keshavjee.¹

At the micro level, factors that influence the clinical adoption of eHealth solutions include the quality of the system, information, and service; use of the system and user satisfaction with it; and net benefits. Contextual factors at the meso level directly influence the adoption of eHealth solutions at the micro level. These contextual factors include the people, the organization,

and the implementation of the technology itself. Environmental factors at the macro level directly influence the degree to which contextual factors at the meso level affect clinical adoption. These environmental factors include health care standards; legislation, policy, and governance; funding and incentives; and societal, political, and economic trends.¹

The Individual/Organization recommendations address the micro and meso dimensions of the implementation context.

eHealth Adoption Maturity Model

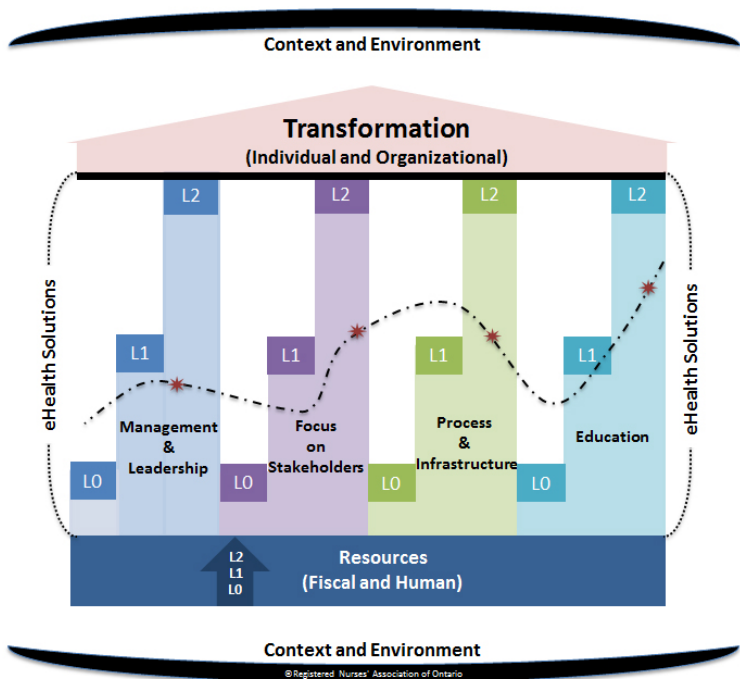
The eHealth Adoption Maturity Model (**Figure 2**) is a conceptual model developed by the expert panel to provide health care leaders, nurses and other health professionals with a visual depiction of eHealth adoption and maturity through the lens of individual and organizational transformation. Each of the Model's seven key elements is briefly described below.

Transformation highlights the changes that occur in individuals and organizations with the introduction of eHealth solutions into health care environments. It delineates characteristics that denote maturity of individual and organizational transformation over time.

Management and Leadership identifies the changes required in the organizational leadership team to enable and support eHealth transformation. It also highlights key attributes of those in management and leadership roles required to advance the maturity of eHealth solutions post implementation.

Focus on Stakeholders accentuates the criticality of stakeholder engagement and a user-centric perspective to the success of eHealth implementations. It provides characteristics to identify maturity in stakeholder transformation.

Figure 2: eHealth Adoption Maturity Model



Process and infrastructure highlights the importance of formal techniques (e.g., change and project management methodologies). It also delineates evidences of organizational maturity in its processes and infrastructures.

Education focuses on the need for all stakeholders to develop discipline- and role-specific informatics competencies. It highlights key dimensions of individual and organizational transformation in eHealth education.

Resources play a vital role in eHealth transformation. This element identifies the changes required in the fiscal and human resources to support eHealth implementation and adoption. It also describes evidences of maturity in these areas.

Context and Environment are pivotal to eHealth transformation. As seen in **Figure 2**, depending on the implementation context, the model elements may not mature at uniform rates, and they may exist at different levels throughout the process of transformation. These levels are categorized along a continuum ranging from Level 0 to Level 2 as follows:

- **Level 0 (Beginning):** individuals or organizations have little experience, knowledge, or operational commitment to eHealth.
- **Level 1 (Intermediate):** individuals or organizations have begun their transformation toward using eHealth to enhance health service delivery and organizational effectiveness.
- **Level 2 (Advanced):** individuals or organizations are fully committed to the use of eHealth as a competitive and foundational driver for their ongoing care delivery.

For more detailed information on each of the model elements and corresponding levels, and their correlation to the recommendations in this Guide, refer to the full Guideline (pp. 23-27; 112-113).

Guideline Development

The recommendations contained in the Guideline were developed collaboratively by an international and interprofessional panel of experts using a rigorous and systematic process. The panel members included health care executives, nurses, and other health professionals from a range of settings (including practice, education, research, and policy). It also included two persons representing recipients of care.

All panel members, apart from the latter, had considerable eHealth expertise. Several had previously been actively involved in implementations that resulted in their organizations attaining Stage 6 or higher on the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM).

The Guideline development process included a systematic review of the peer-reviewed literature and a targeted review of the grey literature to identify the best available evidence. The Guideline recommendations were formulated using the evidence obtained from the literature review. A modified Delphi technique was employed to obtain panel consensus.

For more information on the RNAO expert panel and the Guideline development process, refer to the full Guideline (pp. 13-14; 104-111).

Interpretation of Evidence

Levels of evidence have been assigned to each Guideline recommendation to indicate how well particular sources of evidences are able to eliminate alternate explanations of the phenomena of interest. The higher the level of evidence, the greater the likelihood that the relationships presented between the variables are true. Levels of evidence do not reflect the merit or quality of individual studies.

For the purposes of this Guideline, expert opinions, clinical experiences of and reports from respected authorities are recognized as credible sources of evidence.

Table 1 describes the levels of evidence used in the Guideline and the corresponding sources of evidence.

Table 1: Levels of Evidence

| LEVEL | SOURCE OF EVIDENCE |
|-------|--|
| Ia | Evidence obtained from meta-analysis or systematic reviews of randomized controlled trials, and/or synthesis of multiple studies primarily of quantitative research. |
| Ib | Evidence obtained from at least one randomized controlled trial. |
| IIa | Evidence obtained from at least one well-designed controlled study without randomization. |

| LEVEL | SOURCE OF EVIDENCE |
|-------|--|
| IIb | Evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization. |
| III | Synthesis of multiple studies primarily of qualitative research. |
| IV | Evidence obtained from well-designed non-experimental observational studies, such as analytical studies, descriptive studies, and/or qualitative research. |
| V | Evidence obtained from expert opinion, committee reports, and/or clinical experiences of respected authorities. |

Source: Adapted from Scottish Intercollegiate Guidelines Network (SIGN) and D. Pati.^{2,3}

Individual/Organization Recommendations

RECOMMENDATIONS 1.1 - 1.2:

- 1.1: Health care organizations will ensure visible executive sponsorship throughout all phases of the implementation of the eHealth solution.**
- 1.2: Executive leadership will establish a formalized governance structure with defined roles and responsibilities to guide and support all phases of the implementation and adoption of the eHealth solution, in alignment with the organizational culture, goals, and objectives.**

(Level of Evidence = V)

Indicators of Success:

Structural Indicators

- Executive leadership established a formalized governance structure with roles, responsibilities, and sponsorship to guide and support all phases of the implementation of the eHealth solution.

Process Indicators

- Governance structure established with diverse representation (e.g., interprofessional and cross functional) and clearly delineated roles and responsibilities.

Outcome Indicators

- Governance structure supports successful implementation of the eHealth solution.


TOOLS:

- Model of Clinical Informatics Governance for Nursing:
 - Key roles;
 - Interprofessional partnerships; and
 - Shared governance council structure.
- Generic project governance structure and role alignment.

For more information, refer to the Guideline (pp. 31-32, 114-115).

RECOMMENDATION 1.3:

Executive leadership will assess individual, organizational, and technical readiness for the implementation of an eHealth solution.

(Level of Evidence IV)

Indicators of Success:
Structural Indicators

- Organization implemented policies and procedures to support a comprehensive organizational readiness assessment in the early planning phase.

Process Indicators

- Organization completed a readiness assessment that included individual, organizational, and technical dimensions.
- Organization addressed all gaps identified.

Outcome Indicators

- Organization demonstrated individual, organizational, and technical readiness.



TOOLS:

- Organizational Readiness Assessment Resources:
 - Organizational readiness assessment tool;
 - Health IT attitude assessment tool;
 - Financial assessment tool;
 - IT system inventory tool;
 - Staffing inventory tool; and
 - Organizational change readiness assessment tool.

For more information, refer to the Guideline ([Appendix F](#)).

RECOMMENDATION 1.4:

Project steering committees will establish an interprofessional team including representation from persons who are/were recipients of care to identify and select an eHealth solution to support the organization's strategic vision and plan. A systematic process that encompasses the use of a decision matrix and structured evaluation guide is recommended.

(Level of Evidence V)

Indicators of Success:

Structural Indicators

- Organization implemented policies and procedures that support a rigorous vendor selection process with active involvement of the appropriate individuals (e.g., working group of the executive steering committee and diverse end user groups).

Process Indicators

- Organization identified a diverse team that completed the “Steps in the eHealth Solution Selection Process” (see Tools below).

Outcome Indicators

- The eHealth Solution selected supports the requirements of the organization and the end user groups.



TOOLS:

- Resources to Support the Selection of eHealth Solutions:
 - Steps in the eHealth solution selection process;
 - Sections of a request for information;
 - Major components of a request for proposal (RFP);
 - RFP Template;
 - Vendor reference checking tool;
 - Vendor evaluation matrix tool; and
 - Structured evaluation guide (e.g., HIMSS usability evaluation guides).^{4,5}

For more information, refer to the Guideline ([Appendix G](#)).

RECOMMENDATION 1.5:

Contract negotiation teams will collaborate with the project steering committee to support and inform the licensing agreement negotiations and to ensure that the terms and conditions discussed during the eHealth solution selection process are included in the contract.

(Level of Evidence V)

Indicators of Success:

Structural Indicators

- Organization implemented policies to support contract management, informed by the project steering committee.

Process Indicators

- Contract negotiation was informed by the project steering committee with input from the interprofessional and cross functional eHealth solution selection team, as needed.

Outcome Indicators

- Organization's licensing agreement included all items on the contract checklist and structured evaluation guide.
- Satisfaction with the contract among stakeholders (e.g., senior management, interprofessional and cross-functional contract negotiation team, and vendor).

RECOMMENDATION 1.6-1.11, 1.14:

1.6: Project managers will use formal project management methodology to guide the implementation of the eHealth solution.

(Level of Evidence III)

1.7: Project leads will collaborate with the steering committee to ensure that the right people are in the right place at the right time to lead and support various facets of the implementation of the eHealth solution.

(Level of Evidence V)

1.8: Project leads will collaborate with the steering committee to identify discipline-specific champions at all levels of the organization (representing each stakeholder group impacted) to build awareness of the system, and promote adoption among their peers and across the organization.

(Level of Evidence III)

1.9: Health care organizations will use a formal change management methodology to address the role-specific needs of the individuals as they transition from the present to the future state.

(Level of Evidence IV)

RECOMMENDATION 1.6-1.11, 1.14:

1.10: Project leads will develop a stakeholder management plan early in the planning phase to fully engage all stakeholders for optimal implementation and adoption of the eHealth solution.

(Level of Evidence V)

1.11: Project leads will collaborate with the steering committee to develop and implement a communication management strategy to control the delivery of targeted communication to specific stakeholders using the most effective media at the right times, with built-in channels for feedback. The communication management strategy should be initiated early in the planning phase and updated regularly throughout the project.

(Level of Evidence V)

1.14: Project leads will collaborate with the steering committee to identify key indicators for monitoring and evaluation and use a comprehensive evaluation framework to guide the project evaluation.

(Level of Evidence III)

Indicators of Success:

Structural Indicators

- Organization implemented policies and procedures that supported the use of formal project and change management methodologies.

Process Indicators

- Organization's eHealth solution implementation project was guided by the following:
 - formal project and change management methodologies that included plans for:
 - ◆ stakeholder management; communication management; and
 - ◆ project evaluation.
 - resource allocation plan for all phases of the project to ensure the right people in the right place at the right time.

Outcome Indicators

- Organization achieved all project milestones and goals included in the evaluation framework.



TOOLS:

- Project and Change Management Resources:
- Project management plan template;
- Project charter template;
- Project management best practices;
- Change management frameworks and models;
- Stakeholder management plan template;

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- Stakeholder engagement tools;
- Communication management resources; and
- Project evaluation framework and tools.

For more information, refer to the Guideline ([Appendices I, J, K, L and O](#)).

RECOMMENDATION 1.12:

Health care organizations will incorporate usability processes throughout the implementation and adoption of the eHealth solution to enhance individual and organizational efficiencies, effectiveness, and user satisfaction.

(Level of Evidence V)

Indicators of Success:

Structural Indicators

- Organization implemented usability processes to enhance individual and organizational efficiencies, effectiveness, and user satisfaction.

Process Indicators

- Organization facilitated access to individuals with expertise in usability processes.
- Organization implemented processes to capture usability incidents in their risk management system.

Outcome Indicators

- All usability issues and risks reviewed to identify trends and implement process improvements.

RECOMMENDATION 1.13:

Project leads will develop a comprehensive education and training plan to enable individuals to learn and integrate the new eHealth solution into their daily routine and workflows.

(Level of Evidence V)

Indicators of Success:**Structural Indicators**

- Organization implemented policies and procedures to ensure adequate training is provided for new and existing end users to ensure efficient and effective use of the technology.

Process Indicators

- Project team developed comprehensive education and training plan that included formal evaluation of end user knowledge and skills.

Outcome Indicators

- Percentage of end users who were deemed proficient in role-specific competencies related to the eHealth solution and discipline-specific informatics core competencies following formal evaluation of their knowledge and skills.
- End user satisfaction with the education and training received.



TOOLS:

- Education and Training Resources:
- Competency evaluation instrument that includes role- and discipline-specific informatics competencies;⁶⁻¹⁰
- Training needs assessment;
- Training and course planning matrix; and
- Video highlighting best practices for integrating computers into the health professionals' clinical context.

For more information, refer to the Guideline ([Appendix N](#)).

RECOMMENDATION 1.15:

Health care organizations will have an ongoing post-implementation operational plan that includes data governance structures and processes that support sustainability and continuous optimization of the eHealth solution.

(Level of Evidence V)

Indicators of Success:

Structural Indicators

- Organization implemented policies and procedures to support sustainability and ongoing optimization.

Process Indicators

- Organization developed post-implementation operational plan that included mechanisms that support the following:
 - funding and allocation of resources;
 - changes to regulatory and professional standards; and
 - practice changes and workflows (e.g., clinical, operational, or financial).

Outcome Indicators

- Evaluation metrics confirmed adoption and integration:
 - percentage of end users who perceive that the quality of the system, information, and service is high;
 - percentage of end users who report a high level of satisfaction with the eHealth solution six months after training; and
 - percentage of end users who perceive that the eHealth solution facilitates safe, high-quality care.



TOOLS:

- Resources for Sustainability and Ongoing Optimization:
- Data governance structures; and
- Strategies for optimizing eHealth solutions

For more information, refer to the Guideline ([Appendix P](#)).

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