

Registered Nurses' Association of Ontario – Nursing Best Practice Guidelines Program  
*Advancing Healthcare Leadership and Professional Practice in a Digital Era – 2016*

**Systematic Review Search Strategy – Research Question 1 & 2**

Concurrent with the review of existing guidelines, a systematic review for recent literature relevant to the scope of the guideline was conducted by a health sciences librarian.

**Research Question 1:** What individual factors contribute to high quality digital health systems and their successful adoption?

**Research Question 2:** What organizational factors contribute to high quality digital health systems and their successful adoption?

**Databases Searched:** Cumulative Index to Nursing and Allied Health (CINAHL), Cochrane Systematic Reviews (SR), MEDLINE, and MEDLINE in Process

**Inclusion Criteria:**

- Target Population:
  - Individuals: nurses, inter-professional healthcare teams, and healthcare executives
  - Healthcare organizations
  - Health care systems
- Study Characteristics
  - Timeframe
    - *Research Question 1, Research Question 2:* 10 years [January 2006 – Present (2016)]
    - Seminal articles outside this timeframe (hand searched articles submitted by the panel):
      - Must meet all of the inclusion criteria of the systematic review (except of the date)
      - Article must be “value add” (article addresses a concept that is not already in the included literature)
      - Two Nursing Research Associates (NRA) will screen the article for title and abstract and full-text for relevance (Program Manager will tie-break any discrepancies)

Type of Studies & Search Terms

- All study designs that can be appraised using RNAO research team critical appraisal tools will be included
- Study designs: systematic reviews, meta-analysis, qualitative and quantitative research studies (e.g. mixed methods studies, randomized controlled trials, controlled clinical trials, quasi-experimental, cohort, case-control, and cross-sectional studies)

Other Characteristics

- Published in English
- Accessible for retrieval
- Across health settings/sectors
- Within the scope of inter-professional practice

- Primary focus of article is on topic area
- Targeted grey literature/unpublished search: dissertations, guidelines/best practices on health IT implementations/adoption, models/frameworks on health IT implementations/adoption, papers on success factors/lessons learned, textbooks on health IT implementations/adoption, especially where factors are supported by research

**Exclusion Criteria:**

- Non-English studies
- Unrelated topic
- Articles that do meet the inclusion criteria
- Targeted grey literature search will be conducted separately from the formal systematic review process, thus grey literature will be flagged, but excluded: dissertations, commentaries, editorials, conference abstracts, case studies, articles lacking study methodology.

**Search Terms**

Below are condensed search strategies used for each research question. Comparable terms were used in all other databases searched.

Digital Health System		High Quality Digital Health Systems and Successful Adoption
OR		OR
Health information systems Hospital information systems Medical informatics Nursing informatics Computerized medical records systems Electronic health records Medical order entry systems Clinical information system Digital health eHealth Electronic medical record Electronic patient record Acronyms: EHR, EMR, EPR, CPOE	A N D	Attitude to Computers/ workflow/ Work Simplification/ Efficiency, Organizational/ Personal Satisfaction/ (attitude adj2 computer?).mp. workflow?.mp. (work* adj2 simpl*).mp. efficien*.mp. productivit*.mp. satisf*.mp. adopt*.mp. utiliz*.mp. utilis*.mp. us?abilit*.mp. acceptance.mp. (use?? adj2 pattern*).mp. (intent* adj2 "use").mp. sustainabilit*.mp. sustain-abilit*.mp. participation?.mp. factor?.mp. success*.mp.

## Systematic Review Search Strategy – Research Question 3

**Research Question 3:** What education and training do individuals/organizations need to lead and support high quality digital health system implementations and adoption?

**Databases Searched:** Cumulative Index to Nursing and Allied Health (CINAHL), Education Resource Information Centre (ERIC), and MEDLINE

### Inclusion Criteria:

- Target Population:
  - Individuals: nurses, inter-professional healthcare teams, and healthcare executives
  - Healthcare organizations
  - Health care systems
  
- Study Characteristics
  - Timeframe
    - *Research Question 3:* 5 years [January 2011 – 2016]
    - Seminal articles outside this timeframe (hand searched articles submitted by the panel):
      - Must meet all of the inclusion criteria of the systematic review (except of the date)
      - Article must be “value add” (article addresses a concept that is not already in the included literature)
      - Two Nursing Research Associates (NRA) will screen the article for title and abstract and full-text for relevance (Program Manager will tie-break any discrepancies)

### Type of Studies & Search Terms

- All study designs that can be appraised using RNAO research team critical appraisal tools will be included
- Study designs: systematic reviews, meta-analysis, qualitative and quantitative research studies (e.g. mixed methods studies, randomized controlled trials, controlled clinical trials, quasi-experimental, cohort, case-control, and cross-sectional studies)

### Other Characteristics

- Published in English
- Accessible for retrieval
- Across health settings/sectors
- Within the scope of inter-professional practice
- Primary focus of article is on topic area
- Targeted grey literature/unpublished search: dissertations, guidelines/best practices on health IT implementations/adoption, models/frameworks on health IT implementations/adoption, papers on success factors/lessons learned, textbooks on health IT implementations/adoption, especially where factors are supported by research

**Exclusion Criteria:**

- Non-English studies
- Unrelated topic
- Articles that do meet the inclusion criteria
- Targeted grey literature search will be conducted separately from the formal systematic review process, thus grey literature will be flagged, but excluded: dissertations, commentaries, editorials, conference abstracts, case studies, articles lacking study methodology.

**Search Terms**

Below are condensed search strategies used for each research question. Comparable terms were used in all other databases searched.

Education and Training		Individuals or Organizations		Digital Health System
OR		OR		OR
Education Training Teaching Information Instruction In-service training Professional education Continuing education Curriculum Curriculum resources Curriculum support In-service Workshop Professional Development Mentorship Orientation E-learning Simulation Competence Knowledge Skills Abilities Education, Medical Education, Inter-professional  <b>MEDLINE MeSH:</b> Education, Nursing Education, Professional/ Education, Continuing/ Education, Nursing, Continuing/ Education, Professional, Retraining/ Education, Distance/ Education Department, Hospital/ ?Education, Public Health Professional/ Staff Development/ Preceptorship/	A N D	<i>Individuals:</i> Nurses Registered nurses Registered practical nurses Nurse practitioners Advanced practice nurse Clinical nurse specialist Nursing students Leaders Chief Nursing Executive Chief Nursing Officer Administrator – administration Executives Healthcare executives  Regulated healthcare professionals Allied health personnel Pharmacists Physicians Physiotherapist Occupational therapist Social worker Dietician Respiratory therapist Speech language pathologist  Unregulated healthcare providers Personal support workers  Preceptors Nurse educators Resource nurses  <i>Organizations:</i> Hospitals Long term care homes Primary care	A N D	Health information systems Hospital information systems Medical informatics Nursing informatics Computerized medical records systems Electronic health records Medical order entry systems Clinical information system Digital health eHealth Electronic medical record Electronic patient record Acronyms: EHR, EMR, EPR, CPOE

Advancing Healthcare Leadership and Professional Practice in a Digital Era

<p>exp Teaching/  exp Curriculum/  educat*.mp.  ((profession* or staff?) adj2  develop*).mp.  train*.mp.  preceptor*.mp.  teaching*.mp.  curricul*.mp.</p>	<p>Ambulatory care  Public health  Community care programs  Home care  Academic institutions  Health facilities  Health care organizations  Home health care  Clinic  Doctor's office  Physician's office  Community health</p>		
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## Systematic Review Search Strategy – Research Question 4

**Research Question 4:** What system level factors contribute to high quality technology-enabled health service delivery and successful health systems transformation?

**Databases Searched:** Cumulative Index to Nursing and Allied Health (CINAHL), Education Resource Information Centre (ERIC), and MEDLINE

### Inclusion Criteria:

- Target Population:
  - Individuals: nurses, inter-professional healthcare teams, and healthcare executives
  - Healthcare organizations
  - Health care systems
  
- Study Characteristics
  - Timeframe
    - *Research Question 4:* 5 years [January 2011 – 2016]
    - Seminal articles outside this timeframe (hand searched articles submitted by the panel):
      - Must meet all of the inclusion criteria of the systematic review (except of the date)
      - Article must be “value add” (article addresses a concept that is not already in the included literature)
      - Two Nursing Research Associates (NRA) will screen the article for title and abstract and full-text for relevance (Program Manager will tie-break any discrepancies)

### Type of Studies & Search Terms

- All study designs that can be appraised using RNAO research team critical appraisal tools will be included
- Study designs: systematic reviews, meta-analysis, qualitative and quantitative research studies (e.g. mixed methods studies, randomized controlled trials, controlled clinical trials, quasi-experimental, cohort, case-control, and cross-sectional studies)

### Other Characteristics

- Published in English
- Accessible for retrieval
- Across health settings/sectors
- Within the scope of inter-professional practice
- Primary focus of article is on topic area
- Targeted grey literature/unpublished search: dissertations, guidelines/best practices on health IT implementations/adoption, models/frameworks on health IT implementations/adoption, papers on success factors/lessons learned, textbooks on health IT implementations/adoption, especially where factors are supported by research

**Exclusion Criteria:**

- Non-English studies
- Unrelated topic
- Articles that do meet the inclusion criteria
- Targeted grey literature search will be conducted separately from the formal systematic review process, thus grey literature will be flagged, but excluded: dissertations, commentaries, editorials, conference abstracts, case studies, articles lacking study methodology.

**Search Terms**

Below are condensed search strategies used for each research question. Comparable terms were used in all other databases searched.

System Factors		Technology		Health Service Delivery Health System Transformation
OR		OR		OR
Structures Processes Roles  Legislation Policy Policies Governance Health care standards Information management standards Professional practice standards Regulations Accreditation standards Funding Incentives Professional associations Interoperability standards Privacy and security Health information protection  Policy and procedures Supports for ongoing training and education Quality improvement indicators/metrics Monitoring and evaluation parameters Government programs/initiatives Facilitating access to resources Standardized use of evidence based practices (e.g. standards of practice, care pathways, guidelines) Leadership Strategic vision, mission, values Organizational Culture	A N D	Digital health Digitization Digital transformation eHealth Electronic health record Health information system Health information technology Healthcare information technology Information technology IT infrastructure IT strategy	A N D	Health care system Health services Health system transformation System changes System transformation Comparative health systems Healthcare transformation  <b>MEDLINE MeSH terms:</b> Delivery of Health Care Health services Health care reform

<p>Organizational performance                  Organizational innovation                  Organizational change                  Structural characteristics</p> <p>Health Policy                  Health Care Reform                  Policy Making                  Public Policy                  Regulation                  Government Funding</p> <p>Quality of health care                  Organizational efficiency                  Organizational policy                  Policymaking                  Engagement                  Systems theory                  Social processes                  Contextual factors                  Key mechanisms                  Standards                  Societal trends                  Political trends                  Economic trends                  Theoretical model                  Frameworks                  Systems readiness</p>			
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**Hand Search**

Panel members were asked to review personal libraries to identify key articles not found through the above search strategies. Articles identified by panel members were included in the search results if two nursing research associates independently determined the articles had not been identified by the literature search and met the inclusion criteria.