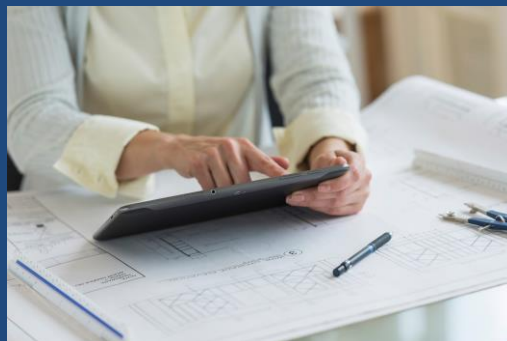# Supplement

to the
IPAC Program Standard
and
IPAC Program Audit Tool (PAT©)

Processes used by IPAC Canada to develop the
IPAC Program Standard and IPAC Program Audit Tool (PAT©)

April 2017

TABLE OF CONTENTS

1. INTRODUCTION TO THE SUPPLEMENT

The *Infection Prevention and Control (IPAC) Program Standard* defines the expectations for IPAC programs in Canada and for infection control professionals (ICPs). This standard has been developed for use in Canadian health care organizations with input from experts across Canada, including infection prevention and control professionals, infectious disease physicians, occupational health professionals and public health professionals.

The *IPAC Program Standard* is based on national and provincial standards, guidelines and best practices (e.g., Canadian Standards Association, Public Health Agency of Canada, Ontario's Provincial Infectious Diseases Advisory Committee - PIDAC), recommendations from international bodies such as the World Health Organization and the Centers for Disease Control and Epidemiology (CDC) and the scientific literature. The *IPAC Program Standard* has undergone rigorous review from infection prevention and control authorities across the continuum of care, including IPAC Canada's Standards and Guidelines Committee and Programs and Projects Committee.

The *IPAC Program Standard* will be revised based on trends in health care and IPAC following extensive consultation with IPAC experts in a variety of practice settings. The standard has been endorsed by the Canadian Patient Safety Institute (CPSI) and the Canadian Standards Association (CSA) and is aligned with the IPAC requirements of Accreditation Canada.

This supplement provides transparency documentation on the development process for the standard and the *IPAC Program Audit Tool*, including literature search strategies, stakeholder review processes and the process for risk grading of standards for auditing purposes.

2. THE PAT© WORKING GROUP

A proposal for a national IPAC program audit tool was approved by the IPAC Canada Board of Directors in November, 2012. The first meeting to discuss the development of the project was held on January 4, 2013 and the first meeting of the working group was held on April 11, 2013. The last meeting of this group was May 11, 2016. A total of 38 meetings (57 hours) were attended by the working group, and an additional 35 meetings (70 hours) were logged by the co-chairs. Many additional hours were spent by the working group outside of meetings researching the scientific literature and working on assigned tasks.

Members of the PAT working group include those with IPAC expertise in a broad range of disciplines and health care settings, representing most of the provinces in Canada. Members were assigned "homework" and expected to provide reports and results of their work at meetings. This project would not have moved forward without the hard work of the members of the working group.

Members of the PAT© Working Group are listed in Appendix A.

3. DEVELOPMENT PROCESS FOR THE IPAC PROGRAM STANDARD

The IPAC Program Standard has been planned, developed and evaluated through a defined and rigorous process that includes a systematic review of the scientific literature, peer consultation and an extensive review process. The standards are clear, valid, relevant and can be interpreted consistently, facilitating quality improvement when applied in a health care organization.

The following specific processes are highlighted in this supplement.

A. Consultation with CADTH

The members of the PAT© working group attended a workshop with the Canadian Agency for Drugs and Technologies in Health (CADTH) on July 22, 2015, to define an approach for critical appraisal of the evidence when reviewing the literature and the use of a standard hierarchy of evidence for grading resource materials and studies. When there is no literature to support a standard, CADTH agreed that it is acceptable to note that the standard is an Accreditation Canada requirement or a CSA standard.

The work with CADTH led directly to the development of this supplement, as the working group felt it was important to be transparent with the process for development of the documents.

B. Development of IPAC Program Standard

The *IPAC Canada Program Standard* is based on current evidence, research and expert opinion and is consistent with national standards (e.g., Canadian Standards Association), Accreditation Canada requirements and recommendations from the Canadian Patient Safety Institute (CPSI) and provincial health bodies. It was developed by a multidisciplinary working group and reviewed by peers and experts in the field of infection prevention and control and infectious diseases.

The *IPAC Canada Program Standard* is subject to review within three to five years from the date of publication.

C. Literature Search Methodology

The following methodology was used to review the scientific literature generated from the overarching topic, "*Auditing infection prevention and control programs in health care facilities*":

- A working table of contents was developed by the PAT© Working Group to encompass all elements that were deemed to be required for a successful IPAC program.
- Each working group member was assigned to one or more of these elements.
- The titles and abstracts of all studies identified by the search strategy were then reviewed by members of the PAT© Working Group for relevance and evidence to support the inclusion of their assigned elements.
- Each member presented his/her reviews to the committee at regular working sessions, to confirm relevance and identify gaps in the literature.

During this process, it became clear that many of the elements that were deemed essential for IPAC programs were not supported by robust studies or evidence. The decision was made to use the literature to support statements made in the text of the documents, but to only define standards that were supported by evidence and/or by national and provincial bodies and experts.

Research Questions

The following questions were applied to specific targeted areas:

1. **What is the scope of infection prevention and control programs in health care?**

   - Is the IPAC program integral to the structure of the organization and consistently applied across the organization?
   - How does the IPAC program affect the organization?
   - How does the organization affect the IPAC program?

- Is IPAC incorporated into all committee meetings?
- Is IPAC incorporated into all policy manuals and procedures?

2. **Which IPAC measures influence patient or organizational outcomes?**

- Weighting audit elements or score
  - How is a weight assigned to audit criteria/elements based on whether a deficiency will result in high or low risk for infection or other harm?
  - What is the relative importance of outcomes if the IPAC audit element is not met?
- What are the health risks/benefits related to effective IPAC interventions/deficiencies?
- What are the IPAC measures that reduce costs to the health system?
- What are the IPAC measures that reduce morbidity and mortality?

3. **How does IPAC organizational culture change and how are IPAC practices influenced with the use of IPAC role models and champions? Include keywords:**

- role model/role modelling
- champions
- opinion leaders/thought leaders
- internal responsibility system
- influencing staff motivation
- influencing infection prevention and control practices
- changing organizational culture

Databases Used:

- Grey literature
- MEDLINE
- Embase
- CINAHL

Exclusion Criteria:

- Date of publication: last 10 years
- Language of publication: English
- Study type: exclude letters, commentaries, editorials, and news items

Search strategies and results are detailed in Appendix B.

4. DEVELOPMENT PROCESS FOR THE IPAC PROGRAM AUDIT TOOL (PAT©)

The *IPAC Program Audit Tool (PAT©)* has been developed to audit the standards described in the *IPAC Program Standard*. The PAT© includes two components:

- *Auditing the IPAC Program*, which defines the full audit process; and
- the *PAT© Auditor Workbook*.

The following specific processes are highlighted in this supplement.

A. Development of Auditing Annex

Auditing the IPAC Program is an informational standalone annex detailing the procedures that must be used to carry out a successful audit of an IPAC program. It is based on current epidemiological

practice for process surveillance and is consistent with Accreditation Canada requirements and recommendations from the International Society for Quality in Health Care (ISQua). This document was developed by a multidisciplinary working group and reviewed by peers and experts in the field of infection prevention and control and epidemiology.

Auditing the IPAC Program is subject to review within three to five years from the date of publication.

B. Development of IPAC Program Audit Tool (PAT©) / PAT© Workbook

The PAT© is an audit tool for auditing a health care organization's IPAC program, based on the IPAC program standards that have been published by IPAC Canada. The audit tool was developed by the PAT© working group and condensed into a standalone workbook for the convenience of the auditor.

The PAT© auditor workbook is unique and is based on established audit practice.[1][2,3] The auditor workbook has undergone field testing in acute care facilities, community hospitals and long-term care.

The *IPAC Program Audit Tool* is subject to review within three to five years from the date of publication.

C. Risk Grading of IPAC Program Standards

Risks are threats or negative outcomes that can be expected to occur if a particular procedure or practice is not performed or is performed incorrectly. When developing IPAC program audit criteria, risk answers the question, "*What/who is harmed by a deficiency if the standard is not met?*"

Grading risk factors is a subjective process.[4] Risk grades are allocated to the chosen risk factors based on an evaluation of the consequences that the risk factor has on clients/patients/residents, staff or the organization, using a sliding scale (e.g., low, medium, high). This scale represents the strength of the risk factor in the area or department being audited.

Judgement must be used to determine the risk grade that a risk factor should have in relation to other risk factors. Assigning a risk grade can be done by the auditor or by a group using a consensus tool, such as the Delphi Technique.[5] The same grading might not be applicable to a particular risk factor in all audited areas. For example, environmental cleaning within the operating room would carry a higher weight than would environmental cleaning in office spaces.

The IPAC Canada PAT© working group has graded each of the IPAC program standards for their risk likelihood (i.e., the **likelihood** of the risk occurring if the standard is not met) and impact (i.e., the potential **impact** of the risk if the standard is not met), using the definitions in Tables 1 and 2.

Likelihood Definitions

IPAC standards are graded as to the likelihood or probability of an IPAC-related risk occurring as a result of a standard not being met. Points are awarded from one to four, as indicated in Table 1.

Table 1: Likelihood or probability of an IPAC-related risk occurring if an IPAC standard is not met

UNLIKELY OCCURRENCE (1 POINT) (i.e., "*Bad things won't happen*")

If the IPAC standard is not met, it is UNLIKELY that there will be an IPAC risk (i.e., <10% chance of occurring in the next 12 months unless circumstances change).

POSSIBLE OCCURRENCE (2 POINTS) (i.e., "*Bad things could possibly happen*")

If the IPAC standard is not met, it is POSSIBLE that there will be an IPAC risk (i.e., 10-50% chance of occurring in the next 12 months unless circumstances change).

LIKELY OCCURRENCE (3 POINTS) (i.e., "*Bad things are likely to happen*")

If the IPAC standard is not met, it is LIKELY that there will be an IPAC risk (i.e., 50 - 90% chance of occurring in the next 12 months unless circumstances change).

ALMOST CERTAIN OCCURENCE (4 POINTS) (i.e., "*Bad things will happen*")

If the IPAC standard is not met, it is ALMOST CERTAIN that there will be an IPAC risk (i.e., >90% chance of occurring in next 12 months unless circumstances change).

Impact Definitions

IPAC standards are further graded as to the impact on patients, staff and/or the organization as a result of a standard not being met. Points are awarded from one to four as indicated in Table 2.

Table 2: Impact on patients, staff and/or the organization if an IPAC standard is not met

MINOR IMPACT (1 POINT)

If the IPAC standard is not met, there will be a MINOR IMPACT to patients, staff and/or the organization, manifest by one or more of the following:

- superficial infections increased in number, severity or over time (from the usual pattern)
- minor impact on quality of care to patients
- temporary illness or minor injuries to staff that does not require leave of absence
- inefficiencies in the delivery of programs or services having negligible or no direct impact on client/patient/resident care
- financial losses are minimal and easily absorbed
- minor environmental damage with limited clean-up required
- stakeholder relations have been adversely impacted but can be restored through discussions
- limited loss of physical assets

MODERATE IMPACT (2 POINTS)

If the IPAC standard is not met, there will be a MODERATE IMPACT to pat**ients, staff and/or the organization, manifest by one or more of the following:**

- deep or organ space infections substantially increased in number, severity or over time (from the usual pattern)

- an infectious disease outbreak affecting small numbers of patients and staff

- a situation with the potential for life-altering outcome to patients or staff

- a temporary impact on quality of care to patients that is potentially harmful

- injuries or health problems to staff requiring short term leave of absences

- moderate disruption in the delivery of essential services

- moderate financial losses in the delivery of health care services

- moderate environmental damage with some clean-up required but no permanent damage

- threat of lawsuit due to non-compliance with legislation, regulations, contractual agreements or organizational policies

- some loss of public trust/ unfavorable media attention/ criticism by external review agencies

- loss of significant but replaceable physical assets (e.g., standard medical equipment)

MAJOR IMPACT (3 POINTS)

If the IPAC standard is not met, there will be a MAJOR IMPACT to pat**ients, staff and/or the organization, manifest by one or more of the following:**

- a life-altering outcome in a patient or staff

- an infectious disease outbreak affecting large numbers of patients and staff

- a sustained impact on quality of care to patients that is harmful

- environmental contamination involving a high-risk area or population

- a significant disruption in the delivery of essential services

- a breach of Canadian, provincial or regional standards of practice or policies

- higher health care costs that are unexpected and have a significant impact on the delivery of health care services

- environmental damage (e.g., biohazardous material spill) requiring extensive clean-up and resulting in some permanent damage)

- significant damage to reputation and credibility (i.e., public confidence) of the organization

- loss of significant physical assets with some service disruption

EXTREME IMPACT (4 POINTS)

If the IPAC standard is not met, there will be an EXTREME IMPACT to pat**ients, staff and/or the organization, manifest by one or more of the following:**

- patient or staff death, permanent disability or chronic condition
- large/widespread environmental contamination or exposure
- significant impact on quality of care and/or safety to patients
- closure of facility(s), program(s) or service(s)
- significant financial losses or constraints compromising the organization's ability to meet its goals
- loss of critical assets (e.g., specialized medical equipment) for an extended period
- legal action relating to death or serious sequelae
- irreparable damage to reputation and credibility of the organization
- strong criticism by external review agencies

D. Using a Risk Matrix to Assign a Risk Weight to each IPAC Program Standard

Because risk is difficult to measure directly, combining a set of risk factors can effectively result in better conceptualization of a particular risk, allowing it to be more easily measured through the use of a risk matrix. For example, using the information in Tables 1 and 2, the total risk value associated with a deficiency in an IPAC standard is equal to the sum of the LIKELIHOOD and IMPACT points assigned to the standard. This value can then be evaluated with the help of a quantitative matrix (Table 3).[6]

Table 3: Scoring IPAC risk based on likelihood and impact of infection risk

LIKELIHOOD of occurrence of deficiency	IMPACT of deficiency			
	Minor (1)	Moderate (2)	Major (3)	Extreme (4)
Almost Certain (4)	HIGH RISK (5)	EXTREME RISK (6)	CRUCIAL RISK (7)	CRITICAL RISK (8)
Likely (3)	MODERATE RISK (4)	HIGH RISK (5)	EXTREME RISK (6)	CRUCIAL RISK (7)
Possible (2)	LOW RISK (3)	MODERATE RISK (4)	HIGH RISK (5)	EXTREME RISK (6)
Unlikely (1)	NEGLIGIBLE RISK (2)	LOW RISK (3)	MODERATE RISK (4)	HIGH RISK (5)

Using the matrix, infection risk can be allocated to one of six categories: Negligible, Low, Moderate, High, Extreme, Crucial and Critical. The probability of risk occurrence if an audit standard is not met and the impact of the risk on the individual/organization (from the risk grading) are the two parameters used for placing the risk in the matrix categories. For example, if a risk likelihood is "POSSIBLE" (probability value = 2 points) but it has an "EXTREME" impact (impact value = 4 points), the resulting risk can be categorized as 'EXTREME' (total 2 + 4 = 6 points). This is termed the "risk weight" of the standard.

The IPAC Canada PAT© working group has assigned a risk weight value to each of the IPAC program standards. These weight values are used when scoring the audit tool and can be used to help prioritize action plans for the organization.

E. Validation and Verification Exercise

Validation is the determination that evidence exists to verify that the audit tool criterion/standard has been met. Audit evidence (i.e., records, statements of fact or other information) is used by the auditor to validate that an IPAC program standard has been met.

A validation and verification exercise was carried out by members of the PAT© Working Group, to develop evidence for the auditor to ensure that a standard was met. This evidence included:

- **Document Review:** A suggested list of documents that might be reviewed, as well as the type of information the auditor should look for in those documents to prove that a standard was met, were developed for each standard.

- **Staff Interviews:** Suggestions as to which staff should be questioned, as well as the provision of sample questions that might be asked to prove that a standard was met, were developed for those standards for which staff interviews were considered to be necessary.

- **Direct Observation:** In some instances, proof that a standard was met could best be determined by observing practice. In these cases, suggestions were made regarding which staff should be observed and what an auditor might be looking for when observing practice.

F. Consensus

The PAT© working group assigned risk weights and carried out validation and verification of standards using a consensus model.

When assigning risk weights to standards, each member of the working group independently assigned "likelihood" and "impact" values to each standard to develop a risk weight, with the rationale for each. At working group meetings, the assigned weights were reviewed and there was group discussion when there was disagreement on the values chosen, which often resolved the issue. Where 100% consensus was not achieved, the average of the disputed values was chosen.

Consensus was also part of the validation/verification exercise. Where recommendations were not unanimous, differences of opinion were recorded, discussions took place and solutions were found and accepted. Often, wording changes sufficed to achieve consensus. Occasionally, a recommendation was discarded when there was excessive divergence of opinion that could not be resolved.

G. Review Process

The *IPAC Program Standard*, *Auditing the IPAC Program* and the *PAT© Auditor Workbook* were extensively reviewed at several points during their development, prior to publication:

a) Review by IPAC Canada Board

The IPAC Canada Board reviewed all documents at several stages during the development phases, over a period of two years. The final versions were approved by the Board in September, 2016.

b) Review by Stakeholders

Opportunity for feedback on the quality and content of the *IPAC Program Standard* was offered to external stakeholders before its release. Revisions to the document were made based on that feedback. A full list of reviewers may be found in Appendix A.

c) Field Testing of Workbook and PAT©

The PAT© was trialed by infection control professionals in eight health care organizations across Canada, who conducted three designated audits using the *PAT© Auditor Workbook* and associated forms to develop action plans for improvement for their organizations. Revisions to the PAT© were then made based on feedback received. A full list of field testers may be found in Appendix A.

Results of PAT© Field Testing

The following is a summary of responses from those who trialed the *PAT© Auditor Workbook*:

1. The Workbook was easy to use in auditing selected IPAC Program standards (Strongly agree = 75%, Agree = 25%).

2. The introductory content of the Workbook is logically organized to assist the auditor in understanding the auditing process and the steps in conducting an audit (Strongly agree = 63%, Agree = 37%).

3. Instructions for using the Workbook are clear and easy to understand (Strongly agree = 37%, Agree = 63%).

4. Instructions for scoring are clear and easy to understand (Strongly agree = 50%, Agree = 37%, Disagree = 13%).

5. The Workbook provides easy to use templates for documenting audit results (Strongly agree = 50%, Agree = 37%, Strongly disagree = 13%).

6. The suggested documents for review and sample evidence statements provided in the Workbook for evaluating **documentation** evidence were appropriate and useful (Strongly agree = 50%, Agree = 50%).

7. The suggested interview question(s) and responses provided in the Workbook for evaluating **interview** evidence was appropriate and useful (Strongly agree = 62.5%, Agree = 12.5%, Disagree = 25%).

8. The suggested observable evidence provided in the Workbook for evaluating **observation** evidence was appropriate and useful (Strongly agree = 63%, Agree = 37%).

9. Standards are weighted according to their potential risk to individuals or the organization if they are not met. From the forms provided, is it clear how to develop action plans and priorities based on these risks? (Strongly agree = 37%, Agree = 37%, Disagree = 13%, No opinion = 13%).

Testamonials

Some comments from those who field tested the *PAT$^©$ Auditor Workbook*:

- *This has been an awesome exercise for me and I hope/expect to make good use of this in the future.*
- *It certainly gave me insight on how to do a proper audit.*
- *Did receive some interesting answers from staff while performing interviews.*
- *This audit is all inclusive, detailed and does not leave any stone un-turned.*
- *Has improved with accreditation of affiliates.*
- *The PAT$^©$ was so useful in auditing our organization's Infection Control program!*

5. CONFLICT OF INTEREST STATEMENTS/DISCLAIMERS

The *IPAC Program Standard* and *IPAC Program Audit Tool (PAT$^©$)* was funded by IPAC Canada. Members of the PAT$^©$ Working Group have declared no competing interest in relation to the guideline. It was incumbent upon each member to declare any interests or connections with relevant commercial enterprises if their personal situation changed.

APPENDIX A: PEER REVIEW

The following groups and individuals reviewed the *IPAC Program Standard* and provided feedback:

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APPENDIX B: DETAILED LITERATURE SEARCH STRATEGY

Auditing infection prevention and control programs in health care facilities

a. A literature search of the grey literature (web search) was performed using the following search strategy:

(infection-control OR infection-prevention) audit -site:www.ncbi.nlm.nih.gov

The first 200 Google search results retrieved by this search string were reviewed.

b. A literature search of the CINAHL database was performed using the following search strategy:

#	Query	Results
S1	(MM "Infection Control+") OR (MM "Bacterial Infections/PC") OR (MM "Cross Infection/PC") OR (MM "Catheter-Related Infections/PC") OR (MM "Pneumonia, Ventilator-Associated/PC") OR (MM "Sterilization and Disinfection+") OR (MM "Equipment Contamination/PC") OR (MM "Equipment Reuse") OR (MM "Infection/PC") OR (MM "Urinary Tract Infections/PC") OR (MM "Communicable Diseases/PC") OR (MM "Wound Infection+/PC") OR (MM "Handwashing")	29,289
S2	(MH "Audit") OR (MH "Nursing Audit") OR (MH "Quality Improvement/MT/ST/SN/AM/EV/TD") OR (MH "Evaluation and Quality Improvement Program/MT/ST/SN/AM/EV/TD") OR (MH "Quality Management, Organizational/MT/ST/SN/AM/EV/TD") OR (MH "Quality of Health Care/MT/ST/SN/AM/EV/TD") OR (MH "Quality Assessment/MT/ST/SN/AM/EV/TD") OR (MH "Quality Assurance/MT/ST/SN/AM/EV/TD") OR (MH "Program Evaluation/MT/ST/SN/AM/EV/TD") OR (MH "Process Assessment (Health Care)/MT/ST/SN/AM/EV/TD") OR (MH "Outcome Assessment/MT/ST/SN/AM/EV/TD") OR (MH "Accreditation/MT/ST/SN/AM/EV/TD") OR (MH "Clinical Indicators/MT/ST/SN/AM/EV/TD") OR (MH "Benchmarking/MT/ST/SN/AM/EV/TD") OR (MH "Guideline Adherence/MT/ST/SN/AM/EV/TD")	21,702
S3	S1 AND S2 Limiters - Published Date from: 20000101-20131231; English Language; Exclude MEDLINE records	155

c. A literature search of the MEDLINE database was performed using the following search strategies:

i. Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present

#	Searches	Results
1	exp *Infection Control/ or *Bacterial Infections/pc or *Catheter-Related Infections/pc or *Communicable Diseases/pc or *Cross Infection/pc or *Disinfection/ or *Equipment Contamination/pc or *Equipment Reuse/ or *exp Wound Infection/pc or *Infection Control Practitioners/ or *Infection/pc or *Pneumonia, Ventilator-Associated/pc or *Sterilization/ or *Urinary Tract Infections/pc or exp *Hand Hygiene/	42533
2	exp *Clinical Audit/ or exp *Infection control/standards or exp *Program Evaluation/ or *"Outcome and Process Assessment (Health Care)"/ or *"Outcome Assessment (Health	116844

#	Searches	Results
	Care)"/ or *"Peer Review, Health Care"/ or *"Process Assessment (Health Care)"/ or *"Quality Assurance, Health Care"/ or *"Quality Indicators, Health Care"/ or *"Quality of Health Care"/ or *Accreditation/ or *Benchmarking/ or *Guideline Adherence/ or *Health Care Evaluation Mechanisms/ or *Infection Control Practitioners/standards or *Professional Review Organizations/ or *Program Evaluation/ or *Quality Assurance, Health Care/ or *Quality Improvement/ or *Quality Indicators, Health Care/ or *Total Quality Management/	
3	1 and 2	1279
4	3 not (exp Africa/ or exp Asia/ or exp Caribbean Region/ or exp Central America/ or exp Gulf of Mexico/ or exp Latin America/ or exp South America/ or exp Europe, Eastern/)	1159
5	((infection adj2 prevent$) or (infection adj2 control$) or cross infection$ or nosocomial or hospital acquired or (infection adj2 (health$ adj2 associated)) or (hand$ adj2 (wash$ or disinfect$ or clean$ or hygiene or saniti$)) or ((surface$ or equipment$ or environment$ or instrument$) adj2 (contaminat$ or clean$ or steriliz$ or sterilis$ or disinfect$)) or antisepsis$ or asepsis$ or PAT©ient isolation or quarantin$).ti. or ((infection adj2 prevent$) or (infection adj2 control$) or cross infection$ or nosocomial or hospital acquired or (infection adj2 (health$ adj2 associated)) or (hand$ adj2 (wash$ or disinfect$ or clean$ or hygiene or saniti$)) or ((surface$ or equipment$ or environment$ or instrument$) adj2 (contaminat$ or clean$ or steriliz$ or sterilis$ or disinfect$)) or antisepsis$ or asepsis$ or PAT©ient isolation or quarantin$).ab. /freq=3	23446
6	(audit$ or assess$ or evaluat$ or (quality adj2 (assur$ or imrov$ or manag$ or control$ or indicator$ or measure$)) or (quality adj3 care) or accredit$ or benchmark$ or ((standard$ or guideline$) adj3 (complian$ or adher$ or implement$ or appl$))).ti. or (audit$ or assess$ or evaluat$ or (quality adj2 (assur$ or imrov$ or manag$ or control$ or indicator$ or measure$)) or (quality adj3 care) or accredit$ or benchmark$ or ((standard$ or guideline$) adj3 (complian$ or adher$ or implement$ or appl$))).ab. /freq=3	884108
7	5 and 6	1449
8	limit 7 to ("in data review" or in process or "pubmed not medline")	92
9	4 or 8	1251
10	limit 9 to english language	1146
11	limit 10 to yr="2000 -Current"	924
12	limit 11 to ("in data review" or in process or "pubmed not medline")	80
13	from 12 keep 4-6, 14, 17-18, 27, 30, 32...	25
14	limit 11 to "medline"	844
15	13 or 14	869
16	limit 15 to abstracts	594
17	limit 16 to "reviews (maximizes sensitivity)"	280
18	16 not 17	314

ii.   Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present - Reviews

#	Searches	Results
1	exp *Infection Control/ or *Bacterial Infections/pc or *Catheter-Related Infections/pc or *Communicable Diseases/pc or *Cross Infection/pc or *Disinfection/ or *Equipment Contamination/pc or *Equipment Reuse/ or *exp Wound Infection/pc or *Infection Control Practitioners/ or *Infection/pc or *Pneumonia, Ventilator-Associated/pc or *Sterilization/ or *Urinary Tract Infections/pc or exp *Hand Hygiene/	42533
2	exp *Clinical Audit/ or exp *Infection control/standards or exp *Program Evaluation/ or *"Outcome and Process Assessment (Health Care)"/ or *"Outcome Assessment (Health Care)"/ or *"Peer Review, Health Care"/ or *"Process Assessment (Health Care)"/ or *"Quality Assurance, Health Care"/ or *"Quality Indicators, Health Care"/ or *"Quality of Health Care"/ or *Accreditation/ or *Benchmarking/ or *Guideline Adherence/ or *Health Care Evaluation Mechanisms/ or *Infection Control Practitioners/standards or *Professional Review Organizations/ or *Program Evaluation/ or *Quality Assurance, Health Care/ or *Quality Improvement/ or *Quality Indicators, Health Care/ or *Total Quality Management/	116844
3	1 and 2	1279
4	3 not (exp Africa/ or exp Asia/ or exp Caribbean Region/ or exp Central America/ or exp Gulf of Mexico/ or exp Latin America/ or exp South America/ or exp Europe, Eastern/)	1159
5	((infection adj2 prevent$) or (infection adj2 control$) or cross infection$ or nosocomial or hospital acquired or (infection adj2 (health$ adj2 associated)) or (hand$ adj2 (wash$ or disinfect$ or clean$ or hygiene or saniti$)) or ((surface$ or equipment$ or environment$ or instrument$) adj2 (contaminat$ or clean$ or steriliz$ or sterilis$ or disinfect$)) or antisepsis$ or asepsis$ or PAT©ient isolation or quarantin$).ti. or ((infection adj2 prevent$) or (infection adj2 control$) or cross infection$ or nosocomial or hospital acquired or (infection adj2 (health$ adj2 associated)) or (hand$ adj2 (wash$ or disinfect$ or clean$ or hygiene or saniti$)) or ((surface$ or equipment$ or environment$ or instrument$) adj2 (contaminat$ or clean$ or steriliz$ or sterilis$ or disinfect$)) or antisepsis$ or asepsis$ or PAT©ient isolation or quarantin$).ab. /freq=3	23446
6	(audit$ or assess$ or evaluat$ or (quality adj2 (assur$ or imrov$ or manag$ or control$ or indicator$ or measure$)) or (quality adj3 care) or accredit$ or benchmark$ or ((standard$ or guideline$) adj3 (complian$ or adher$ or implement$ or appl$))).ti. or (audit$ or assess$ or evaluat$ or (quality adj2 (assur$ or imrov$ or manag$ or control$ or indicator$ or measure$)) or (quality adj3 care) or accredit$ or benchmark$ or ((standard$ or guideline$) adj3 (complian$ or adher$ or implement$ or appl$))).ab. /freq=3	884108
7	5 and 6	1449
8	limit 7 to ("in data review" or in process or "pubmed not medline")	92
9	4 or 8	1251
10	limit 9 to english language	1146
11	limit 10 to yr="2000 -Current"	924
12	limit 11 to ("in data review" or in process or "pubmed not medline")	80
13	from 12 keep 4-6, 14, 17-18, 27, 30, 32...	25

#	Searches	Results
14	limit 11 to "medline"	844
15	13 or 14	869
16	limit 15 to abstracts	594
17	limit 16 to "reviews (maximizes sensitivity)"	280

Research Question #1

A literature search of the electronic databases MEDLINE, Embase and CINAHL were performed using the following search strategy:

a. Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present

#	Searches	Results
1	*Infection Control/ or *Antisepsis/ or *Asepsis/ or *Sterilization/ or *Disinfection/ or *PAT©ient Isolation/ or *Quarantine/ or exp *Hand Hygiene/ or *Infection Control Practitioners/ or *Cross Infection/pc or *"Infectious Disease Transmission, Professional-to-PAT©ient"/pc or *"Infectious Disease Transmission, PAT©ient-to-Professional"/pc or *Surgical Wound Infection/pc or *Catheter-Related Infections/pc or *Pneumonia, Ventilator-Associated/pc	44842
2	*"Organization and Administration"/ or *Health Facility Administration/ or *Organizational Policy/ or *Decision Making, Organizational/ or *Efficiency, Organizational/ or exp *Governing Board/ or *Hospital Administration/ or *Institutional Management Teams/ or *Models, Organizational/ or *Organizational Culture/ or *Organizational Innovation/ or *Organizational Objectives/ or exp *Personnel Management/ or *Professional Staff Committees/ or *Committee Membership/ or *Administrative Personnel/ or *Health Facility Administrators/ or *Hospital Administrators/ or *Nurse Administrators/ or *Physician Executives/ or *Chief Executive Officers, Hospital/ or *Clinical Governance/ or *Hospital Restructuring/ or exp *Management Audit/ or *Total Quality Management/ or *Employee Discipline/ or *Employee Performance Appraisal/ or *Employee Incentive Plans/ or *"Outcome and Process Assessment (Health Care)"/ or *"Process Assessment (Health Care)"/ or *Leadership/	175567
3	1 and 2	766
4	(infect$ adj (prevent$ or control$)).ti,kf.	7803
5	(organization$ or administrat$ or executive$ or governance or management$ or committee$ or board$1 or policy or policies or procedure$ or structur$ or restructure$ or (decision adj mak$) or buy-in or employe$).ti,kf.	976444
6	4 and 5	1416
7	limit 6 to ("in data review" or in process or "pubmed not medline")	37
8	3 or 7	803

#	Searches	Results
9	limit 8 to english language	716
10	limit 9 to last 10 years	395
11	limit 10 to (comment or editorial or letter or news)	54
12	10 not 11	341
13	remove duplicates from 12	335
14	from 13 keep	65

b. Embase 1974 to 2014 May 05

#	Searches	Results
1	*infection control/ or *asepsis/ or *antisepsis/ or *disinfection/ or *instrument sterilization/ or *hand washing/ or *infection control practitioner/ or *cross infection/pc or *surgical infection/pc or *catheter infection/pc or *hospital infection/pc or *healthcare associated infection/pc or exp *device infection/pc or *ventilator associated pneumonia/pc	32091
2	*"board of trustees"/ or *"organization and management"/ or *administrative personnel/ or *advisory committee/ or *change management/ or *health care management/ or *health care organization/ or *health care personnel management/ or *health care quality/ or *hospital administrator/ or *hospital management/ or *hospital organization/ or *hospital personnel management/ or *hospital planning/ or *hospital policy/ or *leadership/ or *management style/ or *management theory/ or *management/ or *nonbiological model/ or *nurse administrator/ or *nursing management/ or *organization/ or *organizational climate/ or *organizational development/ or *organizational efficiency/ or *organizational structure/ or *organizational theory/ or *particiPAT©ory management/ or *personnel management/ or *process control/ or *process design/ or *process development/ or *process model/ or *process monitoring/ or *process optimization/ or *total quality management/ or *workflow/	176481
3	1 and 2	870
4	limit 3 to english language	733
5	limit 4 to last 10 years	581
6	limit 5 to (editorial or letter)	27
7	5 not 6	554
8	limit 7 to exclude medline journals	18
9	from 8 keep 1	1

c. EBSCOhost CINAHL with Full Text

#	Query	Results
S1	(MM "Infection Control") OR (MM "Infection Preventionists") OR (MM "Asepsis") OR (MM "Handwashing") OR (MM "Surgical Scrubbing") OR (MM "PAT©ient Isolation") OR (MM "Quarantine") OR (MM "Sterilization and Disinfection") OR (MM "Universal Precautions")	22,241

#	Query	Results
	OR (MM "Cross Infection/PC") OR (MM "Disease Transmission, Professional-to-PAT©ient/PC") OR (MM "Disease Transmission, PAT©ient-to-Professional/PC") OR (MM "Surgical Wound Infection/PC") OR (MM "Catheter-Related Infections/PC") OR (MM "Pneumonia, Ventilator-Associated/PC")	
S2	(MM "Organizational Culture+") OR (MM "Organizational Politics") OR (MM "Organizational Development+") OR (MM "Change Management") OR (MM "Team Building") OR (MM "Organizational Efficiency+") OR (MM "Productivity") OR (MM "Teamwork") OR (MM "Work Redesign") OR (MM "Organizational Policies") OR (MM "Hospital Policies+") OR (MM "Organizational Structure+") OR (MM "Organizational Restructuring+") OR (MM "Personnel Management+") OR (MM "Decision Making, Organizational") OR (MM "Governing Board") OR (MM "Management") OR (MM "Collaboration") OR (MM "Health Facility Administration+") OR (MM "Nursing Administration+") OR (MM "Nursing Management") OR (MM "Management Styles") OR (MM "Organizational Change") OR (MM "Organizational Compliance") OR (MM "Scope of Practice") OR (MM "Scope of Nursing Practice") OR (MM "Process Assessment (Health Care)+") OR (MM "Administrative Personnel") OR (MM "Clinical Governance") OR (MM "Quality Management, Organizational") OR (MM "Committees") OR (MM "Health Facility Administrators") OR (MM "Nurse Administrators+") OR (MM "Physician Executives") OR (MM "Hospital Restructuring") OR (MM "Leadership") OR (MM "Organizational Objectives") OR (MM "Organizational Theory") OR (MM "Quality Improvement") OR (MM "Workload") OR (MM "Nursing Process")	160,921
S3	S1 AND S2	1,346
S4	S1 AND S2	1,319
S5	(S1 AND S2) NOT (PT Editorial OR PT Commentary OR PT Letter OR PT Brief Item)	1,160
S6	(S1 AND S2) NOT (PT Editorial OR PT Commentary OR PT Letter OR PT Brief Item) Limiters - English Language	1,133
S7	(S1 AND S2) NOT (PT Editorial OR PT Commentary OR PT Letter OR PT Brief Item) Limiters - Published Date: 20040101-20141231; English Language	768
S8	(S1 AND S2) NOT (PT Editorial OR PT Commentary OR PT Letter OR PT Brief Item) Limiters - Published Date: 20040101-20141231; English Language; Exclude MEDLINE records	365
S9	from S8 keep	58

Research Question #2

A literature search of the electronic databases MEDLINE, Embase and CINAHL were performed using the following search strategy:

    a. Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present

#	Searches	Results
1	exp *Infection Control/ or *Infection Control Practitioners/	29239
2	Clinical Audit/mt or Nursing Audit/mt or Medical Audit/mt or Management Audit/mt or Program Evaluation/mt or Benchmarking/mt or Evaluation Studies as Topic/	126776
3	*Economics/ or exp *"Costs and Cost Analysis"/ or *Models, Economic/ or exp *Economics, Hospital/ or exp *Infection Control/ec or *Infection Control Practitioners/ec	63725
4	exp *"Outcome and Process Assessment (Health Care)"/ or *Risk Assessment/ or *Risk Management/ or *Risk/ or *Cost-Benefit Analysis/	65808
5	((Incidence/ or Morbidity/ or Mortality/ or Prevalence/) and (Cross Infection/ or "Infectious Disease Transmission, Professional-to-PAT©ient"/ or "Infectious Disease Transmission, PAT©ient-to-Professional"/ or Surgical Wound Infection/ or Catheter-Related Infections/ or Pneumonia, Ventilator-Associated/ or Methicillin-Resistant Staphylococcus aureus/ or Clostridium Infections/ or Urinary Tract Infections/ or Gram-Positive Bacterial Infections/ or Gram-Negative Bacterial Infections/ or Vancomycin Resistance/ or exp Drug Resistance, Microbial/ or exp Infection/)) or *Cross Infection/mo or *"Infectious Disease Transmission, Professional-to-PAT©ient"/mo or *"Infectious Disease Transmission, PAT©ient-to-Professional"/mo or *Surgical Wound Infection/mo or *Catheter-Related Infections/mo or *Pneumonia, Ventilator-Associated/mo or *Methicillin-Resistant Staphylococcus aureus/mo or *Clostridium Infections/mo or *Urinary Tract Infections/mo or *Gram-Positive Bacterial Infections/mo or *Gram-Negative Bacterial Infections/mo or *Vancomycin Resistance/mo or exp *Drug Resistance, Microbial/mo or exp *Infection/mo	39256
6	1 and (2 or 3 or 4 or 5)	1731
7	(infect$ adj2 (prevent$ or control$)).ti,kf.	11611
8	(audit$ or evaluat$ or assess$ or score$ or scoring or weigh$).ti,kf.	779348
9	(econom$ or cost$ or financ$ or fiscal$).ti,kf.	150254
10	(risk$ or harm$ or adverse or benefit$ or increase$ or decrease$ or more or less or fewer or outcome$ or effect$1).ti,kf.	2134168
11	((morbidity or mortality or incidence or prevalence or rate or rates) and (infection$ or infectious or transmission or staphylococcus or clostridium or "c difficile" or vancomycin)).ti,kf.	20377
12	7 and (8 or 9 or 10 or 11)	2032
13	limit 12 to ("in data review" or in process or "pubmed not medline")	99
14	6 or 13	1830
15	limit 14 to english language	1605
16	limit 15 to last 10 years	737
17	limit 16 to (comment or editorial or letter or news)	74
18	16 not 17	663
19	remove duplicates from 18	655

b. Embase 1996 to 2014 Week 18

#	Searches	Results
1	*infection control/ or *infection prevention/ or exp *asepsis/ or *infection control practitioner/	27005
2	*medical audit/ or exp *program evaluation/ or *evaluation study/ or *quality control procedures/ or *quality control/ or *evaluation research/ or *health care quality/	64391
3	*economic aspect/ or exp *"cost"/ or exp *economics/ or exp *financial management/ or exp *health economics/	165426
4	*outcome assessment/ or *risk/ or *risk benefit analysis/ or *infection risk/ or *risk reduction/ or *risk assessment/ or *risk management/	78091
5	(*incidence/ or *infection rate/ or *morbidity/ or *mortality/ or *prevalence/) and (exp infection/ or communicable disease/ or cross infection/ or device infection/ or healthcare associated infection/ or hospital infection/ or injection site infection/ or disease transmission/ or surgical infection/ or infectious complication/ or catheter infection/ or postoperative infection/ or ventilator associated pneumonia/ or methicillin resistant Staphylococcus aureus/ or Clostridium difficile/ or vancomycin resistant Enterococcus/)	11633
6	1 and (2 or 3 or 4 or 5)	1122
7	limit 6 to (editorial or letter)	54
8	6 not 7	1068
9	limit 8 to english language	929
10	limit 9 to last 10 years	682
11	limit 10 to exclude medline journals	70

c. CINAHL

#	Query	Results
S1	(MM "Infection Control+") OR (MM "Infection Preventionists")	24,821
S2	(MH "Audit/MT") OR (MH "Nursing Audit/MT") OR (MH "Evaluation/MT") OR (MH "Program Evaluation/MT") OR (MH "Benchmarking/MT") OR (MH "Process Assessment (Health Care)/MT") OR (MH "Quality Assessment/MT") OR (MH "Quality Management, Organizational/MT")	2,044
S3	(MM "Economics") OR (MM "Costs and Cost Analysis+") OR (MM "Economic Aspects of Illness") OR (MM "Financial Management+") OR (MM "Infection Control+/EC") OR (MM "Infection Preventionists/EC")	40,819
S4	(MM "Risk Assessment") OR (MM "Risk Management") OR (MM "Relative Risk") OR (MM "Cost Benefit Analysis") OR (MM "Outcome Assessment") OR (MM "Outcomes (Health Care)") OR (MM "Nursing Outcomes")	31,800
S5	((MH "Prevalence") OR (MH "Incidence") OR (MH "Morbidity") OR (MH "Mortality")) AND ((MH "Infection+") OR (MH "Cross Infection+") OR (MH "Communicable Diseases") OR (MH "Catheter-Related Infections+") OR (MH "Pneumonia, Ventilator-Associated") OR (MH "Disease Transmission, PAT©ient-to-Professional") OR (MH "Disease Transmission,	6,851

Professional-to-PAT©ient") OR (MH "Disease Transmission+") OR (MH "Surgical Wound Infection") OR (MH "Methicillin-Resistant Staphylococcus Aureus") OR (MH "Clostridium Difficile") OR (MH "Bacterial Infections+"))

S6 S1 AND (S2 OR S3 OR S4 OR S5)   192

Limiters - Published Date: 20040101-20141231; English Language; Exclude MEDLINE records

BIBLIOGRAPHY

1. The International Society for Quality in Health Care (ISQua). Guidelines and Standards for External Evaluation Organisations. 2015 [cited March 30, 2017]; 4th edition; Available from: http://www.isqua.org/accreditation-iap/reference-materials.
2. Accreditation Canada. Qmentum Program: Infection Prevention and Control Standards. 2014 [cited January 14, 2015].
3. Accreditation Canada. Qmentum Program: Long-Term Care Services Standards. 2015 [cited March 12, 2015]; Available from: http://www.accreditation.ca/qmentum.
4. Miles E, Jazaie R. Internal Audit Risk Assessment and Audit Planning. Moss-Adams L.L.P. Certified Public Accountants/Business Consultants. May 6, 2011. 2011.
5. Dalkey N, Helmer O. An Experimental Application of the Delphi Method to the use of experts. Management Science. 1963;9(3):458-67.
6. TUTORIALSPOINT 2014. Project Risk Management. Tutorials Point (I) Pvt. Ltd. [cited August 23, 2014]; Available from: http://www.tutorialspoint.com/management_concepts/project_risk_management.htm.