

# **Evidence-Based Nursing Practice (Infection prevention & control)**

## **Session 5: Critical appraisal Part 2: Implementation/evaluation, case control & cohort studies**

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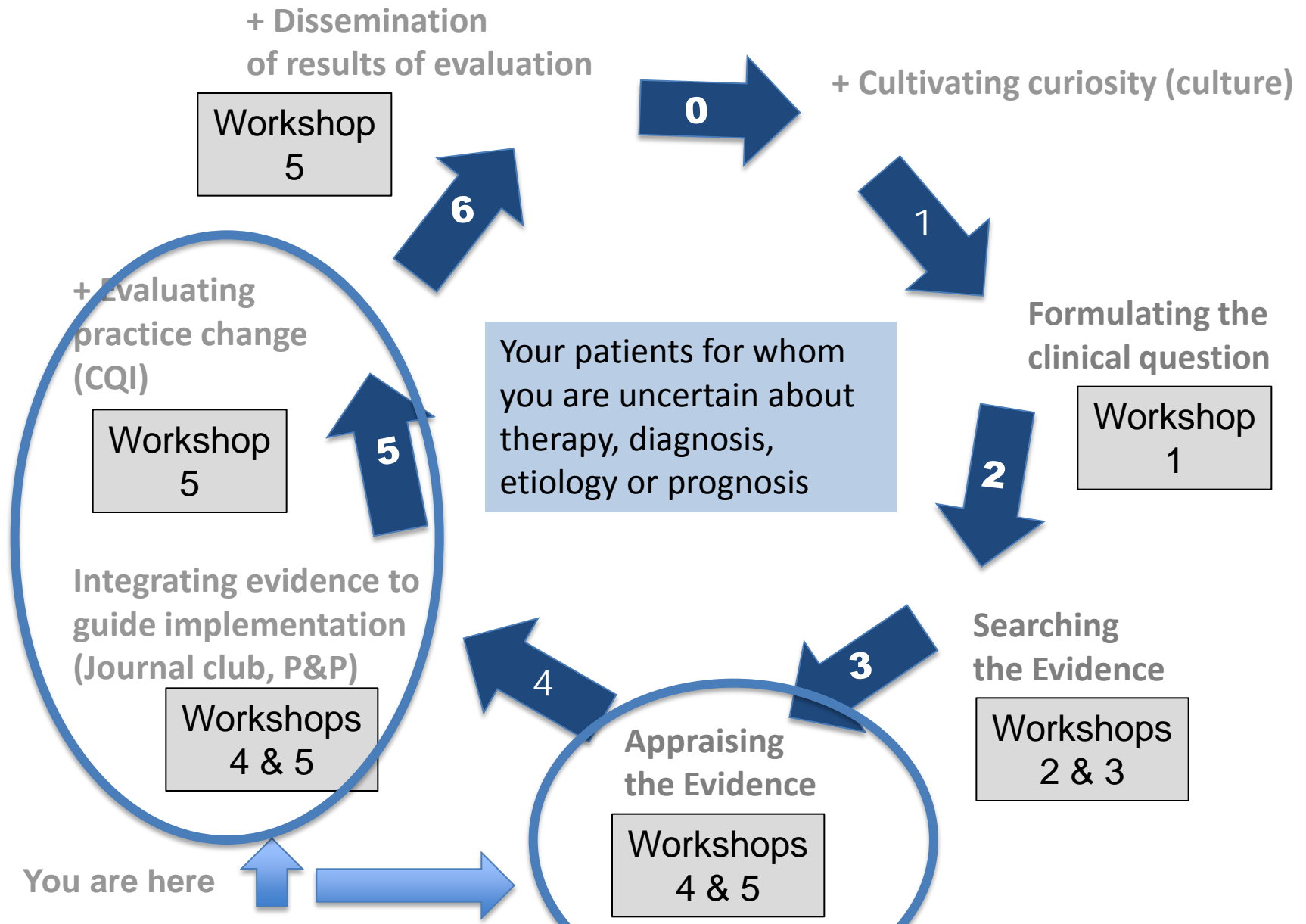
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# WORKSHOPS

Date	Topic	Time	Location
<del>December 16</del> January 13	Introduction to EBNP	1.5 hours	Conference room 2
<del>January 20</del> February 17	Basics of searching 1- clinical tools	1.5 hours	Conference room 2
<del>January 27</del> February 17	Basics of searching 2- biomedical databases	1.5 hours	A-805
<del>February 3, 10</del> February 24	Critical appraisal 1- Intro/P&P, RCT, systematic review	1.5 hours	Conference room 2
<del>February 10,</del> <del>24</del> March 24	Critical appraisal 2 – implementing/evaluating, Case control, cohort	1.5 hours	Conference room 2



# EBNP PROCESS: A METHODOLOGY + A FRAMEWORK



# Workshop 5 - Objectives

By the end of the workshop, you will be able to:

1. Understand the basics of how to apply criteria to appraise a case control study
2. Understand the basics of how to apply criteria to appraise a cohort study
3. Understand the basics of creating an implementation and evaluation plan.



# BASICS OF HOW TO APPLY CRITERIA TO APPRAISE A COHORT STUDY AND A CASE CONTROL STUDY

# Harm/Etiology articles

- See the effects of possibly harmful agents on patient outcomes
- Could be found in a RCT but unethical to expose patients to harm
- Observational studies (no intervention) overcome this barrier

# Cohort studies

- Big sample of population who already get a treatment or a certain exposure and another group without the treatment or exposure and follow them forward over time. Compare the outcomes.
- (-) Subject to bias, two groups can differ in other ways than the variable studied.



# Case Control Studies

- Possibility of large sample. Look back, often in medical records, for patients who already have a condition and compare with others who do not have the exposure. Useful to easily get large samples, look at rare outcomes, etc.
- (-) Subject to bias, can show statistical relation between two unrelated factors.





# Harm / Etiology : Appraisal Criteria

- Validity of results
  - Patients similar to prognostic factors?
  - Similar assessment to detect the outcomes?
  - Follow up sufficiently complete?
- Results
  - Strong association between exposure and outcome?
  - Precision of the risk estimate?

# Harm / Etiology : Appraisal Criteria

- Patient care
  - Samples similar to my patient?
  - Follow up: long enough?
  - Exposure similar to the experience of my patient?
  - How big is the risk?

# Cohort study: Appraisal criteria

- Patients similar for prognostic factors known to be associated with the outcome?
- Similar circumstances and methods to detect the outcomes?
- RELATIVE RISK:  $\frac{\text{Risk outcome in exposed group}}{\text{Risk outcome in unexposed group}}$

# Case Control Study : Appraisal Criteria

- Cases and control similar to circumstances that can lead to exposure? (same opportunity to exposure to harm)
- Similar circumstances and methods to determine exposure?
- ODDS RATIO:  
Odds of exposure in patients with outcome  
Odds of exposure in patients without outcome

# Harm / Etiology : Appraisal Conclusion

- Use critical appraisal worksheets.  
[http://www.dartmouth.edu/~biomed/services.html/EBP\\_docs/CriticalAppraisalWorksheetHarm-Etiology-revised-July2014.pdf](http://www.dartmouth.edu/~biomed/services.html/EBP_docs/CriticalAppraisalWorksheetHarm-Etiology-revised-July2014.pdf)
- Grey area: rarely all black or white
- Use your judgment!
- Don't forget what you really want to know!  
(PICO)

# OVERVIEW OF WHAT WE LEARNED TO DATE ON CRITICAL APPRAISAL AND SYNTHESIS

# WORKSHOP 4 OBJECTIVES

1. Understand the basics of critical appraisal
2. Understand the basics of how critical appraisal is used to synthesize evidence for P&P development
3. Understand the basics of how to apply criteria to appraise a randomized controlled trial
4. Understand the basics of how to apply criteria to appraise a systematic review

# WHAT IS CRITICAL APPRAISAL?

- A systematic way of assessing the quality and relevance to practice of a given research article.
- Instead of looking at the abstract and conclusions we look at the methods section of the study
- Each study design (type of evidence) has a methodology that needs to be followed in order to achieve its objectives
- Some evidence has been pre-appraised and assigned a “level of evidence”
  - You may wish to do this yourself when synthesizing the evidence for a P&P





# WHAT ARE LEVELS OF EVIDENCE?

- Used to grade evidence quality by type of study.
- Sometimes classified by question type (Therapy, Diagnosis etc).
- Not the same as the ~~evidence hierarchy pyramid~~.
- Over 100 different grading scales in use<sup>1</sup>!
- A few commonly used examples:
  - Centre for Evidence-Based Medicine, Oxford: 1a-5
  - GRADE: A-D combined with 1 or 2 (UpToDate uses this system)
  - SORT (Patient centered, used in family medicine since 2004): A-C

<sup>1</sup> Ebell, et al

# HOW DO WE APPRAISE AN ARTICLE?

- Critical appraisal looks at whether a given study has met the standards for its chosen design.
- Each type of evidence has its own set of criteria—you can use worksheets to help you.
- Some general criteria:
  - Is the methodology appropriate and clearly reported?
  - Is the study well designed?
  - Are the findings well reported?
  - Are the findings relevant to your institution/patient(s)?
  - Should you change your practice based on these findings?

# APPRAISING AN RCT

## FRISBE

- **F=** Follow-up- is everyone accounted for?
- **R=** Randomization- was assignment of patients to treatment or control random? Was allocation concealed?
- **I=** intention to treat analysis- were all patients analysed in the group to which they were assigned?
- **S=** Similar baseline characteristics of patients- were groups similar at start of study?
- **B=** Blinding- were patients, health workers and study personnel “blinded” to who had treatment and who placebo/comparison?
- **E=** Equal treatment- aside from the intervention was everyone treated equally?

[Critical Appraisal tools](#) - Dartmouth College



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# APPRAISING A SYSTEMATIC REVIEW

1. What question was addressed? Was it focused and clearly stated and?
2. Were all relevant studies identified? (published and unpublished). Was the search well reported/conducted? Can it be repeated with same results?
3. Were inclusion criteria predetermined, clearly stated and appropriate?
4. Were the included studies valid? Were the studies appraised?
5. Did 2 or more individuals select studies and extract data?
6. Were results similar from study to study? Ideally there would be homogeneity in the results. See forest plot.
7. Was conflict of interest reported?
8. What is the clinical importance of the results? Are the results precise? Does the authors' interpretation of results match the results themselves?

# EBNP STEP-BY-STEP ARTICLE SERIES

- Developed by a group of nurses at the Arizona State University College of Nursing and Health Innovation's Center for the Advancement of Evidence-Based Practice.
- 12 articles published every few months in AJN 2009-2011.
- “The purpose of this series is to give nurses the knowledge and skills they need to implement EBP consistently, one step at a time”.
- At the time of publication “Chat with the Authors” phonecalls were scheduled to provide additional support.
- The articles are written in a narrative format following the 7 steps of EBNP ending in the implementation and evaluation of a Rapid Response Team initiative in a hospital.
- See bibliography at [www.jgh.ca/en/hslebnp](http://www.jgh.ca/en/hslebnp)



# WHAT DOES THIS MEAN FOR NURSES INVOLVED IN P&P AND CQI?

- Developing a P&P requires synthesizing the evidence i.e. putting it all together into a summary and recommendations
- To know what is the best evidence you need to appraise what is out there and select the best studies to support your P&P.
  - Use the Step-by-Step series of articles published in AJN to guide you in this process- see next slides for template and examples



# EXAMPLE SYNTHESIS TABLE

**Table 2: The 15 Studies: Levels and Types of Evidence**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Level I: Systematic review or meta-analysis	X	X	X												
Level II: Randomized controlled trial				X											
Level III: Controlled trial without randomization															
Level IV: Case-control or cohort study					X	X									
Level V: Systematic review of qualitative or descriptive studies															
Level VI: Qualitative or descriptive study (includes evidence implementation projects)							X	X	X	X	X	X	X	X	X
Level VII: Expert opinion or consensus															

Adapted with permission from Melnyk BM, Fineout-Overholt E, editors. Evidence-based practice in nursing and healthcare: a guide to best practice. 2nd ed. Philadelphia: Wolters Kluwer Health / Lippincott Williams and Wilkins; 2010.

1 = Chan PS, et al. (2010); 2 = McGaughey J, et al.; 3 = Winters BD, et al.; 4 = Hillman K, et al.; 5 = Sharek PJ, et al.; 6 = Chan PS, et al. (2009); 7 = DeVita MA, et al.; 8 = Mailey J, et al.; 9 = Dacey MJ, et al.; 10 = McFarlan SJ, Hensley S.; 11 = Offner PJ, et al.; 12 = Bertaut Y, et al.; 13 = Benson L, et al.; 14 = Hatler C, et al.; 15 = Bader MK, et al.



# IMPLEMENTING & EVALUATING YOUR INTERVENTION



# REQUIREMENTS FOR IMPLEMENTATION

- Clearly stated purpose
- Key stakeholders
- Measurable outcomes
- IRB proposal- protocol

# IMPLEMENTATION PLAN TEMPLATE-CHECKPOINTS 1-5

Figure 1. EBP Implementation Plan Template

ARCC EBP Implementation Plan		
PICOT Question:		
Team Members:		
EBP Mentor and Contact Info:		
Preliminary Checkpoint	<ul style="list-style-type: none"> <li>Who are the stakeholders for your project                             <ul style="list-style-type: none"> <li>Active (on the implementation team) and Supportive (not on the team, but essential to success)</li> </ul> </li> <li>Identify project team roles and leadership</li> <li>Begin acquisition of any necessary approvals for project implementation and dissemination (for example, system and unit leadership, internal review board [IRB])</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint One	<ul style="list-style-type: none"> <li>Hone PICOT question and assure team is prepared</li> <li>Build EBP knowledge and skills</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Two	<ul style="list-style-type: none"> <li>Conduct literature search and retain studies that meet criteria for inclusion</li> <li>Connect with librarian</li> <li>Meet with implementation group – TEAM BUILD</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Three	<ul style="list-style-type: none"> <li>Critically appraise literature</li> <li>Meet with group to discuss how completely evidence answers question; pose follow-up questions and re-review the literature as necessary</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Four	<ul style="list-style-type: none"> <li>Meet with group</li> <li>Summarize evidence with focus on implications for practice and conduct interviews with content experts as necessary to benchmark</li> <li>Begin formulating detailed plan for implementation of evidence</li> <li>Include who must know about the project, when they will know, how they will know</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Five	<ul style="list-style-type: none"> <li>Define project purpose—connect the evidence and the project</li> <li>Define baseline data collection source(s) (for example, existing datasets, electronic health record), methods, and measures</li> <li>Define postproject outcome indicators of a successful project</li> <li>Gather outcome measures</li> <li>Write data collection protocol</li> <li>Write the project protocol (data collection fits in this document)</li> <li>Finalize any necessary approvals for project implementation and dissemination (for example, system leadership, unit leadership, IRB)</li> <li><b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:

- Stakeholder analysis
- Define team roles & responsibilities
- Get approvals from leadership

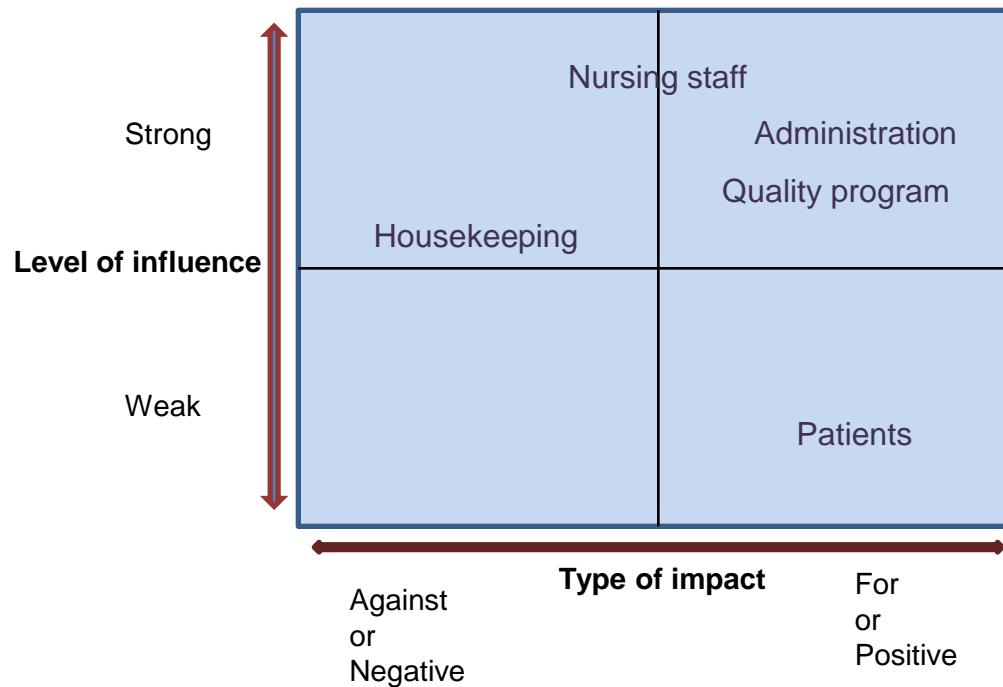
- Workshops 1-4
- PICO
  - Searching
  - Critical appraisal
  - Evidence synthesis

- Define:
- Purpose
  - Indicators

- Gather data- current state  
Write protocol

# PRELIMINARY CHECKPOINT

Example stakeholder analysis for decontamination of privacy curtains project:



# CHECKPOINTS TWO-FOUR

- Don't forget! We are available to conduct the search for you and help you access the full-text of the articles!

[Libraries](#) > Health Sciences Library (HSL)

## Welcome to the Health Sciences Library (HSL)



Instruction sign up



Article ILL



Book ILL



Book Purchase



Literature Search



Ask a librarian >



# CHECKPOINT FIVE

## **Outcome measures can include:**

- Quality indicators
- Incident reporting
- Satisfaction/complaints
- Return on investment data
- Data from patient records (test results etc.)
- Benchmark data etc
- Other?

(see “Evidence-Based Practice, Step By Step: Following the Evidence: Planning for Sustainable Change” for more about outcome measures)

# IMPLEMENTATION PLAN TEMPLATE- CHECKPOINTS 6-11

Checkpoint Six (about midway)	<ul style="list-style-type: none"> <li>• Meet with implementation group</li> <li>• Discuss known barriers and facilitators of project</li> <li>• Discuss strategies for minimizing barriers and maximizing facilitators</li> <li>• Finalize protocol for implementation of evidence</li> <li>• Identify resources (human, fiscal, and other) necessary to complete project</li> <li>• Supply EBP Mentor with written IRB approval and managerial support</li> <li>• Begin work on poster for dissemination of initiation of project and progress to date to educate stakeholders about project—get help from support staff</li> <li>• Include specific plan for how evaluation will take place: who, what, when, where, and how, and communication mechanisms to stakeholders</li> <li>• <b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Seven	<ul style="list-style-type: none"> <li>• Meet with implementation group to review proposed poster</li> <li>• Make final adjustment to poster with support staff</li> <li>• Inform stakeholders of start date of implementation and poster presentation</li> <li>• Address any concerns or questions of stakeholders (active and supportive)</li> <li>• <b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Eight	<ul style="list-style-type: none"> <li>• Poster presentation (preferred event is a system-wide recognition of quality, research, or innovation)</li> <li>• LAUNCH EBP implementation project</li> <li>• <b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Nine	<ul style="list-style-type: none"> <li>• Midproject meet with all key stakeholders to review progress and provide outcomes to date</li> <li>• Review issues, successes, aha's, and triumphs of project to date</li> <li>• <b>Begin relationship with EBP Mentor</b></li> </ul>	Notes:
Checkpoint Ten	<ul style="list-style-type: none"> <li>• Complete final data collection for project evaluation</li> <li>• Present project results via poster presentation—locally and nationally</li> <li>• <b>Celebrate with EBP Mentor and Agency Leadership</b></li> </ul>	Notes:
Checkpoint Eleven	<ul style="list-style-type: none"> <li>• Review project progress, lessons learned, new questions generated from process</li> <li>• <b>Consult with EBP Mentor about new questions</b></li> </ul>	Notes:

©Fineout-Overholt, 2009. This form may be used for educational purposes without permission. If you use it for your practice change, please let us know by e-mailing [ellen@transforminghealthcarewitharc.com](mailto:ellen@transforminghealthcarewitharc.com).

Halfway point

- Barriers & facilitators
- Finalize protocol
- Poster

Address concerns of stakeholders  
Poster presentation  
**LAUNCH!**

Review progress

- Data collected to date

Finalize data collection

- Present results

# CHECKPOINT SIX- MAKING YOUR CASE

- What data will you need and what outcomes will you measure for the following?
  - Strategic- what will the impact be? How does this fit in with strategic plan, accreditation etc?
  - Business- what is the potential return on investment?
  - Resources- what is needed to achieve the desired outcome?
    - Infrastructure
    - Supplies
    - Human resources

# CHECKPOINT SEVEN- LAUNCHING THE PILOT

## 'To Do' List for RRT Pilot Rollout

- Attend pilot unit staff meetings
- Create poster and/or flyer to inform staff of rollout date
- Order "RRT Launch" buttons
- Meet with Quality/Performance Improvement Department director and unit-based quality council representative
- Meet with Clinical Informatics Department to develop electronic data documentation tool
- Make sure collecting outcomes measures is possible
  - Finance Department follow-up
  - Health Information Management Systems/Medical Records Department follow-up
- Check with RRT members to make sure they're ready to go

Gallagher-Ford, L., Fineout-Overholt, E., Melnyk, B. M., & Stillwell, S. B. (2011). Evidence-Based Practice, Step by Step: Rolling Out the Rapid Response Team. *AJN The American Journal of Nursing*, 111(5), 42-47.



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# EVALUATION

- Analyze data collected for pilot project- get help from a statistician?
  - Was there a statistical or clinical significance pre and post-intervention?
- Make changes based on analysis for hospital-wide implementation
- Think about how to disseminate the results
  - Present?
  - Publish?

Fineout-Overholt, E., Gallagher-Ford, L., Melnyk, B., & Stillwell, S. B. (2011). Evidence-based practice, step by step: evaluating and disseminating the impact of an evidence-based intervention: show and tell. *Am J Nurs*, 111(7), 56-59. doi: 10.1097/01.naj.0000399317.21279.47



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# SIMILAR TO STEPS IN LEAN PROJECT

## **DMAIIC**

- **Define**
- **Measure**
- **Analyse**
- **Innovate**
- **Implement- includes evaluation**
- **Control- what measures can you put in place to make ensure that changes are maintained?**

# APPRAISING A CASE CONTROL & COHORT STUDY

Let's appraise together

IN CONCLUSION

## SUPPORT FOR YOU

- A JGH Librarian is available to provide one-on-one instruction or to conduct literature searches
  - Francesca Frati, local 2438, [ffrati@jgh.mcgill.ca](mailto:ffrati@jgh.mcgill.ca)
  - Jacynthe Touchette, local 2453, [jtouchette@jgh.mcgill.ca](mailto:jtouchette@jgh.mcgill.ca)
- Tutorials are available 24/7
  - [JGH.ca/HSL](http://JGH.ca/HSL) > Subject Guides  
or
  - [www.jgh.ca/en/hslworkshops](http://www.jgh.ca/en/hslworkshops)

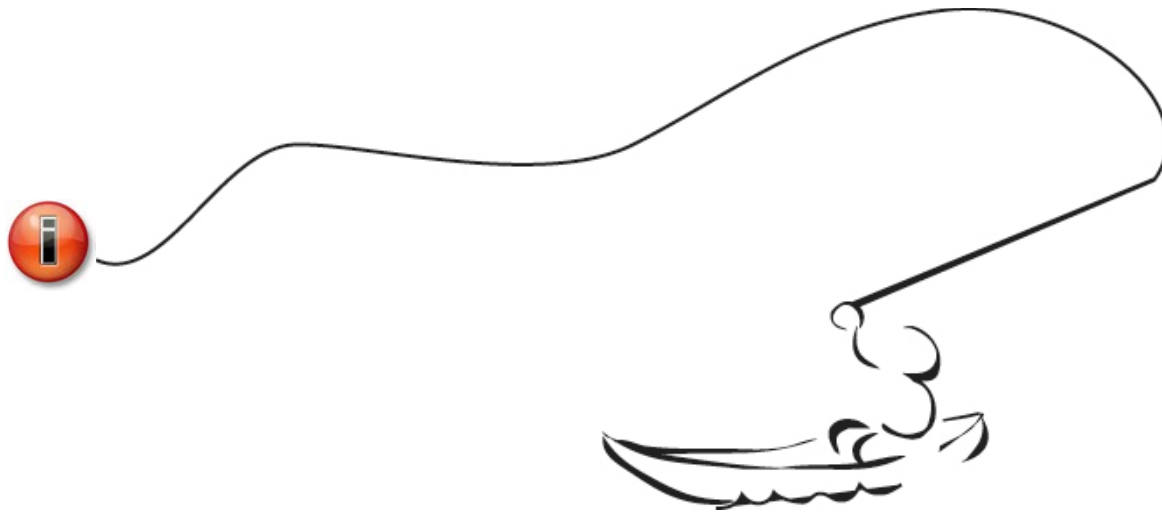


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THANK YOU!



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