

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

## **Session 1: Intro To EBNP**

**Jan 13, 2015**

**Francesca Frati, MLIS**



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# EBNP for infection prevention & control

- Series of workshops designed to help develop skills useful for participating in a journal club, developing P&P's and CQI initiatives
- Focused on real life clinical practice
- Aims to integrate EBNP into your practice
- Course website: [www.jgh.ca/en/hslintroebp](http://www.jgh.ca/en/hslintroebp)

# WORKSHOPS

| Date        | Topic  | Time      | Location          |
|-------------|--|-----------|-------------------|
| January 13  | Introduction to EBNP                         | 1.5 hours | Conference room 2 |
| January 20  | Basics of searching 1- clinical tools        | 1.5 hours | Conference room 2 |
| January 27  | Basics of searching 2- biomedical databases  | 1.5 hours | A-805             |
| February 3  | Critical appraisal 1- RCT, systematic review | 1.5 hours | Conference room 2 |
| February 10 | Critical appraisal 2 – Case control, cohort  | 1.5 hours | Conference room 2 |



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# Workshop 1 - Objectives

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

1. Describe the seven steps of the EBNP process
2. Describe how the EBNP process relates to P&P development and CQI
3. Describe the difference between clinical and nursing practice questions
4. Use PICO to formulate an answerable clinical question
5. Identify the type of clinical question and identify the best studies and resources to answer each question type



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# INTRODUCTION TO THE CONCEPT OF EBNP

But first let's take a look at Evidence-based medicine/practice...

# WHAT IS EVIDENCE-BASED MEDICINE/PRACTICE?

- Sackett and colleagues (1996) ... defined it as “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients” (p. 71). (Kloda 2012)
- A methodology divided into 5 iterative steps to answer clinical questions:
  - Etiology, Diagnosis, Therapy, Prognosis etc.
- EBM is more than just searching for articles: these are also all evidence:
  - books (best for background questions),
  - hospital guidelines/ Policies & Procedures
  - clinical guidelines

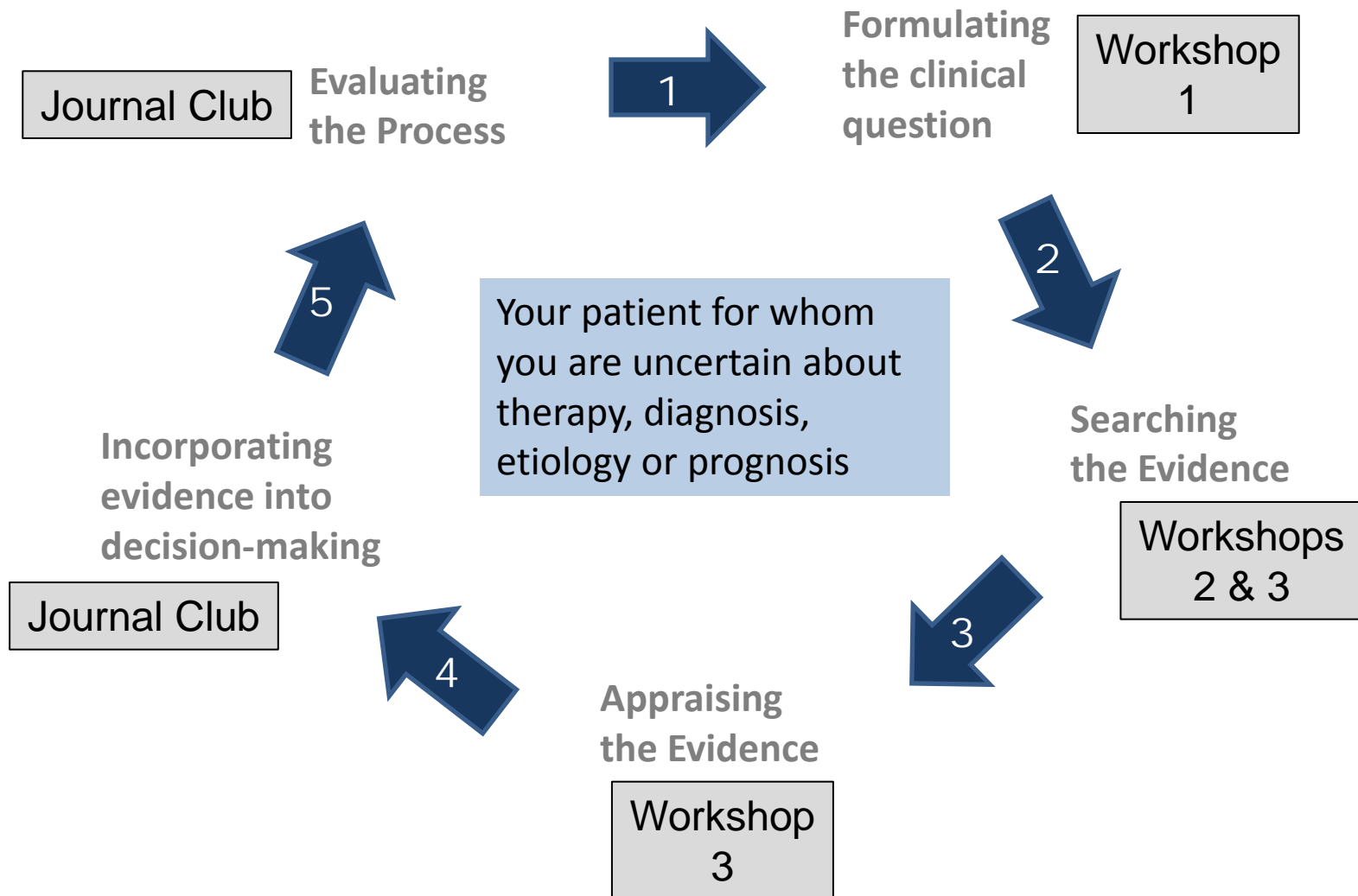
# WHAT IS EVIDENCE-BASED MEDICINE/PRACTICE? CONT...

- **Clinical judgment is an integral part of the process and so are patient values**
- You are looking for the best evidence \*available\*
- Sometimes the answer is that there is no evidence (but at least you know for sure)
- EBP uses the same methodology as EBM applied to disciplines other than medical i.e. allied health



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# EBM/P PROCESS: AN ITERATIVE METHODOLOGY





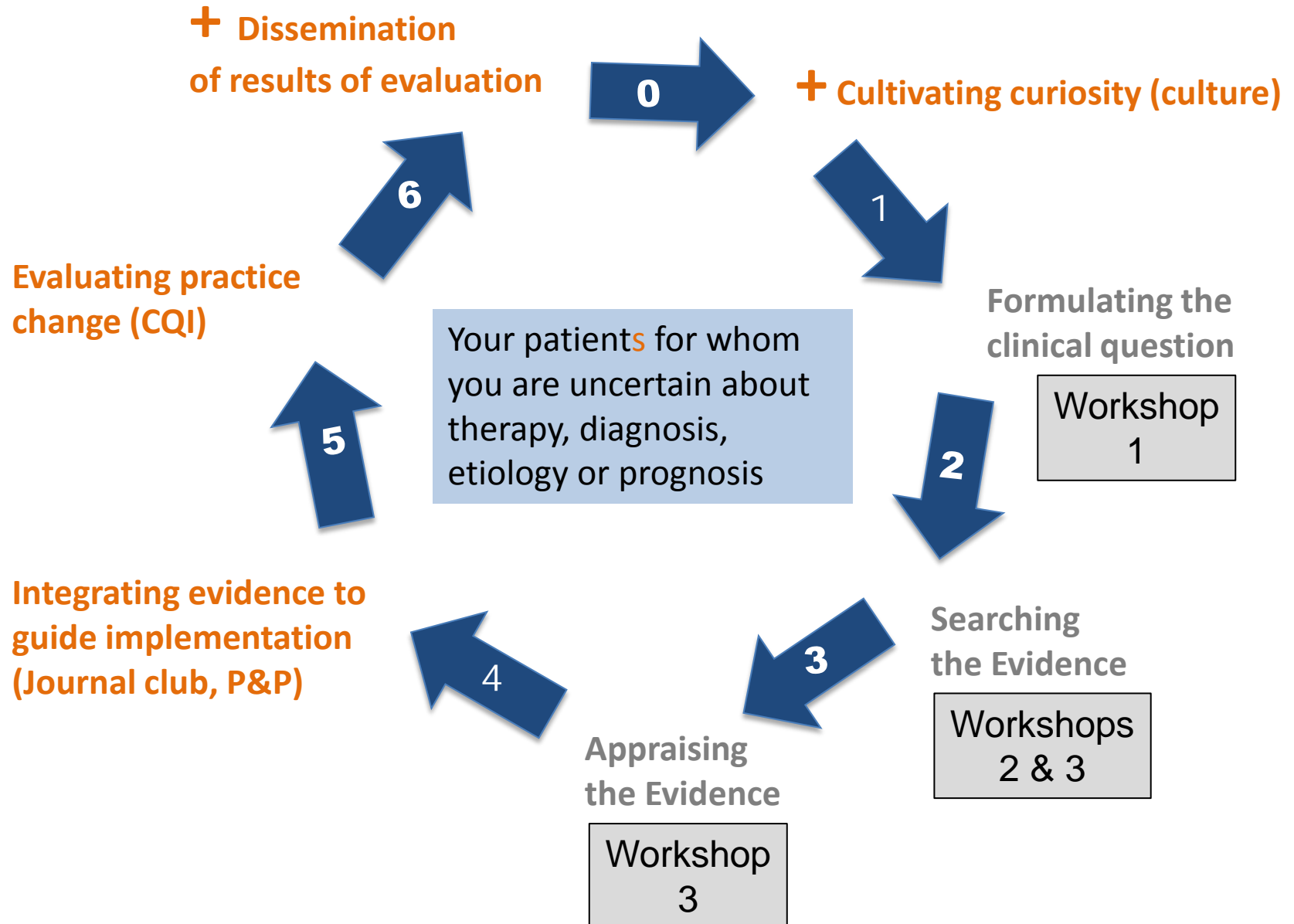
## WHAT ARE THE LIMITATIONS?

- EBM was designed to best answer therapy questions in medical practice by individual clinicians
- Not great for qualitative questions
- EBP is more inclusive of other evidence types (qualitative, mixed methods)
- Neither are great for nursing practice- where the development of P&P's and CQI is a big part of the process

# EBNP SEEKS TO SOLVE SOME OF THESE PROBLEMS

- Designed specifically for nurses
- Added aspect of CQI and change management
- Evidence is integrated into P&P so not reliant on clinical application by each individual
- CNS/nurse educators trained in EBNP as facilitators
- **Provides a framework that has as its goal the measurable improvement of:**
  - Quality & consistency of care
  - Patient outcomes
  - Cost containment

# EBNP PROCESS: A METHODOLOGY + A FRAMEWORK



# ROLE OF THE CNS OR NURSE EDUCATOR

- Plays role of facilitator
  - Acts as EBNP mentor
  - Acts as champion of change
  - Acts as opinions leader
  - Educates

Schub, 2014

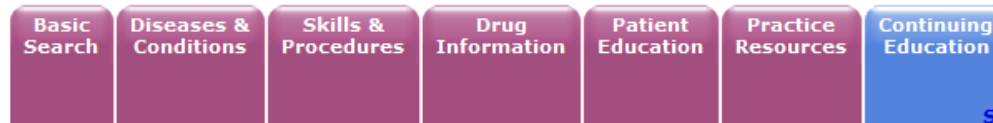
# THE FACILITATOR'S ROLE IN AN EBNP PROJECT

- Facilitates steps 1-3 of the 7 EBNP steps
- Develops detailed written implementation plan that includes the following:
  - Members of team (active and supportive roles)
  - Conceptual model
  - Steps & timeline
  - Barriers & facilitators to successful implementation
- IRB approval
- Implementation meetings
  - Piloting change
  - Financials
  - Communication plan
  - Outcome measures

Schub, 2014

# NURSING REFERENCE CENTRE CONTINUING EDUCATION MODULE

Schub, 2014



[Search History/Alerts](#)

**Browse for:**

evidence based nursing practice

☒ **Alphabetical** ☐ **Relevancy Ranked**

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[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

[Evidence-Based Nursing Practice: Implementing](#)

[Evisceration and Dehiscence, Wound - Preventing and Managing: Postoperative Complications](#)

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[Exemestane \(Aromasin\)](#)

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[Exophthalmic Goiter: an Overview](#)

[External Cephalic Version: Breech Delivery](#)

[External Defibrillation: Performing](#)

[External Defibrillator, Automated: Use of In-Hospital](#)

[External Otitis, Malignant](#)

**Key Content**



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# THERE ARE 2 TYPES OF QUESTIONS

**1. Clinical questions- are about clinical practice.  
EBNP is designed to answer these types of questions**

- E.g. you will cite these articles in your P&P

**2. Nursing practice questions- are about the implementation/evaluation process. You can still use the principles of EBNP to answer these questions**

- E.g. You will refer to these articles to help you understand how best to implement CQI, P&Ps etc.



# CLINICAL QUESTIONS- EXAMPLES

1. These are questions that are directly about patient care:

- how to test for a type of infection
- how to treat a type of infection
- how infections are transmitted
- how infections can be prevented from spreading



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# THERE ARE SEVERAL TYPES OF CLINICAL QUESTIONS

| Type of Question                       |
|--|
| <b>Diagnosis</b> (test)                |
| <b>Therapy</b> (treatment, prevention) |
| <b>Etiology/Harm</b>                   |
| <b>Prognosis</b>                       |
| <b>Economics</b>                       |
| <b>Meaning</b>                         |

They can be **foreground** questions or **background** questions- more about this in next slides...



# NURSING PRACTICE QUESTIONS- EXAMPLES

2. These are questions that relate to nursing practice, management or implementation issues or processes- they still ultimately benefit patients but they do not fit under the categories of etiology, diagnosis, therapy, prognosis:

- What would increase nurses' compliance to infection control P&Ps?
- How to influence change when there is resistance to new P&Ps?
- What are barriers and facilitators to implementing EBNP?



# THERE ARE SEVERAL TYPES OF PRACTICE QUESTIONS

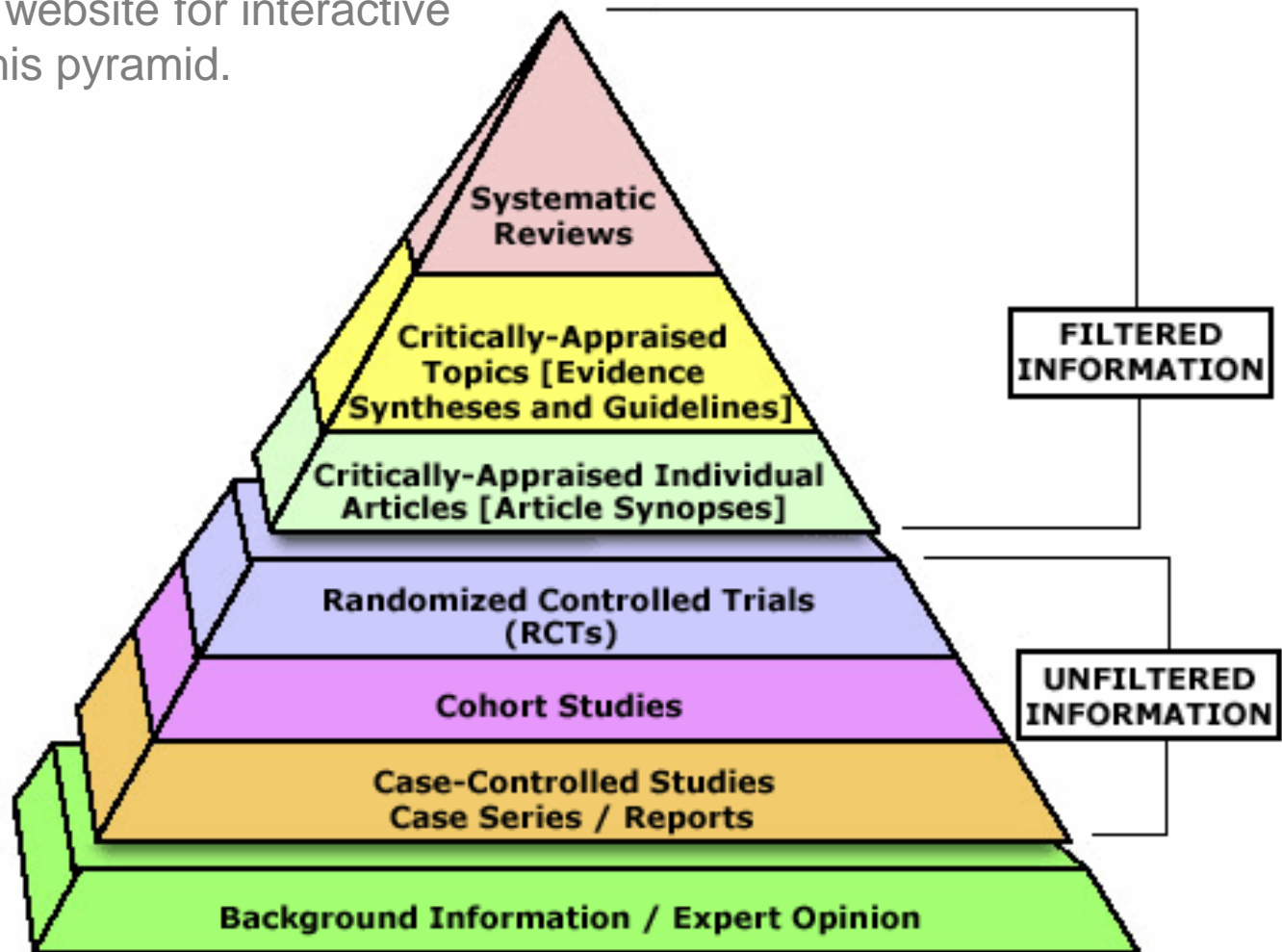
- No current model exists for classifying these types of questions in EBNP but they generally fall under these categories:
  - About CQI
  - About P&P development
  - About change management
  - Implementation science
  - Implementation of EBNP
  - Other...?



WHAT IS THE EVIDENCE?

# WHAT IS THE EVIDENCE?

See course website for interactive version of this pyramid.



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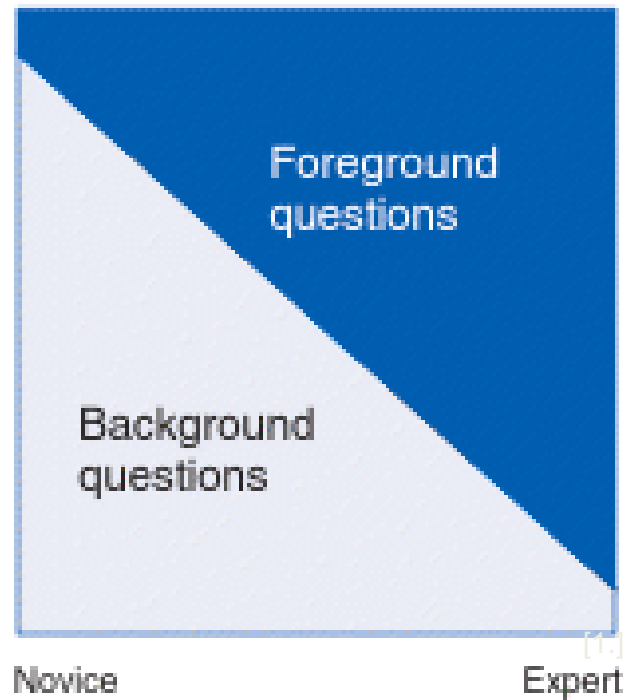
# TYPES OF STUDIES

- **Case reports/case studies-** detailed report of a single patient
- **Case series-** track patients with a known exposure (e.g. similar treatment)
- **Case-control studies-** compare patients with a disease or outcome with patients who do not have that disease or outcome- can be prospective or retrospective
- **Cohort studies-** track large numbers of people over a long period of time- can be prospective or retrospective
- **Randomized controlled trials-** measure the effect of a treatment in a controlled setting
- **Systematic reviews-** systematically search the published and unpublished literature to synthesis the evidence with reduced bias
- **Meta-analyses-** when quantitative data is homogenous enough it can be statistically pooled to provide a greater statistical significance- often done with systematic review

To learn more about different study designs see:

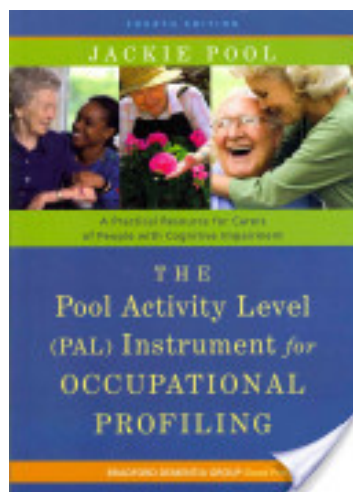
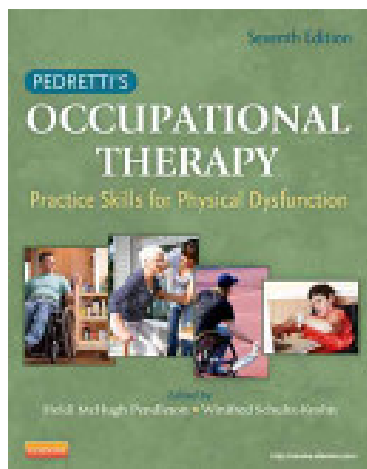
<http://hsl.lib.umn.edu/biomed/help/understanding-research-study-designs>

**What is MRSA  
(Methicillin-resistant  
Staphylococcus  
aureus)?**



**Is a staph DNA test  
as effective for  
diagnosing MRSA  
as compared to the  
Gold standard 48  
hour tissue sample  
diagnostic test?**

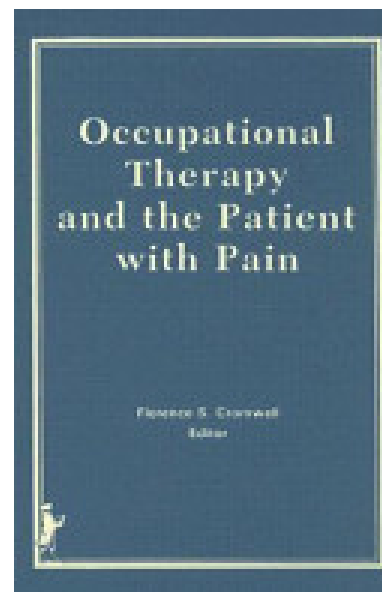
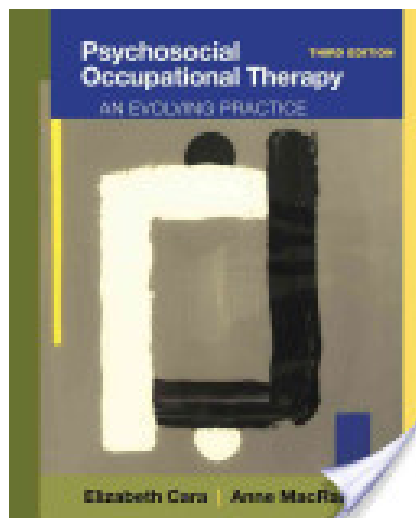
Image: Guyatt et al, 2008



Background  
Questions

## Sources for Background Questions

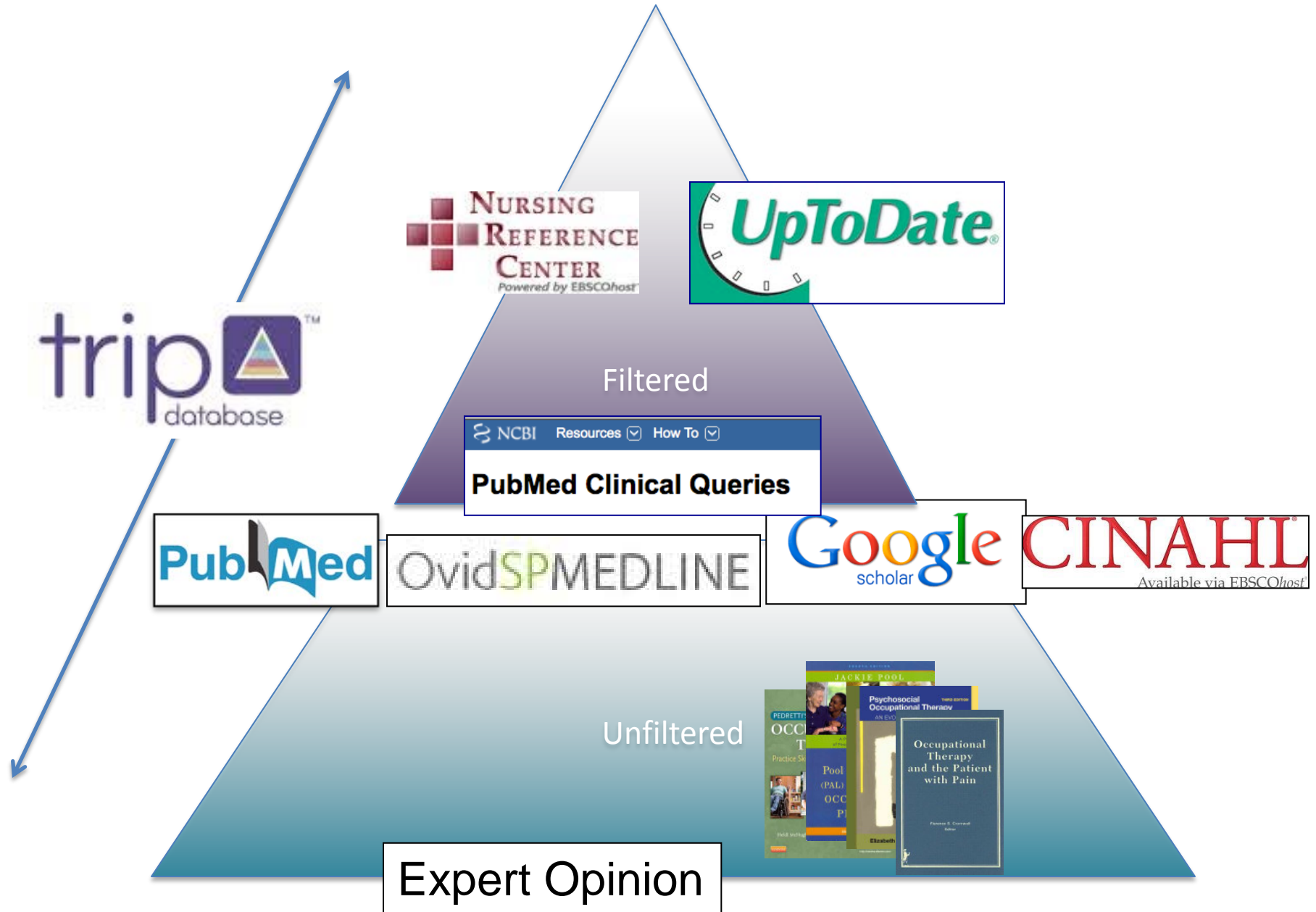
- Textbooks
- Handbooks
- Manuals
- etc



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# SOURCES FOR FOREGROUND QUESTIONS



# THERE ARE 2 TYPES OF RESOURCES

## 1. Clinical tools (aka point-of-care tools):

- Designed to answer clinical questions at point-of-care
- Quick and easy to search
- Try these first to answer clinical questions

## 2. Biomedical databases:

- More powerful, complex searches
- Use these to answer nursing practice questions and also clinical questions- some have clinical question filters (you'll learn about this in the searching workshops)



# CLINICAL QUESTION TYPES & BEST EVIDENCE

| Type of Question                       | Best Evidence  |
|--|--|
| <b>Diagnosis</b> (test)                | <b>Quantitative</b><br>Comparison to Gold Standard   |
| <b>Therapy</b> (treatment, prevention) | <b>Quantitative</b><br>Systematic review of RCTs, RCT  |
| <b>Etiology/Harm</b>                   | <b>Quantitative</b><br>Observational study: cohort or case control                                     |
| <b>Prognosis</b>                       | <b>Quantitative</b><br>Observational study: cohort or case control                                     |
| <b>Economics</b>                       | <b>Quantitative</b><br>Cost-effectiveness study  |
| <b>Meaning</b>                         | <b>Qualitative, mixed methods</b><br>Case study, ethnography, grounded theory, phenomenologic approach |

# PRACTICE QUESTION TYPES & BEST EVIDENCE

- About CQI
  - About P&P development
  - About change management
  - Implementation science
  - Implementation of EBNP
  - Other...?
- Best evidence: case study, program description, cost-effectiveness study, other?

# EXAMPLE:

PLoS One. 2012;7(10):e47200. doi: 10.1371/journal.pone.0047200. Epub 2012 Oct 22.

## **"The 3/3 strategy": a successful multifaceted hospital wide hand hygiene intervention based on WHO and continuous quality improvement methodology.**

Mestre G<sup>1</sup>, Berbel C, Tortajada P, Alarcia M, Coca R, Gallemi G, Garcia I, Fernández MM, Aguilar MC, Martínez JA, Rodríguez-Baño J.

### **Author information**

#### **Abstract**

**BACKGROUND:** Only multifaceted hospital wide interventions have been successful in achieving sustained improvements in hand hygiene (HH) compliance.

**METHODOLOGY/PRINCIPAL FINDINGS:** Pre-post intervention study of HH performance at baseline (October 2007-December 2009) and during intervention, which included two phases. Phase 1 (2010) included multimodal WHO approach. Phase 2 (2011) added Continuous Quality Improvement (CQI) tools and was based on: a) Increase of alcohol hand rub (AHR) solution placement (from 0.57 dispensers/bed to 1.56); b) Increase in frequency of audits (three days every three weeks: "3/3 strategy"); c) Implementation of a standardized register form of HH corrective actions; d) Statistical Process Control (SPC) as time series analysis methodology through appropriate control charts. During the intervention period we performed 819 scheduled direct observation audits which provided data from 11,714 HH opportunities. The most remarkable findings were: a) significant improvements in HH compliance with respect to baseline (25% mean increase); b) sustained high level (82%) of HH compliance during intervention; c) significant increase in AHRs consumption over time; c) significant decrease in the rate of healthcare-acquired MRSA; d) small but significant improvements in HH compliance when comparing phase 2 to phase 1 [79.5% (95% CI: 78.2-80.7) vs 84.6% (95% CI:83.8-85.4),  $p<0.05$ ]; e) successful use of control charts to identify significant negative and positive deviations (special causes) related to the HH compliance process over time ("positive": 90.1% as highest HH compliance coinciding with the "World hygiene day"; and "negative":73.7% as lowest HH compliance coinciding with a statutory lay-off proceeding).

**CONCLUSIONS/SIGNIFICANCE:** CQI tools may be a key addition to WHO strategy to maintain a good HH performance over time. In addition, SPC has shown to be a powerful methodology to detect special causes in HH performance (positive and negative) and to help establishing adequate feedback to healthcare workers.

[www.ncbi.nlm.nih.gov/pubmed/23110061](http://www.ncbi.nlm.nih.gov/pubmed/23110061)

### **MeSH Terms**

[Hand Hygiene/methods\\*](#)

[Hand Hygiene/standards\\*](#)  
[Hospitals\\*](#)

[Humans](#)

[Infection Control/methods](#)

[Infection Control/standards](#)

[Quality Improvement](#)

[World Health Organization](#)

# SELECT YOUR RESOURCE

| TYPE OF EVIDENCE  | RESOURCE   |
|---|--|
| Clinical guidelines   | Trip database  |
| Systematic reviews  | Trip database<br>Cochrane library<br>Pubmed Clinical Queries<br>Cinahl (Nursing & allied health)<br>Google Scholar<br>Ovid-Medline<br>Ovid-Embase (European, pharma)<br>Nursing Reference Centre |
| Evidence summaries  | UpToDate<br>Nursing Reference Centre<br>Dynamed (family medicine)  |
| Individual studies (RCT, Cohort, Case controlled, case study etc.)- non-appraised | Pubmed Clinical Queries<br>Pubmed<br>Cinahl (Nursing & allied health)<br>Google Scholar<br>Ovid-Medline<br>Ovid-Embase (European, pharma)<br>Nursing Reference Centre                            |
| Background info   | UpToDate<br>Nursing Reference Centre<br>Textbooks (print and online)   |

# INTERACTIVE PYRAMID

- [www.jgh.ca/en/hslintroebp](http://www.jgh.ca/en/hslintroebp)



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# ASKING ANSWERABLE QUESTIONS



# FORMULATING CLINICAL QUESTIONS

- Clinical scenarios (the story) can be complex and involve many issues surrounding patient care
- Often scenarios can be broken down into more than one question
- Each question can be formulated using PICO to:
  1. **identify key concepts,**
  2. **Identify the type of question and**
  3. **Identify the type of evidence to best answer the question.**

# What is a PICO?

P

Patient or Population

I

Intervention or exposure

C

Comparison

O

Outcome



Each question can be formulated using PICO to:

1. **identify key concepts,**
2. **Identify the type of question and**
3. **Identify the type of evidence to best answer the question.**

## 1. Why are key concepts important?

- Help you to build your search.
- Can be used as keywords, or to map to subject headings.
- You will learn more about keywords and subject headings in the next workshop...



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Each question can be formulated using PICO to:

1. **identify key concepts,**
2. **Identify the type of question** and
3. **Identify the type of evidence to best answer the question.**

## 2. WHY IS KNOWING THE TYPE OF QUESTION IMPORTANT?

- Helps you select best evidence to answer question
  - would an RCT be the best type of evidence to answer your question? Not always possible to blindly randomize people for ethical or practical reasons...



Each question can be formulated using PICO to:

1. **identify key concepts,**
2. **Identify the type of question and**
3. **Identify the type of evidence to best answer the question.**

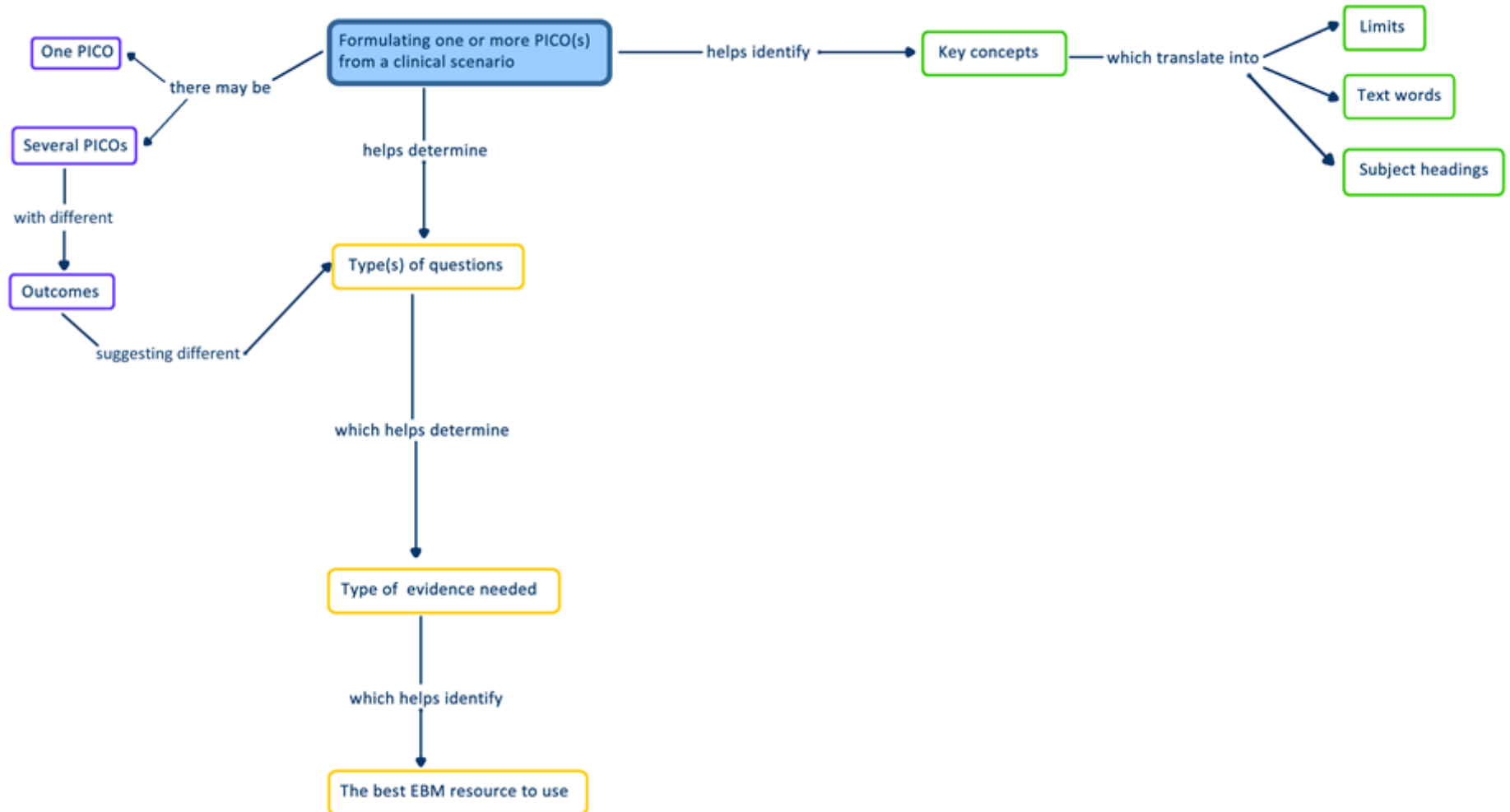
### 3. WHY IS KNOWING THE TYPE OF EVIDENCE IMPORTANT?

- Helps you select best resource to find best evidence
  - Should you search Pubmed or Cinahl or UpToDate?

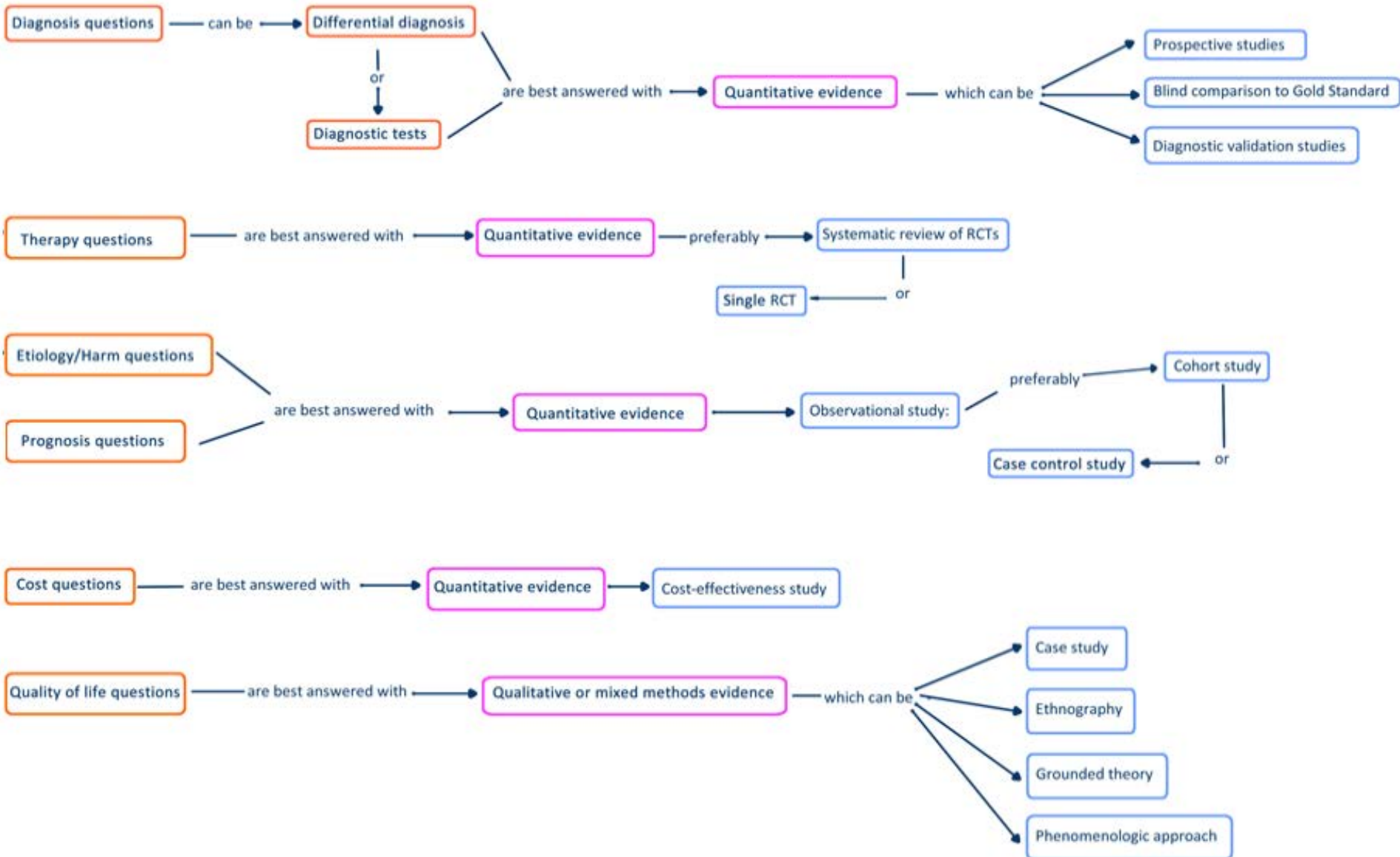


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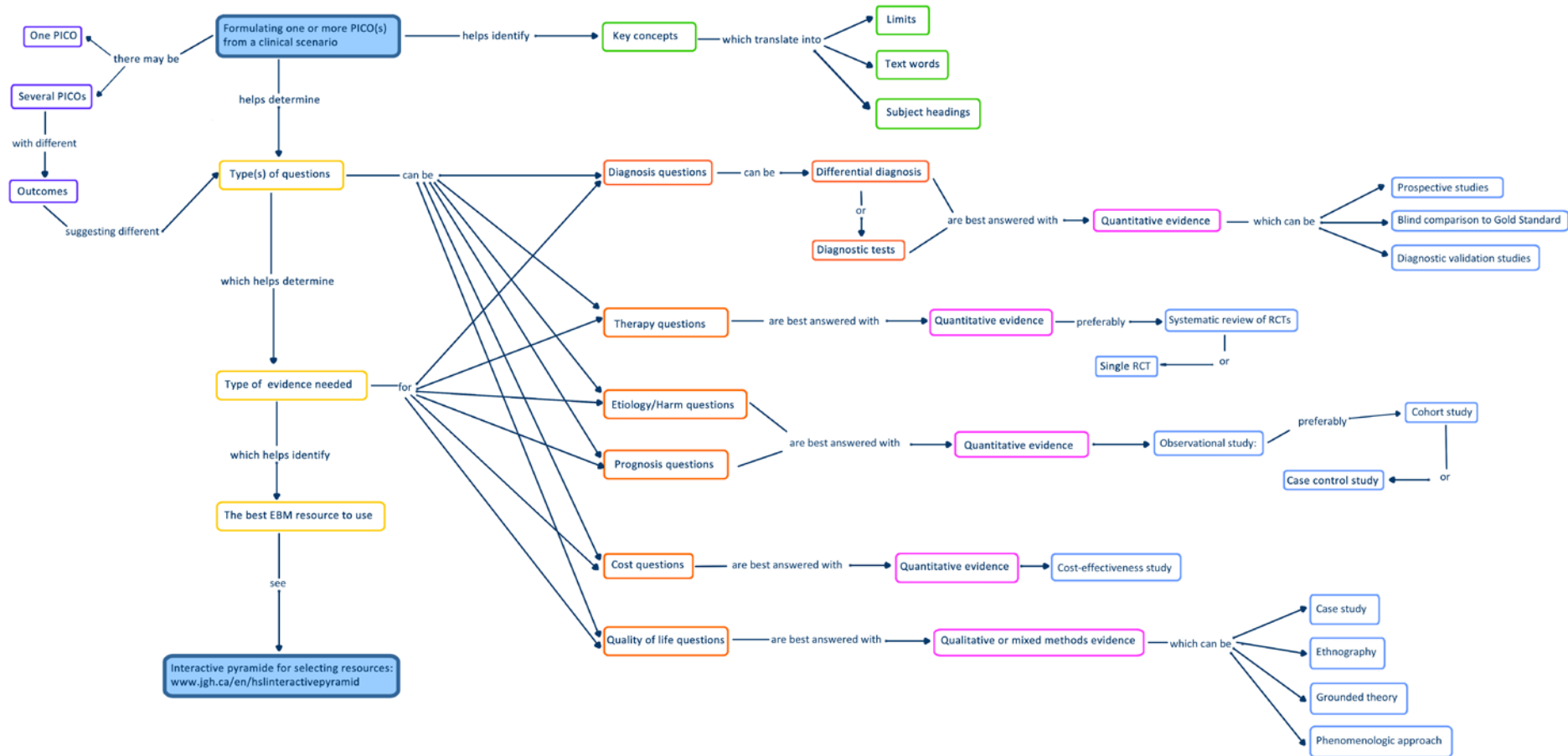
# PICO IN CONTEXT



# TYPE OF QUESTION -> TYPE OF EVIDENCE



# THE BIG PICTURE





# FORMULATING AN ANSWERABLE CLINICAL QUESTION

| P | In patients with...                             | Patient, Population  |
|---|---|--|
| I | Does...   | 1) Therapy<br>2) Other types of intervention   |
| C | Compared to...                                  | 1) Other therapy<br>2) Other intervention or no intervention<br>3) Standard of care or no comparison |
| O | Reduce, increase<br>(patient oriented outcomes) | Positive or negative clinical outcome?   |



# Example scenario

- **Patient information/scenario**

You have noticed an increase in the cases of HA-MRSA and suspect that a faster diagnosis could prevent spread of the infection more effectively. You are wondering if the new DNA tests which provide results in a couple of hours are as effective as the 48 hour tissue sample test that has been used until now.

- **Question**

In diagnosing HA-MRSA is the DNA test as effective as the 48 hour tissue sample?

- **PICO elements**

P: Hospitalized patients with suspected HA-MRSA

I: DNA diagnostic test

C: 48 hour tissue sample

O: Effective diagnosis of HA-MRSA

**Type of question:** Diagnosis

**Best evidence:** Systematic review of RCTs or RCT

**Best Sources:** Cinahl, PubMed, UpToDate, TRIP Database, Nursing Reference Centre

# ANSWERING NURSING PRACTICE QUESTIONS

- **Reminder:** These are questions that relate to nursing practice, management or implementation issues or processes- they still ultimately benefit patients but they do not fit under the category of etiology, diagnosis, therapy, prognosis.
- They don't always fit the PICO format but formulating the question, identifying key concepts and determining the type of research to best answer the question is still important.
- You will more likely find evidence by searching the biomedical databases rather than clinical tools



## HANDS ON

- Today we will work with a real clinical scenario...



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# INFECTION PREVENTION & CONTROL PATIENT-CARE SCENARIO

When postpartum mothers are positive for influenza, the current practice at JGH is to separate the mom and baby for 48 hours in order to prevent transmission of the infection to baby.

This is based on the 2007 CDC recommendations.

You wonder whether the evidence for these recommendations is strong enough given the known benefits for baby of rooming in and breastfeeding.

You would like to know if there is any good quality evidence more recent than 2007 that shows equally effective infection prevention when keeping baby with mother.

<http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf>

# INFECTION PREVENTION & CONTROL PATIENT-CARE SCENARIO

- Is this a single question?
- What are the PICO(s)?
- What type of question(s)?



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# NOT ALL RESEARCH IS CREATED EQUAL

- Even studies at the top of the evidence pyramid (systematic reviews, RCTs) can be poorly done
- Authors can reach conclusions not supported by the data
- Studies can be biased- did the authors do anything to mitigate this?
- You need to assess whether the study is relevant to your patients and your context



# WHAT IS CRITICAL APPRAISAL?

- A systematic way of assessing the quality and relevance of a given research article.
- Focus is on the methodology section instead of abstract/conclusion.
  - Is study well conducted/reported?
  - What are the limitations? i.e. small sample size, not randomized etc.
  - Is bias likely?
  - Are the results relevant to your patient/environment?
- Different criteria are used for different study types.
- There are worksheets to help with this.
- You will learn more about this in later workshops...

## WHAT IS PRE-APPRAISED EVIDENCE?

- Some evidence has been pre-appraised and assigned a “level of evidence” regardless of where it falls on the “pyramid”.
  - Some pre-appraised evidence comes in the form of a synthesis of the evidence- i.e. UpToDate
  - Sometimes a single study is appraised i.e. DARE (critically appraised systematic reviews)

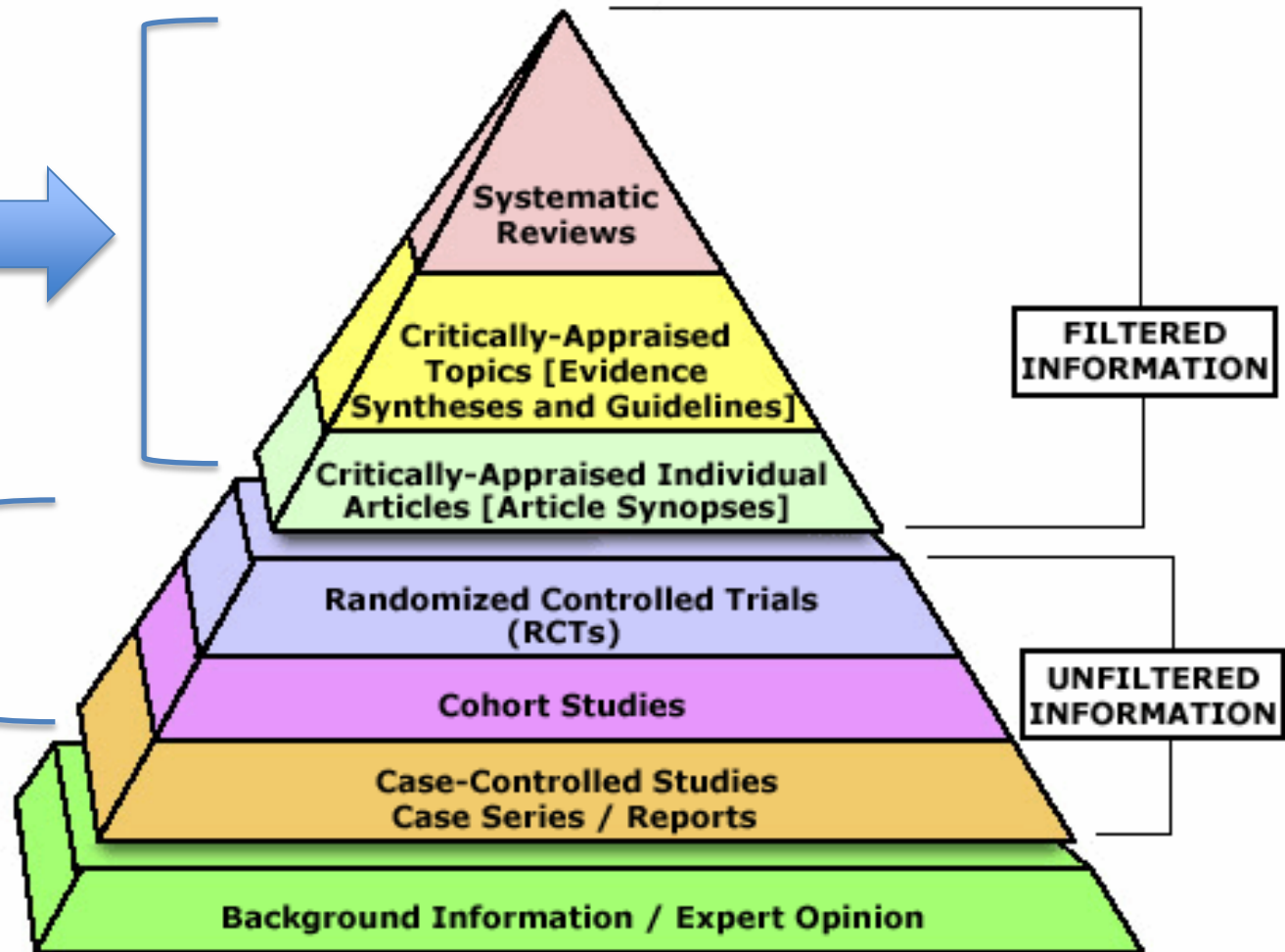


# JUST BECAUSE IT'S FILTERED, DOESN'T MEAN IT'S PRE-APPRAISED

May still need to be appraised by you



Needs to be appraised by you



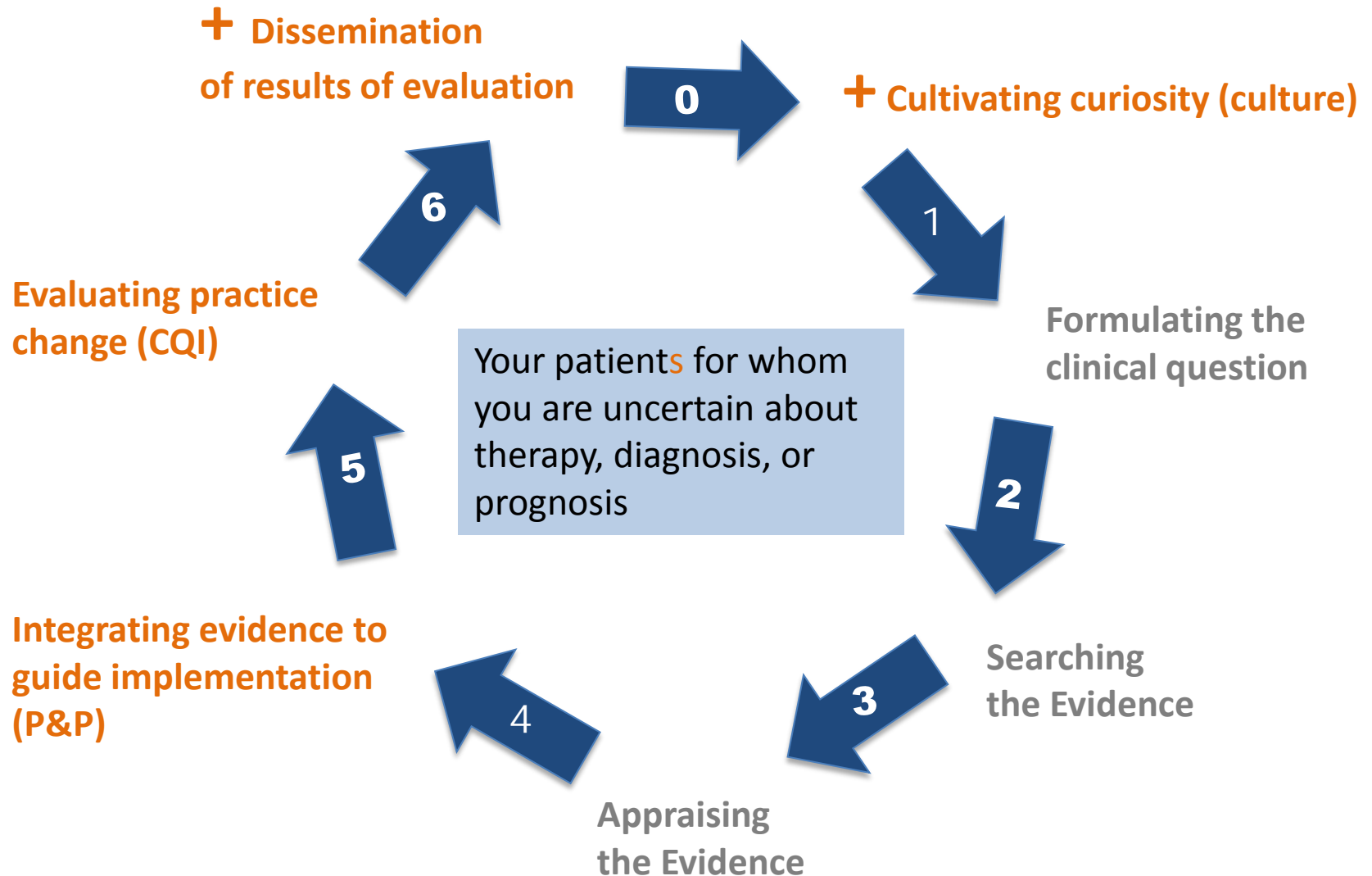
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See course website for interactive version of this pyramid.

# IN CONCLUSION

Let's do a brief review...

# EBNP PROCESS



## EBNP...

- Designed specifically for nurses
- Added aspect of CQI and change management
- CNS/nurse educators trained in EBNP as facilitators
- **Provides a framework that has as its goal the measurable improvement of:**
  - **Quality & consistency of care**
  - **Patient outcomes**
  - **Cost containment**
- Evidence is integrated into P&P so not reliant on clinical application by each individual



# THERE ARE 2 TYPES OF QUESTIONS

- 1. Clinical questions- EBNP is designed to answer these types of questions**
- 2. Nursing practice questions- you can still use the principles of EBNP to answer these questions**



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EACH CLINICAL QUESTION CAN BE FORMULATED USING PICO TO:

- Identify key concepts.
- Identify the type of question.
- Identify the type of evidence to best answer the question.

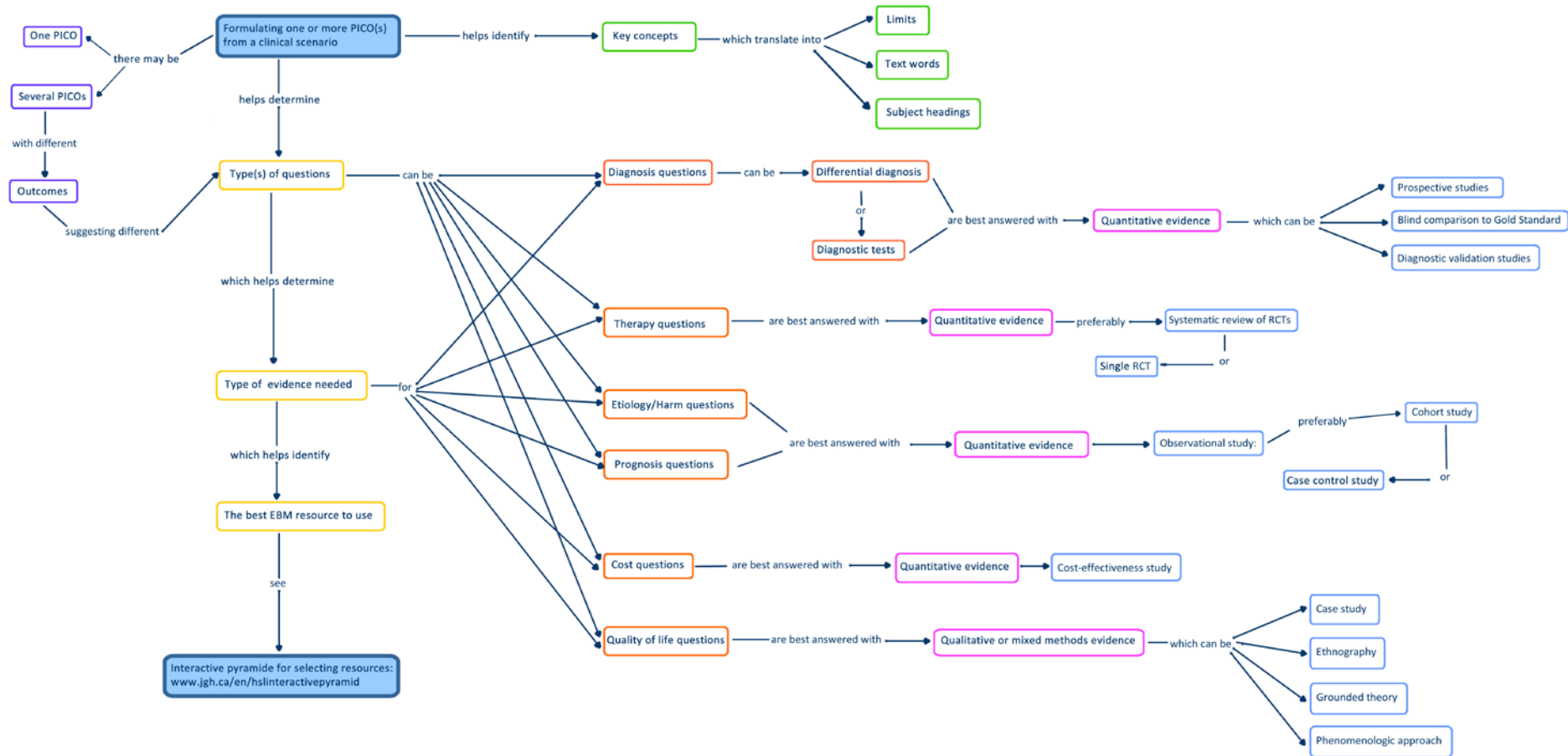


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| Type of Question                       | Best Evidence  |
|--|--|
| <b>Diagnosis</b> (test)                | <b>Quantitative</b><br>Comparison to Gold Standard   |
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| <b>Etiology/Harm</b>                   | <b>Quantitative</b><br>Observational study: cohort or case control                                     |
| <b>Prognosis</b>                       | <b>Quantitative</b><br>Observational study: cohort or case control                                     |
| <b>Economics</b>                       | <b>Quantitative</b><br>Cost-effectiveness study  |
| <b>Meaning</b>                         | <b>Qualitative, mixed methods</b><br>Case study, ethnography, grounded theory, phenomenologic approach |



# THE BIG PICTURE



# SELECT YOUR RESOURCE

| TYPE OF EVIDENCE  | RESOURCE   |
|---|--|
| Clinical guidelines   | Trip database  |
| Systematic reviews  | Trip database<br>Cochrane library<br>Pubmed Clinical Queries<br>Cinahl (Nursing & allied health)<br>Google Scholar<br>Ovid-Medline<br>Ovid-Embase (European, pharma)<br>Nursing Reference Centre |
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| Background info   | UpToDate<br>Nursing Reference Centre<br>Textbooks (print and online)   |

# Remember!

- A JGH Librarian is available to provide one-on-one instruction
  - Francesca Frati, local 2438, [ffrati@jgh.mcgill.ca](mailto:ffrati@jgh.mcgill.ca)
- Tutorials are available 24/7
  - [JGH.ca/HSL](http://JGH.ca/HSL) > Subject Guides or
  - [JGH.ca/HSL](http://JGH.ca/HSL) > Instruction > Workshop presentations & Handouts



# REFERENCES

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THANK YOU!



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