



# Clinical Questions & Answers

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# Agenda

- EBM
- Levels of Evidence
- Searching Responsibly
- Group Exercise
- EBM in practice




EBM, systematic reviews, meta-analyses

# **WHAT IS EVIDENCE BASED MEDICINE?**




The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients/clients.

Sackett, David L. "Evidence based medicine: what it is and what it isn't ." BMJ 1996;312:71-72 (13 January)




EBM asks questions, finds and appraises the relevant data and harnesses that information for everyday clinical practice.

Rosenberg W, Donald A. "Evidence based medicine: an approach to clinical problem solving. " BMJ 1995;310:1122-6

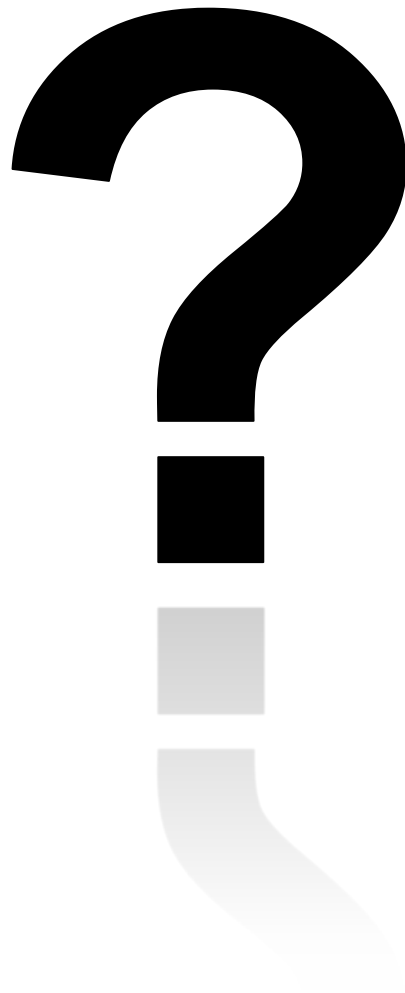


Evidence based medicine requires you to read the right papers at the right time and then to alter your behavior (and what is often more difficult, the behavior of other people) in light of what you have found.

Greenhalgh, Trisha. *How to read a paper*. London: BMJ (1997): p2.



**Pseudonormal mitral filling is associated with similarly poor prognosis as restrictive filling in patients with heart failure and coronary heart disease: a systematic review and meta-analysis of prospective studies.**

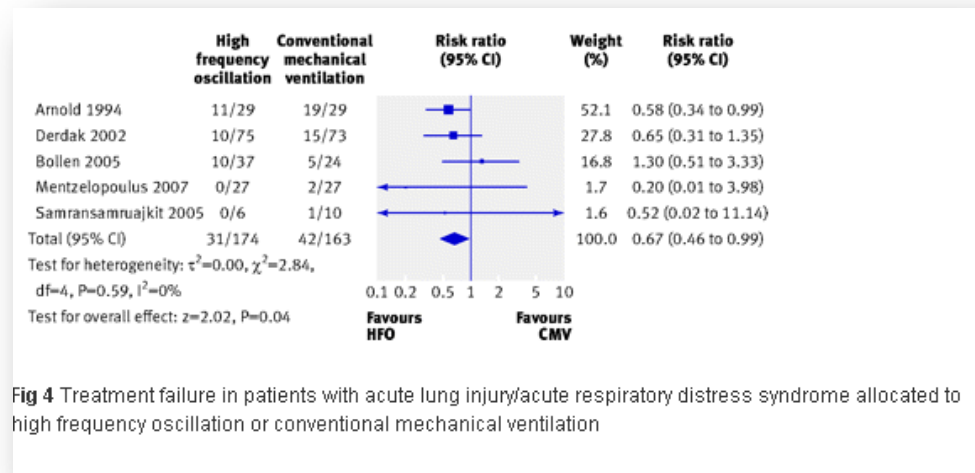


# What is a systematic review?

- A summary of the literature that
  - Uses explicit methods
  - Is based on a thorough literature search
  - Performs a critical appraisal of individual studies
  - Uses statistical techniques to combine data from valid studies (meta-analysis)

# What is a meta-analysis?

- “Analysis of analyses”
- Integrates findings from a variety of studies
- Includes statistical analysis
- Often critiqued for publication bias and missing data



A Forest plot, or ‘blobbogram’ is a common figure in meta-analysis.

It is a graphical display designed to illustrate the relative strength of treatment effects in multiple quantitative scientific studies addressing the same question.

# Why does all this matter?

- It's important to use evidence in practice
- It's important to know HOW to evaluate & apply evidence in practice
- It's important to know where to look for evidence to apply to clinical practice

If there's a better way to practice,  
therapists should find it.



Quality of  
care



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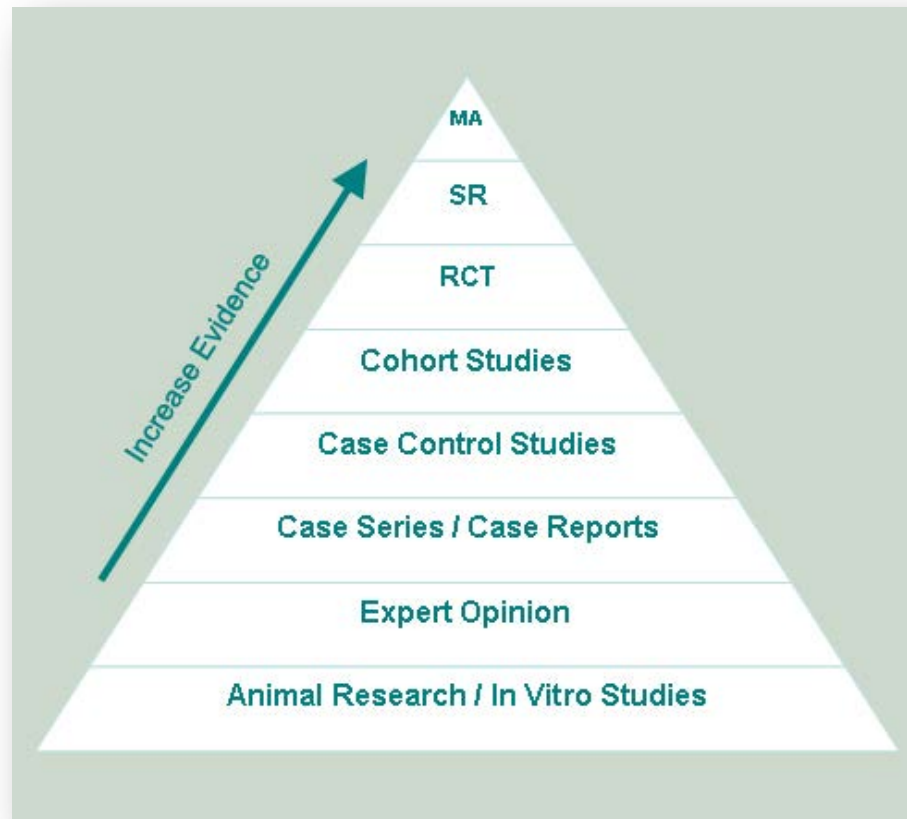


# **LEVELS OF EVIDENCE**

# Levels of Evidence

- Certain study designs are more rigorous.
  - Higher quality study = better decision making
- The “best” study design varies depending on what type of study is being conducted
- SRs, MAs & Randomized Controlled Trials (RCTs) are considered the best study design for detecting differences between intervention groups

# Level of evidence pyramid



The highest level for evidence is for Meta analysis, then Systematic Reviews, then Randomized Controlled Trials, etc...

The base has the largest number of literature studies and provides the least strength of evidence.

<http://smlweb.aub.edu.lb/Tutorial.aspx?file=Tutorials/principles.html>

# The “best” study design varies

<b>Study Design</b>	<b>Good for clinical question category</b>
Randomized controlled trial	therapy, prevention
Cohort Study	prognosis, etiology, prevention
Case control study	prognosis, etiology, prevention
Case series and case reports	prognosis, etiology, prevention

Strength of evidence depends on the type of research method used.

MAs, SRs & RCTs provide the highest level of evidence.

# Rating the evidence

- Often you will see “grades” associated with practice guidelines or recommendations
- This speaks to the confidence that the recommendations are valid



# CLINICAL QUESTIONS

# Creating a Clinical Question

4 components:

1. Patient/population
2. Intervention
3. Comparison
4. Outcome

P  
I  
C  
O

# Which title tells more?

**Effects of short-term pressure-controlled ventilation on gas exchange, airway pressures, and gas distribution in patients with acute lung injury/ARDS: comparison with volume-controlled ventilation.**

Prella M, Feihl F, Domenighetti G.  
[Chest. 2002 Oct;122\(4\):1382-8.](#)

**Tei index in Fabry disease.**

Niemann M, Breunig F, Beer M, Hu K, Liu D, Emmert A, Herrmann S, Ertl G, Wanner C, Takenaka T, Tei C, Weidemann F.

[J Am Soc Echocardiogr. 2011 Sep;24\(9\):1026-32. Epub 2011 Jun 29.](#)

Effects of **short-term pressure-controlled ventilation** on **gas exchange, airway pressures, and gas distribution** in **patients with acute lung injury/ARDS**: comparison with **volume-controlled ventilation**.

**PATIENT  
POPULATION**

**Intervention/Treatment**

***Comparison***

**OUTCOME**

# PICO

- For detailed info on components of a clinical question, see <http://libraries.umdnj.edu/camlbweb/EBM/picomodel.htm>




# **HOW TO SEARCH RESPONSIBLY**



# 1. Identify your subjects

“I need articles about positive pressure ventilation for patients with acute lung injury”

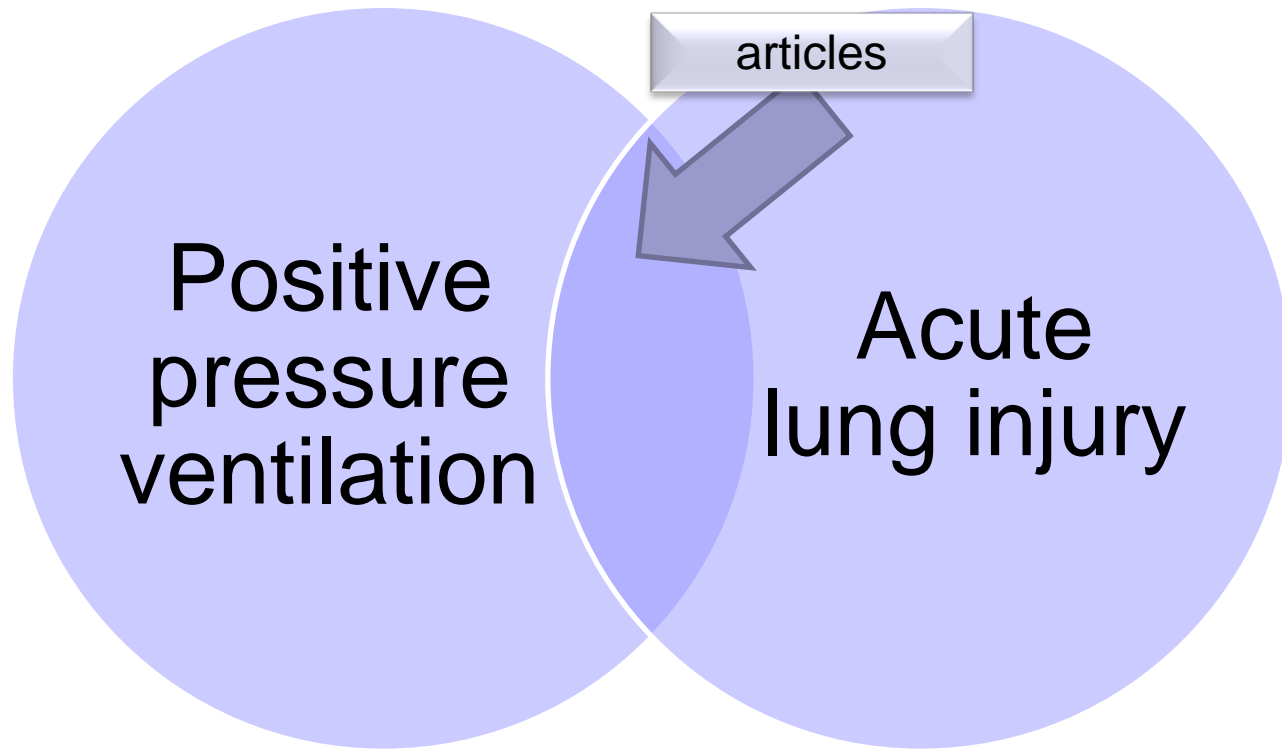


## 2. Break your search into simple phrases

Positive pressure ventilation /  
acute lung injury

*Try this: brainstorm synonyms*

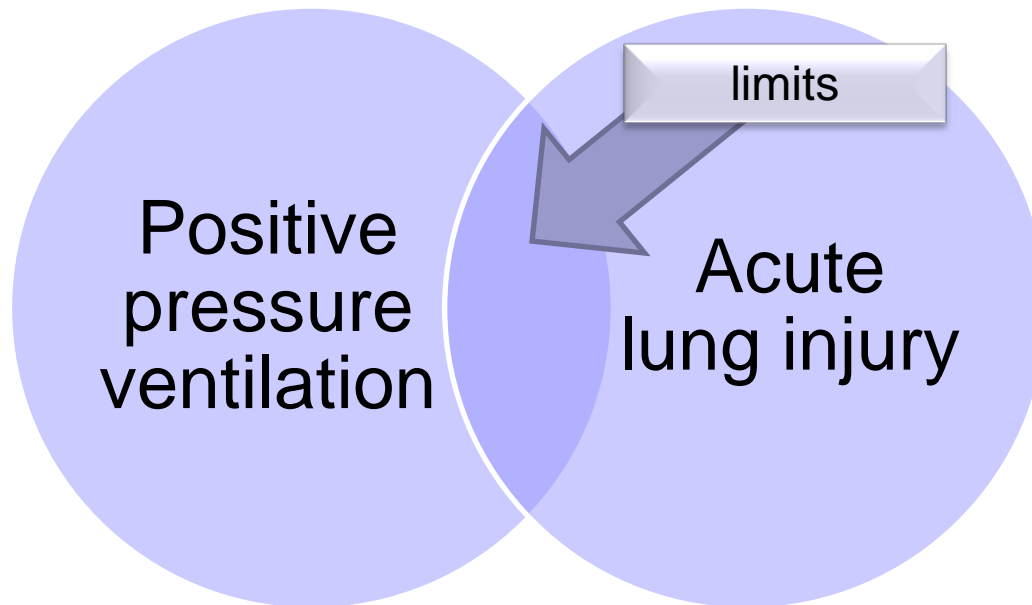
# 3. Connect phrases with Boolean Operators



<http://www.internettutorials.net/boolean.asp>

# 4. Apply limits

Age groups, language, dates, study types, etc.



# Subject Headings vs. Keywords

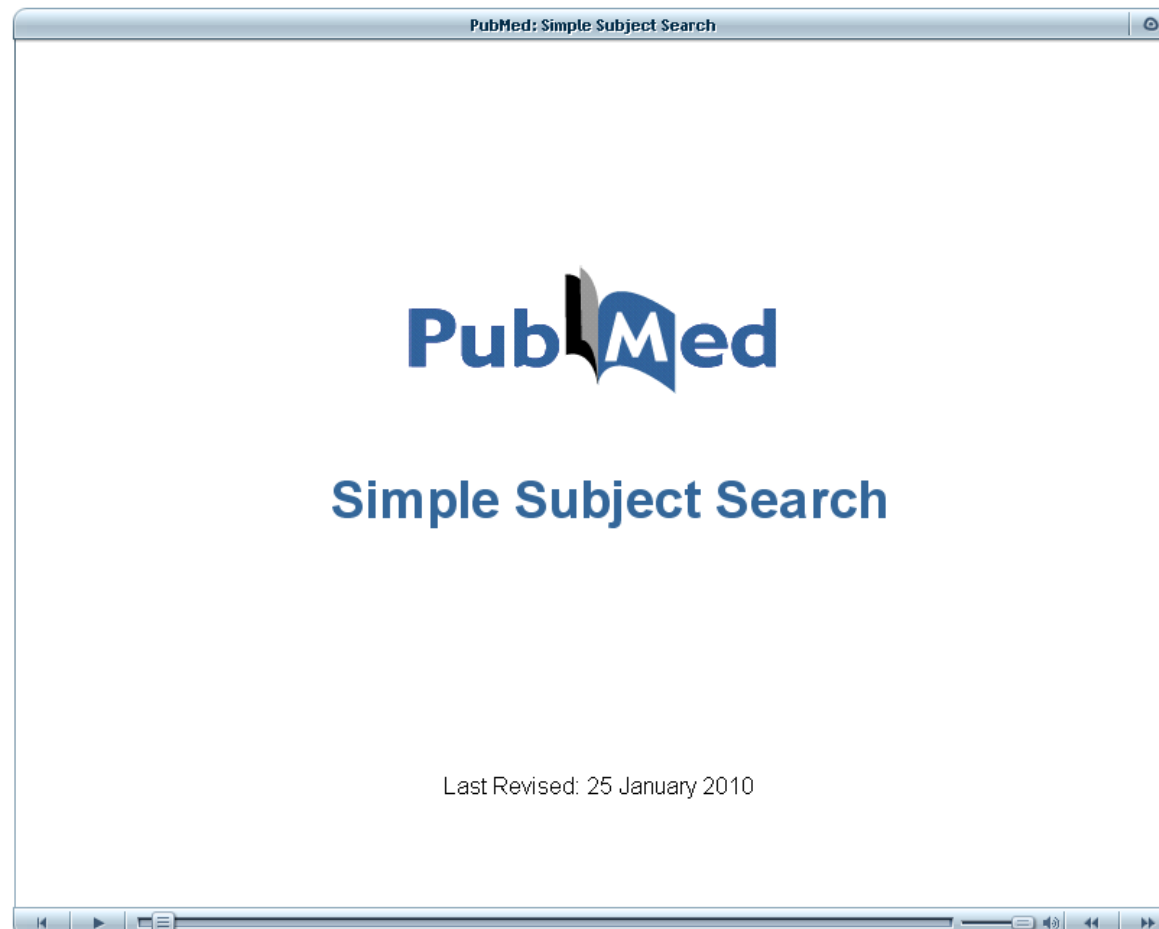
## ■ Subject Heading

- A word or phrase from a controlled vocabulary which is used to describe the subject of a document.
  - Example: MeSH, CINAHL Subject headings, EMTREE keywords

## ■ Keyword

- Any word or phrase in the title, subject headings, notes, abstract, or text of a record in a database used as a search term in a free-text search to retrieve all the records containing it.
  - Example: what you type when you use Google

# PubMed Subject Heading search



# More search tips

## ■ Consider using TRUNCATION

- Shortens a keyword so that it will match with all terms starting with the same stem.

***therap**\* will match with therapy, therapist, therapeutic, etc.*

- Ebsco & PubMed truncator: \* (**asterisk**)
- Truncation handout:

<http://www.lsuhscc.edu/no/library/services/reference/truncation.pdf>

## ■ Keep away from sentences and prepositions!

- Databases don't like the words 'in, to, for, by' etc. – use at your own risk!



**Access: library homepage**

<http://www.lsuhscc.edu/no/library/>

**Tip: Going through library gets more access to full text than [pubmed.gov](http://pubmed.gov)**

# Group assignment

- Divide into groups
  - RTs vs CVS
- Worksheet - Search PubMed & answer questions (15 minutes)
- Share search techniques with class (10 minutes)
- Wrap up/EBM in practice (10 minutes)

# EBM in practice

- Applying the evidence can be like pulling a needle out of a haystack. That's where clinical practice guidelines come in.



# Clinical Practice Guidelines



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The Science Journal of the American Association for Respiratory Care

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Guidelines are available in the following categories:

- [AARC Evidence-Based Guidelines](#)
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## Evidence-Based Guidelines

Weaning and Discontinuing Ventilatory Support  
Care of the Ventilator Circuit and Its Relationship to Ventilator-Associated Pneumonia



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## Clinical Statements/Guidelines

Access to and download of clinical documents is free. Reprints of Guidelines and Clinical Statements are available for purchase.

ACC provides a framework of by leaders in the field of cardiovascular medicine.

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## Statements and Guidelines

The American Heart Association (AHA) publishes medical scientific statements on various cardiovascular disease and stroke topics. AHA volunteer scientists and healthcare professionals write the papers. The statements are supported by scientific studies published in recognized journals and have a rigorous review and approval process. Scientific statements generally include a review of data available on a specific subject, an evaluation on its relationship to overall cardiovascular disease science, and often an American Heart Association position on the basis of that evaluation.

[learn more](#)

## Statements and Guidelines

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National Guideline Clearinghouse  
www.guideline.gov

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## ASE American Society of Echocardiography

Heart & Circulation Ultrasound Specialists

ASE Home > The American Society of Echocardiography

Reprinted from the January 2002 issue of RESPIRATORY CARE [Respir Care 2002;47(1):69-90]

# AARC Clinical Practice Guideline

## Evidence-Based Guidelines for Weaning and Discontinuing Ventilatory Support

*A Collective Task Force Facilitated by the American College of Chest Physicians, the American Association for Respiratory Care, and the American College of Critical Care Medicine*

Table 1. Grades of Evidence Grade Description

- A. Scientific evidence provided by well-designed, well-conducted, controlled trials (randomized and nonrandomized) with statistically significant results that consistently support the guideline recommendation
- B. Scientific evidence provided by observational studies or by controlled trials with less consistent results to support the guideline recommendation
- C. Expert opinion supported the guideline recommendation, but scientific evidence either provided inconsistent results or was lacking

**Recommendation 1.** In patients requiring mechanical ventilation for > 24 hours, a search for all the causes that may be contributing to ventilator dependence should be undertaken. This is particularly true in the patient who has failed attempts at withdrawing the mechanical ventilator. Reversing all possible ventilatory and nonventilatory issues should be an integral part of the ventilator discontinuation process.

Evidence (Grade B)



# Practice Guidelines

- Offer clinical support for decision making in the field
- Created by many organizations & groups
- Local healthcare providers may produce their own set of guidelines or adapt them
- Have you encountered/used other clinical practice guidelines?

# Evaluating the Literature

## ■ Questions to consider

- Was the study original?
- Who is it about?
- Was it well designed?
- Was systematic bias avoided? (i.e., was the study adequately controlled)
- Was it large enough & continued long enough to make the results credible?

FOR MORE TIPS, SEE: *How to read a paper*. Trisha Greenhalgh (2006)

Available in the library → W 20.5 G83h 2006

See also: <http://www.bmj.com/collections/read.dtl>

# For more information on EBM



## Users' Guides Interactive

An online tool to guide clinicians in the appraisal and application of evidence into their everyday practice.

The Users' Guide Interactive Web site contains the entire contents of the first edition of the *Users' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice*, and makes this content interactive with dynamic tips, worksheets, calculators, and illustrative clinical cases. New interactive features are added continually.



The second edition of the *Users' Guides to the Medical Literature* will be available online soon on [JAMAevidence.com](http://JAMAevidence.com), a new online resource for learning, teaching, and practicing evidence-based medicine.

*Users' Guide Interactive* Web site is a joint project between the [Centre for Health Evidence](http://Centre for Health Evidence) and [JAMA & Archives Journals](http://JAMA & Archives Journals). The content is based on the popular *Users' Guides* series in *JAMA* and is edited by Drs Gordon Guyatt, Drummond Rennie, and Robert Hayward with contributions from more than fifty of the most renowned evidence-based medicine (EBM) educators and practitioners in the world.

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Free tour

Free video tour of the Users' Guide Interactive site

# Final Thoughts

## ■ Levels of evidence

- SRs, MAs & RCTs are considered the best study design for detecting differences between intervention groups

## ■ Searching the literature

- Brainstorm keywords
- Utilize truncation, subject headings, limits

## ■ Evaluate the literature

- Was the outcome achieved? Did it help?

## ■ Apply what you've learned to practice

- Recognize local & nat'l practice guidelines

# Further Reading

- Greenhalgh, Trisha. *How to read a paper*. London: BMJ Publishing (2006).
  - Available for checkout: W 20.5 G83h 2010
- Law, Mary. *Evidence-Based Rehabilitation: A guide to practice*. New Jersey: Slack Publishing (2008).
  - Available for checkout: WB 320 L41e 2008



# Thank you!

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