Finding Research

- Define your question
- Plan your search
- Find the evidence
- Evaluate the literature
- Stay organized

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Define your question using PICO

- Patient/Population/Problem
- Intervention
- Comparison (if available)
- Outcome(s)

*View PICO: Developing the Answerable Clinical Question (video under “View PICO Lecture”)
  http://researchguides.uic.edu/content.php?pid=232200&sid=1921075
What is the effectiveness of continuous passive motion therapy (CPM therapy) following knee replacement in achieving optimal range of motion?
**Research Question:** Are virtual reality programs an effective, alternative tool for rehabilitation of stroke victims?

http://libguides.greenriver.edu/content.php?pid=48934&sid=755695
PICO Model Examples

- In underweight refugee children (P), will tube feeding (I) safely restore weight and increase maximum energy intake (O)?

- Is elective adult male circumcision (I) more effective than sexual education (C) in reducing HIV acquisition (O) in an urban Ugandan setting (P)?

- Will a public awareness campaign on the dangers of indoor air pollution due to cooking with biomass fuels in poorly ventilated spaces (I) lower the number of respiratory infections (O) in poor households in Bangladesh (P)?

More PICO information from UIC
http://researchguides.uic.edu/content.php?pid=232200&sid=1921075
Can exercise increase fitness and reduce weight in patients with schizophrenia and depression?

Meeting physical activity guidelines is associated with reduced risk for cardiovascular disease in black South African women; a 5.5-year follow-up study.

Do soccer and Zumba exercise improve fitness and indicators of health among female hospital employees? A 12-week RCT.

Weight and metabolic outcomes after 2 years on a low-carbohydrate versus low-fat diet: a randomized trial.
PICO Model: Background Questions

- General knowledge
- Who/what/when/where/how/why
- Disorder/test/treatment/other aspect of health care

Example: What is continuous passive motion therapy (CPM therapy)?
Do you PICO?
- Probably not- consult a textbook, review article, book

You might have to ask some background questions before you can formulate a PICO question.
PICO Model: Background Questions

- General knowledge
- Who/what/when/where/how/why

Where to look:
- Textbooks
- Access Physiotherapy (Access Medicine, etc.)
- Rehabilitation Reference Center
- UpToDate
PICO Model: Foreground Questions

- Specific knowledge affecting clinical decisions
- “Seek evidence to answer a need for clinical information related to a specific patient, intervention, or therapy” (Hunter College guide)

Example: What is the effectiveness of continuous passive motion therapy (CPM therapy) following knee replacement in achieving optimal range of motion?

Do you PICO?
- Yes! Primary medical literature
PICO Model: Foreground Questions

- Specific knowledge affecting clinical decisions
- “Seek evidence to answer a need for clinical information related to a specific patient, intervention, or therapy” (Hunter College guide)

Where to look:
- PubMed
- Cochrane
- CINAHL

Additional Databases
Levels of Evidence

- Systematic Reviews
- Randomized Controlled Trials
- Cohort Studies
- Case-Control Studies
- Case Series, Case Reports
- Editorials, Expert Opinion

(& Meta Analyses)
PICO Model: Type of question/problem

- By focusing on one of the following aspects you can really narrow your search to relevant sources. It also affects the type of study you might seek out (more on this in a few slides).

  - Diagnosis
  - Etiology
  - Therapy
  - Prognosis
  - Prevention
## Preferred Study Types for PICO Questions

<table>
<thead>
<tr>
<th>Type of Question</th>
<th>Type of Study/Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy: information needed about treatments (effectiveness, cost, etc.)</td>
<td>Double-Blind Randomized Controlled Trial</td>
</tr>
<tr>
<td>Diagnosis: information needed about a diagnostic test (sensitivity, accuracy, etc.)</td>
<td>Controlled Trial</td>
</tr>
<tr>
<td>Prognosis: information needed about the course of the disease over time, expected complications, etc.</td>
<td>Cohort Studies Case Control Case Series</td>
</tr>
<tr>
<td>Etiology/Harm: information needed about causes of disease or contributing factors of disease</td>
<td>Cohort Studies</td>
</tr>
<tr>
<td>Prevention: information needed about the prevention of disease (immunization, social factors, etc.)</td>
<td>Randomized Controlled Trial Cohort Studies</td>
</tr>
<tr>
<td>Quality Improvement: information needed about clients' and health professionals' experiences and concerns</td>
<td>Randomized Controlled Trial</td>
</tr>
</tbody>
</table>
Sample search: PICO

- Is resistance training more effective than wearing knee braces to reduce pain caused by patellar tendinosis in female volleyball players?

- **P** - Female volleyball players w/patellar tendinosis
- **I** - Resistance training
- **C** - Knee braces
- **O** - Reduction of pain
Is resistance training more effective than wearing knee braces to reduce pain caused by patellar tendinosis in female volleyball players?

Circle the key concepts of your question. (#2 on PICO worksheet)
Plan your search

- Preliminary searching
  - Clinical tools (Rehabilitation Reference Center, UpToDate, etc.)
  - General reference resources (Wikipedia, Textbooks)

- Identify synonyms & related terms
  - Beware of jargon
  - Look for controlled vocabulary (database terms)

- Fill in the chart on your PICO handout (#3)
## Sample search: Key concepts & terms

<table>
<thead>
<tr>
<th>Key Concepts</th>
<th>Resistance training</th>
<th>Knee braces</th>
<th>Patellar tendinosis</th>
<th>Volleyball</th>
<th>(Pain reduction)</th>
<th>(Female)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synonyms/Related terms</strong></td>
<td>Strength training</td>
<td>External orthoses</td>
<td>Patellar tendinopathy</td>
<td>Indoor volleyball</td>
<td>(decrease in pain)</td>
<td>(women)</td>
</tr>
<tr>
<td>Eccentric exercises</td>
<td>Knee strap</td>
<td>Jumper’s knee</td>
<td>Beach volleyball</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentric exercises</td>
<td>Patellar strap</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

- **Resistance training**: Exercises that target muscles to increase strength and improve function.
- **Knee braces**: Devices used to support and stabilize the knee joint.
- **Patellar tendinosis**: An inflammation of the tendon that attaches to the kneecap.
- **Volleyball**: A sport played on a court with a net.
- **Pain reduction**: Reducing the intensity or frequency of pain.
- **Female**: Refers to the female gender.
- **Indoor volleyball**: A variant of the sport played indoors.
- **Beach volleyball**: A variant of the sport played on a beach.
Find the Evidence

- Library databases
  - PubMed
  - EMBASE
  - Cochrane Library
  - PEDro
  - CIRRIE
  - Rehabilitation & Sports Medicine Source

- Boolean Operators
  - AND, OR, NOT
• Searching with AND combines terms. It gives you results that satisfy both search terms (only where the two overlap). Some databases use + for AND.

• Searching with OR “means more”! It gives you everything available for each term, including when they overlap. Some databases use | for OR.

• Searching with NOT excludes an entire term, including any overlap between terms. Some databases use – for NOT.
Sample search: Database exploration

- Search for
  “Patellar tendinosis” AND volleyball AND “resistance training”

- Complete Database worksheet and prepare to report back to the group.
Evaluate the literature

- Critical Appraisal Tools
  - PEDro
  - GRADE
  - CEBM
  - CASP
  - PRISMA


- Currency, Relevance, Authority, Accuracy, Purpose

http://guides.nyu.edu/appraisal
Stay organized

- Save your searches!
  - Use a spreadsheet to track database, search terms, number of results, etc.
  - Set up search alerts

- Use a citation manager
  - RefWorks, Zotero, EndNote
  - Save article citations & build bibliographies
Questions?