

EVISCORE FOUNDATION: MASTERING EVIDENCE ACQUISITION

A Guide to Finding the Best Available Evidence in Research

EviScore Foundation Course

Module 2: ACQUIRE

Finding the Best Available Evidence

Module Learning Journey

Module 2: ACQUIRE

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Chapter 1: Why Evidence Searching Matters

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Chapter 2: Choosing the Right Evidence Resource

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Chapter 3: Building Your Search Strategy

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Chapter 4: Mastering PubMed Tools

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Chapter 5: Refining and Managing Your Searches

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Final Knowledge Check

Module Introduction

Learning Outcomes

By the end of this module, you will be able to:

- **Explain** why efficient evidence searching is essential in Evidence-Based Healthcare
- **Select** the most appropriate evidence resource for different clinical questions
- **Describe** the evidence-searching process

- **Understand** the principles of an effective literature search
- **Prepare** a structured search strategy

Why This Module Matters

A well-formulated clinical question has little value unless clinicians can efficiently locate the highest-quality evidence to answer it.

Evidence searching is therefore a core competency in Evidence-Based Healthcare.

EVIDENCE PEARL

"The best clinical question deserves the best available evidence."

CHAPTER 1

Why Evidence Searching Matters

The Third Step of the Evidence Cycle

After asking a focused clinical question, the next step is to **Acquire** the best available evidence.

The Evidence Cycle

Assess

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Ask

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Acquire ★

↓

Appraise

↓

Apply

What Does "Acquire" Mean?

Acquire involves:

- **Identifying** appropriate evidence resources
- **Developing** a search strategy
- **Searching** efficiently
- **Retrieving** the highest-quality evidence

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Searching is a clinical skill—not simply typing words into PubMed.

Why Is an Efficient Search Important?

Every day thousands of new biomedical articles are published. Searching every paper individually is impossible.

Evidence-Based Healthcare therefore emphasizes efficient searching using structured strategies and high-quality information resources.

Inefficient Searching

- ✗ Random Google searches
- ✗ Unstructured keywords
- ✗ Reading every article
- ✗ Ignoring evidence hierarchy

Efficient Searching

- ✓ Structured clinical question
- ✓ Appropriate database
- ✓ Well-designed search strategy
- ✓ Best available evidence first

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Efficiency improves both clinical practice and patient care.

THINK

Consider your last literature search. Did you have a clear plan before you started, or did you search randomly until you found something relevant?

Chapter Takeaway

- ✓ **Understand** that evidence searching is a structured clinical skill
- ✓ **Recognize** the difference between efficient and inefficient searching
- ✓ **Remember** that searching is the bridge between clinical questions and evidence-based decisions

CHAPTER 2

Choosing the Right Evidence Resource

Not All Evidence Resources Are Equal

One of the most important decisions in Evidence-Based Healthcare is selecting the appropriate information resource.

Different resources provide different levels of evidence, levels of synthesis, and clinical

usefulness.

Categories of Evidence Resources

Pre-appraised Resources

Evidence already evaluated by experts

- ACP Journal Club
- TRIP Database

Synthesized Evidence

Evidence combined from multiple studies

- Cochrane Library
- Clinical Practice Guidelines

Point-of-Care Resources

Quick clinical summaries

- DynaMed
- UpToDate

Primary Literature

Original research articles

- PubMed

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Always search the highest available level of evidence first before looking for individual studies.

Understanding Major Evidence Resources

Resource	Primary Purpose	Best Use
Cochrane Library	High-quality systematic reviews	Intervention questions
PubMed	Original biomedical literature	Primary research
TRIP Database	Guidelines, reviews, and evidence summaries	Rapid evidence retrieval
ACP Journal Club	Pre-appraised clinically relevant studies	High-quality research

DynaMed/UpToDate	Point-of-care summaries	Clinical decision support
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Key Principle

Each database serves a different purpose. Selecting the correct resource increases search efficiency and reduces unnecessary reading.

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Choosing the right database is as important as choosing the right keywords.

STOP & THINK

If you needed evidence about whether exercise therapy helps knee osteoarthritis, which resource would you search first? Why?

Chapter Takeaway

- ✓ **Understand** that different resources serve different purposes
- ✓ **Recognize** the evidence hierarchy from summaries to primary research
- ✓ **Apply** the principle of searching synthesized evidence before individual studies

CHAPTER 3

Building Your Search Strategy

Searching Begins Before You Open PubMed

A successful literature search starts with a carefully planned search strategy.

Step-by-Step Search Process

Step 1: Start with your PICOTT question

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Step 2: Identify the main concepts

- Patient
- Intervention
- Comparison (if needed)
- Outcome (if useful)

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Step 3: Convert concepts into search terms

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Step 4: Choose the evidence resource

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Step 5: Perform the search

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Step 6: Evaluate the search results

Clinical Example

PICOTT Question:

In adults with knee osteoarthritis, does exercise therapy reduce pain compared with usual care?

Search Concepts:

- **Concept 1:** Osteoarthritis
- **Concept 2:** Exercise Therapy
- **Concept 3:** Pain (optional)

Initial Search:

"Osteoarthritis" AND "Exercise Therapy"

Identifying Synonyms

Concept	Possible Search Terms
Knee Osteoarthritis	Osteoarthritis, Knee OA, Degenerative Joint Disease
Exercise Therapy	Exercise, Physical Therapy, Rehabilitation
Pain	Pain, Pain Relief, Analgesia

Why Use Synonyms?

- Different authors may use different terminology
- Searching with multiple terms increases retrieval of relevant studies

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Search concepts—not complete sentences.

TRY IT

Take your PICOTT question from Module 1. Identify the main concepts and list possible synonyms for each concept.

Chapter Takeaway

- ✓ **Understand** that search strategy development precedes database searching
 - ✓ **Recognize** the importance of identifying concepts and synonyms
 - ✓ **Apply** the six-step search process to clinical questions
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CHAPTER 4

Mastering PubMed Tools

Boolean Operators: The Foundation of Searching

Boolean operators combine search terms logically and are essential for efficient searching.

AND

Narrows the search

Returns articles containing **both** concepts

Example: Osteoarthritis AND Exercise

OR

Broadens the search

Returns articles containing **either** term

Example: Stroke OR Cerebrovascular Accident

NOT

Excludes unwanted concepts

Example: Stroke NOT Pediatric

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Use OR for synonyms. Use AND to combine different concepts. Use NOT cautiously, as it may exclude relevant studies.

MeSH (Medical Subject Headings)

Why MeSH?

Authors may describe the same concept using different words. MeSH provides a standardized vocabulary that improves search consistency.

Examples:

- **Search Term:** Heart Attack → **MeSH Term:** Myocardial Infarction
- **Search Term:** High Blood Pressure → **MeSH Term:** Hypertension

Advantages of MeSH

- ✓ Standardized terminology
- ✓ More comprehensive retrieval
- ✓ Reduces missed articles
- ✓ Improves precision

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Think like the database. Search using its vocabulary—not only yours.

PubMed Advanced Search

Advanced Search Features

- ✓ Search Builder
- ✓ Search History
- ✓ Field Selection
- ✓ Search Details
- ✓ Index List

Why Use Advanced Search?

Allows clinicians to:

- Combine multiple concepts systematically
- Search specific fields (Title, Author, Journal, MeSH)
- Review previous searches
- Build reproducible search strategies

Example Advanced Search:

"Osteoarthritis"[MeSH] AND "Exercise Therapy"[Title/Abstract]

PubMed Clinical Queries

Finding High-Quality Clinical Studies Faster

Clinical Queries help retrieve methodologically sound studies for common clinical question types.

Clinical Query Categories:

- Therapy
- Diagnosis
- Etiology (Harm)
- Prognosis
- Clinical Prediction Guides
- Systematic Reviews

Search Scope Options:

- **Broad:** Higher sensitivity, finds more articles
- **Narrow:** Higher specificity, finds fewer but more rigorous studies

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Clinical Queries help clinicians locate high-quality evidence more efficiently by applying validated methodological filters.

APPLY

Using your clinical question, determine which Clinical Query category would be most

appropriate. Would you choose broad or narrow scope? Why?

Chapter Takeaway

- ✓ **Understand** Boolean operators and their proper use
 - ✓ **Recognize** the value of MeSH terms for standardized searching
 - ✓ **Apply** Advanced Search tools for complex searches
 - ✓ **Remember** that Clinical Queries filter for methodological quality
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CHAPTER 5

Refining and Managing Your Searches

Your First Search Is Rarely Your Best Search

Searching is an iterative process. After reviewing initial results, clinicians should refine their search strategy to improve relevance and efficiency.

When Should You Refine a Search?

Too Many Results

- Add another concept using AND
- Use MeSH terms
- Apply filters
- Search specific fields (e.g., Title/Abstract)

Too Few Results

- Remove unnecessary concepts
- Add synonyms using OR
- Broaden the search
- Remove restrictive filters

Example Refinement:

Initial Search: Stroke (200,000+ results)

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Refined Search: Stroke AND Thrombolysis (manageable results)

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Searching is a process of continuous refinement—not a one-time event.

Using Filters Effectively

PubMed provides filters that narrow search results based on predefined characteristics.

Common Filters

Publication Type

- Randomized Controlled Trial
- Systematic Review
- Meta-analysis
- Clinical Trial

Publication Date

- Last 1 year
- Last 5 years
- Custom range

Species

- Humans
- Animals

Language

- English
- Other languages

Age Group

- Child
- Adult
- Older Adult

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Apply filters only after constructing a strong search strategy.

Saving Searches with My NCBI

Why Save a Search?

Clinicians and researchers often revisit the same clinical question. My NCBI allows users to save search strategies, create collections, and receive updates when new articles are indexed.

Benefits

- ✓ Save search strategies
- ✓ Create article collections
- ✓ Receive automatic email updates
- ✓ Reuse searches for future patients
- ✓ Support research and systematic reviews

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A well-designed search strategy is a reusable clinical asset.

Evaluating Search Results

Before moving to critical appraisal, ask:

- Are these articles relevant to my PICOTT question?
- Does the study design match my clinical question?
- Have I retrieved the strongest available evidence?
- Should I refine the search further?

Search Quality Checklist

- ☐ Question clearly defined
- ☐ Appropriate database selected
- ☐ Correct search terms used
- ☐ Boolean operators applied correctly
- ☐ MeSH terms considered
- ☐ Filters used appropriately
- ☐ Relevant studies identified

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The best search is one that identifies the right evidence—not simply the most evidence.

REFLECT

Think about a recent search you conducted. Using the Search Quality Checklist, what could you have done differently to improve your results?

Chapter Takeaway

- ✓ **Understand** that searching is an iterative process requiring refinement
 - ✓ **Recognize** when and how to use filters appropriately
 - ✓ **Apply** My NCBI tools for saving and managing searches
 - ✓ **Remember** to evaluate search quality before proceeding to appraisal
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Module Summary

What You Learned

By completing Module 2, you should now be able to:

- ✓ **Explain** the purpose of the Acquire step in Evidence-Based Healthcare
- ✓ **Select** the most appropriate evidence resource
- ✓ **Develop** a structured search strategy
- ✓ **Use** Boolean operators effectively
- ✓ **Understand** the role of MeSH terms
- ✓ **Use** PubMed Advanced Search and Clinical Queries
- ✓ **Apply** filters appropriately
- ✓ **Save** searches using My NCBI
- ✓ **Evaluate** whether search results answer the clinical question

The Evidence Cycle Progress

Assess

↓

Ask 

↓

Acquire 

↓

Appraise 

↓

Apply

Final Knowledge Check

Question 1: Which Boolean operator would you use to combine synonyms in a search?

- a) AND
- b) OR
- c) NOT
- d) NEAR

Question 2: When should you apply filters in PubMed?

- a) Before developing your search strategy
- b) Instead of using Boolean operators
- c) After constructing a strong search strategy
- d) Only when searching for systematic reviews

Question 3: What is the primary advantage of using MeSH terms?

- a) They make searches faster
- b) They provide standardized vocabulary
- c) They eliminate the need for Boolean operators
- d) They only retrieve recent articles

Question 4: Which resource would be most appropriate for finding a quick clinical summary about diabetes management?

- a) PubMed
- b) Cochrane Library
- c) UpToDate
- d) TRIP Database

Question 5: What should you do if your initial search retrieves too many results?

- a) Read all the articles
- b) Use OR to add more terms
- c) Use AND to add another concept
- d) Remove all filters

Answers

Answer 1: b) OR

Why? OR broadens the search to include articles containing any of the synonymous terms, ensuring comprehensive retrieval.

Answer 2: c) After constructing a strong search strategy

Why? Filters should refine an already well-designed search, not replace good search strategy development.

Answer 3: b) They provide standardized vocabulary

Why? MeSH terms ensure consistent indexing regardless of the terminology authors use in their articles.

Answer 4: c) UpToDate

Why? Point-of-care resources like UpToDate provide synthesized clinical summaries for immediate decision-making.

Answer 5: c) Use AND to add another concept

Why? AND narrows the search by requiring articles to contain both concepts, reducing the number of results.

Looking Ahead

Module 3 – APPRAISE

In the next module, you will learn to:

- Assess study validity
- Identify risk of bias
- Interpret study results
- Judge whether evidence is applicable to your patients

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Finding evidence is only the beginning. The next challenge is determining whether it can be trusted.

Remember

Key Take-Home Messages:

1. **Evidence searching is a clinical skill** that requires structured planning and systematic execution
2. **Choose the right resource first** – different databases serve different purposes in the evidence hierarchy
3. **Search concepts, not sentences** – break down your PICOTT question into searchable

components

4. **Use the database's vocabulary** – MeSH terms and Boolean operators improve search precision
 5. **Searching is iterative** – expect to refine your strategy based on initial results
 6. **Quality over quantity** – the best search identifies the right evidence, not the most evidence
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References

Content adapted from:
Duke University