Acquiring the evidence



https://pixabay.com/vectors/fingerprint-detective-criminal-146242/

Objectives

- This presentation aims to introduce evidence-based methods of acquiring evidence to answer clinical questions.
- At the end of this session, the participants are expected to;
 - * Reiterate the 5A of evidence based medicine
 - * Discuss the sources of evidence (the 5S)
 - * Formulate a search strategy using the PICOT question
 - * Describe the standards used in reporting scientific studies



- * My students are dismayed when I say to them, "Half of what you are taught as medical students will in 10 years have been shown to be wrong. And the trouble is, none of your teachers knows which half."
- * Dr. Sydney Burwell, Dean of Harvard Medical School (1956)



* The half-life of medical knowledge is **7 years**.

Sanghvi N, The Half-Life of Medical Knowledge <u>https://www.eplabdigest.com/blog/Half-Life-Medical-Knowledge</u>



 «Today, the half-life of medical knowledge is currently about 18-24 months, and it is projected that in about four years that half-life will be only 73 days»

> Colcacino C, 2017. Medicine in a Changing World 2016-2017 Alvin F. Poussaint, Martín-J. Sepúlveda https://hms.harvard.edu/news/medicine-changing-world

Beta Blockers

- Until the mid 1970s, beta blockers were completely contraindicated due to the belief that their negative inotropic property would result in worsening heart failure and death.
- * In 1975 that Waagstein et al. described the successful administration of chronic beta blockers in heart failure patients.
- * Later, all patients with systolic dysfunction were considered for beta blockers a core measure of good clinical practice.
- Moreover, in 2012 it was shown that beta blockers conferred no benefit in preventing recurrent myocardial infarctions, strokes, or mortality in patients with stable CAD

Waagstein F, Hjalmmarson A, Varnauskas E, Wallentin I. Effect of chronic beta-adrenergic receptor blockade in congestive cardiomyopathy. Br Heart J. 1975;37:1022.

Bangalore S, et al, for the REACH Registry Investigators. β -blocker use and clinical outcomes in stable outpatients with and without coronary artery disease. JAMA. 2012;308:1340. 6/41

The accumulation of scientific knowledge is increasing exponentially.



https://www.researchgate.net/figure/Number-of-publications-per-year-and-the-cumulative-numberof-publications-on-biochar-from_fig3_326993601

- Fortunately, the ways and means for clinicians to efficiently find current best evidence for clinical decisions have also advanced rapidly.
- One solution for the inherent problem of obsolescence of professional education is "problem-based learning" or "learning by inquiry."



Users' Guides to Medical Literature. Essentials of Evidence-Based Clinical Practice 3rd Ed. McGraw Hill. 2015.

Background vs. Foreground Questions



Background Questions

- * How, When, Why, Who, What...
- * Pathophysiology: how do COX-2 inhibitors work?
- * Clinical manifestations: what is AIDS?
- * Epidemiology: how many people died during the influenza outbreak of 1918?

* Answers:

* "Textbook" or general data source

Foreground Questions

- * Etiology
- * Diagnosis
- * Therapy
- * Prognosis
- * Prevention
- Education
- * Clinical evidence
- * Answers:
 - * Literature

Metformin vs. Weight loss

* Is metformin more effective than weight loss in controlling diabetes in obese patients?

Preappraised evidence

- Finding preappraised evidence may help solving clinical problems about;
 - * treatment or prevention
 - diagnosis
 - differential diagnosis
 - prognosis and clinical prediction
 - * cause
 - * economics

Textbook information

- Treat traditional textbooks as if they were long past their "best before" date
- Textbooks may be more effective in meeting the "background information" need

Resource Listing

Information Source	Examples	Advantages	Disadvantages
Internet	• google.com	 quick and simple easy to read	 lack of depth difficult to assess quality of information
Textbooks	 Harrison's Principles of Internal Medicine UpToDate MD Consult 	 excellent sources for background information 	 often not truly current too general for most foreground questions
Secondary journals	 ACP Journal Club Evidence-Based Medicine 	• prescreened info for relevance and methodologic quality	limited scope
Prefiltered sources	Best EvidenceClinical EvidenceCochrane Library	• prefiltered for methodologic strength	limited scope
Unfiltered databases	MEDLINEPubMedGoogle Scholar	• comprehensive sources of foreground information	 complex and unwieldy difficult to search

Is a text evidence based?

- 1. A text that provides recommendations for patient care must cite evidence, with "in line" references that support each of its key recommendations about the diagnosis, treatment, or prognosis of patients.
- 2. If the text does indicate specific references for its recommendations, check the date of publication of the references; if the most recent is more than 2 to 3 years old, we will need to check whether more recent studies require a change in recommendation.
- Texts that fail these two screens should be used for background reading only.

Criterion	Rating	
"In-line references" for treatment recommendations	0	1
<i>In line = references that are in the text next to individual declarations</i>	None or	Usually or
	few	always
"In-line references" for diagnostic recommendations	0	1
	None or	Usually or
	few	always
Policy indicating steps by the editors/authors to find new evidence	0	1
Likely to be found in the "About" information concerning the text	Absent	Present
Policy indicating the quality rating of research evidence ("levels of	0	1
evidence")	Absent	Present
Policy indicating the grading of strength of recommendations ("grades of	0	1
recommendations")	Absent	Present
Date stamping of individual chapters	0	1
Should be at the beginning or end of each chapter	Absent	Present
Indication of a schedule for updating chapters	0	1
Should be at the start of each chapter or in "About"	Absent	Present
"New evidence" tabs for individual chapters/topics	0	1
Could be called "updates," "best new evidence," etc.	Absent	Present
User alerts for new evidence according to user discipline	0	1
	Absent	Present
Can users sign up for alerts for updates for specific disciplines (e.g.,	0	1
primary care; cardiology)?	Absent	Present
User alerts for new evidence according to individual topic	0	1
	Absent	Present
Can users sign up for new evidence alerts for specific topics (e.g., diabetes;	0	1
warts; hypertension)?	Absent	Present
Metasearch of content and external evidence source	0	1
	Absent	Present
Simultaneous search of several identified evidence-based sources	0	1
	Absent	Present

Health Information Research Unit, McMaster University.



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Online clinical texts

Text	Timeliness	Breadth	Quality
DynaMed	1	3	2
UpToDate	5	1	2
Micromedex	2	8	2
Best Practice	3	4	7
Essential Evidence Plus	7	7	2
First Consult	9	5	2
Medscape Reference	6	2	9
Clinical Evidence	8	10	1
ACP PIER	4	9	7
PEPID	N/A	6	10

Prorok JC, Iserman EC, Wilczynski NL, Haynes RB. Quality, breadth, and timeliness of content updating of ten online medical texts: an analytic survey. J Clin Epidemiol. 2012 Dec;65(12):1289–95. (Numbers in the table are ranks from 1 to 10, with 1 being the best).

The EBM Pyramid 5.0



Evidence-Based Health Care Pyramid 5.0 for finding preappraised evidence and guidance. (From Alper BS, Haynes RB. EBHC pyramid 5.0 for accessing preappraised evidence and guidance. Evid Based Med. 2016;21:123–125,

5-Systems

- A perfect evidence-based clinical information system would integrate and concisely summarize all relevant and important research evidence about a clinical problem and would automatically link, through an electronic medical record, the circumstances of a specific patient to the relevant information.
- The information contained in the system would be based on an explicit review process for finding and evaluating new evidence as it is published and then reliably and promptly updating whenever important new, high-quality, and confirmatory or discordant research evidence becomes available.

- Systems are not there to tell the doctor what to do. These judgements need to integrate the system's evidence with the patient's circumstances and wishes via their clinician's expertise.
- The system's role is to ensure that the cumulative research evidence concerning the patient's problem is immediately at hand.

Electronic Decision Support Systems

- The integration of Evidenc- Based Medicine electronic Decision Support systems into medical practice is still evolving.
- Small benefits have been observed so far. Moderate improvements in morbidity outcomes were reported (<u>https://pubmed.ncbi.nlm.nih.gov/25322302/</u>).
- The evidence for clinical, economic, workload, and efficiency outcomes remains sparse (<u>https://pubmed.ncbi.nlm.nih.gov/22751758/</u>).

4-Synthesized summaries for clinical reference

- There are several robust synthesized summaries of evidence for individual clinical problems
- * These have varying combinations of both background information and foreground evidence for clinical practice.
- They combine information on the nature of the condition, the evidence concerning its management, and guidelines from various interested groups, along with the clinical expertise of the author of each topic.

Evidence-based resources

Name of Product	Editorial Quality Score	Evidence-Based Methodology Score	Volume (%)	
5 Minute Consult				
ACP Smart Medicine				
BestBets				
BMJ Best Practice				
Clinical Access				
Clinical Key				
Cochrane Clinical Answers				
Decision Support in Medicine				
Dynamed				
EBM Guidelines				
Essential Evidence Topics				
eTG Complete				
GP Notebook				
Map of Medicine				
Medscape Drugs & Diseases				
Micromedex				
NICE Pathways				
Nursing Reference Center				
PEMSoft				
PEPID Primary Care Plus Ambulatory Care				
Prodigy				
Rehabilitation Reference Center				
UpToDate				

https://www.jmir.org/2016/1/e15/pdf

3-Evidence- based guidelines

- Systematically derived recommendations are similar to synthesized summary texts, but with a much narrower and sharper focus, for example, a single disease condition or even a special problem within a disease condition, such as diabetic nephropathy.
- Guidelines should include a statement of the strength of the recommendation and quality of the evidence (GRADE)

DEGAM Guidelines

Long Jusion Short version Guideline			
Brennen beim Wasserlassen	S3	053-001	31.12.2021
Module Langfassung, Kurzfassung und Leitlinienreport publiziert: 07/2018, gültig bis: 12/2021 DEGAM-Autoren: G. Schmiemann, K. Gebhardt, E. Hummers		Date of	exprating

DEGAM-Paten: U. Popert, H. Abholz, A. Becker

Date Stic of Stic Stichworte: HWI, Harnwegsinfekt, Brennen beim Wasserlassen, Antibiotikatherapie, Uricult, Katheter

https://www.degam.de/degam-leitlinien-379.html



https://www.degam.de/files/Inhalte/Leitlinien-Inhalte/Dokumente/DEGAM-S3-Leitlinien/053-001_Brennen%20beim%20Wasserlassen/053-001l_Brennen%20Wasserlassen_Langversion_29-08-18.pdf

Another guideline





- * Top down approach
- * No update
- * No information on methodology
- No information on the strength of recommendations
- No information on the quality of evidence
- * >100 guidelines in a week...

https://sbu.saglik.gov.tr/Ekutuphane/Yayin/138

T.C. SAĞLIK BAKANLIĞI BIRINCI BASAMAĞA YÖNELİK TANI VE TEDAVİ REHBERLERİ 2003

2-Systematic Reviews

- If clinical summaries and guidelines have clearly and consistently addressed our clinical question, there is no need to look further.
- However, it takes time following publication of original articles to prepare clinical summaries and guidelines, and neither provides full details.
- If we want to be sure that the summary or guideline is up to date and complete enough in its details, then we'll need to look for more recent systematic reviews and original studies.

The Cochrane Collaboration

- https://www.cochranelibrary.com/
- The Cochrane Collaboration provides the largest single source of syntheses, but only about 30% to 40% of the world's supply.
- Cochrane Reviews have mainly focused on preventive or therapeutic interventions to date, but the Cochrane Collaboration also summarizes diagnostic test evidence.

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EvidenceAlerts

- * <u>https://www.dynamed.com/</u>
- EvidenceAlerts includes all Cochrane Reviews and systematic reviews from over 120 leading clinical journals. Another ready source of syntheses is Ovid's Evidence-Based Medicine Reviews (EBMR) service.

1-Studies

- It takes time to summarize new evidence; summaries, guidelines, and syntheses necessarily follow the publication of original *studies*, usually by at least 6 months, and sometimes by years.
- If every other "S" fails (i.e., no systems, summaries, systematically derived recommendations, or syntheses exist with clear answers to your question), then it's time to look for original studies.

www.essentialevidenceplus.com

Search Results

Showing 1-17 of 17 for: acupuncture asthma

 \Diamond

* Requires a subscription

Sort by Relevance

Refine your results by:

Content

- Epidemiology (1)
- Diagnosis (1)
- Screening and Prevention (0)
- Treatment (4)
- 🗄 Prognosis (0)

Resource

Essential Evidence Topics (13) Evidence (4)

> Cochrane Systematic Reviews (2) POEMs research summaries (2)

Calculators (0)

Decision Support Tools (0) History and Physical Calculators (0) Diagnostic Test Calculators (0) TOP RESULTS | Show all

Summary View

Asthma (acute exacerbation) ESSENTIAL EVIDENCE TOPICS, 8-JUN-2020

Expanded View

Allergic rhinitis ESSENTIAL EVIDENCE TOPICS, 9-AUG-2020

Neurodermatitis ESSENTIAL EVIDENCE TOPICS, 14-NOV-2019

RELATED RESULTS

Cochrane Database of Systematic Reviews COCHRANE SYSTEMATIC REVIEWS,

Placebo or sham interventions strongly affe POEMS RESEARCH SUMMARIES, 16-SEP-2011

<u>Reflexology of uncertain clinical benefit</u> POEMS RESEARCH SUMMARIES, 18-NOV-2009

Cochrane Database of Systematic Reviews COCHRANE SYSTEMATIC REVIEWS,

Hyperventilation ESSENTIAL EVIDENCE TOPICS, 24-JUN-2019

www.accessss.org/

- Is based on the Pyramid 5.0 model and provides simultaneous searching of PubMed via Clinical Queries, as well as PubMed using only the user's search terms.
- * It also provides alerts of newly published evidence according to the user's clinical interests.

ACCESSSSS SMART SEARCH BEST EVIDENCE FOR HEALTH CARE		Dashboard	About E	External Links	Help -	My Account
acupuncture asthma						Q
PLUS Database: MD ⁺ →	Selected Library: None -	Your Search Histor	y -	Advan	ced Options	
EBM Guidelines Summary Clinical Texts (3 Results)						
Migraine						
Life-threatening complications of acupu	uncture					
Summary Clinical Texts	Systematic Guidelin	les	A Origi	nal Studies		
EBM Guidelines (3 Items)	Guidelines in McMaster PLU	S (0 Items)	ACP Journ	al Club (0 Items)		
DynaMed (48 Items)			McMaster	PLUS (2 Items)		
Best Practice (13 Items)	Systematic Reviews	5	Can't find wha	at you are looking	g for?	

Beware!

* When using "more digested" literature, you must be able to determine the methods used to put the information together and it must be "sound".

* "Junk in ... Junk out"

Standards in Reporting http://www.equator-network.org/

Randomised trials	CONSORT	Extensions
Observational studies	STROBE	Extensions
Systematic reviews	<u>PRISMA</u>	Extensions
<u>Case reports</u>	<u>CARE</u>	
<u>Qualitative research</u>	<u>SRQR</u>	COREQ
<u>Diagnostic / prognostic studies</u>	<u>STARD</u>	TRIPOD
Quality improvement studies	<u>SQUIRE</u>	
Economic evaluations	<u>CHEERS</u>	
Animal pre-clinical studies	<u>ARRIVE</u>	
<u>Study protocols</u>	<u>SPIRIT</u>	PRISMA-P



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Summary

- * What are the 5As of evidence based medicine?
- * Please explain the EBM Pyramid 5.0.
- Describe the standards used in reporting scientific studies