Introduction to EVIDENCE-BASED MEDICINE

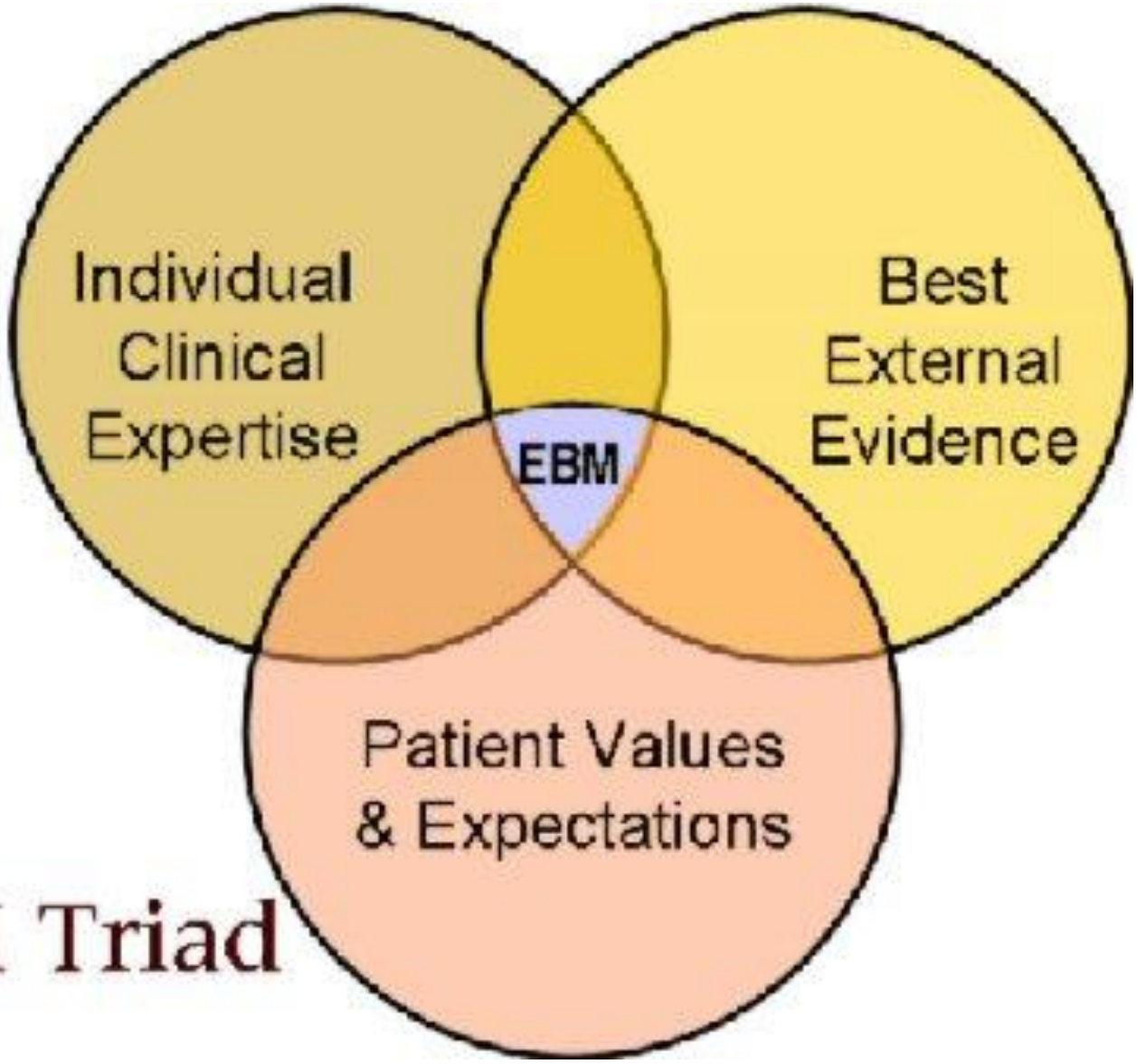
DEPARTMENT OF FAMILY & COMMUNITY MEDICINE
UP-PHILIPPINE GENERAL HOSPITAL

WHAT IS EVIDENCE BASED MEDICINE?

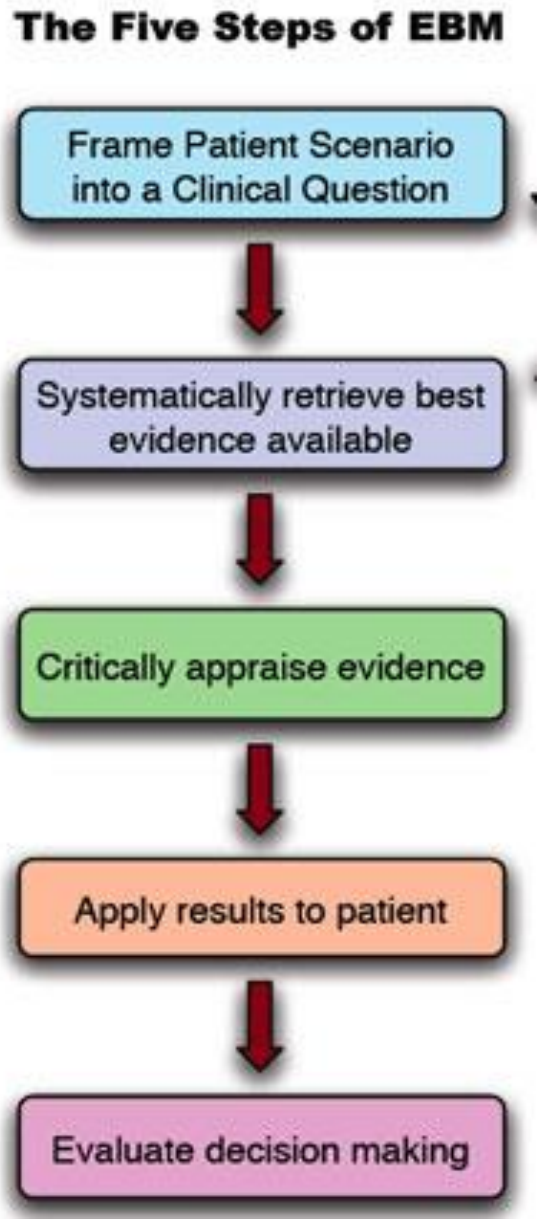
Dr. David Sackett, 1996

The conscientious, explicit, judicious use of current best evidence in making decisions about the care of individual patient.

It means integrating individual clinical expertise with the best available external clinical evidence from systematic research.



The EBM Triad



EVIDENCE-BASED MEDICINE

STEPS IN EBM PROCESS

The patient	**1. Start with the patient – a clinical problem or question arises out of the care of the patient**
The question	2. Construct a well built clincial question from the case
The resource	3. Select the appropriate resource(s) and conduct the search
The evaluation	4. Appraise the evidence for its **validity** and **applicability**
The patient	5. Return to the patient – intergrate the evidence with the clinical expertise, patient preference and apply it to practice
Self evaluation	6. Evaluate your performance with this patient

STEP 1: CLINICAL SCENARIO

- Maria, a 67 year old
- History of congestive heart failure brought on by several myocardial infarctions.
- Hospitalized 2x in the last 6 months for worsening of heart failure

STEP 1: CLINICAL SCENARIO

- Presently in normal sinus rhythm
- She is extremely compliant about taking her medications (enalapril, aspirin and simvastatin)
- She *desperately* wants to stay out of the hospital
- You think she should also be taking digoxin, but you are not certain if this will help keep her out of the hospital.
- You decide to research this question before her next visit.

STEP 2. CONSTRUCT A WELL BUILT CLINICAL QUESTION

ANATOMY OF A CLINICAL QUESTION	
POPULATION	• primary problem, disease, or co-existing conditions • sex, age or race of a patient
INTERVENTION OR TREATMENT	• main intervention, prognostic factor, or exposure • prescribe a drug, Order a test? Order surgery?
COMPARISON OR CONTROL	• main alternative to compare with the intervention • Another drug? Another test? Placebo? • Your clinical question does not always need a specific comparison
OUTCOME	• What do you hope to accomplish/measure/improve/affect? • What are you trying to do for the patient? • Symptoms? Number of adverse events? Functionality? Test scores?
METHODOLOGY	• Type of Evidence/Study

GOING BACK TO MARIA

Patient / Problem	Elderly with congestive heart failure
Intervention	Digoxin
Comparison	Placebo
Outcome	Primary: reduce number of hospitalizations Secondary: reduce mortality
Methodology	Randomized Controlled Trial


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

TYPE OF QUESTION: WHAT TYPE OF STUDY?

Type of Question	Suggested best type of Study
Therapy	RCT>cohort > case control > case series
Diagnosis	Cross sectional>prospective, blind comparison to a gold standard
Etiology/Harm	RCT > cohort > case control > case series
Prognosis	cohort study > case control > case series
Prevention	RCT>cohort study > case control > case series
Cost	economic analysis

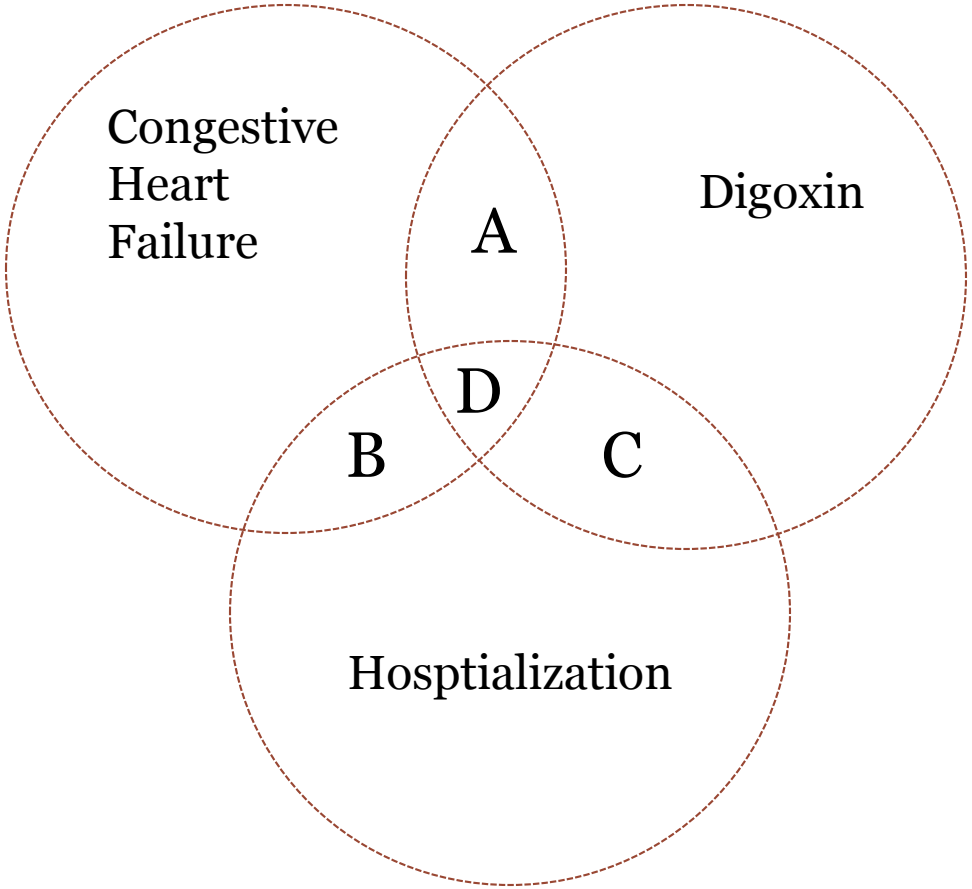
What type of study is best suited for Maria's case?

STEP 3: SELECT THE APPROPRIATE RESOURCE AND CONDUCT THE SEARCH

SEARCH STRATEGIES

- Identify the concepts: KEY TERMS
- Phrase search: “quotation marks”
- Boolean Principle: OR, AND
- MeSH
- Truncation and Wild Card
- Limits
- Related Articles
- Clinical Queries

BOOLEAN PRINCIPLE



By using OR & AND…

How do we get

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1. Intensive care unit-acquired bacteremia in mechanically ventilated patients: clinical features and outcomes.
Ko HK, Yu WK, Lien TC, Wang JH, Slutsky AS, Zhang H, Kou YR.
PLoS One. 2013 Dec 23;8(12):e83298. doi: 10.1371/journal.pone.0083298.
PMID: 24376683 [PubMed - in process]
Related citations

2. Severe bioprosthetic mitral valve stenosis in pregnancy.
Munoz-Mendoza J, Pinto Miranda V, Tanawuttiwat T, Badiye A, Chaparro SV.
Gen Thorac Cardiovasc Surg. 2013 Dec 29. [Epub ahead of print]
PMID: 24374988 [PubMed - as supplied by publisher]
Related citations

3. Use of novel oral anticoagulants for patients with atrial fibrillation: Systematic review and clinical implications.
Albert NM.
Heart Lung. 2014 Jan-Feb;43(1):48-59. doi: 10.1016/j.hrtlng.2013.10.014. Epub 2013 Nov 11.
PMID: 24373340 [PubMed - in process]
Related citations

4. Left Atrial Remodeling and Recurrence of **Congestive Heart Failure** in Patients Initially Diagnosed with Heart Failure.
Yamaguchi K, Yoshitomi H, Ito S, Ito S, Adachi T, Sato H, Watanabe N, Kodani N, Sugamori T, Endo A, Takahashi N, Tanabe K.
Echocardiography. 2013 Dec 24. doi: 10.1111/echo.12497. [Epub ahead of print]

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PMC Images search for *"congestive heart failure"*

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1. 2-[18F]-fluoro-2-desoxy-D-glucose positron emission tomography initial staging impacts on survival in Hodgkin lymphoma.
Cerci JJ, Linardi CC, Pracchia LF, Junior JS, Trindade E, Delbeke D, Cerci RJ, Carr R, Meneghetti JC, Buccheri V.
World J Radiol. 2013 Dec 28;5(12):484-90. doi: 10.4329/wjr.v5.i12.484.
PMID: 24379935 [PubMed]
Related citations

2. A theory-based exercise intervention in patients with **heart failure**: A protocol for randomized, controlled trial.
Rajati F, Mostafavi F, Sharifirad G, Sadeghi M, Tavakol K, Feizi A, Pashaei T.
J Res Med Sci. 2013 Aug;18(8):659-67.
PMID: 24379841 [PubMed]
Related citations

3. Short-term vs. long-term **heart** rate variability in ischemic cardiomyopathy risk stratification.
Voss A, Schroeder R, Vallverdú M, Schulz S, Cygankiewicz I, Vázquez R, Bayés de Luna A, Caminal P.
Front Physiol. 2013 Dec 13;4:364. doi: 10.3389/fphys.2013.00364.
PMID: 24379785 [PubMed]
Related citations

4. Proteinuria and its relation to cardiovascular disease.
Currie G, Delles C.

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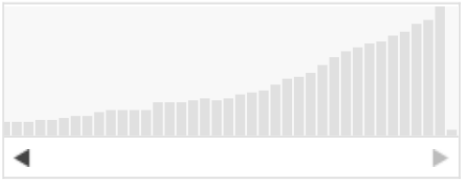
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congestive heart failure readmission
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1. [**Digoxin**: the results of the DIG study in the XXI century].
Helber I, Tucci PJ.
Arq Bras Cardiol. 2010 Oct;95(4):e108-11. Multiple languages.
PMID: 21180781 [PubMed - indexed for MEDLINE] **Free Article**
Related citations

2. BNP-guided vs symptom-guided heart failure therapy: the Trial of Intensified vs Standard Medical Therapy in Elderly Patients With **Congestive Heart Failure** (TIME-CHF) randomized trial.
Pfisterer M, Buser P, Rickli H, Gutmann M, Erne P, Rickenbacher P, Vuillomenet A, Jeker U, Dubach P, Beer H, Yoon SI, Suter T, Osterhues HH, Schieber MM, Hilti P, Schindler R, Brunner-La Rocca HP; TIME-CHF Investigators.
JAMA. 2009 Jan 28;301(4):383-92. doi: 10.1001/jama.2009.2.
PMID: 19176440 [PubMed - indexed for MEDLINE]
Related citations

3. Atrial fibrillation and **congestive heart failure**.
Roy D, Talajic M, Dubuc M, Thibault B, Guerra P, Macle L, Khairy P.
Curr Opin Cardiol. 2009 Jan;24(1):29-34. Review.
PMID: 19102036 [PubMed - indexed for MEDLINE]
Related citations

4. Drug treatment of chronic heart failure in the elderly.
Leibundgut G, Pfisterer M, Brunner-La Rocca HP.
Drugs Aging. 2007;24(12):991-1006. Review.

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"congestive heart failure"
[All Fields] AND ("digoxin"
[MeSH Terms] OR "digoxin"
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Arq Bras Cardiol. 2010 Oct;95(4):e108-11.

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[Article in Multiple languages]

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Publication Types, MeSH Terms, Substances

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Digoxin: the Results of the DIG Study in the XXI Century

Izo Helber e Paulo J. F. Tucci
Escola Paulista de Medicina - Unifesp, São Paulo, SP - Brazil

Abstract

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2009; 53: e1-e90.

2. Arnold JMO, Liu P, Demers C, Dorian P, Giannetti M, Haddad H, et al. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: diagnosis and management. Can J Cardiol. 2006; 22: 23-45.

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4. Packer M, Gheorghiade M, Young JB, Costantini DO, Adams KF Jr, Cody RJ, et al. Withdrawal of digoxin from patients with chronic heart failure treated with angiotensin-converting-enzyme inhibitors. N Engl J Med. 1993; 329: 1-7.

5. The Digitalis Investigation Group. The effect of digoxin on mortality and morbidity in patients with heart failure. N Engl J Med. 2007; 336: 525-33.

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7. Eichhorn EJ, Lukas MA, Wu B, Shusterman N. Effect of concomitant digoxin and carvedilol therapy on mortality and morbidity in patients with chronic heart failure. Am J Cardiol. 2000; 86: 1032-5.

8. Pitt B, Zannad F, Remme WJ, Castaigne A, Perez A, Palensky J, et al. The effect of spironolactone on morbidity and mortality in patients with severe heart failure. Randomized Aldactone Evaluation Study Investigators. N Engl J Med. 1999; 341: 709-17.

9. Young JB, Gheorghiade M, Uretsky BF, Patterson JH, Adams KF Jr. Superiority of "triple" drug therapy in heart failure: Insights from the PROVED and RADIANCE trials. Prospective randomized study of ventricular function and efficacy of digoxin. randomized assessment of digoxin and inhibitors of angiotensin-converting enzyme. J Am Coll Cardiol. 1998; 32 (3): 686-92.

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14. Ahmed A. Digoxin and reduction in mortality and hospitalization in geriatric heart failure: importance of low doses and low serum concentration. J Gerontol A Biol Sci Med Sci. 2007; 62: 323-9.

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16. Ahmed A, Gambassi G, Weaver MT, Young JB, Wehrmacher WH, Rich MW. Effects of discontinuation of digoxin versus continuation at low serum digoxin concentrations in chronic heart failure. Am J Cardiol. 2007; 100: 280-4.

17. Rathore SS, Curtis JP, Wang Y, Bristow MR, Krumholz HM. Association of serum digoxin concentration and outcomes in patients with heart failure. JAMA. 2003; 289: 871-8.

18. Ahmed A, Waagstein F, Pitt B, White M, Zannad F, Young JB, et al. Effectiveness of digoxin in reducing one-year mortality in chronic heart failure in the Digitalis Investigation Group trial. Am J Cardiol. 2009; 103: 82-7.

19. Ferguson DW, Berg WJ, Sanders JS, Roach PJ, Kempf JS, Kienzle MG. Sympathoinhibitory responses to digitalis glycosides in heart failure patients: direct evidence from sympathetic neural recordings. Circulation. 1989;80:65-77.

20. Gheorghiade M, Ferguson D. Digoxin: a neurohormonal modulator in heart failure? Circulation. 1991; 84: 2181-6.

21. Adams KF Jr, Gheorghiade M, Uretsky BF, Patterson JH, Schwartz TA, Young JB. Clinical benefits of low serum digoxin concentrations in heart failure. J Am Coll Cardiol. 2002; 39: 946-53.

22. Slatton ML, Irani WN, Hall SA. Does digoxin provide additional hemodynamic and autonomic benefit at higher doses in patients with mild to moderate heart failure and normal sinus rhythm? J Am Coll Cardiol. 1997; 29: 1206-13.

23. Pfeffer MA, Pfeffer JM, Steinberg C, Finn P. Survival after an experimental myocardial infarction: beneficial effects of long-term therapy with captopril. Circulation. 1985; 72: 406-12.

Arq Bras Cardiol. 2010 Oct;95(4):e108-11.

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Heart Failure

A heterogeneous condition in which the heart is unable to pump out sufficient blood to meet the metabolic need of the body. Heart failure can be caused by structural defects, functional abnormalities (VENTRICULAR DYSFUNCTION), or a sudden overload beyond its capacity. Chronic heart failure is more common than acute heart failure which results from sudden insult to cardiac function, such as MYOCARDIAL INFARCTION.

Year introduced: 2008 (1966)

PubMed search builder options

Subheadings:

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- anatomy and histology
- blood
- cerebrospinal fluid
- chemically induced
- chemistry
- classification
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- congenital
- cytology
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- diet therapy
- drug therapy
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- enzymology
- epidemiology
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1. [Cardiac amyloidosis, about an atypical case].
   Falque B, Davin L, Mélon P, Robinet S, Bruyère PJ, Pierard L.
   Rev Med Liege. 2013 Oct;68(10):497-503. Review. French.
   PMID: 24298723 [PubMed - indexed for MEDLINE]
   Related citations

2. Exercise intolerance in **heart failure**: update on exercise parameters for diagnosis, prognosis and therapeutic interventions.
   Pardaens S, Calders P, Derom E, De Sutter J.
   Acta Cardiol. 2013 Oct;68(5):495-504. Review.
   PMID: 24283111 [PubMed - indexed for MEDLINE]
   Related citations

3. Hospital-to-Home: a hospital readmission reduction program for congestive **heart failure**.
   Huntington MK, Guzman AI, Roemen A, Fieldsend J, Saloum H.
   S D Med. 2013 Sep;66(9):370-3.
   PMID: 24279113 [PubMed - indexed for MEDLINE]
   Related citations

4. Ultrafiltration: contemporary management of fluid overload.
   Critoph CH, Flett AS, Woldman S, Thomas MD.
   Br J Hosp Med (Lond). 2013 Sep;74(9):C134-8. Review. No abstract available.
   PMID: 24273776 [PubMed - indexed for MEDLINE]
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Titles with your search terms

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Statin wars: the heavyweight match--atorvastatin versus [Postgrad Med. 2013]

Serelaxin, recombinant human relaxin-2, for treatment of acute **hea** [Lancet. 2013]

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1. Evaluation of the concurrent use of potassium-influencing drugs as risk factors for the development of hyperkalemia.
   Kuijvenhoven MA, Haak EA, Gombert-Handoko KB, Crul M.
   Int J Clin Pharm. 2013 Dec;35(6):1099-104. doi: 10.1007/s11096-013-9830-8. Epub 2013 Aug 22.
   PMID: 23974985 [PubMed - in process]
   Related citations

2. Influences of simvastatin on vascular endothelial function of patients with coronary heart disease complicated with **congestive heart failure**.
   Wang L, Shi J, Zhang Y.
   Eur Rev Med Pharmacol Sci. 2013 Jun;17(12):1590-3.
   PMID: 23832723 [PubMed - indexed for MEDLINE] **Free Article**
   Related citations

3. **Digoxin** Downregulates NDRG1 and VEGF through the Inhibition of HIF-1α under Hypoxic Conditions in Human Lung Adenocarcinoma A549 Cells.
   Wei D, Peng JJ, Gao H, Li H, Li D, Tan Y, Zhang T.
   Int J Mol Sci. 2013 Apr 2;14(4):7273-85. doi: 10.3390/ijms14047273.
   PMID: 23549264 [PubMed] **Free PMC Article**
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4. Rhythm versus rate control therapy and subsequent stroke or transient ischemic

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1. Influences of simvastatin on vascular endothelial function of patients with coronary heart disease complicated with **congestive heart failure**.
Wang L, Shi J, Zhang Y.
Eur Rev Med Pharmacol Sci. 2013 Jun;17(12):1590-3.
23832723 [PubMed - indexed for MEDLINE] **Free Article**
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2. [Clinical observation of the curative effect of Qiangxin Mixture on **congestive heart failure**].
Chen ZS, Dong YR, Hu WY.
Zhong Xi Yi Jie He Xue Bao. 2003 May;1(1):25-9. Chinese.
PMID: 15339608 [PubMed - indexed for MEDLINE] **Free Article**
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3. Effects of lacidipine on peak oxygen consumption, neurohormones and invasive haemodynamics in patients with mild to moderate chronic heart failure.
de Vries RJ, Dunselman PH, Chin Kon Sung UG, van Veldhuisen DJ, Corbeij HM, van Gilst WH, Lie KI.
Heart. 1996 Feb;75(2):159-64.
PMID: 8673754 [PubMed - indexed for MEDLINE] **Free PMC Article**
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Once you find an article, What will you do with it?

Do the Critical Appraisal!

USE

- The Evidence-Based Family and Community Practice (EBFCP) and Quality Improvement in Health Care Manual (FMRG, 2003)

Other source to Understand:

- Painless EBM by Dr. Dans
- World Wide Web

- BUT the guide questions to be answered must come from the EBFCP Manual

FORMAT OF JOURNAL REPORT

- Case Scenario
- Research Question
- Search
- Title
- Source
- Authors
- Appraisal

EVIDENCE-BASED FAMILY AND COMMUNITY PRACTICE

I. Is it relevant?
II. Is it valid?
III. What are the results?
IV. Is it applicable to my patient?

Critical Appraisal of An Article on Diagnostics

Decision analysis

- appraisal of an article on diagnostics start with the decision analysis line

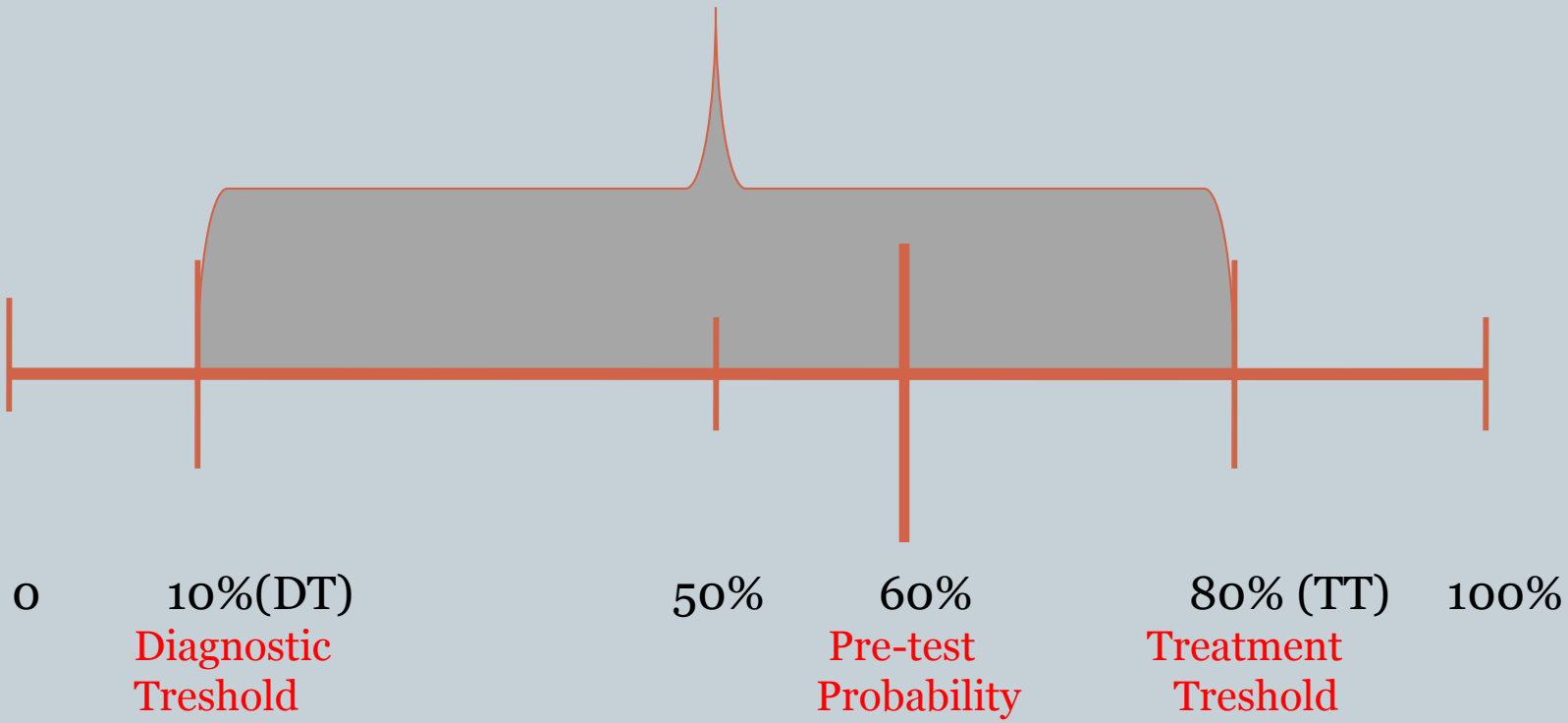
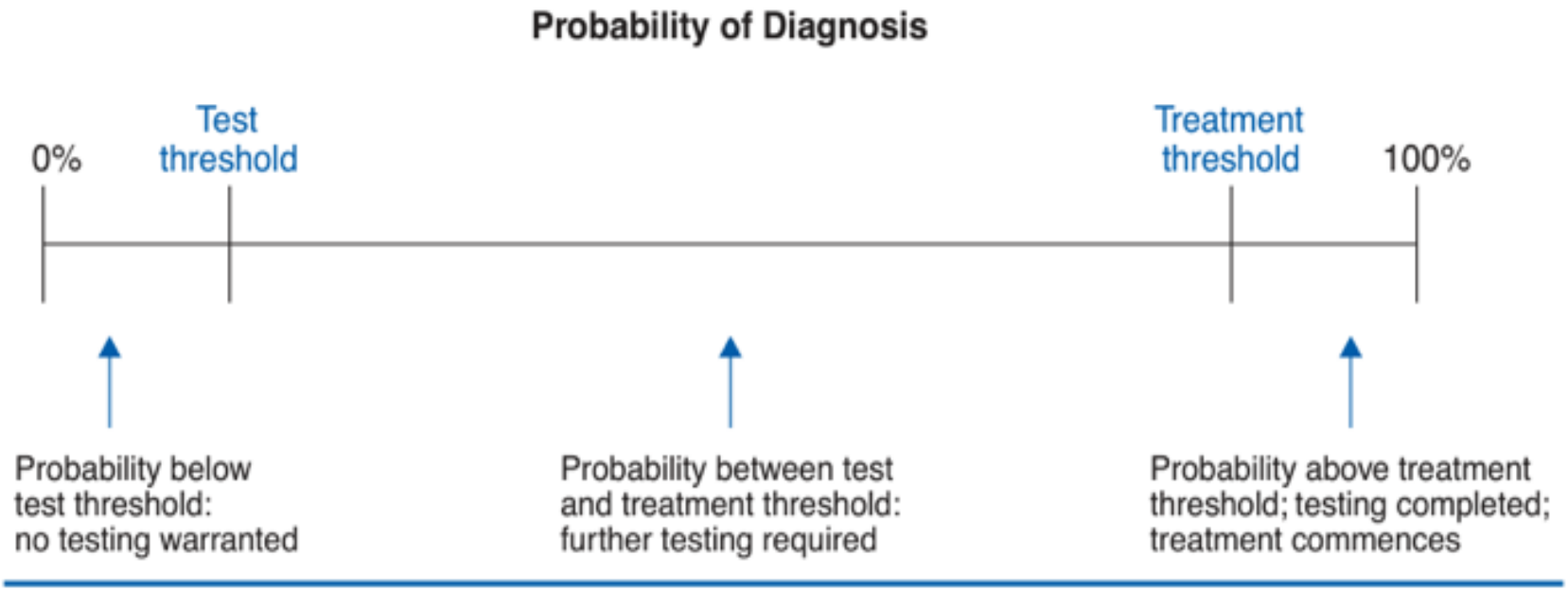


FIGURE 14-2

Test and Treatment Thresholds in the Diagnostic Process



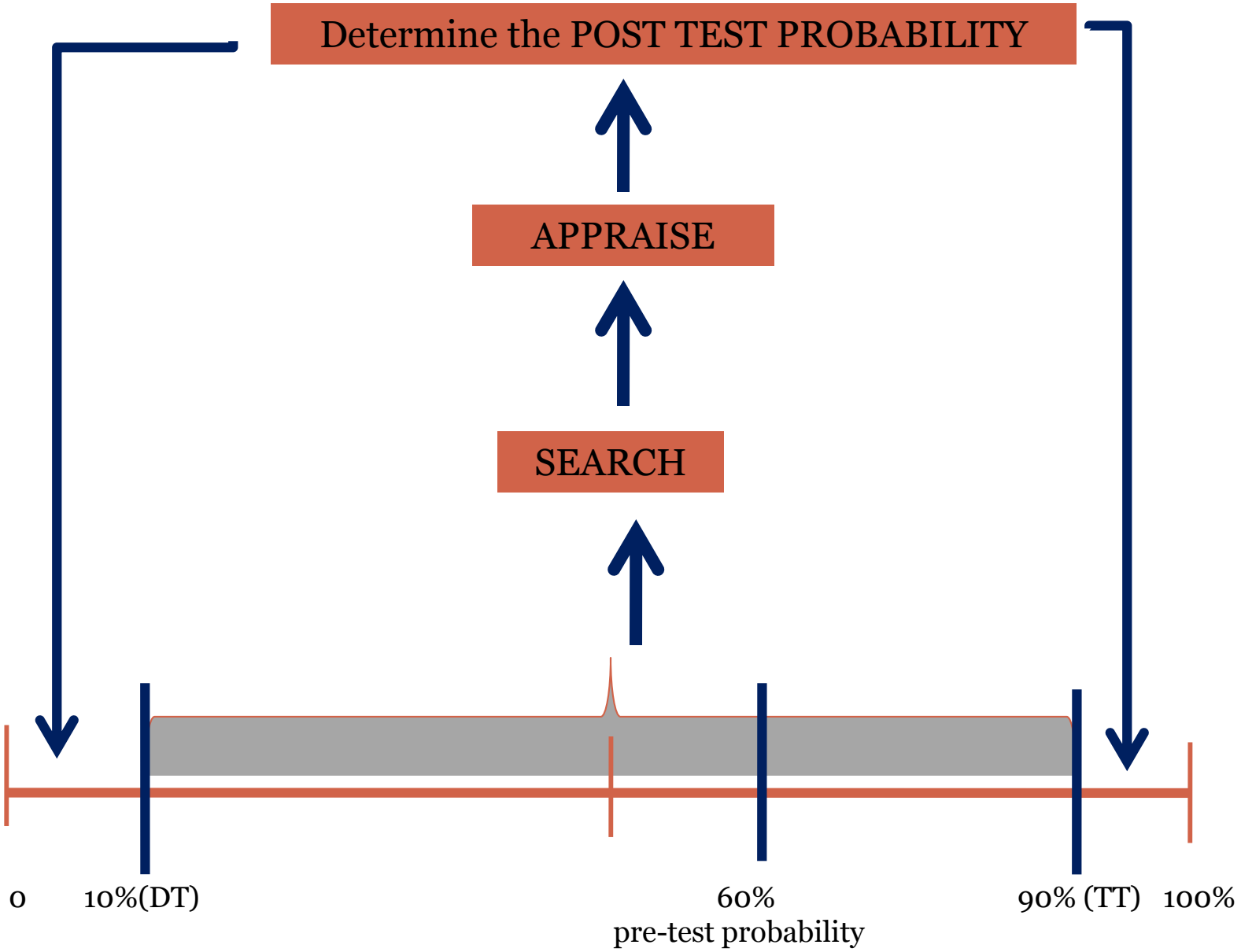
Decision Analysis Line

- Diagnostic Threshold (DT): arbitrary point at which you rule out the disease below this point
  - After this point, you will request for a diagnostic test
- Therapeutic Threshold: arbitrary point at which you decide to treat beyond this point
  - Below this point, you will request for a diagnostic test
- Pre-Test Probability: probability that the patient has the disease
- Post-Test probability: probability that the patient has the disease after doing the diagnostic exam

Case Scenario

- 24 year old male
- Presenting with 1 month history of RUQ pain
- Started out as epigastric pain then localizing in the RUQ
- Usually associated with intake of fatty food
- No other associated symptom
- PE: (-) Murphy's

- What is our pre test probability that this patient has Acute Cholelithiasis?
- Will we request for an HBT ULTRASOUND?


Determine the POST TEST PROBABILITY
APPRAISE
SEARCH
0
10%(DT)
60%
pre-test probability
90% (TT)
100%

Is it relevant?

- Is the objective of the study similar to your clinical dilemma?

	CLINICAL DILEMMA	STUDY
Population		
Intervention and comparative intervention	?	?
Methodology		
Outcome		

Is it valid?

PRIMARY VALIDITY GUIDES

1. Was there an independent comparison with a reference standard?
2. Did the patient sample include an appropriate spectrum of patients to whom the test will be done?

SECONDARY VALIDITY GUIDES

1. Was the reference standard done regardless of the result of the of the diagnostic test being evaluated?
2. Were the methods for performing the test described in sufficient detail to permit replication?

PRIMARY VALIDITY GUIDES

1. Was there an independent comparison with a reference standard?

   Reference standard.

   Accuracy.

   Precision.

* The reference standard should not be part of the diagnostic procedure in question.

PRIMARY VALIDITY GUIDES

2. Did the patient sample include an appropriate spectrum of patients to whom the test will be done?

- Inclusion and Exclusion Criteria.
- Baseline Characteristics (table 1).
- Representativeness includes subjects with the whole spectrum of the disease

- The accuracy of a diagnostic test among patients with low risk for the disease is different from patients with high risk for the disease.

SECONDARY VALIDITY GUIDES

1. Was the reference standard done regardless of the result of the of the diagnostic test being evaluated?

SECONDARY VALIDITY GUIDES

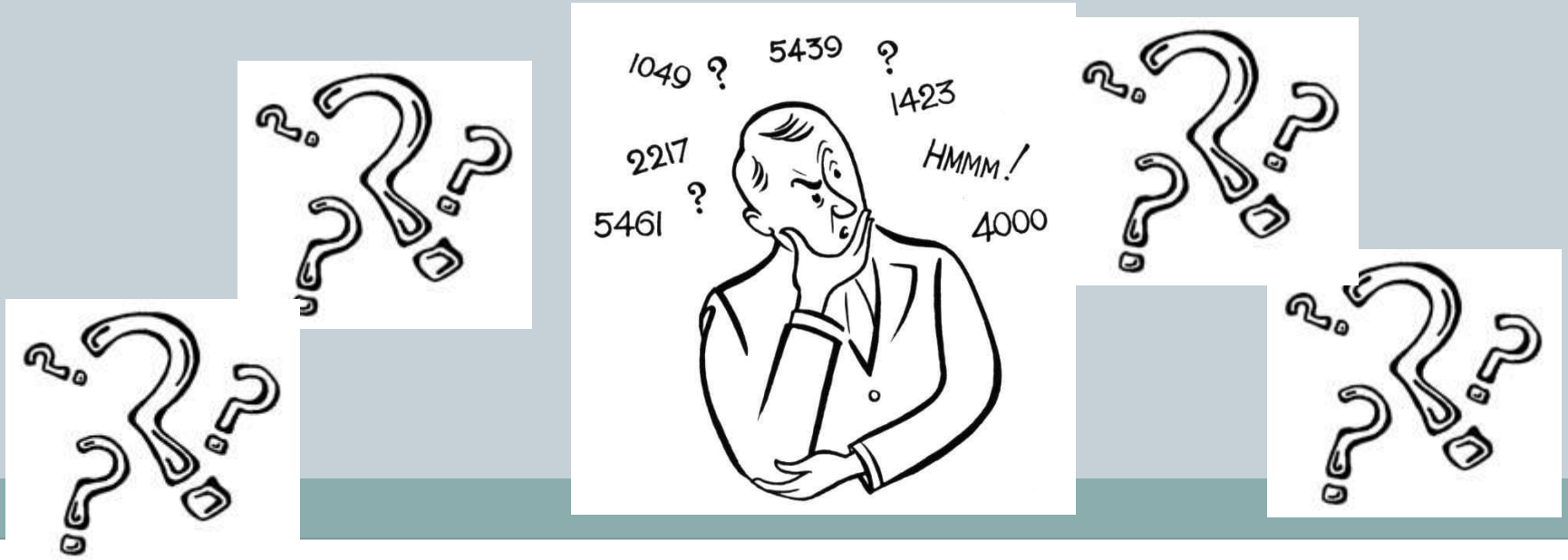
2. Were the methods for performing the test described in sufficient detail to permit replication?

2. Were the methods for performing the test described in sufficient detail to permit replication?

- Look at the results and methodology section.
- Clear procedure including the preparation of subjects.
  - Diets, drugs to avoid.
  - Precautions.
  - Step by step descriptions.
- Be able to duplicate the exam in your setting and still get the same results.

II. Overall is the study valid?

- If you want to be strict about it, you should answer yes in all 4 questions.
- A simple rule might be to answer yes to at least, one primary guide and two secondary guides.



III. What are the results?

What are the likelihood ratios for the different test results?

Likelihood ratios indicates by how much a given test result increases the pre-test probability of the disease.

LR of 1 means that the pre-test probability is same after doing the test

LR >1 increases the probability that the disease is present

Sensitivity & Specificity

		Disease	
		Present	**Absent**
Test	**Positive**	TP	FP
	Negative	FN	TN

SENSITIVITY: probability/likelihood that the diseased patient will test positive: **TP / TP + FN**

SPECIFICITY: probability/likelihood that those without the disease will test negative: **TN/ TN + FP**

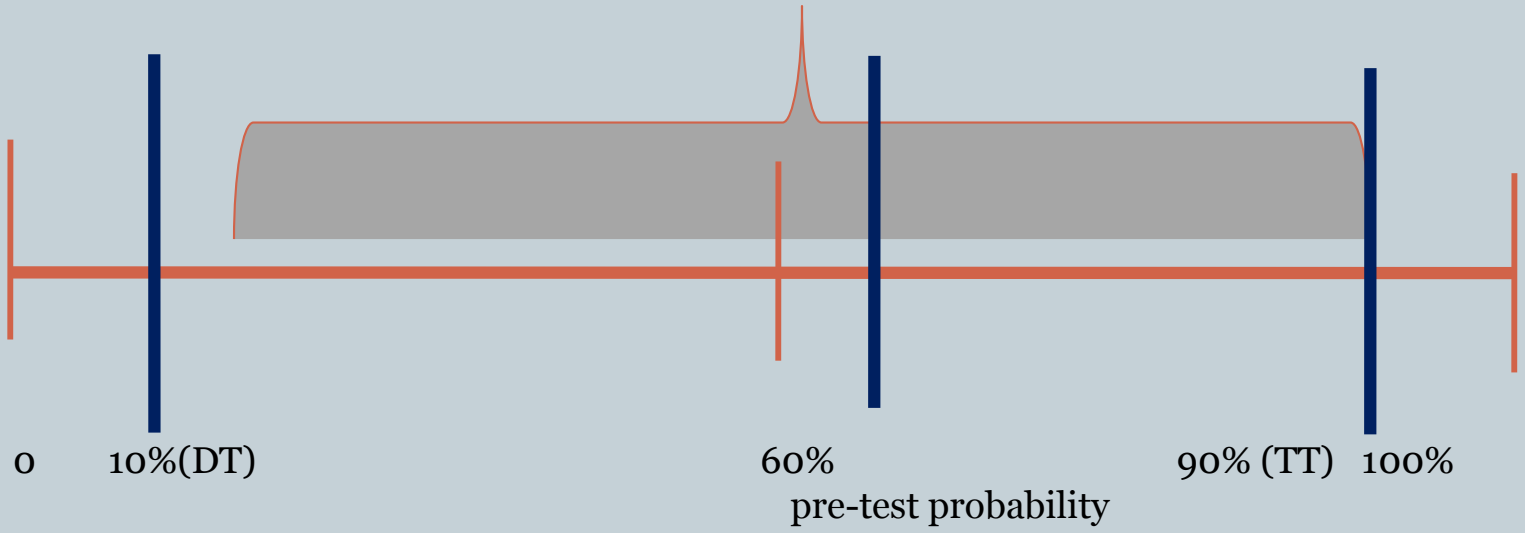
Remember? **SpPIN & SnNOUT**

LIKELIHOOD RATIO

- Likelihood ratio of a positive test
  - Probability that the test is + among diseased person
    Probability that the test is + among non-diseased person
  - LR (+) = Sensitivity/1-Specificity
- Likelihood ratio of a negative test
  - Probability that the test is - among diseased person
    Probability that the test is - among non-diseased person
  - LR (-) = 1-Sensitivity/Specificity

What do Likelihood ratios do?

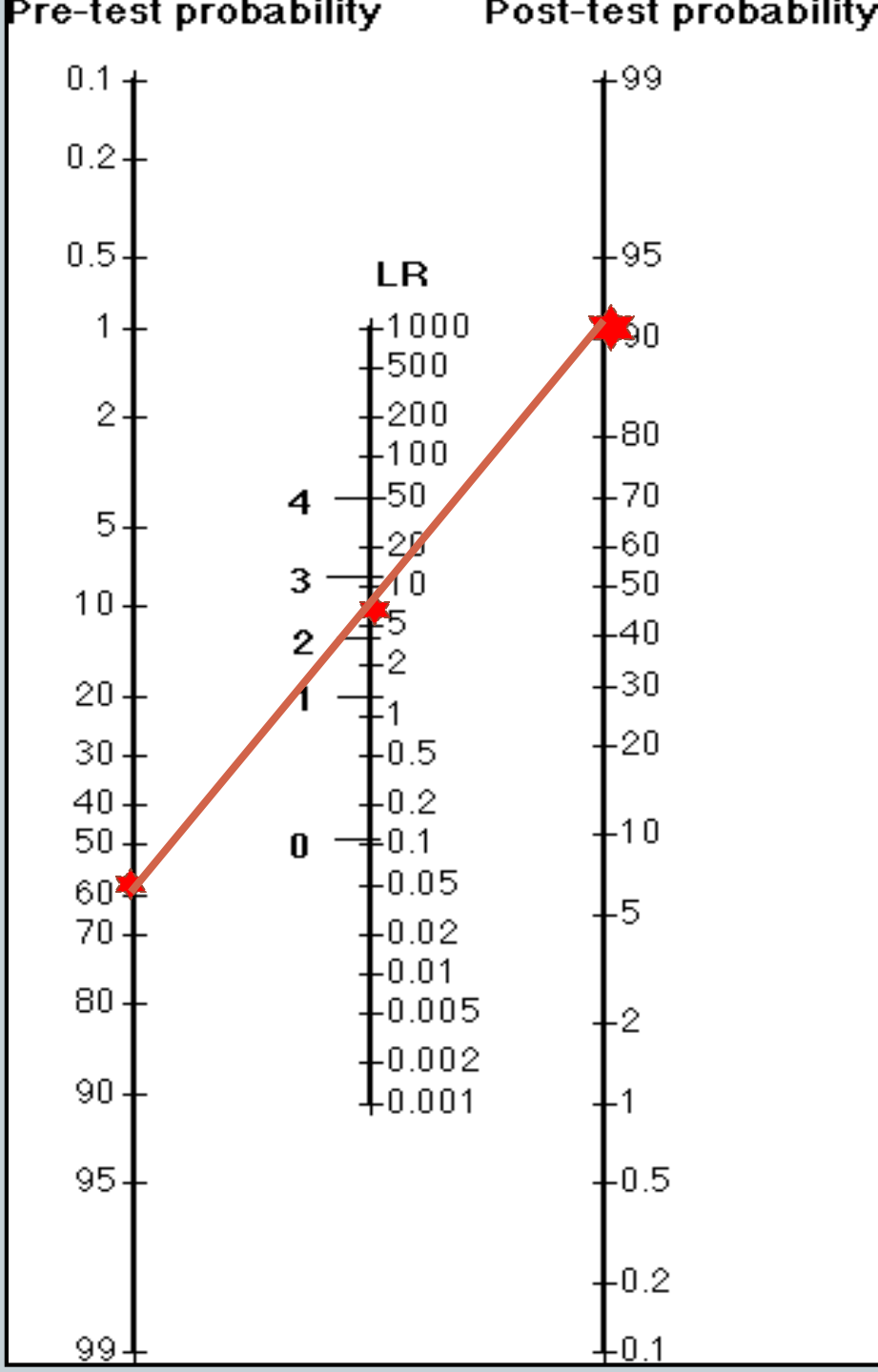
- It can change the probability of the disease after a diagnostic test is done.
- Remember our Case Scenario

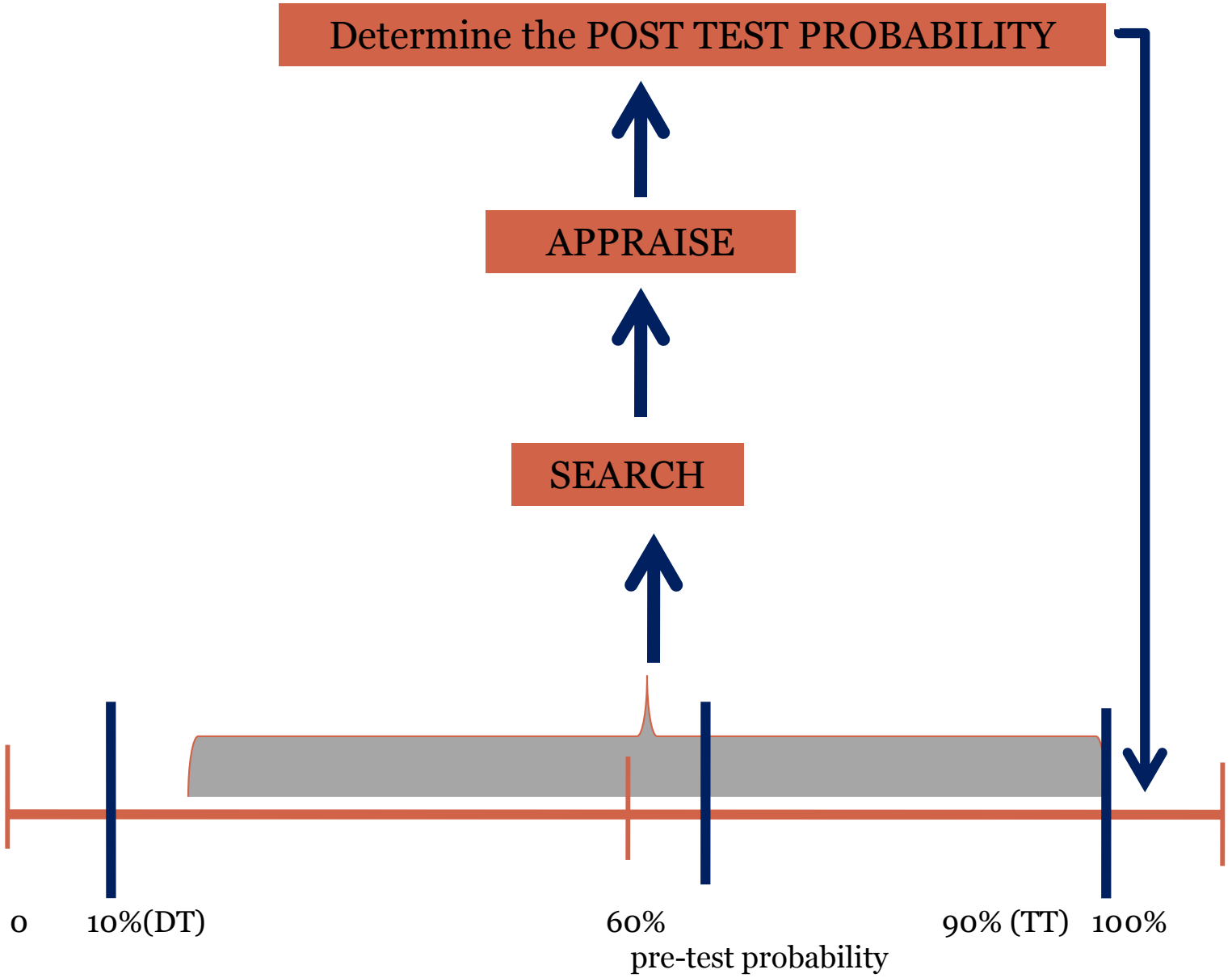


Will the likelihood ratios shift the pre-test probability

- Use a NOMOGRAM
- Given a pre test probability of 60%
- The HBT UTZ yielded a LR of 2.5
- PLOT
- Post test Probability is 93%

- What does this mean?




Determine the POST TEST PROBABILITY
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0
10%(DT)
60%
90% (TT)
100%
pre-test probability

IV. Can the results help me in caring for my patients?

1. Will the reproducibility of the test result and its interpretation be satisfactory in my setting?
   - Is the interpretation simple enough?
   - Is the basis of the interpretation clear and specific?

2. Are the results applicable to my patient?
   - setting is somewhat similar
   - inclusion criteria include characteristics of your patient
   - clinical judgment is required

3. Will the results change my management?

Critical appraisal of an article on therapeutics

Is it relevant?

- Is the objective of the study similar to your clinical dilemma?

	CLINICAL DILEMMA	STUDY
Population		
Intervention and comparative intervention	?	?
Methodology		
Outcome		

I. Is it valid?

Primary Validity Guides

1. Was the assignment of patients to treatment randomized?
2. Were all the patient who entered the trial properly accounted for and attributed at its conclusion?

Secondary Validity Guides

1. Were patient, their clinicians and study personnel "blinded"?
2. Were the groups similar at the start of the trial?
3. Aside from the experimental intervention, were the groups treated equally?

1. Was the assignment of patients to treatment randomized?

- Look at the abstract or methodology.
- Define randomization.
- Random sampling?

- Randomization assures that both known and unknown determinants of outcome are even distributed between the treatment and control

- Avoids selection bias
- More severe disease = worse results
- less severe disease = better results

2. Were all the patient who entered the trial properly accounted for and attributed at its conclusion?

b. Were the patients analyzed in the group to which they were randomized?

- patients, including drop outs or withdrawn, were analyzed to their original grouping at the start of the study
- This preserves the value of randomization
- No crossing over

2. Were all the patient who entered the trial properly accounted for and attributed at its conclusion?

a. Was follow up complete?

- Methodology and Results Section
- Look at the number of patients enrolled at the outset and compare this with the number of patient reported at the results table.
- What is the drop out rate?
- 20 % or more is considered substantial
- If less than 20% dropped out, check if and *intention to treat analysis* was done

- What is intention to treat analysis?

I. Is it valid?

Primary Validity Guides

1. Was the assignment of patients to treatment randomized?
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Secondary Validity Guides

1. Were patient, their clinicians and study personnel "blinded"?
2. Were the groups similar at the start of the trial?
3. Aside from the experimental intervention, were the groups treated equally?

1. Were patients, their clinicians, and study personnel "blind" to treatment?

- Look at the abstract or methodology.

- Define blinding.
- What is its importance?
  - SINGLE blinding?
  - DOUBLE blinding?
  - TRIPLE blinding?

2. Were the groups similar at the start of the trial?

- Baseline characteristics usually labeled

  Table no. 1

- The greater the similarity between known prognostic factors for the control and experimental group, the more likely that the results can be attributed to the intervention, rather than due to the differences in these factors

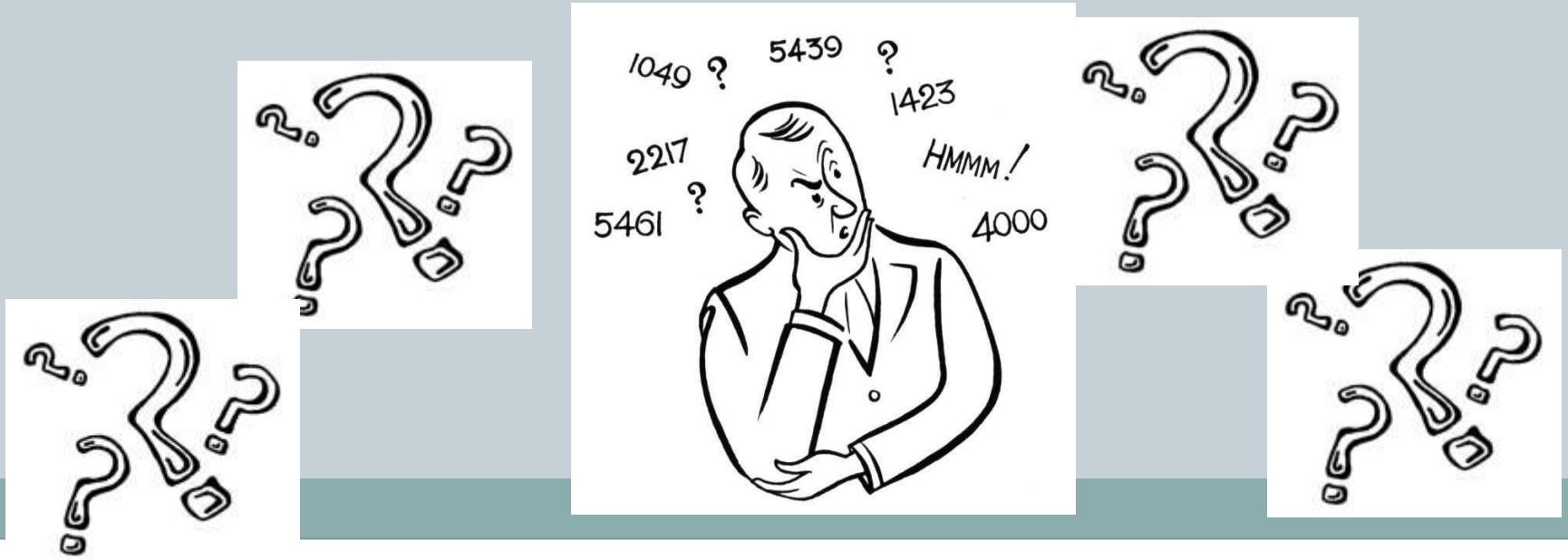
3. Aside from the experimental intervention, were the groups treated equally?

- Look for interventions other than the treatment under study
- "co-interventions" distort the results

- Where outcomes measurements clearly described and determined in the same way between interventions?
- DEFINE
  - Clinical Outcomes
  - Surrogate Outcomes

II. Overall is the study?

- If you want to be strict about it, you should answer yes in all 5 questions.
- A simple rule might be to answer yes to at least, one primary guide and two secondary guides.



III. WHAT ARE THE RESULTS?

a. How large was the treatment effect?

RISK IN TREATMENT (Rt)

$$\frac{\text{No. of patients who did not get well in the treatment group}}{\text{Total no. of patients in the treatment group}}$$

RISK IN CONTROL (Rc)

$$\frac{\text{No. of patients who did not get well in the control group}}{\text{Total no. of patients in the control group}}$$

a. What are the results?

- Absolute Risk Reduction (ARR) = Rc – Rt
- Relative Risk (RR) = Rt/Rc

  RR of 1 : No difference between Treatment and Control
  RR of >1: Treatment is more harmful
  RR of <1: Treatment is more effective

- Relative Risk Reduction (RRR) = 1 – RR

B. How precise was the treatment effect?

- What is the confidence interval?
- What is the p-value?

IV. Are the results applicable to my patients?

- Are the medical, social and economic resources needed to administer the treatment available in your setting?
- Consider the acceptability by your patient, his family and community.
- Are the likely treatment benefits worth the potential harm and costs?

Number needed to treat – 1/ARR

Cost effectiveness Formula: NNT x price/unit x dose x duration

THANK YOU!

The doctor of the future will give no medicine, but will interest her or his patients in the care of the human frame, in a proper diet, and in the cause and prevention of disease.

Thomas A. Edison
US inventor (1847 - 1931)