

Introduction to Evidence-Based Physical Diagnosis

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Disclosures

- None

Objectives

- Rational for Performing Physical exam
- Interesting Historical Facts about Physical Examination
- Understanding Concept of Evidence Based Physical Diagnosis & its Reasoning
- How to measure Diagnostic Accuracy of Clinical Findings ?
- Reliability of Physical Signs
- Useful Resources for Learning Physical Exam/Evidence Based Exam and Utilize

Rational For Performing Physical Exam

- Decline in physical examination skills (1)
- Physical examination inadequacies are a preventable source of medical error, and adverse events are caused mostly by failure to perform the relevant examination (1)
- Physical examination can be of substantial value in hospitalized patient (2)

1- Inadequacies of Physical Examination as a Cause of Medical Errors and Adverse Events: A Collection of Vignettes, Varghese, Abraham et al. The American Journal of Medicine , Volume 128 , Issue 12 , 1322 - 1324.e3

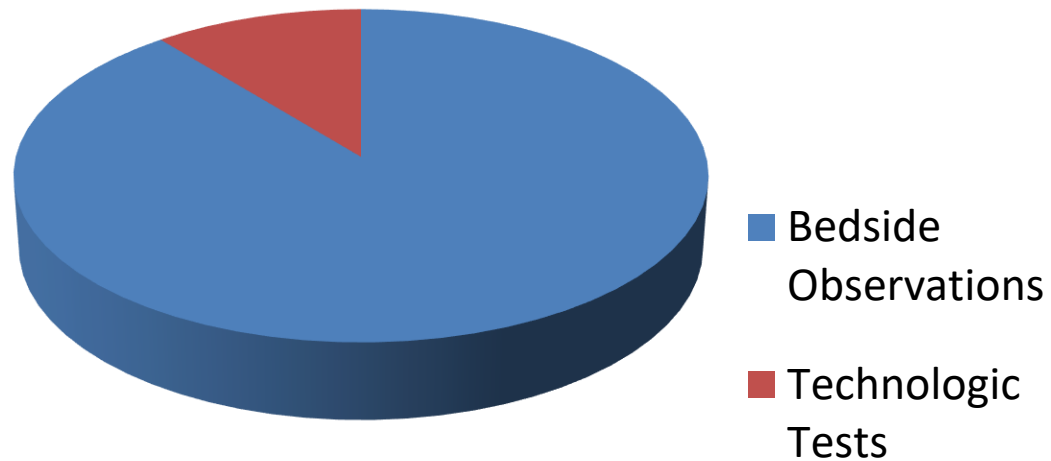
2- Physical examination in the care of medical inpatients: an observational study, Reilly, Brendan M, The Lancet , Volume 362 , Issue 9390 , 1100 - 1105

Rational For Performing Physical Exam

- Studies indicate that approximately 85% of diagnoses are correctly made simply by performing a detailed history and physical examination (1)
- Diagnostic testing beyond the history and physical examination should be used in an intentional, logical, and stepwise fashion; nearly 30% of all health care costs are spent on unnecessary tests and treatments (1)
- Reasonable quality evidence refutes the commonly held belief that ordering additional, unnecessary diagnostic testing alleviates patient fears and concerns (1)

Clinical Observations vs Technology

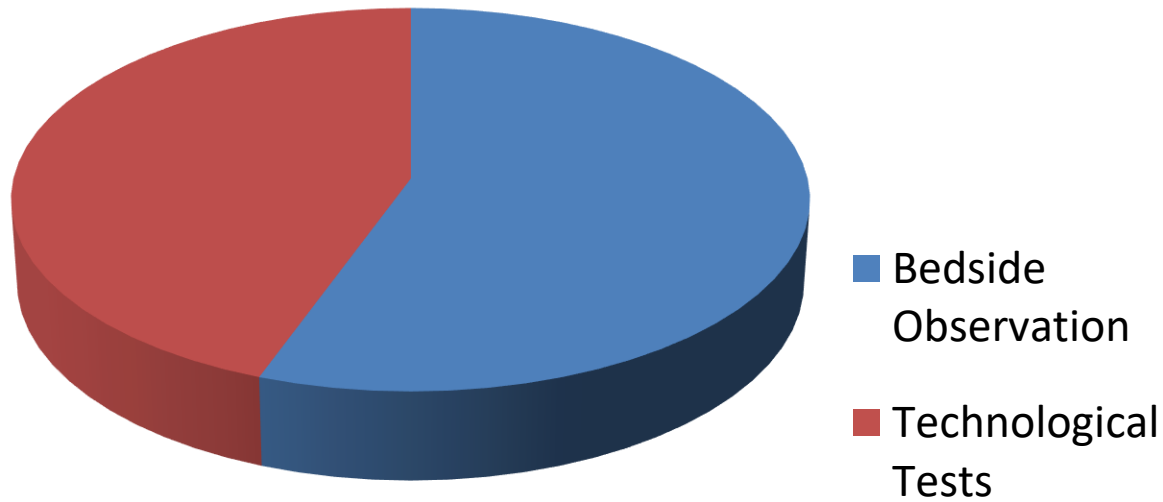
Medicine of 1d Era



*McGee , Steven (2012). Evidence Based
Physical Diagnosis. 3rd ed.*

Clinical Observations vs Technology

Modern Medicine



McGee , Steven (2012). *Evidence Based Physical Diagnosis*. 3rd ed.

Reliance on Technology raises few questions ?

- What is the diagnostic value of the traditional physical exam ?
- Is it outdated & best discarded ?
- Is it completely accurate and underutilized ?
- Is the truth somewhere between these two extremes ?

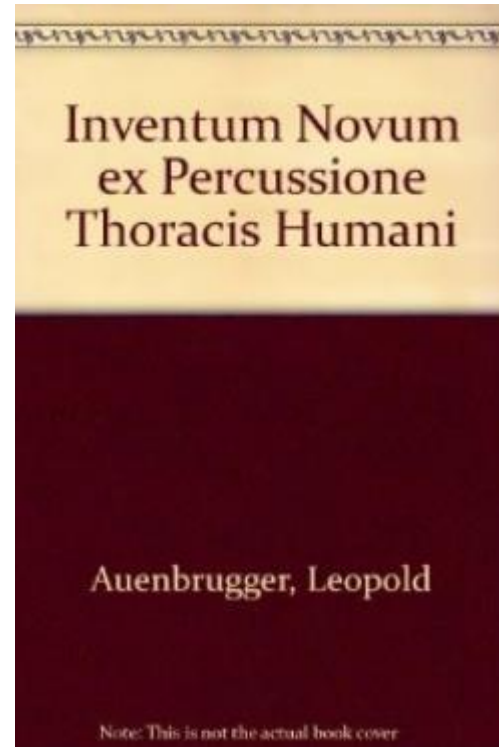
Evidence Based Physical Diagnosis

- Using the diagnostic accuracy of clinical findings according to the existing evidence in order to determine the clinical probability of disease in question.
- Increases the clinician's confidence on clinical diagnosis
- Helps in ; when to pursue technology , how quickly to do the investigations and prudent use of sequence
- For certain diseases clinical diagnosis is of paramount importance

Invention of Percussion- Greatest of all Times



Leopold Auenbrugger
1722- 1809



Invention of Stethoscope-The Cylinder



Rene Laennec
1781-1826

Power of Close Observation-The Method of Dr Joseph Bell



- Observe Closely
- Deduce Shrewdly
- Confirm with hard evidence

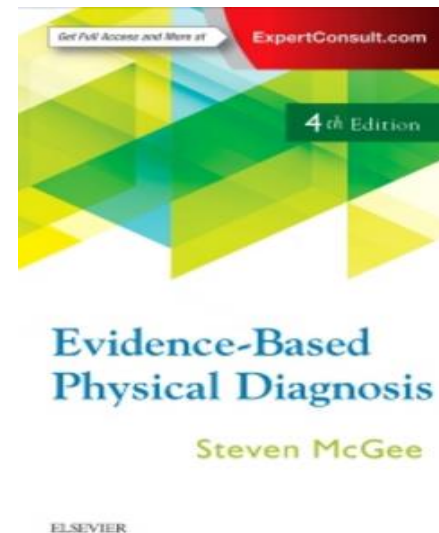
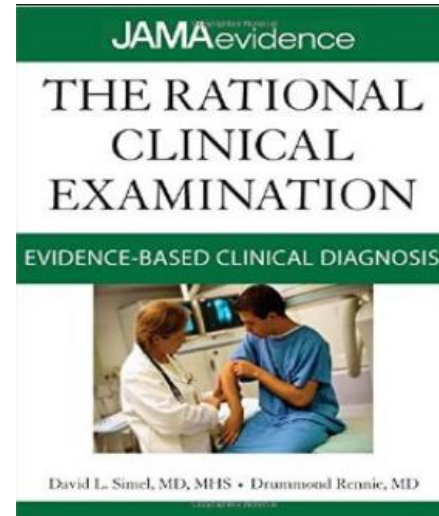
1837-1911

Story of Dr Jo Bell

- Short Video

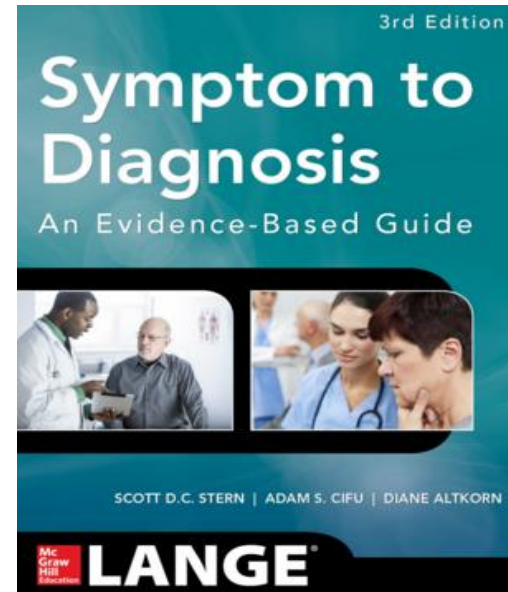
Resources for Learning Evidence Based Physical Diagnosis

- JAMA Evidence – Rational Clinical Exam
- Dr Steven McGee



Resources for Learning Evidence Based Physical Diagnosis

Dr Scott DC Stern An Evidence-Based Guide



Learning Physical Exam Skills: Resources








Physical Examination

10 videos • 7,757 views • Last updated on Jun 17, 2015



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7:02
- 4 **Examination of the Cranial Nerves - Explanation**
University of Leicester
16:15
- 5 **Cardiovascular Examination - Explanation**
University of Leicester
12:49

Learning Physical Exam Skills: Resources



Stanford Medicine 25
Promoting the Culture of Bedside Medicine

*An Initiative of the Program
for Bedside Medicine*



The 25

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The Stanford Medicine 25
Teaching Bedside Exam Skills

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Learning Physical Exam Skills: Resources

- Bates's Guide to Physical Examination
- MacLeod's Clinical Examination
- Hutichson's Clinical Methods
- Talley & O Connors' Clinical Examination, A Systematic Guide to Physical Diagnosis

Smart Phone Application: **Diagnose**



T-Mobile LTE 10:50 PM 20%

Meningitis,...

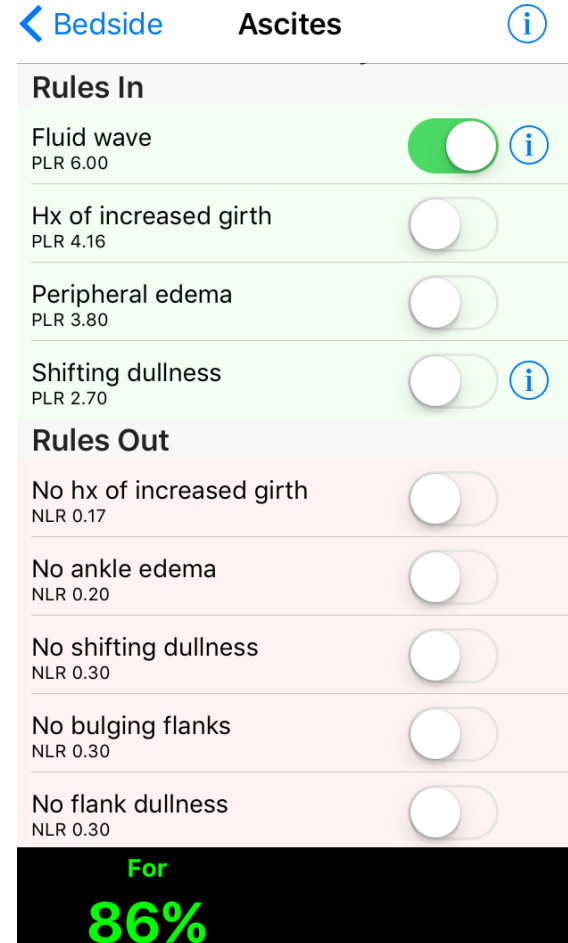
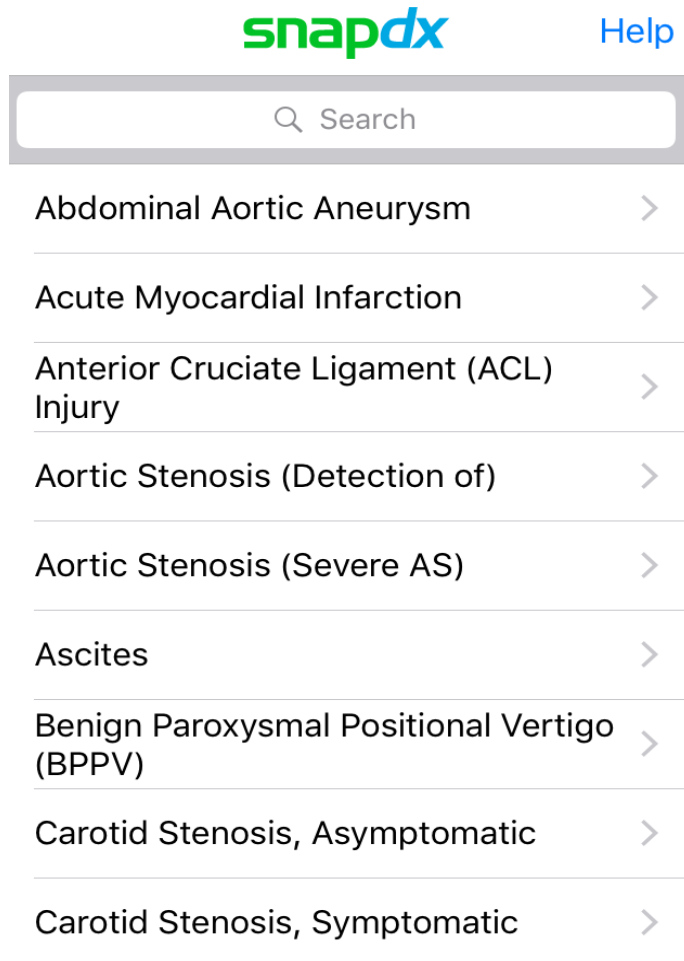
Pretest: 27%

History	+LR	-LR
Headache	1.1	0.43
Nausea/Vomiting	1.3	0.64
Neck stiffness	1.1	0.95

Physical	+LR	-LR
Fever	-	-
Jolt Accentuation	2.4	0.05

2%

Smart Phone Application: **snapdx**



How to Measure Diagnostic Accuracy?

- **Pretest Probability** : Prevalence before applying the results of a clinical finding
- **Sensitivity** : SnNout (-) PID = Positivity in Disease , Helpful when negative
- **Specificity** : SpPin (+) NIH = Negativity in Health , Helpful when positive
- **Likelihood Ratios** : Positive LR or Negative LR , These are diagnostic weights of clinical findings
- **Post Test Probability** :

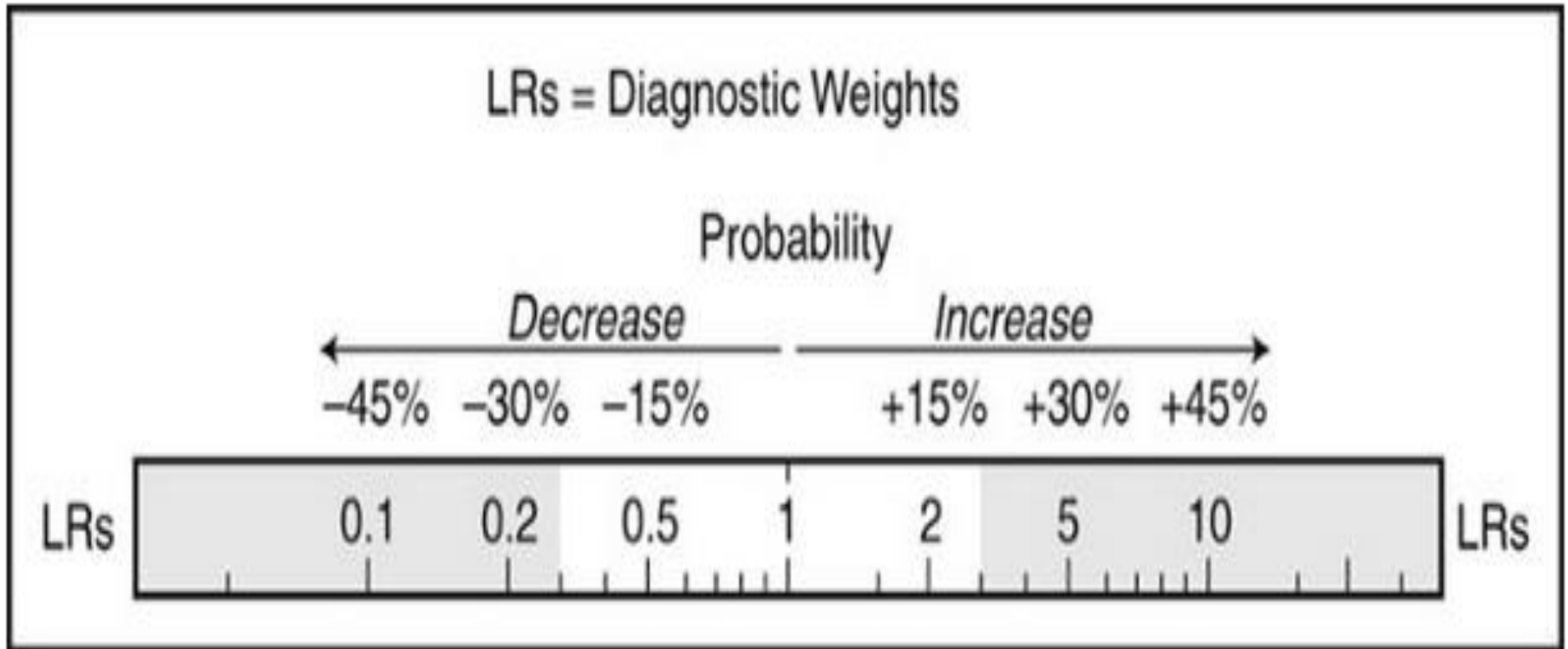
Likelihood Ratios

$$\text{Positive LR} = \frac{(\text{sens})}{(1 - \text{spec})}$$

$$\text{Negative LR} = \frac{(1 - \text{sens})}{(\text{spec})}$$

Likelihood Ratio	Effect
1	No effect
3-10	Disease more likely
0.3-0.1	Disease less likely
> 10	Disease more likely
< 0.1	Disease less likely

Relationship between Likelihood Ratio & Post Test Probability



Reliability of Physical Signs

- Refers to how often multiple clinicians, examining the same patients, agree that a particular physical sign is present or absent.

K-Statistic	Degree of Agreement
0-0.2	Slight Agreement
0.2-0.4	Fair Agreement
0.4-0.6	Moderate Agreement
0.6-0.8	Substantial Agreement
0.8-1	Almost perfect Agreement

k- Statistics--Examples

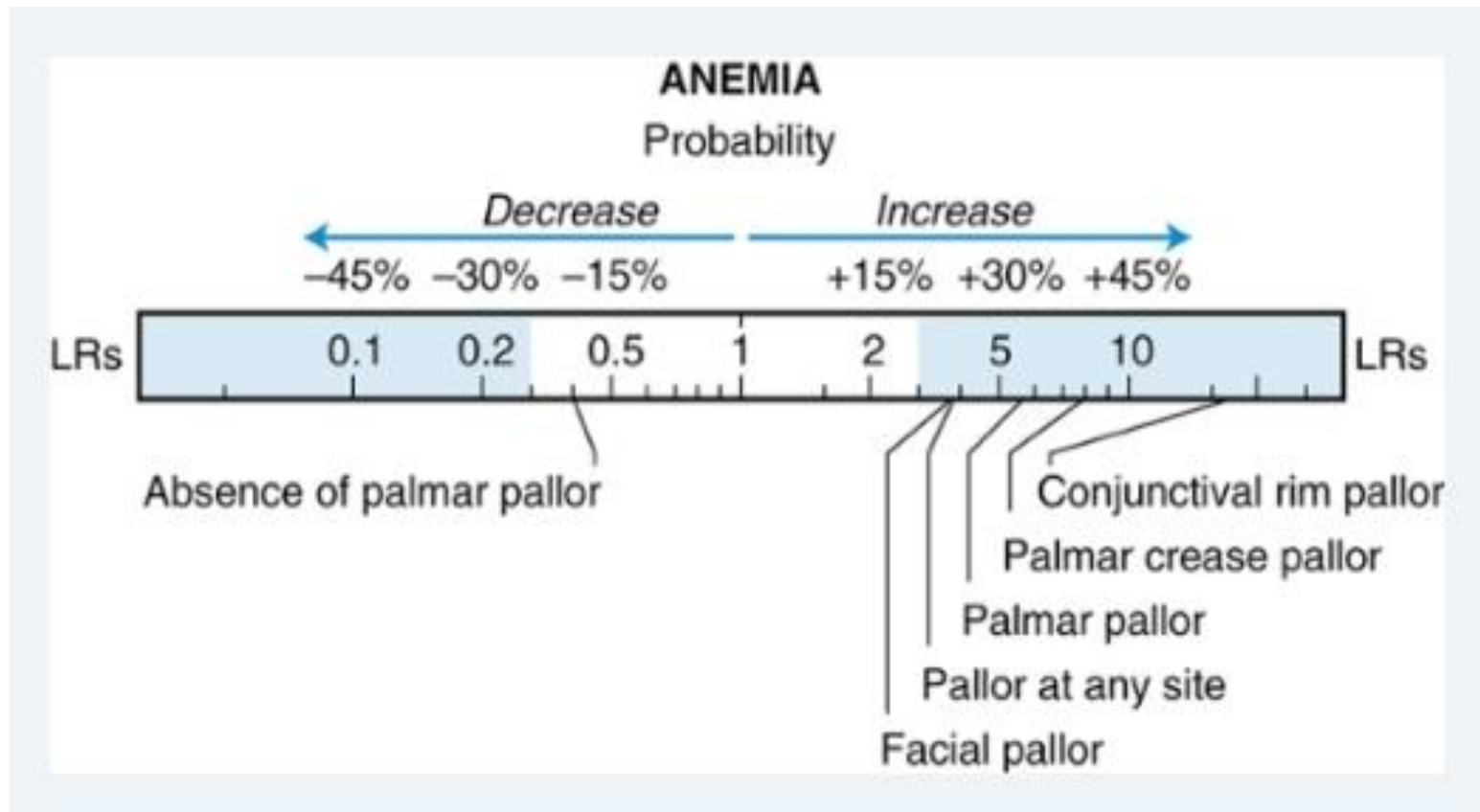
- Clubbing (Schramroth sign)
0.64
- Clubbing (IP depth ratio)
0.98
- Displaced Trachea
0.01
- Intra-retinal Hemorrhages
0.89
- Neck Veins Elevated or Normal
0.08-0.71
- Abdominojugular Test
0.92

*McGee , Steven (2017). Evidence Based Physical
Diagnosis. 4th ed.*

Quick Example: Detecting Anemia

Finding (Reference) [†]	Sensitivity (%)	Specificity (%)	Likelihood Ratio [‡] if Finding Is	
			Present	Absent
Pallor at any site	22-77	66-92	3.8	0.5
Facial pallor	46	88	3.8	0.6
Nailbed pallor	59-60	66-93	NS	0.5
Palmar pallor	58-64	74-96	5.6	0.4
Palmar crease pallor	8	99	7.9	NS
Conjunctival pallor	31-62	82-97	4.7	0.6
Tongue pallor	48	87	3.7	0.6
Conjunctival Rim Pallor				
Pallor present	10	99	16.7	—
Pallor borderline	36	—	2.3	—
Pallor absent	53	16	0.6	—

Quick Example: Detecting Anemia



- Questions