How to Present Medical Evidence to Patients

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MY BELIEF

All Health Care Providers should have their practice underpinned by the best available evidence

Evidence-Based Practice (EBP)

IT'S NOT ABOUT GUIDELINES

140/90
< 6.5%
< 2.0

GUIDELINES RARELY CONSIDER
PATIENT PREFERENCES

IT'S NOT CHECKBOX MEDICINE

PEOPLE DON'T FIT INTO BOXES

IT'S NOT SOMETHING "NEW"

DOING THE RIGHT THING
IS NOT A NEW IDEA

IT'S NOT ABOUT SAVING MONEY

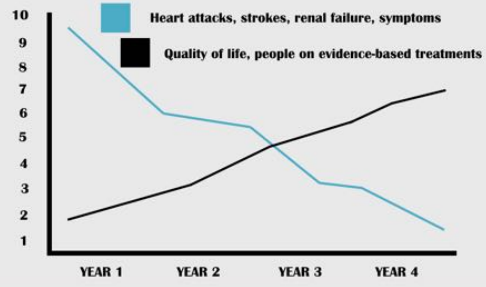
RATIONING
IS NOT THE MOTIVE

IT'S NOT ABOUT RCTs

RCTs ARE USEFUL
BUT THEY ONLY
HELP
INFORM DECISIONS

p<0.05 ≠ GOOD p>0.05 ≠ BAD

IT'S NOT NECESSARILY ABOUT INFLUENCING OUTCOMES



IT'S NOT ABOUT IGNORING BASIC SCIENCE

WE NEED TO UNDERSTAND
HOW IT WORKS

IT'S NOT ABOUT ZERO COMPETING INTERESTS

RESEARCH
COSTS MONEY
SOMEBODY HAS TO PAY FOR IT

WE NEED TO UNDERSTAND
BIAS IS
EVERYWHERE

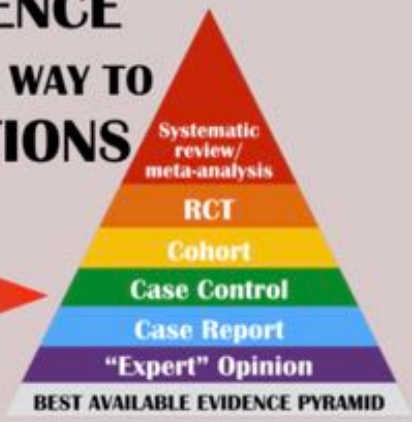
WHAT IT IS

IT'S A WAY OF THINKING

EVIDENCE-BASED PRACTICE

BEST AVAILABLE EVIDENCE
USED IN A HIERARCHICAL WAY TO ANSWER CLINICAL QUESTIONS

Patient
Intervention
Comparator
Outcome

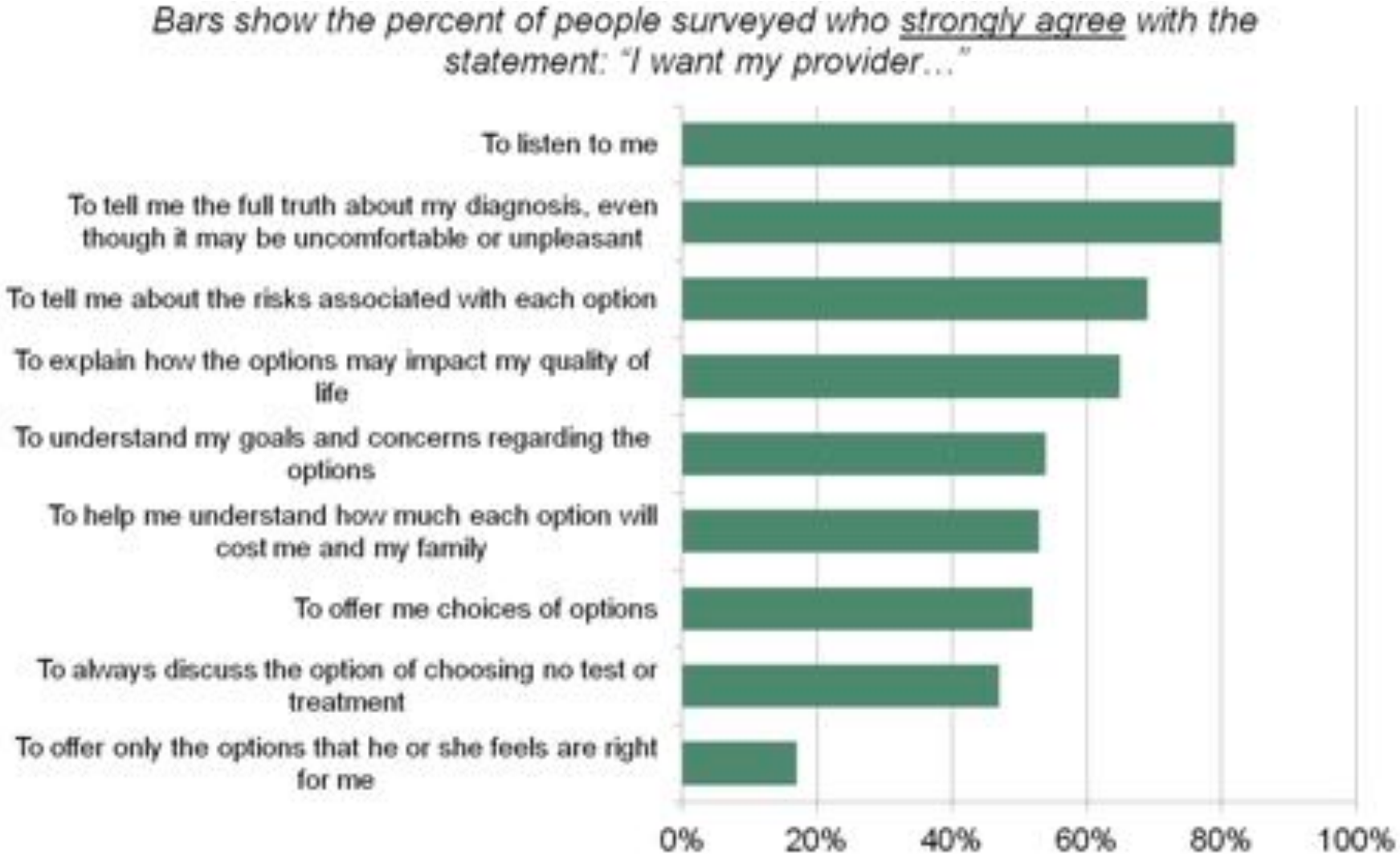


USING CLINICAL EXPERTISE

Diagnostician
Knowledge Broker
Communicator
Being Kind & Careful

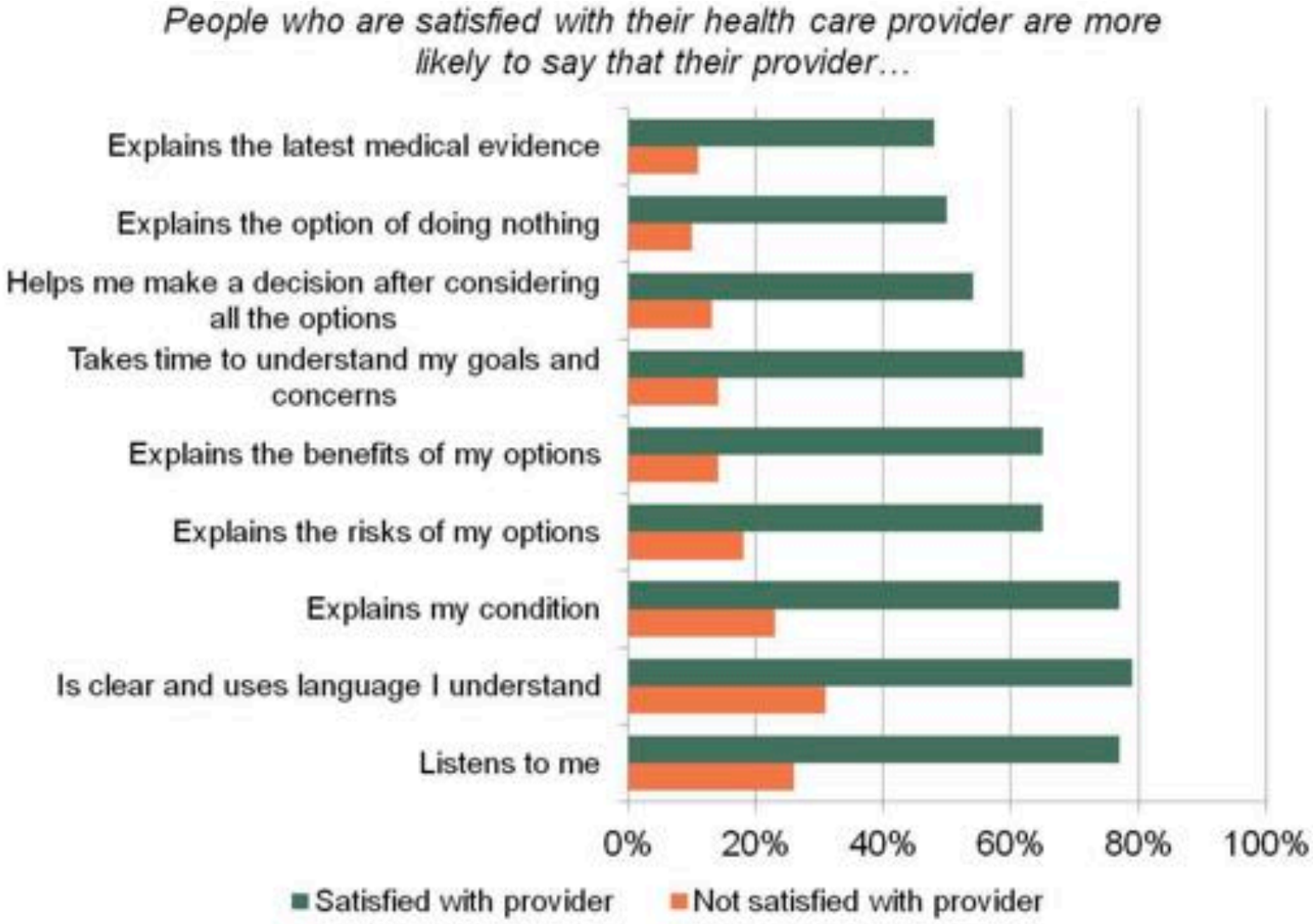
INFORMING PATIENTS & ELICITING & INTEGRATING PREFERENCES

People want involvement in evidence and decisions



Communicating with patients on health care evidence.
Discussion Paper, Institute of Medicine, Washington, DC 2012

Satisfaction is linked to shared decisions



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“Most patients cannot recall a time when their care provider discussed scientific evidence as the basis for better care”

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Discussion Paper, Institute of Medicine, Washington, DC 2012

Many courts (UK, US, CA)

"The reasonable-patient standard … requires physicians and other health care practitioners to disclose all relevant information about the risks, benefits, and alternatives of a proposed treatment that an **OBJECTIVE PATIENT** would find material in making an intelligent decision as to whether to agree to the proposed procedure"

JAMA 2016;315:2063-4

PATIENT REVOLUTION

=

Clinicians and patients working in partnership

KNOWING THE MAGNITUDE OF THE BENEFIT OF TREATMENT

KNOWING the POTENTIAL HARMS - SIDE EFFECTS, COST AND INCONVENIENCE

REALIZING HEALTH DECISIONS ARE YOUR DECISIONS

ESSAY

Why Most Clinical Research Is Not Useful

John P. A. Ioannidis[1,2]*

"The problem of non-useful research should not be seen as a blame game against a specific group (e.g., clinical researchers) but instead should be seen as an opportunity to improve."

"Much current public funding could move from preclinical research to useful clinical research" - pre-clinical funded by industry, blue-sky research by the public

"Instead of trying to make a prolific researcher of every physician, training physicians in understanding research methods and evidence-based medicine may also help improve the situation by instilling healthy skepticism and critical thinking skills."

PLOS Medicine 2016 | DOI:10.1371/journal.pmed.1002049

ESSAY

Why Most Clinical Research Is Not Useful

John P. A. Ioannidis[1,2]*

"Overall, not only are most research findings false, but, furthermore, most of the true findings are not useful."

PLOS Medicine 2016 | DOI:10.1371/journal.pmed.1002049

Evidence Issues

Much of research is not going to be “right”

One study likely proves nothing - need reproducibility

“The evidence for nonreproducibility in basic and preclinical biomedical research is compelling” John Ioannidis

Cohort trials don't prove causation

Research does go unpublished - but large studies do get reported

“Science can be used to inform clinical decisions, but cannot definitively inform value judgements, because the significance of potential benefits and harms of a therapy are in the eye of the beholder and will differ across individuals.”

Circulation. 2017;135:180–195. DOI: 10.1161/CIRCULATIONAHA.116.022622

Some clinical adages?

Ask - how do you feel about being involved in making decisions about your treatment?

It's OK if we say I don’t know, let’s look into it, it’s your decision.

You and your patient’s perception are not necessarily “right” and likely not the same

Patients' Expectations of the Benefits and Harms of Treatments, Screening, and Tests
A Systematic Review

Tammy C. Hoffmann, PhD; Chris Del Mar, MD, FRACGP

BENEFIT - 88% of study authors concluded that participants **overestimated benefits**

HARM - 67% **underestimated harm**

JAMA Intern Med 2015;175:274-286

It's all about figuring out

The Chance

WITH NO

TREATMENT

VS

The Chance

WITH

TREATMENT

Ballpark risk estimate
Epidemiological data/cohort data
- Framingham, QRISK, FRAX, CHA2DS2-VASc

Ballpark benefit estimate
RCT data
use the absolute benefit if people are similar to those in the studies or,
use the relative benefit and apply it to the baseline risk

Key steps to communicating evidence

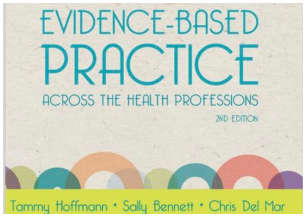
Understand the patient's (and family members') experiences and expectations.

Build partnerships.

Discuss the evidence, including a balanced discussion about uncertainties.

Present recommendations.

Check for understanding and agreement.



Risky Relative Adjectives

HOW

low is low

moderate is moderate

high is high

Evidence-based risk communication

"There is likely no single best method of communicating probabilities to patients but rather several good options with some better suited to certain risk scenarios."

Ann Intern Med 2014;161:270-80

Recommended approaches

Need a time frame, main endpoints, ask what they know

GENERAL SUGGESTIONS - these are “relative”
use percentages (5%) or natural frequencies (5 out of 100) - BOTH?
use absolute terms
add bar graphs or icon arrays
use incremental risk format with icon arrays in the same array

- avoid use of NNTs

if use relative risks add baseline risks

Ann Intern Med 2014;161:270-80

Approaches differ depending on outcome

Every patient is an experiment - dose and effect

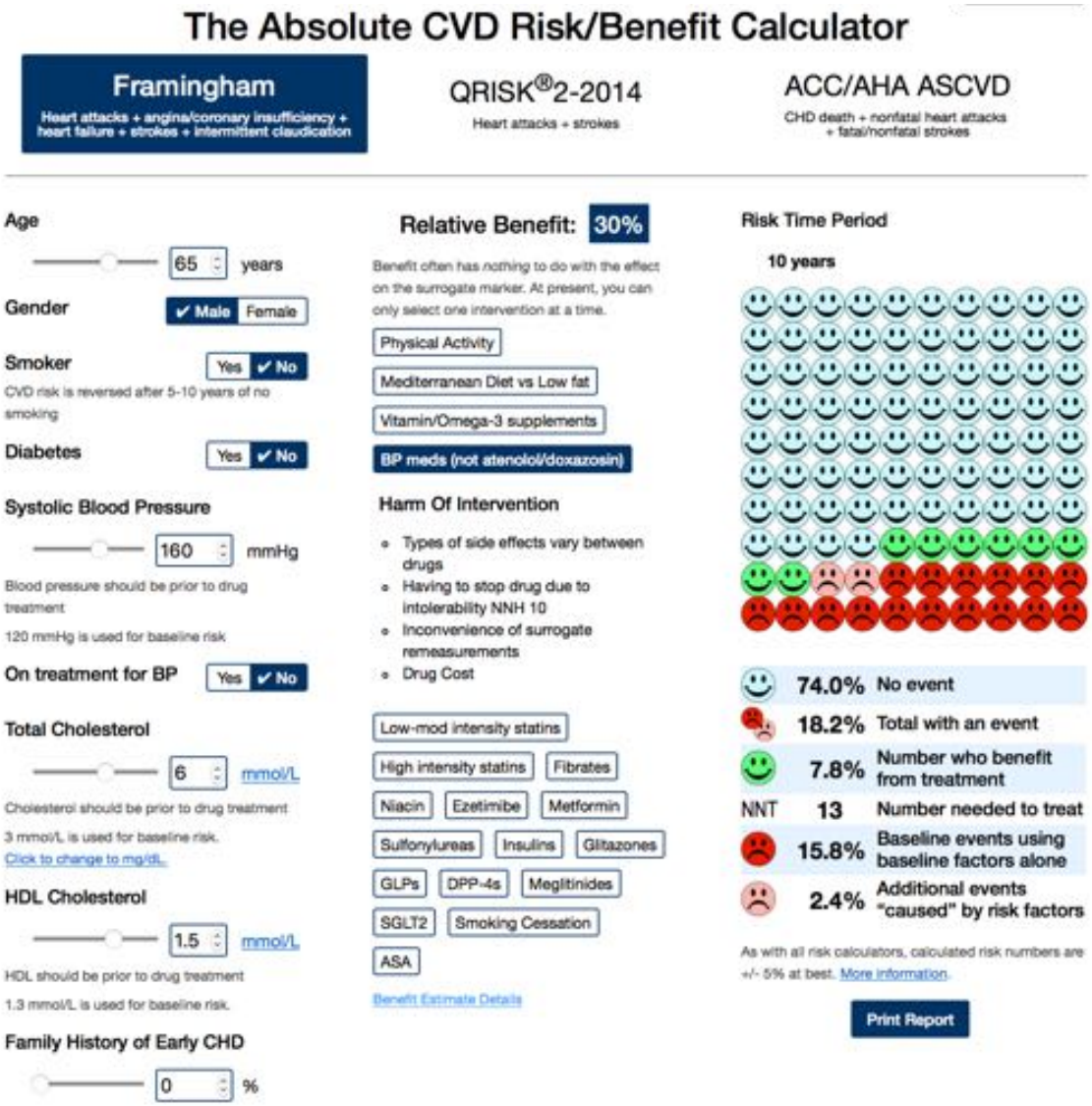
Prevention - one will never know if it worked

Symptoms - we can usually figure out if it is working - but it is tricky

Diagnosis - pre- and post-test probabilities

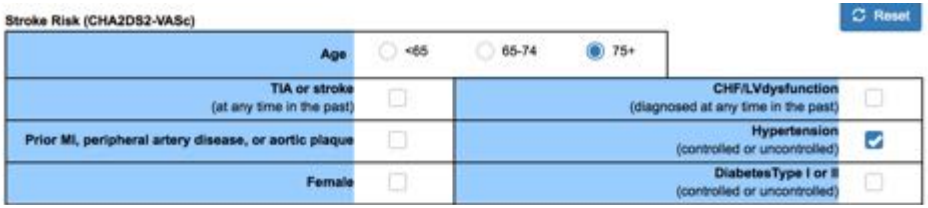
Expectations

Prevention



Calculate ballpark 10-yr risk of CVD - BP, chol, diabetes
Make estimate of benefit based on the best available evidence
Gives a list of adverse effects to discuss

cvdcalculator.com



http://www.sparctool.com

	PERCENT PER YEAR	
	annual risk of **stroke/embolism**	annual risk of **major bleeding** (intracranial bleeding, bleeding requiring hospitalization, HgB decrease of > 20 g/L, or need for transfusion secondary to bleeding)
NO THERAPY	4.3%	0.6%
ASPIRIN	3.4%	1.1%
WARFARIN	1.4%	2.2%
DABIGATRAN 110	1.4%	1.8%
DABIGATRAN 150	0.9%	2.2%
RIVAROXABAN	1.4%	2.2%
APIXABAN	1.1%	1.5%

Calculate ballpark annual risk of stroke - based on risk factors- BP, chol, diabetes
Make estimate of benefit based on the best available evidence - all agents
Make estimate of a GI bleed

10 year fracture risk %

Major osteoporotic fracture (clinical spine, forearm, hip or shoulder fracture)/Hip

RISK FACTORS	Zero				One				Two			
BMI	35	30	25	20	35	30	25	20	35	30	25	20
Female												
50	2	3	3	3	4	4	5	5	6	6	7	8/1
60	5	6	6	7/2	7	9	10/1	10/4	11/1	13/2	14/2	16/6
70	8/1	9/2	10/2	11/4	11/2	13/3	15/4	17/7	16/4	18/6	21/7	25/12
80	14/4	16/5	19/7	21/11	20/8	23/10	27/13	31/20	28/14	33/18	38/22	43/32
Male												
50	2	2	2	2	3	3	4	4	4	5	6	6
60	3	4	4	4	5	6	6	7/1	7	8	10/1	10/2
70	4	5/1	6/1	6/2	6	7	8/2	9/4	8	10	12/4	13/6
80	6/2	7/3	9/4	9/5	9/4	11/5	13/7	14/10	13/7	16/9	19/12	21/16

Risk factors - Previous fracture “atraumatic”, Parent hip fracture, Smoker, Rheumatoid arthritis, Glucocorticoids - now or more than 3 months, >3 drinks a day

https://therapeuticseducation.org/tools

FRAX® WHO Fracture Risk Assessment Tool

Misguided beliefs

Patients believe CVD “prevention” drugs produce a 70% absolute benefit over 5 years when at most only ~ 20-30% benefit is possible over a lifetime

Clin Med 2002;2:527-33

Risk of future illness
CVD risk/benefit

(most people don't benefit despite a lifetime of treatment)

Challenging treatment thresholds

James McCormack PharmD, Aseem Malhotra MRCP and David Newman MD

Assume a person's lifetime risk of CVD is that of a male with two CVD risk factors - roughly 50% (NEJM 2012;366:321-9)

Assume that with multiple risk factor modification we can reduce that risk relatively by 60% (VERY optimistic)

Risk goes from 50% ➡ 20%

30% of individuals BENEFIT

70% DO NOT despite a LIFETIME of treatment

Prescriber September 2015

Symptoms

You primarily need to know IF it works

Safety, cost and convenience

Older medications first - safety

Head-to-head studies are uncommon

Doses in the CPS are “wrong”

N-of-1 studies

Let the patient tell you

Symptom NNTs

PPIS, sildenafil - NNT ~2

NSAIDs, opioids - pain NNT ~3-5

Steroids - sore throat - NNT ~ 3, Bell's palsy - NNT ~10

Antibiotics - acute COPD exacerbation - NNT ~ 5

Topical antibiotics - bacterial conjunctivitis - NNT ~7

Antidepressants - severe depression - NNT ~10

Ipratropium - asthma attack - NNT ~11

Cholinesterase inhibitors - ADAS-Cog >4 - NNT ~10

Sleeping pills - improvement in sleep quality - NNT ~13

But you need to know what goes on in the placebo group

	If person “responds”, what is the % chance it was the medication	
Response in the placebo group	If Benefit 10% - NNT 10	If Benefit 20% - NNT 5
0%	~100%	~100%
20%	~33%	~50%
40%	~20%	~33%

Diagnosis

Likelihood Ratios

LRs are basically a ratio of the probability that a test result is correct to the probability that the test result is incorrect.

Pre-test probability (%)

➡ apply a LR

➡ post-test probability (%)

OPEN ACCESS Freely available online PLOS 1 November 2014 PLOS | ONE

Rapid Antigen Group A Streptococcus Test to Diagnose Pharyngitis: A Systematic Review and Meta-Analysis

LR + = 10.8

LR - = 0.15

General practice clinic in Canada - people with a sore throat who have Strep ~10%

Prevalence	If positive Post test probability	If negative
1%	~10%	~0.2%
10%	~60%	~2%
40%	~90%	~10%

Table 4. Likelihood ratios and the impact on post test probabilities (modified by McGee 2002)[8]

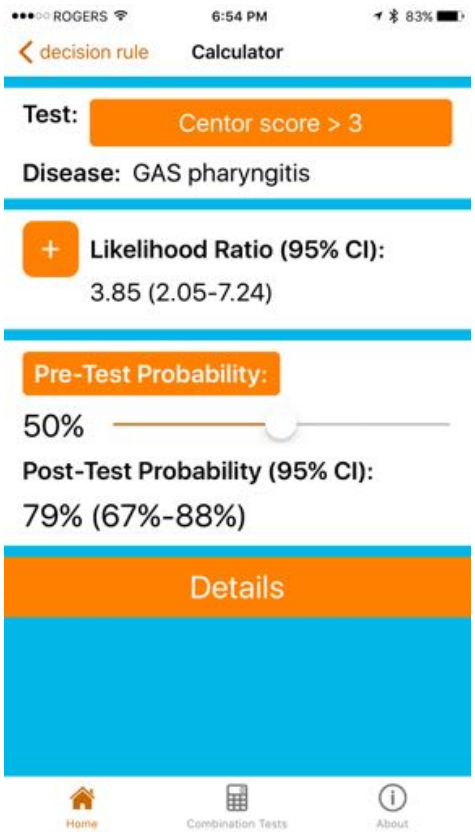
Likelihood ratios			Approximate changes in post-test probabilities
Values between 0 and 1 decrease the probability of disease			
0.1	**Strong evidence**	**Large**	-45%
0.2		**Moderate**	-30%
0.3			-25%
0.4			-20%
0.5	**Weak evidence**	**Slight**	-15%
Likelihood ratio = 1		**None**	0%
Values greater than 1 increase the probability of disease			
2	**Weak evidence**	**Slight**	+15%
3			+20%
4			+25%
5		**Moderate**	+30%
6			+35%
8			+40%
10	**Strong evidence**	**Large**	+45%

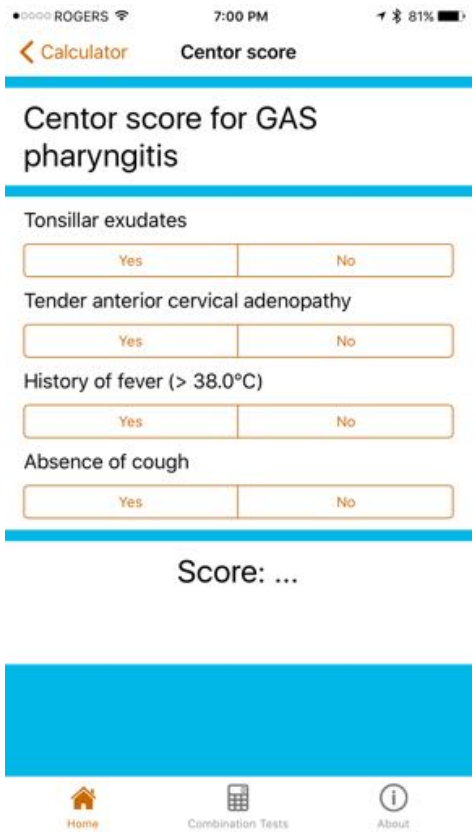
Useful apps and on-line tools

MedCalX - calculate likelihood ratios from sensitivity and specificity AND post-test probability calculator

Useful apps and on-line tools

DxLogic - listing of LR and pre-test probabilities and a post-test calculator

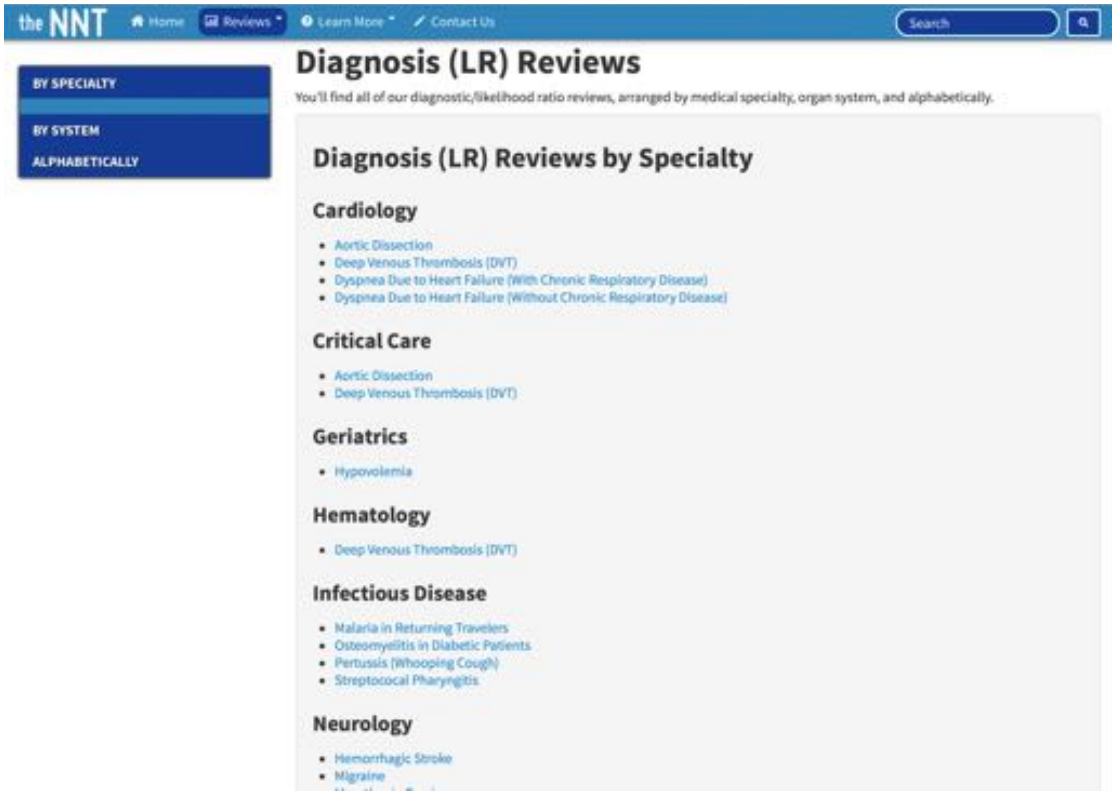


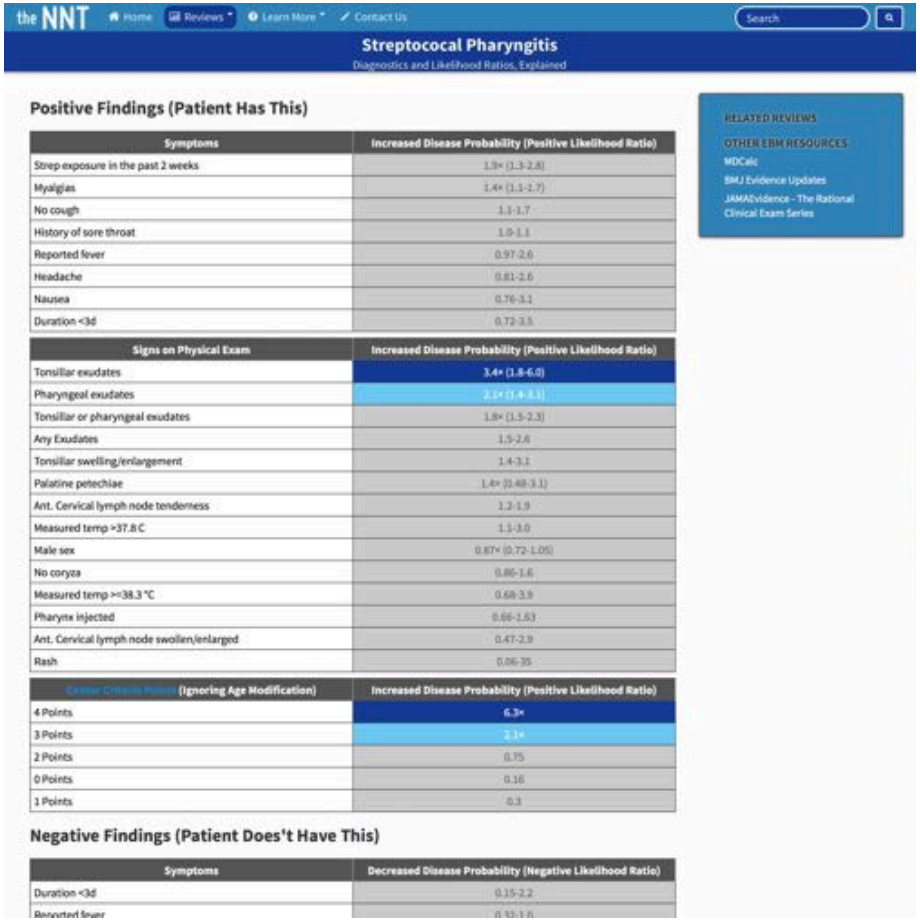


lrdatabase.com - home of DxLogic

Useful apps and on-line tools

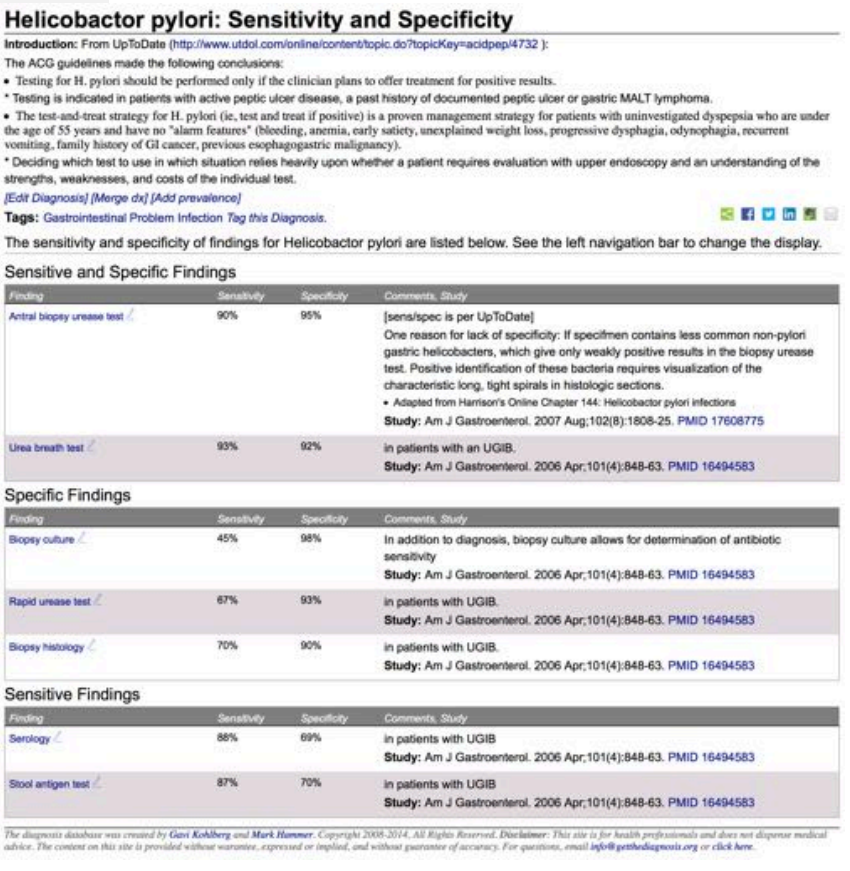
http://www.thennt.com/home-lr/



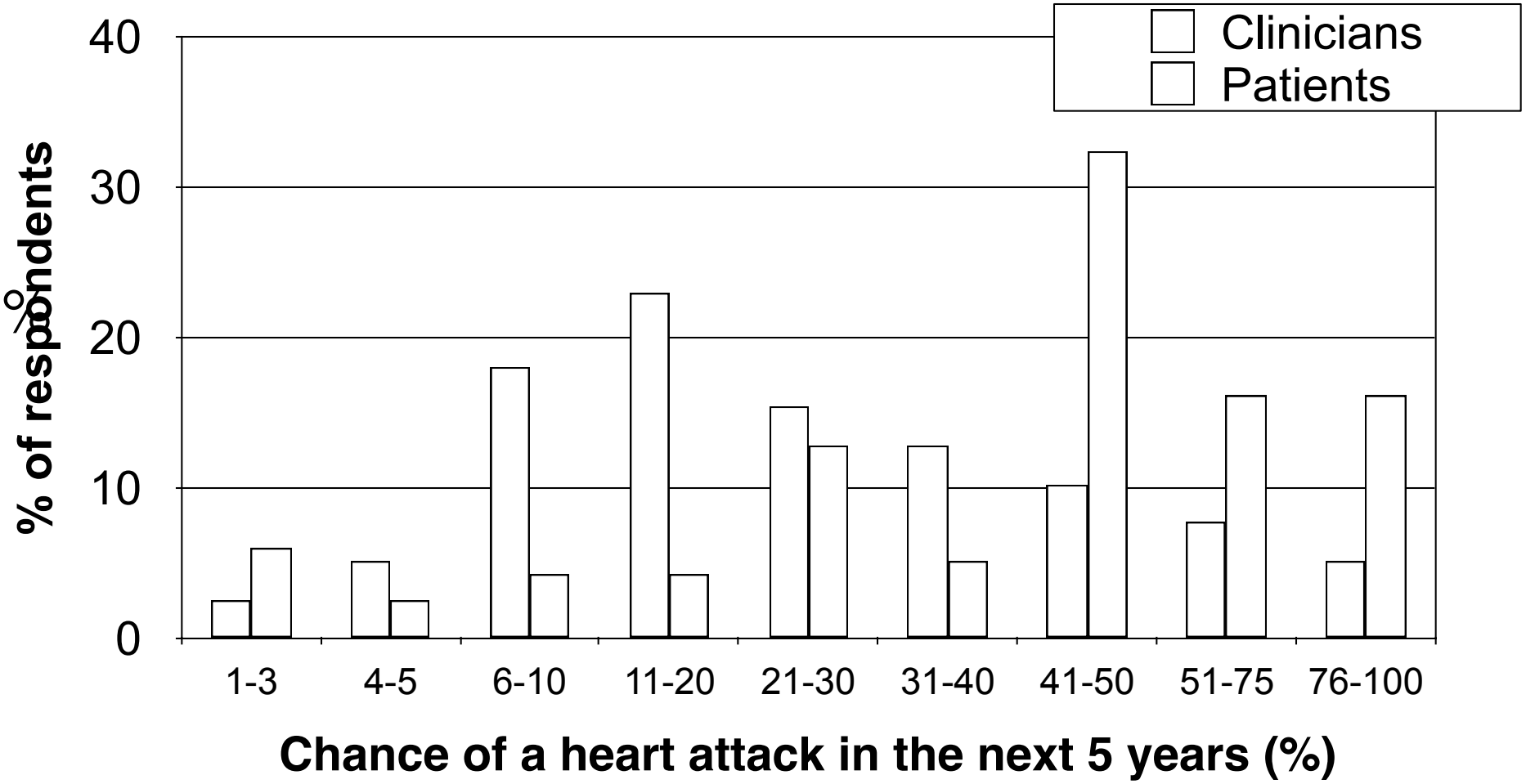


Useful apps and on-line tools

http://getthediagnosis.org/



What is "High Risk"



Beware of “qualitative quantification”

Qualitative descriptor	EU assigned frequency	Mean frequency estimated by participants (n=200)
Very common	>10%	65% (24·2)
Common	1–10%	45% (22·3)
Uncommon	0·1–1%	18% (13·3)
Rare	0·01–0·1%	8% (7·5)
Very rare	<0·01%	4% (6·7)

Values are mean (SD).

Lancet 2002;359:853–54

Shameless self promotion

28TH ANNUAL

Best Science Medicine Course

Formerly The Drug Therapy Decision Making Course – 25 years

Friday, April 7, 2017 and Saturday, April 8, 2017
The Fairmont Waterfront – 900 Canada Place Way, Vancouver, BC

PREVIOUS YEARS' REGISTRANT TESTIMONIALS:

"This course definitely changed my practice"

"This is the most influential course I have ever attended"

"Nice to hear evidence instead of marketing messages"

April 7/8, 2017 - the Fairmount Waterfront

http://bestsciencemedicine.com

Schedule

FRIDAY, APRIL 7, 2017

07:00	Registration (Muffins & Coffee) Chairs – Mike Allan and James McCormack	

"Laugh yourself into stitches" (Twelfth Night) THE START

08:00	Bless thee, bully doctor!	Robert Rangno
08:05	Shakespeare brings greetings from afar	Christopher Gaze
08:20	Much ado about nothing – and so much more	Mike Allan and James McCormack

"The game is afoot" (King Henry IV - Part 1) CVD

09:00	Urgent BP numbers – "all's well that ends well?"	Julian Marsden
09:20	Lowering BP numbers – is there "too much of a good thing?"	Mike Allan
09:40	Questions	
09:50	Bleeding in patients on antithrombotic therapy – "The short and the long of it"	Peter Loewen
10:10	Questions	
10:20	Refreshment Break	

"It was Greek to me" (Julius Caesar) COMMUNICATION

10:40	Speaking with patience – "Knock, knock! Who's there"	Tracy Monk
11:00	Communication of evidence – "what's in a name"	James McCormack
11:20	Questions	
11:30	"The Comedy of Errors" in medicine and how to prevent them	Kam Shojania
11:50	"Make short shrift" of 5 key pediatric studies	Tina Korownyk
12:00	Questions	
12:10	Lunch	

"Eaten me out of house and home" (King Henry IV – Part II) POTPOURRI

13:00	"The short and the long of it" – Two award winning resident presentations	Medical Residents
13:20	NSAIDs myths – "All that glitters is not gold"	Adrienne Lindblad
13:40	Preventing infections in hospital – "Out, damned spot! Out"	Victor Leung
14:00	Questions	
14:20	Refreshment Break	