

Revealing the Mysteries of Information Mastery

Steven R. Brown, MD

Banner Good Samaritan Family Medicine
Residency

December 2010

“It’s not how much you know, it’s how fast you can find the answer.”®



How helpful is the answer? The usefulness equation

$$\text{Usefulness} = \frac{\text{Relevance} \times \text{Validity}}{\text{Work}}$$

- How will you find information?
- How will it find you?



The information jungle

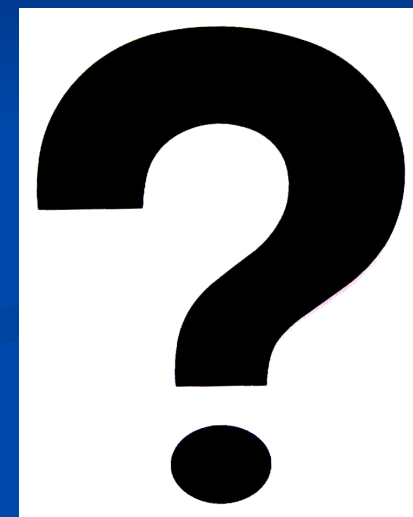
- MEDLINE: 9 Million articles adding 300,000/year
- In primary care to keep up to date, we would need to read 17 articles a day, 365 days a year
- But... Less than 15% of articles published on a topic are useful
- Clinical trials are of varying quality

“Information anxiety”

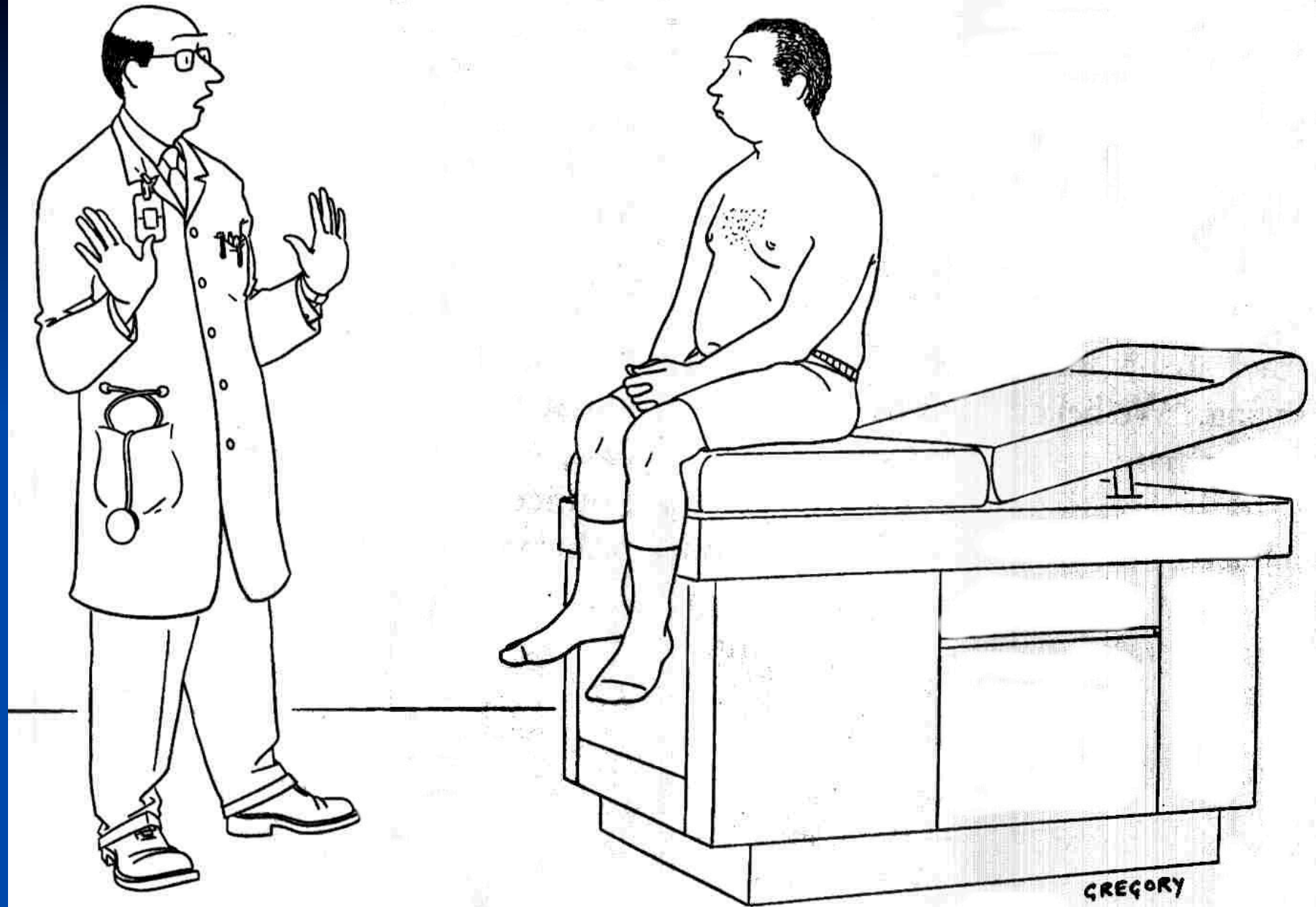
“The frustration that occurs when there is a great deal of information, but it doesn’t tell us what we want or need to know.” *Richard Wurman.*

What's the problem?

- We generate questions
 - About 5 times for every in-patient case and twice for every 3 clinic patients.
 - Thus for each day of 25 patients seen, we generate ~15 questions.
 - We get answers for less than a third (33%) of them.



Covell DG, UmanGC, Manning PR. Information needs in office practice: are they being met?
Ann Intern Med 1985;103:596-9



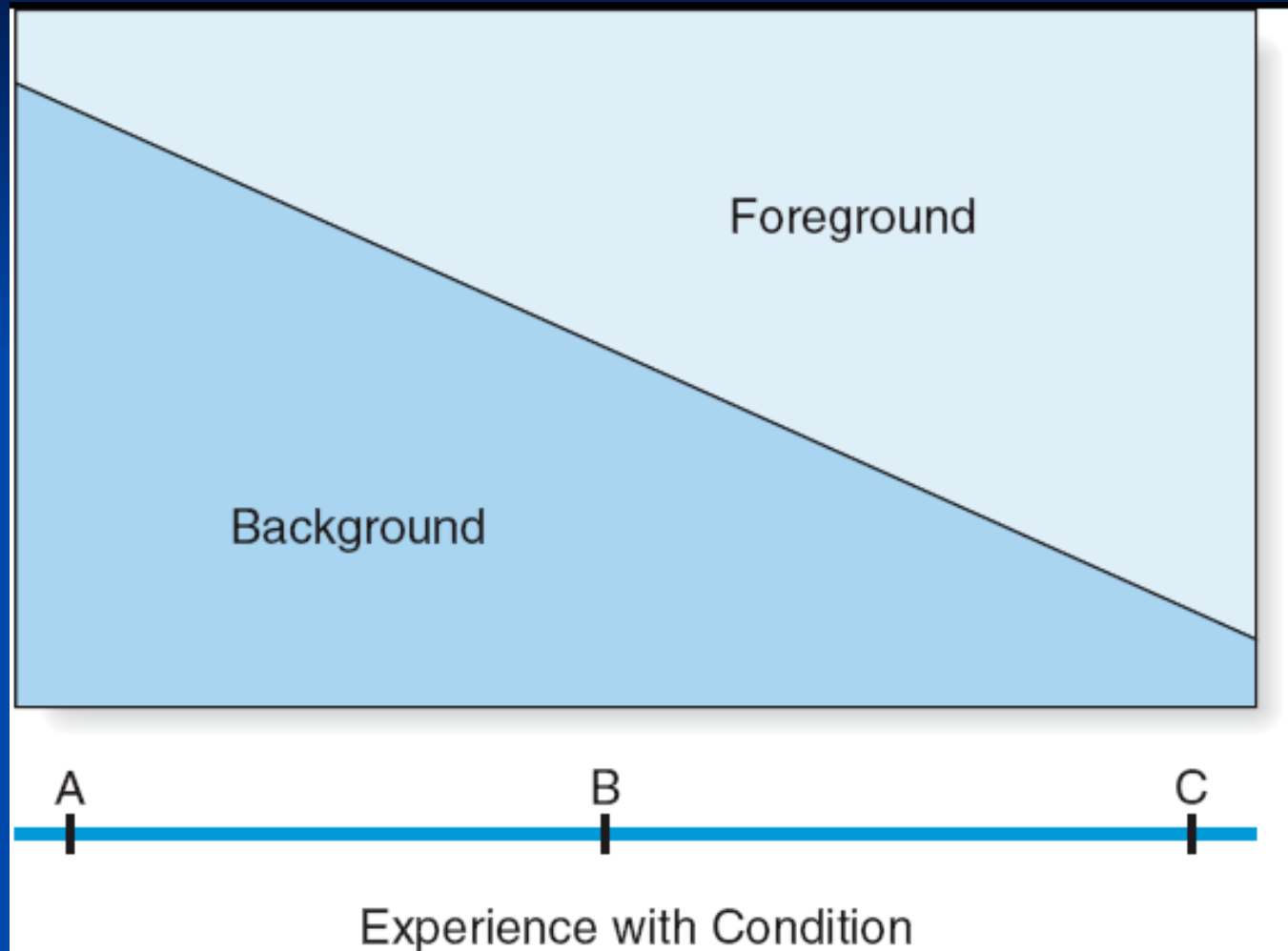
“Whoa—way too much information.”

How do we find
answers?

Clinical questions

- Background
 - General knowledge about a condition or thing
- Foreground
 - Specific knowledge to inform clinical decisions or actions
 - “PICO”

Questions change as experience increases



© Elsevier Ltd 2005. Straus et al.: Evidence-based medicine

Patient/Population

Intervention

Comparison

Outcome

In post-menopausal women, what are the effects of HRT on bone density/fractures?

patient	intervention	outcome(s)
post-menopausal woman	hormone replacement therapy	osteoporosis bone mineral density fracture

The “O” in PICO

Applicability to Practice

- **DOE** (*disease oriented evidence*)
 - Until recently, only information available
 - Aimed at increasing our understanding of disease
 - Crucial to medicine, how a “disease works”
 - DOE vs. POEM
- **POEM** (*patient oriented evidence that matters*)
 - Aimed at evidence that patients care about & clinicians care about their patients
 - HCTZ in HTN reduces morbidity and mortality

“Assuming”

“Knowing”

POEM:

Patient-Oriented Evidence that Matters

What matters to patients and their doctors?

- Morbidity (fractures, heart attacks)
- Mortality
- Cost

Example: HCTZ lowers risk of stroke, myocardial infarction

What doesn't matter to patients?

- Lab values (HDL, LDL)
- Clinical measures (blood pressure)
- Disease markers (bone density)

Disease Oriented Evidence (DOE)

Important for understanding the disease process, but not ready for “prime time”

Comparing DOEs and POEMs

Example	Disease-Oriented Evidence	Patient-Oriented Evidence that Matters	Comment
Antiarrhythmic Therapy	Drug X * □PVCs on ECG	Drug X increases mortality	POEM study contradicts DOE study
Antihypertensive therapy	HCTZ Antihypertensive therapy * □BP	HCTZ Antihypertensive therapy * □mortality	POEM agrees with DOE
Prostate Screening	PSA screening detects prostate cancer early	? whether PSA screening * □ mortality	DOE exists, but the important POEM is unknown

The usefulness equation revisited

$$\text{Usefulness} = \frac{\text{Relevance} \times \text{Validity}}{\text{Work}}$$

A Worksheet for Articles about Treatment

Determine *Relevance*

Is this article worth asking the above to read? If the answer to any of these questions is No, it may be better to read other articles first.

Based on the conclusion of the abstract:

A. Did the authors study an outcome that patients would care about? (Be careful to avoid results that require extrapolation to an outcome that truly matters to patients)

Yes (go on) No (stop)

B. Is the problem studied one that is common to your practice and the intervention feasible?

Yes (go on) No (stop)

C. Will this information, if true, require you to change your current practice?

Yes (go on) No (stop)

Determine *Validity*:

If the answers to all three questions above are Yes, then conduct assessment of the article's validity.

D. Population

1. Are the studied patients similar enough to your patients that you can apply the results in your practice? Yes No (Stop)

E. Study design

1. Was it a controlled trial? Yes No (Stop)
2. Were the subjects randomly assigned? Yes No (Stop)
3. Were steps taken to conceal the treatment assignment from study personnel enrolling patients into the study? Yes No
4. Were patients, providers and outcome assessors "blind" to treatment? Yes No

F. Study conduct

1. Were all patients who entered the trial properly accounted for at its conclusion?
a. Was follow-up complete? Yes No
b. Were patients analyzed in the groups to which they were randomized ("intention-to-treat" analysis)? Yes No
2. Were the intervention and control groups similar? (Table 1) Yes No

G. Study results

1. What were the results? _____

2. Are the results clinically as well as statistically significant? Yes No
3. If a negative trial, was the power of the study adequate? Yes No
4. Were there other factors that might have affected the outcome? Yes No
5. How will it change your practice?

The worksheet

Relevance of Outcome 

Effect on Patient-Oriented Outcomes

- Symptoms
- Functioning
- Quality of Life
- Lifespan

Effect on Disease Markers

- A1c in diabetes
- MICs in infection
- BMD in osteoporosis

Effect on Risk Factors for Disease

- Improvement in markers (blood pressure, cholesterol)

Disease-Oriented Evidence

Valid Patient-Oriented Evidence

Uncontrolled Observations & Conjecture

**Physiologic Research
Preliminary Clinical Research**

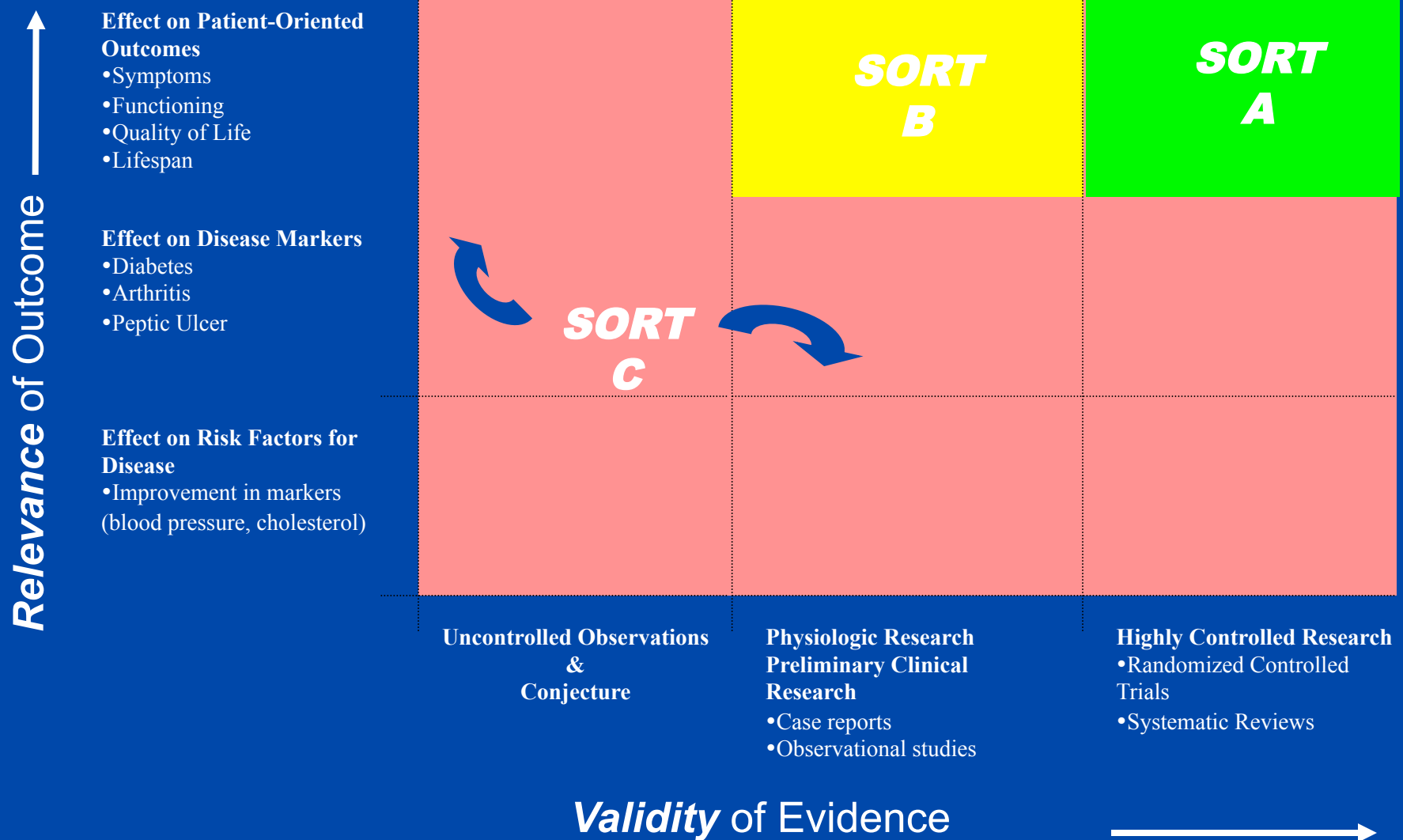
- Case reports
- Observational studies

Highly Controlled Research

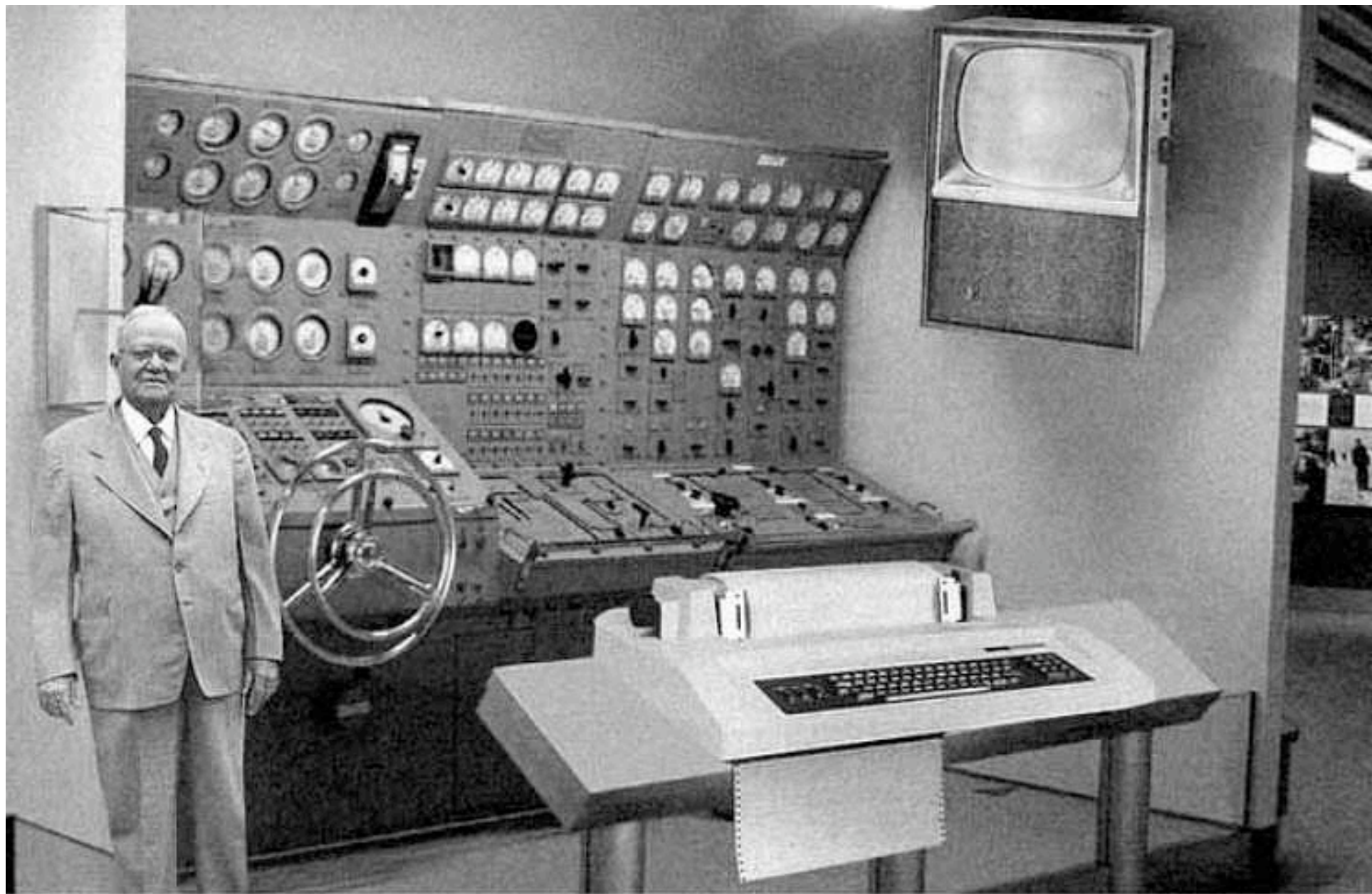
- Randomized Controlled Trials
- Systematic Reviews

Validity of Evidence 

Strength of Recommendation Taxonomy







Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but 50 years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use.

Assessing validity

The 5 “A”s of Evidence-based Medicine

- Ask
- Acquire
- Appraise
- Apply
- Assess

Secondary sources of literature

Let someone else do the hard work!

DOE vs. POEM

some practice

Finding the answer

- ✓ Ask a good question
- ✓ Use efficient methods and sources
- ✓ Question includes relevance screen
- ✓ Use abstract to briefly assess validity



**Have relevant, valid
information find you!**

Evidence-based Resources

- *American Family Physician*
- Dynamed www.dynamicmedical.com
- Essential Evidence Plus
www.essentialevidenceplus.com
- PubMed
- ACP Pier
- Primary Care Medical Abstracts
<http://ccme.org/pcma/>
- 2011 AzAFP Clinical Education Conference March 4-5, 2011, Phoenix, AZ. www.azafp.org. Course director, Mark Ebell, MD.

Information mastery proficiency

- **Level 0:** Decisions based on 3 influences:
Patient request, local experts, pharm. reps
- **Level 1:** Use the highest quality information to guide clinical decisions (100%)
- **Level 2:** Search, evaluate, and make available specialty specific Level 1 information (<1%)
- **Level 3:** Create original research (primary) or systematic reviews (secondary)

So, does duct tape work for warts?



One answer: Duct tape vs. cryotherapy in the treatment of the common wart

Arch Ped Adol Med 2002;156

- “A supply of standard duct tape was provided.”
- “Cut the tape as close to the size of the wart as possible.”
- “Leave the tape in place for 6 days.”
- “If the tape falls off...reapply a new piece of tape.”
- After 6 days, remove the tape, debride, and apply again the next morning.
- Cryotherapy causes “fear and discomfort for many children.”

Duct tape vs. cryotherapy in the treatment of the common wart

Arch Ped Adol Med 2002;156

- 85% resolution with duct tape vs. 60% resolution with cryotherapy at 2 months
- ARR = 25%
- NNT = 4