Critical Appraisal

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Critical Appraisal

= assessment of **evidence** by systematically reviewing its:

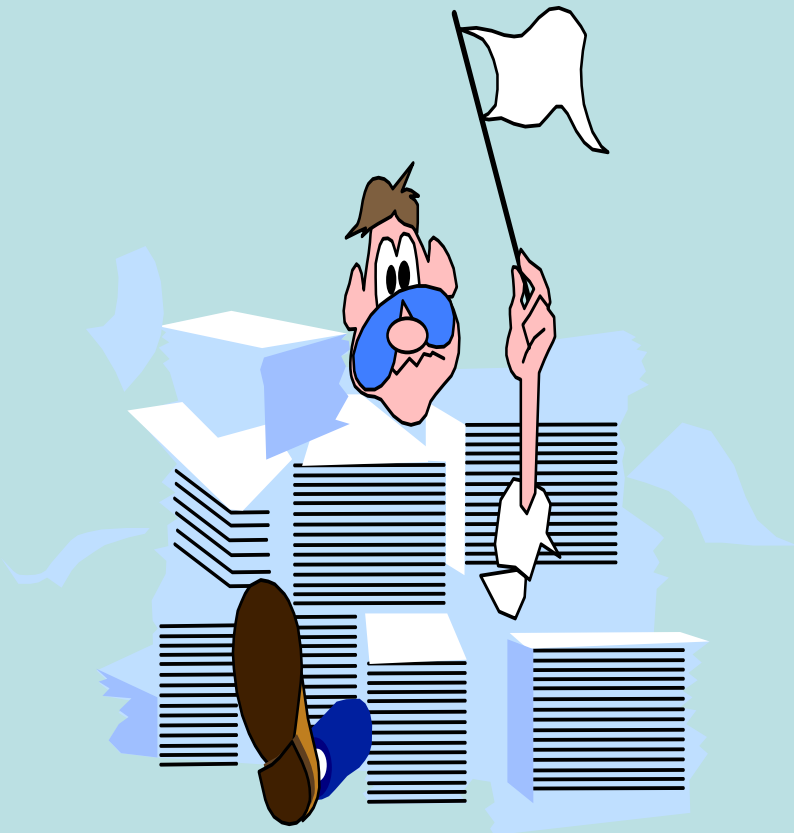
- Relevance
- Validity
- Applicability of its results to specific questions

Why?

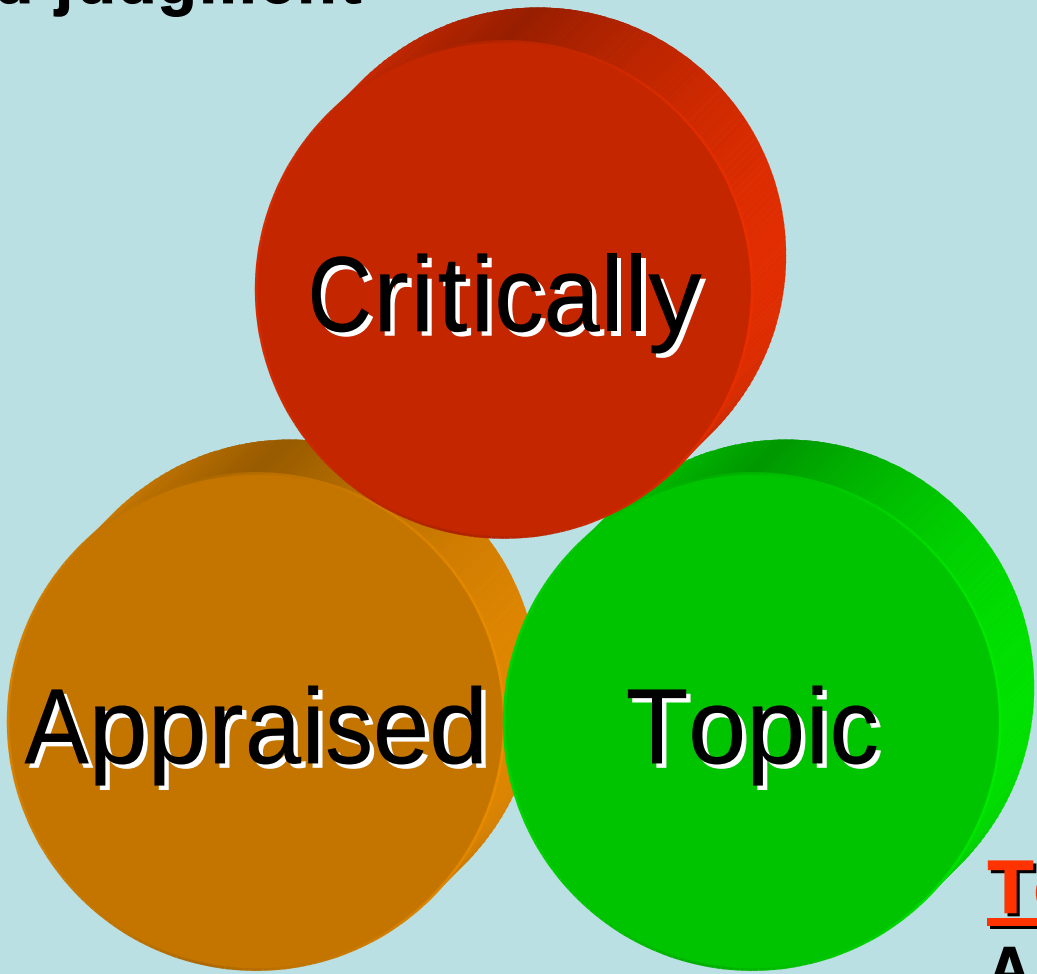
- Medical practice is constantly changing
- Rate of change is accelerating
- “Medline” contains:
  - 6 million references from 4000 journals
  - To keep a head of this information, one would need to read 6000 article each day

Why?

- You can not read every article
- Some articles are more important than others
- You need to divide the way of reading to:
  - Scanning
  - Exhaustive

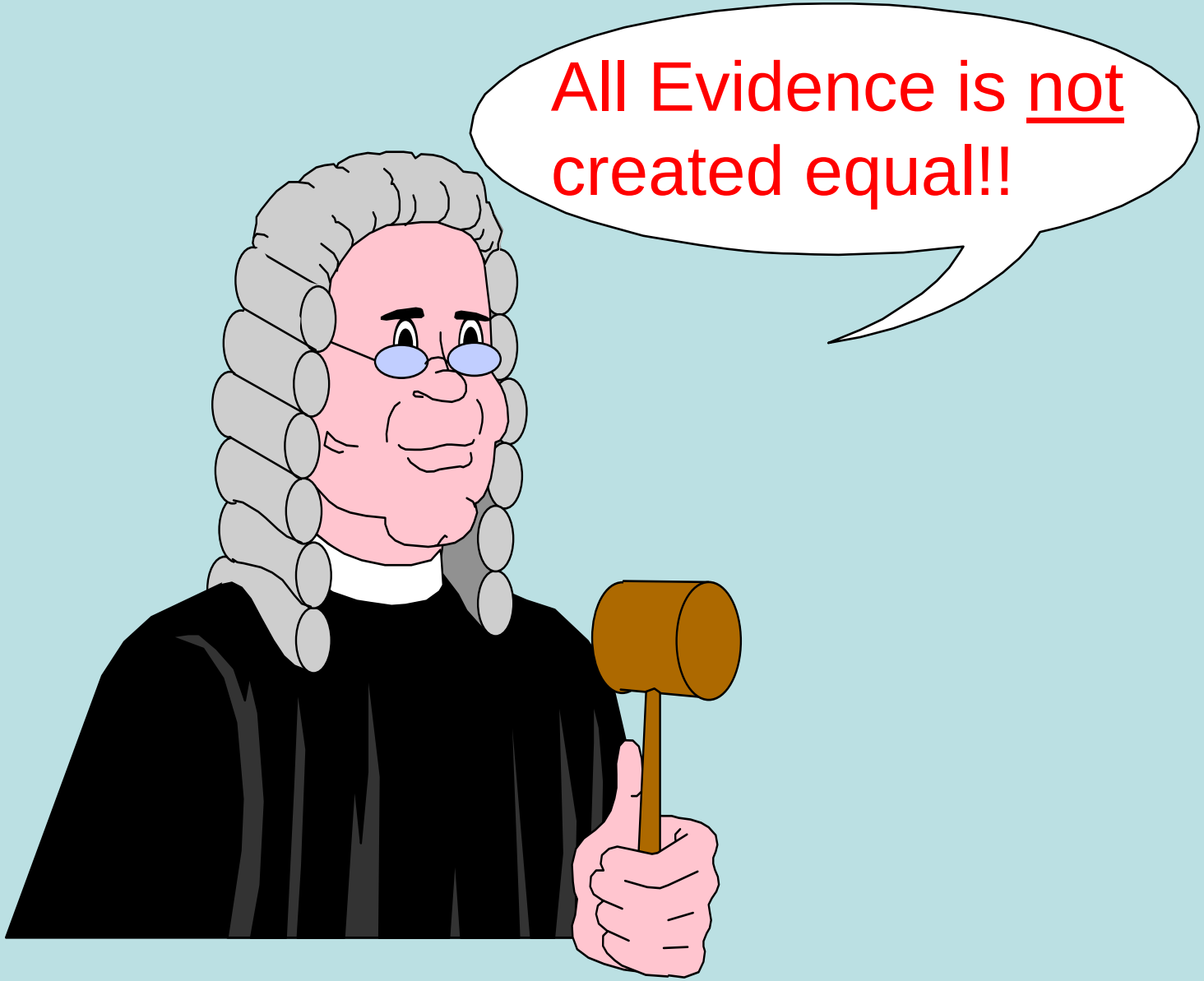


Critical:
careful, exact evaluation and judgment

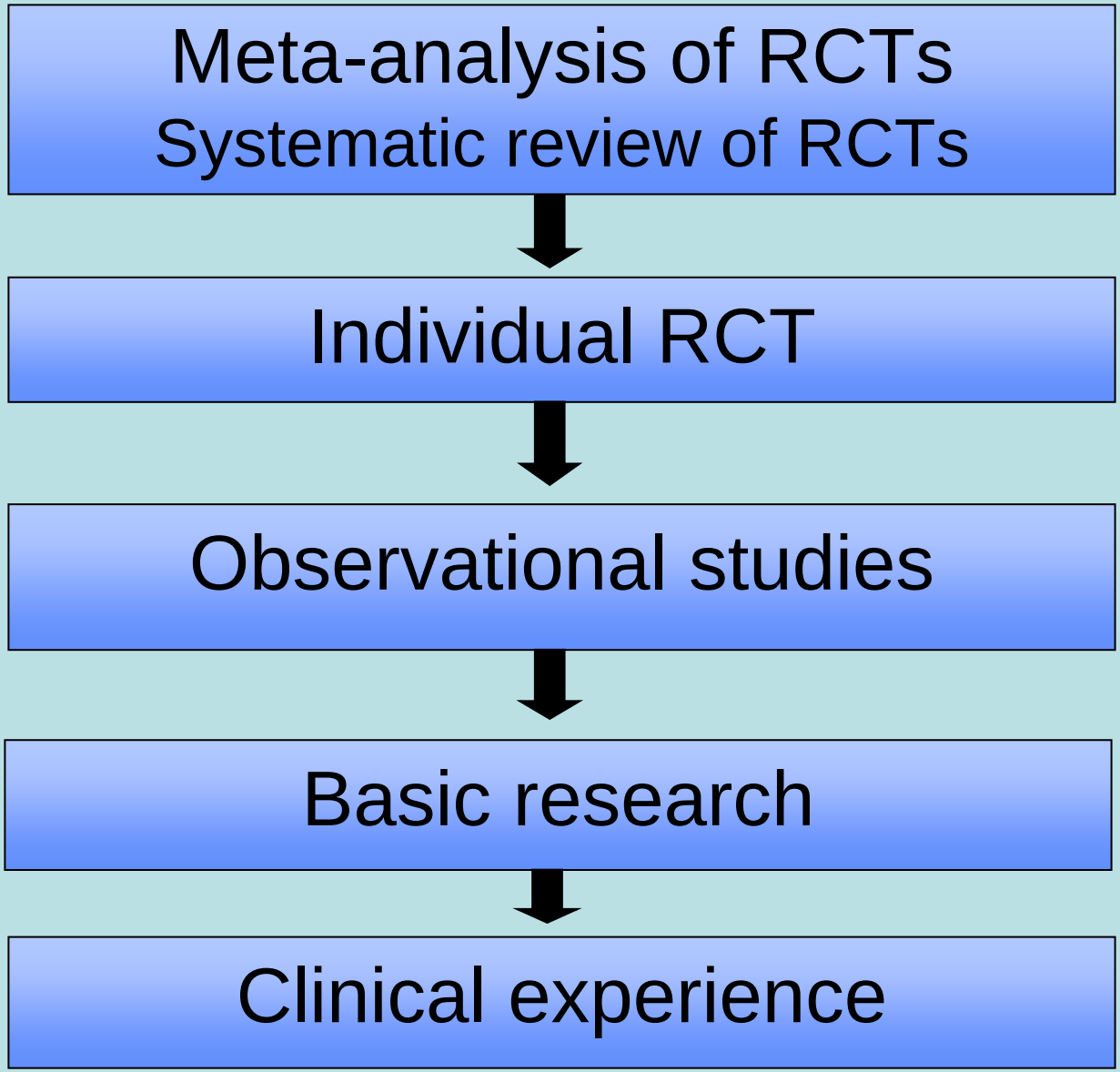


Appraise:
To evaluate & estimate the quality & amount of validity, results and applicability

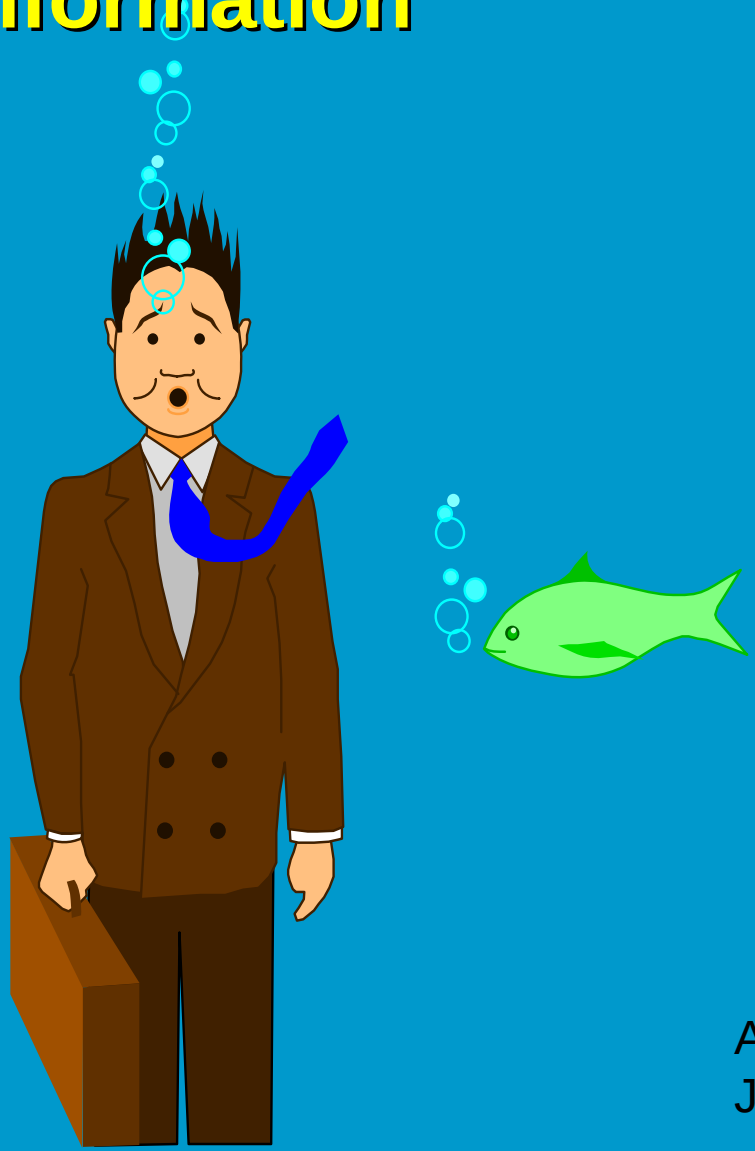
Topic:
A subject of discussion


All Evidence is not created equal!!

Hierarchy of Evidence



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



Adapted from Slawson et al,
J Fam Pract 1994; 38:505-513

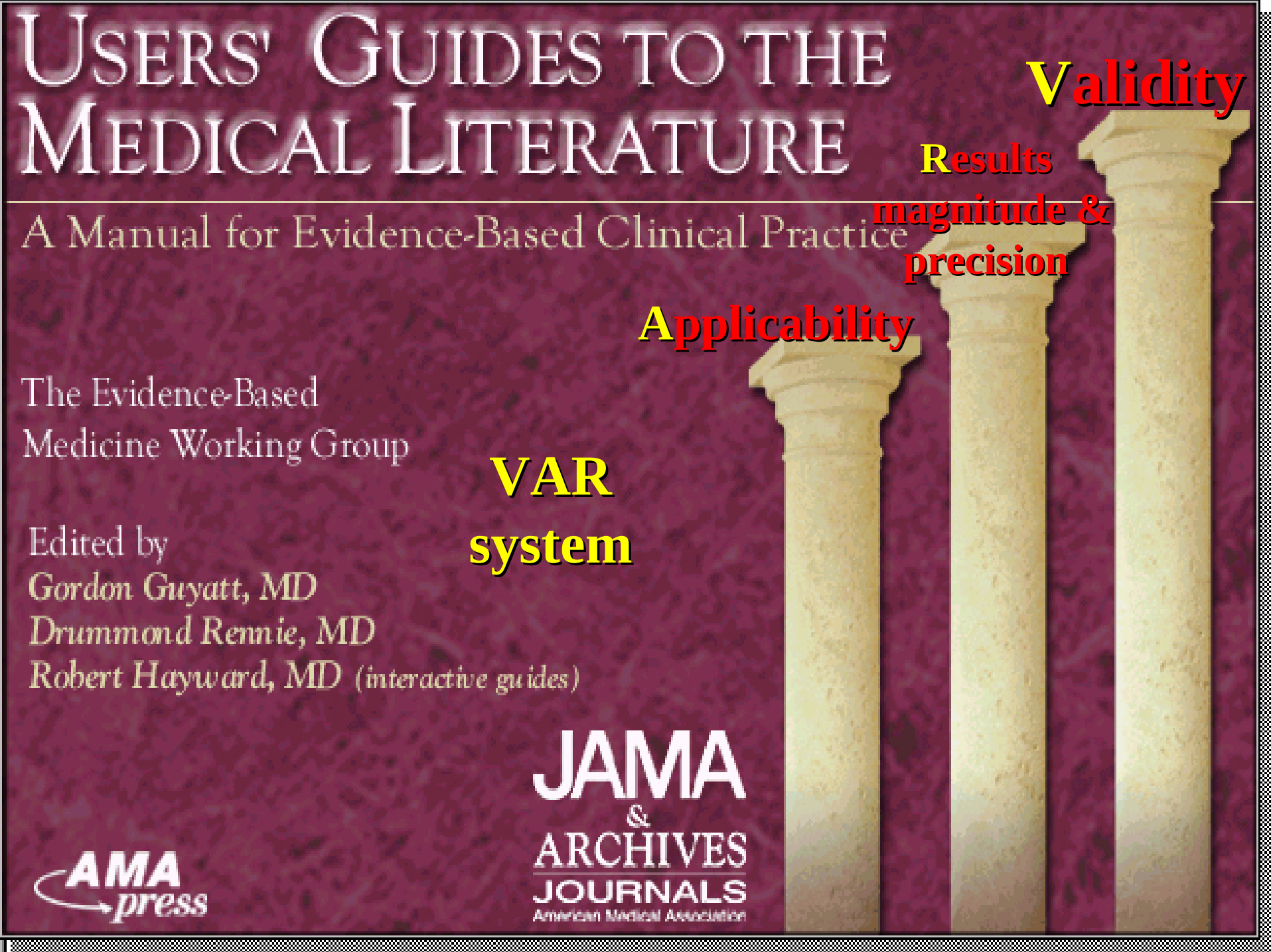
$$\text{Usefulness of Medical Information} = \frac{\text{Relevance} \times \text{Validity}}{\textit{Work}}$$

Work :

- Evidence Search (≠ MEDLINE)
- Retrieval
- Appraisal
- Application to patient

VAR system

1. **V**alidity: Are the results of the study valid?
2. **A**pplicability: Will the results help in caring for our patients?
3. **R**elevance: Are the results important? Impact and precision?


USERS' GUIDES TO THE MEDICAL LITERATURE
A Manual for Evidence-Based Clinical Practice
The Evidence-Based Medicine Working Group
Edited by
Gordon Guyatt, MD
Drummond Rennie, MD
Robert Hayward, MD (interactive guides)
AMA press
JAMA & ARCHIVES JOURNALS
American Medical Association
Validity
Results
magnitude & precision
Applicability
VAR system

3 pillars

V. Are the results of the study **Valid**?

Closeness to the truth

A. Will the results be **Applied** to my patient?

Intervention

Population

Preferences

R. Are the **Results** clinically important?

Magnitude and precision

Ask the right questions

Critical questions

- Are the findings **clinically important**?
- Is the study **valid**?
- Do the findings **apply to my patient**?

Is the study valid?

- **Validity** = how close is the evidence to the truth
- Was the study retrospective or prospective?
- Was it randomized?

Is the study valid?

- Diagnostic / screening tests: was there an independent, blind comparison with a “gold standard” of diagnosis?
- Prognostic markers: was there an inception cohort?
- Therapy / Intervention: was assignment to treatments randomized and blinded?

Screening questions

- Did the study address a clearly focused issue?
  - Clearly stated purpose and research question
  - Clear explanation of the population studied (inclusion / exclusion criteria)
  - Clear overview of interventions
  - Clear overview and justification for outcomes

Screening questions

- Was the assignment of participants to treatment randomized?
- Were all participants in the study accounted for?
  - The results are invalid in case of 15% dropouts

Applicability

Applicability

- Compare your patient to the subjects used in the study
- Consider the feasibility, risks, and benefits of the intervention
- Determine if it is in line with the client's preferences

Applicability

- Will the results help me in caring for my patients?
- Can the results be applied to my patients?
- Rx/intervention AVAILABLE in our setting
- Were all clinically relevant outcomes considered?
- Are the benefits worth the harm and cost?

Remember:

- CAT is a serious meticulous structured piece of hard work
- It can NOT be done in hurry or while doing other tasks simultaneously
- Bring your pencil and yellow highlighter pen
- Be ready to close the door of your office for nearly one hour

Read the conclusions

- Are the objectives met?
- Is there any recommendations?
- Any mention about limitations of the study?

Read the discussion

- Did they make good reasoning for the findings
- Other studies that support or contradict the study results

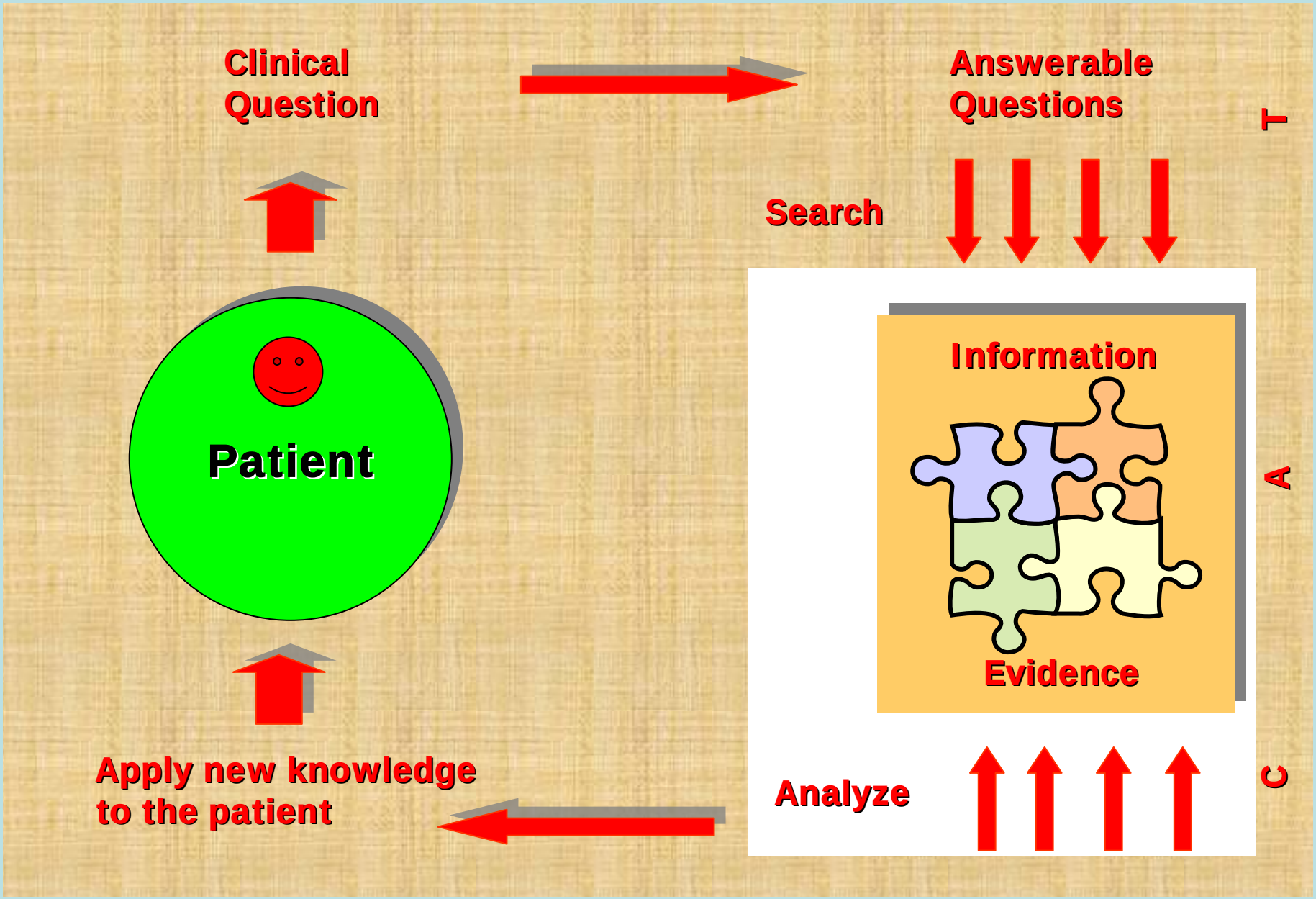
Remember, CAT not always conclusive

It may highlight lack of good evidence

It can be disappointing

It Does not always provide the “easy answer”

Critically Appraised Topic Loop



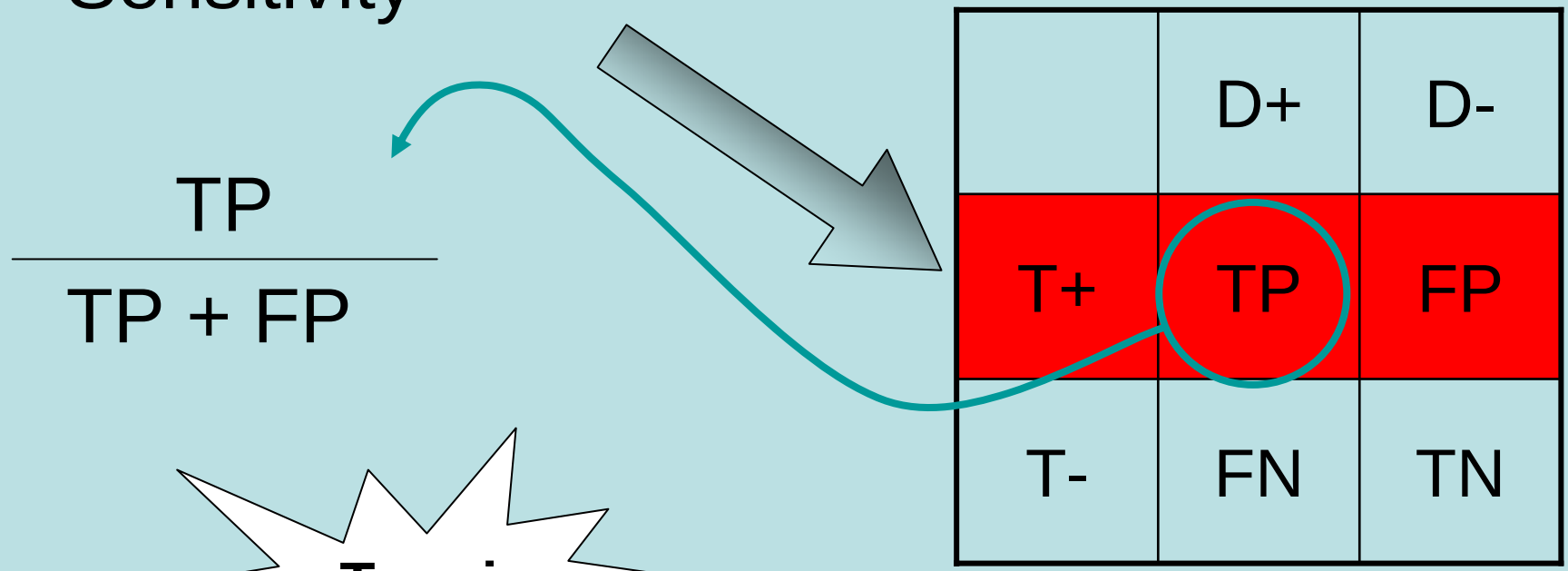
Sensitivity and Specificity

- When a test has a very high sensitivity, a negative result effectively rules out the diagnosis.
- When a test has a very high Specificity, a positive result effectively rules in the diagnosis.
- However, we can be misled by the old sensitivity–specificity approach that restricts us to just two levels (positive and negative) of the test result.

Tools Used in Diagnostic Study

- Sensitivity

$$\frac{TP}{TP + FP}$$



True is always UP

Tools Used in Diagnostic Study

- Specificity

$$\frac{TN}{TN + FN}$$