Appraise I

Once you get a set of articles, how will you know if they are of good quality and useful for application in your clinical setting? Unfortunately this is not such an easy task. So far there are over a hundred different systems that rank the quality and strength of evidence. We recommend that you start out with a basic understanding of the types of studies, and then choose a simple ranking system. Over time and with practice you will be able to handle the more sophisticated ranking systems. Note: many professional groups are seeking harmonization by aspiring to make one mutually acceptable system for grading evidence, *so stay tuned*.

If you have a number of articles and want to identify those that are useful to your clinical uncertainty and in the most time efficient manner; here is a ***BEGINNING*** system for the novice that once learned, will take only minutes. Remember this is by no means a complete critical appraisal of the literature, just a starting point. It will help you determine if the article is worth reading in its entirety. Look at the abstract then follow the algorithm:

1. Take a look at the PICO question; determine 3-4 key words, now pick up the first abstract; highlight the PICO words in the abstract. If your abstract does not contain most of the PICO words, then place the article in the DO NOT READ PILE.

2. Determine the Study Design – 99.9% of healthcare research falls into one of these three broad categories:

Descriptive	**Analytic Observational**	**Experimental**
Monitors and Describes No intervention	Attempts to answer the cause and rate of disease	Tests a hypothesis or determines the effect of an intervention

Some definitions before we go further:

- If the study collects data forward in time it is called *prospective*
- If the study collects data of past experiences it is called *retrospective (i.e. chart audits)*
- If the study gives a snapshot of the outcome of interest in a population at any given time it is called a *cross-sectional study* (i.e. surveys)
- If the study examines changes in a population, relative to the outcome of interest, over a length of time it is called a *longitudinal study*

- If a study compares an outcome of interest between two similar groups where one group received the intervention and one group did not it may be a *controlled* study.

Qualitative and Quantitative

Some experts in trying to simplify the distinction between qualitative and quantitative provide this phrase: "qualitative describes while quantitative enumerates." But RAPDS believes you need a bit more than this oversimplification.

If a study attempts to develop a deep understanding of a complex phenomenon or tries to make sense of a phenomenon in the terms of the meaning people bring to it; this is likely to be a **qualitative study**. The qualitative researcher may use semi-structured or unstructured interviews, focus groups or observations to describe the phenomenon.

Examples:

This is a sculpture located in the atrium of the CRC-- what does it represent to you?

Suppose you wanted to know about the phenomenon of *provider trust* in your patient population. You might ask your patients to tell you what *trust* means in reference to healthcare provision. You would record all the responses and look for themes, e.g. provider competence.

A **quantitative study** on the other hand describes a situation using statistics. Statistics is the science & art of collecting, organizing and analyzing numerical data. Statistics can determine how likely an association between sets of measurements is to have happened by chance alone. Quantitative studies look for relationships among variables or test hypotheses. For example, does smoking cause cancer? Does this immunization prevent the flu? How many parents call the pediatrician when their child has a fever > 101º F?

Quantitative research often begins with an idea [hypothesis] which when measured generates data and by deduction allows a conclusion to be drawn. Qualitative research, on the other hand, begins with observations and generates ideas and hypotheses from the observations [inductive]. The strength of quantitative is reliability [repeatability], measures can be repeated and same results obtained. The strength of qualitative is validity or closeness to the truth; it describes what is really going on.

2. Determine the Type of Study

Descriptive Studies

- Case Reports
- Case Series

These types of studies monitor the occurrence of infections in terms of time, place and person. Simply describes; the what, who, when and where.

Analytic Observational

- Cohort
- Case-control
- Cross sectional

Determines the cause and factors that influence the rate of disease. The investigator observes the occurrence in individuals separated into groups determined by exposure

Experimental

- Clinical Trials
- Randomized Controlled Trial
- Controlled Trials

Tests an intervention or hypothesis. Investigator studies the impact of varying some factor that he/she controls

Case Control Study

Investigator selects a case of interest (can be one or more) with certain characteristics, the investigator then introduces an intervention or exposure then followed over time. The case is matched for the same characteristics but this group is not exposed or receives the intervention. Often retrospective

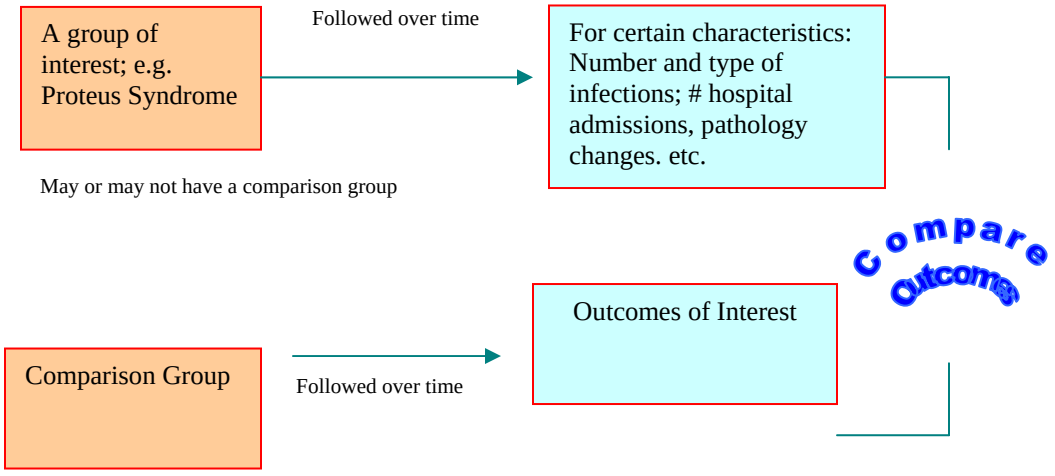
Cohort Study

A cohort is a group of individuals who share a common experience. An investigator decides to measure some characteristic at several points in time. Cohort studies are about the life histories of a group of people. They may tell us what circumstances at a particular point of time are associated with certain characteristics at a later point in time.

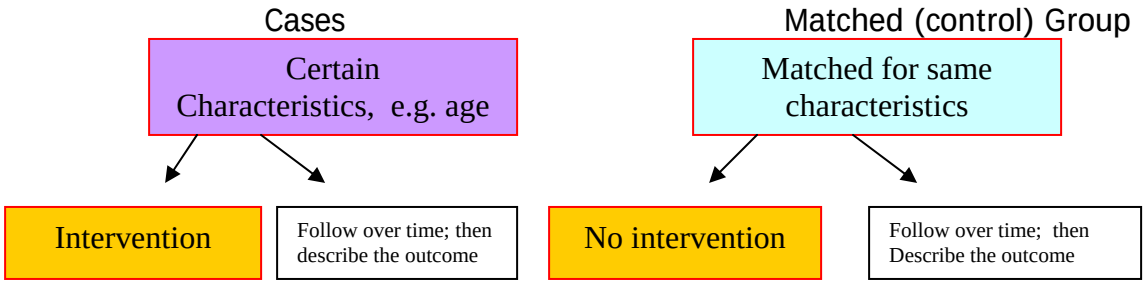
Randomized Controlled Trial

Individuals are assigned to control or study group by randomization (chance alone). The study measures the effects of an intervention on each group. The control is often standard therapy or placebo. There is compelling evidence that RCTs are better than other designs in measuring an intervention's true effect.

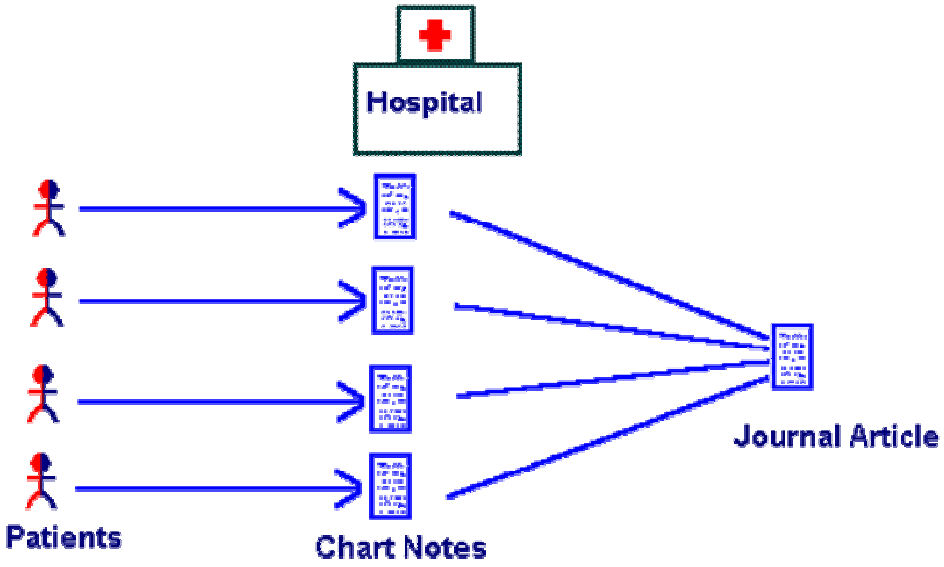
Picture of a Cohort Study

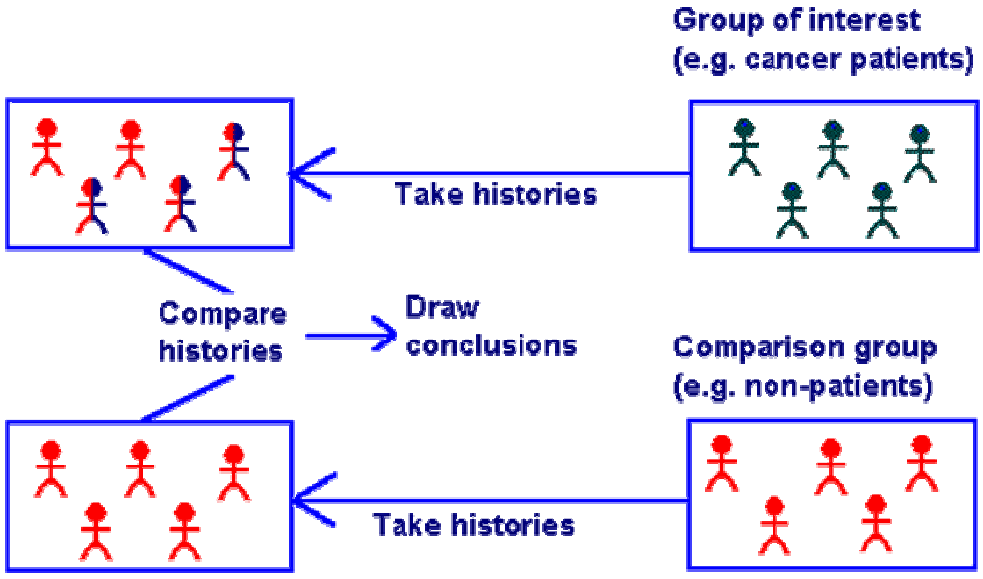


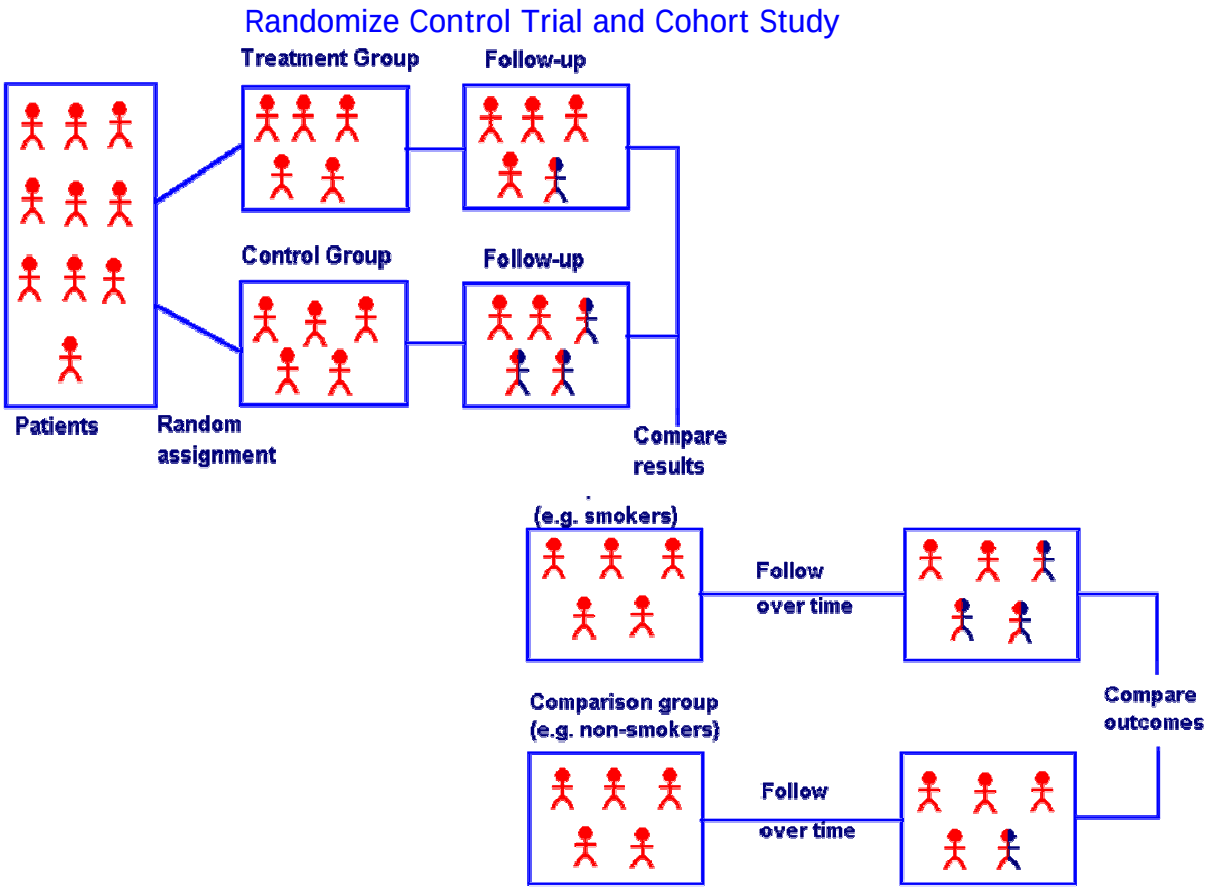
Picture of a Case-Control Study



More pictures : Case Series and Case Control







3. Is it a Review Article?

Suppose the abstract is a review of the literature on a particular topic then choose the type of review:

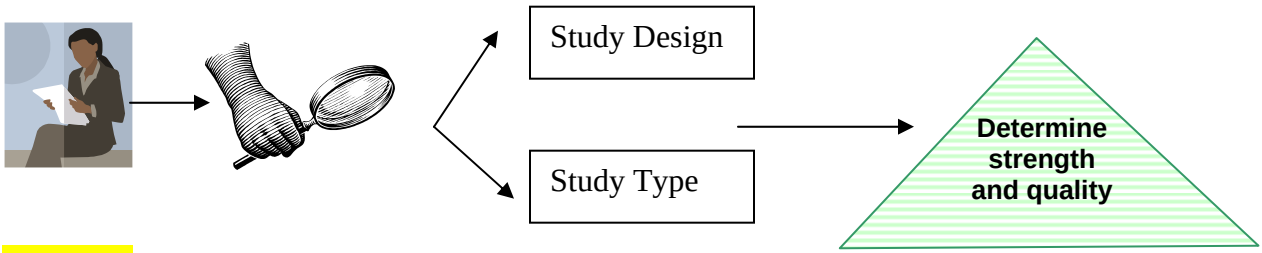
Systematic Review	Critically Appraised Topics	Other Reviews of Literature
A summary of the research literature related to a clearly formulated question [topic]. Uses a standardized method for critical appraisal and offers review and analysis of the evidence. Cochrane Review is an example of a systematic review and is considered one of the most rigorous. Professional groups are commissioned to participate in the reviews and they use strict criteria for search and appraisal.	*CAT* is a summary of the literature and its applicability to clinical practice. Answers a focused question and usually peer reviewed. Done by Professional groups & experts P.O.E.Ms Specialty specific patient oriented evidence that matters. Updated each month through review of >200 medical journals and Cochrane Library	Done by individual authors who may or may have not used a system to gather and critically appraise the articles. These are called INTEGRATIVE REVIEWS

Note: **Meta-analysis and Meta-synthesis:**
Meta-analysis is a technique that seeks to combine the results of multiple studies addressing the same question. Meta-analysis uses specific techniques to control for differences between the studies, and to determine the size of the effect an intervention had on a specific study outcome. Systematic reviews often use meta-analysis. Meta-synthesis, on the other hand, examines and interprets the findings of several qualitative studies in a particular topic area to produce a synthesis that results in a more substantive knowledge of a phenomenon that is achieved with one individual study.

4. Determine the strength and quality

Strength and quality refer to how the study was conducted. If a study measured what it was supposed to measure; *if and only if*, it accounted for confounders such as age, attempted to reduce bias/flaws and when repeated got approximately the same results then the study is considered ***strong***. Bernadette Melnyk and Ellen Fineout-Overholt constructed a hierarchy of *strength* of evidence for novices. Studies closer to the top of the hierarchy usually have more strength and quality. Take a look at your abstract, you have determined the type of study see where it falls on the hierarchy.

Melnyk and Fineout-Overholt (2003)



Example:
Abstract: American Journal of Industrial Medicine 49:921-929 (2006) JV Johnson
BACKGROUND: The impact of long working hours on health has been of major

concern since the late 19th Century. Working hours are again increasing in the US. METHODS: An overview of historical, sociological, and health-related research presented at an international conference on long working hours is discussed as an introduction to a special section in this issue. RESULTS: Research indicates that long working hours are polarizing along class lines with professionals working regular though longer hours and less well-educated workers having fewer though more irregular hours. Extended and irregular hours are associated with acute reactions such as stress and fatigue, adverse health behavior such as smoking, and chronic outcomes such as cardiovascular and musculoskeletal disorders. CONCLUSIONS: Improved methodologies are needed to track exposure to long working hours and irregular shifts longitudinally. Research should focus on the adverse impact that sleep-deprived and stressed workers may have on the health of the public they serve. A variety of protective efforts should be undertaken and evaluated.

ANSWER:

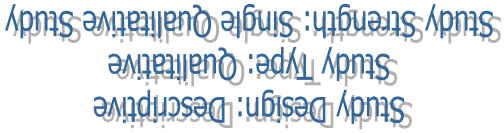
1. Overview of a group of articles; this is called an *integrative review*
2. Expert Opinion
3. Strength and Quality at the bottom of the hierarchy. Because it did not state how it choose the articles for review, nor did it state a system of appraisal nor did it state it was reviewed by others. It merely reported the conclusions from a group of articles.

Want to test yourself with this one?

Age Ageing. 2007 Jan 4; Dignity and the challenge of dying in nursing homes: the residents'view. Pleschberger, S.

OBJECTIVE: to explore the meaning of dignity with regard to end-of-life issues from the perspective of older nursing home residents in western Germany. METHODS: the design included three steps of data generation; narrative interviews with residents of nursing homes constitute the main data pool (n = 20). Theoretical sampling was aimed at maximizing the variety of residents' characteristics. Analysis of the transcripts was supported by Atlas/ti program and followed several different coding procedures and aimed at generating a concept of dignity. RESULTS: dignity was differentiated into intrapersonal dignity and relational dignity, socially constructed by the act of recognition. Social relations and encounters are a prerequisite for relational dignity, which underlines the vulnerability of nursing home residents' who increasingly lack social networks. A broad spectrum of attitudes and behavior, which aimed at recognizing dignity, was bundled under the category 'not being a burden'. In this light, dignity was challenged most by the threat of illness and having care needs. This was fostered by the perception of insufficient care in the nursing homes. In the light of this concept, death with dignity meant 'death at the right time', though the residents in the sample did not want to comment on the time of death, other than aspects like (i) being active to the very last, (ii) respecting one's will and being allowed to die, (iii) not being in pain, (iv) being amongst persons close to one (valediction and showing respect). CONCLUSION: the study

emphasizes the high vulnerability of nursing home residents with regard to dignity. They place their dignity under the constraints of the need for help and care into question.



This section adapted from the articles in ***Evidence Based Dentistry*** by KA Levin (2005-2006); the book ***Studying a Study/Testing a Test*** by RK Riegelman (2005); presentation “Analytical Epidemiology” by the Missouri Department of Health (2004);a presentation Introduction to Epidemiologic Study Design by Dee Koziol (2007) and the input of Sandy Mitchell from RAPDS.

Appraise Worksheet

Design of Study (the broad category)

Descriptive

Analytic Observational

Experimental

Type of Study

Descriptive
- Case Report
- Case Series

Analytic Observational
- Cohort
- Case-Control
- Cross-sectional

Experimental
- Clinical Trials
- Randomize Control Trials

Literature Review
- Systematic Review
- Critically Appraised Topic/Poem
- Other reviews

Strength and Quality

Placement on Melynk and Fineout-Overholt Hierarchy