SUGGESTIONS FOR LEADING A JOURNAL CLUB

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Note: There are many different ways to lead a journal club. The format suggested here is aimed at helping participants learn how to read articles critically. I’ve found it works well, but it does require more effort from the learners than they may initially be used to. If this format can be used for a regular (e.g., monthly) journal club, participants can get used to preparing and contributing more. This handout was developed to help UCSF "Senior Consulting Residents" in the Pediatric Clinic lead a monthly journal club lasting about 50 minutes.

I. Select a provocative article

A. Two good choices are articles that you pulled as a result of an encounter with a particular patient and articles that have been published recently dealing with a clinical problem we commonly encounter.

B. It should report original research. Reviews are out -- the article needs to have a methods section. Meta-analyses, decision analyses and cost-effectiveness analyses are OK, but they are harder to assess critically because the results often depend on whether you can trust the authors and their underlying assumptions. I usually don't bother with them if they are industry sponsored.

C. If the methods are valid, it would change the way we diagnose, treat, or conceptualize the clinical problem or would clarify management of something currently controversial. (It's hard to excite people about critically reading an article which, if valid, would mean that we shouldn't do anything differently.)

D. Sometimes a pair of articles with opposite conclusions, as long as they are not too long or difficult. (For example, back to back articles on coin ingestions in children, with opposite conclusions and recommendations made a good journal club.)

II. Prepare yourself

A. Read the article critically. Write out what the authors did, what results they got, and what they concluded according to the outline below.

B. Think about each of the decisions the investigators made in designing the study, and what they concluded from the results. Were these good design decisions? Were the conclusions reasonable? What are possible problems with the design, sampling, measurements, and so on? How likely are these problems? How would they impact on the results and conclusions?

C. Pick out a few MAIN POINTS OR CONCEPTS that you think are most important in reading this study critically. Examples of these sorts of concepts are: bias in measurement of outcome, loss to follow-up, unrepresentative subjects, effect size/number-needed to treat, confidence intervals for negative studies, etc.
D. Meet with a preceptor who can go over (or help you identify) some of the main points. Provide the preceptor with a copy of the article before the meeting.

E. There are lots of annoying things that can happen and detract from the conference. Try to anticipate and prevent them. Although I generally discourage PowerPoint, if you are going to use a computer, pre-test anything you are going to project. Projecting images from Mac computers is often problematic. Make sure there is enough chalk or dry-erase markers, you and the participants know where the room is, that it has enough chairs, that it is reserved and no one else will be in there, etc.

III. Prepare the participants. A journal club is better if people show up having read the article!

A. Distribute the article about 7 days in advance. It’s easiest for you to e-mail pdf files, but easiest for participants if you hand them the article on paper (obtaining a commitment to read it and come to the journal club when you do so).

B. If possible, make sure all participants have received the article and know that you are looking forward to their participation. If you send a pdf out by e-mail, it may be possible to choose “Return Receipt” so you know everyone got it.

C. Bring extra copies of the article to the session. Several people usually forget to bring it with them, even if they have read it, and it helps if everyone has a copy in front of them. Use 2-sided copies.

D. MAKE SURE EVERYONE KNOWS DATE, TIME, AND PLACE!

IV. Leading the discussion

A. Basic rules and tips

1. Start and end on time! (Of these, ending on time is most important!)

2. The more key points the participants make themselves (rather than you pointing them out) the better. Avoid lecturing and answering your own questions!

3. Try to make sure everyone is involved and interested. It is OK to call on people who are keeping quiet, including faculty members, if you do it in a nice way. If people fall asleep, wake them up; it is distracting to others to have anyone clearly not participating. Similarly, if one or two people are dominating the discussion, say, "I want to hear from some other people now" and try to get others into the discussion. If people are engaged in a separate conversation, stop and bring them back to the group by asking what they are saying.

4. Use the board, NOT PowerPoint. The trouble with PowerPoint is that it gives the message that you have already decided what will be covered, and that you going to be the one making the important points. This tends to make your audience more passive. When you use the board, it makes it much easier to let the participants decide what points are most important to cover, and to keep track of points participants bring up, that you want to come back to later. (Write things you want to come back to in a “Parking Lot” section of the board.) A good sized chalk- or whiteboard lets you keep the basic “H&P” of the article
on the board while talking about possible biases. Finally, putting stuff on the board helps keep the people who come late from slowing things down by asking stuff that has already been covered. It is helpful to think in advance about what you will put where on the board, so you don’t erase stuff you wish was still up there.

B. Format for discussion: Just as with a clinical case presentation, it is helpful to review the factual information before proceeding to discussion of judgment and interpretation. Plan on spending the first few minutes explaining why you chose the article, perhaps by a brief presentation of a relevant case. Then take about 20 minutes going through what the authors of the study did, what results they got, and what they think the implications for clinical practice are, using the outline below. Then the second half of the discussion can center on whether the design and results justify their conclusions, and what to do with the patient that led to your pulling the article.

C. Tips on timing: A common problem is to run out of time just as the discussion is getting interesting. This can result from spending too much time on the more boring stuff at the beginning. You don't want the discussion of what the article says (as opposed to what it means) to last more than half the session. You can speed up by reducing the number of things you ask the group or the number of chances or amount of time you give them to answer. For example, you can just write straightforward aspects of the study design (e.g., the inclusion and exclusion criteria) on the board yourself, rather than asking participants to find them and read them to you. Similarly, if you are afraid things are going too fast, you can slow things down by involving the participants more.

V. Outline of the content of the article: The same sort of learning that allows one to get better at obtaining relevant information from a patient, organizing it, and presenting it to others applies to reading journal articles as well. After using the structure below to review the article yourself, lead the journal club participants through it. Write the main headings one at a time on the board, explain what they mean, and get the participants to fill in the data from the paper. The elements of a study, analogous to the Chief Complaint, HPI, and so on are:

A. Authors and funding source: This is analogous to the "identifying information and source of history" you're taught to put at the very beginning of your H & P. It's a good idea to start with these items so you don't forget them later. Who are the authors? Do you know of any of their previous work, and has it been reliable? Who paid for it? It's not that research sponsored by industry is necessarily untrustworthy, but knowing who sponsored it, just like knowing the study design, gives you a head start at knowing what sorts of biases to look for. For example, if a study sponsored by a drug company finds that their drug is unsafe or inferior to others, you can probably assume that the results have been carefully scrutinized, and any possible threats to their validity have been evaluated!

B. Research Question: What is the question this study was designed to answer? Sometimes it helps to picture a clinical situation you'll be better able to handle if the study is valid. Examples of research questions are: "Does oral amoxicillin reduce morbidity in infants 6-24 mos old with fever > 39 degrees and no source?" or "Does passive smoking increase hospital admissions for respiratory disease in children?" Often the last line of the abstract gives the author's answer to the research question.
C. **Study Design:** What type of study is this? Randomized blinded trial? Cohort study? Case-control study? Cross-sectional study? Case series? If you are having trouble remembering the differences between them, you can Google them. If you want more depth, if you Google “Users Guides to the Medical Literature” you can find a series of articles that discusses different types of studies in greater depth, using a study-design specific approach that complements the approach I take here. Your preceptor can also help you with this.

D. **Study subjects:** Who was in the study? How were they selected? Who was excluded? How many subjects were there? Knowing how they selected the subjects is important in order to know whether the study results are valid (sometimes called "internal validity") and whether they are generalizable to the sort of patients you are likely to see ("external validity").

E. **Predictor variable(s):**

1. What they are: Sometimes called "independent variables," predictor variables are what the authors think might cause or predict changes in the outcome variable. For example, in a randomized trial, the main predictor variable is group assignment: i.e., whether the subjects were randomized to get the test drug or the placebo. In a study of passive smoking and respiratory tract disease, it would be some measure of passive smoking. In the studies of coin ingestions, predictor variables were all the things the authors thought might predict whether the coin would pass spontaneously into the stomach—things like what size of coin, how long ago the ingestion occurred, and whether it was causing difficulty swallowing.

2. How they are measured: For example, passive smoking may be measured crudely by asking the number of adults in the house who smoke or the amount the mother smokes. Sometimes problems with how the variables are measured invalidate the study.

F. **Outcome variables:**

1. What they are: the clinically significant phenomena the investigators are trying to predict, prevent, or treat. Examples are presence or absence of disease, measures of symptom burden, survival time, etc. Watch for studies that show an effect on an outcome variable that is only marginally interesting. For example, moderate jaundice affects neonatal BAER's but has no effect on their hearing. Some studies of cough suppressants compare cough latency (the amount of time it takes a dog to cough when his trachea is irritated); these studies have little clinical relevance.

2. How they are measured: If it's a disease, what are criteria for diagnosis? Are those determining clinical improvement blinded to the treatment group of the subjects?

Sometimes it takes some effort to figure out exactly what the authors were measuring. For example, in studies of drugs for asthma, a common outcome measure is the percent improvement in peak flow or FEV1. If a child comes in with FEV1 = 50% of predicted, and improves to 75%, that could be considered a 25% improvement (75%-50%). Or, it could be considered a 50% improvement, since the reduction in FEV1 below predicted was cut in half. It is important to clarify this, to know what the results mean.
G. **Results:** What did they find? Usually the key results are summarized in tables or figures— it may be helpful to walk the group through the most important tables to make sure everyone can see what results were obtained. If there's a lot and you don't want to put it on the board, you can make a couple of transparencies.

Make sure you consider not just statistical significance, but the *effect size* — that is, the magnitude of the difference between groups. *Relative effect size* is measured using the *risk ratio* (RR), *odds ratio* (OR) or *relative risk reduction* (RRR). It is important for assessing causation but less relevant clinically than the *absolute effect size*, measured by the risk difference, or *absolute risk reduction* (ARR) and the *number needed to treat* (NNT). It's probably easiest to illustrate these with a simple example. If the rate of a bad outcome in the treated group is 15% and in the control group is 20%, then the RR is 15%/20% = .75 and the RRR = 1-RR = 25% and the ARR = 20%-15%=5% and the NNT=1/ARR=20.

H. **Conclusions:** What do the *authors* think the results mean? At this point don't discuss yet whether you agree with them.

VI. **Discussing the validity of the study.** The first part of the discussion dealt with facts, all of which were in the paper. The second half of the discussion deals with interpretation. There are no longer clear right and wrong answers—judgement comes into play.

A. Identify possible biases or flaws in the study. Was the sampling scheme reasonable? Were the measurements valid? Is the study design appropriate to answer the research question? Listing possible biases is akin to listing the differential diagnosis.

B. For each one, estimate how likely it is to have affected the validity of the results, and figure out in what direction it would affect the results. This step is crucial. In a case presentation, it's not that helpful just to throw out a lot of obscure possible diagnoses. You need to see whether the features of the case make these diagnoses likely enough that it's worth doing a test for them. Similarly, no study is perfect. When someone suggests a possible problem, you need to discuss whether this is something that is really important, and how it would affect the results. A COMMON error is to dismiss a study because of "flaws" that are unlikely to account for the results or would have biased the study in the opposite direction from what was found. (This is particularly true for randomized double-blind trials, in which most errors will bias the results towards finding no difference between groups.)

VII. **Wrapping up:** The most important part of the discussion is the "bottom line." Make sure you leave enough time for this! If the journal club started with an actual case, go around the room and see whether the article has changed how people would manage that case. If you don't have a specific case in mind, make one up. For example, at the end of the discussion on coin ingestions you could ask: "OK. You get a telephone call from the mother of a two-year old who has swallowed a quarter 10 minutes ago, but is asymptomatic. How many would have them come in? [Show of hands.] How many would do an X-ray?" Then you can spend the last 5 minutes or so having people justify their answers.