

Perspectives



How to present and summarize a scientific journal article

Thomas Cox, PsyD^a, Cristie Columbus, MD, DIO^b, Kashif Ahmed, MD^b, and Julie Higginbotham, MA^b

^aFaculty Development and Research Education, Baylor University Medical Center, Dallas, Texas, USA; ^bDepartment of Medical Education, Baylor University Medical Center, Dallas, Texas, USA

ABSTRACT

The success of a journal club hinges on the presentation of articles that are both relevant and scientifically robust. It's insufficient for presenters to merely read through an article and highlight a few points without a clear focus. A strong presentation should thoroughly describe the relevance and validity of the study, offer a critique, suggest how further research might address the issue, and discuss the implications for patient care. Selecting the right article is crucial. It is recommended to begin the presentation with a case scenario to emphasize the article's clinical relevance and to revisit the case at the conclusion of the presentation. The components of the article presentation should include background information, methodology and results, and the authors' discussion. Additionally, the presenter should critique the article's validity, noting any potential biases, evaluating the risks and costs of the proposed intervention, and assessing how well the article supports its hypothesis. The presentation should conclude with a summary statement that includes conclusions, implications, and future directions. Having a structured process for journal club presentations guides presenters and ensures that attendees derive maximum benefit from the educational activity. This organized approach fosters a deeper understanding and encourages critical thinking among participants.

KEYWORDS Critique; graduate medical education; journal club; presentation; research

An important part of our training programs is to help trainees critically analyze and evaluate a journal article so they can consider its relevance and apply it to clinical practice. Being able to differentiate high-quality clinical scientific journal articles from low-quality articles is a valuable skill. To achieve this goal, it is helpful to utilize a didactic flow process for a formal presentation of a medical journal article. We begin with a history of medical journal clubs, followed by a method for article selection and presentation. Presentation components include a case-based scenario, article critique/summary, discussion, review of outcomes, conclusions, implications, and future directions. *Table 1* reviews the steps necessary for preparation of a clinical article at journal club.

HISTORY OF MEDICAL JOURNAL CLUBS

The first recorded journal clubs were formed by Sir William Osler at McGill University in 1875. Dr. Osler, a Canadian physician known as the father of modern medicine, is best known for creating the foundation of the discipline of internal medicine and was instrumental in developing the system of clinical medical education. Also, Sir James Paget in the

mid 19th century is credited for the first teaching-module type of journal club; he was a British surgeon and pathologist credited for discovering in human muscle the parasitic worm that causes trichinosis. Dr. Osler and Dr. Paget initiated medical journal clubs for different reasons.

The journal club as a formal educational modality was recorded in the early 1900s in Germany. The 20th century saw significant improvement in scientific reporting and research, with the development of journals for subspecialties. Journals also evolved into a forum for continuing medical education. Today journal clubs are designed to teach critical appraisal skills to physicians in training and offer continuing education for practicing physicians. While this educational tool is not formally incorporated into the undergraduate medical education curriculum, that could be considered, based on the value and importance of journal clubs at more advanced levels of medical training.

ARTICLE SELECTION

The foundation of an outstanding journal club presentation rests on the choice of an interesting and well-written

Corresponding author: Thomas Cox, PsyD, Faculty Development and Research Education, Baylor University Medical Center, 3500 Gaston Ave., Dallas, TX 75246 (e-mail: thomas.cox@bswhealth.org).

The authors report no funding or conflicts of interest.

paper. Before presenting a journal article, we recommend that a trainee have the proposed article reviewed by one or two program staff members to get feedback on the article's educational significance, relevance for practice, and validity. Randomized controlled trials are typically the best to choose; however, other types of studies such as cohort studies, case-controlled studies, and meta-analyses can also be chosen. It is best to avoid case reports and review articles. *Figure 1* reviews the various types

of studies in medical research, both primary and secondary. While past landmark cases that provide some foundations of current clinical practice can be considered, the general recommendation is to choose an article published within the past 3 to 6 months. Look for articles that have provocative or unexpected results or that could lead to a dramatic shift in knowledge or clinical practice that will grab the audience's attention.

Numerous tools are available to aid in article selection, including tools from the American College of Physicians and the McMaster Online Rating of Evidence (MORE) system. Physicians can check online whether a potential article has been reviewed by experts. This process can help ensure that the paper meets the criteria for high scientific merit. In addition, articles that have passed this screening are rated on two 7-point scales by clinicians on relevance and value to their clinical discipline and newsworthiness. These scales can be used as informal guidelines to ensure that a chosen article merits presentation.

Table 1. Key points for selection, appraisal, and presentation of an article

Category	Key points
Article selection	<ul style="list-style-type: none"> • Use peer-reviewed, well-respected journals • Aim for randomized controlled trials • Use recent articles and preferably landmark articles • Seek articles with new or provocative topics or unexpected results
Article appraisal	<ul style="list-style-type: none"> • Assess for sound methodology • Interpret results (statistical and clinical significance) • Apply results to clinical practice if applicable • Assess for bias
Article presentation	<ul style="list-style-type: none"> • Give an appropriate introduction • Aim for a succinct presentation of the article • Allow half of the allotted time for discussion • Focus on article appraisal and critical analysis • Discuss how findings may impact current clinical practice

ARTICLE APPRAISAL

Once an article is selected, it is time to critically appraise it. There are different approaches to critiquing articles. One recommended way is to apply *JAMA's* series of users' guides to the medical literature (see the list at <https://guides.library.vcu.edu/ebm/criticalappraisal>). These guides provide fundamental questions that the reader should address. Key points to focus on in the assessment of the validity of the study include randomization of patients between control and treatment groups, concealment of allocation, use of the intention-

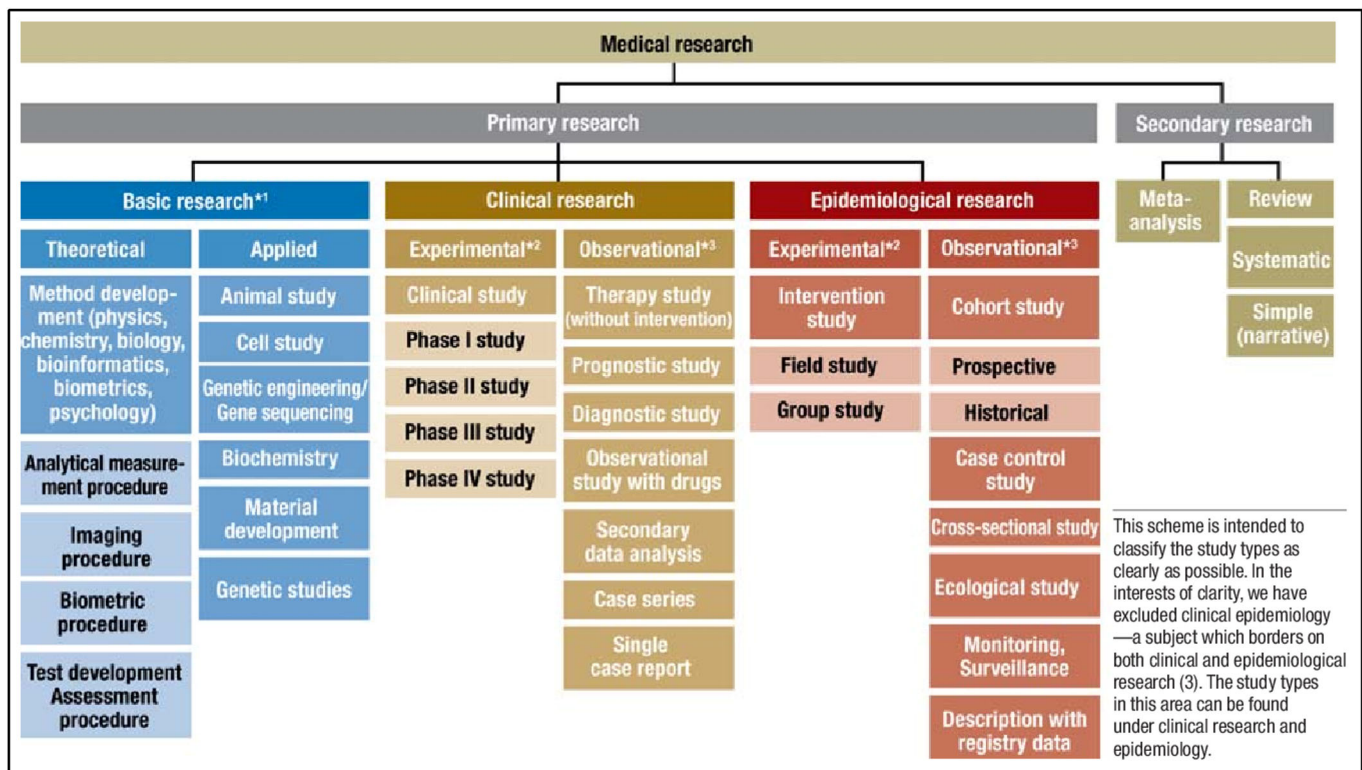


Figure 1. Classification of study types. ⁺¹Sometimes known as experimental research; ⁺²analogous term: interventional; ⁺³analogous term: noninterventional or nonexperimental. Used with permission of Deutscher Ärzteverlag GmbH from Röhrig et al¹; permission conveyed through Copyright Clearance Center, Inc.

to-treat principle, and follow-up of the study. If methodological flaws are found in the appraisal, it does not mean that the article should not be presented, because there is value in discussing points about research design and methodology.

Next, it is important to discuss the results of the study. Understanding basic statistics such as odds ratios and relative risks, as well as calculation of number needed to treat and/or number needed to harm, can help to quantify the results. In addition, it is just as important to evaluate the clinical significance of the results and applicability to patient care; statistical significance does not necessarily indicate clinical significance. Often the first table in an article describes study participant demographics, which can help the reader decide whether results, if clinically significant, can be applied to their own patient population. Finally, one should assess the article for bias, including funding and disclosures, which might affect the study's credibility. *Table 2* contains a summary of key questions a reader should reflect upon and attempt to answer as he or she analytically reads an article. If an editorial accompanies the paper, it is important to read it before the presentation, because editorials often emphasize key points and controversial topics that, together with the presenter's own analysis, can be used to prompt discussion.

Table 2. Key questions to address when analyzing an article

Section	Questions
Background	<ul style="list-style-type: none"> • Have previous studies been done on this topic? If so, what were the results, and how do they lay the groundwork for the article being presented? • What is the aim or hypothesis of this article?
Methods	<ul style="list-style-type: none"> • What type of study was completed (e.g., randomized controlled trial, prospective cohort study)? • Were patients randomized between control and treatment groups? • Were the groups blinded? • Were patients appropriately followed and accounted for at the end of the study?
Results	<ul style="list-style-type: none"> • Were treatment and control groups similar after randomization? • Were results analyzed based on the intention-to-treat principle? • What were the results? • How large was the treatment effect (calculation of relative and adjusted risk ratios and number needed to treat)? • Were the results statistically significant (confidence intervals and <i>P</i> value)? • Were there any complications or side effects?
Conclusions	<ul style="list-style-type: none"> • What are the conclusions of the article? • Were the results clinically significant? • Can I apply the results to my patients and clinical practice? • What are the strengths of the article? • What are the limitations of the article? • What future directions may be taken to further substantiate the conclusions?

ARTICLE PRESENTATION

In preparation for a journal club presentation, one key suggestion is to avoid slide overload. The best approach is to focus only on several key areas and provide the relevant table or data. Be prepared on the day of the presentation. It is beneficial to practice beforehand or have an outline to follow during the presentation to avoid exceeding the time limit. Additionally, the presenter needs to know the audience. Some audiences may have all levels of learners—faculty, fellows, residents, and/or students—making it necessary to briefly explain or review some clinical techniques, processes, or terms in case an audience member is not familiar with it. Also, in preparing a presentation, remember that it is not necessary to provide a detailed description of the article. The audience should have already read the article, so all they need is a review of the main ideas.

The *introduction* of the article provides the audience with the necessary information in context so they can follow the article's presentation. The presenter first needs to state why this article was selected. It is helpful to explicitly define the research question or hypothesis, the targeted objectives of the study, the study's clinical relevance, and why the topic is worthy of study. A well-built research question has four basic components (PICO):

- *Population*: Who was studied
- *Intervention* or *exposure*: The therapy, risk factor, tests, etc.
- *Comparison* or *control*: The alternative to intervention or exposure
- *Outcome*: Clinical, functional, economic outcomes

It can also be useful to highlight any research done before the study to show the developmental process. This portion of the presentation concludes by describing informally what the authors hoped to prove with this research. It is also good practice to discuss the data supporting the current standard of care against which the study intervention is being measured.

Moving to the *methodology*, presenters should accurately describe the research tools and methods used in the study. Is it a randomized controlled trial? Is it prospective or retrospective? Is it blinded? Or is it cross-sectional or longitudinal? It is also important to describe the study population, including inclusion and exclusion criteria. A diagrammatic schema is recommended to construct and clearly illustrate treatment arms; software is available to help with this process. It is recommended that presenters broadly explain how the research question was addressed. Finally, the statistical methods and the power calculation to determine subject numbers should be presented.

The *results* can be highlighted using statistical methods that can be more quickly and easily grasped by the audience, such as means, medians, modes, standard deviations, and correlations. The goal is not to exclude any data but to avoid losing the audience with too much detail.

Following the presentation flow, the next major area is to review the authors' *discussion* and their perspectives on the

study results. This section should include explanations of inconsistent or unexpected results and consider whether the conclusions are supported by the data.

ARTICLE CRITIQUE

The next segment of the article presentation is a critique of the article from a viewpoint of validity. The audience wants to hear the presenter's critique of the article. It is crucial at this point to present the support or criticisms of the study method and conclusions and point out any potential biases. It is also good practice to discuss the tradeoffs between the potential benefits of the study intervention versus the potential risks and costs. This element creates good discussion and debate in journal clubs. While a comprehensive discussion is often beyond the scope of an article presentation, the critique should define any incidence rates of clinically significant toxicities within the study. Finally, describe what the authors accomplished with their work. This may involve a sophisticated analysis of the study's impact on clinical practice or new research methodology. One useful question is whether this study will impact or change the way you practice medicine. At this point, any study limitations can be outlined, even in bullet form.

Other questions that can be addressed during the critique are as follows: Were the authors successful in accomplishing their objectives? Did they answer their research question? Were their controls properly set up? Was the data accurately presented? Was this study powered correctly? What conclusions did the authors draw from the research? Was the research and study significant to impact change, or was it informational in its approach? Presenters can summarize the implications of the article for practice in their field, ensuring that the summary covers the research question. These are also features of a commentary that is solicited by the journal editor.

IMPLICATIONS AND CONCLUSION

There are two areas of focus for the conclusion of the discussion: (1) the implications for medicine, science, research, and health care; and (2) whether the journal article revealed any secondary results or endpoints that weren't in the original research question. At the end, the presenters will want to restate the authors' take-home message followed by their interpretation of the study and provide a personal perspective, detailing why they found the paper interesting and important. Then presenters can also reflect on whether they envision the study results redirecting research in this field and changing the landscape of clinical practice. Often the discussion leads to specific recommendations for future research. For example, how would you change the research question or change the study? How would you change the

protocol to get a clear answer or to get an answer to a more appropriate question? For clinical practice, can this study yield results that can be applied to your patients? If the presenter began with a case scenario, in conclusion, he or she should return to that case and discuss whether it changed the decision-making process. Presenters should watch the time to allow for questions at the end. It is always beneficial to ensure a specific faculty member, maybe a mentor, can attend and make comments or pose audience questions to promote more discussion.

CONCLUSION

This article has outlined a formal process for presenting journal articles, which can greatly benefit both presenters and audience members. By adhering to this structured approach, presenters can better prepare their presentations, ensuring they are clear and comprehensive. Audience members, in turn, will know what to expect, making these sessions more productive and engaging. Implementing a formal presentation process in journal clubs can enhance their effectiveness, contributing more significantly to collective understanding and education.

Moreover, presenting journal articles not only facilitates peer discussion on new developments or landmark cases in a specialty but also enhances the analytical and presentation skills of the presenters. These skills are integral to clinical practice, as they enable practitioners to critically evaluate new information and communicate their insights effectively. Thus, the practice of presenting journal articles serves as a valuable exercise in professional development within the clinical community.

-
1. Röhrig B, Du Prel JB, Wachtlin D, Blettner M. Types of study in medical research: part 3 of a series on evaluation of scientific publications. *Disch Arztebl Int*. 2009;106(15):262–268. doi:10.3238/arztebl.2009.0262.
 2. Syed AF, Ahmed J. How to prepare an outstanding journal club presentation in Unani post graduation. *Int J Adv Health Sci*. 2016;3(3):208–212.
 3. Linzer M. The journal club and medical education: over one hundred years of unrecorded history. *Postgrad Med J*. 1987;63(740):475–478. doi:10.1136/pgmj.63.740.475.
 4. Judd S, Antaki F. Approach to presenting a clinical journal club. *Gastroenterology*. 2014;146(7):1591–1593. doi:10.1053/j.gastro.2014.04.024.
 5. McMaster University. McMaster health knowledge refinery: our process. Accessed June 17, 2024. https://hiru.mcmaster.ca/MORE/physicians/sentinel_reader.html.
 6. Schwartz MD, Dowell D, Aperi J, Kalet AL. Improving journal club presentations, or, I can present that paper in under 10 minutes. *Evid Based Med*. 2007;12(3):66–68. doi:10.1136/ebm.12.3.66-a.