

Journal Club: Screen, Select, Probe & Evaluate

G. R. Kanthraj, C. R. Srinivas*

Department of skin and sexually transmitted diseases, JSS Medical College and Hospital, Mysore, Karnataka; *Department of skin and sexually transmitted diseases, PSG Medical College Hospitals, Peelamedu, Coimbatore, Tamil nadu, India.

Address for correspondence: Dr. G .R. Kanthraj, "Sri Mallikarjuna", # HIG 33 Group 1, Phase 2, Hootagally KHB extension, Mysore – 570018, Karnataka, India. E-mail: kanthacad@yahoo.com

ABSTRACT

Postgraduate dermatology training programs like seminars, panel discussions, and case presentations help residents to acquire knowledge. Journal club (JC) exercises help residents to update themselves with the current literature. What article a resident should choose and how a resident should evaluate and analyze an article or critically appraise a topic are issues that are most relevant for the success of a JC. Little guidance is available in the biomedical literature on how to deal with such issues. The objective of this article is to provide guidance to neophytes on dealing with JC exercises in a way that helps them in learning the critical appraisal skills. A review of the literature and of the author's experience in JC exercises will be presented. Knowing the methodology of rapid screening of articles along with the art of evaluating them, coupled with a sound knowledge of epidemiology and bio-statistics, helps a resident to select appropriate articles and discard poorly conceived or designed topics that may not generate interest in JC attendees. Hence, such an approach helps the resident in acquiring new knowledge in the shortest time. Choosing the right topic and then applying the newly obtained information to clinical practice, participants succeed in making the JC a valuable learning experience. Further, such well-formatted JCs help residents to improve the quality of health care delivered to patients.

Key Words: Journal club, Journal articles, Medical journals

Journal Club (JC) is an established academic exercise in the residency training curriculum^[1] and a method of continuing medical education for over 100 years.^[2] The concept of the JC originated in Europe, and in 1875, Sir William Osler organized the first North American JC at McGill University, Montreal.^[2,3] This exercise was basically aimed at sharing the expense of costly periodicals with his colleagues. Today JC is an established method to train residents to obtain critical appraisal skills, update knowledge on current literature and enhance proficiency in clinical practice.^[3-5] Why do clinicians have to keep abreast with current medical literature? A recent judgement of Supreme Court of Israel on a malpractice issue resulting from the failure to keep updated illustrates the importance of continuing medical education.^[6] A wrongly diagnosed case of

multiple sclerosis underwent surgery for what was thought to be a brain tumor. The court ruled that the physicians were negligent for not updating themselves with current medical developments and such an update would have led them to the correct diagnosis in the instant case.

The mere fact that research reports are published even in the most prestigious journals is no guarantee of their quality.^[7] Critical appraisal refers to the skill of presenting a paper in an objective and structured pattern giving emphasis to the quality and validity of the evidence. A resident should be able to differentiate between what is already known on a particular topic and what the given study adds.^[8] Residents who know the art of critical appraisal are well versed with methods

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and conclusions of published articles and begin to view them with a critical eye and gain good knowledge on epidemiology and biostatistics.^[9,10]

What are the types of JC?

There are three ways in which a JC can be organized: current journal style, topic-based style and evidence based style.^[5] In the current journal style of JC, the presenter chooses a list of current journals and presents relevant papers, while in the topic based style the most important papers on a chosen subject in the past five years are presented. In the evidence-based style of JC, a clinician describes a clinical problem at the end of one JC meeting. At the next JC, usually 4-6 systematic reviews are presented on the subject and the evidence is evaluated with the result that a topic is critically appraised.

A member of the faculty identifies a clinical problem from a recently seen case. A resident is asked to select articles that address the clinical problem. The faculty and residents then critically appraise the selected articles. Under close faculty supervision, the resident leads the discussion and at the end, they come with suitable suggestions for managing the given case. Consequently it helps in delivering the highest quality of health care.^[3]

How should a resident rapidly read and select an article for a JC?

The selection of articles for a JC is a not too easy for a resident. The challenge is to quickly choose a relevant article from the numerous dermatology journals displayed on the library racks. Currently there are more than 50 journals in dermatology,^[11] and many libraries stock only the more important ones. The resident may not be able to read all the journals or may find it difficult to trace all the articles published on a particular topic. Therefore, residents must develop the necessary skills to keep up with the vast amount of information available. As a resident advances in his training level, the number of journals they scan also increases.^[12,13] The choice for an article varies from one medical center to another.

Choosing an article by a resident depends on topics of ongoing research projects or most frequently encountered cases in that center. It may be an endemic

disease like leprosy, an advanced investigation like phototesting, or subspecialty interests like dermatosurgery or pediatric dermatology. Apart from scanning dermatology journals, a resident should not miss dermatology articles published in non-dermatology journals like the Lancet, British Medical Journal, New England Journal of Medicine, and Journal of the American Medical Association.^[14] As pointed by Kanthraj and Siddalingappa,^[15] a periodical Medline or Internet search using Pubmed to locate all recent articles on a particular disease or treatment modality in all journals helps prevent missing some dermatology articles published in non-dermatology journals. This is a rapid and revolutionary aid to teaching and patient care. Now with the help of the internet a resident can easily and freely access the tables of contents of all important journals.

Bigby and Gadden have developed a shortcut method of reading scientific articles.^[16] The steps involved in the rapid selection for an ideal journal article are shown in Figure 1. In the elimination phase the resident reads the titles of all articles; if they are interesting he will continue to read the abstract, which summarizes the various sections of the article concisely.^[16] If the abstract is interesting, he should look at the figures and tables, where the most convincing data are represented.^[17] The graphical representation helps residents to summarize the results in a short time. The way the data has been summarized and displayed can be verified by looking at the figures and tables and then reading the results.^[17] This involves noting the appropriateness of the control group, relevancy of the outcome with reference to the clinical and biological importance, and statistical analysis of the data. Further, the resident should also note any treatment complications, and the follow-up and compliance.

After reading the results, a resident should ask himself: Does the article teach the resident the critical appraisal skills? Does the article have an impact on clinical practice? Does the article help to keep up with the current literature? If the answer is "no", he should stop reading the article, but if "yes", he should proceed to read the materials and methods.

While reading the methods he should note the

eligibility criteria, methods of allocation, sample size, variables like the control group, blindness to treatment and statistical methods. If he is convinced he should note the conclusions, and read the discussion and introduction in that order [Figure 1]. In this way, a resident can choose a high-impact article in a very short time and discard a poorly conceived or designed study or a topic that may not generate interest to the faculty.

Such a monthly exercise of choosing such articles itself will be an art and in turn help in his continued reading.^[18]

How should a resident probe and evaluate an article? An imperfect study that is well described in its limitations, and well presented and discussed, can result in an excellent report. Conversely, a model experiment can be misunderstood because of a poor presentation.

Table 1: Manuscript quality assessment instrument.
 Modified with permission from American College of Physicians. *Based on Goodman, et al.*^[19]

Section	What to look for	Assessment				
		Poor	fair	excellent		
Title	Clear, concise and accurate	1 2 3 4	5 6 7	8 9 10	N/A	
Abstract	Adequate summary of data and conclusion	1 2 3 4	5 6 7	8 9 10	N/A	
Introduction	Clarity of background and rationale for the study. \$	1 2 3 4	5 6 7	8 9 10	N/A	
	Clarity of aims and objectives of the study \$\$	1 2 3 4	5 6 7	8 9 10	N/A	
Methods:Subjects	Description of source of subjects and setting of the study.	1 2 3 4	5 6 7	8 9 10	N/A	
	Clarity of inclusion and exclusion criteria	1 2 3 4	5 6 7	8 9 10	N/A	
	Information on suitability of the comparison groups +++	1 2 3 4	5 6 7	8 9 10	N/A	
Methods:	Clarity of study design #	1 2 3 4	5 6 7	8 9 10	N/A	
Design	Description of blinding (single blind, double blind)	1 2 3 4	5 6 7	8 9 10	N/A	
Methods: Variable measurement	Clarity of variables (compliance) ##	1 2 3 4	5 6 7	8 9 10	N/A	
	Report of important side effects	1 2 3 4	5 6 7	8 9 10	N/A	
	Information on eligible subjects not included (compliance) (Number and reasons)	1 2 3 4	5 6 7	8 9 10	N/A	
	Description of characteristics of the enrolled sample and adequacy (dermographic/prognostic factors) of sample	1 2 3 4	5 6 7	8 9 10	N/A	
Results	Clarity of outcome (any protocol violation dropout/crossover)	1 2 3 4	5 6 7	8 9 10	N/A	
	Report of confidence interval/standard error for outcome *	1 2 3 4	5 6 7	8 9 10	N/A	
	Reports of summary statistics for test performance **	1 2 3 4	5 6 7	8 9 10	N/A	
	Report of magnitude of effects +	1 2 3 4	5 6 7	8 9 10	N/A	
	Report of multiple measured variables ++	1 2 3 4	5 6 7	8 9 10	N/A	
Figures and tables	Effective presentation of important data and balance between text and figures	1 2 3 4	5 6 7	8 9 10	N/A	
Discussion and conclusion	Clarity on what the study adds to the existing knowledge	1 2 3 4	5 6 7	8 9 10	N/A	
	Strength and weakness of the study in relation to other studies	1 2 3 4	5 6 7	8 9 10	N/A	
	Need for future work	1 2 3 4	5 6 7	8 9 10	N/A	
	Appropriateness of supporting evidence (logic/theoretical and its relevancy in reasoning) conclusion	1 2 3 4	5 6 7	8 9 10	N/A	
Overall manuscript	Discussion of study limitations.	1 2 3 4	5 6 7	8 9 10	N/A	
	Appropriateness/strength of the conclusion to the design and results	1 2 3 4	5 6 7	8 9 10	N/A	
	Is the manuscript concise?	1 2 3 4	5 6 7	8 9 10	N/A	
	Organization of the report X	1 2 3 4	5 6 7	8 9 10	N/A	
	Style of presentation	1 2 3 4	5 6 7	8 9 10	N/A	
	Overall quality of the report	1 2 3 4	5 6 7	8 9 10	N/A	

N.A. Not applicable.

\$ The frequency and severity of the existing clinical problem and how the patient would benefit from the study.

\$\$ The research questions and appropriate hypotheses about what will be found.

+++ Applicable when two groups are compared. It should include how patients were chosen (for observational studies) or allocated (for experiments). The aim is to compare like with like.

The reader should understand what the authors set out to do and how they did it.

Assessment of the strengths and limitations, viz. in surveys, case definition; in cohort studies, definition for exposure and disease status; in diagnostic studies, test procedure; in case control studies, definition of cases and controls should be stated clearly.

* If the outcome is a difference between groups, the statistical precision of that difference should be reported.

** It is applicable to studies of diagnostic tests. Summary statistics include sensitivity, specificity, predictive value, and ROC curve or likelihood ratio.

+ Effects include odds ratio, risk differences, differences between means, regression and co-efficient.

++ Multivariate method includes stratification, adjustment, and regression, ANOVA, etc.

X Verify whether all methods are in the methods section and all results in the result section.

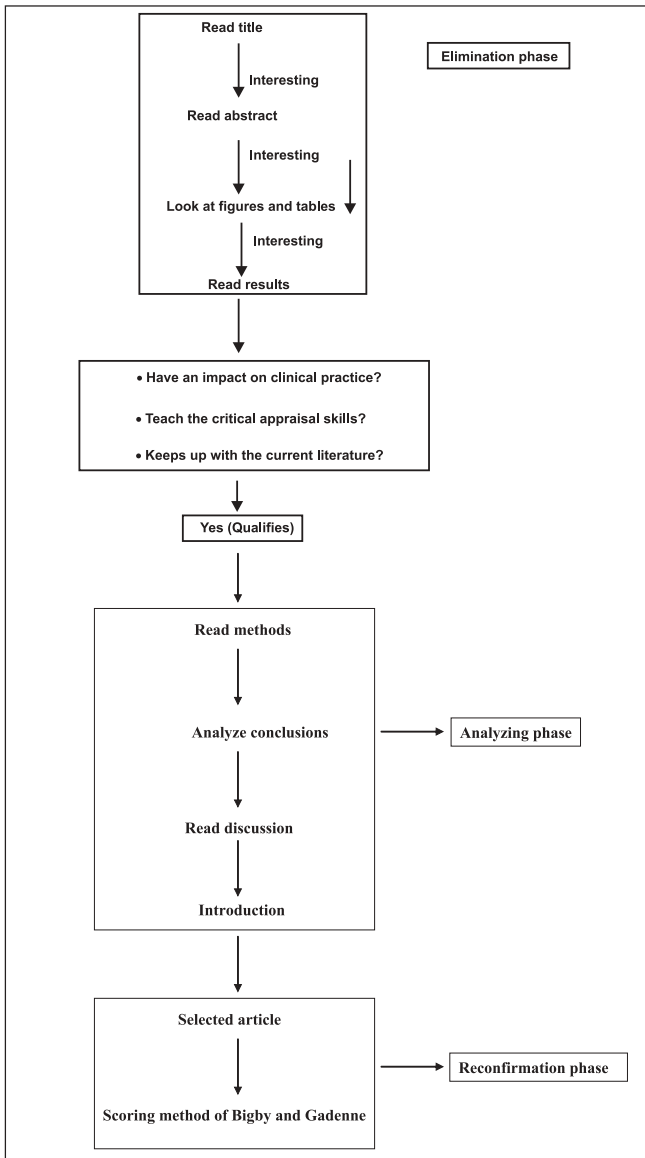


Figure 1: Steps involved in the rapid method to read an article

A resident should be able differentiate between the quality of research conducted and the quality of the research report. One has to analyze the various sections of the article. We have modified the manuscript quality

Table 2: Scoring method of Bigby and Gadenne

Criteria	2 Points	1 Points	0 Points
Patient selection	Defined	Inadequately defined	Not defined
Purpose of study	Defined	Incompletely defined	Not defined
Controls	Adequate	Inadequate	Absent
Blinding	Double blind	Single blind	Non-blind
Randomization	Adequate	Inadequate	Non-existent
Dosage chosen	Adequate	Based on dose finding or	Needed, but not on dose-effect studies
Outcome variables	Clearly defined, relevant, reproducible	Incompletely defined	Poorly defined, not relevant
Assessment of side effects	Adequate, with defined protocol	Inadequate	Missing
Concurrent drug therapy	Adequate	Not given or inadequately assessed	Information missing
Statistical evaluation	Complete	Inadequate	Wrong
Author's conclusion	Adequate and based on results of the study	Inadequate or doubtful or not based on study	Irrelevant

(From: Bigby M, Gadenne AS. Understanding and evaluating clinical trials. J Am Acad Dermatol 1996;34:555-590. Reprinted with permission from Bigby and Gadenne. © American Academy of Dermatology)

* The maximum score is 20. A score of 16 or above indicates a good or very good study. A score of 11 to 15 indicates a fair study whose results can be given some credibility. A study with a score less than 11 is not acceptable and the results need confirmation in a better designed study.

Table 3: Scoring system for evaluating a study other than a clinical trial

Criteria	10 Points	5 Points	0 Points
1. Purpose of study	Defined	Inadequately defined	Not defined
2. Design	Good	Fair	Poorly designed or wrong
3. Subjects/ samples (Inclusion and exclusion criteria)	Defined	Inadequately defined	Poorly designed or wrong
4. Method/Data collection/ Questionnaire/Lab method	Correct	Doubtful	Not defined
5. Outcome measure	Clearly defined	Incompletely defined	Wrong
6. Statistical analysis	Complete with adequate methods	Incomplete with inadequate method	Poorly defined
7. Author's conclusion	Adequate based on results	Doubtful/not based on study	Wrong or missing
8. Clinical impact*	30 Points High impact or first report or first report in India	15 Points Moderate impact or important subsequent report	0 Points Unimportant or subsequent report

*The maximum score is 100. A score of 80 or more indicates a good or a very good study. A score of 55 - 79 indicates a fair study, whose results can be given some credibility. A score less than 55 is not acceptable and the results need confirmation in a better designed study.

Table 4: Scoring system for evaluating a case report

Sr No	Criteria	10 Points	5 Points	0 Points
1.	Purpose of case report	Defined	Inadequately defined	Not defined
2.	Diagnostic criteria/Confirmation of the case/ Investigations/ Description of new treatment/ additional important clinical manifestations	Complete	Partial	Incomplete
3.	Association of another clinical entity/ Description of side effects	Convincing	Doubtful	Not convincing/co-incident.
4.	Rarity/Clinical technique/ New phenomenon/Sign	First time report/ new recognized entity/ first time in Indian context or in that country	Important subsequent report	Unimportant subsequent report
5.	Author's conclusion	Explained with scientific basis	Postulated	Unexplained

The maximum score is 50. A score of 40 or more indicates a good or a very good case report, 28-39 indicates a fair case report, whose results can be given some credibility. A case report with a score less than 28 is not acceptable.

assessment instrument proposed by Goodman et al.^[19] This quality assessment instrument aids to identify whether the authors have described their research in enough detail and with sufficient clarity under each section of the article, so that the reader can independently judge the strengths and weaknesses of the data and conclusions.^[19] The manuscript quality assessment instrument serves as a guideline that provides information to identify the necessary items that have to be described under each section of the article [Table 1].

Evaluating the scientific quality of an article is notoriously difficult.^[19] The CONSORT statement (consolidation of standards for reporting a clinical trial) has been proposed to ensure that randomized controlled trials are properly reported.^[20,21] Randomized trials allow valid inference of the cause and effect and effectively eliminate bias. Bigby and Gadanne^[16] have modified the scoring system proposed by Nyberg for evaluating a clinical trial [Table 2]. A resident has to score the article to reconfirm his selection. Out of a maximum score of 20, a score of 16 or more indicates a good or very good study, 11 to 15 indicates a fair study whose results have some credibility, while less than 11 is not acceptable and means that the results need to be confirmed by a better designed study.^[16]

Statistical analysis is a vital area where medical research reports are concerned. According to a recent study, dermatology journals infrequently perform statistical reviews of submitted manuscripts.^[22] Therefore one has

to evaluate such manuscripts carefully before coming to conclusions. Hence the need for skepticism. Residents should be encouraged to go through publications on "Guidelines for statistical reporting in articles for medical journals,"^[23,24] clinical epidemiology and research methods,^[25] and meta-analysis of the literature.^[26]

We have designed a protocol for evaluating non-clinical trials as well [Table 3]. While the maximum score is 100, a score of 80 or more indicates a good or very good study, 55 to 79 indicates a fair study whose results can be given some credibility, while a study with a score less than 55 is not acceptable and the results need to be confirmed by a better designed study. We also propose a similar scoring system for evaluating case reports [Table 4].

Based on the complete review of the article, the cardinal questions a resident should ask and analyze at the end of JC have been proposed and illustrated earlier by Kanthraj and Siddalingappa.^[15] Choosing a timely topic and then applying the newly acquired knowledge in an actual work situation, participants succeeded in making the JC a valuable learning experience.^[27] A properly organized JC helps residents in delivering quality care to their patients and can make Sir William Osler proud!

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