How to prepare for and present at a journal club

Introduction

Presenting a paper at a journal club can be a daunting prospect for a trainee and one for which undergraduate medical education may leave the trainee feeling under-prepared. However, the ability to critically appraise and present an academic paper is a competency required of the trainee doctor.

This article discusses the benefits of attending a journal club and considers the characteristics common to successful journal clubs. It reviews the impact of new technology on the format of journal clubs and suggests a framework for preparing presentations.

Historical background

The first mention of a journal club is found in the 1835–54 memoirs of British surgeon Sir James Paget. He reported that 'self-elect of the pupils, making themselves into a kind of club, had a small room over a baker's shop near the Hospital-gate where we could sit and read the journals'. Sir William Osler is widely credited as establishing the first organized journal club at McGill University in 1875 (Linzer, 1987). In 1966, Professor Mattingly of Exeter University wrote one of the first articles about journal clubs as an: 'introduction to the systematic use of medical literature' for junior staff, and 'a convenient method of surveying the medical literature' for senior staff (Mattingly, 1966). Since then journal clubs have been widely used to keep abreast of the current literature.

In the 1990s the concept of evidence-based medicine was introduced, defined as '...the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients' (Sackett et al, 1996). The skill of critical appraisal and the ability to use the current evidence base in medical practice has evolved, with journal clubs being integral to this process.

Dr PFD Bowles *is Core Surgical Trainee,* **Mr K Marenah** *is Specialist Registrar in Orthopaedic Surgery,* **Mr DM Ricketts** *is Consultant Orthopaedic Surgeon and* **Mr BA Rogers** *is Consultant Orthopaedic Surgeon in the Department of Trauma and Orthopaedics, Brighton and Sussex University Hospitals, Brighton BN2 5BE*

Correspondence to: Dr PFD Bowles (philippe.bowles@nhs.net)

Why attend journal clubs?

Journal clubs link research to clinical practice by encouraging critical review of the current medical literature and act as a vehicle for the application of evidence-based medicine through continuing medical education (Esisi, 2007; Leung et al, 2013).

Journal clubs also allow academic debate and networking between colleagues of varying seniority (Esisi, 2007). Regular meetings to discuss and appraise the medical literature help trainees to develop their critical appraisal skills. These skills are increasingly seen as a requirement for specialist hospital doctors and the ability to demonstrate them is assessed at specialty training (ST3) interviews (Picard et al, 2010; Leung et al, 2013).

By honing critical appraisal skills, competence is developed and publications may follow in the form of 'letters to the editor' or papers developing research ideas stimulated by the articles reviewed (*Table 1*).

Characteristics of successful journal clubs

Successful journal clubs have generally met for more than 2 years with good participation (Sidorov, 1995). There are many different ways that meetings are structured but common characteristics are as follows (Sidorov, 1995; Alguire, 1998; Deenadayalan et al, 2008; Millichap and Goldstein, 2011):

1. They are held at regular intervals (e.g. monthly)
2. They are held at a set time convenient for the members
3. Attendance is compulsory and an attendance register is held
4. The attending clinicians share common clinical interests
5. There is a nominated chairman, who possesses research experience and is widely respected. His/her role is to chair meetings as well as guide club members in their choice of journal articles
6. The club has a clear purpose which is agreed by the members and is periodically reviewed
7. The articles selected for discussion are aligned with the agreed 'overall aim' of the club and of clinical relevance to the members
8. Original articles are the most frequent papers discussed
9. The papers are read in good time before the meeting. Circulating the subject matter by email or the internet are effective ways to do this
10. Food is available at the meetings; the provision of food at meetings is widely reported to improve attendance.

Table 1. The benefits of a journal club

Critical appraisal skills are developed
Participants keep abreast of current medical literature
Research literacy and evidence-based practice are developed
The needs of continuing medical education are met
Interview skills are developed
Academic debate is stimulated
Intradepartmental social and professional networking take place
Publications are generated (e.g. letters to editor, further research)

The future of the journal club

In the past journal clubs involved the members travelling to meet at a given location. Recently, journal clubs have used web-based platforms. These also improve participants' ability to undertake critical appraisal of the literature (Macrae et al, 2004), although journal clubs in person are more efficient at developing these skills (McLeod, 2010). Most departments therefore still hold physical meetings (Millichap and Goldstein, 2011) with internet technology used as an adjunct.

Social media platforms such as LinkedIn and Twitter have also been used to host journal clubs. Early forays into microblogging-based journal club discussions (e.g. via Twitter) have produced encouraging results. Scheduled discussion forums

advertized and conducted on Twitter can be used to access an international, multidisciplinary community and engage readers directly with authors. One such experimental study, conducted over a 48-hour period, reported participation from 45 contributors representing clinicians, students and members of the public, from 10 countries (Thangsamy and Woo, 2013).

Positive correlations have been shown between the number of 'tweets' a journal article generates and more traditional measures of influence such as citations (Eysenbach, 2011). Regarding the risk of unprofessional conduct, the vast majority of contributions raise no concerns (Leung et al, 2013). In light of this the potential of social media sites to compliment physical meetings and stimulate debate is now being investigated by international medical journals (Leung et al, 2013).

The advantages of journal clubs via social media platforms include:

- Immediate access to authors and editors
- Immediate appraisal and feedback for editors and authors
- The ability for discussion between authors and readers
- The opportunity to promote international discussion
- Enhanced dissemination to developing countries and remote areas
- Development of a forum to answer questions and explore practical applications
- Discussion open to people interested in the topic who are not medical professionals (adapted from Leung et al, 2013).

Presenting at a journal club

Most presentations take place at physical meetings for which standard approaches apply. Powerpoint slides will help convey the structure of the presentation and the data under discussion. Where such facilities are unavailable, slides on overhead projectors or simple handouts are suitable alternatives. The timing of the presentation should be appropriate to the content of the paper and duration of the meeting. Rehearsing the presentation will help to combat nerves and further familiarize the speaker with the content, facilitating an engaging and interactive presentation. Some meetings may favour a less formal roundtable discussion format where the chairperson will help guide the discussion, encouraging group participation.

Schwartz et al (2007) drew a comparison between presenting a critical appraisal and presenting patients; in both the aim is to convey the essential information in a concise manner using a standardized structure. Just as a junior doctor's ability to present clinical problems improves dramatically with practice, the skill of engagingly and concisely conveying the essence of a paper can also be learnt.

The authors suggest the following stepwise approach to presenting an article:

Step 1: introduction

Explain the clinical question that prompted you to consult the literature and what drew you to the article.

Step 2: who wrote the paper?

Consider the title of the paper, the authors and their affiliated institution(s). Are there any outstanding features, e.g. a first study of its kind, a well-known author or institution?

What is the impact factor of the journal? What is the circulation (i.e. regional, national or international) and who is the readership?

Try to ignore the abstract initially. Reading the author's stated conclusions before forming your own ideas about the validity of the paper may influence your appraisal.

Step 3: the hypothesis

What is the research question? Is it well constructed? Does it observe the four basic components (PICO) of a good research question?

- Population – who was studied?
- Intervention – what was the intervention tested?
- Control – what was the alternative that the intervention was compared to?
- Outcome – what was the nature of the outcome measured? (Van Loveren and Aartman, 2007).

Step 4: appraise the evidence base

Read the key references and related papers.

What is already known on the subject? Is this correctly presented? Is the hypothesis correct? Is the question relevant and important in the context of the existing literature? What does the study contribute to the existing literature?

The introduction will usually contain a statement validating the content of the article by placing it in the context of the wider literature. For example, 'Intervention 'x' has been shown to show significant reduction in patient group 'y'. However, no studies to date have assessed the effect of 'x' in patients with a history of 'z'.' (adapted from Schwartz et al, 2007).

Step 5: study design

Consider the following:

The study type

Is it appropriate to the research question and the subject under investigation, e.g. randomized controlled trial, case control, meta-analysis, cross-sectional, descriptive (Schwartz et al, 2007)?

The study population

Can the results of the study be translated to the general population? Is the patient group representative of the normal population? If not, is this addressed in the text?

Randomization

How are the participants allocated into the groups?

Bias

This refers to a flaw in impartiality that introduces systematic error into the methodology and results of a study.

Is the research method exposed to bias?

Has randomization been used to reduce experimenter bias?

What form of blinding or masking has been used to reduce experimental or observational bias?

Inclusion and exclusion criteria

Are these appropriate and clearly stated? Can you identify any oversights that may affect the validity of the study?

Step 6: is the method thorough?

A flawed methodology will undermine the validity of the results. Consider the following:

Was the method and approach to the study appropriately diligent? Were processes consistent? Was follow up complete and consistent in each group? What outcome measures were used and were they appropriate?

Are the statistical tools adopted suitable and correctly interpreted by the investigators?

Have the authors made a power statement (*Table 2*)? What significance level has been used (*P* value)? Has the power of the study been stated, does it exceed 80%? Was a power analysis carried out? Was this before the study or post-hoc (Sexton et al, 2008)? Is the study sufficiently powered to eliminate errors? Do the data exhibit low variability? What is the effect size?

Step 7: results

Are the results clearly stated? Have any results been ignored and why? Is the result statistically significant, i.e. is the *P* value less than 0.05 (is the null hypothesis rejected)? (Petrie, 2010).

Remember to review supplementary graphs and tables and consider whether they are accurate and represent the data presented in the text.

Step 8: discussion and interpretation

Discuss the strengths and weaknesses of the study.

Do the results support the conclusions? Often the conclusions will exceed the scope of the evidence base in the preceding paper.

Consider the statistical significance *vs* the clinical significance? Does the article acknowledge the relevant literature and other approaches? Before concluding, the authors will often include a discussion of the limitations of the study. Close attention should be paid to this to ensure a fair appraisal of the author's claims.

Have the authors declared any conflicts of interest?

Step 9: clinical context

End your appraisal by assessing how the paper might change clinical practice. You might refer back to the clinical question that first drew you to the article.

Step 10: output

Having critically appraised and presented the article, consider whether your comments would be of interest to the publishing journal in the form of a letter to the editor. Particular points of merit, in addition to inconsistencies or statistical shortfallings, are of interest to the journal, its readership and the author. Writing letters to the editor is a useful way to hone writing skills and, if accepted, are often published quickly and enhance a CV. Often, the article may suggest areas for further research.

Conclusions

Mattingly (1966) wrote: 'the printed word appears to remain, at least for the present, the basic agent for the distribution and repositing of knowledge'. This still holds true today, with journal clubs remaining an enjoyable and productive way of keeping up to date and developing academic skills for clinicians of all levels of seniority. BJHM

Conflict of interest: none.

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Table 2. Statistical power explanations

P value	A measure of the strength of evidence against the null hypothesis (usually $P<0.05$, indicating that the result obtained would only be reproduced 5 times out of 100 if there truly was no difference between the two groups tested)
Type 1 (α) error	Incorrectly rejecting the null hypothesis, i.e. a false positive result; decreased by lowering the acceptable *P* value
Type 2 (β) error	When we incorrectly do not reject the null hypothesis, i.e. a false negative result; usually a result of a small sample size and can be eliminated by performing a power analysis
Power	Assuming there is a true underlying difference, how certain do you want to be of detecting this – usually set at ≥80% (i.e. the probability of rejecting the null hypothesis when it is false)
Power analysis	A statistical method of determining the number of subjects needed in a study in order to have a reasonable chance of showing a difference if one exists
Effect size	The value of the response or the outcome variable that reflects the comparison of interest, or a standardized measure of this, e.g. the difference in two population means

adapted from Petrie (2010)

KEY POINTS

- Journal clubs have a long history of promoting review of the medical literature and stimulating debate.
- Journal clubs contribute to the practice of evidence-based medicine.
- The traditional format of journal clubs is evolving to incorporate new technologies such as Twitter.
- Through journal clubs trainee doctors can develop essential skills for interview and enhance their CVs.
- Adopting a step-wise approach to critical appraisal facilitates the analysis of a paper for presentation.