

READER: an acronym to aid critical reading by general practitioners

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SUMMARY. *READER* represents a sequence of steps in the assessment of general practice literature. An article may be judged on the first four steps: *r* for relevance, *e* for education, *a* for applicability, *d* for discrimination. The next step, *e*, involves the evaluation of the article using a scoring system. Finally the reader decides what to do with the article, as illustrated by *r* for reaction.

Keywords: *critical reading; behavioural influences; learning needs.*

Introduction

THERE has been an exponential rise in the volume of literature about general practice. General practitioners are almost overwhelmed by academic journals, professional medical publications and drug company literature. Increasing attention is focused on the problems of selection, appraisal, and digestion of the literature, that is, critical reading.¹ Critical reading is a process which has two major components, why and how; why read certain articles and not others (and the criteria used in this selection), and how to read articles effectively (and guidelines for assessing their quality).

The acronym READER provides a structure to define why and how in an ordered sequence of steps, easily applied to any article. It is a tool to help doctors read selectively and appraise literature. Using the acronym puts readers in control of the literature, enabling them to focus on those articles of importance and discard the remainder. It helps doctors to keep afloat in the rising tide of medical literature and to banish the guilt of half-read journals. The basic principles of critical appraisal represented in the acronym may be used to assess all aspects of the literature from editorials to correspondence, textbooks or drug information.

Reading has many purposes, including pleasure, general awareness and wider education, but in the context of this article, READER is used to help the general practitioner focus only on those articles that will alter practice. Each letter of the acronym represents a progressive step in the assessment of a paper.

The discussion paper is deliberately provocative. The acronym and scoring system for research papers are ruthless, and thus are exclusive rather than inclusive. READER can therefore be used as a protocol for literature triage rather than as generic, all inclusive guidelines.

Relevance

Each article should be assessed in the reader's context. Does the article deal with general practice? This may be determined from the title and summary. The occupation, qualifications and current post of the author(s) will help identify the origin and background of the article. If it does not deal directly with issues in general practice or does not have considerable general practice input, it is unlikely to change a general practitioner's behaviour.

Within general practice, the circumstances of the reader deter-

mine what is relevant. Are the circumstances described in the article relevant to the style of practice, facilities, situation, and location in which the reader works? Service general practitioners need only focus on issues of particular relevance to their practice though they may wish to browse through articles about wider issues of peripheral interest. Circumstances, interests and practice may change and it is impossible to anticipate every eventuality, so scanning titles will identify where one may return if the need arises. Academic general practitioners, trainers and course organizers may have different needs and priorities and should be familiar with a wide range of topics.

Education

Education is used in the context of behaviour modification. The title and summary can be used to judge whether an article could change behaviour. An article confirming a reader's current beliefs or reinforcing clinical practice may be more attractive to read but may be a waste of time since it only confirms what is already done and will not change behaviour. Articles presenting issues which challenge current practice and beliefs, or suggest alternative procedures are more likely to keep the reader up to date with advances in primary care so require further attention.

Applicability

Can the reported research be done in the reader's practice? Though an article may be relevant to general practice, challenge current practice or suggest alternative behaviour, it is only applicable if it can be done in the reader's own practice. For example, an article showing the value of employing a physiotherapist may not be applicable in a non-fundholding practice without community physiotherapy, the problems of inner city practice may not be relevant to isolated rural doctors, nor the issues surrounding private medicine in an area of high deprivation.

Another example is an article suggesting that fibrinolytic drugs are useful in immediate cardiac care by general practitioners. This may be relevant to general practice, and could change behaviour, but if in the area in which the reader works there is a cardiac ambulance providing full immediate cardiac care, including fibrinolysis, then it may not be applicable in the reader's particular circumstances.

Therefore, if the reader cannot identify with the practice or circumstances of the paper, then it is probably not worth reading. If the issue is applicable to the practice, it may change behaviour.

Discrimination

The message in an article may be relevant, could change behaviour and may be applicable but is the message valid? Epidemiology provides the scientific tools by which general practitioners measure the validity of research, although many doctors are uncomfortable with epidemiological concepts. There are two options, either to depend on the experts or make one's own judgement.

Most articles in high quality journals are peer reviewed. In such journals, each paper will have been refereed by at least two reviewers who are respected experts in their field and they will have assessed the quality of the studies on the reader's behalf. The more respected the journal the more stringent the review procedure. However, not all authors agree with the opinion of the referee² and even in highly respected journals, papers with statist-

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ical shortcomings may slip through.³ As one descends through the hierarchy of journals, the less rigorous the reviewers' assessments and the greater the likelihood that a poor quality study will be published. Clinical trials of new drugs have been found to have statistical inadequacies, generally owing to inadequate sample size and length of follow up.⁴ Papers with positive results are more likely to get published. One of the authors of a paper may be a statistician or there may be an acknowledgement to a statistician and if so the study is probably more valid since the statisticians are putting their reputation on the line.

Articles from academic departments are more likely to have had additional internal peer review. However, they may have failed the earlier assessments in READER.

Readers can use their own judgement to examine the quality of a paper. What type of study is it? Is it descriptive or is it a randomized controlled double blind trial? In general, descriptive studies make observations and identify associations which cannot be separated into cause or effect. They should not be given sufficient weight to change behaviour. A randomized controlled double blind trial is the ideal method of intervention evaluation. The methods used need to be examined. How were the subjects chosen and could bias have been introduced into the sample? How were the controls chosen and could bias have influenced the controls? Was the study design appropriate? Was it double blind, single blind, and how many subjects were excluded from the trial, or dropped out? Are there any other methodological problems? Are the statistical methods appropriate? The size of the sample⁵ and confidence intervals⁶ give further pointers towards the trial's power.

General practitioners who lack experience and expertise in assessing the quality of papers should not make changes in behaviour without confirmation of the results by others and should depend only on recognized experts or high quality peer reviewed journals.

The principles of critical appraisal also apply when discussing drug therapy with drug company representatives. The gold standard for assessment of any drug intervention is the double blind randomized controlled trial and a general practitioner should request evidence of such a trial in a respectable journal. If available, it will certainly be presented immediately.

Evaluation

If research is relevant, could change behaviour, could be incorporated into practice, and is epidemiologically sound, then the paper should be considered seriously. A scoring system can be applied to the paper, weighted to reflect the importance of scientific appraisal (Figure 1).

Reaction

Articles can be placed into four categories, according to their score (Figure 1). It must be remembered that articles may be published which are of value but which may not fulfil the criteria.

A score of 24+ indicates that it is a classic paper which should make an immediate impact on practice. The article needs to be brought to a practice meeting, circulated to all members of the practice team and implemented as soon as possible.

A score of 20–23 indicates that it is a paper of value which should be photocopied or clipped from the journal and filed for immediate access. However, the reader should be aware that the greater the number of articles filed, the less likely that any individual article will be consulted. Therefore it may be useful to choose only one or two articles each month.

A score of 15–19 means that although not fulfilling all the criteria a paper may be of interest. Full and accurate details of articles should be stored on an index card or computer index. There is no need to retain journals routinely; libraries are for storing

Relevance	Score
Not relevant to general practice	1
Allied to general practice	2
Only relevant to specialized general practice	3
Broadly relevant to all general practice	4
Relevant to me	5
Education	
Would certainly not influence behaviour	1
Could possibly influence behaviour	2
Would cause reconsideration of behaviour	3
Would probably alter behaviour	4
Would definitely change behaviour	5
Applicability	
Impossible in my practice	1
Fundamental changes needed	2
Perhaps possible	3
Could be done with reorganization	4
I could do that tomorrow	5
Discrimination	
Poor, descriptive study	1
Moderately good, descriptive study	2
Good descriptive study but methods not reproducible	3
Good descriptive study with sound methodology	4
Single blind study with attempts to control	5
Controlled single blind study	6
Double blind, controlled study with method problem	7
Double blind controlled study with statistical deficiency	8
Sound scientific paper with minor faults	9
Scientifically excellent paper	10

Figure 1. System for scoring research papers, based on relevance, education, applicability and discrimination.

journals. However, currently many libraries are reducing the range of journals held owing to financial restraints. Computer databases are available: MedLine is an international database available on CD ROM and by online search but there are others, including CINAHL directed towards nursing, and PSYCHINFO towards psychology, and they are usually available at a local medical library. Information accessibility is improving continuously with developments in technology, and members of the British Medical Association may now link directly to MedLine using a personal computer and modem from their home or practice. The Royal College of General Practitioners in London retains a unique database on all aspects of general practice.

A score of less than 15 means that a paper has failed to fulfil the criteria so should be ignored.

Discussion

This guide is aimed at the average service general practitioner who has little time for an extensive review of the literature. It helps to focus only on those issues with direct influence on practice. Those general practitioners who wish to study critical appraisal in more depth are directed towards the critical appraisal package of the College of Family Physicians of Canada,⁷ a key article from McMaster University⁸ and the definitive text of critical reading for general practitioners by Sackett and colleagues.⁹ It may also be useful to look at the assessment of papers from the point of view of a referee¹⁰ or a prospective author¹¹ and two useful checklists, designed for assessment of clinical papers have previously been published by Gardner and colleagues.¹²

There are, however, occasions when a paper does not fulfil these criteria yet may be of importance to a general practitioner. Most major scientific findings are first illustrated in a preliminary study, and a novel and stimulating preliminary study may

alert general practitioners to future developments but not change behaviour. A paper that fulfils all the other criteria but is not applicable in the practice begs the question: is the problem with the research or with the practice?

It is interesting to speculate for whom the article is written: for the benefit of the author or the benefit of the reader? Unfortunately, some articles are inspired and influenced by the need to publish for career promotion. Peer review will establish the quality of a paper, but there is a difference between quality and value. In addition, articles may not be complete work but may be a part presentation of a larger project.¹³ These factors may cloud interpretation of research.

Critical appraisal has been introduced into the membership examination of the RCGP, reflecting the importance of this skill. Candidates are asked to appraise and comment on an article. What we read, and how we are influenced by what we read, may be significant determinants of behaviour so it is useful to learn this skill early and be able to use it throughout one's career.

The acronym and basic scoring system are aimed at the vast majority of busy general practitioners. Those in academic practice would be expected to have a wider knowledge and to read a variety of papers dealing with a range of subjects and circumstances. Academics would also be expected to have more expertise and experience of scientific assessment, evaluation of statistics and use of epidemiological tools.

Epidemiology is the science by which we measure general practice. There is an increasing realization of the common ground between those two disciplines, and of the need for general practitioners to be familiar with basic epidemiological principles in order to interpret the scientific literature.

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