Evidence-based medicine

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Evidence-based medicine can be defined as the well-conceived and beneficial use of current research knowledge in making decisions concerning patient care. The concept of evidence-based medicine has two fundamental principles, it is based on best available research studies and the subsequent transfer of their results to use in practice. It follows that an evidence-based approach has several advantages. Patients are better served because only tested procedures will be endorsed. The standing of the profession will be enhanced because only proven treatments will be offered.

Evidence hierarchies classify the importance and robustness of diverse types of biomedical research. There is no universally accepted hierarchy of evidence, though there is broad agreement on the relative strength of the principal types of research, or epidemiological studies. Randomized controlled trials (RCTs) rank above observational studies, while expert opinion and anecdotal experience are ranked at the bottom. Nonetheless, RCTs are not always the 'ideal' way of conducting clinical research. The "ladder of evidence" was developed, to a large extent, for questions related to interventions or therapies. For questions related to the cause, diagnosis or prognosis of a disease, cohort studies or case-control studies will often be more appropriate. It is useful to think of the various study designs, not as a hierarchy but as categories of evidence which will allow the strongest possible, practical and ethical study-design to be chosen.

It is crucial that the quality, strengths and weaknesses of each individual study is aptly assessed. For this reason the clinical researcher must have a comprehensive knowledge of all research methodology and research designs. A certain level of authority, often undeserved, is given to papers published in peer reviewed, current content journals. Readers and research workers often fail to appreciate that all published papers do not merit the same level of robustness and indeed may sometimes be in error. It follows that all published clinical studies, in whatever journal, must be assessed by potential authors, using the techniques of critical appraisal.

Journal Editors and their Editorial Board have an ethical responsibility to ensure that all published material has undergone a rigorous peer review system. Unbiased and independent critical assessment is an intrinsic part of all scholarly work, making peer review an important and fundamental extension of the scientific process. A well held view is that true scientific peer review begins after a paper is published. Journals should have a mechanism for readers to submit comments, questions or criticisms about published articles. Authors have a responsibility to respond appropriately and cooperate with any requests from the journal for data or additional information should questions about the paper arise after publication.

Editorial decisions should be based on the relevance of a manuscript to their journal and on the manuscript's originality, quality, and contribution to evidence about important questions. Editors should not exclude from consideration for publication, studies with findings that are negative or that credibly challenge accepted wisdom, not statistically significant or have inconclusive findings. A public record of such negative or inconclusive findings may be of value to other researchers considering similar work and prevent needless use of resources, time and effort. Equally important is that such studies may provide evidence, which combined with that from other studies through meta-analysis, could help answer important clinically relevant questions.

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