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Neuroimaging Clinics of North America. Evidence-Based Neuroimaging

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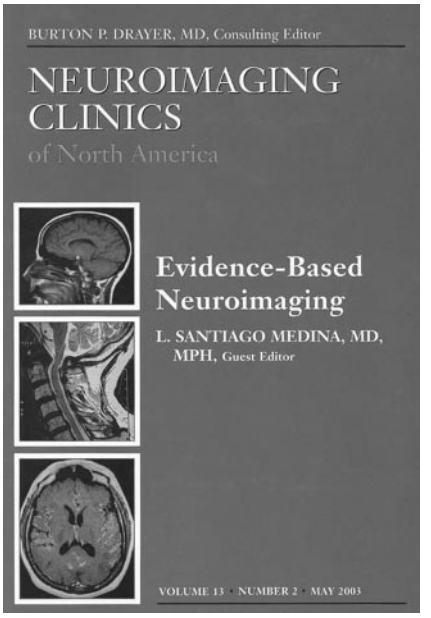
Neuroimaging Clinics of North America. Evidence-Based Neuroimaging
L. Santiago Medina, guest editor. Vol. 13, No. 2. May 2003. Philadelphia: WB Saunders; 327 pages, 90 illustrations. $80.00.

A volume of the *Neuroimaging Clinics of North America* dedicated to evidence-based knowledge in various neurologic disorders is a welcome initiative and an important contribution to the radiology literature.

For several years, there has been growing interest on the appropriate use of the current best evidence to make decisions about patient care. A systematic review of the available clinical research to assess the validity and applicability of the evidence represents the mainstay of evidence-based medicine; however, a balanced perspective between the quality of supporting scientific evidence and the physician's expertise and skills must also be integrated with patients' values and concerns for sound decision making. This pertains not only to medical treatment in general, but also to the application of diagnostic imaging tests. It is no secret that diagnostic tests and particularly imaging procedures are seldom evaluated in well-designed randomized clinical trials. Admittedly, there are factors that contribute to the paucity of randomized controlled trials in radiology. For example, the lack of gold standards can limit the appropriate measure of the diagnostic performance of a test. Conversely, ethical issues may be raised if the accuracy of an emerging technique is to be measured against an invasive procedure established as the gold standard.

Santiago Medina has assembled a group of recognized authorities in neuroradiology who were able to combine their review of the best available evidence from clinical research with their own expertise and offer the reader a summary of recommendations for the efficient utilization of diagnostic imaging resources.

The book contains 16 chapters that cover the evidence behind the use of imaging for some of the most prevalent neurologic diseases. Also to the credit of the guest editor, this multiauthored periodical publication shows a fairly consistent approach in presenting the information. Most the chapters follow a similar outline that includes a systematic literature review with critical analysis of the methodology used. The evidence for imaging patients with the various diseases selected for review is ranked in three levels, from controlled randomized trials to descriptive studies, and is graded from I to III. Level I is given to evidence obtained from well-designed randomized controlled trials or meta-analysis of randomized controlled trials. Level II is assigned to evidence that includes nonrandomized control trials, cohort studies, case control studies, or uncontrolled prospective studies. Level III is given to descriptive studies, case series, or reports of expert opinion or expert committees.



The chapters are nicely subdivided, which enhances the presentation and makes the book more readable. This arrangement also allows the reader to browse for the desired information easily. In each chapter, a summary of the evidence is consistently provided, and most of them are appropriately inserted either after the review of specific disorders or diagnostic modalities or following a more general discussion on cost-effectiveness analysis and future developments. Also included is pertinent demographic and clinical information, useful for gaining insight on pretest probability. The best available evidence for cost effectiveness is also presented in most chapters. In this regard, the chapters on head trauma, multiple sclerosis, and vertebroplasty deviate somewhat from this basic format, but they still provide a useful update.

The first chapter offers a clear and concise introduction to the fundamentals for judicious and systematic review of external evidence in decision making. This overview will enhance the reader's understanding of the basic principles behind that particular way of thinking that is needed for critical assessment of available data. The concept of statistical power and the importance of sample size as well as the different measures of diagnostic performance of a test are nicely illustrated with practical examples.

The chapter on imaging of acute ischemic stroke is an excellent comprehensive review of the existing

data and summarizes the evidence for the different contributions of imaging, from detection of hemorrhage and stroke to determination of penumbra. It is evident from this review that we are still striving for data supporting the use of screening MR before thrombolytic therapy.

The chapter on neuroimaging of seizures is also worth highlighting. It divides the applications of neuroimaging according to the type of epilepsy syndrome or seizure disorder, taking into account the pertinent epidemiologic data and addressing focused questions that include the impact on patient management. The importance of pretest probability is emphasized, because clinical decision rules are useful to predict imaging findings and patient outcome.

It is also interesting to realize how readily we may accept and routinely use a given procedure despite a relative paucity of evidence in support of such practice. That is the case of CT for sinusitis. Most treatment decisions remain clinically based. The sensitivity and specificity of CT for acute sinusitis is at best acceptable and, as for chronic sinusitis, CT does not correlate with clinical findings in most cases.

In conditions such as brain tumors, multiple sclerosis, and head and cervical spine trauma, and even in the investigation of headache, the contributions of neuroimaging seem unquestionable although practically all supportive evidence is based on level II and III studies. As for cost-effectiveness, the paucity of information is abysmal.

It is difficult to find serious fault in this well-conceived volume of the *Neuroimaging Clinics.* Perhaps I would have chosen a few more prevalent clinical problems such as AIDS, hydrocephalus, or carotid stenosis to be discussed above some of the selected subjects in this book. For example, the chapter dedicated to amyothropic lateral sclerosis, although nicely written, does not belong in this assemblage of conditions whose common denominator is prevalent disease.

Precisely one of the messages of this book is to stay away from obscure diseases.

Overall, this work raises our concerns particularly when facing the demands of the health care system for more effective and economical ways of improving diagnoses and outcomes. This compilation of existing evidence—or lack of it—should be mandatory reading for all of us involved in neuroimaging with the hope that it will engender desire among investigators to pursue meaningful research. The review of these articles has been assigned priority for our scheduled departmental journal clubs with residents and staff. When designing our investigations, our mission should be to address the key elements that can truly make a difference, that is, to conduct randomized controlled studies dealing with imaging of common health problems to measure the impact on clinical outcomes.