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# Future Challenges in Perinatal-Neonatal Medicine

V Y H Y u

## INTRODUCTION

We are now in an era of Evidence Based Medicine (EBM). Government and private agencies supporting and purchasing perinatal-neonatal health care, together with pregnant women and new parents, are increasingly demanding that the quality of obstetric and neonatal care be objectively evaluated. They are further demanding that such clinical practices be based on scientific evidence of efficacy and safety. The most important priority in perinatal-neonatal medicine as we enter the new millennium is to increase the practice of evidence-based perinatal-neonatal medicine.

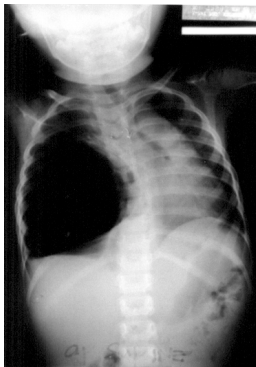
## EVALUATION OF PERINATAL-NEONATAL CARE

In the evaluation of the quality of the clinical care provided to high-risk pregnancies and critically-ill infants<sup>(1)</sup>, four questions are asked: (1) Efficacy: Can the intervention work? Whether it does more good than harm when implemented under carefully controlled conditions according to a research protocol? (2) Effectiveness: Does the intervention work? Whether it does more good than harm when implemented under normal 'field' conditions as in everyday clinical practice? (3) Efficiency: Is the intervention worth implementing? Whether the resources needed are better spent this way than in some other way? (4) Availability: Is the intervention reaching those who need it? Whether the services are accessible to the mothers and infants who may benefit from them? To answer these questions, firstly, medical evidence concerning beneficial effects of perinatal-neonatal interventions obtained by randomised controlled trials (RCTs) with long term outcome data are required. This will help determine efficacy. Secondly, population-based studies on long-term survival and disability among high-risk infants with accompanying economic evaluation are required. This will help determine effectiveness, efficiency and availability.

## EVIDENCE-BASED MEDICINE

EBM is a term that was first coined at McMaster University in Canada in the 1980s<sup>(2)</sup>. It describes the practice of systematically finding, appraising and using contemporaneous research finding as the basis for clinical decisions<sup>(3)</sup>. EBM is defined as the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The hierarchy of strength of such evidence from the weakest to the strongest is: (1) Physiological rationale and basic science research in animal models. (2) Clinical experience with no controls such as in a case report or series. (3) Observational study with historical or concurrent controls. (4) RCT of the intervention, with or without a systematic review of similar RCTs.

Cover Picture:  
 Chest x-ray  
 showing large  
 cystic lesion  
 at the right  
 lower lobe.  
 (Refer to pages  
 398-400)



V Y H Y u, MD, MSc  
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 DCH

## SYSTEMATIC REVIEWS

A systematic review involves the following steps: (1) The objectives of the review are specified. (2) Studies are identified and selected. (3) The validity of these studies is assessed. (4) The results of independent studies are combined. (5) Inferences from these results are made. This process requires an exhaustive search for published and unpublished RCTs so that all those of adequate quality to contribute to the decision-making are included. A standard methodology is followed so that the results can be 'meta-analysed' to obtain a quantitative estimate of the benefits and harms of any intervention. The results of RCTs can thus be combined to produce unbiased and precise estimates of the effect of an intervention on clinical outcomes, as distinguished from a non-systematic review where opinion is mixed with evidence.

Increasingly more professional bodies and academic institutions are acknowledging the preparation of a systematic review as evidence of having conducted important research. For example, the American Board of Paediatrics currently permits Neonatal Fellows to submit a systematic review as proof of meaningful research accomplishment contributing towards their postgraduate training accreditation.

The validity of systematic reviews has been questioned because they sometimes draw conclusions that are misleading or contrary to that obtained from a single but large RCT. It is without doubt that a large RCT with the power to detect important endpoints that include long-term follow-up data and economic evaluations, is superior to a meta-analysis comprised of many small trials.

## COCHRANE CENTRES

Systematic reviews in pregnancy and childbirth were first compiled in 1988 in database form as the Oxford Database of Perinatal Trials with regular updates. This was followed by the publication of the textbook *Effective Care in Pregnancy and Childbirth* in 1989 (Chalmers I, Enkin M, Keirse MJNC, Oxford, Oxford University Press, 1989) and its neonatal companion *Effective Care of the Newborn Infant* (Sinclair JC, Bracken MB, Oxford, Oxford University Press, 1992). Currently, the Cochrane Pregnancy and Childbirth Review Group and the Cochrane Neonatal Review Group continuously update systematic reviews in perinatal-neonatal medicine. These reviews are published electronically in the Cochrane Library containing the Cochrane Database of Systematic Reviews<sup>(4)</sup>. There are now about a dozen Cochrane Centres in various parts of the world.

## STRATEGY FOR THE NEW MILLENNIUM

It has now been widely acknowledged that RCTs are the best method of evaluating the efficacy of medical interventions. The results of a single large RCT or systematic reviews are increasing being applied to guide both providers and consumers in making informed decisions on health care policy and delivery. However, it cannot be assumed that such findings will automatically change medical opinion and practice among obstetricians and neonatologists. To be effective, systematic reviews of RCTs must be easily accessible to clinicians who need to be aware of them, who read them, and who are convinced enough to implement the findings. A strategy needs to be developed for the dissemination of results of systematic reviews in such a way that day-to-day clinical practice is modified for the better.

Australian neonatologists and obstetricians had been surveyed to determine how often systematic reviews are consulted, what are the

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predictors of their use, and whether their use has resulted in changes to clinical practice<sup>(5)</sup>. The survey showed that, compared to obstetricians, neonatologists were younger and more held an academic appointment, possessed a research degree, and had authored research papers. A higher percentage of neonatologists used computers at work (word processing, data analysis, and MEDLINE search). Furthermore, 72% of them used systematic reviews, compared to 44% of obstetricians. The majority of those who use systematic reviews had actually modified their clinical practice accordingly. Predictors of the use of systematic reviews included a younger age, a full-time staff specialist appointment, familiarity with computers, attendance at annual national scientific conferences, and authorship of research paper. Strategies, which increase awareness of EBM therefore, include: (1) Improvement to access and training in digital information technology (Internet, MEDLINE, Cochrane Library). (2) Utilisation of professional bodies such as national societies or specialist colleges to stimulate research and disseminate research findings. (3) Targeting of low compliance groups such as non-academic clinicians in private practice and those in the older age group.

**CONCLUSIONS**

The practice of perinatal-neonatal medicine is increasing evidence-based, but there is considerable room for improvement. The major priority in the new millennium is to encourage and facilitate all obstetricians and all neonatologists of all nationalities in both developed and developing countries, to practice EBM at all times. **SMD**

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