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A Review of the Use of Health Technology Assessment in Relation to the Safe and Effective Use of Diagnostic Imaging Technologies in Health Care

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Abstract

Health Technology Assessment (HTA) has become the standard methodology use by government agencies for evaluating the role and funding priorities of new Diagnostic Imaging (DI) technologies. A structured literature review of recent HTA reports concluded that there had been no major developments in assessment methods used in HTA and, therefore, no widespread spillover from the development in research methods in general to the field of HTA methodology.

Purchasing decisions of new technology are guided by a DI professional assessment of improvements in image quality, efficiency, safety and capacity for expanded range of diagnostic and procedural interventions. The implementation of a new technology in DI often precedes systematic reviews by HTA bodies of patient outcomes and may be based on data provided by manufacturers and on recent papers presented at professional conferences. This situation often leads to a clash of evaluation cultures between the DI profession and the HTA agencies charged with informing public purchasing and health policy.

As emerging DI technologies sit at the border of computer technology and social interaction between patients and clinicians, a number of authors have concluded that because of the complexities of health systems, both qualitative and quantitative data are required to resolve questions about the appropriate use of diffuse DI technologies. The authors conclude that assessment of DI technologies s should be based on qualitative methods involving surveys of the experience of practitioners and patients rather than only on traditional quantitative methods.

Keywords:

health technology assessment; diagnostic imaging; quantitative assessment; qualitative assessment

Definition of HTA

Health Technology Assessment (HTA) is a scientific and policy domain that has grown rapidly over the past twenty years. HTA is a multidisciplinary field of policy analysis. It studies the medical, social, ethical, and economic implications of development, diffusion and use of health technology. HTA seeks to inform health policy makers by using the best scientific evidence on the medical, social, economic and ethical implications of investments in health care.

HTA and priority setting

The impact of on new Diagnostic Imaging (DI) technologies on health care is seen as a major factor in the improvement in health outcomes in many developed countries. At the same time, DI is seen by critics as a driver of increases in health expenditure. While the various health professions have traditionally managed the introduction of new diagnostic imaging technology, principles of evidence based medicine are being rigorously applied to the introduction process by many government health authorities. New techniques and procedures have to be not only effective and beneficial, but also justify any increased costs and resources. It is a reality that a mechanism such as HTA is required for priority setting in government environments where there are competing calls on limited resources.

Literature review of developments in HTA methodology

A review of relevant literature has been conducted to determine trends in the use of HTA methodology for the assessment of DI technologies. Consideration is being given by academic radiologists to the issues of how to both collect evidence on the impacts of DI as well as how to deal with appraisal of rapidly changing technology [1]. A conceptual framework of a hierarchy of levels of efficacy that could guide thinking about imaging test evaluation has been developed. In particular, the framework relates the key questions; "How well does this test distinguish disease from the non-diseased state?"; "How much does this intervention improve the health of people?"; "What is the cost of that improvement?" The model describes decision analysis and cost-effectiveness analysis, which are quantitative modeling techniques usually used to answer the two core questions for imaging.

However, a structured literature review by Draborg et al [2] of 433 HTA reports from the period 1989 to 2002 by eleven leading HTA institutions worldwide found that lit-

erature reviews were still the most often used method of assessment. The authors concluded that there had been an increase in the number of HTAs but no major developments in assessment methods used and, therefore, no widespread spillover from the development in research methods in general to the field of HTA methodology.

Discussion

As a group of emerging technologies, DI sits at the border of computer technology and social interaction between patients and clinicians and thus calls for a socio-technological approach to evaluation of organizational, cultural and technological factors. An innovative qualitative approach to the assessment of DI technologies is required when seeking new directions for evaluation [3]. The conclusions of a recent workshop, Putting Evidence into Practice in Edmonton, concluded that: "In the end, evidence and information cannot be the determining factor in policy decisions. There will always be world views and values, which will help to determine when a condition becomes a problem and when the political situation is such that a decision can be made."[4]

The ability of HTA systematic reviews to keep pace with technological change in DI technologies is being challenged in environments of limited resources for research and evaluation. While both quantitative and qualitative techniques of evaluation have evolved over the last decade, the HTA paradigm of systematic review has not, yet controlled trial evidence of the outcome of DI technologies is often hard to find. It is suggested that assessment of DI technologies should be based on qualitative methods involving surveys of the experience of practitioners and patients rather than only on traditional quantitative methods.

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