

# Emerging Ethical Issues in Magnetic Resonance Imaging.

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## INTRODUCTION AND COMMENTARY: EMERGING ETHICAL ISSUES IN MAGNETIC RESONANCE IMAGING

This issue of Topics in Magnetic Resonance Imaging represents a first foray into the realm of medicine where principles in bioethics and a range of issues in modern imaging meet. With its roots in medical ethics, the field of bioethics emerged in the 1960s from an accumulation of concerns that “the old tradition of medical ethics was too frail to meet the ethical challenges posed by the new science and medicine” (1). Very much an integration of theory, philosophy, and practice from a wide range of disciplines, bioethics involves a “systematic study of the moral dimensions—including moral vision, decisions, conduct and policies—of the life sciences and health care, employing a variety of ethical methodologies in an interdisciplinary setting (2). In its application to medical imaging, bioethics gives us the foundation upon which to frame the complex problems faced by imagers with research programs to maintain, clinical imaging centers to run, and subject and patient welfare at the core of our activity. This special issue draws upon widely varying examples of issues in medical imaging—conflict of interest, screening magnetic resonance imaging (MRI) for breast cancer, child abuse, screening for coronary artery disease, and the impact of managed care on the development and adoption of new technologies—to introduce and highlight the broad scope of the issues at hand.

In the first article in this issue, “Conflicts of interest in magnetic resonance imaging: Issues in clinical practice and research,” bioethicist Mildred Cho describes the many circumstances in which conflict of interest arises in MRI in medicine and research and carefully distinguishes between sound strategies for managing conflict of interest issues versus misconduct or malpractice. With conflict of interest virtually routine in the imaging disciplines because of the close relationship among industry, academia, and private practice, Cho emphasizes that a careful understanding of the variables that constitute conflict of interest is essential for the proper mitigation of potential adverse effects. Given the rapid pace at which MRI is evolving, however, her discourse clearly underscores the need for professionalism and disclosure in medical imaging to extend well beyond the parameters of existing capabilities of today and to anticipate the technology and concerns of tomorrow.

The article entitled “Ethical issues in contrast-enhanced magnetic resonance imaging screening for breast cancer,” by health outcomes analyst Sylvia Plevritis and radiologist Debra Ikeda provides an in-depth analysis of the practical, technologic, and profoundly personal considerations surrounding breast cancer imaging with new MRI capabilities. With the renewed debate over the effectiveness of breast cancer screening with conventional mammography (3), the challenge posed to MRI to prove its effectiveness in reducing breast cancer mortality is even greater than before. The authors describe the risks and benefits of MRI screening that should be explained to screening participants and the evidence needed by policy makers who ultimately will determine the allocation of health care resources to MRI breast cancer screening.

In his article “Ethical issues in imaging nonaccidental injury: Child abuse,” Patrick Barnes provides a detailed discussion of the role of imaging in diagnosing inflicted traumatic injury to the central nervous system in children and the role of the neuroradiologist as an expert medical witness. With traumatic central nervous system injury reportedly the leading cause of morbidity and mortality in children, the appropriate and ethical use of diagnostic imaging studies in both the medical environment and the courtroom is vital. The imaging study may be a determining factor in the medical, social, and legal outcomes at stake for a child and family. In our view, one of the most critical messages from this article is that despite tense dynamics and pressures endemic in the legal setting, the opinion of the medical expert should be the same whether rendered for the defense or for the prosecution, that is, unbiased and data driven.

In a very different application of advanced imaging that encompasses a variety of modalities including both MRI and gated computed tomography (CT), radiologist Lewis Wexler considers the “Ethical considerations in image-based screening for coronary artery disease.” Coronary artery disease (CAD) and its complications account for 20% of all deaths in the United States—more than any other cause of death—and half of those who die suddenly of an acute myocardial infarction have no prior symptoms or overt manifestations of their underlying CAD. Diagnostic tests utilizing MRI and CT are being developed to screen for CAD in symptomatic patients as well as preclinical or asymptomatic individuals, but clinical studies have not definitively demonstrated the efficacy of either of these modalities. Screening sites are nevertheless proliferating, and patients are demanding screening tests for CAD (4). Current concepts of the pathophysiology of CAD, the ethical issues surrounding emerging screening trends, and the appropriate role of the radiologist as a physician interacting directly with a patient are discussed in this important article.

The final article in this special issue, “Managed care, medical technology, and the well-being of society,” by health research policy analyst Laurence Baker challenges the common perception that managed care has worsened patient care. This article considers the effects of managed care on technology development, adoption, and use, and examines the related implications for the well-being of patients. Dr. Baker describes how the growth in managed care has brought about attempts to limit the use of some new technologies and reductions in physician and hospital reimbursement that, in turn, have shifted demand for new innovations and created limitations on their availability. Downstream changes in the level of market demand then influence the strategies of researchers and developers, ultimately shifting the kinds of research that is

done and the innovations that are brought to market. While advances in medical technology have yielded substantial benefits for patients, they also have been an important driver of health care costs. In this article, Dr. Baker meticulously examines the trade-offs between spending for the promise of new technology, better health care, and patient quality of life.

Quality of life, in fact, is one of the four structural elements embodied by the moral context in clinical ethics (5); the other elements are medical indications, patient preferences, and the contextual features of a person's condition or situation. While each of the contributions to this special issue of Topics in Magnetic Resonance Imaging considers a unique perspective, approach, or methodology in medical imaging, each embraces these fundamental elements. As such, we hope this special issue provides the basis for a new awareness of the ethical issues in medical imaging and the dialogue in which we must engage, not only within the medical imaging community but with our colleagues whose values and standards for advancing quality and compassionate medicine we share.

