Preauthorization of CT and MRI Examinations: Assessment of a Managed Care Preauthorization Program Based on the ACR Appropriateness Criteria® and the Royal College of Radiology Guidelines

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Purpose: To evaluate computed tomography (CT) and magnetic resonance imaging (MRI) utilization patterns before and after the implementation of a preauthorization program based on the ACR Appropriateness Criteria® and the guidelines of the Royal College of Radiologists.

Materials and Methods: All CT and MRI requests received at the preauthorization center and CT and MRI examinations actually performed were identified by our health care service's centralized computerized database between January 1, 2000, and December 31, 2003. The obligatory preauthorization of CT and MRI requests was established for CT in September 2001 and for MRI in February 2002. All ambulatory CT and MRI examination requests sent for approval during the study period by most of our health care physicians were included in the study. The preauthorization program model is presented, and multiple parameters were evaluated from January 2000 to December 2003, before and after preauthorization was established.

Results: Before preauthorization was required, the CT and MRI utilization rates were constantly increasing by 20% and 5% per year for CT and MRI, respectively. After preauthorization was implemented, CT and MRI annual performance rates decreased from 25.9 and 7 examinations per 1,000, respectively, in 2000 to 17.3 and 5.6 examinations per 1,000, respectively, in 2003. The decreases in the utilization of MRI and CT imaging between 2001 and 2003 were 9% (12,129 compared with 11,070 MRI examinations) and 33% (81,223 compared with 57,204 CT examinations), respectively, resulting in substantial, statistically significant cost savings. The deferral rate ranged from 7.5% to 12.2% (mean = 9.8%) for CT and 13.9% to 21.4% (mean = 17%) for MRI. Deferred cases in CT were most commonly in neuroradiology, musculoskeletal radiology, and CT angiography (ranges of deferred cases 9% to 12%, 11% to 12%, and 10% to 12%, respectively). Deferred cases in MRI were most commonly in abdominal and chest radiology (ranges of deferred cases 32% to 37% and 20% to 31%, respectively). Computed tomography was more commonly utilized inappropriately by pediatric professions, and MRI was more commonly utilized inappropriately by medical subspecialty professions.

Conclusion: Preauthorization of CT and MRI requests results in a substantial decrease in utilization of these modalities with reduction in imaging costs.

Key Words: Computed tomography, MRI, preauthorization, imaging utilization

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INTRODUCTION

During the past few decades, the costs of health care services have increased considerably while inherently scarce health care resources have decreased. In 1965, the United States devoted 5.9% of its gross national product to health expenditures. By 1995, this figure had risen to approximately 14%, and if current projections hold, it is estimated that expenditures will double to $2.3 trillion, or approximately 17% of the gross national product by 2007 [1]. The present situation in Israel is similar, with a significant increase in the portion of the gross national product devoted to health expenditures in the past few decades. Rationing health resources has become inevitably necessary with the rapid emergence of managed care organizations that have developed programs designed to intervene with the delivery of services, judging the appropriateness of procedures before they are performed.

Diagnostic radiology plays an important role in medical practice, providing physicians with valuable clinical information that may guide the management of their patients. Diagnostic radiologic services constitute a significant portion of health care costs, accounting for approximately 8% of health care costs paid to physicians in the United States [1]. In the past few decades, the utilization of radiologic services has increased dramatically [2,3]. This is largely due to the increased use of newer and more expensive technologies, such as computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound; the shift toward an older population; patient demand; the fear of litigation; and fee-for-service systems that encourage physicians, radiologists, and especially nonradiologists to perform more studies. Selecting the most appropriate diagnostic imaging procedure has become a complex task, with evident inappropriate utilization subjecting patients to unnecessary radiation exposure [4], expense, physical risk, emotional distress, and sometimes prolonged hospitalization.

In 1990, the guidelines of the Royal College of Radiologists (RCR) [5] were introduced in the United Kingdom to encourage the appropriate use of radiologic examinations and to reduce the use of clinically unhelpful examinations. The RCR's guidelines set the clinical situation for requesting an examination, provide possible imaging techniques, and give a graded recommendation on whether the investigation is appropriate, with explanatory comments. The recommendations used are as follows: examination indicated (will most likely contribute to clinical diagnosis and management), examination not indicated initially (clinical problem may resolve with time, and examination should be initially deferred for 3 to 6 weeks), examination not indicated routinely (examination should not be performed unless the clinician provides cogent arguments for it), examination not indicated (the rationale for the examination is untenable), and specialized investigation (complex or expensive investigations that should be performed for physicians with relevant clinical expertise).

In 1993, the ACR formed a task force that developed the ACR Appropriateness Criteria® [6,7]. The ACR Appropriateness Criteria® are evidence-based guidelines developed to help referring physicians make the most appropriate imaging or treatment decisions. The guidelines were developed by expert panels in diagnostic imaging, interventional radiology, and radiation oncology. Each panel included leaders in radiology and other specialties. Currently, more than 170 topics and 800 variants are addressed by these criteria. Each clinical condition is discussed by its variants, and a radiologic examination or procedure is recommended using an appropriateness scale ranging from 1 (least appropriate) to 9 (most appropriate). The RCR and ACR guidelines aid with the management of clinical problems and provide an orderly sequence of studies that are most likely to provide a diagnosis.

In the past, programs requiring the preauthorization of radiology requests have received a great deal of criticism from the public as well as from physicians [8-10]. However, a vast majority of these programs were based on a paucity of clinical guidelines, were not intended to cause physician behavior modification and education, and simply created cumbersome barriers that interfered with patient care [8]. A few articles have addressed the applicability of the ACR Appropriateness Criteria® as well as the RCR's guidelines [11-13], implying that they may be applied to general practice and may influence referrals by general practitioners. With the rising costs of radiologic services and especially the high rate of nonradiologist-performed procedures, preauthorization programs operated by radiologists seem to be a possible solution. Given the rapid advance in imaging technology, preauthorization programs run by medical management companies, insurance companies, or nonradiologist physicians may not provide an adequate solution. They may lack the professional radiologic expertise to be able to identify the preferred study, they may have professional biases, and they may be legally or morally committed to group or corporate benefits. However, we are not aware of any articles reporting large-scale preauthorization programs operated by board-certified radiologists and based on these guidelines. We present a preauthorization program for CT and MRI examinations based on the ACR and the RCR guidelines.

MATERIALS AND METHODS

Background

Macabbi Health Care Service's is the second largest health care provider in Israel, serving more than 1.7