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Abstract Category: DNP in Policy Leadership

Title: Title of Doctoral Capstone Project:

Purpose: The tremendous increase in cardiovascular services in the last decade has been driven largely by the growth of cardiac imaging. Appropriate Use Criteria (AUC) for single photon emission computed tomography myocardial perfusion imaging (SPECT MPI) was updated in 2009 to guide more responsible use of cardiac radionuclide imaging (RNI) as well as to guide and trend utilization patterns. In 2010, the Intersocietal Accreditation Commission (IAC) published quality of care standards that require nuclear medicine laboratories to obtain and document quality assurance measurements of AUC for SPECT MPI in order to receive proper accreditation, to establish a database to guide insurance coverage decisions, and offer an alternative to current prior authorization and precertification approaches. To date, there have been no published studies on AUC and SPECT MPI in community-based hospitals.

Objective 1: To describe rates of appropriate patient referrals for single photon emission computed tomography myocardial perfusion imaging (SPECT MPI) studies, as defined by 2009 appropriate use criteria (AUC), in a community-based hospital setting

Objective 2: To determine the frequency of inappropriate testing

Objective 3: To determine the frequency of inappropriate indications; to explore the association between referral patterns with trends of the appropriateness categories; to explore the association between SPECT MPI results and appropriateness categories.

Abstract:

Background

The tremendous increase in cardiovascular services in the last decade has been driven largely by the growth of cardiac imaging. Appropriate Use Criteria (AUC) for single photon emission computed tomography myocardial perfusion imaging (SPECT MPI) was updated in 2009 to guide more responsible use of cardiac radionuclide imaging (RNI) as well as to guide and trend utilization patterns. In 2010, the Intersocietal Accreditation Commission (IAC) published quality of care standards that require nuclear
medicine laboratories to obtain and document quality assurance measurements of AUC for SPECT MPI in order to receive proper accreditation, to establish a database to guide insurance coverage decisions, and offer an alternative to current prior authorization and precertification approaches. To date, there have been no published studies on AUC and SPECT MPI in community-based hospitals.

Specific Aims

To describe rates of appropriate patient referrals for single photon emission computed tomography myocardial perfusion imaging (SPECT MPI) studies, as defined by 2009 appropriate use criteria (AUC), in a community-based hospital setting; to determine the frequency of inappropriate indications; to explore the association between referral patterns with trends of the appropriateness categories; to explore the association between SPECT MPI results and appropriateness categories.

Methods

Demographic, stress data, and imaging results were collected from 162 patient charts and electronic medical records over a 4-month period for SPECT MPI stress testing. Charts were retrospectively reviewed and referrals categorized as ‘appropriate,’ ‘inappropriate’ or ‘uncertain.’ Patient records were chosen for review based on convenience. The sample included inpatients and outpatients referred for SPECT MPI within one facility. Categories were initially assigned by two cardiologists overseeing SPECT MPI during a chosen day and then categorized a second time by a cardiology nurse researcher. Studies were further classified across appropriateness categories according to provider type. The top three inappropriate indications were also tabulated. Differences between referral group and the appropriateness categories were compared using Fisher Exact Chi-square. SPECT MPI studies were then read by the cardiologist as ‘normal’ or ‘abnormal’ and differences between the SPECT MPI results and the appropriateness categories were tested using Fisher Exact Chi-square.

Results

One hundred fifty seven of the patients were successfully categorized into appropriate use categories. The majority of patients were categorized as ‘appropriate’ (73%), 23% as ‘inappropriate’ and 4% as ‘uncertain.’ The patient population was inherently a low-risk population: Thirty-four percent of the participants were < 50 and 79% were < 69 years of age; ninety-one percent of the patients had normal sestimibi scans and had no previous history of coronary revascularization and 89% of the patients were able to exercise on the treadmill. Women < 50, and those patients referred by primary care, hospitalists and emergency room physicians, were more likely to undergo inappropriate SPECT MPI. Symptomatic, low-risk patients who had interpretable EKGs and were able to exercise, accounted for more than one-half of the inappropriate tests (57%). Intermediate risk, symptomatic patients who were able to exercise with normal EKGs (17.1%) and preoperative risk assessment for low-risk patients (11.4%) were the second and third most referred indications for inappropriate SPECT MPI. Differences between the appropriate categories and the referring group were found to be statistically significant (p < 0.0013). Although there was a higher proportion of abnormal SPECT results in the
appropriate category (78.6%) than inappropriate category (14.3%), there was no statistically significant difference between the three groups (p=0.68).

Conclusions

With the rapid growth of cardiac imaging procedures and increased need for SPECT MPI for both risk assessment and diagnosis, all academic and community-based hospitals should adhere to the AUC for SPECT MPI to prevent overuse, improve healthcare delivery and promote quality assurance efforts. Utilization trending will lead to practice optimization, target education efforts and reduce third party costs to practitioners and health plans. Community-based hospitals are more likely to target low-risk patients. By identifying inappropriate referral patterns and sources as well as identifying low-risk patient categories, hospitals can successfully reduce inappropriate RNI.