PET UTILIZATION FOR PATIENT MANAGEMENT

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INTRODUCTION

Myocardial perfusion imaging (MPI) with positron emission tomography (PET) has been a valuable tool for the imaging cardiologist to identify risk, quantify risk, and to guide therapy in patients with known or suspected coronary artery disease (CAD). The sensitivity and specificity of PET MPI have been identified as the key drivers for use. A normal perfusion study indicates low risk with a less than 1% annualized rate of cardiac events of cardiac death and non-fatal myocardial infarction, while an abnormal study indicates high risk[1]. In addition, PET MPI can identify patients with high-grade obstructive CAD, resulting in fewer patients undergoing invasive cardiac angiography without revascularization[2]. Although PET MPI has been found to have multiple benefits over single photon emission computed tomography (SPECT), the overall use of PET MPI in the U.S. is far behind the use of SPECT MPI[2, 3].

To better understand the benefits of PET MPI for patient management, MedAxiom interviewed four cardiovascular organizations that added PET MPI to their imaging programs in the last decade. All four programs have found PET MPI to be an integral part of their imaging programs. A review of program demographics, payer landscape, PET MPI use cases, and key drivers for PET MPI program growth will provide valuable insights.

BENEFITS OF PET OVER SPECT[3]

1. **Lower dose of radiation exposure to the patient**
2. **PET has the ability to quantify myocardial blood flow**
3. **PET has improved resolution**
4. **PET requires shorter time to obtain the images**

PROGRAM DEMOGRAPHICS

All four cardiovascular organizations have added PET MPI to their imaging programs within the last five to 10 years. All four programs offer outpatient PET MPI imaging with one program offering inpatient imaging in addition to outpatient imaging. Each program describes the ability to perform between eight and 12 PET MPI studies per day.

PAYER LANDSCAPE

All four programs describe Medicare fee-for-service (FFS) as providing the best reimbursement with the least amount of friction. No prior authorization is required. Programs range from 60-80% Medicare FFS for their PET MPI patient populations. One of the major barriers to an increase in PET MPI use is commercial payer reimbursement as many payers will cover PET MPI but require prior authorizations and limit usage to certain patient populations. For tracer coverage, all programs note that tracer was a pass-through payment, and reimbursement was not a challenge in the majority of cases.

PET MPI USE CASES

All four programs describe PET MPI as first line noninvasive imaging study for possible ischemic heart disease in patients unable to ambulate and over age 65 who require ischemic work-up to assess the presence of flow-limiting obstructive CAD as a potential etiology for chest pain or equivalent symptoms. In addition, programs describe use of PET MPI for risk stratification and prognostic value in symptomatic patients with suspected or known CAD. In review of the recently published ASNC/SNMI PET MPI appropriate use criteria (AUC), all primary reasons for use of PET MPI described by the programs meet the AUC with scores of 7 – 9[4].

MOST COMMON REASONS TO ORDER PET MPI

1. **Rule out ischemic CAD 2**
2. **Quantify ischemic CAD**
3. **Patients unable to ambulate**
4. **Patients >65**
5. **Patient BMI >40**

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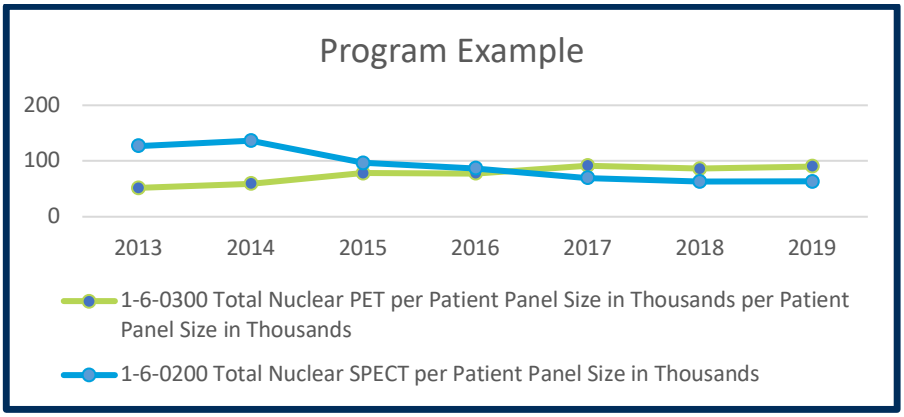
All programs note a decrease in their SPECT volumes in the first two to three years of adding PET MPI, likely due to the transition of SPECT to PET in certain patient populations **(figure 1).**

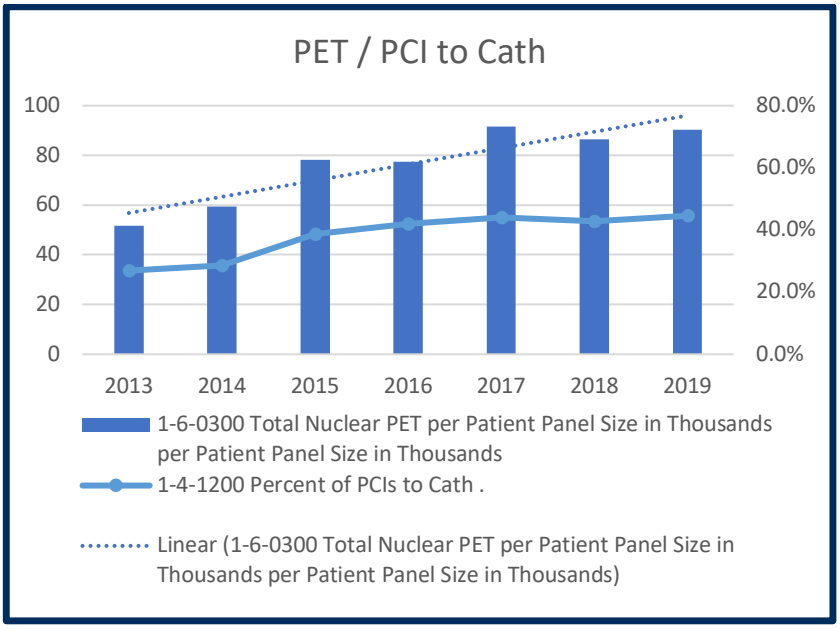
FIGURE 1



All note they found PET MPI to provide better sensitivity and specificity and greater support for appropriate decision to proceed with invasive imaging with possible percutaneous intervention. All programs anecdotally note a decrease in false positive studies with PET MPI and an increase in confidence for the negative study minimizing the need for additional invasive imaging. In some cases, a decrease in diagnostic coronary angiography is noted and in other cases there is a shift programs' percutaneous coronary intervention to cath ratio suggesting fewer normal diagnostic catheterizations **(figure 2)**. Although the data does not allow a statistical analysis, the trends are noted by the program leaders and PET MPI results are described as a major contributing factor.

> "PET MPI is an integral component of our noninvasive imaging program."

FIGURE 2



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One program has the benefit of having a PET MPI camera inside the hospital. The initial plan was to provide the modality for outpatients. However, soon after implementation, the program started offering PET MPI to inpatients and found the modality to be invaluable for chest pain evaluation from the Emergency Department (ED) and the inpatient floors. The program found the benefit of fewer false positive tests, shorter turn-around times, and ease of use for patients created a significant value for their acute care patients. They currently offer services five days per week but are planning to increase to seven days per week.

OPPORTUNITY FOR PROGRAM GROWTH

Use of PET MPI for ED and inpatients

KEY DRIVERS FOR PET MPI GROWTH AND SUSTAINABILITY

All programs find PET MPI to be a strong economic driver for their organizations. However, the economic benefit and sustainability relies on volumes. Several common factors are noted as key drivers for the organizations.

KEY DRIVERS	
Physician Leadership	It's crucial to have a physician champion leading the initiative from vision to implementation. Adoption of PET MPI starts with a clinical strategy that is physician initiated and physician led. All programs note that close to 50% or more of their physicians read PET MPI and 100% order the studies.
Supportive Payer Market	As noted above, Medicare FFS is reliable and requires the least administrative processes for reimbursement. All four programs note very little Medicare Advantage in their markets, resulting in 60-80% of the patients that clinically qualify for PET MPI being Medicare FFS. All the programs note that most commercial insurers would cover PET MPI, but the administrative requirements were higher, and the inclusion criteria were fewer.
Competent Nuclear Imaging Staff	All programs note that they have competent nuclear imaging staff who manage the transition to PET MPI well and support the image acquisition to allow for the improved accuracy of PET MPI over SPECT MPI.
Knowledgeable Ordering Physicians	All programs have full physician engagement in their cardiology program, a key factor for program growth. Two programs note that non-cardiologists order a small portion of their studies and they are looking for ways to better educate and engage more non-cardiologists to use PET MPI for their appropriate patient populations.

REFERENCES

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