SNMMI AUC Factsheet for FDG PET/CT in Restaging and Treatment Response Assessment in Lung Cancer

EXECUTIVE SUMMARY
Nuclear medicine imaging studies are essential for the diagnosis and management of many diseases, including cancer. The ready availability of medical imaging studies in conjunction with concerns about missed diagnoses has, at times, resulted in inappropriate use and overuse of medical imaging technology, including nuclear imaging. The overuse has resulted in an unnecessary financial burden on the health-care system and in some cases unnecessary exposure to ionizing radiation. Overuse and inconsistent use of imaging procedures has prompted a push for multi-stakeholder consensus documents outlining the most appropriate and cost-effective use of advanced medical imaging studies.

Precision medicine is evolving to include a variety of data to optimize patient care and improve outcome. Multimodality imaging is paving the way toward this goal. PET/CT with 18F-FDG is now established as an important imaging modality in many clinical conditions, particularly in oncology. Many tumors demonstrate high glucose metabolism as one of the hallmarks of cancer. PET/CT provides combined anatomic and physiologic (glucose metabolism) information that may be used for initial diagnosis, staging, restaging, treatment response assessment, and prognosis in patients with cancer. Moreover, PET information can contribute significantly when other imaging modalities are equivocal.

AUC INTRODUCTION
The purpose of this document is to describe the appropriate use criteria (AUC) of PET/CT in the response assessment and restaging of patients with cancer. For the purposes of this work, the term assessment of response is taken to mean the period in which the intended target of the therapeutic regimen is being evaluated, whereas the term restaging of disease is taken to mean the period in which there is concern for new or progressive disease after completion of prior therapy. Moreover, this document excludes “initial staging” and “surveillance.”

CLINICAL SCENARIOS FOR LUNG CANCER
Lung Cancer represents around 13.3% of all new cancer cases, and it is estimated that it will be the cause of 26.5% of all cancer-related deaths, with only around 17.7% of all lung cancer patients surviving 5 years from the initial diagnosis.

Because of the high-risk recurrence of metachronous metastasis in patients with colorectal carcinoma, there is great interest in noninvasive restaging and therapy monitoring. Currently, PET/CT is not routinely used for initial staging, other than to evaluate indeterminate findings from other modalities.

<table>
<thead>
<tr>
<th>Scenario no.</th>
<th>Description</th>
<th>Appropriateness</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Restaging for detection of local recurrence</td>
<td>Appropriate</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Restaging for detection of metastases</td>
<td>Appropriate</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Treatment response evaluation</td>
<td>Appropriate</td>
<td>7</td>
</tr>
</tbody>
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Rating and Scoring
The scenarios are scored as “appropriate,” “may be appropriate,” or “rarely appropriate” on a scale from 1 to 9. Scores 7–9 indicate that the use of the procedure is appropriate for the specific scenario and is generally considered acceptable. Scores 4–6 indicate that the use of the procedure may be appropriate for the specific scenario. This implies that more research is needed to classify the scenario definitively. Scores 1–3 indicate that the use of the procedure is rarely appropriate for the specific scenario and generally is not considered acceptable.

Methodology
The process for AUC development was modeled after the RAND/UCLA Appropriateness Method for AUC development. It included identifying a list of relevant clinical scenarios, a systematic review of evidence, and a systematic synthesis of available evidence, while adhering to the Institute of Medicine’s standards for developing trustworthy clinical guidance.

This AUC was developed by the Society of Nuclear Medicine and Molecular Imaging with participation from experts affiliated with the following organizations: European Association of Nuclear Medicine; American Society of Clinical Oncology; American College of Nuclear Medicine; Society for Pediatric Radiology; and Canadian Association of Nuclear Medicine.

For the complete manuscript and listing of references, visit: http://snmmi.files.cms-plus.com/Quality/jnm197988_v1.pdf

JNM Reference