

# SNMMI AUC Factsheet for FDG PET/CT in Restaging and Treatment Response Assessment in Head and Neck Cancer



## EXECUTIVE SUMMARY

Nuclear medicine imaging studies are essential for the diagnosis and management of many diseases, including neoplastic disease. 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 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  $^{18}\text{F}$ -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 a combined anatomic and physiologic (glucose metabolism) information that may be used for initial diagnosis, staging, restaging, treatment response assessment, and prognosis in patient 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 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 HEAD AND NECK CANCER

In the United States, there is an estimated 55,000 new head and neck cancer cases every year and approximately 12,000 deaths each year. Head and neck squamous cell carcinoma (HNSCC) accounts for 90% of head and neck cancers. The overall 5-year survival rate for all stages is approximately 60%. The survival depends on several factors, the most important of which is disease stage and Human Papilloma Virus (HPV) association.

PET/CT findings in post-therapy assessment are time and therapy dependent. An increase in FDG uptake occurs in recently radiated tissues, which may last 12 to 16 weeks. To ensure a balance between the disadvantages of early and late imaging, the first post-treatment PET/CT scan to assess therapy response is recommended at least 12 weeks post-radiation therapy, to minimize radiation related inflammatory uptake and at least 3 weeks after completion of chemotherapy.

## Clinical Scenarios for Head and Neck Cancer

Scenario no.	Description	Appropriateness	Score
1	Restaging for detection of local recurrence	Appropriate	7
2	Restaging for detection of metastases	Appropriate	9
3	Treatment response evaluation	Appropriate	7

## 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](http://snmmi.files.cms-plus.com/Quality/jnm197988_v1.pdf)

## JNM Reference

Jadvar H, et al. Appropriate Use Criteria for  $^{18}\text{F}$ -FDG PET/CT in Restaging and Treatment Response Assessment of Malignant Disease: J Nucl Med 2017; 58:2026-2037 (10.2967/jnumed.117.197988).