

Title:	Positron emission tomography (PET) for head and neck cancer
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Aim

To assess the safety, effectiveness and cost-effectiveness of PET/CT for squamous cell cancer of the head and neck: in addition to conventional staging of newly diagnosed or recurrent cancer; in addition to conventional assessment for suspected residual cancer after definitive treatment; and in addition to conventional staging of cancer metastatic to cervical lymph nodes from an unknown primary site.

Results and conclusions

Safety: PET and PET/CT are considered safe procedures.

Effectiveness: No direct evidence was found reporting the health outcomes of patients with head and neck cancer, assessed with and without FDG-PET. Therefore, evidence for accuracy, change in management and the expected benefit of changes in treatment on health outcomes was considered to evaluate the effectiveness of PET using a linked evidence approach.

Evidence for the incremental accuracy of PET over conventional staging indicated that in addition to conventional staging, PET/CT improves the accuracy of staging of newly diagnosed or recurrent cancer and leads to a change in management in the majority of patients in whom additional disease is detected. PET changed management in 32% of all patients (70% when additional lesions were detected; 11% when no additional lesions).

Evidence for the incremental accuracy of PET in suspected residual disease after definitive treatment indicated that PET has a low negative likelihood ratio (range 0-0.18) and a high negative predictive value (NPV range 83-100%).

Evidence was limited on the additional value of PET/CT to conventional staging for the assessment of patients with an unknown primary site.

Economic considerations: The estimated cost of PET for 100 patients was \$105,300 (range:\$76,100-\$206,700) with a slight cost offset attributable to subsequent short-term changes in patient management, giving an estimated net cost of \$81,00 per 100 patients. An exploratory threshold analysis was conducted to consider the potential impact of increasing the radiotherapy field; based on conservation assumptions it was estimated that the cost per recurrence avoided is around \$151,100 (range \$109,400-\$295,000).

Recommendation

MSAC finds that PET/CT is safe. MSAC finds that PET/CT improves the accuracy of staging of newly diagnosed or recurrent cancer, and leads to a change in management in the majority of patients in whom additional disease is detected; while this is expected to improve outcomes for patients, the magnitude of this effect could not be quantified. MSAC finds that PET/CT has a high negative predictive value in patients with suspected residual cancer, and permits the avoidance of invasive procedures, including surgery, in the majority of patients in whom these were planned; while this is expected to reduce morbidity and improve quality of life, the magnitude of this effect could not be quantified. MSAC finds that PET/CT improves the detection of otherwise occult primary sites of metastatic head and neck cancer, leading to changes in the management of these patients; the impact of such changes on patient outcomes could not be quantified. MSAC advises that public funding should be supported for these indications.

Methods

This report updates a previous MSAC review from 2001. A recent high quality health technology assessment (HTA) report from the National Coordinating Centre for HTA (NCCHTA)-United Kingdom (Facey et al, 2007) was used as the basis of this assessment. A systematic review to January 2008 was undertaken to include more recent studies. In the absence of an overall measure of health outcome (eg life-years saved), a threshold analysis was conducted to explore economic implications.