

Advice Statement 009/17

December 2017

Is FDG PET-CT clinically and cost-effective for staging and/or restaging in patients with suspected renal or bladder cancer following an abnormal result on contrast-enhanced CT or MRI?



This advice has been produced following completion of evidence note 72 by Healthcare Improvement Scotland, in response to an enquiry from the Scottish PET-CT Working Group. The evidence note is available from the Healthcare Improvement website.

Background

Cancers of the kidneys and bladder accounted for approximately 6% (n=1,841) of all cancers in Scotland in 2015. The most common cancers affecting the kidneys or bladder are renal cell carcinomas and urothelial carcinomas, respectively.

Conventional radiological imaging for suspected urological cancers includes ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and bone scintigraphy. ¹⁸F-fluorodeoxyglucose positron emission tomography - computed tomography (FDG PET-CT) is an additional imaging modality that could potentially be used for staging or restaging in patients with suspected renal or bladder cancer following indeterminate findings on conventional imaging.

Clinical effectiveness

Renal cancer

- A meta-analysis of seven studies (n=535) evaluated the diagnostic accuracy of FDG PET-CT for restaging renal cell carcinoma in patients with suspected disease recurrence:
 - Pooled sensitivity was 0.88 (95% confidence interval (CI) 0.84 to 0.91) and pooled specificity was 0.88 (95% CI 0.82 to 0.92).
- In a small retrospective study (n=104) in patients with suspected renal cell carcinoma recurrence or metastases, treatment method and/or intent was changed for 43% (n=45) of study participants.

Bladder cancer

- A meta-analysis of seven studies (n=253) reported diagnostic accuracy for FDG PET-CT separately for primary staging and restaging/metastases detection in patients with suspected bladder cancer:
 - Primary staging (2 studies) - pooled sensitivity was 0.90 (95% CI 0.70 to 0.99) and pooled specificity was 1.00 (95% CI 0.74 to 1.00).
 - Restaging/metastases (5 studies) - pooled sensitivity was 0.82 (95% CI 0.72 to 0.89) and pooled specificity was 0.89 (95% CI 0.84 to 0.95).

- Four observational studies (2 prospective and 2 retrospective; n=293) reported changes to patient treatment method and/or intent in 20-47% of study participants based on FDG PET-CT findings.

Safety

- The studies identified did not evaluate adverse events relating to the use of FDG PET-CT in patients with suspected renal or bladder cancer.
- Imaging using FDG PET-CT involves exposing patients to ionising radiation. No studies reported on the effect of this radiation exposure on patients with renal or bladder cancer.

Cost effectiveness

- No cost-effectiveness evidence was identified relating to the use of FDG PET-CT in patients with suspected renal or bladder cancer.

Conclusion

There was evidence from meta-analyses of small numbers of patients (n=535 and n=253, respectively) that FDG PET-CT is effective for detecting disease recurrence or metastases in patients with suspected renal or bladder cancer following indeterminate findings on conventional imaging.

Evidence from a small number of observational studies suggests that FDG PET-CT findings influence treatment decisions in up to half of patients with suspected renal or bladder cancer following indeterminate conventional imaging results. No studies were identified that reported long-term oncological or quality of life outcomes resulting from changes in patient management. Therefore it is uncertain what impact FDG PET-CT findings have on long-term patient outcomes.

No evidence was identified which assessed the cost-effectiveness of FDG PET-CT in patients with urological cancers. Therefore, no conclusions could be drawn about the cost-effectiveness of FDG PET-CT in this patient group.

Further research

- Current evidence on FDG PET-CT in patients with renal or bladder cancer appears to be at stage three or four of the [IDEAL-D framework](#).
 - Future diagnostic studies should evaluate the impact of FDG PET-CT imaging on treatment decisions and subsequent oncological or other long-term outcomes in patients with suspected renal or bladder cancer following equivocal results on initial imaging.
 - Cost-effectiveness analyses are required to evaluate the use of FDG PET-CT in patients with suspected renal or bladder cancer based on indeterminate CT or MRI results. Studies should consider long-term oncological outcomes.

Advice context:

The status of SHTG Advice Statements is 'required to consider'.

No part of this advice may be used without the whole of the advice being quoted in full. This advice represents the view of the SHTG at the date noted.

It is provided to inform NHS boards in Scotland when determining the place of health technologies for local use. The content of this Advice Statement was based upon the evidence and factors available at the time of publication. An international evidence base is reviewed and thus its generalisability to NHSScotland should be considered by those using this advice to plan services. It is acknowledged that

the evidence constitutes only one of the sources needed for decision making and planning in NHSScotland. Readers are asked to consider that new trials and technologies may have emerged since first publication and the evidence presented may no longer be current. SHTG Advice Statements are intended to inform a decision at a particular point in time. They will however be considered for review if requested by stakeholders, based upon the availability of new published evidence which is likely to materially change the advice given. This advice does not override the individual responsibility of health professionals to make decisions in the exercise of their clinical judgment in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Acknowledgements

SHTG would like to thank the following individuals and organisations who provided comments on the draft Advice Statement:

- *Dr John Brush, Consultant Radiologist & Lead Clinician for Radiology, NHS Lothian*
- *Dr Ross Clark, Consultant Urologist, NHS Ayrshire & Arran*
- *Dr Robert Jones, Reader and Honorary Consultant in Medical Oncology, University of Glasgow and The Beatson*
- *Dr Nicholas MacLeod, Clinical Oncologist, The Beatson, NHS Greater Glasgow & Clyde*
- *Dr Param Mariappan, Consultant Urological Surgeon and Honorary Clinical Senior Lecturer University of Edinburgh*

Declarations of interest were sought from all reviewers. All contributions from reviewers were considered by the SHTG's Evidence Review Committee. However, reviewers had no role in authorship or editorial control and the views expressed are those of SHTG.

Chair
Scottish Health Technologies Group



NICE has accredited the process used by Healthcare Improvement Scotland to produce its evidence review products. Accreditation is valid for 5 years from January 2013. More information on accreditation can be viewed at www.nice.org.uk/accreditation