2307b: Positron Emission Tomography – Computed tomography (PET-CT) scanning for individuals with recurrent prostate cancer

Narrative summary of papers presented for review

Three papers were presented for review by NHS England. Paper 1 is an open label, singlearm trial which compared standard of care ^{18}F-fluciclovine PET-CT and investigational prostate-specific membrane antigen (^{68}Ga-PSMA-11) PET-CT in 50 men to detect prostate cancer biochemical recurrence localisation after radical prostatectomy. Paper 2 is a Phase III, open-label, randomised controlled trial (RCT) which randomised 195 men to ^{18}F-PSMA1007 PET-CT or ^{18}F-fluorocholine PET-CT to detect the localisation of prostate cancer biochemical recurrence. All men underwent both ^{18}F-PSMA-1007 PET-CT and ^{18}Ffluorocholine PET-CT. Paper 3 is a prospective, pre- and post-treatment cohort study which assessed the effect of ^{68}Ga-PSMA-11 PET-CT on management of recurrent prostate cancer in 382 men, as a secondary endpoint to a previous prospective multicentre trial.

Paper 1: Calais et al 2019. ^{18}F-fluciclovine PET-CT and ^{68}Ga-PSMA-11 PET-CT in patients with early biochemical recurrence after prostatectomy: a prospective, single-centre, single-arm, comparative imaging trial

This paper reports a prospective, single-arm comparative study of men with recurrent prostate cancer after radical prostatectomy (median age 68 years [interquartile range (IQR) 64 to 74]). Data were collected from 50 consecutive patients (enrolled between February 2018 and September 2018) at one University medical centre in the USA. All patients underwent ^{18}F-fluciclovine PET-CT and followed by ^{68}Ga-PSMA-11 PET-CT, with a median time interval between the two scans of 6 days (IQR 2 to 8). The median PSA concentration at enrolment was 0.48 ng/mL (IQR 0.38 to 0.83) and the median time from radical prostatectomy to PET-CT was 3 years (IQR 1 to 8). Patients had previously received adjuvant radiotherapy (12%) or adjuvant androgen deprivation therapy (20%). The two types of PET-CT scans were interpreted independently by three masked experts each, with positive or negative assessments for the presence of prostate cancer based on five anatomical regions (i.e. prostate bed, pelvic lymph nodes, extrapelvic nodes [M1a], bone [M1b], or other organ [M1c]). Median follow-up was 8 months (IQR 7 to 9) with no patients lost to follow-up.

Paper 2: Olivier et al 2022. Phase III Study of ^{18}F-PSMA-1007 Versus ^{18}FFluorocholine PET-CT for Localization of Prostate Cancer Biochemical Recurrence: A Prospective, Randomized, Crossover Multicenter Study

This paper reports a prospective, open-label, study which randomised 195 men with prostate cancer who had received prior definitive therapy. Patients were randomised to either ^{18}FPSMA-1007 PET-CT or ^{18}F-fluorocholine PET-CT first and then crossed over to receive the other PET-CT scan. Data were collected from six centres in France between March 2019 and October 2020 and data were reported on 190 men (median age 69 years [IQR 49 to 84]). Five patients were excluded from analysis; one due to receiving ^{18}F-fluoro-D-glucose (FDG) PET-CT instead of ^{18}F-fluorocholine PET-CT and four patients with failed ^{18}F-PSMA1007 PET-CT scans. Complete follow-up assessments were available for 189 patients

as one patient died 3.5 months after PET-CT scans. Prior prostatectomy had been performed in
154 men (81%) and median PSA level at enrolment was 1.7 ng/mL (IQR 0.6 to 4.2). ^{18}FPSMA-1007 PET-CT and ^{18}F-fluorocholine PET-CT images were interpreted by three independent masked readers, and a composite standard of truth (i.e. recurrence, no recurrence, or undetermined) was determined by an independent expert panel which considered all available clinical patient data collected prior to inclusion in the study to the end of the follow-up period (i.e. 6 months), excluding data from ^{18}F-PSMA-1007 PET-CT and ^{18}F-fluorocholine PET-CT scans. Patients were monitored for 24 hours after the second scan to assess adverse events. Subsequent treatments, additional diagnostic methods, and prostate-specific antigen (PSA) values were collected in the 6 months follow-up period. The median follow-up time was 8.3 months (IQR 2.9 to 16.1).

Paper 3: Fendler et al 2020. Impact of ^{68}Ga-PSMA-11 PET on the Management of Recurrent Prostate Cancer in a Prospective Single-Arm Clinical Trial

This paper reports a prospective cohort study which is a follow on study to a prospective multicentre trial in men with biochemical recurrence of prostate cancer. Data were collected for 382 of 635 men from two University medical centres in the USA using three questionnaires (pre-^{68}Ga-PSMA-11 PET-CT, post-^{68}Ga-PSMA-11 PET-CT and 3- to 6-month follow-up). Study dates were not stated. All patients had undergone ^{68}Ga-PSMA-11 PET-CT or PET-MRI (magnetic resonance imaging). Referring physicians reported data on pre- and post-^{68}Ga-PSMA-11 PET-CT site of recurrence, diagnostic tests intended to be used pre^{68}Ga-PSMA-11 PET-CT and those that were implemented post-^{68}Ga-PSMA-11 PET-CT, and intended patient management based on clinical findings. At 3- to 6-month follow-up, physicians reported on whether the intended management of patients stated pre-^{68}Ga-PSMA-11 PET-CT had been implemented post-^{68}Ga-PSMA-11 PET-CT. Pre- and post-^{68}GaPSMA-11 PET-CT questionnaires were complete for 382 patients (intended management cohort) and 206 patients had complete follow-up data (implemented management cohort). Intermodality changes in patient management (e.g. systemic to local treatment) were defined as major changes, with the exception of local treatment with or without adjuvant androgen deprivation therapy, which was considered a minor change. Intramodality changes (i.e.
switching different treatments within the same treatment modality, such as local treatments) were considered minor changes, with the exception of a switch of systemic treatment (i.e. modality abiraterone/enzalutamide to chemotherapy), which was considered a major change.

Effectiveness

Detection rates

Calais et al 2019 reported greater overall detection rates for biochemical recurrence of prostate cancer with ^{68}Ga-PSMA-11 PET-CT (28 of 50 patients; 56% [95% confidence interval (CI) 41% to 70%]) compared to ^{18}F-fluciclovine PET-CT (13 of 50 patients; 26% [95% CI 15% to 40%]) at the patient level. The difference was statistically significant (odds ratio (OR) 4.8 [95% CI 1.6 to 19.2], p=0.0026).

Calais et al 2019 also reported subgroup analyses for detection rates for biochemical recurrence of prostate cancer by anatomical region. Statistically significantly greater detection rates were reported for ^{68}Ga-PSMA-11 PET-CT compared with ^{18}F-fluciclovine PET-CT in the pelvic nodes region (15 of 50 patients; 30% [95% CI 18% to 45%]) versus 4 of

[1] The upper CI of 513.0 seems very large, the reasons for which are not discussed in the paper.

50 patients; 8% [95% CI 2% to 19%], respectively); OR 12·0 (95% CI 1·8 to 513·0[1]], p=0·0034); and in the subgroup analysis of any extrapelvic lesions (8 of 50 patients; 16% [95% CI 7% to 29%) versus 0 of 50 patients; 0% [95% CI 0% to 6%]; OR non-estimable [95% CI non-estimable], p=0·0078). No statistically significant differences in detection rates were reported between ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT for individual extrapelvic lesion locations: extrapelvic nodes (M1a) (6% versus 0%, respectively), bone (M1b) (8% versus 0%, respectively), and other organ (M1c) (4% versus 0%, respectively). Detection rates for prostate bed recurrence were slightly higher by ^{18}F-fluciclovine PET-CT compared with ^{68}Ga-PSMA-11 PET-CT, but the difference was not statistically significant (9 of 50 patients; 18% [95% CI 9% to 31%] versus 7 of 50 patients; 14% [95% CI 6% to 27%], respectively). The OR was 0.6 (95% CI 0.1 to 3.1) p=0·73.

Calais et al 2019 also reported subgroup analyses for detection rates based on PSA concentration levels. There were no statistically significant differences in detection rates between ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT for patients with PSA 0.2 to 0.5 ng/mL (12 of 26 patients; 46% [95% CI 27% to 67%] versus 7 of 26 patients; 27% [95% CI 12% to 48%] respectively; p=0.227), or PSA 1.01 to 2.00 ng/mL (4 of 6 patients; 67% [95% CI 22% to 96%] versus 1 of 6 patients; 17% [95% CI 0% to 64%] respectively; p=0.250). There was a statistically significant difference in detection rates in patients with PSA 0.51 to 1.00 ng/mL, with greater detection rates reported for ^{68}Ga-PSMA-11 PET-CT compared with ^{18}F-fluciclovine PET-CT (12 of 18 patients; 67% [95% CI 41% to 87%] versus 5 of 18 patients; 28% [95% CI 10% to 53%] respectively; p=0.039). No statistically significant differences were reported for PSA subgroups by patient or disease location.

Olivier et al 2022 reported the overall proportion of patients with correct detection rates for recurrence at the patient level and by anatomical region. They reported higher rates for overall correct detection of positive recurrence by ^{18}F-PSMA-1007 PET-CT (0.82 [95% CI 0.78 to 0.86]) compared to ^{18}F-fluorocholine PET-CT (0.65 [95% CI 0.60 to 0.71]). The difference of 0.16 (95% CI 0.11 to 0.22) was statistically significant (p<0.0001); the OR was 2.40 (95% CI 1.79 to 3.21; p<0.0001). There were no statistically significant differences in positive predictive values between the ^{18}F-PSMA-1007 PET-CT and ^{18}F-fluorocholine PETCT scans: OR 0.95 (95% CI 0.42 to 2.15; p=0.90). The difference in overall correct detection rates in determining negative recurrence was greater with ^{18}F-PSMA-1007 PET-CT (0.77 [95% CI 0.72 to 0.82]) compared to ^{18}F-fluorocholine PET-CT (0.57 [95% CI 0.51 to 0.62]). The difference of 0.21 (95% CI 0.15 to 0.26) was statistically significant (p<0.0001); the OR was 2.61 (95% CI 1.97 to 3.46; p<0.0001). Positive predictive values were not statistically significantly different between the ^{18}F-PSMA-1007 PET-CT and ^{18}F-fluorocholine PET-CT scans (OR 0.58 [95% CI 0.22 to 1.55]; p=0.27).

Olivier et al 2022 also reported sub-group analyses on detection rates for prostate cancer recurrence based on PSA levels. They reported that detection rates for recurrence were greater in patients with higher PSA levels (Table 1). Detection rates were statistically significantly greater with ^{18}F-PSMA-1007 PET-CT compared to ^{18}F-fluorocholine PET-CT for all PSA levels (Table 1).

Table 1: Patient level proportion of patients with correct detection rates for prostate cancer lesions by PSA level at baseline reported by Olivier et al 2022

PSA level*	^{18}F-PSMA-1007	^{18}F-fluorocholine	Odds ratio	p-value
<0.5 ng/mL (n=43)	0.57 (95% CI 0.45 to 0.68)	0.39 (95% CI 0.28 to 0.50)	2.10 (95% CI 1.13 to 3.89)	0.002
≤0.5 ng/mL to <1.0 ng/mL (n=25)	0.83 (95% CI 0.72 to 0.93)	0.43 (95% CI 0.28 to 0.58)	6.88 (95% CI 3.35 to 14.13)	<0.0001

≤1.0 ng/mL to <2.0 ng/mL (n=33)	0.81 (95% CI 0.72 to 0.89)	0.50 (95% CI 0.37 to 0.62)	4.31 (95% CI 2.26 to 8.24)	<0.0001
≥2.0 ng/mL (n=78)	0.85 (95% CI 0.79 to 0.91)	0.74 (95% CI 0.66 to 0.82)	2.01 (95% CI 1.27 to 3.19)	0.003

*Number of patients with recurrence detected by standard of truth (i.e. recurrence, no recurrence, or undetermined based on all available clinical patient data from pre-inclusion to end of follow-up)

Olivier et al 2022 also reported patient level correct detection rates based on clinical investigators' overall findings which demonstrated statistically significantly greater detection rates with ^{18}F-PSMA-1007 PET-CT (0.80 [95% CI 0.74 to 0.86]) compared to ^{18}Ffluorocholine PET-CT (0.50 [95% CI 0.42 to 0.57]), p<0.0001. The same paper also reported correct detection rates by anatomical region based on masked readers' findings. Seventy two patients had 78 anatomical regions with confirmed prostate cancer, with more lesions detected with ^{18}F-PSMA-1007 PET-CT compared with ^{18}F-fluorocholine PET-CT. The superiority of ^{18}F-PSMA-1007 PET-CT was demonstrated for overall composite anatomical region sensitivities (0.77 [95% CI 0.69 to 0.84]) compared to ^{18}F-fluorocholine PET-CT (0.57 [95% CI 0.48 to 0.67]). The difference was statistically significant (p<0.0001).

Fendler et al 2020 reported differences in pre- and post-^{68}Ga-PSMA-11 PET-CT referring physician indications for site of recurrence and detection rates based on location of disease post-^{68}Ga-PSMA-11 PET-CT. No lesion localisation was reported in 27% (103 of 382) patients by ^{68}Ga-PSMA-11 PET (reported difference -19% post-^{68}Ga-PSMA-11 PET-CT compared to pre-^{68}Ga-PSMA-11 PET-CT by referring physician indication), locoregional disease in 33% (126 of 382) patients by ^{68}Ga-PSMA-11 PET (reported difference +51% post-^{68}Ga-PSMA-11 PET-CT compared to pre-^{68}Ga-PSMA-11 PET-CT by referring physician indication), extrapelvic nodal metastatic disease (M1a) in 17% (64 of 382) patients by ^{68}GaPSMA-11 PET-CT (reported difference +41% post-^{68}Ga-PSMA-11 PET-CT compared to pre^{68}Ga-PSMA-11 PET-CT by referring physician), and osseous (M1b) or visceral (M1b) metastatic disease detected in 85 and four patients, respectively, by ^{68}Ga-PSMA-11 PET-CT (reported difference +37% post-^{68}Ga-PSMA-11 PET-CT compared to pre-^{68}Ga-PSMA-11 PET-CT by referring physician).

One of the included papers (n=50) reported a statistically significant difference in detection rates for biochemical recurrence of prostate cancer at the patient level and by anatomical region, with greater rates reported by ^{68}Ga-PSMA-11 PET-CT compared to ^{18}F-fluciclovine PET-CT. The same paper also reported statistically significantly greater detection rates in patients with PSA 0.51 to 1.00 ng/mL with ^{68}Ga-PSMA-11 PET-CT compared to ^{18}F-fluciclovine PET-CT, no significant differences were reported between ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT scans for other PSA levels. The second paper (n=195) reported statistically significantly greater detection rates for correctly determining positive or negative recurrence of prostate cancer by ^{18}F-PSMA-1007 PET-CT compared to ^{18}F-fluorocholine PET-CT. The paper also demonstrated that positive predictive values were equivocal for ^{18}F-PSMA-1007 PETCT and ^{18}F-fluorocholine PET-CT scans. The third paper (n=382) reported that referring physicians often accepted the reported location of disease by ^{68}Ga-PSMA-11 PET-CT, and this impacted on subsequent patient management.

Validation of PET-CT findings

Calais et al 2019 reported that ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT findings were validated in 15 of 50 patients (30%) using reference standards including histopathology, follow-up imaging, and PSA decreases after focal treatment without androgen deprivation treatment: 5 of 13 (38%) patients with ^{18}F-fluciclovine PET-CT positive

findings and 10 of 28 (36%) patients with ^{68}Ga-PSMA-11 PET-CT positive findings. Five patients had MRI or CT follow-up imaging but lesion validation was not confirmed because follow-up scans were negative. Neither PET-CT scans showed false-positive findings in the 15 patients in whom lesions were verified (both ^{18}F-fluciclovine PET-CT and ^{68}Ga-PSMA-11 PET-CT findings had 100% positive predictive values). There was no statistically significant difference in per-patient sensitivity between ^{18}F-fluciclovine PET-CT (33% [95% CI 15% to 58%]; five true positives and ten false negatives) and ^{68}Ga-PSMA-11 PET-CT (66% [95% CI 42% to 85%]; ten true positive and five false negative). The OR was 3·5 (95% CI 0·67 to 34·5); p=0·18. The specificity and negative predictive values of ^{18}F-fluciclovine PET-CT and ^{68}Ga-PSMA-11 PET-CT scans could not be established.

One of the included papers (n=50) reported validation of findings with ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT in 15 patients using reference standards.

Patient management

Calais et al 2019 reported patient management following ^{18}F-fluciclovine PET-CT or ^{68}GaPSMA-11 PET-CT scans. They reported that 11 of 50 patients (22%)[2] received focal treatment (e.g. metastasis surgery and metastasis stereotactic body radiation treatment), 30 of 50 patients (60%) underwent androgen deprivation treatment, and nine of 50 patients (18%) were managed with active surveillance. However, the authors reported that their study was not designed to assess the effect of ^{18}F-fluciclovine PET-CT or ^{68}Ga-PSMA-11 PET-CT on patient management and no statistical comparisons were reported.

Olivier et al 2022 reported changes in patient treatment plans before and after ^{18}F-PSMA1007 PET-CT and ^{18}F-fluorocholine PET-CT scans in 187 patients; data were missing for three patients. Treatment decisions were changed in 100 patients, with 89 decisions considered major changes. No statistical comparisons were reported.

Table 2: Major and minor changes in patient management before and after ^{18}F-PSMA-1007 PET-CT and ^{18}F-fluorocholine PET-CT scans reported by Olivier et al 2011

		After PET-CT					
		ADT only	**Radiation treatment only**	**Radiation treatment + ADT**	**No treatment**	**Other**	**Surgery**
Before PET-CT	**No treatment**	**16**	**13**	**9**		**3**	**1**
	ADT only		**7**	**5**	**2**	**2**	0
	Radiation treatment only	**6**		4	**1**	0	**1**
	Radiation treatment + ADT	**6**	7		**1**	**2**	0
	Other	**5**	**4**	**3**	**1**		0
	Chemotherapy	0	**1**	0	0	0	0

Major changes – figures in bold. ADT – androgen deprivation treatment.

[2] The number of patients reported differed in the text and supplementary table. The number of patients from the supplementary table was extracted. The narrative in the text reports 15 of 50 (30%) compared to table 3 of the supplement which reports 11 of 50 (22%).

Fendler et al 2020 reported intended management implementation at 3- to 6-month follow-up in 206 patients after ^{68}Ga-PSMA-11 PET-CT. They reported that the intended management was implemented in 160 of 206 (78%) patients. A change in management was intended in 136 of the 206 patients, of whom 98 (72%) patients received the intended management change after ^{68}Ga-PSMA-11 PET-CT, whilst 38 (28%) patients did not. The intended pre^{68}Ga-PSMA-11 PET management plan was implemented in 62 of 70 (89%) patients at 3- to 6-month follow-up. Minor changes in management were implemented in 31 of 40 (78%) patients, while major changes in different types of treatment ranged from 66% (major change to systemic treatment in 19 of 29 patients) to 76% (major change to local treatment in 26 of 34 patients).

Fendler et al 2020 reported changes in intended management strategies after ^{68}Ga-PSMA11 PET-CT by location of disease. Major changes were reported in the subgroup of patients with no lesion localisation by ^{68}Ga-PSMA-11 PET-CT (38 of 103 patients; 37%), with the greatest change towards active surveillance (18 of 38 patients; 47%). Major changes were reported in the subgroup of patients with locoregional disease by ^{68}Ga-PSMA-11 PET-CT (61 of 126 patients; 48%), with the greatest change towards local treatment (34 of 61 patients; 56%). In the subgroup of patients with extrapelvic nodal metastatic disease (M1a) according to ^{68}Ga-PSMA-11 PET-CT, major changes were implemented in 31 of 64 (48%) patients, with the largest group changing to systemic treatment (20 of 31 patients; 65%). In the subgroup of patients with osseous or visceral metastatic disease (M1b/c), major changes were implemented after ^{68}Ga-PSMA-11 PET-CT in 52% (46 of 89) patients, with the largest group intended for local or systemic treatment after ^{68}Ga-PSMA-11 PET-CT; 15 of 46 (33%) patients and 20 of 46 (43%) patients, respectively.

Fendler et al 2020 also reported changes in intended management after ^{68}Ga-PSMA-11 PET-CT based on PSA levels. Major changes were implemented in 39% of patients with PSA <0.5 ng/mL (n=85), 58% of patients with PSA 0.5 to <1.0 ng/mL (n=57), 53% of patients with PSA 1.0 to < 2.0 ng/mL (n=90), 45% of patients with PSA 2.0 to < 5.0 ng/mL (n=96), and 35% of patients with PSA ≥5.0 ng/mL (n=54). Minor changes were implemented in 26% of patients with PSA <0.5 ng/mL (n=85), 25% of patients with PSA 0.5 to <1.0 ng/mL (n=57), 22% of patients with PSA 1.0 to < 2.0 ng/mL (n=90), 17% of patients with PSA 2.0 to < 5.0 ng/mL (n=96), and 22% of patients with PSA ≥5.0 ng/mL (n=54).

One of the included papers (n=50) reported patient management after ^{68}Ga-PSMA-11 PET-CT and ^{18}F-fluciclovine PET-CT, with the majority of patients receiving androgen deprivation treatment (60%), but no statistical comparisons were reported. The second paper (n=195) reported changes to patient management in 53% of patients after ^{18}F-PSMA-1007 PET-CT and ^{18}F-fluorocholine PET-CT, with the majority considered major changes, but no statistical comparisons were reported. The third paper (n=382) reported that patient management decisions changed in over half the patients after ^{68}Ga-PSMA-11 PET-CT.

Impact of PET-CT scans on diagnostic tests

Olivier et al 2022 reported changes in diagnostic thinking for 149 patients, with a greater proportion of changes due to ^{18}F-PSMA-1007 PET-CT which contributed more to changes in 93 patients (62%) compared to ^{18}F-fluorocholine PET-CT which contributed more to changes in four patients (3%). The paper also reported a more accurate diagnosis and changes in treatment that were more beneficial to patients after PET-CT scans (122 patients), with benefit reported more in 88 (46.3%) patients by ^{18}F-PSMA-1007 PET-CT compared to

^{18}Ffluorocholine PET-CT which contributed more benefit in only 6 patients (3.2%). No statistical comparisons were reported.

Fendler et al 2020 reported on the diagnostic tests planned before ^{68}Ga-PSMA-11 PET-CT and tests prevented or implemented after ^{68}Ga-PSMA-11 PET-CT according to the referring physicians. Before ^{68}Ga-PSMA-11 PET-CT, referring physicians intended to perform 443 tests on 382 patients. After ^{68}Ga-PSMA-11 PET-CT, 150 tests were prevented, mostly bone scans or ^{18}F-NaF PET (52 of 150 tests, 35%) and CT scans (43 of 150 tests, 29%). After ^{68}Ga-PSMA-11 PET-CT, 73 diagnostic tests were implemented in 70 patients, mainly biopsies to confirm ^{68}Ga-PSMA-11 PET-CT–positive sites of disease (44 of 73 tests, 60%).

One of the included papers (n=195) reported a greater proportion of changes in diagnostic thinking and more accurate diagnosis with ^{18}F-PSMA-1007 PET-CT compared to ^{18}F-fluorocholine PET-CT, but no statistical comparisons were reported. A second paper (n=382) reported that more diagnostic tests were prevented than implemented after ^{68}Ga-PSMA-11 PET-CT.

Reporter agreement

Calais et al 2019 reported statistically significantly lower inter-reader agreement in detection rates for ^{18}F-fluciclovine (pairwise kappa value (κ) ≤0·20) compared to ^{68}Ga-PSMA-11 PETCT (κ values ≥0·60) at the patient level (p=0.0020) and by disease location (p ≤0·016), with the exception of prostate bed recurrence (p=0.046).

Olivier et al 2022 reported intra- and inter-reader kappa agreements for the detection of metastases at the patient level which ranged between 0.24 to 0.73 and 0.30 to 0.36 for ^{18}FPSMA-1007 PET-CT, respectively, and between 0.48 to 0.72 and 0.34 to 0.40 for ^{18}Fflourocholine PET-CT, respectively. The same paper also reported intra- and inter-reader kappa agreements for the detection of metastases at the anatomical region level which ranged between 0.62 to 0.72 and 0.70 to 0.75 for ^{18}F-PSMA-1007 PET-CT, respectively, and between 0.68 to 0.76 and 0.61 to 0.64 for ^{18}F-flourocholine PET-CT, respectively. No statistical comparisons were reported.

One of the included papers (n=50) reported significantly higher agreement between readers in interpreting detection rates by ^{68}Ga-PSMA-11 PET-CT compared to ^{18}Ffluciclovine PET-CT, with the exception of prostate bed recurrence. The second paper (n=195) reported reader agreements for the detection of metastases at the patient and anatomical region level, but no statistical comparisons were reported.

Safety

Olivier et al 2022 reported that four patients who underwent ^{18}F-PSMA-1007 PET-CT had four adverse events (i.e. toothache, diarrhoea, chest discomfort, and arterial hypertension) and one patient had one adverse event (i.e. shoulder pain) after the administration of ^{18}Ffluorocholine PET-CT. None of the adverse events were considered to be related to the two PET-CT scans. They reported no serious adverse events and no patient discontinued participation in the study due to an adverse event.

One of the included papers (n=195) reported that five patients experienced an adverse event not related to PET-CT scans (4 patients with ^{18}F-PSMA-1007 PET-CT and one patient with ^{18}F-fluorocholine PET-CT). No serious adverse events occurred.

References

- Calais, J., Ceci, F., Eiber, M., Hope, T.A., Hofman, M.S., Rischpler, C., Bach-Gansmo, T., Nanni, C., Savir-Baruch, B., Elashoff, D., Grogan, T., 2019. ^{18}F-fluciclovine PET-CT and ^{68}Ga-PSMA-11 PET-CT in patients with early biochemical recurrence after prostatectomy: a prospective, single-centre, single-arm, comparative imaging trial. The Lancet Oncology,

20(9), pp.1286-1294. Available from https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2819%2930415-2/fulltext

- Fendler, W.P., Ferdinandus, J., Czernin, J., Eiber, M., Flavell, R.R., Behr, S.C., Wu, I.W.K., Lawhn-Heath, C., Pampaloni, M.H., Reiter, R.E. and Rettig, M.B., 2020. Impact of 68Ga-PSMA-11 PET on the management of recurrent prostate cancer in a prospective single-arm clinical trial. Journal of Nuclear Medicine, 61(12), pp.1793-1799. Available from https://jnm.snmjournals.org/content/61/12/1793
- Olivier, P., Giraudet, A.L., Skanjeti, A., Merlin, C., Weinmann, P., Rudolph, I., Hoepping, A. and Gauthé, M., 2023. Phase III Study of 18F-PSMA-1007 Versus 18F-Fluorocholine PET/CT for Localization of Prostate Cancer Biochemical Recurrence: A Prospective, Randomized, Crossover Multicenter Study. Journal of Nuclear Medicine, 64(4), pp.579585. Available from https://jnm.snmjournals.org/content/64/4/579