Clinical Area:	**FDG PET for colorectal cancer: Recurrence/restaging**
Keywords:	**FDG PET, colorectal cancer, recurrent, liver metastases**
Reference:	**Imdahl A, Reinhardt MJ, Nitzsche EU, Mix M, Dingeldey A, Einert A. et al. Impact of ^{18}F-FDG-positron emission tomography for decision making in colorectal cancer recurrences. Langenbeck's Arch Surg 2000; 385: 129-134.**

Study Type: Comparison of diagnostic tests

Study Aim: To evaluate the impact of FDG PET on detection of local colorectal cancer recurrences and hepatic or pulmonary metastases.

Outcomes

- *Primary:* Sensitivity, specificity

Design

- *Number of subjects:* n=71 patients (77 investigations)
- *Description of study population:* Mean age=64 years (range=31-89 years); 42 men/29 women. Operation for colorectal cancer between 8 months and 6 years before PET investigation. 45 patients had had rectal cancer; 26 had had colonic carcinoma. FDG PET investigation performed because of a raised CEA level in n=14, for suspicion of local recurrence or metastases in n=33 and for staging in n=24 patients with a known recurrence or metastases.
- *Inclusion and exclusion criteria:* <u>Inclusion</u>: Suspicion of tumor recurrence or metastases either due to a raised carcinoembyronic antigen (CEA) level or to imaging methods. Exclusion criteria not discussed.
- *Power*: Not discussed.

Validity

- *Independent blind comparison with a gold standard or follow-up of those not receiving the gold standard test?* The "gold standard" was either histological proof of malignancy or patients in whom all other investigations (e.g. CT scan, chest x-ray) suggested malignancy. PET image interpretation was done by individuals blinded to clinical data and results of other imaging procedures.
- *Was "normal" defined?* Yes, according to FDG uptake or standard uptake value (SUV).
- *Appropriate spectrum of disease?* Yes, only included patients suspected of having a recurrence.
- *Consecutive patients?* Yes.
- *Methods described in enough detail to enable you to replicate the test?* Yes.
- *Reproducible results?* Yes.

Conclusions regarding validity of methods:

Appears to have reasonably valid methodology. The number of patients included was relatively small, especially because the patient population included a mixture of those with suspected and known recurrences. Confidence intervals for sensitivity and specificity were not given.

Results
N=20, malignancy not detected by any method
N=60/88 tumor sites, malignancy confirmed by histology

Comparison of FDG PET and computed tomography (CT) for the detection of local recurrence

	PET	CT[1]
	%	%
Sensitivity	92	88
Specificity	87	89
PPV	76	81
NPV	96	93

PPV=positive predictive value; NPV=negative predictive value
[1]CT scan performed in 68 out of 71 patients

Comparison of FDG PET and computed tomography (CT) for the detection of hepatic metastases

	PET	CT[1]
	%	%
Sensitivity	100	87
Specificity	98	91
PPV	96	83
NPV	100	93

PPV=positive predictive value; NPV=negative predictive value
[1]CT scan performed in 68 out of 71 patients

Comparison of FDG PET and chest x-ray for the detection of pulmonary metastases

	PET	Chest x-ray[1]
	%	%
Sensitivity	94	64
Specificity	100	98
PPV	100	90
NPV	98	92

PPV=positive predictive value; NPV=negative predictive value
[1]Chest x-ray performed in 69 out of 71 patients

Authors' Conclusions
"FDG PET has the impact to change treatment policy in patients with colorectal tumor recurrence. It is certainly recommended in patients with an otherwise unclear rise of CEA level or for differentiation of a postoperative scar from local recurrence."

Reviewer's Conclusions
In this small study, PET performed well in terms of sensitivity and specificity of detecting colorectal cancer recurrence and metastases. In particular, PET had a high negative predictive value, so that there is a high rate of confidence that a negative finding indicates the absence of colorectal cancer recurrence.