Supplementary Online Content

Gertsen EC, Brenkman HJF, van Hillegersberg R, et al; PLASTIC Study Group. ^{18}F-fludeoxyglucose–positron emission tomography/computed tomography and laparoscopy for staging of locally advanced gastric cancer: a multicenter prospective Dutch cohort study (PLASTIC). *JAMA Surg*. Published online October 27, 2021. doi:10.1001/jamasurg.2021.5340

This supplementary material has been provided by the authors to give readers additional information about their work.

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eAppendix. Participating Centers

1. University Medical Center Utrecht, Utrecht
2. The Netherlands Cancer Institute – Antoni van Leeuwenhoek, Amsterdam
3. Amsterdam University Medical Center, location AMC, Amsterdam
4. Catharina Hospital, Eindhoven
5. Erasmus MC University Medical Center, Rotterdam
6. Leiden University Medical Center, Leiden
7. Zuyderland MC, Sittard-Geleen
8. Rijnstate Hospital, Arnhem
9. ZGT Hospital, Almelo
10. Amsterdam University Medical Center, location VUmc, Amsterdam
11. Elisabeth Twee-Steden Hospital, Tilburg
12. University Medical Center Groningen, Groningen
13. Medical Center Leeuwarden, Leeuwarden
14. Albert Schweitzer Hospital, Dordrecht
15. Gelre Ziekenhuizen, Apeldoorn
16. Isala Ziekenhuis, Zwolle
17. Maasstad Ziekenhuis, Rotterdam
18. Radboud university medical center, Nijmegen

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eMethods. Detailed Methods

FDG-PET/CT protocol

Patient preparation and scan acquisition / reconstruction

Preferably, the FDG-PET/CT will be performed after a first MDT. Due to logistic reasons, performing the FDG-PET/CT before the first MDT is allowed as well, in case of high suspicion of a cT3-4 tumor by the radiologist. Preparation of patients for FDG-PET/CT, scanning and image reconstruction may all be performed according to the institutional protocols of the participating centers, preferably incorporating the guidelines of the European Association of Nuclear Medicine (EANM) / EANM Research Ltd. (EARL)[13] and/or the Nederlandse Vereniging voor Nucleaire Geneeskunde (NVNG).

In general, patients will have to refrain from strenuous exercise, and fast for at least 4 to 6 hours before the injection of FDG. Patients should be prehydrated by drinking approximately 1 L of water in the 2 h before injection. Fasting blood glucose should preferably be below 11 mmol/L. After the injection of FDG, patients should remain seated or lying and silent for 1 h in a warm room. The acquisition of a PET scan from eyes to thighs should be started 60 min (range 55 - 75 min) after the injection of FDG, being accompanied by a low-dose CT of the same scanning range.

In some institutions, all PET scans are made with a standard-dose diagnostic CT with intravenous contrast. This is allowed in this study, although it is not preferable from a perspective of radiation protection and kidney protection, since all patients have already undergone a diagnostic CT shortly before the PET/CT for standard staging of their gastric cancer.

Scan interpretation and follow-up

Scans are read, interpreted and reported by the nuclear medicine physicians of the respective participating centers. Generally, the intensity of FDG uptake in the primary tumour and locoregional lymph nodes should be reported, as well as suspicion of distant metastases. The standardised uptake value corrected for body weight (SUVmax bw) of the primary tumour should be measured (preferably on the PET reconstruction according to EARL, if available).

The results of the PET/CT are discussed in the institutional MDT. If PET/CT identifies new lesions that are possible metastases, biopsy and/or additional imaging of a lesion is advised to confirm or exclude metastasis.

Staging laparoscopy protocol

Diagnostic laparoscopy will be performed after FDG-PET/CT, prior to the initiation of treatment, and should be executed or supervised by a gastrointestinal or oncological surgeon. In a side-study, the influence of the type of hospital and execution by the surgeon or a resident on the quality of the laparoscopy will be investigated.

Surgery

During diagnostic laparoscopy, there are 2 goals:

1. To evaluate the resectability of the primary tumor (T-stage)
2. To evaluate the presence or absence of peritoneal metastases

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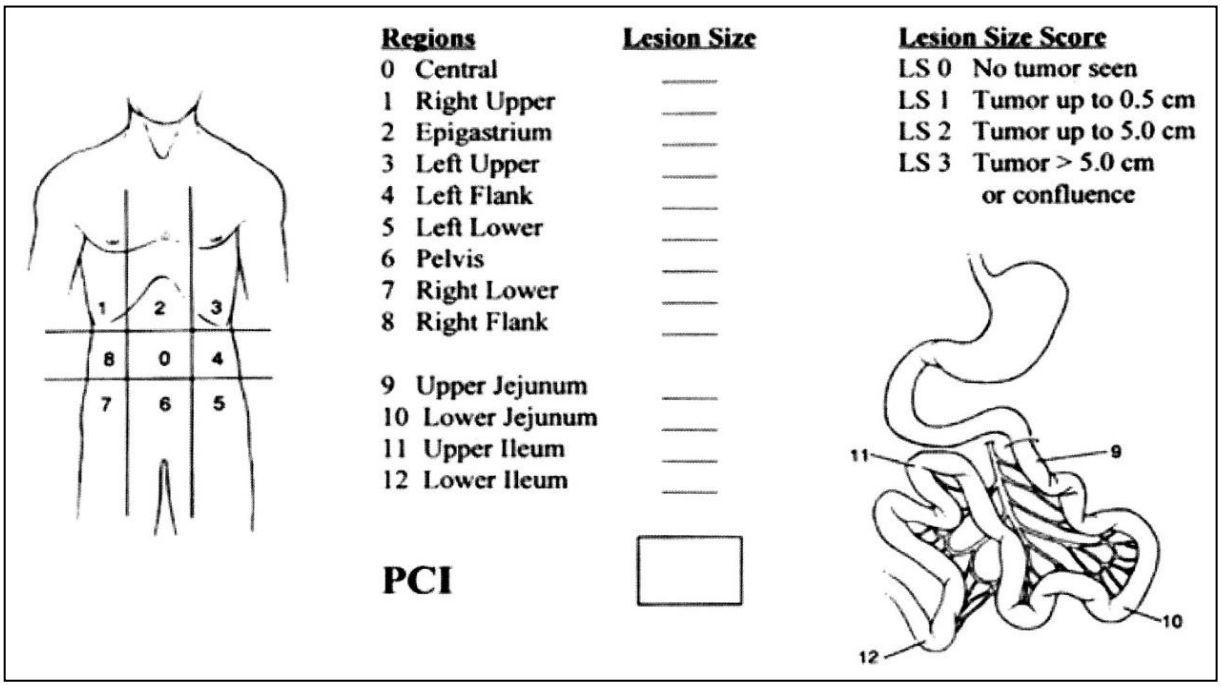
To evaluate the resectability of the tumor, a thorough inspection of the stomach and tumor along with surrounding organs should be performed. To evaluate the presence or absence of peritoneal metastases, all 4 quadrants of the peritoneal cavity should be thoroughly inspected. In case of a tumor localized at the posterior wall of the stomach, it is advised to open the omental bursa and inspect it accordingly. In case of suspicious macroscopic lesions, biopsies will be taken and sent for pathological review. Macroscopic lesions will be scored according to the peritoneal cancer index (PCI, eFigure).



eFigure. Peritoneal Cancer Index (PCI)

Although it is not part of the revised guidelines, all centers participating in this study are recommended to perform cytology of the peritoneal cavity, as this reflects microscopic M1-disease. In case of performing peritoneal cytology, at least 500ml of saline should be introduced and equally dispersed throughout the peritoneal cavity in all quadrants and the omental bursa if opened. After collection, the samples will be sent for pathological review.

Pathology

Pathological review of potential peritoneal metastases and/or cytology will be analyzed by a dedicated gastrointestinal pathologist. Histological peritoneal samples should be sectioned and stained with haematoxylin & eosin (H&E). Peritoneal cytology should be evaluated with conventional smear cytology and with cell blocks of the remaining peritoneal lavage. If necessary, additional immunohistochemical stainings will be performed (e.g. EpCam and/or calretinin).

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eTable. FDG-PET/CT sensitivity and specificity

eTable A. FDG-PET/CT sensitivity and specificity, all patients

	Distant metastatic cancer confirmed			**Positive Predictive Value**
	Yes	No	Total	
FDG-PET/CT-positive	10	6	16	
FDG-PET/CT-negative	20	201	221	63% (95%CI: 40-81%)
Total	30	207	237	
Sensitivity and specificity	33% (95%CI: 17-53%)	97% (95%CI: 94-99%)		

In a total of 237 patients recurrent disease was scored during 6 months follow-up, data of 1 patient were missing.
For this analysis, only those with high suspicion of metastatic disease (n=15) were regarded as FDG-PET/CT-positive; patients with equivocal FDG-PET/CT results were regarded as FDG-PET/CT -negative.

eTable B. FDG-PET/CT sensitivity and specificity, patients with FDG-avid primary tumour

	Distant metastatic cancer confirmed			**Positive Predictive Value**
	Yes	No	Total	
FDG-PET/CT-positive	7	4	11	
FDG-PET/CT-negative	15	199	214	64% (95%CI: 36-85%)
Total	22	203	225	
Sensitivity and specificity	31% (95%CI: 14-55%)	98% (95%CI: 95-99%)		

In a total of 225 patients recurrent disease was scored during 6 months follow-up
For this analysis, only those with high suspicion of metastatic disease (n=11) were regarded as FDG-PET/CT -positive; patients with equivocal FDG-PET/CT results were regarded as FDG-PET/CT -negative.

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eTable C. FDG-PET/CT sensitivity and specificity for peritoneal disease

	Peritoneal disease confirmed			**Positive Predictive Value**
	Yes	No	Total	
FDG-PET/CT-positive	3	0	3	
FDG-PET/CT-negative	42	300	342	100% (95%CI: 31-100%)
Total	45	300	345	
Sensitivity and specificity	7% (95%CI: 2-19%)	100% (95%CI: 98-100%)		

A total of 345 patients underwent both FDG-PET/CT and SL

For this analysis, only those with high suspicion of peritoneal metastatic disease (n=3) were regarded as FDG-PET/CT -positive; patients with equivocal FDG-PET/CT results were regarded as FDG-PET/CT -negative.

eTable D. FDG-PET/CT sensitivity and specificity for patients with cT4 tumours

	Distant metastatic cancer confirmed			**Positive Predictive Value**
	Yes	No	Total	
FDG-PET/CT-positive	2	2	4	
FDG-PET/CT-negative	3	17	20	50% (95%CI: 16-84%)
Total	5	19	24	
Sensitivity and specificity	40% (95%CI: 5-85%)	89% (95%CI: 67-99%)		

A total of 24 patients had a cT4 tumour and available follow-up data

For this analysis, only those with high suspicion of metastatic disease (n=4) were regarded as FDG-PET/CT -positive; patients with equivocal FDG-PET/CT results were regarded as FDG-PET/CT -negative.

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eTable E. FDG-PET/CT sensitivity and specificity for patients with cN+ tumours				
	Distant metastatic cancer confirmed			**Positive Predictive Value**
	Yes	No	Total	
FDG-PET/CT-positive	8	5	13	
FDG-PET/CT-negative	14	103	117	62% (95%CI: 37-82%)
Total	22	108	130	
Sensitivity and specificity	36% (95%CI: 17-59%)	95% (95%CI: 90-98%)		
A total of 130 patients had a cN+ tumour and available follow-up data For this analysis, only those with high suspicion of peritoneal metastatic disease (n=13) were regarded as FDG-PET/CT -positive; patients with equivocal FDG-PET/CT results were regarded as FDG-PET/CT -negative.				

eTable F. SL sensitivity and specificity for detecting macroscopic peritoneal disease, all patients				
	Metastatic cancer confirmed			**Positive Predictive Value**
	Yes	No	Total	
Macroscopic lesion (≥1)	50	65	115	
No macroscopic lesion	11	231	242	43% (95%CI: 38-50%)
Total	61	296	357	
Sensitivity and specificity	82% (95%CI: 70-91%)	78% (95%CI: 73-83%)		
Macroscopic lesion (≥1) includes all patients in whom biopsies were taken, also those in whom there was no or low suspicion of metastatic disease. For this analysis, patients with positive cytology only were not regarded as *Macroscopic lesion (≥1)* or confirmed metastatic cancer, as the outcome of peritoneal lavage cannot be determined in advance.				

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