Casi Clinici

Giuseppe Malinverni

S.C. di RADIOTERAPIA

A.O "ORDINE MAURIZIANO"

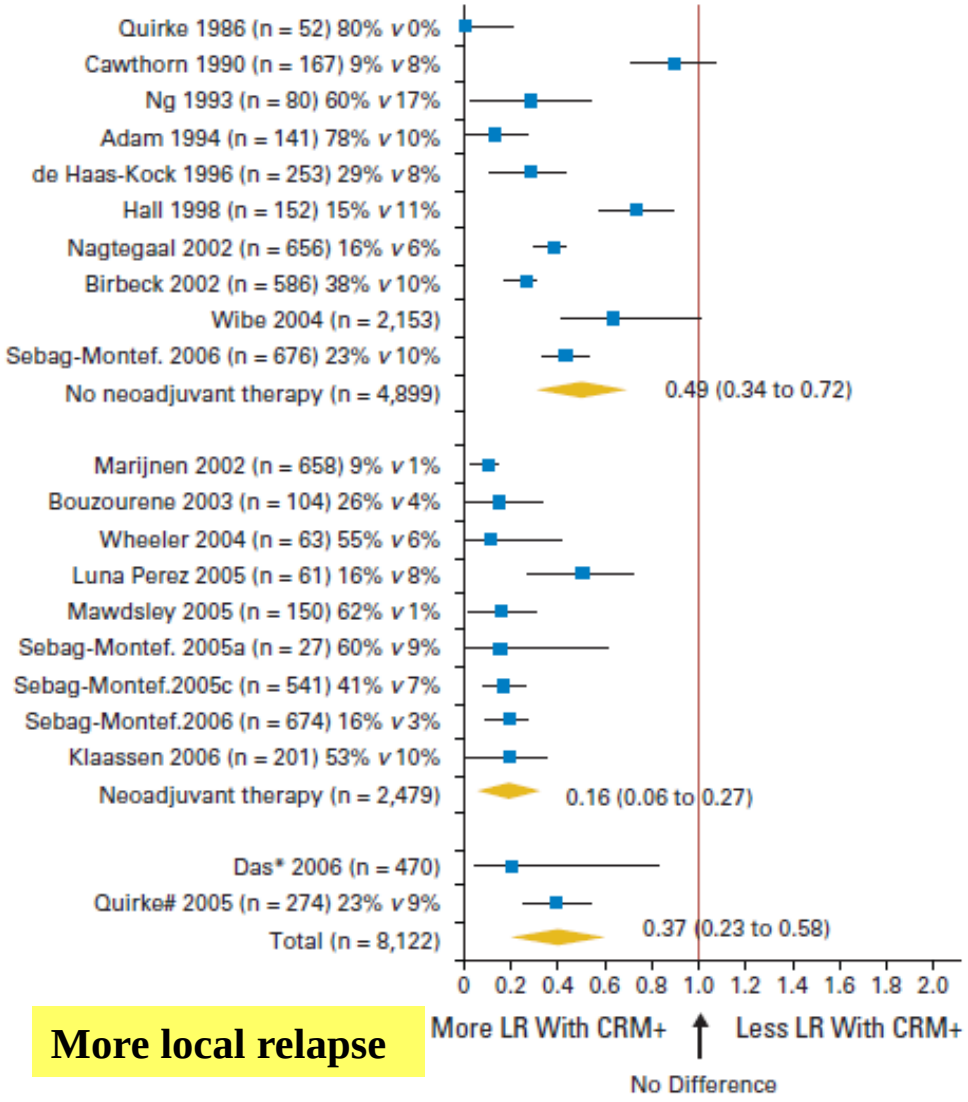
Osp. Mauriziano Umberto I° TORINO

What Is the Role for the Circumferential Margin in the Modern Treatment of Rectal Cancer?

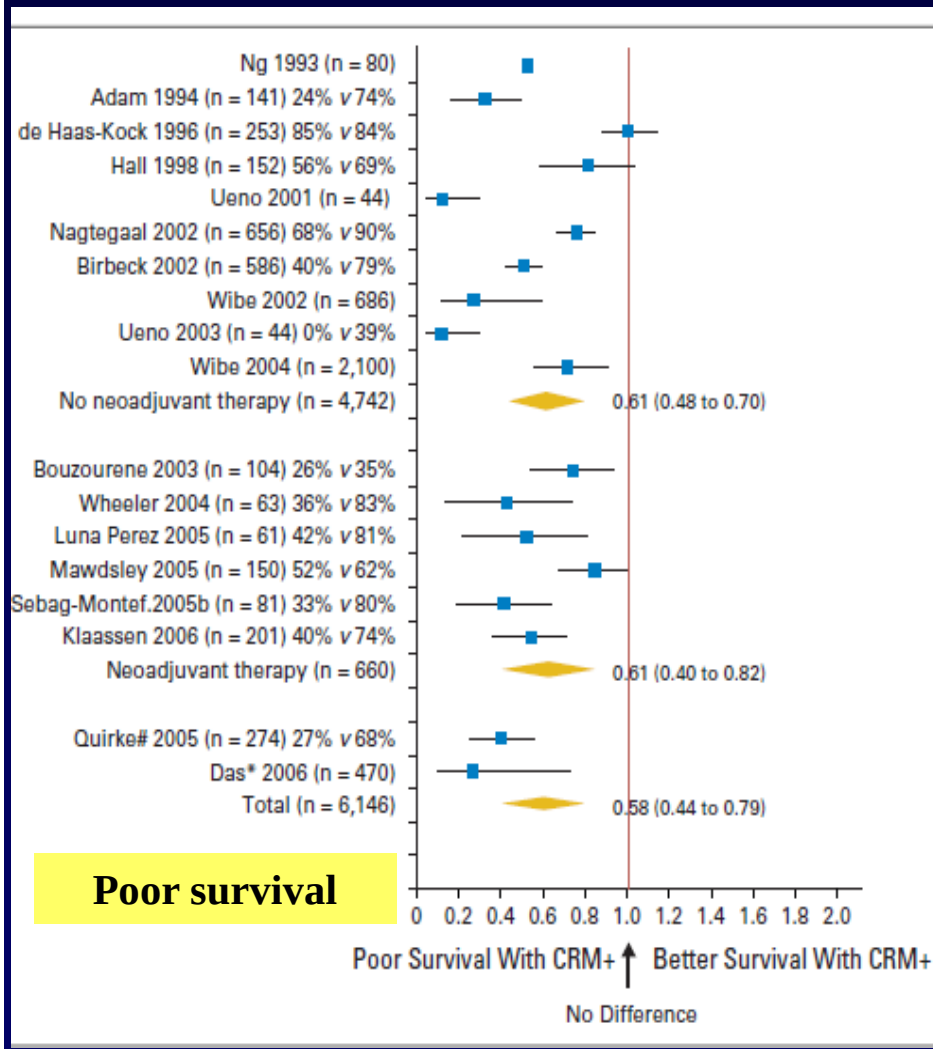
Iris D. Nagtegaal and Phil Quirke

VOLUME 26 · NUMBER 2 · JANUARY 10 2008

JOURNAL OF CLINICAL ONCOLOGY

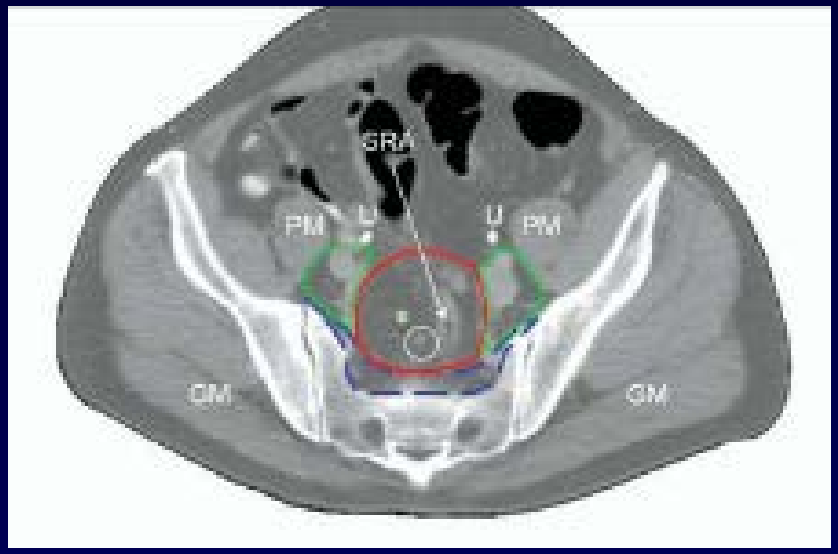


More local relapse

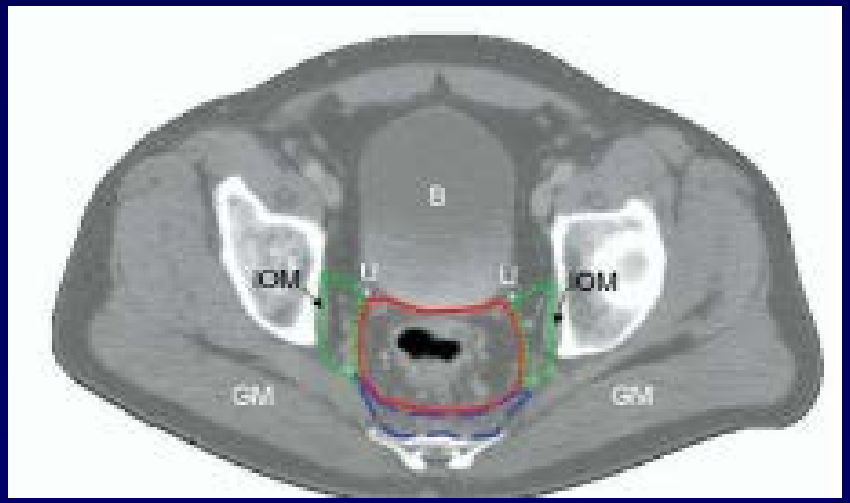


Poor survival

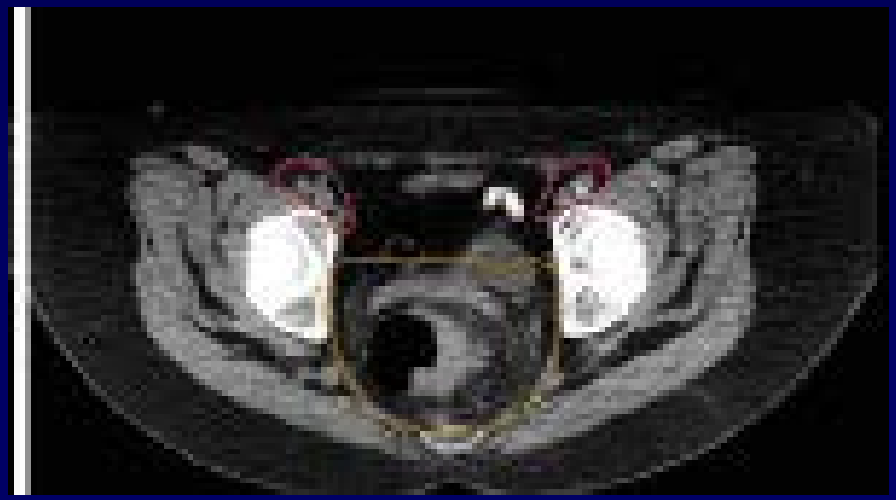
Mesoretto: limite superiore



Mesoretto: limite anteriore

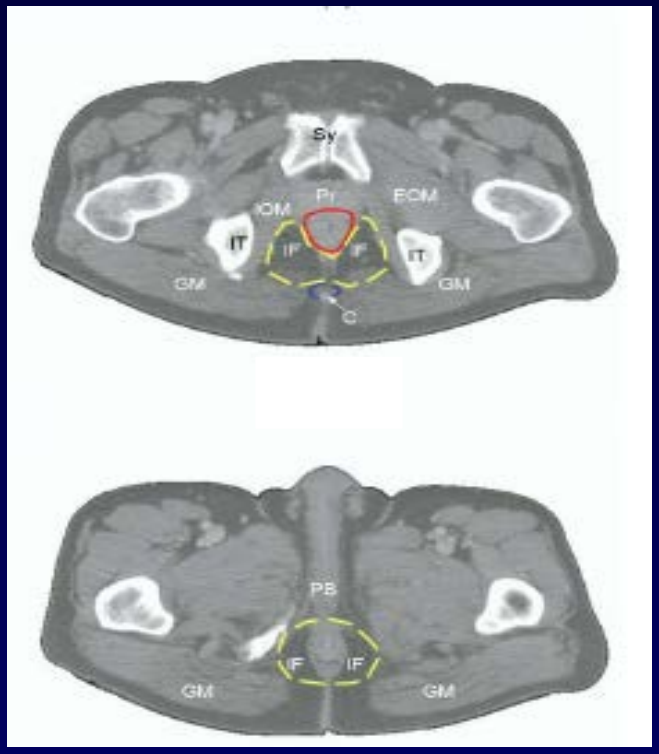


Roels S. IJROBP 2006



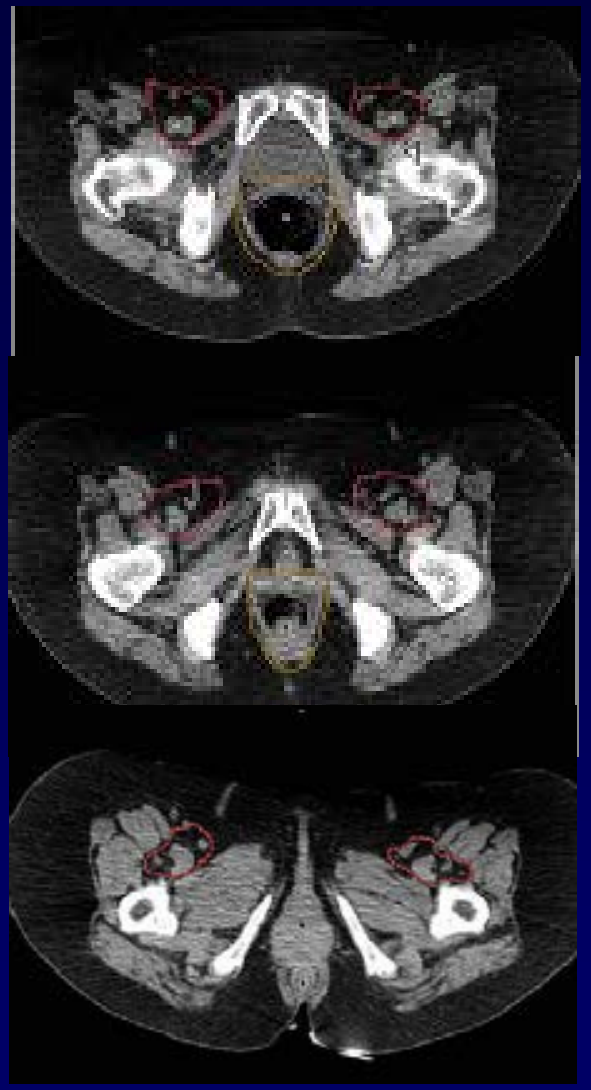
Myerson RJ. IJROBP 2008

limite inferiore



Roels S. IJROBP 2006

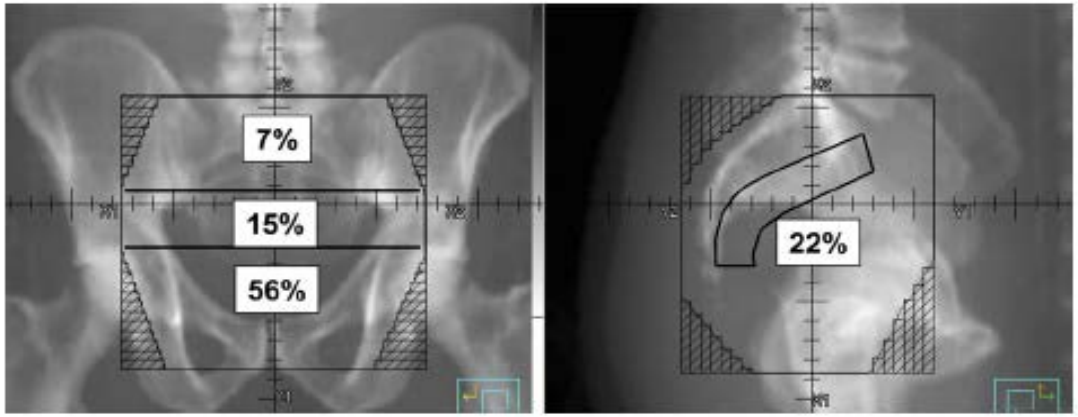
VS



Myerson RJ. IJROBP 2008

PATTERNS OF LOCOREGIONAL RECURRENCE AFTER SURGERY AND RADIOTHERAPY OR CHEMORADIATION FOR RECTAL CANCER

TSE-KUAN YU, M.D., PH.D.,* PRIYA R. BHOSALE, M.D.,† CHRISTOPHER H. CRANE, M.D.,*



1. Distribution of in-field recurrences. The numbers denote the percentage of in-field recurrences at each region.

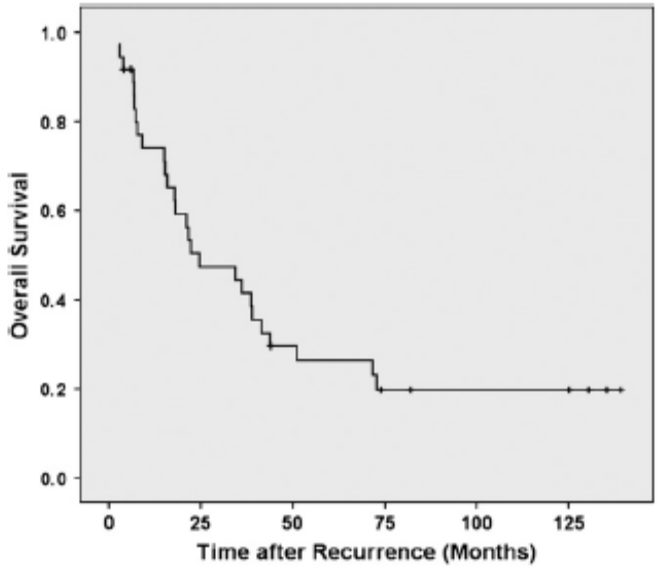
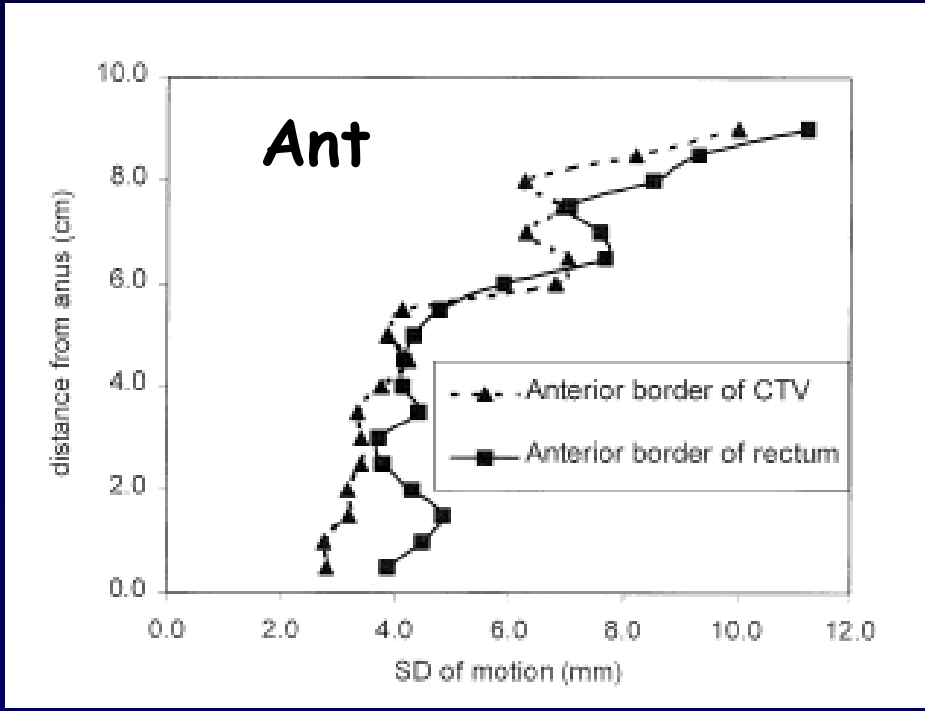


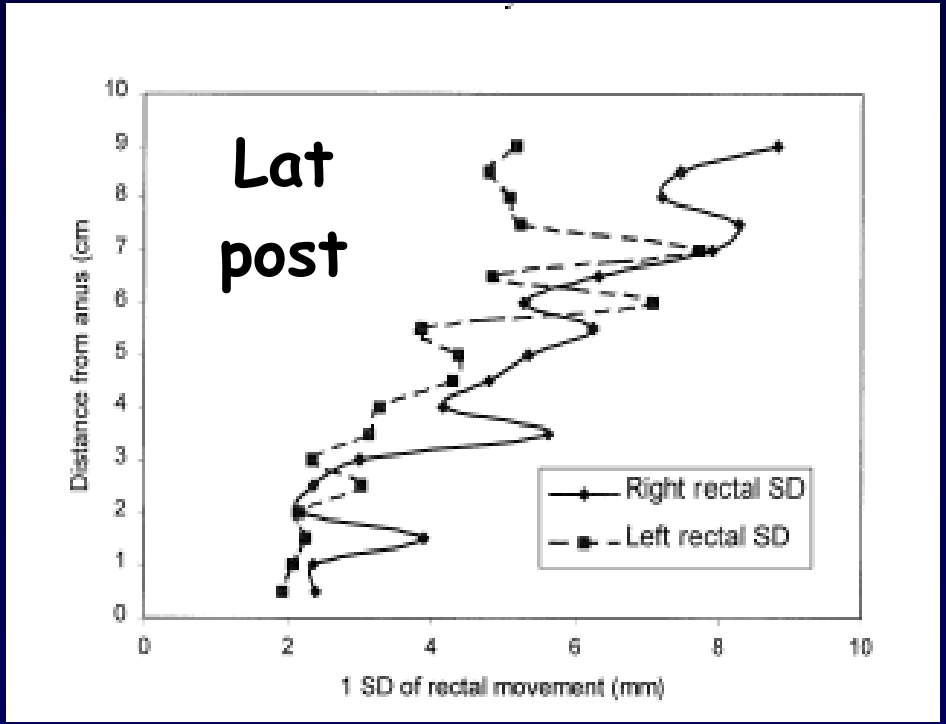
Fig. 3. Kaplan-Meier estimates of overall survival after locoregional recurrence.

There were only a limited number of marginal and out-of-field failures, indicating that standard pelvic RT fields are appropriate for most rectal cancer patients.

Because a large proportion of locoregional failures occurred within the radiotherapy field in the low pelvic and presacral regions, consideration should be given to including the low pelvic and presacral regions in the **radiotherapy boost field**, especially in patients at high risk of locoregional recurrence.

Organ motion





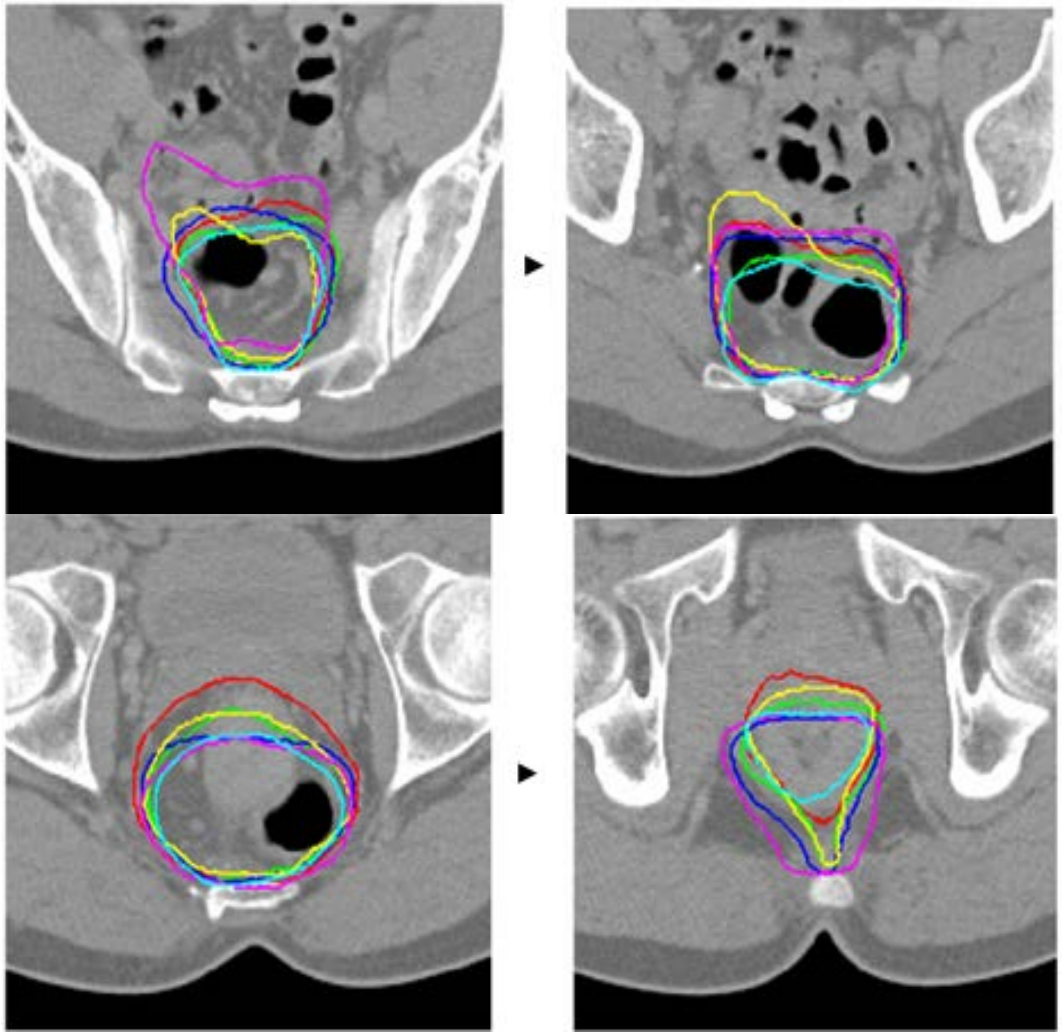
evaluation interfraction mesorectum motion

Nuyttens JJ. IJROBP 2002

Mesorectum delineation in one patient

Bony anatomy registration of repeated CT ´s to CT 1

red = CT1
green= CT 2
dark blue= CT 3
yellow= CT 4
magenta =CT 5
light blue = CT 6



IDENTIFICAZIONE DEI PAZIENTI A RISCHIO

IMAGING & RESPONSE

PET-Based Treatment Planning in Radiotherapy: A New Standard?

Vincent Grégoire[1,2], Karin Haustermans[3], Xavier Geets[2], Sarah Roels[3], and Max Lonneux[2,4]

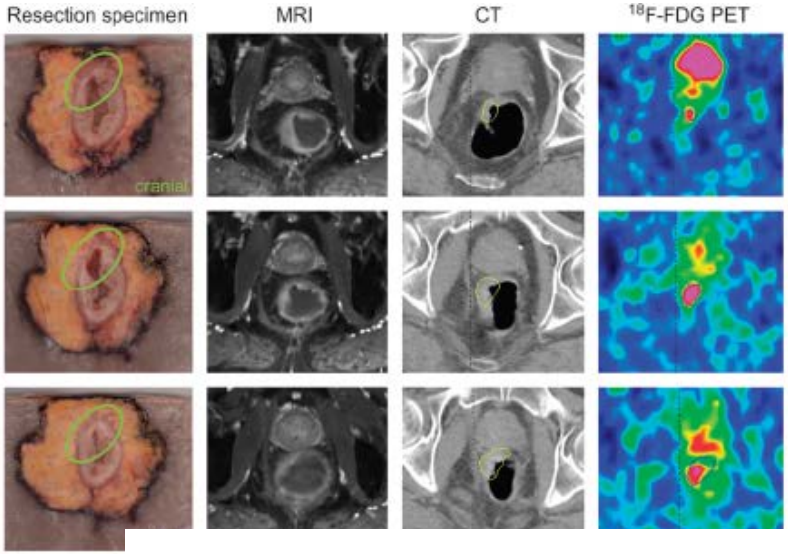


FIGURE 4. Correlation of resection specimen with different imaging modalities for patient with rectal cancer. (Column 1) Macroscopic section through rectal cancer resection specimen from top to bottom. (Columns 2–4) Correlating imaging studies: MRI, CT, and ^{18}F-FDG PET, respectively (all performed in prone position). This figure illustrates how molecular imaging modalities can be validated by correlation with pathologic specimen.

SPECIFICITA'

- lesione primitiva (T)

LIMITE

- MTS linfonodali (N)

Kantorowa, J Nucl Med 2003
Mukai M, Oncol Rep 2000
Ciernik IF IJROBP 2005

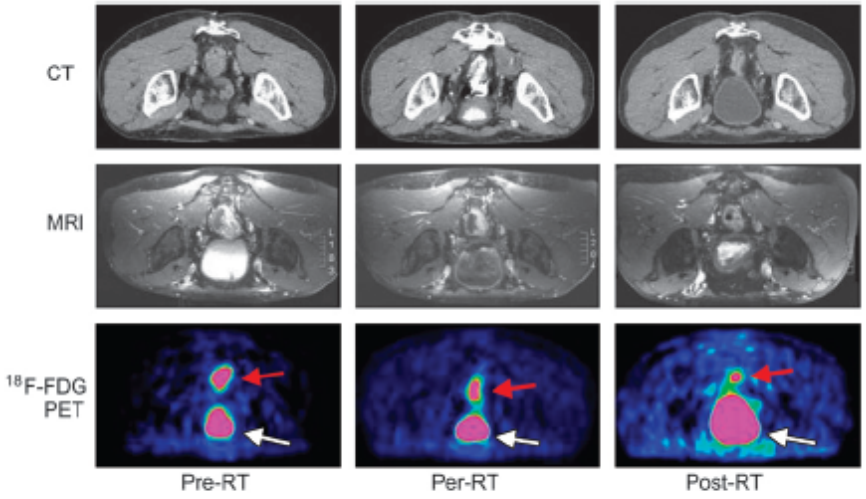


FIGURE 3. Imaging studies performed before and during course of treatment for patient with rectal cancer. (Upper row) Images from CT performed in prone position before chemoradiotherapy (RT), during chemoradiotherapy, and at time of surgery. (Middle row) Images from MRI performed in supine position before chemoradiotherapy, during chemoradiotherapy, and at time of surgery. (Lower row) Images from ^{18}F-FDG PET performed before chemoradiotherapy, during chemoradiotherapy, and at time of surgery. Tumor (red arrows) shows high level of uptake of ^{18}F-FDG before start of treatment; ^{18}F-FDG signal decreases during treatment and is lowest at time of surgery. ^{18}F-FDG PET can help in delineating GTV before treatment and in replanning radiation treatment during course of treatment. White arrows indicate urinary bladder.

PET in treatment response

Table 1 Relevant studies of PET

Study	*n*	Therapy	Timing	Response criteria	Outcome measure	Result	*P*
Engenhart *et al*[7] (1992)	21	RT	8-9 wk pc	ΔSUV	LC	SUV normalization; PPV 20%; NPV 67%	
Schiepers *et al*[14] (1999)	9	RT	2-3 wk pc	TuGluc	Histo, cell kinetics	Decreased 138 nmol/mL per min after RT	0.008
Guillem *et al*[11] (2000)	15	CRT	4-5 wk pc	ΔSUV, VR, δTLG	Histo	VR PPV 60%	
Oku *et al*[9] (2002)	40	RT	3-5 wk pc	SUV	Recurrence	SUV < 3.2	< 0.05
Amthauer *et al*[15] (2004)	20	CRT + H	2-4 wk pc	ΔSUV	Histo	36% decrease SUV PPV 93%; NPV 100%	0.003
Calvo *et al*[16] (2004)	25	CRT	4-5 wk pc	ΔSUV	Histo	2 *vs* 2.7 decrease SUV	NS
Guillem *et al*[17] (2004)	15	CRT	4-5 wk pc	ΔSUV, VR, δTLG	Recurrence, OS, RFS	63% decrease SUV 70% decrease TLG	0.08 0.03
Denecke *et al*[18] (2005)	23	CRT + H	2-4 wk pc	ΔSUV	Histo	36% decrease SUV PPV 77%; NPV 100%	0.002
Konski *et al*[19] (2005)	20	CRT	3-4 wk pc	ΔSUV	Histo	52% *vs* 75% decrease SUV	NS
Cascini *et al*[20] (2006)	33	CRT	12 d pi	ΔSUV	Histo	22% *vs* 63% decrease SUV	< 0.0001
Capirci *et al*[13] (2006)	88	CRT	5-6 wk pc	Negative PET	5 yr OS and DFS	91% *vs* 72% 81% *vs* 62%	0.024 0.003
Kalff *et al*[12] (2006)	34	CRT	7-43 d pc	VR	OS PFS	100% *vs* 79% 100% *vs* 47%	< 0.0001 < 0.0001
Capirci *et al*[21] (2007)	45	CRT	5-6 wk pc	ΔSUV	Histo	66% decrease SUV PPV 77%; NPV 89%	0.0015
Melton *et al*[22] (2007)	21	CRT	4-5 wk pc	ΔSUV, VR, δTLG	Histo	70% decrease SUV PPV 58%; NPV 100%	< 0.001
Kristiansen *et al*[23] (2008)	30	CRT	7 wk pc	VR	Histo	PPV 83%; NPV 33%	NS
Siegel *et al*[8] (2008)	32	RT (short)	7-8 d pi	ΔSUV	Histo	40% decrease SUV	NS
Nakagawa *et al*[10] (2008)	59	RT	2-3 wk pc	SUV	OS MS	SUV < 5: 95 *vs* 42 mo, 70% *vs* 44%	0.042
Vliegen *et al*[24] (2008)	20	CRT	4-6 wk pc	ΔSUV	Histo	83% *vs* 59% decrease SUV	0.025
Janssen *et al*[25] (2009)	30	CRT	2 wk pc	ΔSUV	Histo	43% decrease SUV PPV 91%; NPV 82%	
Konski *et al*[26] (2009)	53	CRT	3-4 wk pc	ΔSUV	Histo	67% *vs* 55% decrease SUV	NS
Rosenberg *et al*[27] (2009)	30	CRT	pc	ΔSUV	Histo	66% *vs* 48% decrease SUV PPV 83%; NPV 64%	0.040

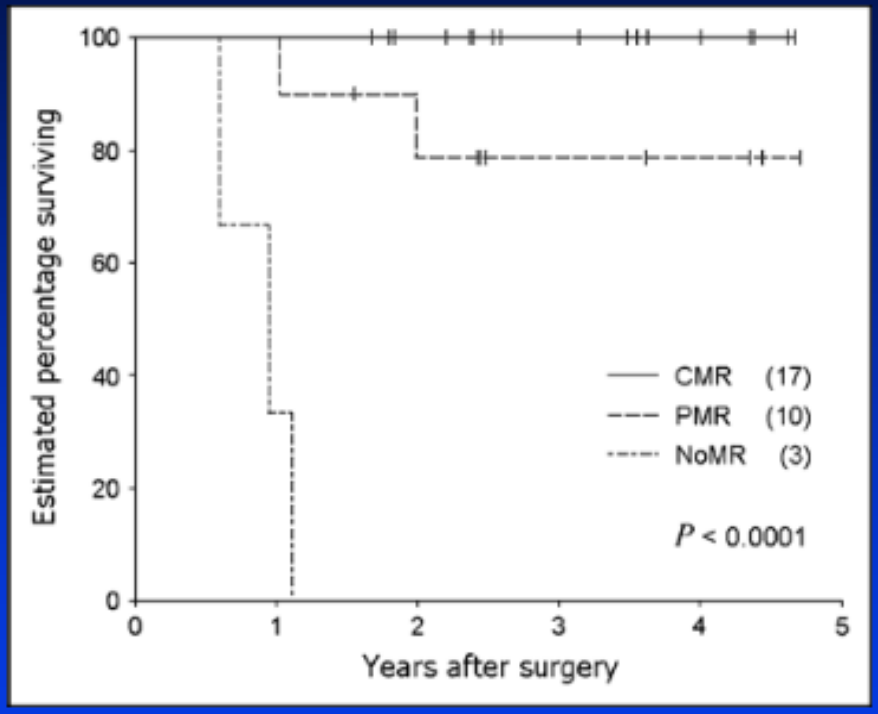
PET in treatment response

FDG-PET Response Assessment: Neoadjuvant Chemoradiation of Rectal Cancer

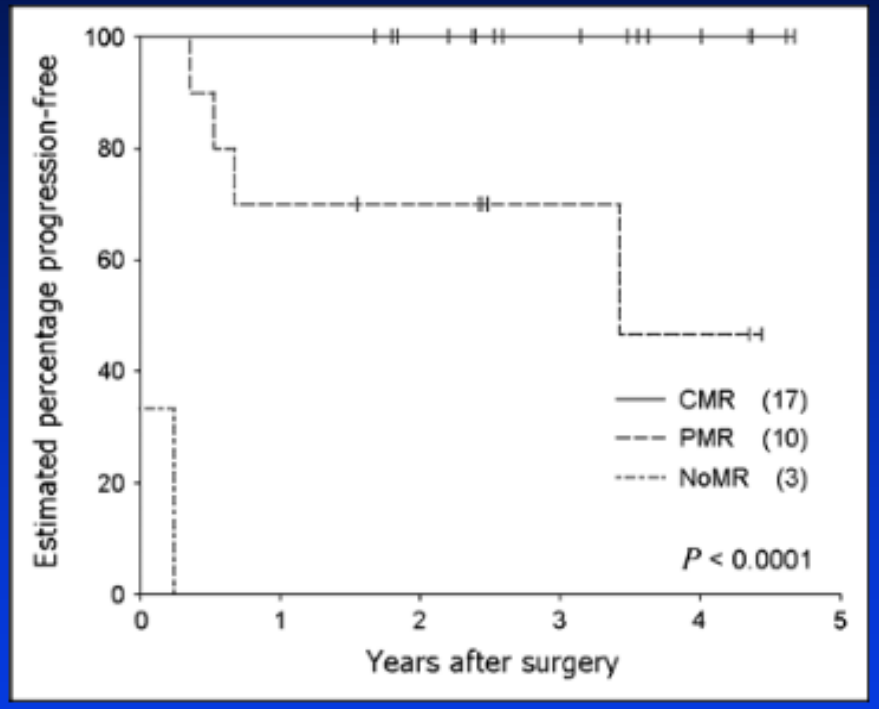
- 30 patients: PET before and 26 ± 9 d after chemoradiation, followed by surgery
- PET response assessed qualitiatively
  - CMR 17 (5 with CRp)
  - PMR 10 (1 with Crp)
  - NoMR 3
- CR by CT or MRI in only 5/24

Kalff et al. J Nucl Med 2006;

FDG-PET Response Assessment: Neoadjuvant Chemoradiation of Rectal Cancer



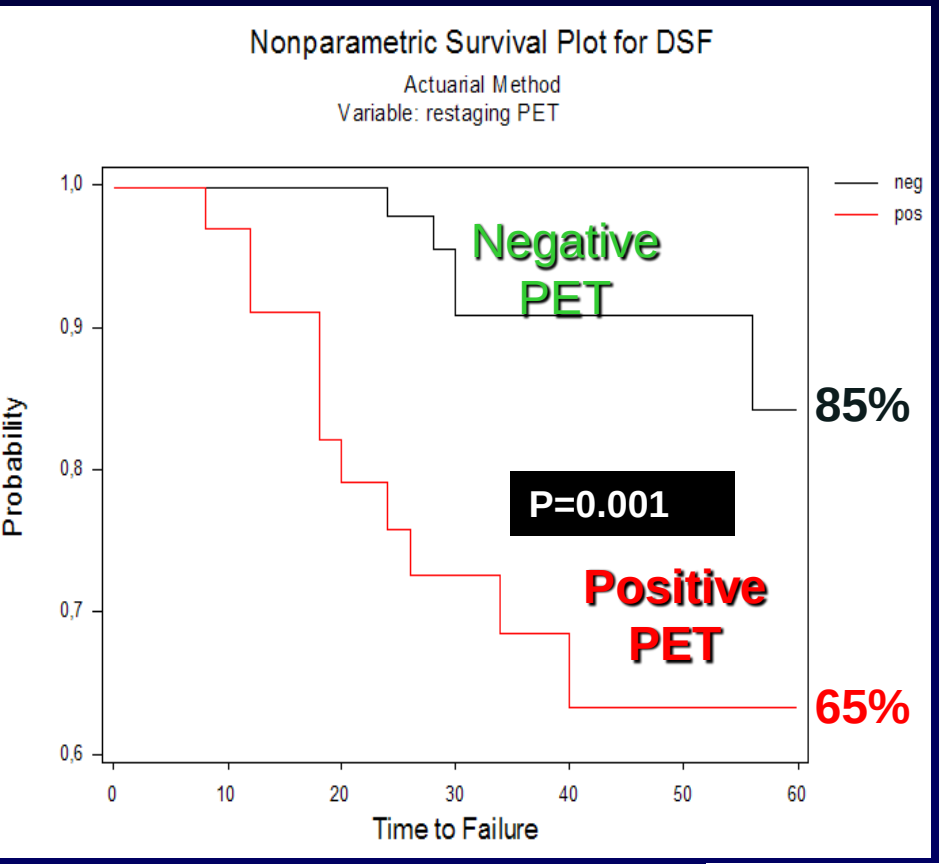
OS



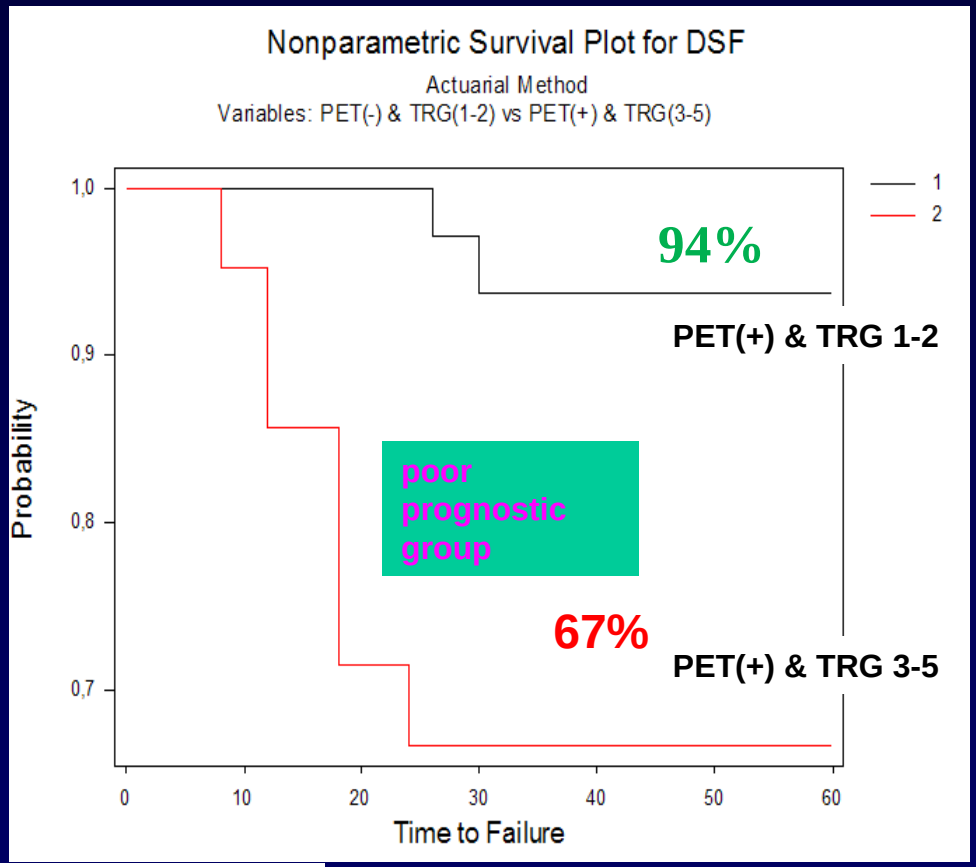
PFS

Kalff et al. J Nucl Med 2006;

Restaging PET vs 5-yr DFS



PET E TRG vs 5-yr DFS



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VOLUME 23 · NUMBER 9 · MARCH 20 2005

JOURNAL OF CLINICAL ONCOLOGY

Effectiveness of Gene Expression Profiling For Response Prediction of Rectal Adenocarcinoma to Preoperative Chemoradiotherapy

TS gene expression levels may have significant prognostic significance for patients with stage II and III rectal carcinoma after neoadjuvant chemoradiotherapy.

These parameters could be incorporated as part of the management of the patient with rectal cancer. ..... to identify group of patients at highest risk of recurrence.

It may be that it is in this group that other therapies ..... may have a more beneficial effect.