peritoneal carcinomatosis from 14% in the S-arm to 4% in the CRT+S-arm (p<0.0001). There was also a small, but significant effect on hematogenous dissemination in favor of the CRT group (35 vs. 29%, p=0.025). LRRs occurred in 5% within the radiation field, in 2% in the margins of the radiation field, and in 6% outside the radiation field while in 1% the exact site in relation to the radiation field was unclear. Only 1% of patients had an isolated infield LRR after CRT+S.
Conclusions: In patients with esophageal or junctional cancer, preoperative chemoradiotherapy improves locoregional control, reduces peritoneal carcinomatosis and has a favorable effect on hematogenous dissemination. Infield locoregional recurrences are rare.

OC-0418
SBRT for unresectable liver metastases: preliminary results of a phase II clinical trial.
M. Scorsetti[1], A. Tozzi[1], T. Comito[1], F. Alongi[1], E. Clerici[1], P. Navarria[1], A.M. Ascolese[1], F. Lobefalo[1], P. Mancosu[1], S. Tomatis[1]
[1]*Istituto Clinico Humanitas, Radiotherapy and Radiosurgery, Rozzano (Milan), Italy*

Purpose/Objective: To evaluate the feasibility of high-dose stereotactic body radiation therapy (SBRT) in the treatment of unresectable liver metastases.
Materials and Methods: Patients with one to three unresectable liver metastases with maximum individual tumour diameters less than 6cm, a Karnofsky Performance Status of at least 70, were enrolled and treated by SBRT on a phase II clinical trial. Dose prescription was 75Gy in 3 consecutive days.. SBRT was delivered using the volumetric modulated arc therapy (VMAT) by RapidArc technique, The primary end point was in-field local control. Secondary end points were toxicity, and survival.
Results: Between February 2010 and September 2011, 61 patients with 76 lesions were treated. Among them, 21 (34.3%) had stable extrahepatic disease at study entry. The most frequent primary sites were colorectal(45.9%) and breast cancer(18%). 78.7% of patients had one lesion, 18.0% and 3.3% had 2 and 3 lesions, respectively. After a median of 12 months (range 2-26 months) in-field local response rate was 94%. Median OS rate was 19 months, actuarial survival at 12 months was 83.5%. None of the patients suffered from grade 3 or higher acute toxicity. No radiation induced liver disease (RILD) was detected. One patient experienced G3 late toxicity at 6 months, due to chest wall pain.
Conclusions: SBRT for unresectable liver metastases can be considered as an effective, safe, and noninvasive therapeutic option with excellent rates of local control and a low treatment related toxicity.

OC-0419
Clinical complete response in rectal cancer to increase conservative treatment. ACCORD12 randomized trial
E. Chamorey[1], J.P. Gérard[2], K. Benezery[2], E. François[3], S. Gourgou-Bourgade[4]
[1]*Centre Antoine Lacassagne, Epidemiology, Nice, France*
[2]*Centre Antoine Lacassagne, Radiotherapy, Nice, France*
[3]*Centre Antoine Lacassagne, Medical Oncology, Nice, France*
[4]*Centre Val d'Aurelle, Statistics, Montpellier, France*

Purpose/Objective: During the ACCORD12 randomized trial, a specific evaluation of the clinical tumor response of the rectal cancer following neoadjuvant chemoradiotherapy (CRT) was performed before surgery. The correlation of this end point with patient characteristics and treatment outcomes is reported.
Materials and Methods: Between 2005 and 2008 a randomized trial comparing 2 different regimens of CRT (cap45 : capecitabine + 45 Gy/5w vs capox50 : capecitabine + 50 Gy/5w + oxaliplatine) included 598 patients. A careful evaluation of the clinical response of the tumor was planned 5 weeks after the end of CRT just before surgery. Rectoscopy and digital rectal examination (DRE) was used to establish a specific score of clinical response adapted from the RECIST criteria : Clinical complete response : no visible or palpable tumor, supple rectal wall (CCR) ; partial response (PR), stable disease (ST), progressive disease (PROG). This score was correlated with patients characteristics, type of surgery, pathological response and 3-year clinical outcome.
Results: Clinical response was evaluable in 475 patients. Score was as follow : CCR : 5%, PR : 62%, ST : 29%, PROG : 4%. There was a trend toward more CCR in the capox 50 arm (6,5 % vs 3,7 %). When analysed for the whole cohort of 475 patients, CCR was associated with early T stage (T2 : 11% vs T3-4 : 5%). CCR was associated with sphincter saving surgery, ypCR, CRM+, Disease Free Survival (table 1).
Conclusions: CCR appears as a very important end point after neoadjuvant treatment of rectal cancer. It is correlated with increased pCR, negative CRM, 3 year DFS and it is probably influencing the chance of a sphincter saving procedure. Rectoscopy and DRE should be performed after neoadjuvant CRT to evaluate the tumor response and adapt the surgical technique.
Reference : JP Gérard et al. Clinical outcome ACCORD12. 10.1200/JCO.2012.42.8771

	CCR (24 pts) %	Part;Stable;Prog (451 pts) %
Sph. Sav. Surg.	21 88 %	380 71 %
ypCR	14 58 %	72 16 %
CRM+ (≤1mm)	0 0 %	45 10 %
3y DFS	91 %	70 %

OC-0420
Improving quality of care in rectal cancer:the role of a central review platform in CTV delineation.
I. Joye[1], M. Lambrecht[1], D. Jegou[2], E. Hortobágyi[1], A. Pelgrims[1], P. Scalliet[3], K. Haustermans[1]
[1]*University Hospitals Leuven, Radiation Oncology, Leuven, Belgium*
[2]*Belgian Cancer Registry, Biostatistics, Brussels, Belgium*
[3]*Cliniques Universitaires St. Luc, Radiation Oncology, Brussels, Belgium*

Purpose/Objective: The increased use of high conformal radiation techniques with steep dose gradients requires a very precise definition of the clinical target volume (CTV). Although delineation guidelines are widely available, little is known about their correct implementation into daily practice. Within a national project we investigated the impact of central review on the quality of CTV delineation based on the guidelines as published by Roels et al (IJROBP 2006).
Materials and Methods: Dedicated software (Aquilab, France) was installed at a central review facility and at each participating radiation oncology department. The CTV was uploaded on a secured server and centrally reviewed. In order to account for the variability in the time of inclusion between two patients in and between centres, we used a ranking system in which each 5 consecutive patients per centre were regarded as one category. This categorical patient order (cpatorder) was correlated with three volumetric parameters: kappa index (KI), volumetric ratio (RV) and commonly contoured volume (VCC). To compare the results of the volumetric parameters between the first ten patients and the others per centre a sensitive analysis was performed. A generalized linear model was used for normally distributed parameters (RV) and a regression logistic model for non-normally distributed parameters (KI, VCC).
Results: Between March 2010 and September 2012, 20 centres submitted 1255 rectal cancer cases, from which 1224 were included in the final analysis. A median of 64 patients were submitted per centre (range 6 -198). CTV was modified in 74.2% of the cases. Sensitive analysis demonstrated that there was a significant increase in RV and VCC between the first ten patients and the others (p<0.0005 resp. p<0.05) (Fig. 1). Statistical analysis did not show a sustained significant improvement in CTV delineation during the whole review period. When assessing the influence of the location of the primary tumour on CTV delineation, there was less consensus on delineation for mid seated lesions compared to low and high seated tumours. This might be explained by disagreement on which nodal volumes to include.

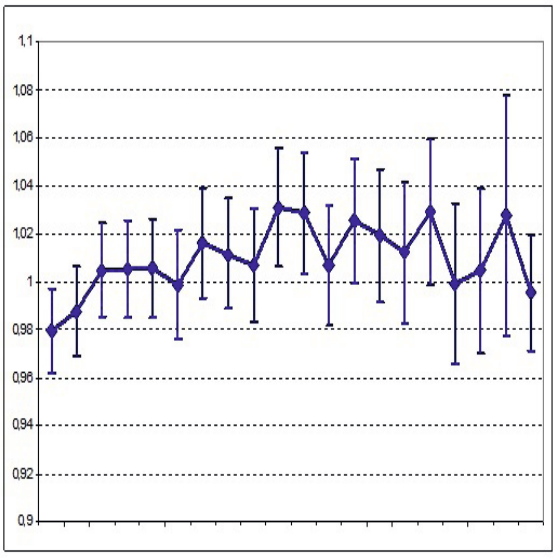

Fig. 1: Least square means of RV by categorical patient order (corrected for CTV original and centre).

Conclusions: Central review significantly improved the uniformity of the CTV delineation in the first ten rectal cancer patients submitted per centre. The high agreement on CTV delineations from the beginning of the review period and the fact that some centres submitted a low number of cases may explain the lack of a learning curve over the whole period. Further analysis of the data can highlight current ambiguities in the delineation guidelines and can help us in further improving these.

OC-0421

Quality Indicators in radiation therapy for rectal cancer. A population based study in Southern Switzerland 2011-12

V. Bianchi Galdi[1], A. Franzetti-Pellanda[2], A. Spitale[1], M.C. Valli[3], L. Ortelli[1], P. Mazzola[1], S. Peverelli[1], L. Mazzucchelli[4], A. Bordoni[1]
[1]*Cantonal Institute of Pathology, Ticino Cancer Registry, Locarno, Switzerland*
[2]*Clinica Luganese, Radiation Oncology Dept., Lugano, Switzerland*
[3]*Oncology Institute of Southern Switzerland (IOSI), Radiation Oncology Dept., Bellinzona, Switzerland*
[4]*Cantonal Institute of Pathology, Clinical Pathology, Locarno, Switzerland*

Purpose/Objective: Research on quality of cancer care (QoCC) during the last decade has demonstrated that the increase in knowledge on treatments with proven efficacy does not directly translate into optimal treatment delivery to patients. On the other hand, data describing the proportion of patients with rectal cancer (RC) who benefit of up-to-date evidence-based diagnostic-treatment procedures are still scarce in the literature. Aims of the present study are: 1) to describe the methods used for the selection of RC specific quality indicators (QI); 2) to analyse three QI concerning patients diagnosed with a new RC in Southern Switzerland and receiving neo-adjuvant radiation therapy (RT).
Materials and Methods: QI have been developed in the context of a QoCC project as follows: seek and nomination of multidisciplinary RC Working Group, selection of QI on an evidence-based manner, choice of QI through a two-rounds Delphi-process and validation of final QI by an international Advisory Board (consensus ≥ 70%). Patients with RC incident from 2011 to 2012 were retrieved from the files of Ticino Cancer Registry. According to ICD-O-III tumour classification, epithelial tumours were included, but neuroendocrine, GIST, sarcoma, lymphoma. Additional information was extracted from the single pathology and RT records in both public and private hospitals. QI will be presented as proportion with the corresponding 95% confident intervals. The numerator and the denominator will be defined according to the definition of each QI.
Results: We initially considered 51 rectum-specific QI, of which 15 were RT-related. At the end of the whole process, 21 QI were finally validated (RT-related, N=9). Results of patients diagnosed with RC in 2011-2012 will be presented for the following 3 RT-related QI: *1) proportion of patients with RC for which the request for the pathological examination includes the information of neo-adjuvant RT (in patients with RC undergoing neo-adjuvant RT and surgery); 2) proportion of patients with locally advanced RC undergoing neo-adjuvant RT (in patients with locally advanced RC undergoing surgery; 3) proportion of patients with RC and undergoing neo-adjuvant RT operated within 6-8 weeks after the end of neo-adjuvant RT (in patients with RC undergoing neo-adjuvant RT and surgery).*
Conclusions: QI are mandatory not only for clinicians, but also for stakeholders and patients. QI should be defined, developed and tested with scientific evidence-based rigor in a careful and transparent manner. The present QI study is based on expertise and active involvement of local health care providers and international experts representing all major disciplines (epidemiology, pathology, radiology, gastroenterology, surgery, radiation oncology, oncology, nuclear medicine), thus increasing quality, acceptance and translation of results into the daily clinical practice.

OC-0422

Towards a validated decision tool for rectal cancer based on sequential PETCT imaging before and during treatment

R. van Stiphout[1], G. Lammering[1], M.A. Gambacorta[2], E. Meldolesi[3], M. Souvatzoglou[4], K. Herrmann[4], V. Valentini[3], P. Lambin[1]
[1]*Department of Radiation Oncology (MAASTRO) - GROW - University Medical Centre, Maastricht, The Netherlands*
[2]*Bioimmagini e Scienze Radiologiche - Università Cattolica S. Cuore, Rome, Italy*
[3]*Department of Radiotherapy - Università Cattolica S. Cuore, Rome, Italy*
[4]*Department of Nuclear Medicine - Technische Universitat Munchen, Munchen, Germany*

Purpose/Objective: To tailor treatment for locally advanced rectal cancer (LARC) an early accurate prediction of tumor response after preoperative chemoradiotherapy (CRT) is required. In literature, response prediction for LARC is mainly based on PET-imaging, but these studies are small and rarely validated. This study provides a prediction model based on a multicentric analysis of LARC response with clinical and sequential PET data of before and during treatment from three different institutes.
Materials and Methods: In total, 112 patients from one institute were used to train the prediction model.The model was tested on respectively 78 and 28 patients from two different institutes. All LARC patients were prospectively accrued between 2007 and 2011 and received long-course radiotherapy (45-55 Gy) and concomitant chemotherapy. Two PETCT scans were made, pretreatment (day0) and halfway treatment (day 15). Tumors were semi-automatically contoured using a signal-to-background based threshold method. Extracted PET features of the two time points were SUV_{mean}, SUV_{max}, metablic tumor volume (MTV) and maximal tumor diameter. Response indices between day0 and day 15 were calculated. They were analyzed together with age and gender of the patient and cT- and cN-stage. The endpoint for prediction was pathologic complete response (pCR) defined as ypT0N0, based on pathology reviews of the resected specimen. Eleven patients who were also included in a wait-and-see study were considered to have pCR when they were recurrence free for at least 1 year. Significant predictors from a univariate Mann-Whitney U test were included in a multivariate model based on logistic regression to predict tumor response. Performance of the model was expressed as a bootstrapped AUC (Area Under the Curve) of the Receiver Operating Characteristic (ROC).
Results: The data distributions, number of missing values and pCR rates were similar between the institutes (Table). Based on the univariate analysis and outcome of the logistic regression, cT- and cN-stage, maximal diameter at day15 and response index of SUV_{max} were selected as predictors. A nomogram was deducted from this model (Figure), resulting in performances of 0.78 for the training dataset and 0.69 and 0.64 for the smaller validation datasets.

Dataset	Type	N	Missing	% pCR	AUC [95% C.I.]
Institute 1	Training	112	0.5%	21,4%	0.78 [0.67-0.88]
Institute 2	Validation	78	1.8%	23.1%	0.69 [0.55-0.82]
Institute 3	Validation	28	0.7%	25.0%	0.64 [0.40-0.85]

Conclusions: Sequential PET-imaging has predictive power for response after chemoradiotherapy in LARC patients. Application of the developed model in other institutes is less accurate, but still useful for tailored decision making. When patients are assigned to risk groups for an uncomplete response, high risk patients may be candidates for radiotherapy boost and adjuvant chemotherapy strategies, while the low risk patients may be followed-up with a wait-and-see policy,