**Table S1: Description of quality indicators for colorectal cancer care**

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| Indicator 1 | Availability and constitution of multidisciplinary tumor boards/ ambulatory multidisciplinary teams |
| Numerator | Number of institutions/ ambulatory multidisciplinary teams, that provide a tumor board with the following structural conditions:The tumor board/ambulatory multidisciplinary team should discuss 50 cases per year and decide on treatment planning.The core team members should be designated and include: a visceral surgeon, a radiation oncologist, a (diagnostic) radiologist, a gastroenterologist, a medical oncologist, a pathologist. |
| Denominator | All institutions/ ambulatory multidisciplinary teams |
| Indicator 2 | Pre-therapeutic assessment of CRC-patients by tumor boards/ambulatory multidisciplinary teams |
| Numerator | Number of patients, which had an pre-therapeutic assessment by a tumor board/ambulatory multidisciplinary team |
| Denominator | All patients with:1. RC or2. Metastasizing CC or3. CRC and loco-regional recurrence |
| Indicator 3 | Tumor board/ambulatory multidisciplinary team with expertise in metastatic surgery |
| Numerator | Number of tumor boards/ambulatory multidisciplinary teams with expertise (hepato-biliary surgeons, oncologists) and technical qualification for surgery of liver metastases |
| Denominator | All institutions/ambulatory multidisciplinary teams with tumor board |
| Indicator 4 | Availability and content of a preoperative colonoscopy report |
| Numerator | Number of patients, which had a colonoscopy report preoperatively, which included the following quality criteria:Completeness of the examinationsLocalization of the tumorDescription of the tumor (for example: small, medium, big, circumferential)Measured size of the tumor |
| Denominator | All patients with CRC, which had a resection of the primary tumor. |
| Indicator 5 | Colonoscopy reports with documentation of specific quality aspects |
| Numerator | Number of colonoscopy reports, which content the following aspects completely:Pre-procedural risk estimationCompleteness of colonoscopyQuality of bowel preparationComplete description of all located polyps, including localization of each polyp, size, number and macroscopic morphologyRecommendation for follow-up |
| Denominator | Colonoscopy reports of patients with CRC of an institution (random sample) |
| Indicator 6 | Pre-therapeutic availability of a histo-pathologic diagnosis (tumor biopsy) |
| Numerator | Number of patients, in which the diagnosis was confirmed by pre-therapeutic biopsy |
| Denominator | All patients with CRC, who received a primary therapy (resection of the primary tumor or a neo-adjuvant radio(chemo)therapy) |
| Indicator 7 | Pre-therapeutic liver imaging in patients with CRC |
| Numerator | Number of patients, who had a pre-therapeutic liver imaging with ultrasound or CT or MRI |
| Denominator | All patients with CRC, who received a primary therapy (resection of the primary tumor or a neo-adjuvant radio(chemo)therapy) |
| Indicator 8 | Pre-therapeutic rigid rectoscopy in RC-patients |
| Numerator | Number of patients, who had a pre-therapeutic rigid rectoscopy to define the distance of the lower tumor margin to the anocutaneous line (description in cm) |
| Denominator | All patients with RC, who received a primary therapy (resection of the primary tumor or a neoadjuvant radio(chemo)therapy) |
| Indicator 9 | Pre-therapeutic staging using cTNM-categories in RC-patients |
| Numerator | Number of patients with pre-therapeutic assessment:Depth of tumor invasion (cT),Peri-rectal lymph nodes (cN) andDiagnostic of metastases (cM) |
| Denominator | All patients with CRC, who received a primary therapy (resection of the primary tumor or a neo-adjuvant radio(chemo)therapy) |
| Indicator 10 | Pre-therapeutic pelvis imaging using multi-slice CT or high-resolution MRI in RC-patients |
| Numerator | Number of patients, who had pre-therapeutic imaging of the pelvis with multi-slice CT or high-resolution MRI |
| Denominator | All patients with CRC, who received a primary therapy (resection of the primary tumor or a neo-adjuvant radio(chemo)therapy) |
| Indicator 11 | Pre-therapeutic imaging of liver and lungs using CT or MRI in CRC-patients with liver metastases |
| Numerator | Number of patients, who had a pre-therapeutic CT or MRI (PET-CT only with specific indications) of the liver or the lungs |
| Denominator | All patients with CRC and CRC-liver metastasis |
| Indicator 12 | Pre-operative assessment of bowel, urinary and sexual function in RC-patients |
| Numerator | Scores (with EORTC-QLQ-CR 29 questionnaire) of the functional status of the preoperative bowel, urinary and sexual function |
| Denominator | All patients with RC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 13 | Assessment of Bethesda-criteria in patients with CRC |
| Numerator | Number of patients, who had assessment and documentation of the Bethesda-criteria |
| Denominator | All patients with CRC, who had resection of the primary tumor |
| Indicator 14 | Preoperative stoma education where appropriate |
| Numerator | Number of patients who had preoperative counseling regarding a planned stoma |
| Denominator | All patients with CRC, who had a stoma-surgery |
| Indicator 15 | Preoperative marking of stoma-localization in surgery of CRC |
| Numerator | Number of patients, who had preoperatively marked the localization of the stomain a sitting and standing position |
| Denominator | All patients with CRC, who had a stoma-surgery |
| Indicator 16 | Neoadjuvant radio(chemo)therapy in RC-patients |
| Numerator | Number of patients, who had a neo-adjuvant radio(chemo)therapy. |
| Denominator | All patients with RC of the mid and low third rectum and TNM-categoriescT3, 4/cM0 and/or cN1, 2/cM0, who had surgery |
| Indicator 17 | Radiotherapy in line with quality standards of the German Society of Radiation Oncology (DEGRO) in RC-patients |
| Numerator | Number of patients with RC, who had radiotherapy according to the following quality criteria of the German Association of Radio-oncology (Deutsche Gesellschaft für Radioonkologie, DEGRO):1. Availability of a 3-D-plan with CT and a maximum of 5mm layer thickness2. Application of a minimum of 3 radiation fields, which get radiated daily3. Discontinuity of the radiation (course) less than 5 days4. Maintaining of the dosage of 5x5 = 25 Gy during short-time radiation5. Maintaining of a total dose of a minimum of 45 Gy during long-time radiation6. Application of chemotherapy simultanously to radiotherapy during long-time radiation. |
| Denominator | All patients with RC, who received radiotherapy |
| Indicator 18 | Antibiotic prophylaxis before CRC-surgery |
| Numerator | Number of patients, who received antibiotic prophylaxis before surgical tumor resection |
| Denominator | All patients with CRC, who had surgery |
| Indicator 19 | En bloc resection in case of tumor adherence to other organs |
| Numerator | Number of patients, who had en bloc resection |
| Denominator | All patients with CRC, of whom tumor adherence to other organs was found during surgery |
| Indicator 20 | Intra-operative exploration of liver and peritoneal lining  |
| Numerator | Number of patients, who had intra-operatively an exploration of liver and peritoneal lining |
| Denominator | All patients with CRC, who had surgery |
| Indicator 21 | Intraoperative local dissemination of tumor cells  |
| Numerator | Number of patients, in which the pathologist had documented an intra-operative local dissemination of tumorcells |
| Denominator | All patients with CRC and primary radical resection of the tumor (R0-resection) |
| Indicator 22 | Total/partial mesorectal excision (TME/PME)in RC-patients  |
| Numerator | Number of patients, who received a TME (if localization of tumor was in the lower or middle third of the rectum) or a PME (if localization of tumor was in the high third of the rectum) |
| Denominator | All patients with RC, who had surgery. |
| Indicator 23 | Abdominal perineal resection (APR) in RC-patients  |
| Numerator | Number of patients, who received an abdominal perineal resection |
| Denominator | All patients with RC, who had surgery |
| Indicator 24 | Major anastomotic leakage after elective CRC-surgery |
| Numerator | Number of patients with post-surgical interventions due to a clinically manifest anastomotic leakage |
| Denominator | All patients with CRC, who had elective surgery |
| Indicator 25 | Surgical re- interventions after CRC-surgery |
| Numerator | Number of patients with abdominal re-interventions due to complications during the acute inpatient care |
| Denominator | All patients with CRC, who had resection of the primary tumor |
| Indicator 26 | Examination of least 12 lymph nodes |
| Numerator | Number of patients with at least 12 removed and patho-histologically examined lymph nodes |
| Denominator | All patients with CRC, who had resection of the primary tumor. |
| Indicator 27 | Rate of local R0-resection in patients with CRC |
| Numerator | Number of patients with local R0-resection |
| Denominator | All patients with CRC, who had resection of the primary tumor |
| Indicator 28 | Rate of pT1 carcinoma in CRC-patients  |
| Numerator | Number of patients with pT1 carcinoma |
| Denominator | All patients with CRC, who had resection of the primary tumor |
| Indicator 29 | Liver- and lung-metastasectomy in patients with stage IV CRC |
| Numerator | Number of patients who had metastasectomy (of liver or lung) |
| Denominator | All patients with CRC and metastasis of liver or lung |
| Indicator 30 | Documentation of distal tumor-free margin in RC-patients |
| Numerator | Number of patients with documentation of the distance of distal tumor margin to the distal resection margin in mm and of the distance of the tumor to circumferential meso-rectal resection margin in mm |
| Denominator | All patients with RC, who had resection of the primary tumor with TME or PME |
| Indicator 31 | Mesorectal CRM-positive (CRM < 1mm) radical surgical resection in RC-patients |
| Numerator | Number of patients, who had a specimen with positive circumferential margin (CRM < 1mm). |
| Denominator | All patients with RC, who had a radical resection of the tumor in curative intention. |
| Indicator 32 | Quality of Total Mesorectal Excision (TME) |
| Numerator | Number of patients with good or moderate quality of TME |
| Denominator | All patients with RC, who had TME |
| Indicator 33 | Pathology reports following quality standards of the German Society of Pathology |
| Numerator | Number of pathology reports, which include the following criteria completely.LocalizationType of tumor according to WHO classificationDepth of tumor invasion (pT-classification)Status of regional lymph nodes (pN-classification)Number of examined lymph nodesNumber of affected lymph nodesGradingDistance to resection marginsR-classificationInvasion of lymph-/ blood vesselsIn RC-specimens additionallyQuality of TMEGrade of tumor-regression in case of neo-adjuvant therapy (if applicable) |
| Denominator | All pathology reports of patients with CRC and surgical tumor-resection  |
| Indicator 34 | Postoperative pain assessment after surgery of CRC |
| This indicator was excluded after the panel ratings because it was already included in a general part of the patient survey |
| Indicator 35 | Post-operative assessment of bowel, urinary and sexual function in RC-patients |
| Numerator | Changes of scores (EORTC-QLQ-CR 29 questionnaire) of the functional status of the prost-operative bowel, urinary and sexual function in comparison to the preoperative score (see indicator 12) |
| Denominator | All patients with RC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 36 | Providing of information and instructions about stoma management in patients with stoma |
| Numerator | Number of patients with stoma, who received information about stoma care before discharge including the following aspects:Instructions about stoma careA contact person (stoma therapist) for stoma care |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 37 | Adjuvant chemotherapy in patients with stage III CC |
| Numerator | Number of patients, who received adjuvant chemotherapy |
| Denominator | All patients with CC UICC-stage III, who had R0-resection of the primary tumor |
| Indicator 38 | Time interval between surgery and starting adjuvant chemotherapy in patients with stage III CC |
| Numerator | Number of patients with a time period of less than 6 weeks until start of an adjuvant chemotherapy. |
| Denominator | All patients with CC UICC-stage III, who had R0-resection of the primary tumor. |
| Indicator 39 | Documentation of chemotherapy treatment summary in medical records and passing on this information to the patient and to the physician providing surveillance |
| Numerator | Number of patients, of whose the following aspects were documented in the medical chart:A summary of the chemotherapy treatment,Its transition to the patient andIts transition to the physician(s) providing continuing care. |
| Denominator | All patients with CRC, who received chemotherapy |
| Indicator 40 | Delivery of a written plan for pain management in CRC-patients where appropriate |
| Numerator | Number of patients, who received a plan for pain management |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 41 | Examination of microsatellite-instability in CRC-patients younger than 50 years |
| Numerator | Number of patients, in which an examination for microsatellite-instability was performed |
| Denominator | All patients with CRC under 50 years of age, who had a resection of the primary tumor |
| Indicator 42  | Postoperative colonoscopy within 6 months in patients with incomplete preoperative colonoscopy |
| Numerator | Number of patients, who received a complete colonoscopy within 6 months postoperatively |
| Denominator | All patients with CRC, who had surgery and who did not have complete colonoscopy preoperatively |
| Indicator 43 | Postoperative surveillance as recommended in the German evidence-based guideline |
| Numerator | Number of patients, who undergo surveillance |
| Denominator | All patients with stage II and III UICC after R0-resection |
| Indicator 44 | Sharing the decision with the patient regarding therapeutic procedures |
| Numerator | Number of patients, who claim they had been involved by therapists in the decision making process regarding therapeutic procedures |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 45 | Opportunities to ask the specialists questions |
| Numerator | Number of patients, who claim they had sufficient opportunities to ask questions |
| Denominator | All patients with CRC, who had a resection of the primary tumor and who participated in the patients’ survey |
| Indicator 46 | The patient is offered contact with a companion in distress |
| Numerator | Number of patients, who claim they had been offered a contact person for distress |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 47 | The patient knows, which activities are allowed at home |
| Numerator | Number of patients, who claim they had been told, which activities are allowed at home |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 48 | The patient knows, which side effects or late complications to be aware of at home |
| Numerator | Number of patients, who claim they had been told, which side effects or late complications to be aware of at home |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 49  | The patient knows, when to contact physicians providing continuing care |
| Numerator | Number of patients, who claim they had been told, when to contact their general practitioner or a specialist. |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 50 | 5-year overall survival in CRC-patients |
| Numerator | Number of patients, who survived at least 5 years |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |
| Indicator 51 | 5-year local recurrence rate in RC-patients  |
| Numerator | Number of patients, who had surgery of a local recurrence. |
| Denominator | All patients with RC UICC-stage I-III, who had R0-resection of the primary tumor. |
| Indicator 52 | 30-day-mortality rate after primary CRC-surgery  |
| Numerator | Number of patients, who died within a time period of 30 days after surgery. |
| Denominator | All patients with CRC, who had resection of the primary tumor. |
| Indicator 53 | Assessment of quality of life with a specific instrument in CRC-patients  |
| Numerator | Number of patients with CRC, in which the quality of life was assessed with a specific survey instrument (EORTC QLQ-C30) |
| Denominator | All patients with CRC, who have had surgery and were randomly selected for participation in the patient survey |