

Quality Indicators for Colorectal and Pancreatic Cancer to monitor and improve oncological care within Comprehensive Cancer Care Networks (CCCN)

Work package 10 Task 3 Quality Indicators

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Version:	3.0, final
Date:	02.04.2020

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This report arises from the Innovative Partnership for Action Against Cancer Joint Action, which has received funding from the European Union through the Consumers, Health, Agriculture and Food Executive Agency of the European Commission, in the framework of the Health Programme 2014-2020. The content of this report represents the views of the author/s only and is his/her/their sole responsibility; it cannot be considered to reflect the views of the European Commission and/or the Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains. The authors are not responsible for any further and future use of the report by third parties and third-party translations.

Acknowledgements

The authors would like to thank all members of the steering committee under Task 3 – Quality Indicators for Cancer Care in WP 10 – Governance of Integrated and Comprehensive Cancer Care as well as all members of the expert panel group, whose comments and feedback to the selected quality indicators have been very valuable and indispensable.

Abbreviations

CCCN	Comprehensive Cancer Care Network
CRM	Circumferential Resection Margin
CT	Computed Tomography
ERCP	Endoscopic Retrograde Cholangio-Pancreatography
GIN	Guideline International Network
IET	Ipaac Evaluation Tool
iPAAC	Innovative Partnership for Action Against Cancer
TME	Total Mesorectal Excision
QI	Quality Indicator
US	Ultrasound
VAC	Vacuum-Assisted Closure
WP	Work Package

Background

The Comprehensive Cancer Care Networks (CCCNs) represent innovative approaches for the management of cancer patients consisting of multiple cooperating health units with specific expertise in the different steps of care. Quality Indicators (QIs) constitute valid and reliable tools that allow to measure the quality of oncologic care among similar structures belonging to different health systems. Objective of Work Package 10, Task 3 was to develop a standardized tool (the iPAAC Evaluation Tool for Quality Indicators in Oncology – iET-QIs) in order to define a multi-step process for the selection of QIs for the evaluation of CCCNs, and to assess its efficacy by applying this instrument.

The iET-QI was developed as a methodological tool describing an 8-step process that leads to the selection of QIs feasible for the CCCN setting (see document “Methodology Paper iPAAC”). The tool was implemented accordingly with the reporting standards for guideline-based performance measures of the Guideline International Network (GIN).

In this report the final set of quality indicators for colorectal and pancreatic cancer are presented.

Quality Indicators for Colorectal Cancer

Quality Indicator	Reference	Further supporting references
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QI 1 Colorectal: Information on distance to mesorectal fascia - rectal cancer

<p>Numerator: Patients of the denominator with information on distance to mesorectal fascia in the diagnostic report</p> <p>Denominator: All patients with rectal cancer of the middle and lower third and MRI or thin-slice CT of the pelvis</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 2 Colorectal: Preoperative abdominal and pelvic CT - colorectal cancer

<p>Numerator: Patients of the denominator with preoperative abdominal and pelvic CT</p> <p>Denominator: All patients with Colorectal Cancer and resection</p>	<p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., Am J Surgery (2010) 200:572–576</p>	
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Quality Indicator	Reference	Further supporting references
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QI 3 Colorectal: Complete elective colonoscopies - colorectal cancer center

<p>Numerator: Colonoscopies of the denominator which have been completed</p> <p>Denominator: All elective colonoscopies for each colonoscopy unit of the colorectal cancer center</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 4 Colorectal: CEA blood test - colon cancer

<p>Numerator: Patients of the denominator with CEA blood test prior to treatment</p> <p>Denominator: All patients with colon cancer stage IV and rectal cancer and any treatment</p>	<p>Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. <i>J Am Coll Surg.</i> 2014 Jan;218(1):16-25.e1-4.</p>	<p>Giuliani J, Marzola M, Indelli M, Frassoldati A.: Oncological quality indicators and Colorectal Cancer Program: data from 2009-2010 of University Hospital in Ferrara, Italy. <i>Recenti Prog Med.</i> 2012 Feb;103(2):56-61</p> <p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. <i>J Natl Compr Canc Netw</i> 2013;11:431-41.</p> <p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., <i>Am J Surgery</i> (2010) 200:572-576</p>
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Quality Indicator	Reference	Further supporting references
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QI 5 Colorectal: MMR-assessment - colorectal cancer

<p>Numerator: Patients of the denominator with immunohistochemical assessment of mismatch repair (MMR) proteins</p> <p>Denominator: All patients with initial colorectal cancer diagnosis < 50 years old</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 6 Colorectal: Pre-therapeutic case presentation: first diagnosis - colorectal cancer

<p>Numerator: Patients of the denominator which have been presented at an interdisciplinary tumor board before therapy</p> <p>Denominator: All elective patients with rectal cancer and all patients with colon cancer stage IV</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., Am J Surgery (2010) 200:572–576</p> <p>Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. J Am Coll Surg. 2014 Jan;218(1):16-25.e1-4.</p>
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Quality Indicator	Reference	Further supporting references
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QI 7 Colorectal: Pre-therapeutic case presentation: relapses/metachronous metastases - colorectal cancer

<p>Numerator: Patients of the denominator which have been presented at the pre-therapeutic tumor board</p> <p>Denominator: All patients with colorectal cancer and relapse or new metastases</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 8 Colorectal: Post-operative case presentation - colorectal cancer

<p>Numerator: Patients of the denominator which have been presented at the post-operative tumor board</p> <p>Denominator: All patients with colorectal cancer and surgical resection or endoscopic treatment</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>Wesselmann S, Winter A, Ferencz J, Seufferlein T, Post S. Documented quality of care in certified colorectal cancer centers in Germany: German Cancer Society benchmarking report for 2013. Int J Colorectal Dis. 2014. 29(4): 511–8</p>
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Quality Indicator	Reference	Further supporting references
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QI 9 Colorectal: Revision surgery - colon cancer

<p>Numerator: Revision surgeries of the denominator due to peri-operative complications within 30 days from elective surgery</p> <p>Denominator: All elective colon cancer surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 10 Colorectal: Revision surgery - rectal cancer

<p>Numerator: Revision surgeries of the denominator due to peri-operative complications within 30 days from elective surgery</p> <p>Denominator: All elective rectal cancer surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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Quality Indicator	Reference	Further supporting references
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QI 11 Colorectal: Local R0 resections - colon cancer

<p>Numerator: Surgeries of the denominator with local R0 – after completion of surgical treatment</p> <p>Denominator: All colon cancer surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>National Health Service UK: Performances of colorectal cancer surgery: https://www.nhs.uk/service-search/performance-indicators/organisations/hospital-specialties-colorectal-surgery?Radius=25</p> <p>Healthcare Quality Improvement Partnership Ltd. (HQIP), National Bowel Cancer Audit Annual Report 2018: https://www.nboca.org.uk/content/uploads/2018/12/NBOCA-annual-report2018.pdf</p> <p>National Services Scotland: Colorectal Cancer Quality Performance Indicators https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p>
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QI 12 Colorectal: Local R0 resections -rectal cancer

<p>Numerator: Surgeries of the denominator with local R0 after completion of surgical treatment</p> <p>Denominator: All rectal cancer surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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Quality Indicator	Reference	Further supporting references
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QI 13 Colorectal: Post-operative wound infection - colorectal cancer

<p>Numerator: Surgeries of the denominator with post-operative wound infection within 30 days from surgery requiring surgical wound revision (rinsing, spreading, VAC bandage)</p> <p>Denominator: All elective colorectal cancer surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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QI 14 Colorectal: Anastomotic leakage - colon cancer

<p>Numerator: Patients of the denominator having anastomotic leakage requiring re-intervention (radiological or surgical)</p> <p>Denominator: All patients with colon cancer in whom anastomosis was performed in an elective resection</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>National Services Scotland: Colorectal Cancer Quality Performance Indicators https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p>
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Quality Indicator	Reference	Further supporting references
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QI 15 Colorectal: Anastomotic leakage - rectal cancer

<p>Numerator: Patients of the denominator having anastomotic leakage requiring intervention (radiological or surgical)</p> <p>Denominator: All patients with rectal cancer who undergo anterior resection and TME. No exclusions</p>	<p>https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p>	<p>National Services Scotland: Colorectal Cancer Quality Performance Indicators https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p> <p>Wesselmann S, Winter A, Ferencz J, Seufferlein T, Post S. Documented quality of care in certified colorectal cancer centers in Germany: German Cancer Society benchmarking report for 2013. <i>Int J Colorectal Dis.</i> 2014. 29(4): 511–8</p>
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QI 16 Colorectal: Post-operative mortality - colorectal cancer

<p>Numerator: Patients of the denominator who died within 30d of elective surgery</p> <p>Denominator: All patients with colorectal cancer and elective surgery (without trans-anal wall resection)</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>National Services Scotland: Colorectal Cancer Quality Performance Indicators https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p>
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Quality Indicator	Reference	Further supporting references
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QI 17 Colorectal: Primary resection of liver metastases - colorectal cancer

<p>Numerator: Patients of the denominator who underwent resection of liver metastases</p> <p>Denominator: All patients with stage IV colorectal cancer who have only liver metastases</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	
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Quality Indicator	Reference	Further supporting references
QI 18 Colorectal: Analysis of lymph nodes - colorectal cancer		
<p>Numerator: Patients of the denominator with 12 or more lymph nodes removed and examined</p> <p>Denominator: All patients with colorectal cancer and resection</p>	<p>Caldarella A, Amunni G, Angiolini C, Crocetti E, Di Costanzo F, Di Leo A et al., Feasibility of evaluating quality cancer care using registry data and electronic health records: a population-based study. <i>Int J Qual Health Care.</i> 2012. 24(4):411-8</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p> <p>Desch CE, McNiff KK, Schneider EC, Schrag D, McClure J, Lepisto E et al. American Society of Clinical Oncology/National comprehensive cancer network quality measures <i>J. Clin. Oncol.</i>, 26 (21) (2008)</p> <p>Healthcare Quality Improvement Partnership Ltd. (HQIP), National Bowel Cancer Audit Annual Report 2018: https://www.nboca.org.uk/content/uploads/2018/12/NBOCA-annual-report2018.pdf</p> <p>National Services Scotland: Colorectal Cancer Quality Performance Indicators https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf</p> <p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., <i>Am J Surgery</i> (2010) 200:572–576</p> <p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure</p>

the Quality of Colorectal Cancer Care in the Veterans Health Administration. *J Natl Compr Canc Netw* 2013;11:431–41.

National Health Service UK:
Performances of colorectal cancer surgery:<https://www.nhs.uk/service-search/performance-indicators/organisations/hospital-specialties-colorectal-surgery?Radius=25>

Ministry of Health New Zealand, Bowel Cancer Quality Improvement Report 2019:
<https://www.health.govt.nz/system/files/documents/publications/bowel-cancer-quality-improvement-report-mar19v1.pdf>

Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. *J Am Coll Surg*. 2014 Jan;218(1):16-25.e1-4.

Manchon-Walsh P, Aliste L, Espinàs JA, Prades J, Guarga A, Balart J et al. Improving survival and local control in rectal cancer in Catalonia (Spain) in the context of centralisation: a full cycle audit assessment. *Eur J Surg Oncol* 2016

Quality Indicator	Reference	Further supporting references
<p>QI 19 Colorectal: Quality of TME - rectal cancer</p>		
<p>Numerator: Patients with good-to-moderate quality (grade 1: mesorectal fascia or grade 2: intra-mesorectal excisions) TME</p> <p>Denominator: All patients with rectal cancer and elective radically resection (without Thoracoscopic Wedge Resection)</p>	<p>Kowalski, C., Graeven, U., von Kalle, C. et al. Shifting cancer care towards Multidisciplinarity: the cancer center certification program of the German cancer society. BMC Cancer 17, 850 (2017)</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p> <p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. J Natl Compr Canc Netw 2013;11:431–41.</p> <p>Wesselmann S, Winter A, Ferencz J, Seufferlein T, Post S. Documented quality of care in certified colorectal cancer centers in Germany: German Cancer Society benchmarking report for 2013. Int J Colorectal Dis. 2014. 29(4): 511–8</p> <p>Manchon-Walsh P, Aliste L, Espinàs JA, Prades J, Guarga A, Balart J et al. Improving survival and local control in rectal cancer in Catalonia (Spain) in the context of centralisation: a full cycle audit assessment. Eur J Surg Oncol 2016</p>

Quality Indicator	Reference	Further supporting references
QI 20 Colorectal: Distal tumor-free margin - colorectal cancer		
<p>Numerator: Patients of the denominator with clear/negative margins (for surgeries completed 2006 or later)</p> <p>Denominator: All patients with colorectal cancer stage II-III and resection</p>	<p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. J Natl Compr Canc Netw 2013;11:431–41.</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p> <p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., Am J Surgery (2010) 200:572–576</p> <p>Manchon-Walsh P, Aliste L, Espinàs JA, Prades J, Guarga A, Balart J et al. Improving survival and local control in rectal cancer in Catalonia (Spain) in the context of centralisation: a full cycle audit assessment. Eur J Surg Oncol 2016</p> <p>Wesselmann S, Winter A, Ferencz J, Seufferlein T, Post S. Documented quality of care in certified colorectal cancer centers in Germany: German Cancer Society benchmarking report for 2013. Int J Colorectal Dis. 2014. 29(4): 511–8</p>

Quality Indicator	Reference	Further supporting references
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QI 21 Colorectal: Complete pathology report after resection - colorectal cancer

<p>Numerator: Patients of the denominator with a complete pathology report containing: TNM; grading, depth of invasion of the tumor, state lymph-vascular and perineural invasion, quality of specimen, status of the margins, number of lymph nodes removed, examined and involved</p> <p>Denominator: All patients with colorectal cancer and resection</p>	<p>Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. <i>J Am Coll Surg.</i> 2014 Jan;218(1):16-25.e1-4.</p>	
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QI 22 Colorectal: Neoadjuvant radiotherapy/radiochemotherapy stage II–III - rectal cancer

<p>Numerator: Patients of the denominator with neoadjuvant radiotherapy/radio-chemotherapy</p> <p>Denominator: All patients with rectal cancer stage II-III and radiotherapy/radio-chemotherapy</p>	<p>Caldarella A, Amunni G, Angiolini C, Crocetti E, Di Costanzo F, Di Leo A et al., Feasibility of evaluating quality cancer care using registry data and electronic health records: a population-based study. <i>Int J Qual Health Care.</i> 2012. 24(4):411-8</p>	<p>Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. <i>J Am Coll Surg.</i> 2014 Jan;218(1):16-25.e1-4.</p>
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Quality Indicator	Reference	Further supporting references
QI 23 Colorectal: Neoadjuvant radio-chemotherapy because of a threatened/involved CRM on preoperative MRI - rectal cancer		
<p>Numerator: Patients of the denominator who receive long course neoadjuvant radio-chemotherapy</p> <p>Denominator: All patients with rectal cancer with a threatened or involved CRM on preoperative MRI undergoing surgery. Exclusion: Patients who refused radiotherapy. Patients in whom radiotherapy is contraindicated. Patients who presented as an emergency for surgery</p>	<p>National Services Scotland: Colorectal Cancer Quality Performance Indicators</p> <p>https://www.isdscotland.org/Health-Topics/Quality-Indicators/Publications/2015-06-23/2015-06-23-Colorectal-QPI-Report.pdf.</p>	

Quality Indicator	Reference	Further supporting references
QI 24 Colorectal: Beginning of the adjuvant chemotherapy - colon cancer		
<p>Numerator: Patients of the denominator with beginning of chemotherapy within 8 weeks after surgery</p> <p>Denominator: All patients with colon cancer stage III who had received adjuvant chemotherapy</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. J Natl Compr Canc Netw 2013;11:431–41.</p> <p>Desch CE, McNiff KK, Schneider EC, Schrag D, McClure J, Lepisto E et al. American Society of Clinical Oncology/National comprehensive cancer network quality measures J. Clin. Oncol., 26 (21) (2008)</p> <p>Siegel EM, Jacobsen PB, Lee JH, Malafa M, Fulp W, Fletcher M et al. Florida Initiative for Quality Cancer Care: improvements on colorectal cancer quality of care indicators during a 3-year interval. J Am Coll Surg. 2014 Jan;218(1):16-25.e1-4.</p>

Quality Indicator	Reference	Further supporting references
QI 25 Colorectal: Adjuvant chemotherapy - colon cancer		
<p>Numerator: Patients of the denominator who received adjuvant chemotherapy</p> <p>Denominator: All patients with a colon cancer stage III who had a R0 resection of the primary tumor</p>	<p>European Cancer Centre Certification Programme Annual Report Colorectal Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Colorectal_2019.pdf</p>	<p>Caldarella A, Amunni G, Angiolini C, Crocetti E, Di Costanzo F, Di Leo A et al., Feasibility of evaluating quality cancer care using registry data and electronic health records: a population-based study. <i>Int J Qual Health Care.</i> 2012. 24(4):411-8</p> <p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., <i>Am J Surgery</i> (2010) 200:572–576</p> <p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. <i>J Natl Compr Canc Netw</i> 2013;11:431–41.</p>

Quality Indicator	Reference	Further supporting references
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QI 26 Colorectal: Liver CT or US evaluation within 12 months - colorectal cancer

<p>Numerator: Patients with liver CT or US evaluation within 12 months</p> <p>Denominator: All patients with colorectal cancer and resection</p>	<p>Giuliani J, Marzola M, Indelli M, Frassoldati A.: Oncological quality indicators and Colorectal Cancer Program: data from 2009-2010 of University Hospital in Ferrara, Italy. <i>Recenti Prog Med.</i> 2012 Feb;103(2):56-61</p>	<p>Caldarella A, Amunni G, Angiolini C, Crocetti E, Di Costanzo F, Di Leo A et al., Feasibility of evaluating quality cancer care using registry data and electronic health records: a population-based study. <i>Int J Qual Health Care.</i> 2012. 24(4):411-8</p> <p>Hayman et al: Assessing compliance with national quality measures to improve colorectal cancer care at the VA., <i>Am J Surgery</i> (2010) 200:572–576</p> <p>Jackson GL, Zullig LL, Zafar SY, Powell AA, Ordin DL, Gellad ZF et al. Utilizing NCCN Practice Guidelines to Measure the Quality of Colorectal Cancer Care in the Veterans Health Administration. <i>J Natl Compr Canc Netw</i> 2013;11:431–41.</p>
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Quality Indicators for Pancreatic Cancer

Quality Indicator	Reference	Further supporting reference
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QI 1 Pancreatic: Pretherapeutic case presentation - pancreatic cancer

<p>Numerator: Patients of the denominator who were presented at the pretherapeutic tumor board</p> <p>Denominator: All patients with pancreatic cancer</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	<p>van Rijssen LB, van der Geest LG, Bollen TL, Bruno MJ, van der gaast A, Veerbek L et al. National compliance to an evidence-based multidisciplinary guideline on pancreatic and periampullary carcinoma. <i>Pancreatology</i>, 16 (2016) http://dx.doi.org/10.1016/j.pan.2015.10.002</p>
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QI 2 Pancreatic: Post-operative case presentation - pancreatic cancer

<p>Numerator: Patients of the denominator who were presented at the post-operative tumor board</p> <p>Denominator: All patients with pancreatic cancer and resection</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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Quality Indicator	Reference	Further supporting references
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QI 3 Pancreatic: Pancreatitis after ERCP – pancreas

<p>Numerator: ERCP's of the denominator with endoscopy-specific complications (= Pancreatitis, bleeding and perforation) after ERCP</p> <p>Denominator: All ERCPs for each endoscopy unit</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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QI 4 Pancreatic: Adjuvant chemotherapy - pancreatic cancer

<p>Numerator: Patients of the denominator with adjuvant chemotherapy</p> <p>Denominator: All patients with pancreatic cancer and resection</p>	<p>van Rijssen LB, van der Geest LG, Bollen TL, Bruno MJ, van der gaast A, Veerbek L et al. National compliance to an evidence-based multidisciplinary guideline on pancreatic and periampullary carcinoma. <i>Pancreatology</i>, 16 (2016) http://dx.doi.org/10.1016/j.pan.2015.10.002</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p> <p>Karl Y. Bilimoria, David J. Bentrem, Keith D. Lillemoe, Mark S. Talamonti, Clifford Y. Ko, on behalf of the American College of Surgeons' Pancreatic Cancer Quality Indicator Development Expert Panel, Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, <i>JNCI: Journal of the National Cancer Institute</i>, Volume 101, Issue 12, 16 June 2009, Pages 848–859;</p>
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Quality Indicator	Reference	Further supporting references
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QI 5 Pancreatic: Palliative chemotherapy - pancreatic cancer

<p>Numerator: Patients of the denominator with palliative chemotherapy</p> <p>Denominator: All patients with pancreatic cancer clinical stage III (palliative situation) or IV and ECOG 0-2</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	<p>Karl Y. Bilimoria, David J. Bentrem, Keith D. Lillemoe, Mark S. Talamonti, Clifford Y. Ko, on behalf of the American College of Surgeons' Pancreatic Cancer Quality Indicator Development Expert Panel, Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, JNCI: Journal of the National Cancer Institute, Volume 101, Issue 12, 16 June 2009, Pages 848–859</p>
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QI 6 Pancreatic: Resection of pancreatic cancer clinical stage I or II

<p>Numerator: Patients of the denominator who underwent resection or had a valid reason documented for not undergoing resection</p> <p>Denominator: All patients with pancreatic cancer clinical stage I or II</p>	<p>Bilimoria, K. et al (2009): Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, JNCI, Volume 101, Issue 12, pages 848-859. https://academic.oup.com/jnci/article/101/12/848/2515610</p>	
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Quality Indicator	Reference	Further supporting references
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QI 7 Pancreatic: Resection of pancreatic cancer clinical stage IV

<p>Numerator: Patients of the denominator with cancer-directed surgery</p> <p>Denominator: All patients with pancreatic cancer clinical stage IV (reverse target value)</p>	<p>Bilimoria, K. et al (2009): Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, JNCI, Volume 1010, Issue 12, pages 848-859. https://academic.oup.com/jnci/article/101/12/848/2515610</p>	
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QI 8 Pancreatic: Revision surgeries - pancreas

<p>Numerator: Patients of the denominator with revision surgeries after peri-operative complications within 30d of pancreatic surgery</p> <p>Denominator: All patients with or without pancreatic cancer with pancreatic surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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Quality Indicator	Reference	Further supporting references
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QI 9 Pancreatic: Post-operative wound infections - pancreas

<p>Numerator: Patients of the denominator with post-operative wound infection within 30 days from pancreatic surgery with need for surgical wound revision (flushing, opening, VAC dressing)</p> <p>Denominator: All patients with or without pancreatic cancer with pancreatic surgeries</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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QI 10 Pancreatic: Surgery_R0-resection: If a patient undergoes cancer-directed resection, then the margins should be macroscopically clear

<p>Numerator: Patients of the denominator with macroscopically clear margins</p> <p>Denominator: All Patients with pancreatic cancer who underwent cancer-directed resection</p>	<p>Bilimoria, K. et al (2009): Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, JNCI, Volume 1010, Issue 12, pages 848-859. https://academic.oup.com/jnci/article/101/12/848/2515610</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>
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Quality Indicator	Reference	Further supporting references
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QI 11 Pancreatic: Post-operative mortality – pancreas

<p>Numerator: Patients of the denominator who died within 30 days from pancreatic resection</p> <p>Denominator: All patients with pancreatic resections</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	<p>Bilimoria, K. et al (2009): Assessment of Pancreatic Cancer Care in the United States Based on Formally Developed Quality Indicators, JNCI, Volume 101, Issue 12, pages 848-859. https://academic.oup.com/jnci/article/101/12/848/2515610</p> <p>Agency for Healthcare Research and Quality https://www.qualityindicators.ahrq.gov/Downloads/Modules/IQI/V2019/Ver-si-on_2019_Benchmark_Tables_IQI.pdf</p>
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QI 12 Pancreatic: Lymph node examination - pancreatic cancer

<p>Numerator: Patients of the denominator with ≥ 12 regional lymph nodes in the surgical specimen after completion of surgical therapy</p> <p>Denominator: All patients with pancreatic cancer and resection who have undergone a lymphadenectomy</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	<p>Agency for Healthcare Research and Quality https://www.qualityindicators.ahrq.gov/Downloads/Modules/IQI/V2019/Ver-si-on_2019_Benchmark_Tables_IQI.pdf</p> <p>Kowalski, C., Graeven, U., von Kalle, C. et al. Shifting cancer care towards Multidisciplinarity: the cancer center certification program of the German cancer society. BMC Cancer 17, 850 (2017)</p>
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Quality Indicator	Reference	Further supporting references
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QI 13 Pancreatic: Complete pathology report after resection– pancreatic cancer

<p>Numerator: Patients of the denominator with a complete pathology report containing: pT, pN, M. tumor grading: proportion LN affected non-affected</p> <p>Denominator: All patients with pancreatic cancer and resection</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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QI 14 Pancreatic: Social services counselling – pancreatic cancer

<p>Numerator: Patients of the denominator who received counselling from the social services</p> <p>Denominator: All patients with pancreatic cancer</p>	<p>European Cancer Centre Certification Programme Annual Report Pancreatic Cancer Centres (2019) http://ecc-cert.org/fileadmin/user_upload/Annual_Report_Pancreatic_Cancer_2019.pdf</p>	
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