

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

Work Package 6 Task 3 Quality Indicators

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Abbreviations

CCCN	Comprehensive Cancer Care Network
CraNE	Network of Comprehensive Cancer Centres: Preparatory activities on creation of National Comprehensive Cancer Centres and EU Networking
GIN	Guideline International Network
IET	iPACC Evaluation Tool
iPACC	Innovative Partnership for Action Against Cancer
QI	Quality Indicator
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 6, Task 3 was to apply the instruments developed under Innovative Partnership for Action Against Cancer (iPAAC) Joint Action (the iPAAC Evaluation Tool for Quality Indicators in Oncology – iET-Qis) to other tumor entities and derive a set of Quality Indicators for Lung Cancer.

The iET-QI was developed within the Innovative Partnership for Action Against Cancer (iPAAC) Joint Action 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 Lung Cancer are presented.

Quality Indicators for Lung Cancer

QI 1: Percentage of patients having surgery for a NSCLC discussed in a postoperative tumour board/MDT meeting

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Patients of the denominator with discussion in a postoperative tumour board/MDT meeting</p> <p>Denominator: All patients with NSCLC and surgery</p>	<p>Beck, N., F. Hoeijmakers, E.M. Wiegman, H.J.M. Smit, F.M. Schramel, et al., Lessons learned from the Dutch Institute for Clinical Auditing: the Dutch model for quality assurance in lung cancer treatment. J Thorac Dis, 2018. 10(Suppl 29): p. S3472-S3485.</p>	

QI 2: Pretherapeutic tumour board/MDT meeting

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Patients of the denominator presented in the pretherapeutic tumour board/MDT meeting</p> <p>Denominator: All LC patients with first diagnosis of Lung Cancer</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2022): http://ecc-cert.org/wp-content/uploads/2022/10/lcc_annua_lreport-2022-A1_220601.pdf .</p>	<p>Target value: $\geq 90\%$</p> <p>Definition: Pretherapeutic = before surgery and/or systemic treatment</p>

QI 3: PD-L1 testing for NSCLC in stage III with radiochemotherapy

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with PD-L1 testing before starting radio-chemotherapy</p> <p>Denominator: Primary cases* with NSCLC stage III with radio-chemotherapy</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Target value: $\geq 75\%$</p>

QI 4: Pathological Diagnosis

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Number of patients with Lung Cancer who have a pathological diagnosis (including following surgical resection).</p> <p>Denominator: All patients with Lung Cancer.</p> <p>Excluding patients who refuse investigations or surgical resection.</p>	<p>Public Health Scotland, Information Services Division (ISD). Lung Cancer. Quality Performance Indicators. Patients diagnosed between January 2016 and December 2018. [online] 2020; Available from: https://www.isdscotland.org/Health-Topics/Quality-Indicators/Cancer-QPI. [visited: 06.01.2022]</p>	<p>Target value: 80%</p>

* see definition primary cases at the end of the document

QI 5: Pathological Diagnosis – tumour subtype

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Number of patients with a pathological diagnosis of NSCLC who have a tumour subtype identified.</p> <p>Denominator: All patients with a pathological diagnosis of NSCLC.</p> <p>No exclusions.</p>	<p>Public Health Scotland, Information Services Division (ISD). Lung Cancer. Quality Performance Indicators. Patients diagnosed between January 2016 and December 2018. [online] 2020; Available from: https://www.isdscotland.org/Health-Topics/Quality-Indicators/Cancer-QPI. [visited: 06.01.2022]</p>	<p>Target value: 90%</p> <p>Tumour subtype: squamous/non-squamous</p>

QI 6: Pre-treatment diagnosis

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Number of patients who receive curative treatment (radical radiotherapy, radical chemoradiotherapy or surgical resection) that have a cytological / histological diagnosis prior to treatment.</p> <p>Denominator: All patients with Lung Cancer who receive curative treatment (radical radiotherapy, radical chemoradiotherapy or surgical resection).</p> <p>Excluding patients who refuse investigations.</p>	<p>Public Health Scotland, Information Services Division (ISD). Lung Cancer. Quality Performance Indicators. Patients diagnosed between January 2016 and December 2018. [online] 2020; Available from: https://www.isdscotland.org/Health-Topics/Quality-Indicators/Cancer-QPI. [visited: 06.01.2022]</p>	<p>Target value: 95%</p>

QI 7: Surgical expertise: Number of lung resections

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Surgical expertise, Number anatomical resections (ICD-10 C34.0-9, C78.0)</p> <p>Denominator: -----</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024) : https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Target value: ≥ 75</p> <p>Validated in ECC Lung Cancer Centres</p> <p>Definition anatomical resections: anatomical segment resection, lobectomy, pneumectomy, bronchio- and angioplasty</p>

QI 8: Videothoroscopic (VATS) and robotic-assisted (RATS) anatomical resections

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Operations of the denominator performed videothoroscopically (VATS) and/or robot-assisted (RATS).</p> <p>Denominator: Surgical primary cases* (number of anatomical resections)</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): http://ecc-cert.org/wp-content/uploads/2022/10/lcc_annua_lreport-2022-A1_220601.pdf</p>	<p>No target value</p> <p>Anatomical resections: anatomical segment resection, lobectomy, pneumectomy, bronchio- and angioplast.</p>

QI 9: Local R0 resections in stages IA/B and IIA/B

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with (local) R0 resections after completion of surgical treatment</p> <p>Denominator: Surgical primary cases* in stages IA/B and IIA/B with anatomical Lung resection</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Target value: $\geq 95\%$</p>

* see definition primary cases at the end of the document

QI 10: Local R0 resections in stages IIIA/B

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with (local) R0 resections after completion of surgical treatment</p> <p>Denominator: Surgical primary cases* in stages IIIA/B with anatomical Lung resection</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Target value: $\geq 85\%$</p>

QI 11: If a patient undergoes resection for stage T1ba or greater tumour, an anatomical pulmonary resection should be performed. (Stage I/II with a tumour ≥ 2 cm NSCLC) a T1b =2-3cm (9th ed.)

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Patients of the denominator with anatomical pulmonary resection (no segmentectomy)</p> <p>Denominator: All NSCLC patients stage I/II, with a tumour ≥ 2cm and resection</p>	<p>Khorfan, R., D.T. Cooke, R.A. Meguid, L. Backhus, T.K. Varghese, Jr., et al., Institutional factors associated with adherence to quality measures for stage I and II non-small cell lung cancer. J Thorac Cardiovasc Surg, 2021. 162(3): p. 649-660 e8.</p>	<p>American Joint Committee on Cancer seventh edition staging was used in this study: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8441990/#R13 Adapted to 9th version</p>

* see definition primary cases at the end of the document

QI 12: Surgical Lymph Node Staging ≥ 10 Lymph nodes at resection.

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Patients of the denominator with lymph node staging ≥ 10 lymph nodes</p> <p>Denominator: All NSCLC patients stage Ia-IIb with surgical resection including lymph node staging</p>	<p>Odell, D.D., J. Feinglass, K. Engelhardt, S. Papastefan, S.L. Meyerson, et al., Evaluation of adherence to the Commission on Cancer lung cancer quality measures. J Thorac Cardiovasc Surg, 2019. 157(3): p. 1219-1235.</p>	

QI 13: Stage II-III NSCLC patients receiving chemo-radiation

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Receiving concomitant or sequential chemo-radiation</p> <p>Denominator: NSCLC patients in stage II-III that did not receive surgery</p>	<p>Andreano, A., M.G. Valsecchi, A.G. Russo, S. Siena, and G. Lombardy Lung Cancer Working, Indicators of guideline-concordant care in Lung Cancer defined with a modified Delphi method and piloted in a cohort of over 5,800 cases. Arch Public Health, 2021. 79(1): p. 12.</p>	

QI 14: Adjuvant cisplatin-based chemotherapy stages II-III A1/2

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with cisplatin-based chemotherapy</p> <p>Denominator: R0 and lymph node-resected NSCLC primary cases* with anatomical lung resection (NSCLC, stage II-III A1/2, with ECOG 0/1)</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Plausibility corridor: < 15% and > 70% No target value</p>

QI 15: Stereotactic Ablative Radiotherapy (SABR) in inoperable stage I Lung Cancer

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Number of patients with stage I Lung Cancer not undergoing surgery who receive SABR</p> <p>Denominator: All patients with stage I Lung Cancer not undergoing surgery</p> <p>Excluding Patients with small cell Lung Cancer (SCLC), Patients who refuse SABR, and Patients who die prior to treatment.</p>	<p>Public Health Scotland, Information Services Division (ISD). Lung Cancer. Quality Performance Indicators. Patients diagnosed between January 2016 and December 2018. [online] 2020; Available from: https://www.isdscotland.org/Health-Topics/Quality-Indicators/Cancer-QPI. [visited: 06.01.2022]</p>	<p>Target value: 35%</p>

* see definition primary cases at the end of the document

QI 16: Interventional bronchoscopy (thermal procedures and stenting)

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Interventional bronchoscopy (thermal procedures and stenting) for each service provider</p> <p>Denominator: ---</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Target value: $\geq 10/y$</p> <p>Definition interventional bronchoscopy: (1) bronchoscopic dilation of the trachea with insertion of a synthetic splint (stent), (2) bronchoscopic dilation of the trachea with insertion of a metal splint (stent) (3) bronchoscopic excision or destruction of diseased tissue</p>

QI 17: Chemo-immunotherapy in SCLC

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of denominator with combination with PD-L1 antibody therapy (atezolizumab or durvalumab)</p> <p>Denominator: Primary cases* with SCLC stadium IV and chemotherapy (platinum/etoposide)</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>No target value</p>

* see definition primary cases at the end of the document

QI 18: Clinical Trials and Research Study Access

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Number of patients with Lung Cancer enrolled in an interventional clinical trial or translational research.</p> <p>Denominator: All patients with Lung Cancer.</p> <p>No exclusions</p>	<p>Public Health Scotland, Information Services Division (ISD). Lung Cancer. Quality Performance Indicators. Patients diagnosed between January 2016 and December 2018. [online] 2020; Available from: https://www.isdscotland.org/Health-Topics/Quality-Indicators/Cancer-QPI. [visited: 06.01.2022]</p>	<p>Target value: $\geq 5\%$</p>

QI 19 Post-operative bronchial stump/anastomotic insufficiency

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with post-operative bronchial stump/anastomotic insufficiency</p> <p>Denominator: Surgical primary cases* for each department</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>Plausibility corridor: $< 0,01\%$. Target value: $\leq 5\%$</p>

* see definition primary cases at the end of the document

QI 20 Maintenance therapy after definitive radiochemotherapy

Quality Indicator	Reference	Further supporting references/information on the QI
<p>Numerator: Primary cases* of the denominator with durvalumab therapy started.</p> <p>Denominator: Primary cases* after definitive concomitant radiochemotherapy without progression and with PD-L1 expression of $\geq 1\%$ on tumour cells</p>	<p>European Cancer Centre Certification Programme Annual Report Lung Cancer (2024): https://ecc-cert.org/wp-content/uploads/2024/10/quality-indicators_lc-2024-A1_240524.pdf</p>	<p>No target value</p>

* see definition primary cases at the end of the document

Further explanation on used terms

(1) Definition primary cases

SoS for Lung Cancer Care, 1.2. Multidisciplinary cooperation (p.11 et seq.)

- All patients with newly diagnosed Lung Cancer,
- Pathology report must be available (ICD C34.0-34.9)
- The time of counting is the time of the pathological confirmation of diagnosis
- Patients with no pathological confirmation of diagnosis may be counted if (all of the following apply):
 - Solitary pulmonary nodule, suspected malignoma
 - FDG-PET positive
 - Documented size progression over course of time (at least 8 weeks)
 - High risk for patients through pathological confirmation
 - Presentation tumour board and indication radiotherapy without pathological confirmation
 - Time of counting is date of presentation tumour board
- One primary case with synchronous treatment of Lung Cancer (independent of the side or lobe localisation)
- Two primary cases with metachronous treatment, if these occur on different sides (not counted as a second primary case is the occurrence in different lobes on the same side)