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Supporting Information

Supplementary material

This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.

Appendix to: Segelov E, Carrington C, Aranda S, et al. Developing clinical indicators for oncology: the inaugural indicator set for the Australian Council on Healthcare Standards. *Med J Aust* 2021; doi: 10.5694/mja2.51087.

Supplementary Table 1: Initial set of candidate cancer clinical indicators addressed

Proposed clinical indicator	Area
Percentage of cancer patients who received X within the priority access target for their wait, from date A to date B. Various time points considered:	Access
▪ diagnosis to treatment (decision-to-treatment)	Access
▪ date referral is received to date of consultation	Access
▪ specialist consultation to treatment	Access
▪ referral to diagnosis	Access
▪ referral to the commencement of treatment	Access
▪ final pathology report to systemic adjuvant treatment	Access
▪ first consultation to the time imaging tests (CT/MRI) were completed	Access
▪ abnormal/positive screening results to diagnostic assessment	Access
▪ abnormal mammogram to diagnostic biopsy (Breast Cancer)	Access
Referral to the time when treatment plan agreed by both patient and specialist	Access
Percentage of cancer resection reports of all disease sites received within 14 days from the date of surgery	Access
Percentage of cancer patients of X cancer type, staging, who underwent molecular pathology test for Y specific treatment	Access
Percentage of cancer patients of X cancer type, staging, with Y treatment, who underwent Z pathology test before any systemic treatment	Access
Percentage of PET-CT scan before invasive staging test (eg, mediastinoscopy) for lung cancer patients	Assessment
Percentage of stage I breast cancer patients who received imaging tests to detect distant metastasis	Assessment
Percentage of patients with early-stage breast cancer (stage I or II) and clinically negative axillary nodes who receive sentinel node biopsy	Assessment
Percentage of cancer patients in need of palliative care who received an initial assessment within 48 hours of admission	Assessment
Percentage of cancer patients ≥ 65 years old who received a screening assessment for age dependent functional impairment using at least one screening tool, such as the G8, VES-13 or their combined use for even greater sensitivity	Assessment
Percentage of cancer patients with abnormal initial screening tests who received a comprehensive geriatric assessment (CGA)	Assessment
Percentage of cancer patients who have documented staging information	Assessment
Percentage of cancer patients who received the pathology/imaging results before the start of treatment	Assessment
Specific assessments (see 2 sub-indicators below)	Assessment
▪ Percentage of radical prostatectomy patients evaluated for PTEN gene deletion	Assessment
▪ Percentage of breast cancer patients tested for BRAC/HER2, etc	Assessment
Percentage of cancer patients with documented discussion of clinical trial enrollment (in MDT or between patients and the clinician)	Treatment planning
Percentage of cancer patients with documented discussion regarding biobank donations	Treatment planning
Percentage of cancer patients presented to MDT at any point following diagnosis	Treatment planning
Percentage of cancer cases discussed at an MDT meeting for which treatment plans are developed by the MDT	Treatment planning
Percentage of cancer patients discussed during an MDT meeting before curative/radical treatment	Treatment planning
Percentage of cancer patients with documented evidence of cancer staging in MDT recommendations	Treatment planning
Percentage of low-risk disease patients with documented discussion of treatment plans/options and/or active surveillance and end-point	Treatment planning
Percentage of cancer patients whose treatment plans were provided to the patient and GP	Treatment planning
Percentage of cancer patients who received the verbal or written information on treatment planning (documented)	Treatment planning
Percentage of stage IV breast cancer/metastatic lung cancer patients with referral to palliative care documented	Treatment planning
Percentage of patients in need of palliative care whose file contains a	Treatment

Proposed clinical indicator	Area
medication list documented to the professionals caring for the patient	planning
Percentage of cancer patients who have a documented ACP	Treatment planning
Percentage of patients with a diagnosis of X cancer who receive Y treatment according to Z guidelines	Treatment
Percentage of cancer patients who received cytotoxic chemotherapy whose treatment is guided by a hospital approved chemotherapy treatment protocol	Treatment
Percentages of stage III colon cancer patients aged 65 or over treated with guideline-recommended chemotherapy	Treatment
Percentage of cancer patients who received a coordinated process of care throughout their cancer treatment pathway following OCP	Treatment
Percentage of cancer patients who received a copy of the OCP	Treatment
Percentage of cancer patients who complete the intended curative / radical treatment plan	Treatment
Percentage of cancer patients who were provided with the name of someone who coordinated their care throughout treatment	Treatment
Percentage of cancer patients who had definitive diagnosis pre-operatively/other treatments	Treatment
Percentage of cancer patients with DCIS who do not undergo axillary clearance	Treatment
Percentage of patients in the high risk of cancer groups who were referred to family cancer services following the referral guidelines	Support Services
Percentage of patients with metastatic cancer referred to (or seen by) palliative care specialist	Support Services
Percentage of cancer patients who have smoking status/tobacco use documented received support in the form of referrals and pharmacotherapy	Support Services
Percentage of cancer patients who were screened for psychosocial distress	Support Services
Percentage of cancer patients who have a documented survivorship plan	Support Services
Percentage of cancer patients who have a documented rehabilitation plan	Support Services
Percentage of cancer patients with documented discussion relating to the benefits of cancer counselling following diagnosis	Support Services
Percentage of cancer patients who experience unplanned readmissions within 30 days of index admission (original diseases and/or treatment related)	Outcome
Percentage of cancer patients who died within 30 days following surgical intervention	Outcome
Percentage of cancer patients who died within a year following cancer treatment with curative intent	Outcome
Percentage of cancer patients hospitalized for treatment-related complications	Outcome
Percentage of prostate cancer patients experiencing significant urinary incontinence (> 2–3 pads/day) 1-year post-surgery	Outcome
Percentage of cancer patients who received a complete follow-up care plan documented following their major cancer treatments	Follow-up
Percentage of cancer patients whose discharge information following completion of treatment was sent to GP	Follow-up
Percentage of cancer patients referred to physiotherapy for urinary incontinence following surgery	Follow-up
Percentage of cancer patients who received shared cancer care post-treatment between GP and the cancer specialist following RACGP guidelines	Follow-up
Percentage of cancer patients who reported adequate involvement in decisions about care and treatment	PREMs
Percentage of cancer patients who reported that their views were taken into account during treatment	PREMs
Contribution to national quality clinical cancer registries	Other
Evidence of compliance to scope of practice of clinicians e.g. volume of surgeries, subspecialty (sampling, rolling of audits)	Other
Adherence to voluntary standards	Other
Indicators on financial toxicity	Other

Supplementary Table 2: Rankings by score of the Stage 2 clinical indicators*

Type	Clinical indicators	Clinical relevance (0–5)	Ease of collection (0–5)	Total (0–5)
Access	Waiting time from the specialist consultation to treatment	4.56	3.88	8.44
	Waiting time from the abnormal mammogram to diagnostic biopsy (Breast Cancer)	4.59	3.71	8.30
	Percentage of patients with early-stage breast cancer (stage I or II) and clinically negative axillary nodes who receive sentinel node biopsy	4.44	3.81	8.25
Assessment	Percentage of cancer patients who have documented staging information	4.69	3.56	8.25
	Percentage of breast cancer patients tested for BRAC/HER2	4.31	3.69	8.00
	Percentage of cancer patients presented to MDT at any point following diagnosis	4.56	3.56	8.12
	Percentage of cancer patients with documented evidence of cancer staging in MDT recommendations	4.38	3.69	8.07
Treatment	Percentage of cancer patients who received anticancer treatment which is guided by a hospital approved anticancer therapy protocol	4.69	3.75	8.44
Outcome	Percentage of cancer patients who died within 30 days following surgical intervention	4.31	4.06	8.37
Follow-up	Percentage of cancer patients whose discharge information following completion of treatment was sent to GP	4.63	3.69	8.32
Others	Contribution to national quality clinical cancer registries	4.50	4.19	8.69
Access	Waiting time from the time of diagnosis to treatment	4.72	3.44	8.16
	Waiting time from the date of the referral is received to the consultation	4.59	3.41	8.00
	Waiting time from the abnormal / positive screening results to diagnosis assessment	4.35	3.12	7.47
	Percentage of cancer resection reports of all disease sites received within 14 days from the data of surgery	4.06	3.94	8.00
	Percentage of PET-CT scan before invasive staging test (e.g. mediastinoscopy) for lung cancer patients	4.06	3.38	7.44
	Percentage of stage I breast cancer patients who received imaging tests to detect distant metastasis	4.13	3.25	7.38
Assessment	Percentage of cancer patients discussed during MDT meeting before curative/radical treatment	4.31	3.25	7.56
Treatment Plan	Percentage of cancer patients who received the verbal or written information on treatment planning (documented)	4.5	3.19	7.69

MDT = multidisciplinary team meeting. * Several additional indicators were submitted during the ranking exercise.

Supplementary Table 3: Discussion points considered in Stage 3 for generating the final CIs

Area for assessment	Discussion points and options considered
Timing, access, diagnosis, treatment plan	▪ Agreed that a time point relating to diagnosis should be measured although lots of discussion ▪ About which one is most optimal: ‣ time from referral to diagnosis (as per Danish Health system) ‣ time from referral to first specialist appointment. The imprecise definition of "specialist appointment" is noted, considering multiple visits are often required to reach a definitive diagnosis ‣ time from diagnosis to final (documented) treatment plan. The treatment plan is patient-centred, which would need to be clearly defined; also at what point the plan is called "final" ‣ time from diagnosis to the first course of treatment ‣ timing compliance with OCPs, standards and/or guidelines but recognition that these vary
Documentation: stage of cancer, aim, diagnosis, summary care plan	▪ Need to define what constitutes diagnosis clinical/pathological (ie, tissue obtained) ▪ Lack of documentation of clinical stage known to be poorly performed from other data sets and recognized as important ▪ Need to define what would be the minimal information required to be recorded ▪ Can measure the event of the provision of treatment plan to patient and GP ▪ Suggested parameters to measure appropriate staging: ‣ recorded result of cross-sectional/functional imaging ‣ proportion of patients receiving imaging assessment to determine staging, secondary cancers
Clinical trial access/discussion, participation	▪ Recognition this is a major focus of government ▪ Suggested parameters: ‣ documentation of the availability of pathways for trial referral ‣ proportion of patients with documented discussion about or referral to clinical trials (many MDT proformas have this section) ▪ It was reported that previous indicators around clinical trial participation (in Radiation Oncology clinical indicator set) were poorly supported and deleted in the 2017 set review
Biobank and Molecular Tumour Board access and participation	▪ This extends far beyond familial cancers but was assigned to incorporate familial cancers. However, it is difficult to measure ▪ Suggested parameter: referral to familial cancer service; however, does not apply to most cancer diagnoses
Pathology structured reporting	▪ Should be addressed in the pathology CI set
Access to appropriate cancer care experts	▪ Definition of "expert" would need further discussion ▪ A large teaching hospital admits sick Oncology patients under General Medicine ▪ ? Link to OCPsbut which ones ▪ Include psychosocial support resources
Provision or referral to post treatment rehabilitation/survivorship/ health optimisation	▪ Suggested parameters: ‣ proportion of appropriate patients referred to cancer support services – need to define what these are ‣ proportion of appropriate patients referred to survivorship/rehabilitation program/secondary health optimization ‣ proportion of appropriate patients with documented referral to smoking cessation program; exercise and/or dietary counselling
Adherence to contemporary diagnostic and treatment guidelines	▪ Demonstrated by audit ▪ Need to have a selection of guidelines from which the organisation can choose
Quality and appropriateness of treatment, by craft group	▪ Suggested parameter: ‣ proportion 30-day (or other time point) mortality rate following surgery, systemic anti-cancer therapy; radiotherapy (if not in RO set)
Electronic data capture	▪ Electronic prescribing of cancer medications ▪ e-Prescribing systems and audits for Quality Use of Medications and compliance
Evidence of compliance with scope of practice of clinicians	▪ For example, volume of surgery, sub-specialties, robotic surgery. ▪ Adherence to scope of practice was discussed to be a matter addressed within broader hospital standards under Clinical Privileges/Accreditation
Unplanned readmission rate by category	▪ Proportion of patients readmitted, by category
Completion of treatment	▪ Would apply to for patients with curative-intent treatment plan
Proportion of patients with	▪ Could audit according to standard followup guidelines

defined follow-up plans	
Communication with clinical care team	▪ Measure of communication with primary care provider (GPs) ▪ Evidence of documented treatment plan provided to patients and GPs ▪ Proportion of patients seeing more than 1 specialist for routine follow-up 1 year following treatment (excluding where there are specific complications/ongoing issues) ▪ What about shared care?
Involvement of palliative care for patients with incurable disease	▪ Early involvement v any involvement; community liaison
Documentation of advanced care planning	▪ Suggested parameters: ‣ proportion of appropriate patients with documented resuscitation/not-for-resuscitation plan ‣ proportion of appropriate patients dying without an advanced care plan ‣ proportion of inappropriate resuscitations due to inadequate care plan
Outcome	▪ Medium-term outcome for curative patients is of interest ▪ Suggested parameters: ‣ 1-year mortality following treatment with curative intent. Discussion that with modern treatments, 1-year rates are very high and may not be the best time-point however longer times means more loss to follow-up. ‣ group discussed indicators for defined groups with known poorer outcomes; eg, Aboriginal and Torres Strait Islander peoples and low-SES patients, although difficulties exist in readily accessing information
Contribution to national quality clinical cancer registries	▪ Currently there are data/feedback from some nationally accredited/recognized cancer registries. Similar CI within the intensive care set ▪ Suggested parameter: Proportion of patients (admissions) by unit/facility contributing to cancer registries.
Patient understanding of their condition and treatment	▪ Proof of education, patients receiving necessary information during patient induction and formation of treatment plan ▪ Documentation of induction program for incoming patients ▪ Discussion on nature of information to patients verbal versus written
Financial toxicity	▪ Adherence to voluntary standards; eg, Cancer Council Australia Voluntary Standards ▪ Evidence of specific financial counselling and social work
Geriatric oncology	▪ Use of assessment tool for patients over 65 years old. Discussion as to which was most appropriate or would there need to be stratification for patients' condition and proposed treatment?
Patient experience and outcome	▪ Important that these be included in CIs

CI = clinical indicator; OCP = optimal care pathway; RO = radiation oncology; SES = socio-economic status.