

Clinical application of optimal care pathways at a regional cancer centre

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Abstract

Objective: To assess the feasibility of clinical application of recently produced Optimal Care Pathways and explore patterns of care for oncology patients receiving care based in the City of Greater Bendigo.

Design, setting and participants: A retrospective audit of hospital administrative and medical records data undertaken at Peter MacCallum Cancer Centre (PeterMac) and Bendigo Health between January and June 2016. Eligible cases were PeterMac patients with a residential address in the City of Greater Bendigo and who received care based at the PeterMac Bendigo campus as a new patient between 01 January and 31 December 2015.

Outcome measures: Congruence of routine care with timeframes for steps described in the Optimal Care Pathways for cancer patients commissioned by the Victorian Department of Health and Human Services.

Results: Assessment of congruence of routine care to the Optimal Care Pathways was complicated by missing data. Where data were available, many pathways of care did not fit the Optimal Care Pathway process map template, due to screening-related or asymptomatic presentations or appropriate deviations in clinical management responsive to individual patient need.

Conclusion: This study is the first to report feasibility of mapping routine care against the parameters recommended by the Optimal Care Pathways, and to provide guidance for the future assessment of usual care of cancer services to best practice guidelines.

The delivery of health care across Australian states and territories is complicated by a plethora of different policies and system-oriented approaches to the delivery and remuneration of health services.¹ Further complicating the delivery of health care is the diverse landscape and geographical magnitude across which care must be provided.^{2,3} Health outcomes for people affected by cancer and living in regional and rural areas, are worse compared to matched metropolitan counterparts,^{4,5} with the incidence of all cancers, and burden of death from cancer, higher for people in regional and rural areas.^{6,7}

In 2015/16, the Victorian Department of Health and Human Services published a series of optimal care pathways (OCPs) that describe consensus guidance regarding best practice in cancer care for 15 tumour types. Each pathway maps the patient's journey from early detection and diagnosis to survivorship or end-of-life care, and provides recommendations for treatment timeframes and models of care at specific points throughout the care pathway. The OCPs were designed with the intention of contributing to the improvement of both clinical outcomes and patient experience, irrespective of the geographical location of service delivery. The pathways are now nationally endorsed by the National

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Cancer Expert Reference Group, Australia's only government endorsed, high-level, expert national cancer forum.^{8,9}

Although encouraged, integration of OCPs as frameworks for cancer service delivery is not mandated, but rather they are presented as an opportunity to map usual care against the optimal pathway, identifying potential for process and system enhancement.⁸⁻¹⁰ To date, there has been little exploration or consideration of how usual care can be mapped against OCPs for patients in regional cancer centres.

This study set out to explore patterns of care for oncology patients receiving care, based in the City of Greater Bendigo, against the recommendations set out in OCPs, using routinely collected hospital administrative and medical records data. Bendigo was selected as the data collection site as it represents a large regional centre with an established integrated cancer service and presentation and management of common tumour types. The study explored pathways of patients with breast, lung and prostate cancers and reports on the congruence of routine care provided to this cohort of regional Australian cancer patients as assessed against optimal care pathways.¹⁰ For the purpose of the study, the terms 'regional' and 'rural' are used interchangeably, recognising that there are issues unique to each.

Methods

Data sources and patients

The study was a retrospective audit of hospital administrative and medical record data conducted at the Peter MacCallum Cancer Centre (PeterMac), East Melbourne campus, from January to June 2016, with supplementary data collection undertaken at Bendigo Health over a three week period in May, 2016. The study took part prior to the relocation of PeterMac to the Victorian Comprehensive Cancer Centre in Parkville, Melbourne.

Eligible cases were PeterMac patients with a residential address in the City of Greater Bendigo and who received care based at the PeterMac Bendigo campus as a new patient between 1 January and 31 December, 2015. Patients were considered new if they had not attended PeterMac previously, or were attending a different PeterMac clinic for the first time. Postcodes (3515, 3523, 3550, 3551, 3555, 3556, 3557, 3558 and 3570) were used to identify eligible cases from an Excel spreadsheet of PeterMac administrative data supplied by the Health Information Service (HIS), of all patients presenting in the study period. Clinic attendances for these patients were then reviewed through electronic medical records to assess the treatment-based location of care. With the exception of possible one-off imaging and procedural appointments, or one-off consultations with alternate treating teams that did not result in a transfer of care to that treating team, patients were considered to have had their care based in Bendigo if the entirety of the patient's oncology needs could be met at the PeterMac Bendigo campus and Bendigo Health in the study period.

Data extraction

Referral information, disease characteristics and treatment details (including episode of care dates) for eligible patients were extracted from the PeterMac electronic record using a standardised form. Data extracted from the medical record included all information needed to populate detailed process maps to allow comparisons between patient patterns of care and OCPs. Additional event data was extracted from Bendigo Health paper medical records to supplement and contextualise information extracted from PeterMac records. The data extraction form was piloted and revised using the first 10 cases; once finalised data were extracted for all patients including the first 10 cases.

Patients with one of the three most prevalent cancer types excluding non-melanoma skin cancer (breast, prostate and lung cancer) were process mapped, to ensure adequate numbers to support meaningful comparisons of data gathered within and across cancer types. Non-melanoma skin cancers were excluded as these pathways are commonly brief compared with other tumour types.

Process mapping

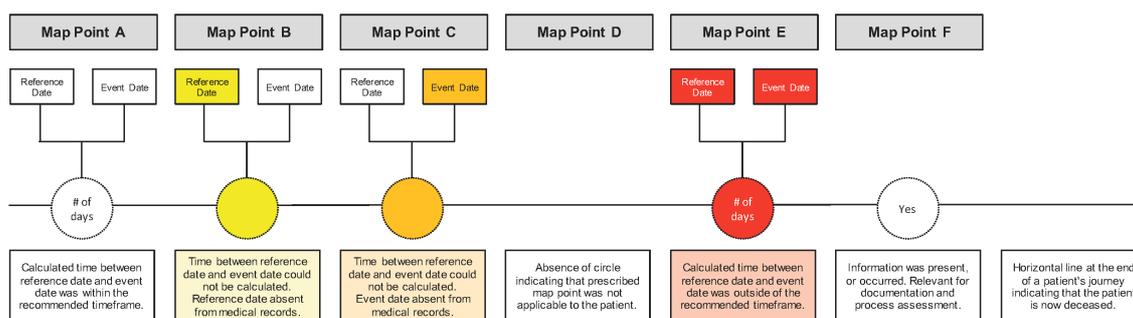
Process maps allow for visual representation of multiple, independent or interdependent events that occur at definable time points.¹¹ In this study each eligible patient journey from first symptomatic presentation to last health service contact was mapped (figure 1). Episode of care dates were used to

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create a chronologically-ordered list of events to populate a purposively designed process map template for each patient's journey during their treatment. Data were used to develop a process map and to compare patient pathways with recommendations set out in the OCPs.

Figure 1: Diagrammatic representation of process mapping

Process mapping can be used to visualise the patient journey from first symptomatic presentation to last health service contact. Patient progression through their care is represented linearly over time. Relevant map points are represented by circles, each corresponding to a step in the OCP framework. Calculated map point timeframes are compared with timeframes recommended by the OCP framework.



Results

A total of 141 patients were considered for process mapping, consisting of 53 breast cancer patients, 45 lung cancer patients and 43 prostate cancer patients.

Breast cancer

Process maps were constructed for 51 of 53 breast cancer patients. Two breast cancer patients were excluded from process mapping as neither had histories with Bendigo Health's HIS.

Data for women with breast cancer were grouped according to mode of entry into their treatment pathway. These groupings included GP-initiated pathways (n=20, 39%), screening-initiated pathways (n=21, 41%), and other pathways (n=10, 20%). The other pathways grouping included patients with insufficient medical record information to accurately determine the initiation of their pathway.

Patients with GP-initiated pathways were mapped according to the prescribed OCP pathway (figure 2); however, patients with screening-initiated and other pathways fitted less easily within the prescribed OCP pathway, and their mapping was truncated to exclude map points relating to GP presentation and referral. Due to this, it was not always possible to compare timeframes for patients with screening-initiated and other pathways against OCP timeframes, as many of the published OCP timeframes require GP-related reference dates for calculation.

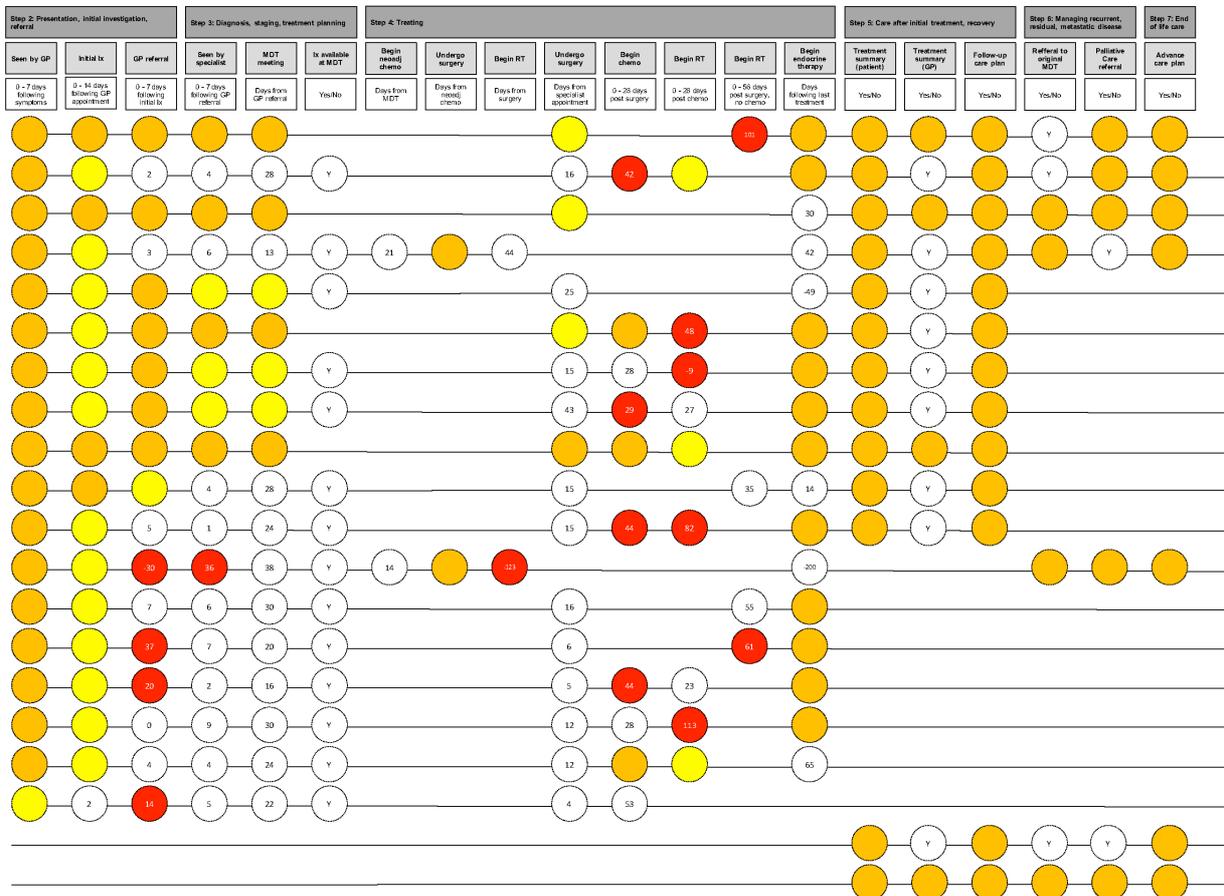
Data necessary to map patients' treatment pathways against the OCP recommendations were frequently missing from the medical records and many process map points were unable to be populated. Only 12 (60%) patients with GP-initiated pathways, 7 (33%) patients with screening-initiated pathways, and no patients with other pathways, had 50% or more of their required process map points.

The most frequently missing process map point for all breast cancer patients was the treatment summary provided to the patient, with this information unavailable for any of the 41 patients for whom it was relevant. Only one of 41 patients had information relating to a follow-up care plan.

The most populated map point was the treatment summary for GPs, available for 35 (85%) patients for whom this was relevant. For the purposes of this study, any correspondence to the GP that outlined the diagnosis and previous treatments of the patient was considered a treatment summary.

Figure 2: Process maps for patients with breast cancer

Process maps were completed for 20 patients with breast cancer and who had GP-initiated pathways. GP, General Practitioner; Ix, Investigation; MDT, Multi-disciplinary team; Neoadj, Neoadjuvant; Chemo, Chemotherapy; RT, Radiotherapy.



Within the GP-initiated pathway, 16 process map points were outside the timeframes recommended in the OCPs, with three of these occurring before the timeframe was designated to start. Nine map points were calculated to be outside of the recommended timeframe for patients with screening-initiated pathways and no map points were calculated outside the defined timeframe for patients with other pathways.

Lung cancer

Process mapping was completed for 43 of 45 lung cancer patients. Two patients with lung cancer were excluded as they could not be located by Bendigo Health's HIS.

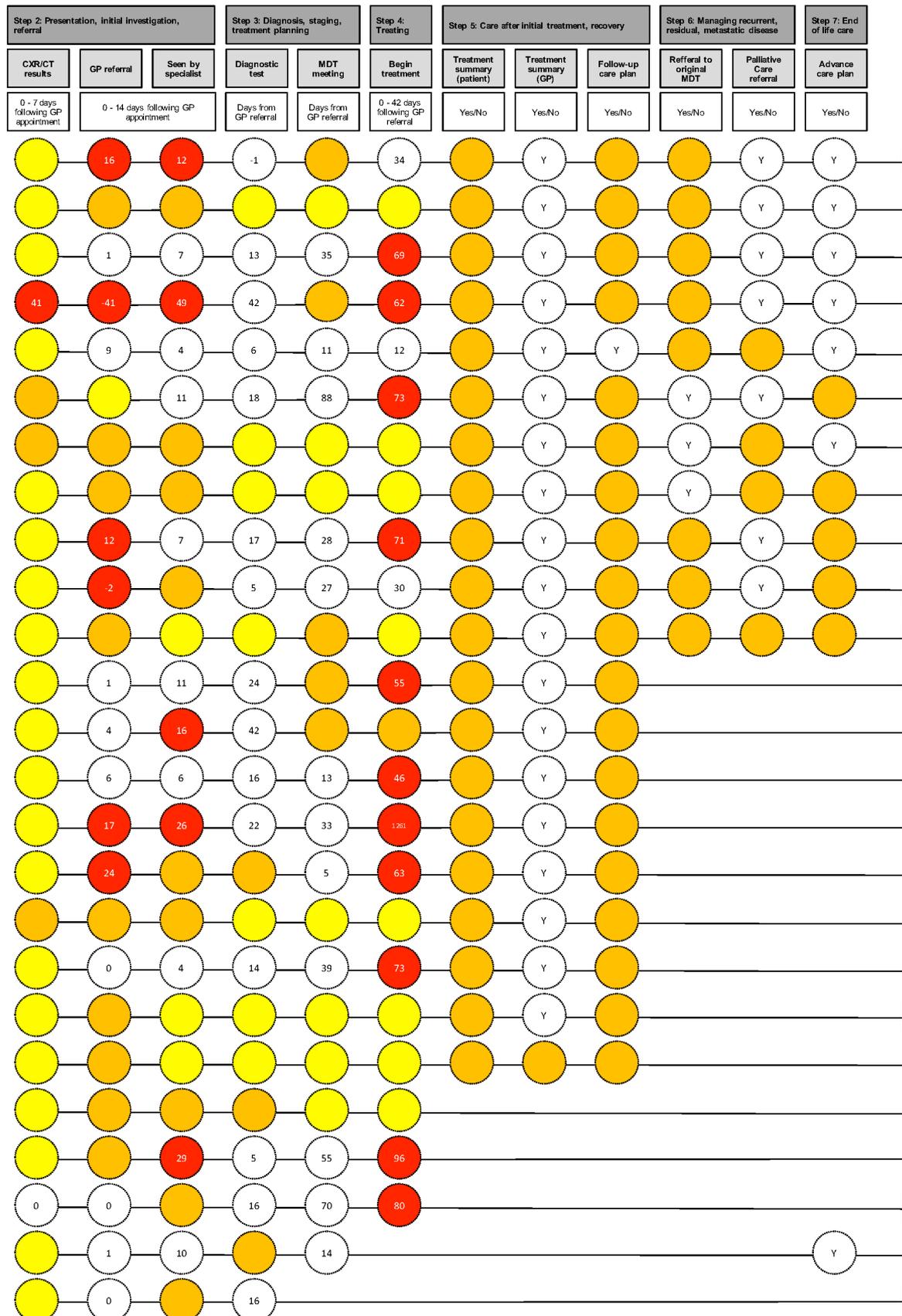
Patients were grouped by mode of entry into the pathway, which for lung cancer included patients with GP-initiated pathways (n=25, 58%), patients whose initial presentation was to the Emergency Department (ED) (n=6, 14%), patients with incidental findings (n=9, 21%), and patients with other pathways such as those already under the care of respiratory physicians and those with pathways that could not be determined (n=3, 7%).

Patients with GP-initiated pathways were mapped according to the OCP recommendations for lung cancer, which begins at symptomatic presentation to the GP (figure 3). Patients with all other pathways into the system fitted less easily within the prescribed OCP pathway due to their mode of entry, and their mapping was truncated to exclude map points relating to GP presentation and referral. Due to this, it was not possible to compare timeframes for these patients to OCP timeframes as all OCP timeframes for lung cancer require GP-related reference dates for calculation.

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Figure 3: Process maps for patients with lung cancer

Process maps were completed for 25 patients with lung cancer and who had GP-initiated pathways. CXR, Chest X-Ray; GP, General Practitioner; MDT, Multi-disciplinary team.



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Only 14 (56%) patients with GP-initiated pathways, four (67%) patients with ED-initiated pathways, six (67%) patients with incidental findings and one (33%) of the patients with another pathway, had 50% or more of their required process map points. The most frequently missing process map point for all lung cancer patients was the treatment summary provided to the patient, with this information unavailable for any of 34 patients for whom it was relevant. Only one of 34 patients had information relating to a follow-up care plan. The most populated map point was the treatment summary for GPs, which was available for 30 (88%) patients.

For patients with GP-initiated pathways, 23 map points were outside of the recommended timeframe and two of these occurred before the timeframe was designated to start. Reasons for delays included the need for repeated biopsies, patient requests for active surveillance and the management of comorbid conditions.

Prostate Cancer

Data were extracted for 43 of 45 prostate cancer patients. Three prostate cancer patients were excluded, two of whom were unable to be identified through Bendigo Health's HIS, and one of whom had notes that were inaccessible during the data collection period.

Prostate cancer patients were unable to be considered in this study as only six (14%) of 43 patients had 50% or more of their required process map points. The most frequently available information was the radiotherapy start date following diagnosis, available for 17 (40%) patients.

Discussion

This is the first study, to our knowledge, to test the feasibility of applying OCPs to a clinical setting. Difficulties were encountered in the utilisation of OCPs to map pathways of care for all three cancer types explored in this study.

Pathway initiation is an important consideration for the OCP framework, which currently and predominantly focuses on symptomatic GP presentation as a pathway starting point. Given that many breast cancer patients present through screening-initiated pathways, it will be important for the OCP framework to give additional consideration to asymptomatic screening as an entry point in future, and provide adjusted timeframes for breast cancer treatment as appropriate.

For lung cancer patients, GP-presentation is not necessarily appropriate or what happens for patients, and many in this study began their treatment journeys with ED presentations, incidental findings and referrals from respiratory physicians whom they were seeing for other concurrent respiratory illnesses. Process mapping for patients without GP-initiated pathways were necessarily truncated to exclude GP-related map points, and the entirety or complexity of the patient's treatment journey was subsequently not reflected in the completed process map.

Similarly, some lung cancer patients presented to their GP, from where they were sent to the nearest ED with a letter due to the urgency of their symptoms. For the purposes of this study, these patients were considered to have a GP-initiated pathway. However, they are in fact distinctly different to other patients with GP-initiated pathways who do not provoke such urgency, and it was not possible for this to be reflected by the pathway.

In compiling the process maps for the breast, lung and prostate cancer patients, it became apparent that large amounts of information needed to map patients' treatment pathways to OCP recommendations were missing from medical records. This was particularly true for prostate cancer, primarily due to patients receiving private treatment through a urologist, and there being no medical records relevant to their cancer care available in the public service.

Data requiring communication between the health service and the GP were most frequently missing, which had several downstream consequences. Pathway mapping requires information about the symptoms that lead to GP presentation and information around GP referral. If the date of presentation with symptoms and the date of GP referral are unavailable, the time between landmark events cannot be calculated and the mapping of several points is affected.

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Where information was readily available, it was frequently related to correspondence from the treating oncology team to the GP, or related to the cancer treatment itself (surgery, chemotherapy, radiotherapy). This information is the most routinely collected by the health service and therefore these data were well represented in this study. However, commencement dates for chemotherapy were more likely to be missing in the medical records than the date of chemotherapy completion. Chemotherapy completion dates impact downstream treatment decision-making and are therefore important in correspondence between clinicians. This highlights a discrepancy in the medical records between the information required for optimal care mapping and the information regularly documented by the health service.

Comparing deviations in the timeframes calculated from medical record data with the timeframes recommended in the OCPs was difficult as deviations due to patients' unique clinical needs are recognised as often necessary and appropriate. To use OCPs as a standard for best practice therefore not only requires reference and event date information to calculate an individual's pathway timeframes, but also requires additional contextual information about treatment decision-making processes and a knowledge of appropriate clinical decisions relevant to an individual. Additionally, many patients had map points that occurred earlier in their treatment pathways than recommended by the OCPs, and this type of deviation cannot be accommodated in the current iteration of the OCPs. The OCP timeframes also do not currently allow for consideration of delayed diagnoses, self-discharge, patient-requested active surveillance against medical advice and complicated ethical scenarios, all of which were encountered in the sample for our study.

Based on the study results, the following recommendations are proposed to strengthen the potential of OCPs to deliver against their intent:

1. Where data are to be used to benchmark practice against OCPs, they should be collected prospectively with a standardised template. Prospective data collection will seek to improve accuracy, efficiency and utility of mapping processes.
2. Routine collection of the nature of the patient's symptoms and the date they are reported to have begun, the date patients present to the GP and date of GP referral, as well as commencement dates for chemotherapy and radiotherapy, need to be included in hospital medical records. These data represent landmark events in the OCP framework, and unavailability of dates complicates comparison of routine care to optimal timeframes.
3. Hospitals should continue their efforts to increase communication with GPs and allied health practitioners, and these communications should be documented in the medical records. These data represent specified processes in the OCP framework, and documentation will ensure completeness of mapping results.
4. Timeframes should be developed for alternate modes of entry into the pathways for each tumour type, including for asymptomatic screening-initiated pathways in breast cancer, and ED and incidental pathways for lung cancer. Adjusted timeframes are needed to support the appraisal of care for alternate modes of entry.
5. Standardised treatment summary templates could be developed and utilised by hospitals to enhance communication of treatment information to GPs and patients, and minimise burden on hospital staff.
6. Patient-friendly treatment summaries and follow-up care plans should be provided to patients and documented in the medical record. This data, was most frequently missing from medical records, offers opportunity for process enhancement.
7. Further consideration should be given to the role of clinical judgement in treatment decision-making and how subsequent deviations from the OCP timeframes could and should be interpreted.

Conclusion

This study is the first to assess the feasibility of application of OCPs in a clinical setting for the purpose of mapping regional cancer care to best-practice pathways. While OCPs offer an opportunity for service and process enhancement, in order to best utilise OCPs in future research or health service assessment, a variety of considerations and amendments will be required. Given the variability of patient needs, some pathways may never map directly to OCPs and many more may appropriately deviate from the OCPs at differing stages.

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