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Review

Healthcare providers' perspectives on care coordination for adults with cancer and multiple chronic conditions: a systematic review

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Abstract

Objectives Inherent treatment complexities for patients with both cancer and multiple chronic conditions (MCC) make these patients likely candidates for shared care between primary care providers (PCPs) and oncologists. However, providers' views on the optimal model for care coordination between PCPs and oncologists in the context of both cancer and MCC are unclear. Thus, the purpose of this systematic review is to evaluate the perceptions of PCPs and oncologists regarding barriers and facilitators to care coordination during the care of patients with cancer and MCC, and their opinions on what is needed to improve current care coordination strategies.

Methods We systematically searched PubMed, CINAHL and PsycINFO for articles pertaining to PCPs' and oncologists' perspectives, experiences and needs regarding care coordination during the cancer care continuum, in the context of patients with cancer and MCC.

Key findings A total of 22 articles were retained. From qualitative synthesis, three themes emerged regarding PCPs' and oncologists' perceived barriers to cancer care coordination: (1) limited findings of physicians' experiences in MCC care; (2) lack of defined provider roles in cancer care; and (3) lack of comprehensive information sharing, efficient communication methods and clear shared-care plans during care for cancer patients with MCC.

Conclusions Results provide insights into providers' needs for navigating the complexities of cancer care coordination. Future studies should consider further investigating the needs of patients and multiple provider types for optimizing care coordination throughout the cancer care continuum.

Keywords cancer; care coordination; multiple chronic conditions; physician perspective

Introduction

The number of cancer survivors in the United States has grown significantly and is expected to surpass 20 million by 2026.^[1] Many cancer survivors (defined here as any person ever diagnosed with cancer) live with chronic comorbid conditions, such as hypertension, dyslipidaemia, diabetes, and depression or anxiety, and many have multiple chronic conditions (MCC).^[2,3] Therefore, effective cancer care involves treating both the cancer and chronic comorbidities. However, patients with chronic comorbidities experience worse cancer outcomes than those without, including lower cancer remission rates,^[4] higher chemotherapy toxicity rates^[4] and lower survival rates.^[5–11] Cancer treatment outcomes are worsened further when two or more chronic comorbidities are present.^[12] Since 90% of fee-for-service Medicare beneficiaries with cancer also have two or

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more chronic comorbidities,^[13] finding ways to improve cancer treatment outcomes for patients with MCC is a high priority.

Inherent treatment complexities for patients with both cancer and MCC make these patients likely candidates for shared care between primary care providers (PCPs) and oncologists in order to effectively manage both ongoing chronic comorbidities and acute cancer treatment.^[14,15] The Agency for Healthcare Research and Quality (AHRQ) states: ‘Care coordination involves deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient’s care to achieve safer and more effective care. This means that the patient’s needs and preferences are known ahead of time and communicated at the right time to the right people and that this information is used to provide safe, appropriate, and effective care to the patient.’^[16] However, care coordination remains a challenge for patients with both cancer and MCC. Facilitating more patient-centered care for these patients may lead to improvements in patient adherence to complicated treatment regimens, patient satisfaction with care, quality of life and both oncologic and nononcologic treatment outcomes.^[17–20] While ‘patient-centered care’ may involve many facets of patient–provider–health system interactions, the coordination of a patient’s care between multiple treating providers is one important aspect. Previous reviews have evaluated cancer care coordination among survivors. For instance, Lawrence *et al.*^[21] assessed PCPs’ perspectives on cancer care and discovered various barriers and challenges to care coordination. Additionally, Shapiro documented current research on cancer survivorship, including the importance of care coordination, need for effective communication and widespread prevalence of MCC among cancer survivors.^[22] To further elaborate on this research area, the literature gap in care coordination between oncologists and PCPs must be addressed to further enhance the care of cancer survivors with MCC.^[21]

New contributions

It is critical to incorporate both patient and provider preferences into patient-centered care standards to facilitate implementation success and sustain long-term patient-centered practice changes across diverse patient populations. However, providers’ views and opinions on the optimal model for care coordination between PCPs and oncologists in the context of both cancer and MCC are unclear. Thus, the purpose of this systematic review was to evaluate the perceptions of PCPs and oncologists regarding barriers and facilitators to care coordination during the care of patients with cancer and MCC, and their opinions on what is needed to improve current care coordination strategies. Here, the scope of care coordination expands across the entire spectrum of cancer survivorship, from acute treatment to post-acute treatment, including the care of both cancer and MCC. Based on findings from the review, recommendations for PCPs, oncologists, organizations and researchers are presented. Findings and recommendations may help inform the development of patient-centered practices, policies and guidelines that facilitate coordination of cancer care in real-

world settings, as well as provide insight into care coordination models.^[15]

Methods

Review protocol

The review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and the full review protocol can be found in Data S1.

Eligibility criteria

The review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. English-language articles were included if they met the following criteria: (1) published in the last 10 years (2008–2018); (2) peer-reviewed randomized controlled studies, nonrandomized controlled studies, quantitative descriptive studies or qualitative studies; (3) inclusion of patients aged 18 years or older diagnosed with any type or stage of cancer; (4) inclusion of patients with one or more chronic comorbid condition, of any kind; (5) inclusion of PCP and oncologist perceptions about the current state of care coordination, barriers and facilitators to coordinated care, or needs and experiences regarding cancer care coordination; and (6) ability to extract results.

For this review, we focused on the perspectives of physicians, including family medicine physicians, general practitioners and medical, radiation or surgical oncologists. Therefore, articles with results that did not explicitly differentiate physician and nonphysician healthcare providers were excluded. Additionally, a 10-year timeframe was used to include articles with results most salient to current practice. Interview, focus group and survey studies were anticipated to be most likely to answer the question of interest: ‘What are PCPs’ and oncologists’ perspectives on care coordination for patients with both cancer and MCC?’ Randomized controlled studies, nonrandomized controlled studies, quantitative descriptive studies and qualitative studies were all eligible for inclusion under our protocol in order to capture interviews, focus groups or surveys that were conducted and reported alongside other study designs.

Information sources and search strategy

We systematically searched PubMed, CINAHL and PsycINFO for articles pertaining to PCPs’ and oncologists’ perspectives, experiences and needs regarding care coordination of patients with cancer and MCC. To include articles not indexed in these databases, hand-searched references were also included by reviewing the reference lists of retained articles. Search terms included variations on ‘cancer’, ‘comorbidities’, ‘care coordination’ and ‘physician perception’. A complete list of search strings is presented in Data S2.

Study selection

Citations were downloaded into an EndNote library. Articles underwent initial title and abstract screening, followed by

full-text screening. During both phases, all articles were independently reviewed by the second and eighth authors, with discrepancies resolved via discussion and consensus.

Data extraction

Data were extracted by the second author during full-text screening using a standardized form and reviewed by the eighth author for accuracy and completeness. This standardized form contains fields for study location, general descriptions (including study design and sample characteristics), objectives and results.

Data items

This study focused on qualitative data, such as PCP's and oncologist's opinions, thoughts or beliefs. To facilitate incorporation of diverse types of qualitative data, measures of interest were intentionally broadly defined as 'provider perspectives' on care coordination.

Risk of bias in individual studies

Risk of bias within each study was assessed independently by the second and senior author using the Mixed Methods Appraisal Tool (MMAT), version 2018,^[23] and performed simultaneously with data extraction. The MMAT contains five study design categories: qualitative, quantitative randomized controlled, quantitative nonrandomized, quantitative descriptive and mixed methods. Each category contains five quality criteria that are rated as 'Yes', indicating a particular criterion was met according to the MMAT's criteria descriptions and the evaluator's assessment of the information presented in the article; 'No', indicating a particular criterion was not met; or 'Can't tell', indicating that the evaluator could not make a determination on whether that criterion had been met. Depending on the number of quality criteria met, each article was assigned a quality score ranging from 0 to 5, with 0–1 indicating low quality (high risk of bias), 2–3 indicating moderate quality (moderate risk of bias) and 4–5 indicating high quality (low risk of bias).

Summary measures and synthesis of results

Given our focus on provider perspectives, qualitative synthesis of the data was performed by the first author to develop themes reflecting PCPs' and oncologists' needs, as well as perceived barriers and facilitators to effective care coordination for patients with both cancer and MCC. The qualitative synthesis process consisted of three steps: (1) for each article with quantitative results (e.g. quantitative survey results), descriptive statistics and/or statistical associations were summarized in text format; (2) for each article with qualitative results (e.g. interview results), themes were summarized in text format; and (3) text summaries for each article were reviewed and categorized into overarching themes that emerged from the data and that described 'take-home messages' regarding PCPs' and oncologists' perspectives on care coordination for patients with cancer and MCC.

Overarching themes were discussed by all authors until consensus was reached.

Risk of bias across studies

Risk of bias across studies was qualitatively evaluated via discussion among the authors to reach a consensus on the degree of confidence (low, moderate or high) in the overall body of evidence. Discussion focused on the number of articles retained; characteristics of participants across studies in terms of differences and similarities in provider demographics, practice setting, demographics of the patient population and cancer type and stage of the patient population; consistency of study objectives and data collected across studies; and quality scores obtained using the MMAT.

Results

Characteristics of included studies

A total of 22 articles were retained in the review, Figure 1. A list of the 22 included articles (18 unique studies) and a summary of their findings are presented in Table 1. Four articles^[24–27] in this review presented results from the Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009. All were retained, as each concentrated on a different aspect of the survey findings. Also, two articles presented results from the Cancer Care Outcomes Research and Surveillance Consortium (CanCORS).^[14,28] Both articles were retained, as each focused on data collected during a different time period (data from 2005 to 2006^[14] or 2012 to 2013^[28]).

Studies represented the perspectives of 8638 physicians, including 4503 PCPs, 185 surgical oncology specialists and 3950 radiation or medical oncology specialists; however, some overlap of oncology specialists may be present between the CanCORS study populations.

Most studies reported in the 22 articles had a cross-sectional quantitative (13)^[14,24–35] or qualitative (6) design,^[36–41] while two used mixed methods (surveys and interviews),^[42,43] and one was longitudinal (surveys and interviews).^[44] Most (19)^[14,24–28,30,32–36,38–44] included physician perspectives as a main outcome measure, although three^[29,31,37] included physician perspectives as an adjunct to patient perspectives. Some articles were excluded because they focused on nonphysician providers such as nurses, nurse practitioners, physician assistants and allied healthcare providers.

Two studies in this review focused on patients with lung cancer,^[29,40] two focused on breast cancer,^[34,42] and the remaining 18 focused on multiple or unspecified types of cancer.^[14,24–28,30–33,35–39,41,43,44] Also, studies focused on different phases of cancer care, including those who had completed cancer treatment, were undergoing active cancer treatment or were in varying or unspecified phases of cancer care. While there is heterogeneity between these patients, all qualify as cancer survivors based on the National Cancer Institute's definition.^[1] Nine studies explicitly mentioned PCPs' or oncologists' views and experiences with providing care to patients with both cancer and MCC or described

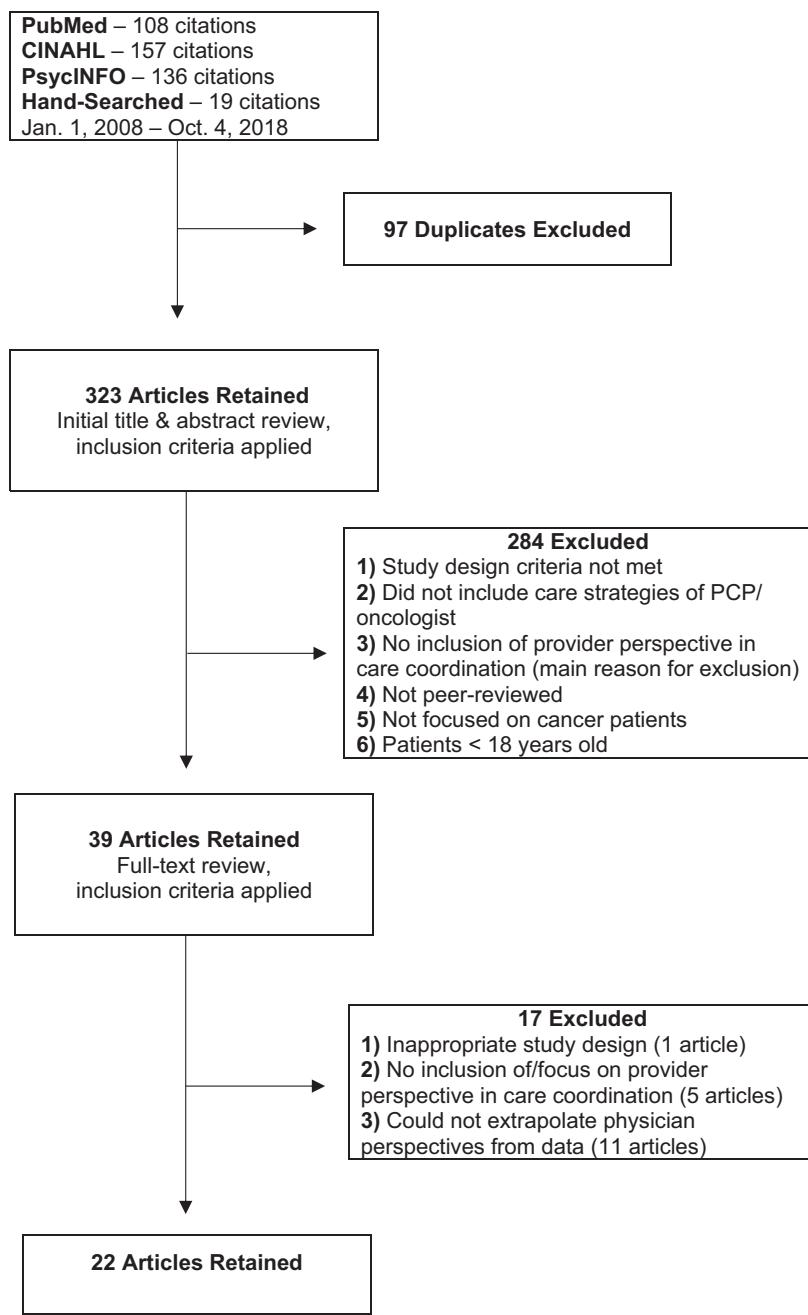


Figure 1 PRISMA diagram. PCP, primary care physician.

providers' perceptions of their role in helping patients manage general health versus cancer-specific health.^[14,25,28,31,34,36,39–41] Similarly, three studies mentioned PCPs' and/or oncologists' perceptions of survivorship care plans (SCPs) or cancer treatment summaries;^[26,33,35] five studies mentioned physician experiences with or perceptions of communication methods for cancer care coordination,^[28,38,41,43] or general perceptions of care coordination during the cancer care continuum;^[39] six mentioned physicians' perceived provider-, practice- or system-related barriers and facilitators to coordinating care for patients with

cancer, or physicians' unmet needs regarding cancer care coordination;^[36–40,43] and 14 studies focused on PCPs' and oncologists' perceptions of their roles in shared cancer care or preferred models of cancer care.^[14,24–29,31,32,34,36,39,41,42]

Risk of bias in individual studies

Table 2 describes the risk of bias in individual studies. MMAT quality scores ranged from 2 to 5, with four studies^[14,33,42,44] assigned a score of 2 or 3 (moderate risk of bias) and 18 studies^[24–32,34–41,43] assigned a score of 4 or 5

Table 1 Evidence table of included articles[†]

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Aubin M, 2012; Canada ^[29]	Evaluate PCPs' specialists' and patients' perceptions of PCPs' role in the cancer care continuum.	Cross-sectional survey.	232 PCPs and 45 specialists caring for patients with lung cancer.	PCPs' coordination with the oncology team was described as shared care by 48.9% of PCPs, parallel care by 45.4% and not included in coordination by 5.7%. PCP perceptions of their actual level of involvement in cancer care varied between phases: 87.8% of PCPs reported being involved in the diagnostic phase; 43.7% reported being involved in the treatment phase; and 70.1% reported being involved in the advanced cancer phase. For PCPs' perceived role in care coordination, fewer PCPs desired involvement during the treatment phase as compared to diagnostic and advanced phases; specialists perceived PCPs' involvement to be needed most during the advanced phase and least during the treatment phase. Exact percentages were not available. During diagnostic, treatment and advanced cancer phases, perceived roles of PCPs differed between PCPs, specialists and patients, but PCPs' importance in emotional support was similar for all groups.
Chan RJ, 2017; Asia-Pacific countries ^[30]	Assess oncology practitioners' perceptions of cancer survivorship care practices.	Cross-sectional survey.	1501 oncology practitioners, including 250 physicians, 1192 nurses and 59 allied health professionals.	Looking only at physicians' perceptions in survivorship care, average perception of responsibility in coordination between providers was 33.99, on a scale of 9–45. The average level of confidence with care coordination was 60.40, on a scale of 0–90. The average perceived frequency of care coordination was 30.29, on a scale of 9–45. Substantially higher levels were reported by physicians in confidence and frequency of coordination between providers during survivorship care than nurses and allied health professionals.
Cheung WY, 2013; USA ^{[24],‡}	Determine the effect of physician attitudes and self-efficacy on their preferences regarding cancer survivorship care models.	Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009.	938 PCPs and 1088 oncologists.	51% of PCPs preferred a model in which PCPs were mostly responsible for patients' cancer survivorship care or preferred shared care between providers. But 59% of oncologists preferred a model in which oncologists were mainly responsible. These differing viewpoints could result in inefficient cancer care coordination. 43% of PCPs reported actively screening for recurrent cancer; these PCPs were more likely to prefer models in which PCPs were mostly responsible for patients' cancer survivorship care or shared care between providers (Odds Ratio = 2.08). Most oncologists did not believe PCPs could provide appropriate cancer follow-up care (78%), detect recurrent cancer (62%), deliver psychosocial support (92%) or hold primary responsibility (87%) in cancer survivorship care. A small proportion of PCPs reported high confidence in detecting recurrent cancer (34%) and managing long-term cancer effects (19%), as compared to the proportion of oncologists reporting high confidence in detecting recurrent cancer (80%) and managing long-term cancer effects (70%).

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Cheung WY, 2009; USA ^[31]	Evaluate differences in expected role of PCPs and oncologists during cancer survivorship care.	Cross-sectional survey.	255 PCPs and 123 oncologists, as well as their patients with cancer.	PCPs and oncologists generally agreed that management of general health problems was expected to be provided mainly or fully by PCPs. PCPs and oncologists both expected to be responsible for cancer recurrence follow-up, other cancer screenings and preventative care. PCPs' expectations for their role in survivorship care were more extensive than patients' expectations for PCPs' role.
Dahlhaus A, 2014; Germany ^[36]	Identify GPs' perceptions of their role, involvement and cooperation during cancer care.	Semistructured telephone interviews.	30 GPs.	Oncologists' expectations for their role in survivorship care were less extensive than patients' expectations for oncologists' role. GPs' involvement differed at specific stages of cancer, with least involvement during curative and palliative care. GPs perceived their role to be improving cancer care by using their knowledge of patients' comorbidities, and GPs tailored their care to be more patient-centered by enhancing patients' understanding of cancer care and improving quality of life. Although GPs expressed a desire to be involved in cancer care coordination, they reported challenges during cancer care due to not being informed of their patients' cancer care.
Dawes AJ, 2015; USA ^[42]	Evaluate PCPs' knowledge, attitudes and confidence towards breast cancer survivorship care in the safety net.	Surveys and focus groups.	Survey: 42 physicians and 17 nonphysician healthcare providers. Focus groups: providers, unable to differentiate between physicians and nonphysicians.	Due to lack of coordination, some GPs reported individually initiating communication with patients or specialists to get more information, while other GPs reported effective communication initiated from other providers. 43% of physicians 'somewhat agreed' or 'strongly agreed' with PCPs' skills for delivery of follow-up cancer care, and 62% agreed with PCP skills to provide recurrent cancer screening. Only 33% of physicians 'somewhat agreed' or 'strongly agreed' with PCPs having primary responsibility in follow-up cancer care, and only 26% indicated PCPs could better provide psychosocial support compared to oncologists.
Del Giudice ME, 2009; Canada ^[32]	Evaluate PCPs' perspectives in providing follow-up cancer care to survivors. Identify PCPs' needs and concerns with follow-up care.	Cross-sectional survey.	330 PCPs.	PCPs preferred to take primary responsibility of follow-up cancer care about 2.5–3.5 years after conclusion of cancer treatment. Majority of PCPs (>90%) recommended modalities to improve follow-up cancer care, such as a specialist-provided patient letter, cancer-specific guidelines, expedited referrals to specialists and expedited processing of possible cancer recurrences. PCPs' views about providing follow-up cancer care to survivors included belief in their ability to provide psychosocial support (79.8%) and provide care at earlier cancer stages (63.7%); however, they also acknowledged specialists' importance during cancer recurrences (67.2%) and the likelihood that patients would prefer follow-up care from a specialist (71.7%).

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Dicicco-Bloom B, 2013; USA ^[37]	Evaluate information sharing during cancer survivorship care between PCPs, survivors and oncologists.	Interviews.	11 PCPs and 10 NPs.	Themes did not differentiate between PCPs' and NPs' responses, but the following findings were obtained directly from PCPs' responses only. A PCP expressed the importance and lack of continually visiting with patients undergoing cancer treatment to stay informed. Another PCP shared her experiences with calling oncologists with questions and usually receiving a response if in a community setting, but another PCP never received communication back after referring her patient to a large cancer center. A PCP expressed that he/she did not follow-up with the oncologist when making changes to medications for comorbidities, which indicates a lack of shared information in both directions. A PCP also reported calling the patient to get necessary information to stay connected with the patient's care. A few PCPs indicated challenges to care for patients during cancer follow-up due to lack of information sharing from oncologists.
Easley J, 2016; Canada ^[38]	Assess healthcare provider perspectives of cancer care coordination.	Interviews.	58 HCPs: <ul style="list-style-type: none">• 21 FPs• 15 surgeons• 12 medical oncologists• 6 radiation oncologists• 4 GPs.	Challenges were identified during cancer care coordination, such as overall delays in transcribing medical notes, problems obtaining patient information mostly due to incompatibility between electronic medical record software, lack of inclusion of necessary HCPs in other physician reports, inadequate relationships among providers and overlaps of care provided by different HCPs. Solutions to these challenges may lead to more efficient care coordination between FPs and cancer specialists.
Forsythe LP, 2012; USA ^{[25]†‡}	To assess physicians' perceptions and practices in psychosocial support during cancer survivorship care.	Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009.	1130 oncologists and 1021 PCPs (excluded 51 PCPs not caring for survivors with breast or colon cancer).	Broad involvement in psychological care, health promotion and physical symptom management was reported by the majority (>61%) of oncologists and PCPs. Significantly more PCPs reported independent responsibility for health promotion as compared to oncologists (51.2% and 31.2% respectively, $P < 0.001$). For survivorship care, a significantly higher percentage of oncologists than PCPs indicated shared involvement in psychological care, health promotion and all components of psychosocial care ($P < 0.001$ for all). The majority (>60%) of PCPs reported independent treatment of depression/anxiety, smoking cessation and sexual dysfunction among cancer survivors. The majority (>50%) of oncologists reported only independently assessing adverse psychological events and treating cancer-related pain.

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Forsythe LP, 2013; USA ^{[26],‡}	Assess oncologists' and PCPs' use of SCPs in current practice.	Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009.	1130 oncologists and 1020 PCPs (excluded 51 PCPs not caring for survivors with breast or colon cancer and 1 not practising in primary care).	When asked about current sharing of SCPs, oncologists (20.2%) were significantly more likely to recall 'always/almost always providing SCPs' than PCPs (13.4%) to recall receiving SCPs ($P = 0.001$). Overall, a minority of oncologists and PCPs reported use of SCPs in current practice. PCPs who mentioned receiving a SCP from an oncologist tended to report never experiencing uncertainty or problems in coordinating care, always engaging in necessary communication between physicians, and reported higher confidence in their delivery of follow-up cancer care compared to PCPs who did not mention receiving an SCP ($P < 0.05$). 56.5% of oncologists preferred to be primarily responsible for providing SCPs; the majority (45.8%) of PCPs preferred an SCP model in which another provider was most responsible; and only 16% of oncologists and 37.3% of PCPs preferred a shared-care model.
Kane P, 2016; New Zealand ^[39]	Assess GPs' perceptions and challenges in providing continuity of cancer care.	Semistructured interviews and focus groups.	34 GPs.	Challenges for continuity of care, as perceived by GPs, included: only seeing 10–20 new cancer patients per year; need for more clarified, timely and comprehensive communication from specialists; and patients' inadequate funds to afford both GP and specialist visits. GPs perceived their role in cancer care to center around clarifying patients' understanding, providing psychosocial support and managing adverse effects and chronic comorbidities (including follow-up cancer care). GPs wanted to be included as part of the team in providing continuity of care to patients with cancer.
Klabunde CN, 2009; USA ^{[14],§}	Define current role of PCPs during cancer care, from PCPs' and oncologists' perspectives.	Survey data from Cancer Care Outcomes Research and Surveillance Consortium (CanCORS I).	1694 PCPs and 1621 cancer specialists.	The general trend found that PCPs (>90%) were more involved in providing or sharing management of general care as compared to cancer specialists; however, cancer specialists were more involved in providing or sharing cancer care specifically, compared to PCPs. For treatment of comorbidities, 98.2% of PCPs currently provided or shared this role during cancer care, while >70% of cancer specialists referred the patient or were completely uninolved in treatment of comorbidities. This study documented variability of PCPs' roles in cancer care based on geographic location.
Klabunde CN, 2017; USA ^{[28],§}	Discover what influences follow-up cancer care communication and coordination of care from oncologists' perspective.	Survey data from Cancer Care Outcomes Research and Surveillance Consortium (CanCORS II).	357 oncologists.	49.6% of oncologists reported communicating follow-up to PCPs for all patients, yet 12.4% did not communicate any information to PCPs after cancer treatment. For modes of communicating information from oncologists to PCPs, most oncologists reported always using printed material (52%), sometimes using telephone (67.6%), never using EHRs (42.2%) and never using e-mail (56.1%). 58.5% of oncologists reported 'always/usually' communicating via 1 mode listed above; however, 24.2% reported communicating via more than 1 mode, and 17.3% did not use any mode to share patient information with PCPs.

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Merport A, 2012; USA ^[33]	Identify CSPs' and PCPs' usage of and preferences for treatment summaries and SCPs.	Cross-sectional surveys.	108 CSPs and 400 PCPs.	Generally, oncologists tended to report primarily caring for conditions related to cancer care themselves (>57%), but oncologists tended to report shared care or PCPs as primarily responsible for managing general care. Geographic location of oncologists' practice site influenced coordination of care between oncologists and PCPs.
Potosky AL, 2011; USA ^{[27],‡}	Identify the desired care model, perceptions, confidence and recurrent cancer screening roles among PCPs and oncologists during follow-up cancer care.	Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009.	1072 PCPs and 1130 oncologists.	56% of CSPs reported using treatment summaries, but only 14% used SCPs. For treatment summaries, items most likely ($\geq 90\%$) to be mentioned were diagnosis, treatment start date, treatment plan and cancer stage. 54% of PCPs recalled receiving treatment summaries, and PCPs' most preferred items included in treatment summaries and SCPs were 'summary of treatment received' (95%), follow-up schedules (89%), recommendations (89%), possible side effects (84%), and future treatment-related health risks (67%).
Puts M, 2017; Canada ^[44]	Evaluate family physicians' and oncologists' decision-making process for cancer therapy, including effects of comorbidity, frailty and functional status.	Longitudinal, semistructured interviews and surveys.	15 family physicians and 13 oncologists.	The most commonly desired cancer care model reported by PCPs was the shared-care model, and the most commonly desired model reported by oncologists was the oncologist-led model. A larger proportion of PCPs than oncologists believed that PCPs had necessary skills to provide follow-up cancer care, and 51% of PCPs thought they could provide psychosocial support better than oncologists. Oncologists, compared with PCPs, had significantly higher confidence in their ability to provide follow-up cancer care in the following 3 areas: testing for recurrent cancer, physical effects and psychosocial effects ($P < 0.001$). The results for recurrent cancer screening showed that both PCPs and oncologists recommended tests that were not in agreement with guidelines, and PCPs generally recommended more unnecessary tests than did oncologists.

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Rankin NM, 2017; Australia ^[40]	Evaluate the experiences of GPs in diagnosis and treatment of lung cancer.	Interviews and focus groups.	11 GPs.	GPs expressed challenges coordinating care for patients with lung cancer care, including referring patients to specialists, uncertainty of GPs' role, absence of patient visits with GPs after diagnosis, inadequate GP knowledge and lack of timely information from multidisciplinary teams. GPs were supportive of patients' need for psychosocial care, and they noted that patients' comorbidities and providers' geographic location affected the diagnostic interval of lung cancer.
Rose DE, 2012; USA ^[34]	Analyze physicians' reported practice style during tasks in cancer care. Determine whether practice style was associated with patients' perceptions of care.	Cross-sectional survey.	Population for objective 1: 347 cancer physicians, including 111 medical oncologists, 66 radiation oncologists and 170 surgeons. Population for objective 2: 411 breast cancer patients connected with their medical oncologists (111).	8% of physicians reported managing comorbidities themselves, 24% managing, 62% referring and 6% not handling. Out of all physicians, medical oncologists mainly cared for 5 out of the 10 tasks themselves, and they mainly comanaged (42%) or referred (43%) patients for comorbidity care. For other tasks for which the majority of medical oncologists reported comanaging (decisions about surgery type, radiation use and depression treatment), patients reported significantly better care ratings when their oncologists comanaged care as opposed to oncologists referring them to another provider ($P < 0.05$ for all). Similarly, for cancer-related arm symptom treatment, comanagement was the most common style of care for medical oncologists, and patients reported significantly better care ratings with comanaged care versus independent oncologist care ($P < 0.05$). 3 themes emerged from the interviews:
Sada YH, 2011; USA ^[41]	Evaluate oncologists' and PCPs' perceptions of their roles and communication in shared care for patients with cancer and comorbidities.	Semistructured interviews.	14 physicians, including 6 PCPs and 8 radiation, surgical or medical oncologists.	1 PCPs and oncologists reported that sharing information through EHRS advanced communication, but phone calls, paging and e-mails were still used in urgent situations. 2 Providers discussed the priority of cancer over comorbidities and necessity for comorbidities to be managed before undergoing cancer therapy, and some oncologists insisted that comorbidities be managed directly by PCPs, while others did not. Confusion was present in the respective roles of comorbidity management during cancer care. 3 Oncologists and PCPs clearly identified that PCPs should control psychological care and manage changing behaviours and setting goals.
Shen MI, 2015; USA ^[43]	Assess PCPs' perceptions and preferences in communicating with oncologists during cancer care in underserved areas.	Survey and interviews.	Survey: 128 PCPs. Interviews: 18 PCPs.	PCPs perceived receiving adequate communication from oncologists about diagnosis but inadequate communication about treatment. PCPs were generally not satisfied with communication since majority (59%) indicated that 'not enough' information was communicated. PCPs desired different modes of communication based on the scenario, but telephone and e-mail were the most commonly desired modes of communication. PCPs wanted to be included more in communication with oncologists and serve in a supporting role during cancer care.

Table 1 (Continued)

First author, year; country	Relevant objective(s)	Study design	Sample characteristics	Relevant findings
Watson EK, 2010; United Kingdom ^[35]	Identify perceptions of PCPs on cancer care reviews (summaries). Identify opinions of PCPs and oncologists on follow-up care and survivorship care plans.	Cross-sectional survey.	100 oncologists and 200 PCPs.	In current practice, 94% of PCPs used cancer reviews from oncologists, which mostly (>50%) discussed treatment, psychological care, social support, needs of family and patients' care decisions. Generally, PCPs were dissatisfied with the current communication of information. In discharge letters for follow-up, oncologists provided PCPs with histology of tumor, treatment summary, directions for treatment, directions for PCP follow-up and information previously discussed with patient (>80% for all); PCPs reported receipt of the information, which most claimed as inadequate. PCPs believed that recurrent symptoms, relatives' cancer risk, psychosocial care and consequences should also be included to improve survivorship care plans.

CSP, cancer specialist physician; FP, family physician; GP, general practitioner; HCP, healthcare provider; EHR, electronic health record; NP, nurse practitioner; PCP, primary care physician; SCP, survivorship care plan.

*Many articles were excluded from the current review because the perspectives of physicians could not be completely separated from the perspectives of nonphysicians.

[†]Articles report results from the Survey of Physician Attitudes Regarding the Care of Cancer Survivors (SPARCCS) in 2009. All were retained, as each concentrated on a different aspect of the survey findings.

[‡]Articles report results from the Cancer Care Outcomes Research and Surveillance Consortium (CanCORS). Both articles were retained, as each focused on data collected during a different time period.

(low risk of bias). Quality scores are based on information presented in an article, how well this information matched quality criteria described in the MMAT and evaluators' judgement; thus, scores may have a subjective component and may not reflect the actual quality of the study in question.

Risk of bias across studies

Our confidence in the overall body of evidence was moderate. Most of the 22 included articles achieved a relatively high-quality rating. However, context variability was present. For example, some studies reported provider views and experiences surrounding cancer care coordination in the context of specific types of cancer, while other studies did not. There was also inconsistency in how 'provider views' were operationalized in each study. Some studies focused on provider satisfaction with tools used to facilitate cancer care coordination (such as use of a shared electronic health records (EHR) or shared-care plans), while other studies focused on providers' perceptions of their roles in cancer care coordination, communication methods for cancer care coordination or providers' opinions on personal-, practice- and system-related barriers and facilitators to effective cancer care coordination. The most common reasons for excluding a study from this systematic review were lack of inclusion/focus on provider perspectives and lack of extractable data on PCP or oncologist perceptions of cancer care coordination strategies, experiences or perceptions. Also, while some studies explicitly mentioned providers' views on managing both cancer and chronic comorbidities, other studies implied the presence of comorbidities through the need for care coordination between generalists and specialists.

Qualitative synthesis

Three themes emerged from the qualitative synthesis of articles: (1) limited findings of physicians' experiences in MCC care; (2) lack of defined provider roles in cancer care; and (3) lack of comprehensive information sharing, efficient communication methods and clear shared-care plans during care for cancer patients with MCC.

Limited findings of physicians' experiences in MCC care

Evidence of physicians' perspectives for providing care for MCC in patients with cancer was limited, since the majority of studies either briefly mentioned comorbidities or did not address the interplay of cancer and comorbidities. In those mentioning MCC, mixed opinions and experiences were documented. Between PCPs and oncologists, the consensus was that PCPs should manage general health, either mainly or fully,^[14,28,31] while using their knowledge of patients' MCC to appropriately tailor care.^[36] The majority of PCPs were primarily responsible for treating MCC and providing general care for cancer survivors, such as treating depression/anxiety and addressing smoking cessation and sexual

Table 2 Risk of bias assessment for individual articles

Article (First Author, Year)	MMAT design category [†]	Quality score [‡]	Criteria met	Total quality score [‡]
	Criteria			
Aubin M, 2012 ^[29]	Quantitative nonrandomized			
	Are the participants representative of the target population?	✓	✓	4
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Is the qualitative approach appropriate to answer the research question?	✓		
	Are the qualitative data collection methods adequate to address the research question?	✓		
	Are the findings adequately derived from the data?	✓		
	Is the interpretation of results sufficiently substantiated by data?	✓		
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓		
	Is there an adequate rationale for using a mixed methods design to address the research question?	✓		
	Are the different components of the study effectively integrated to answer the research question?	✓		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	✓		
	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	✓		
	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?			
	Is the sampling strategy relevant to address the research question?	✓		
	Is the sample representative of the target population?	✓		
Chan RJ, 2017 ^[30]	Quantitative nonrandomized			
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
Cheung WY, 2013 ^[24]	Quantitative nonrandomized			
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
Cheung WY, 2009 ^[31]	Quantitative nonrandomized			
	Are the participants representative of the target population?	✓		
	Are measurements appropriate regarding both the outcome and intervention (or exposure)?	✓		
	Are there complete outcome data?	✓		
	Are the confounders accounted for in the design and analysis?	✓		
	During the study period, is the intervention administered (or exposure occurred) as intended?	✓		
	Is the qualitative approach appropriate to answer the research question?	✓		
	Are the qualitative data collection methods adequate to address the research question?	✓		
	Are the findings adequately derived from the data?	✓		
	Is the interpretation of results sufficiently substantiated by data?	✓		
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓		
	Is there an adequate rationale for using a mixed methods design to address the research question?	✓		
	Are the different components of the study effectively integrated to answer the research question?	✓		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	✓		
Dahllaus A, 2014 ^[36]	Qualitative			
	Are the findings adequately derived from the data?	✓		
	Is the interpretation of results sufficiently substantiated by data?	✓		
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓		
	Is there an adequate rationale for using a mixed methods design to address the research question?	✓		
	Are the different components of the study effectively integrated to answer the research question?	✓		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	✓		
Dawes AJ, 2015 ^[42]	Mixed methods			
	Are the findings adequately derived from the data?	✓		
	Is the interpretation of results sufficiently substantiated by data?	✓		
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓		
	Is there an adequate rationale for using a mixed methods design to address the research question?	✓		
	Are the different components of the study effectively integrated to answer the research question?	✓		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	✓		
Del Giudice ME, 2009 ^[32]	Quantitative descriptive			
	Are the findings adequately derived from the data?	✓		
	Is the interpretation of results sufficiently substantiated by data?	✓		
	Is there coherence between qualitative data sources, collection, analysis and interpretation?	✓		
	Is there an adequate rationale for using a mixed methods design to address the research question?	✓		
	Are the different components of the study effectively integrated to answer the research question?	✓		
	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	✓		

Table 2 (Continued)

Table 2 (Continued)

Article (First Author, Year)	MIMAT design category [†]	Quality score [‡]	Criteria	Total quality score [‡]
Merport A, 2012 ^[33]	Quantitative nonrandomized	3	<p>Are the measurements appropriate?</p> <p>Is the risk of nonresponse bias low?</p> <p>Is the statistical analysis appropriate to answer the research question?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Is there an adequate rationale for using a mixed methods design to address the research question?</p> <p>Are the different components of the study effectively integrated to answer the research question?</p> <p>Are the outputs of the integration of qualitative and quantitative components adequately interpreted?</p> <p>Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?</p> <p>Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?</p>	5
Pototsky AL, 2011 ^[27]	Quantitative nonrandomized	5	<p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p> <p>Is there coherence between qualitative data sources, collection, analysis and interpretation?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p>	5
Puts M, 2017 ^[44]	Mixed methods	3	<p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p> <p>Is there coherence between qualitative data sources, collection, analysis and interpretation?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p>	5
Rankin NM, 2017 ^[40]	Qualitative	5	<p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p> <p>Is there coherence between qualitative data sources, collection, analysis and interpretation?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p>	5
Rose DE, 2012 ^[34]	Quantitative nonrandomized	4	<p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p> <p>Is there coherence between qualitative data sources, collection, analysis and interpretation?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p> <p>Is the qualitative approach appropriate to answer the research question?</p> <p>Are the qualitative data collection methods adequate to address the research question?</p> <p>Are the findings adequately derived from the data?</p>	5
Sada YH, 2011 ^[41]	Qualitative			

Table 2 (Continued)

Article (First Author, Year)	MMAT design category [†]	Quality score [†]		Criteria met	Total quality score [†]
		Criteria	Total quality score [†]		
Shen MJ, 2015 ^[43]	Mixed methods	<p>Is the interpretation of results sufficiently substantiated by data?</p> <p>Is there coherence between qualitative data sources, collection, analysis and interpretation?</p> <p>Is there an adequate rationale for using a mixed methods design to address the research question?</p> <p>Are the different components of the study effectively integrated to answer the research question?</p> <p>Are the outputs of the integration of qualitative and quantitative components adequately interpreted?</p> <p>Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?</p>	✓ ✓ ✓ ✓ ✓ ✓ ✓		4
Watson EK, 2010 ^[35]	Quantitative nonrandomized	<p>Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?</p> <p>Are the participants representative of the target population?</p> <p>Are measurements appropriate regarding both the outcome and intervention (or exposure)?</p> <p>Are there complete outcome data?</p> <p>Are the confounders accounted for in the design and analysis?</p> <p>During the study period, is the intervention administered (or exposure occurred) as intended?</p>	✓ ✓ ✓ ✓ ✓ ✓		4

[†]Quality assessed using the Mixed Methods Appraisal Tool (MMAT) – version 2018. MMAT contains five study design categories; qualitative, quantitative randomized controlled, quantitative nonrandomized, quantitative descriptive and mixed methods. Each category contains five quality criteria that are rated as ‘Yes’, indicating a particular criteria was met according to the MMAT’s criteria descriptions and the evaluator’s assessment of the information presented in the article; ‘No’, indicating a particular criteria was not met according to the MMAT’s criteria descriptions and the evaluator’s assessment of the information presented in the article; or ‘Can’t tell’, indicating that the evaluator could not make a determination on whether that criteria had been met based on the MMAT’s criteria descriptions and the information presented in the article. Depending on the number of quality criteria met, each article was assigned a quality score ranging from 0 to 5, with 0–1 indicating low quality (high risk of bias), 2–3 indicating moderate quality (moderate risk of bias) and 4–5 indicating high quality (low risk of bias).

dysfunction among cancer survivors.^[14,25,39] Most oncologists or cancer specialists reported not providing care for MCC.^[14,34] Many studies indicated the importance of PCPs to provide emotional, psychosocial and psychological support,^[27,29,32,39–41] but some oncologists and PCPs had differing opinions about PCPs' ability to adequately deliver psychosocial support.^[24,42] Further, an interference between MCC care and cancer care was noted, with MCC care being deprioritized during active cancer therapy,^[41] yet oncologists reporting that MCC minimally affected treatment decisions for cancer survivors.^[44]

Lack of defined provider roles in cancer care

Of note, most retained studies did not explicitly differentiate provider roles in caring for cancer patients with MCC versus without MCC or explicitly differentiate provider roles in caring for MCC that are potentially related versus unrelated to cancer and its treatment. However, providers in the reviewed articles perceived PCPs' role in cancer care to be focused on providing psychosocial support and caring for patients' chronic comorbidities in general,^[14,27,32,36,39–41] while oncologists' role in cancer care was perceived to be focused solely on cancer treatment or post-treatment cancer-specific care.^[14,27,28] Klabunde *et al.*^[28] reported oncologists' minor role in management of comorbidities that may be related to cancer and its treatment, including depression, hypertension and weight gain. Similarly, PCPs were more likely than oncologists to report a desire for shared cancer care between PCPs and oncologists, while oncologists were more likely to report a desire to individually manage patients' cancer treatment.^[24,27] Further, PCPs consistently expressed a need to have primary responsibility for their patients' follow-up cancer care, including screening for recurrence of the primary cancer, screening for other cancers and general preventative health care.^[31,32,42] However, oncologists perceived that PCPs may need additional education and training before they can effectively be responsible for these activities.^[24] Similarly, some PCPs expressed low self-confidence with performing these activities without additional education and clear hand-off directions from oncologists as patients transition from acute cancer care to follow-up care.^[27,35,37] Alongside cancer care, oncologists and PCPs also shared conflicting perspectives of their roles in comorbidity management, with hypertension and diabetes being specifically mentioned,^[41] but the differentiation of provider roles in caring for MCC related or unrelated to cancer and its treatment was not explicitly established.

Lack of comprehensive information sharing, efficient communication methods and clear shared-care plans during care for cancer patients with MCC

Most retained studies did not explicitly differentiate providers' communication patterns in caring for cancer patients with MCC versus without MCC or explicitly differentiate providers' communication patterns in caring for MCC that are potentially related versus unrelated to cancer and its

treatment. However, results highlighted a need for improved communication between PCPs and oncologists who were managing cancer care for mutual patients.^[28,35–39,43,44] PCPs stated that they had difficulty reaching oncology specialists to clarify cancer treatment follow-up plans or request additional information about patients' treatment history.^[36,37] There was variability in methods used to communicate treatment summaries and care plans to other providers, including a shared EHR, phone, fax or e-mail.^[28,41,43] Further, PCPs reported difficulty obtaining cancer treatment summaries and SCPs from oncology offices, which hindered their ability to provide quality care to patients.^[26,33,35] Many PCPs were dissatisfied with information provided in treatment summaries and expressed the need for descriptions of the cancer treatment received; follow-up schedules; oncologist recommendations for follow-up treatment, testing and monitoring; recurrent symptoms reported by the patient; potential short-term side effects related to the cancer treatment; long-term health risks related to the cancer treatment; information on the cancer risk for patients' relatives; recommendations for psychosocial care; and information previously discussed with the patient.^[33,35] As for cancer treatment decision-making related to communication between PCPs and oncologists, physicians' perspectives revealed inconsistencies about the effect of comorbidities on cancer treatment decision-making,^[44] indicating an area that requires clarification for MCC related or unrelated to cancer and its treatment.

Recommendations

Based on the three identified themes, Table 3 presents recommendations for PCPs, oncologists, organizations and researchers to enhance patient-centered practices, policies and guidelines that facilitate coordination of cancer care for patients with both MCC and cancer. Recommendations focus on: (1) development of educational materials and guidelines for PCPs, oncologists, medical students, residents and fellows to enhance interprofessional learning; (2) providing sufficient staff, administrative support, technology and resources to facilitate coordination of care for patients with both MCC and cancer; and (3) the need for future research related to transitions of care between PCPs and oncologists, PCPs' and oncologists' current care coordination practices, and tools to help create and share SCPs for patients with both MCC and cancer.

Discussion

This systematic review examined the perceptions of PCPs and oncologists regarding barriers and facilitators to care coordination during the cancer care continuum, and their opinions on what is needed to improve current care coordination strategies. A total of 22 articles were retained, and three themes emerged from the qualitative synthesis of article results: (1) limited findings of physicians' experiences in MCC care; (2) lack of defined provider roles in cancer care; and (3) lack of comprehensive information sharing, efficient communication methods and clear shared-care plans during care for cancer patients with MCC. These challenges may

Table 3 Recommendations to inform development of patient-centered practices, policies and guidelines that facilitate coordination of cancer care in real-world settings

For providers	For organizations	For researchers
<i>To address limited findings of physicians' experiences in MCC care</i>		
Primary care providers		
1 Seek out additional education and training related to providing psychosocial support to patients with cancer.	1 Provide Continuing Medical Education (CME) and institutional resources for PCPs and oncologists to learn more about best practices for treating patients with both MCC and cancer.	1 Future research should investigate PCPs' and oncologists' views on MCC care for patients with cancer.
Oncologists	2 Provide interprofessional educational opportunities for medical students, residents and fellows to learn about best practices for treating patients with both MCC and cancer.	2 Future research should address development of educational materials, tools and resources for students and providers to learn more about best practices for treating patients with both MCC and cancer.
<i>To address lack of defined provider roles in cancer care</i>		
Primary care providers		
1 Seek out additional education and training related to follow-up cancer care and screening for recurrent cancer.	1 Provide education and training for PCPs to learn more about follow-up cancer care and screening for recurrent cancer.	1 Future research should address development of educational materials for PCPs related to follow-up cancer care and screening for recurrent cancer.
Oncologists	a. During medical student training. b. During medical resident/fellow training. c. As CME. d. As institution-specific in-services.	2 Future research should address development of educational materials for oncologists related to best practices for hand-off directions to PCPs.
	2 Provide encouragement, administrative support and resources needed for oncologists to provide clear hand-off directions to PCPs as patients transition from acute cancer care to follow-up care.	3 Future research should address development of educational curricula for medical students, residents and fellows related to best practices for hand-off directions during transitions of cancer care.
	a. Provide institutional guidelines for hand-off directions to PCPs. b. Provide printed and EHR templates for hand-off directions to PCPs and/or shared-care plans. c. Designate a person responsible for providing hand-off directions to PCPs.	4 Future research should investigate best practices for implementation of hand-off guidelines during transitions of cancer care between oncologists and PCPs.
<i>To address lack of comprehensive information sharing, efficient communication methods and clear shared-care plans during care for cancer patients with MCC</i>		
Primary care providers		
1 Designate a person responsible for communicating and coordinating care with oncologist offices for patients with both MCC and cancer.	1 Provide printed templates for scanning/faxing and EHR templates for oncologists to create and share treatment summaries and SCPs with PCPs.	1 Future research should address development, implementation and sustainability of interprofessional care coordination models targeted to patients with both MCC and cancer.
Oncologists	2 Provide printed templates for scanning/faxing and EHR templates for PCPs to share information about treatment of patients' MCC with oncologists.	2 Future research should address development and testing of EHRs that are interoperable across practices and specialties, to facilitate care coordination.
	3 Provide printed templates for scanning/faxing and EHR templates for PCPs and oncologists to request treatment information for mutual patients.	3 Future research should address development of educational materials for PCPs, oncologists and trainees related to best practices for creating and sharing

Table 3 (Continued)

For providers	For organizations	For researchers
<p>a. Descriptions of the cancer treatment received.</p> <p>b. Follow-up schedules.</p> <p>c. Recommendations for follow-up treatment, testing, and monitoring.</p> <p>d. Recurrent symptoms reported by the patient.</p> <p>e. Potential short-term side effects related to the cancer treatment.</p> <p>f. Long-term health risks related to the cancer treatment.</p> <p>g. Information on the cancer risk for patients' relatives.</p> <p>h. Recommendations for psychosocial care.</p> <p>i. Information previously discussed with the patient.</p> <p>2 Designate a person responsible for communicating and coordinating care with PCP offices for patients with both MCC and cancer.</p>	<p>4 Provide sufficient staff for coordinating care between oncologists and PCPs for patients with both MCC and cancer.</p> <p>5 Provide resources and tools (such as EHR) for PCPs and oncologists to coordinate the care of patients with both MCC and cancer.</p> <p>6 Provide institutional guidelines for coordinating care between PCPs and oncologists for patients with both MCC and cancer, to facilitate consistency of information sharing between practices.</p> <p>a. For the content of treatment summaries and SCPs.</p> <p>b. For the transmission of treatment summaries and SCPs (e.g., fax or EHR).</p> <p>c. For designating a staff member(s) responsible for creating and sharing treatment summaries and SCPs with other providers.</p>	<p>treatment summaries and SCPs for patients with both MCC and cancer.</p>

MCC, multiple chronic conditions; SCP, shared-care plan; PCP, primary care physician; EHR, electronic health record.

lead to role confusion among PCPs and oncologists, and lack of training in specific areas of complex care in patients with cancer and MCC may lead to duplicate or unnecessary treatments and tests, leading to higher healthcare costs and patient burden.^[27] A small portion of studies mentioned caring for MCC in cancer survivors, but more studies are needed to adequately address the needs and experiences of PCPs and oncologists in this area.

The studies retained in this review did not explicitly differentiate PCP and oncologist roles or communication patterns in caring for cancer patients with MCC versus without MCC. Similarly, most retained studies did not explicitly differentiate PCP and oncologist roles or communication patterns in caring for MCC that are potentially related versus unrelated to cancer and its treatment. While the results presented in this review are generally applicable to PCPs and oncologists caring for patients with both cancer and MCC, more research is needed to investigate how these providers' experiences and needs related to care coordination may differ when caring for cancer patients with MCC versus without MCC. It may be assumed that caring for patients with both cancer and MCC requires more frequent communication between PCPs and oncologists. However, future studies should examine how the roles, strategies and tools that PCPs and oncologists use to manage workflow and information sharing may differ when caring for cancer patients with MCC versus without MCC, and for MCC that are potentially related versus unrelated to cancer and its treatment. Identifying these differences may help in finding feasible and efficient ways to optimize care coordination and patient satisfaction with cancer care.

Findings about PCPs' barriers to cancer care and preference for shared-care models, along with physicians' experiences with survivorship care models, were consistent with previous reviews.^[15,21] During survivorship care, the insufficient and heterogeneous communication between providers documented by Halpern *et al.*^[15] was also reemphasized in this systematic review. To appropriately care for cancer survivors, especially those faced with the added complexity of MCC, clearly defined communication channels and implementation guidelines for survivorship care models are needed,^[15,45–47] and inclusion of MCC care in these models is crucial for PCPs and oncologists to provide optimal patient care.^[48]

The Institute of Medicine recommends that every cancer patient receive an individualized SCP^[49] and the Commission on Cancer also includes development and delivery of care plans as a recommendation for institutions.^[50] Care plans may improve information sharing, promote care coordination and positively affect communication between providers.^[22] Based on role confusion between PCPs and oncologists during care of cancer patients with MCC in this review, these care plans could be essential in standardizing patient care and implementation of survivorship care models. Further, shared-care plans may help to incorporate PCPs as active participants in survivorship care.^[48] To address the challenges identified in this review, future studies may develop practice-based interventions and SCPs tailored specifically to the needs of PCPs and oncologists caring for patients with both cancer and MCC. However, it should be

noted that while delivery of SCPs may improve patients' satisfaction with care, more research is needed to demonstrate effectiveness of SCPs in improving patients' physical, functional and psychological outcomes.^[51] Some practice settings may also have difficulty implementing SCPs due to lack of time, staff and buy-in, and uncertainty over who should have primary responsibility for developing and delivering SCPs.^[52,53] Future studies should address ways to incorporate SCP development and delivery into existing workflows, and examine ways to encourage implementation of SCP recommendations by PCPs and oncologists caring for complex patients with both cancer and MCC.

This study has limitations. As the review is based on existing publications, it is possible that salient provider opinions may not have been captured by the original studies. Due to the rigor used in study selection and relatively high quality of the retained studies, we have relatively high confidence that the findings and themes outlined here reflect those most relevant to practising PCPs and oncologists caring for patients with cancer and MCC. All studies included in this review were rated as moderate or high quality (moderate or low risk of bias), and results were not presented according to study quality rating. Also, results may not be generalizable to providers caring for patients with various types or stages of cancer, all practice settings or all specialties. It must be noted that these results describe PCPs' and oncologists' perceptions, but do not focus on the needs of other physician specialists or nonphysician providers. Likewise, patient preferences and needs regarding care coordination are not the focus of this review but must be considered for high-quality cancer care.

Conclusion

Despite these limitations, results provide insights into physicians' needs for navigating the complexities of care coordination in patients with cancer and MCC. Future studies should consider investigating the needs of multiple provider types for optimizing care coordination for cancer survivors; specifically, further research should acknowledge physicians' experiences and perceptions of caring for MCC.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Data S1. Review protocol.

Data S2. Search strings.