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Number 43

Measuring Healthcare Organization Characteristics in Cancer Care Delivery Research

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None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

The information in this report is intended to help healthcare decision makers—patients and clinicians, health system leaders, and policymakers, among others—make well-informed decisions and thereby improve the quality of healthcare services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information, i.e., in the context of available resources and circumstances presented by individual patients.

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of healthcare in the United States.

The National Cancer Institute (NCI) requested this report from the EPC Program at AHRQ. AHRQ assigned this report to the following EPC: Johns Hopkins University Evidence-based Practice Center (Contract Number: 75Q80120D00003). The report was presented at the NCI public meeting Measuring Healthcare Organization Characteristics in Cancer Care Delivery Research on June 21, 2023.

The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new healthcare technologies and strategies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

This EPC evidence report is a Technical Brief. A Technical Brief is a rapid report, typically on an emerging medical technology, strategy, or intervention. It provides an overview of key issues related to the intervention—for example, current indications, relevant patient populations and subgroups of interest, outcomes measured, and contextual factors that may affect decisions regarding the intervention. Although Technical Briefs generally focus on interventions for which there are limited published data and too few completed protocol-driven studies to support definitive conclusions, the decision to request a Technical Brief is not solely based on the availability of clinical studies. The goals of the Technical Brief are to provide an early objective description of the state of the science, a potential framework for assessing the applications and implications of the intervention, a summary of ongoing research, and information on future research needs. In particular, through the Technical Brief, AHRQ hopes to gain insight on the appropriate conceptual framework and critical issues that will inform future research.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the healthcare system as a whole by providing important information to help improve healthcare quality.

If you have comments on this Technical Brief, they may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

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Key Informants

In designing the study questions, the EPC consulted a panel of Key Informants who represent subject experts and end-users of research. Key Informant input can inform key issues related to the topic of the Technical Brief. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches, and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The Task Order Officer (TOO) and the EPC work to balance, manage, or mitigate any conflicts of interest.

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Peer Reviewers

Prior to publication of the final evidence report, the EPC sought input from independent Peer Reviewers without financial conflicts of interest. However, the conclusions and synthesis of the scientific literature presented in this report do not necessarily represent the views of individual reviewers. AHRQ may also seek comments from other Federal agencies when appropriate.

Peer Reviewers must disclose any financial conflicts of interest greater than $5,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential nonfinancial conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential nonfinancial conflicts of interest identified.

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Measuring Healthcare Organization Characteristics in Cancer Care Delivery Research

Structured Abstract

Objectives. This Technical Brief aims to identify: 1) frameworks that describe organizational context and process characteristics relevant to cancer care delivery research, and compare these frameworks to the Integrated Framework recently developed by National Cancer Institute staff Weaver, Breslau, and colleagues; 2) approaches used to improve understanding of how organizational characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, or treatment; 3) organizational context and process characteristics examined in studies assessing cancer care; and 4) evidence gaps and future research needs to advance the science of assessing the effects of organizational characteristics on cancer care.

Review methods. We integrated discussions with Key Informants and syntheses of evidence from searches of literature published from 2010 to 2023, using PubMed®, CINAHL®, SCOPUS®, PsycINFO®, and the Cochrane Central Register of Controlled Trials, as well as select grey literature.

Findings. We identified 17 frameworks that were developed or applied to examine the effects of organizational characteristics (including structures, context, and processes) on cancer care delivery. Our analysis of these frameworks supported the comprehensiveness of the Integrated Framework, although a few identified characteristics were not explicitly included in the Integrated Framework. We found 90 studies that take various approaches to describe, measure, and analyze organizational characteristics in the context of cancer care research. Of these, we identified 25 that tested associations between organization characteristics and screening, diagnosis, or treatment outcomes, and described measurement in detail. Cancer-related studies that include organizational measures have used a wide range of study designs and focused mostly on structural characteristics (e.g., type, size), total care models such as the patient-centered medical home, and processes of improvement project implementation and barrier assessment (such as guideline implementation). We identified specific organizational measures examined in the cancer care literature, noting little standardization of measures across studies and a need for multilevel inquiry. Our discussions with Key Informants and review of the literature indicated that many characteristics of healthcare organizations are relevant to cancer care delivery and useful to assess when precisely defined. Studies with stronger designs and more rigorous organizational measurement are needed to better determine the effects of organizational characteristics on the outcomes of cancer care.

Conclusion. Our findings suggest that the Integrated Framework generally covers relevant organizational context and process characteristics. The literature has a wide array of studies examining organizational characteristics, but few studies directly associate organizational factors with clinical outcomes. Research and collaboration are needed to improve measurement of organizational factors, to clarify our understanding of multilevel aspects of organizational context and process and how they affect care, and to standardize terminology and measures.

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Executive Summary

Main Points

- A critical part of understanding the quality of medical care across the cancer continuum is understanding the key characteristics of organizations that deliver care while taking into consideration the multilevel nature of healthcare delivery. Organizational characteristics can influence patient care-seeking behaviors, access to care, provider decision-making, patient and provider experience, quality of care, and disparities in care.[1] It is therefore critical to understand organizational characteristics when designing and disseminating multilevel interventions.[1]
- To advance research investigating the relationship between organizational characteristics and cancer care delivery, Weaver, Breslau, and colleagues developed an Integrated Framework that incorporated organizational characteristics from prominently cited frameworks, systematic reviews, and feedback from collaborators.[1] Our systematic analysis of 17 relevant frameworks supports the comprehensiveness of the Integrated Framework in terms of key organizational context and process characteristics. A few characteristics (e.g., accessibility, readiness for change, past experience with change, absorptive capacity, and complexity) were found in more than one other framework but were not explicitly included in the Integrated Framework.
- Ninety studies employed different approaches (i.e., topics, data/analysis types, and study designs) for describing, measuring, and evaluating organizational characteristics within the context of cancer care delivery research, mostly focusing on screening or treatment, while using a wide variety of study designs and both qualitative and quantitative data.
- The most common study themes included: implementation of quality improvement projects and investigation of context and process barriers to implementation; evaluation of total care models such as patient-centered medical homes; or structural and resource-related characteristics such as size, type, affiliation, or characteristics of the patient population.
- Fewer studies considered important organizational concepts such as leadership, psychological states and traits among organization members (e.g., burnout) and groups (e.g., team cohesion), team composition, organizational design, or organizational readiness.
- Twenty-five studies directly tested associations of specific healthcare organizational context, process characteristics, and delivery of cancer care with association of measurement of organizational phenomena; studies mostly had prospective or retrospective cohort designs and assessed organization- or unit-level outcomes (e.g., percent compliance with guideline) rather than patient-level outcomes (e.g., screened/not).
- Screening-related studies mostly focused on total care models and were largely conducted in general medical settings (i.e., not cancer-specific).
- Treatment-related studies covered a variety of settings, themes, and cancer types.
- Few studies examined diagnostics or diagnostic outcomes, such as breast cancer diagnosis quality measures for use of needle/core biopsy.
- Studies that examined the relationship between organizational characteristics and cancer screening, diagnosis, and/or treatment tended to focus on less complex characteristics,

such as size, participation in a specific type of health insurance payment program, or patient population demographics, with few studies examining more complicated characteristics such as organizational teamwork, provider attitudes and traits, or centralization (e.g., consolidation of authority or patient volume).
- Studies had little standardization of measures of organizational characteristics that might be considered high-quality (e.g., measured using validated scales).

Background and Purpose

As demonstrated by the well-known Donabedian, Andersen, and other frameworks, organizational characteristics can influence patient care-seeking behaviors, access to care, provider decision-making, patient and provider experience, quality of care, and disparities in healthcare organizations.[1] A healthcare organization is a purposefully designed, structured social system developed for the delivery of healthcare services by specialized workforces to defined communities, populations, or markets.[2] It is critical to understand organizational characteristics when designing and disseminating interventions, including interventions aiming to improve care delivery and outcomes across the cancer continuum.[1] Inattention to organizational characteristics has historically limited clinical and delivery system interventions.[3] Organizations are often unaware of the characteristics critical to the intervention's effectiveness and whether the intervention needs to be adapted to the specific delivery system setting.

Challenges in understanding organizational characteristics include failure to use organizational theories to inform interventions and measurement approaches, the multilevel nature of organizational characteristics influencing healthcare delivery, and the multiple important perspectives on the process.[1] Consistent and externally valid measurement of non-structural characteristics, such as change readiness can be challenging,[1] and sometimes the design and methods of organizational studies are more limited in their ability to produce generalizable evidence.

To advance research investigating the relationship between organizational characteristics and cancer care delivery, Weaver, Breslau, and colleagues developed a framework known as the Integrated Framework that incorporated organizational characteristics from prominently cited frameworks, systematic reviews, and feedback from collaborators.[1]

The purpose of this Technical Brief was to identify: 1) frameworks that have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment, and compare these frameworks to the Integrated Framework; 2) approaches used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment; 3) healthcare organizational context and process characteristics that have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment; and 4) evidence gaps and future research needs.

Methods

We used methods consistent with those outlined in the Evidence-based Practice Center Program Methods Guidance (https://effectivehealthcare.ahrq.gov/products/collections/cer-methods-guide), including interviewing 10 Key Informants representing governmental and non-governmental perspectives in cancer care delivery research and organizational science as applied to cancer care. We searched PubMed®, CINAHL®, SCOPUS®, PsycINFO®, and the Cochrane Central Register of Controlled Trials from 2010 to 2023. We reviewed published articles and

grey literature relevant to cancer care in the United States. We included studies that evaluated organizational measures in the context of cancer screening, diagnosis, or treatment. Details of our methodology can be found in the full report.

Results

We summarize the key findings below by Guiding Question.

Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

1a: How do these existing frameworks compare to the Integrated Framework developed by Weaver, Breslau, and colleagues?

Findings: We identified 17 frameworks developed for or applied in cancer care delivery research that describe organizational context and process characteristics. They were developed for several purposes, including to describe how value can be defined and measured in care delivery, to advance the assessment of organizational characteristics in multilevel intervention research, to inform measurement in quality and safety initiatives, and to guide implementation efforts. Some of the models were developed in a very specific context (e.g., radiation oncology, nursing, or vaccination promotion); others focused on organizational characteristic measurement more generally (i.e., not specific to a particular context or application of care delivery). Our systematic analysis of these frameworks supports the comprehensiveness of the Integrated Framework for context characteristics (including organizational structure, organizational culture, financial structure, patient population, and capacity) and process characteristics (including organizational learning and quality improvement activities, care processes and infrastructure application (e.g., use of health information technology and decision support), and team processes). We found a few characteristics (e.g., accessibility, readiness for change, experience with change, absorptive capacity, and complexity) that were presented in more than one other framework but were not explicitly included in the Integrated Framework.

Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

Findings: We identified 90 studies that used various approaches to describe, measure, and evaluate organizational characteristics within the context of cancer care delivery. Studies that evaluated organizational measures in a cancer context mainly focused on screening or treatment, with few studies considering diagnosis. Topical themes in the studies included: implementation of quality improvement projects and investigating context and process barriers to implementation; evaluation of total care models; or structural and resource-related characteristics such as size, type, affiliation, or characteristics of the patient population. Few studies considered important organizational concepts such as leadership, psychological states and traits among organization members (e.g., motivation) and of groups (e.g., team norms), team composition, or

organizational readiness. Approaches to assessing organizational influences on cancer care included qualitative and quantitative data collection and study designs that ran the gamut from randomized controlled trials to case studies.

Guiding Question 3: Which healthcare organizational context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

3a: For each identified study, what were the following: i) study design; ii) setting; iii) population; iv) measures of organizational context and process characteristics (measurement instrument name and type, number of items, references, etc.); and v) primary and secondary clinical outcomes studied?

Findings: We identified 25 studies that had strong relevance to this Guiding Question and featured sufficient description of the organizational concepts involved. The studies were mostly prospective or retrospective cohort designs, and typically measured organization- or unit-level outcomes such as, percentage compliance with guidelines rather than patient-level outcomes such as, whether a patient is screened or not. We noted some differences between studies in the broad categories of cancer screening, diagnosis, and treatment. For example, the largest portion of screening-related studies were categorized thematically as total care model studies and tended to be conducted in general medical settings (i.e., not cancer-specific). Treatment-related studies covered a greater variety of settings, themes, and cancer types. Few studies addressed cancer diagnosis. Across all studies, organizational characteristics that were measured tended to be less complex such as size, payment program participation, or demographics of the patient population. Few studied in-depth organizational concepts such as teamwork, provider attitudes and traits, or centralization (as in tightly controlled decision-making, for example). Fifteen studies among those meeting criteria for Guiding Question 3 directly examined the association between healthcare organization context and process characteristics and clinical outcomes of cancer screening, diagnosis, or treatment. Twelve examined the relationship between organizational characteristics and a clinical primary outcome and four included a clinical secondary outcome.

Guiding Question 4: What are the evidence gaps and future research needs?

4a: What are the evidence gaps in the current understanding of how organizational characteristics impact cancer care delivery and cancer-related outcomes?

4b: What methodologic approaches or measurement tools are needed to better understand the impact of organizational context and processes on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

Findings: We found that studies generally lacked standardized definitions for organizational characteristics or standardized methods for measuring them. Few studies directly associated healthcare organization characteristics with clinical outcomes of cancer care. Further research is needed to develop high quality methods for measurement of organizational constructs and to incorporate more complex and in-depth organizational measurement in efforts to better understand organizational influences on cancer care.

Limitations

For Guiding Question 1, the determination of what constitutes a "framework" and whether characteristics in abstracted frameworks were included in the Integrated Framework were subject to interpretation. For Guiding Questions 2 and 3, the search for empirical studies on the topic was limited to cancer-related studies conducted in the United States and published since 2010. For Guiding Question 4, the limited focus on organizational characteristics in study design and measurement in the literature as a whole makes specifying gaps and identifying the most pressing research needs challenging.

Implications and Conclusions

Our findings have important implications for cancer care delivery research. They suggest that the Integrated Framework comprehensively covers relevant organizational context and process characteristics. With some refinement, the Integrated Framework should provide investigators with useful guidance about organizational characteristics to potentially consider in future healthcare delivery research related to cancer screening, diagnosis, or treatment. This report highlights organizational characteristics that effectively measure phenomena in this complex and changing care area and have been used in cancer care research to date. A compendium of measures with suggested definitions and measurement approaches could be a welcome support to researchers who recognize the importance of organizational influences but are not sure how to meaningfully measure them. Such a compendium can be expected to encourage rigorous research without stifling creativity in developing new and better measurement approaches to a wide array of important organizational concepts.

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1. Introduction

1.1 Importance of Measuring Organizational Characteristics in Healthcare Delivery

A critical part of understanding the quality of medical care is understanding the characteristics of organizations that deliver care while taking into consideration the multilevel nature of healthcare delivery. As suggested by such thinkers as Donabedian and Andersen,[1, 2] organizational characteristics can influence patient care-seeking behaviors, access to care, clinician decision-making, collaboration and coordination, patient and clinician experience, quality of care, and disparities in care.[3] It is therefore critical to understand organizational characteristics when designing and disseminating interventions.[3] Yano describes how inattention to organizational characteristics has limited clinical and delivery system interventions.[4] Specifically, when interventions are tested in a single or a small number of institutions, organizational characteristics are less likely to vary, so they are either ignored or controlled (in effect). As a result, knowledge of the organizational characteristics that can influence the success or failure of the intervention is lacking. Thus, when trying to disseminate the intervention, organizations are unaware of the characteristics critical to the intervention's effectiveness – or whether and how the intervention needs to be adapted to different organizational contexts. This limitation weakens the generalizability of the findings derived from one setting to other settings and to population-level interventions.

1.2 Historical Perspective on the Importance of Organizational Characteristics in Healthcare Delivery

A 1966 paper from Avedis Donabedian includes his classic structure-process-outcome framework for evaluating the quality of medical care.[1] Later work tested the interaction among these features (reviewed in Hearld et al. 2008).[5] Structural characteristics include the levels of care, types of care available, and organization size. Process characteristics include specific aspects of care delivery (e.g., whether cancer screening occurs according to guidelines). Outcome characteristics include the end results of care (e.g., survival or health-related quality of life). Over the past half century, efforts have sought to expand our understanding of how to measure and improve the quality of care. Organizational context as the fungible internal and external elements of setting has been added to the classic structure-process-outcomes triad. In 2009, a team of patient safety researchers laid out critical organizational aspects to measure in the production of safe care.[6] A 2011 review noted the importance of organizational characteristics influencing patient safety practices.[7] In 2014, Marsteller and colleagues extrapolated from existing frameworks to elucidate the range of organizational and other influences on implementation of efforts to change provider behavior.[8] It is now widely recognized that group traits developed through interactions among members of an organization (such as shared mental models and psychological safety) are critical to the success of care delivery and yet are distinct from organizational "process" characteristics in the original framework.[1, 9, 10]

Similarly, Ronald Andersen's Behavioral Model of Health Service Use developed in the late 1960s has evolved over time, as described in his 1995 article.[2] The initial model focused on the person and family, including predisposing characteristics (demographic, social structure, health

beliefs), enabling resources at the personal/family and community levels, and perceived or evaluated needs, all culminating in health service use. The version of the model presented in 1995 added the critical role of the healthcare system and external environment at the front end and the outcomes that result from health service use on the back end. Thus, the 1995 version starts with the healthcare system and external environment and traces how they interact with population characteristics including enabling resources and needs to influence health behaviors and outcomes.

1.3 Challenges in Measuring Healthcare Organization Characteristics

A healthcare organization is a purposefully designed, structured social system developed for the delivery of healthcare services by specialized workforces to defined communities, populations, or markets.[11] Despite the value of understanding the influence of organizational characteristics, it is challenging to determine their effects on care delivery and outcomes. Organizational theories such as, Diffusion of Innovation, Social Network Theory, or Resource Dependency Theory can help inform measurement approaches but are not used in many studies. According to organizational theory, organizational characteristics influencing the efficiency and quality of healthcare delivery involve multiple levels (e.g., clinic, system, and local community environment) and multiple perspectives (e.g., patient, provider, and administrative).[3] Also, changes in care delivery are influenced by contextual characteristics within the organization, system, and community surrounding the organization.[12] Measuring these non-structural characteristics using externally valid constructs is challenging.[3] For example, while measuring the number of beds and patient volume may be straightforward, assessing organizational change (e.g., readiness to adopt a new healthcare delivery model) is a much more complex undertaking, generally requiring labor intensive methods, such as surveys or interviews. Where characteristics are social constructs produced organically in real time, then one might question how they can even be measured.

Assessing organizations that deliver cancer care involves even greater challenges.[3] In their review of cancer care delivery research protocols from the National Cancer Institute (NCI) Community Oncology Research Program (NCORP), Weaver et al. found that assessment of organizational characteristics was common. The extent to which measurement approaches were based on organizational theories was more variable. Further, multiple types of organizations are involved in cancer care delivery, ranging from solo practices to large integrated systems. Investigators must consider how organizational characteristics, contextual elements, and care processes influence cancer care outcomes. Such research is critical to enhance our knowledge of the context and environment where the care is delivered, to improve the fidelity and impact of interventions disseminated in new settings, and to reduce waste in healthcare delivery. Ultimately, such knowledge will help to improve patient outcomes over the continuum of cancer care.

1.4 Development of an Integrated Framework

As part of their 2022 review of organizational characteristic measurement in NCORP protocols, Weaver and colleagues initially developed a framework, incorporating key characteristics from prominently cited frameworks and systematic reviews (see below).[3] Their framework is an effort to list and organize the range of healthcare organization characteristics

that may be relevant in multilevel cancer care delivery research. Its development responds to calls from the cancer care delivery research field to inform organization characteristic measurement. The framework is not intended to recommend what specific organizational characteristics are relevant in a given study but to offer a resource researchers can refer to when determining which organizational characteristics could be useful in their studies.

The initial framework was further refined based on additional frameworks and feedback from internal and external collaborators.[13] The frameworks below informed the Integrated Framework's development. They span over 50 years of work, much of which is non-cancer-focused, yet suggests their importance in identifying what has been learned and can be readily applied to cancer care research.

- Yano's Organizational Research Framework[4]: describes the role of organizational research in advancing the implementation of evidence-based practice into routine care settings;
- Piña's Health Care Delivery Organizations and System's Framework[14]: describes domains and elements that may be useful in characterizing various sizes and types of care delivery organizations that may influence key outcomes of interest;
- Damschroder and colleagues' Consolidated Framework for Implementation Research: lists constructs thought to influence implementation[15, 16];
- Scholl's review of organizational characteristics and shared decision making[17]: provides a comprehensive overview of organizational- and system-level characteristics that are likely to influence the implementation of shared decision making;
- Andersen's healthcare utilization model review article: examines whether studies that have used the Andersen behavioral model included environmental and provider-related variables, as well as methods for analyzing those variables[18];
- Donabedian's model of care quality review article: reflects on evolution of the classic structure-process-outcome framework over the past 20 years[19];
- Ferlie and Shortell's Quality Improvement Framework: proposes a more comprehensive, multilevel approach to quality improvement[20];
- Wagner's Chronic Care Model: describes a model for improving chronic illness care[21];
- Garvin's Framework for Building a Learning Organization: discusses the important qualities and main activities of learning organizations[22];
- The Agency for Healthcare Research and Quality (AHRQ) Learning Health System Framework: defines learning health systems and describes their characteristics.[23]

The resulting Integrated Framework from Weaver and Breslau (Tables 1a-1c) includes the overarching domains of organizational context, processes, and outcomes, along with more specific subdomains. Specifically, organizational context includes subdomains for capacity, financial structure, organizational culture, organizational structure, and patient population. The organizational process domain includes subdomains for organizational learning and quality improvement activities, care processes and infrastructure application (e.g., use of health information technology and decision support), and team processes. The organizational outcome domain includes subdomains for organizational-level patient outcomes and other organizational outcomes. Altogether, 47 specific characteristics are included in the framework.

Further evaluation of the Integrated Framework is needed to compare its content with other frameworks that have been developed or applied in cancer care delivery research. Comparing the content of the Integrated Framework to other frameworks will provide insights regarding the extent to which other frameworks include content not currently reflected in the Integrated Framework.

1. Introduction

Table 1a. Integrated Framework – organizational context

Subdomain	Characteristics	Example Variables
Capacity (physical and human assets or resources)	Health information technology infrastructure	EMR availability/vendor(s), specific EMR functionality, time since EMR adopted, patient portal availability/vendor, specifics about patient portal functionality
	Organization type	Facility type/level (e.g., clinic, service line, hospital, health system); Organizational designations that relate to population served, size, etc. (e.g., safety net); Practice type (e.g., solo, single specialty, group specialty practice)
	Organizational assets	Capital assets; Drug assets; Equipment assets; Supply assets
	Service comprehensiveness	Type, scope, and/or differentiation in scope of services offered or specialty teams/services offered
	Size and volume	Number of beds; Number of facilities/locations/clinics; Number of patients served
	Staffing and skill-mix	Aggregated organizational level indices of number of providers and/or staff, experience, training or training requirements; Types of clinicians/specialties/staff (e.g., number of interpreters); Aggregate indices of clinician demographics (e.g., proportion of clinicians of certain race/ethnicities)
Financial Structure	Financial solvency	Organizational debts and/or expenses
	Ownership	Government, for-profit, or nonprofit entity
	Payment model and payment program participation	Proportion of payments received for patient care that are fee for service, bundled payments, fully capitated, or partially capitated; Payer mix (e.g., percentage of patients with private insurance); Types of insurance or payments accepted (e.g., private, public); Participation in payment models (e.g., Accountable Care Organization, Oncology Care Model); Proportion of provider pay that comes from salary or base pay, productivity or relative value units, quality performance measures, patient satisfaction
Organizational Culture	Community orientation	Number and/or type of community engagements or activities; Organization level indices of concern for local community/social conscientiousness
	Competition–collaboration continuum	Number, type, or other features of collaborative activities the organization engages in with the community and/or competitors; Where organization falls on scale from competitive to collaborative in relation to other organizations in community and competitors (e.g., survey measures of alliance orientation or interorganizational collaboration)
	Cultural competence	Existence of or specific aspects of policies related to respect for and service of diverse populations (e.g., required cultural competency training); Types and/or availability of services designed to meet the social, cultural, and linguistic needs of diverse patient pop. (e.g., proportion of patients matched with translation services)
	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	Aggregated organization/group level indices of staff perceptions of organizational characteristics, policies, or resources (e.g., organization level measures of staff knowledge or beliefs about teamwork); Aggregated organization/group level indices of implicit bias, organizational justice, and related constructs; Aggregated indices of senior leadership knowledge, attitudes, and beliefs (e.g., aggregate measures of communication, vision/strategic thinking)
	Organizational climate	Aggregated organizational level indices of employee/staff perceptions of psychological safety/ability to speak up, patient safety culture or patient safety climate, general organizational culture
	Organizational goals	Indices capturing the existence of or specific facets of organizational goals, priorities, and strategic plans of organizational leadership

1. Introduction

Subdomain	Characteristics	Example Variables
	Resource allocation	Policies or methods of resource allocation (i.e., dollars, staff time/personnel, equipment, space, etc.); Organization level indices of staff perceptions of organizational justice or equity in organization resource allocation
Organizational Structure	Academic arrangements	Affiliation with medical/nursing/allied health school; Types and/or number of health professions trainees, policies related to trainee scope of practice or training activities
	Affiliations	Affiliation with or located in/near a hospital campus, health system, or other provider network and /or type (e.g., ownership affiliation, referral network)
	Configuration	Organization configuration (e.g., classification of organization structure based on organization chart (e.g., entrepreneurial/flat, divisional); Organization of clinical services (e.g., service lines, multidisciplinary clinic); Workflow policies or standard operating procedures (e.g., information about the sequencing, timing, location, responsibility, or other aspects of clinical or non-clinical facility tasks)
	Location	Geographic location of organization including address, state, rural/urban, or other geospatial information
	Leadership structure	Leadership and governance structure for organizational policy making or decision-making (e.g., number of levels of approval for policy development); Organizational level indices of practice autonomy
	Research and innovation	Degree to which organizational mission emphasizes research/innovation; Organizational clinical trial and research participation (e.g., extent to which organization participates in or originates research activities); Organizational clinical trial and research policies or rules (e.g., existence of policies or rules)
Patient Population	Geographic characteristics	Organizational-level indices of patient geographic characteristics (e.g., percentage of patients residing in rural areas)
	Patient clinical trial/research participation	Percentage of patients enrolled in clinical trials, organizational-level (aggregated) measures of patient-perceived barriers to clinical trial participation that have to do with the clinic or facility (e.g., facility parking fees for clinical trial visits)
	Patient demographics	Organizational-level indices of patient demographics (e.g., percentage of patients with different clinical or socioeconomic characteristics)
	Patient financial status	Aggregated organizational-level indices of patient ability to pay for care, financial burden, or distress

EMR = electronic medical record

Table 1b. Integrated Framework – organizational processes

Subdomain	Characteristics	Example Variables
Organizational Learning and Quality Improvement Activities	Use of audit/feedback/dashboards	NA
	Use of quality improvement or other improvement methods (e.g., Lean Six Sigma)	NA
	Participation in state or national quality improvement collaboratives	NA
Care Processes and Infrastructure Application	Care management processes	General care management/patient workflow, management of specific care process/task (e.g., workflow or protocols used in practice, not interpersonal variables)
	Clinical decision support	Use of clinical guideline reminders/decision aids
	Screening processes	Processes for screening patients for medical (e.g., cancer screening) and non-medical (e.g., presence of caregiver) factors
	Standardization	Use of organizational protocols; Emphasis on clinical practice guidelines or standard organizational care pathways; Clinician knowledge of guidelines
	Use of health information technology system	Use of EMR by clinicians, staff, patients, and caregivers
Team Processes	Care coordination	Organizational processes and procedures that support deliberate organization of patient care activities with more than 2 providers (e.g., functioning and frequency of tumor boards); Processes and teamwork behaviors used to align, time, and connect patient care activities both over time and across disciplines or specialties
	Communication	Processes and procedures used to communicate; Quality of communication
	Patient centeredness	Organizational processes/procedures to support patient engagement in shared decision making; Efforts to engage patients in care (e.g., degree to which feedback from patient advisory boards is integrated into strategic goals)
	Referral processes	Internal and external referral processes; Handoffs
	Relationships	Nature of roles and responsibilities; Interpersonal styles; Care team familiarity/tenure

EMR = electronic medical record; NA = not applicable

Table 1c. Integrated Framework – organizational outcomes*

Subdomain	Characteristics	Example Variables
Organizational Level Patient Outcomes*	Disease-related outcomes	Complication rates, disease-specific morbidity and mortality
	Intermediate outcomes/ Process quality measures	Clinical guideline adherence, comorbidity management, quality measures
	Patient care experience	Organizational level measures of patient experience (e.g., surveys)
	Costs	Organizational level care costs
Other Organizational Outcomes*	Efficiency	Organizational level measures of average patient wait times, clinician workload
	Recognition and rewards	Organizational accreditations; Receipt of organizational awards; Pay-for-performance
	Utilization	Hospital readmission rates, emergency department visit rates, intensive care unit admissions, etc.
	Workforce	Organizational indices of employee retention, turnover, burnout

* The Integrated Framework focuses on contexts and processes but includes the above information to provide a sense of the outcomes other projects are focusing on. To align with the Integrated Framework's focus, this Technical Brief addresses contexts and processes but not outcomes.

1.5 Improving Measurement of Healthcare Organization Characteristics in Cancer Care Delivery

Several important points emerge from the above background. There is a need for better conceptual and definitional clarity of organizational characteristics. While measuring some characteristics is straightforward, other characteristics present measurement challenges. Thus, there is a need to explore how organizational science can inform conceptualization of healthcare organization characteristics, clarify the definitions of these characteristics in the context of cancer care, identify existing standardized measures for assessing these characteristics, and elaborate on gaps and areas for further research. For example, Diffusion of Innovation theory could specify influential measures of intervention uptake (e.g., simplicity, compatibility with values, trialability) and provide insights for how outcomes are produced. Use of organizational science will improve our understanding of how organizational characteristics influence cancer care delivery at the patient, provider, and system levels. This information, in turn, will inform our ability to improve access, quality, and outcomes, and reduce disparities in care. The decisional dilemma is "how can we define and measure organizational characteristics to improve research on cancer care delivery and enhance cancer care and outcomes?"

As specified in the below Guiding Questions, this Technical Brief aims to compare the content of the Integrated Framework with other frameworks of organizational characteristics to determine whether the relevant content is covered. By evaluating the Integrated Framework's comprehensiveness, this Technical Brief evaluates its potential to be a useful resource to researchers who want to consider incorporating organization characteristics in their multilevel cancer care delivery research. This Technical Brief also reviews how organizational characteristics are currently assessed in existing cancer care delivery research and what measures are used, as well as identifying relevant knowledge gaps. The results of this Technical Brief can be used to inform future observational and interventional cancer care delivery research.

1.6 Guiding Questions

The purpose of this Technical Brief is to address the following Guiding Questions:

1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

- 1a: How do these existing frameworks compare to the Integrated Framework developed by Weaver, Breslau, and colleagues?

2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

3: Which healthcare organizational context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

- 3a: For each identified study, what were the following: i) study design; ii) setting; iii) population; iv) measures of organizational context and process characteristics (measurement instrument name and type, number of items, references, etc.); and v) primary and secondary clinical outcomes studied?

4: What are the evidence gaps and future research needs?

- 4a: What are the evidence gaps in the current understanding of how organizational characteristics impact cancer care delivery and cancer-related outcomes?
- 4b: What methodologic approaches or measurement tools are needed to better understand the impact of organizational context and processes on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

The results of this Technical Brief will inform a compendium that can serve as a resource to the cancer care delivery research community. This compendium will complement the existing AHRQ Compendium of United States Health Systems by providing information about important healthcare organizational characteristics that cannot be obtained from administrative or claims data.[24]

2. Methods

The methods for this Technical Brief follow the Content and Procedures Guide for the Evidence-based Practice Center Program. The protocol was posted on the Effective Health Care website (https://effectivehealthcare.ahrq.gov/products/organization-cancer-care/protocol).

Throughout this report, we used the following definition of terms: Organizational characteristics encompass structural, context, and process constructs occurring within/ around organizations that are studied in macro-, meso- or micro- organizational science. They are not limited to organization-level phenomena. Structural characteristics include generally unchangeable (in the short term) elements such as bed size, number of staff or profit status; process characteristics include specific aspects of care delivery (e.g., use of best practices) and team processes such as coordination and communication. Outcome characteristics include the end results of care at the patient, provider, team, or organizational levels (e.g., survival, screening rates). Although organizational context may be distinguished from structure as the fungible internal and external elements of setting such as leadership and culture, the Integrated Framework consolidates these notions under organizational context, and thus we use the term that way here.[7] Further, we use the term "measures" to describe specific parameters that can be described numerically or qualitatively, and "constructs" to describe concepts that are not measurable as one variable such as infrastructure or coordination. . As we note elsewhere in this report, however, variation in terminology and definitions exists in the organizational sciences literature, and opinions about the definitions used here may differ.

2.1 Discussions With Key Informants

We recruited 10 Key Informants (KIs) representing governmental and non-governmental perspectives in cancer care delivery research and organizational science as applied to cancer care, to give input on what important influences on cancer care can be attributed to organizational context or process. We gathered preliminary feedback from the KIs using a Web-based form, and then used that feedback as prompts for discussion in two meetings with the KIs. KIs were invited to review the draft report and are acknowledged in the final report by name and affiliation with the disclaimer that all views expressed therein are strictly those of the report authors.

2.2 Grey Literature Search

We reviewed eight grey literature sources that were proposed by team members or internal senior advisors as potentially measuring relevant organizational characteristics: the Care Coordination Measures Atlas, the Veterans Affairs State of the Art (SOTA) scoping review and other articles on care coordination, the Agency for Healthcare Research and Quality (AHRQ) Comparative Health System Performance Initiative Bibliography, the Oncology Care Model, Implementation Science Compendia, the Cancer Prevention and Control Research Network, the Organization Theory for Implementation Science workgroup products, the American Hospital Association Survey of Hospitals, and Medicare Cost Report data. One team member (SYK) conducted the searches, tracked screening, and extracted the data using a form developed by the team in Microsoft® Excel. Extracted items included the organizational frameworks used and organizational constructs and measures listed. Sources were excluded if they were not specifically set in the cancer care context. A principal investigator (JM) discussed and reviewed approaches and findings with the team member.

Based on recommendations from our KIs, we also searched a number of issue briefs and reports published by agencies and organizations, including the Brookings Institute, Centers for Medicare and Medicaid Services, Commonwealth Fund, Health Care Systems Research Network, National Academies of Science, Engineering, and Medicine, National Coalition for Cancer Survivorship, Robert Wood Johnson Foundation, and United States Department of Health and Human Services – Office of the Assistant Secretary for Planning and Evaluation. In addition, we reviewed the National Cancer Institute's definition of designated cancer centers, issue briefs from the State of Cancer Care in America, the methodology for U.S. News and World Report – Cancer Center Rankings, and the full websites for the Alliance of Dedicated Cancer Centers and Consortium of Comprehensive Cancer Centers for Quality Improvement. One team member (LR) conducted the searches, tracked screening, and extracted the data using a form developed by the team in Microsoft® Excel. Extracted items included the organizational frameworks used and organizational constructs and measures listed. Sources excluded were not specifically set in the cancer care context. A principal investigator (JM) discussed and reviewed approaches and findings with the team member.

2.3 Published Literature Search

We conducted a systematic search for published evidence using PubMed®, CINAHL®, Scopus®, PsycINFO®, and the Cochrane Central Register of Controlled Trials. We limited the search to the last 13 years because older studies have less relevance to modern cancer care delivery. A 13-year cut-off corresponds roughly to the implementation of the Affordable Care Act (ACA) (circa 2010). We included US-based studies only as the organization, financing, and delivery of healthcare in the US is unique.

We conducted separate searches by Guiding Questions: 1) to identify relevant frameworks of organizational characteristics, and 2) to identify approaches, designs, and measures for assessing organizational characteristics in cancer care delivery research (Guiding Questions 2 and 3). The literature from the Guiding Question 1-3 searches also informed our approach to Guiding Question 4 on evidence gaps and research needs. See Appendix A. Methods Table A-1 through A-8 for the search strategies.

Unique citations identified by the search strategies were independently assessed using the inclusion and exclusion criteria outlined in Table 2. For Guiding Question 1, a framework was defined as "a framework or organization of the characteristics used to evaluate healthcare organizations." A framework had to address multiple domains or subdomains of the Integrated Framework to be included. If an article did not report on a framework directly but did refer to a potentially relevant framework of organizational characteristics, we excluded the article but noted the framework cited and searched for articles describing that framework.

We used the artificial intelligence (AI) feature of DistillerSR (AI Classifier Manager) as a semi-automated screening tool to conduct this review efficiently at the abstract screening stage. First, paired reviewers screened the abstracts of a randomly selected 10 percent sample of the unique citations identified by the search strategies. The remaining abstracts were screened by the AI Classifier Manager based on the results of our screening of the initial sample. Reviewers independently checked 10 percent of the articles screened by the AI Classifier Manager to confirm the accuracy and consistency of the AI review. In the review of a randomly selected 10 percent sample of citations, the discrepancy rate between AI system and the human reviewer was 2.0 percent for Guiding Question 1 citations and 8.6 percent for Guiding Questions 2-4 citations, which is similar to what we usually see when comparing two human reviewers.

Full-text articles were evaluated for inclusion by two independent reviewers using the eligibility criteria listed in Table 2. However, for Guiding Question 1, if an article published since 2010 referred to a framework published before 2010, the framework was included. In some cases, there were multiple articles on a framework as they can evolve over time. In general, we included the most recent version of the framework (for example, i-PARIHS rather than Promoting Action on Research Implementation in Health Services [PARIHS]) as the recent articles were more likely to have more complete coverage of organizational characteristics. We did not include frameworks that informed the development of the Integrated Framework as that would have created circular logic of comparing a framework included in the Integrated Framework to the Integrated Framework.

We updated the literature search during the public posting phase and incorporated any new information into the report. See Appendix B for a full list of articles excluded at the full text screening stage.

Table 2. Inclusion and exclusion criteria for the Technical Brief

Inclusion/Exclusion	Criteria
Inclusions	**All Guiding Questions** • Address organizational characteristics in United States-based health systems/healthcare • Published 2010 to present **Guiding Question 1** • Framework must be used in a cancer screening, diagnosis or treatment context • Framework published before 2010 could be included if an article published since 2010 referred to the framework **Guiding Question 2/3** • Studies with primary empiric data related to the delivery of cancer screening, diagnosis, or treatment • The focus or stated purpose of the paper is on testing the influence of organizational characteristics/traits • Must include an interpretation or have a discussion of the effects of the organizational components tested
Exclusions	**All Guiding Questions** • Addresses organizational characteristics outside United States-based health systems/healthcare **Guiding Question 1** • Framework is not used in a healthcare context **Guiding Question 2/3** • Literature reviews, commentaries, and opinion pieces • Organizational characteristics/traits are included only as a covariate or control without presenting results that address these Guiding Questions.

2.4 Data Organization and Presentation

2.4.1 Information Management

For Guiding Question 1, detailed information was extracted from frameworks that had been applied to cancer care delivery. A principal investigator (CS) abstracted in a Microsoft® Word table information about the context and process characteristics of the frameworks for examining effects of organizational characteristics on cancer care delivery and outcomes. Articles were read in full, but abstraction primarily focused on relevant tables and figures to minimize the need to deduce framework components from the text. Where information in the figures and tables was too generic to be useful, specific examples from the text were abstracted. The abstracted categories and characteristics were taken directly from the papers. Only context and process

characteristics at the organization level were abstracted from tables and figures. Outcomes were not abstracted given the Integrated Framework's focus on organizational context and process characteristics. Abstracted frameworks may have included other categories related to individual or external factors that were not abstracted as these factors are not covered in the Integrated Framework. For example, payment policy is an external factor that would not have been abstracted for Guiding Question 1, but an organization's payer mix is a characteristic of the organization that would be considered for Guiding Question 1. The characteristics abstracted from the included frameworks were then compared to the content of the Integrated Framework and characteristics not included in the Integrated Framework were noted. While abstraction was conducted by a single principal investigator (CS), a second team member (LR) reviewed the comparison of the abstracted frameworks to the Integrated Framework.

For Guiding Questions 2-4, paired reviewers (VD, JM, SYK, LR, RS, MV, AZ) independently assessed the quality of information about the organizational characteristic measures used in studies. That assessment focused on whether the measure is defined clearly (i.e., in a manner that can be readily replicated). We also classified studies according to whether they apply to cancer screening, diagnosis, and/or treatment to determine the extent to which findings apply to different aspects of cancer care. We used a Microsoft® Excel spreadsheet to extract information about the approaches used to measure and test organizational characteristics and processes related to cancer care delivery (Guiding Question 2), and organizational characteristics examined in studies assessing cancer care delivery. The extraction included information about the study design, setting, population, specific organizational measures, and outcomes used (Guiding Question 3), and evidence gaps or research needs identified in studies (Guiding Question 4).

We relied on an inductive qualitative approach using a process of thematic classification into topical categories with dual coding to classify 90 studies identified as relevant through the full-text screening process. Relevance was judged based on fit with the Guiding Questions and/or topics called out among the major categories of the Integrated Framework that guides this Technical Brief. One coder (JM) created initial categorizations and brief explanations based on a review of 40 per cent of the studies. The inductive approach was selected to be revelatory of consistency/inconsistency with the Integrated Framework. After the full team reviewed the initial coding structure, two additional coders (SYK, MV) applied these codes to the full set of studies and generated new codes as needed. Coders resolved conflicts through discussion with the Task Leader (EB) and the initial coder (JM).

In the next step, we split up the themes among the team members (VD, SYK, MV, AZ) and used a unique Guiding Question 2 form which focused on study approach to extract information on all studies. This permitted a uniform discussion of each category. For each study we abstracted study design; cancer care aspect (cancer screening, diagnosis, and/or treatment) involved; brief summary of findings; approach to measurement; and organizational characteristics measured. Team members then qualitatively summarized the group of studies assigned to each theme or category. In this step, we also identified studies well suited to addressing Guiding Question 3 based on one of two criteria, or both: 1) sufficient measurement and instrumentation to replicate or 2) tight fit with Guiding Question 3 as worded. Finally, we linked identified themes to the Integrated Framework elements and noted areas of divergence.

A set of 25 studies were selected to address Guiding Question 3. These were abstracted by two team members (VD, MV) using a unique form for Guiding Question 3, which included: study characteristics (study theme, first author and year of publication, aspects of cancer care

(i.e. screening, diagnosis, or treatment) addressed in the study, study aim, design, setting, population, organizational level, number of organizations in the study, and organization ownership); description of organizational characteristics measured (classification of the characteristic as a specific organizational context or process according to the Integrated Framework, study's definition or description of the characteristic, approach to measurement, measurement instrument used, and number of items and type of scale of the instrument); primary and secondary outcomes (outcome name, type of the outcome as it relates to aspects of cancer care, whether the outcome is also an organizational characteristic, and whether the environmental influence on the outcome was measured); and study conclusions (main findings of the study and whether the study reports relevant research gaps). One principal investigator (JM) reviewed the abstractions and summarized findings for Guiding Questions 3 and 4.

2.4.2 Data Presentation

We used evidence tables to organize the detailed information extracted from studies. Then we created tables and figures with accompanying text to summarize the information on the Guiding Questions according to whether the studies focused on cancer screening, diagnosis, or treatment.

2.5 Peer Review and Public Commentary

Experts in cancer care delivery research and organizational science were invited to provide external peer review of this Technical Brief. The AHRQ Task Order Officers and an Associate Editor from AHRQ's Evidence-based Practice Center Program also provided comments. We addressed all reviewer comments, revising the text as appropriate, and documented everything in a disposition of comments report that will be made available 3 months after AHRQ posts the final Technical Brief on the Effective Health Care website.

3. Findings

3.1 Results From Discussion With Key Informants

The 10 Key Informants (KIs) were generally in agreement about the proposed methods for this Technical Brief. They helped to identify frameworks, models, or theories (other than the Integrated Framework) that describe how organizational characteristics may influence cancer care (screening, diagnosis, or treatment) or healthcare delivery in general. KIs called attention to relevant reports that might not be found in the traditional peer-reviewed literature. Some of the KIs suggested that we use additional terms in our search strategy and abstract additional details about organizations (e.g., level, ownership, and number of organizations in the participating study) and patient populations from relevant studies (see Appendix C for summary of the discussion and themes).

The KIs highlighted major challenges in reviewing the literature. Publications investigating organizational characteristics in cancer care delivery are often more about what should have been done, that is, suggesting characteristics that should have been measured, and not about what has been done and tested. Recent developments related to the Coronavirus Disease (COVID-19) pandemic are only now beginning to appear in the literature. Terminology is not used consistently in the literature. It is important to determine and define the unit of analysis in relevant frameworks (e.g., institutions that are part of a larger corporate entity). In addition, the distinctions between academic and community settings are blurring, as more community hospitals take on some academic roles as part of networks. It is also important to consider temporal factors (such as changes to process that reset a system to a new state) as well as structural and temporal complexity (e.g., dynamic patterns that create changes at different structural levels with varying time lags) in the frameworks. Some frameworks are simpler and less detailed. More complex frameworks cover more ground but are harder to implement. There needs to be a balance between completeness of the framework and the degree of complexity.

Discussions with the KIs helped to define the most important considerations for interpreting and applying evidence on the topic of this report. The team reviewed the KIs' input and integrated it as appropriate for the defined scope of the Technical Brief, while taking into consideration the evidence identified in the peer reviewed and grey literature.

3.2 Results of the Grey Literature Search

Multiple grey literature sources were searched, including sources received from our KIs. Among eight sources that were suggested by team members or internal senior advisors, five met inclusion criteria that specifically addressed cancer care, and included information pertaining to the frameworks in Guiding Question 1 or the organizational context and process characteristics that were focused on in Guiding Questions 2-4. The Agency for Healthcare Research and Quality (AHRQ) Care Coordination Measures Atlas was last updated in 2014.[25] This resource is available online and provides a rich catalog of measures of care delivery and coordination that can potentially address Guiding Questions 1-3. Organizational measures that have been used in the cancer care delivery setting include: the Breast Cancer Patient and Practice Management Process Measures Surgeon Survey; the Care Transitions Measure (CTM-3); Head and Neck Cancer Integrated Care Indicators; Care Evaluation Scale for End-of-Life Care (CES); Oncology Patients' Perceptions of the Quality of Nursing Care Scale (OPPQNCS); Follow-Up Care Delivery scale; Adapted Picker Institute Cancer Survey; Primary Care Provider Ambulatory Care Experiences Survey (PCP ACES); and the Melanoma Continuity of Care—Recall System.

3.2 Findings, Results of the Grey Literature Search

AHRQ launched the Comparative Health System Performance (CHSP) Initiative to study how healthcare systems promote evidence-based practice (EBP) in delivering care.[26] The CHSP Initiative led to the creation of the Compendium of U.S. Health Systems and a bibliography of publications on comparative health system performance.[27] The working group defined a health system as including "at least one hospital and at least one group of physicians that provides comprehensive care (including primary and specialty care) who are connected with each other and with the hospital through common ownership or joint management." The compendium provides health-system level aggregated data on structural features of provider organizations. Organizational characteristics of the health systems included in the compendium are derived from existing secondary data sources on hospitals and other healthcare provider organizations such as the American Hospital Association's Annual Survey.[28] These sources will be discussed later in this section. While the compendium's focus is not on cancer care delivery, it provides useful information on organizational characteristics, mainly on environmental characteristics of the organization or structural features of the health system as a unit of organization and workforce capacity.[29] The most common organizational characteristics reported in the research using the compendium were the size of the health system (the numbers of beds, physicians, and hospitals), teaching intensity of the system, patient population (pediatric or adults), percentage of low-income patients, ownership distribution, geographic coverage of the system (e.g., multistate system or single state), charity care provision, nursing home affiliation, and participation in alternative payment models.

The third source we identified is the Center for Medicare and Medicaid Innovation (CMMI). The CMMI has run 52 care delivery and payment innovation programs since its creation in 2010. Evaluation reports of these demonstration programs used a similar set of organizational characteristics, primarily structural features, to control for their confounding effects on the relationship between the outcomes of interest and demonstration programs. Among many, the Oncology Care Model directly targets cancer care-related payment and health outcomes and draws interest from cancer researchers. The evaluation reports refer to organizational characteristics that the federal agency used to assess the performance of the payment model demonstration. These reports used multilevel sociodemographic and market-supply characteristics (beneficiary, practice, and market-levels) as control variables in their analyses. Organizational characteristics mainly included structural and environmental features of healthcare organizations: academic medical center, health system affiliation, ownership, size and volume of events, and specialty type. Market-level factors included the size of the population, percentage of older adults, poverty level of patients, Medicare Advantage penetration, provider supply, and emergency department visits among Medicare fee-for-service patients. These organizational variables were primarily derived from the American Hospital Association's Annual Survey and Health Resources and Services Administration (HRSA) Area Health Resource files.

Another source is the American Hospital Association's Annual Survey. It is frequently cited by research articles and other grey literature as the main sources of organizational characteristics, primarily structural features. The American Hospital Association's Annual Survey includes about 900 variables permitting the categorization of hospitals based on size, ownership, teaching status, and presence of many facilities and services. Commonly used organizational characteristics derived from these data include hospital beds, ownership, teaching status, critical access status, location (metropolitan/ rural/ urban), Medicare case mix index, and staffing. This data source covers nearly all hospitals that are members of the association and provides annual data. According to the American Hospital Association's website, the response rate on the annual

survey has been over 75 percent each year.[30] To ensure the validity of the survey, the Association employs a three-stage validation process: 1) addressing missingness in the data based on historical data or comparisons with similar organizations; 2) clarifying and validating unusual changes in responses over year; and 3) reexamining individual outliers from the aggregated responses or historical trends. In addition, a study by Everson, Lee, and Friedman evaluated internal consistency, construct validity, and criterion validity of the American Hospital Association's longitudinal survey focusing on a subset of items - the Information Technology Supplement Survey.[31] This study found that the instrument that the survey uses for the health information technology section is a reliable and valid measure.

Similarly, the Medicare Cost Report data are frequently cited by other research articles regarding financial metrics. Medicare-certified institutional providers are required to submit an annual cost report to Medicare, which contains information on facility characteristics, including the type of organization provider as reported in the hospital cost report (e.g., general short-term, cancer hospital, children's hospital), utilization data, cost, and financial statement data such as margins, payment, and expenses on specific services and facilities.

Among the nearly 25 pieces of grey literature mentioned by KIs, only three included information pertaining to the frameworks and organizational context/process that we focused on in Guiding Questions 1-4. One of the items we identified was a table included in a chapter of the book titled, Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis.[32] The book largely focuses on barriers to providing high-quality care for patients experiencing cancer across the United States. In chapter 7, which describes translating evidence into clinical practice, measuring care quality, and enhancing performance, a table describes nine quality measures commonly used in cancer care. The table refers to structure, process, outcome, cost, and efficiency as well as advantages and disadvantages of using these measures to assess quality of cancer care.

We also found relevant information in Transforming Cancer Care and the Role of Payment Reform: Lessons from the New Mexico Cancer Center, a report published by the Brookings Institute.[33] The report describes innovations in care delivery and includes a list of structural, process, and outcome measures that the New Mexico Cancer Center uses to promote clinical actions that improve the quality of cancer care.

The American Society of Clinical Oncology – State of Cancer Care issue briefs identified potential barriers to providing oncology care in the United States.[34] The major concerns of practices related to payer pressures, including prior authorizations and denials and appeals for coverage. Other environmental pressures reported by practices were competitive pressures, concerns around staffing shortages, electronic health record issues, and increasing costs (see Appendix C, Table C-1).

3.3 Results of the Published Literature Search

Figure 1 shows the search flow diagram for Guiding Question 1 (identifying relevant frameworks). Specifically, 4,875 records were identified for screening, of which 4,794 were excluded, leaving 81 for full text review. Of these, 10 were considered eligible for inclusion. One was later excluded because it was an application of a framework already included, and one was excluded because it informed the development of the Integrated Framework. In addition, 34 frameworks were identified from the KIs or articles that were excluded for not directly reporting on frameworks but that referred to frameworks for possible inclusion. In the latter case, we hand searched for articles describing the mentioned frameworks. Of these 34 frameworks, nine were included while six were excluded because they informed the development of the Integrated

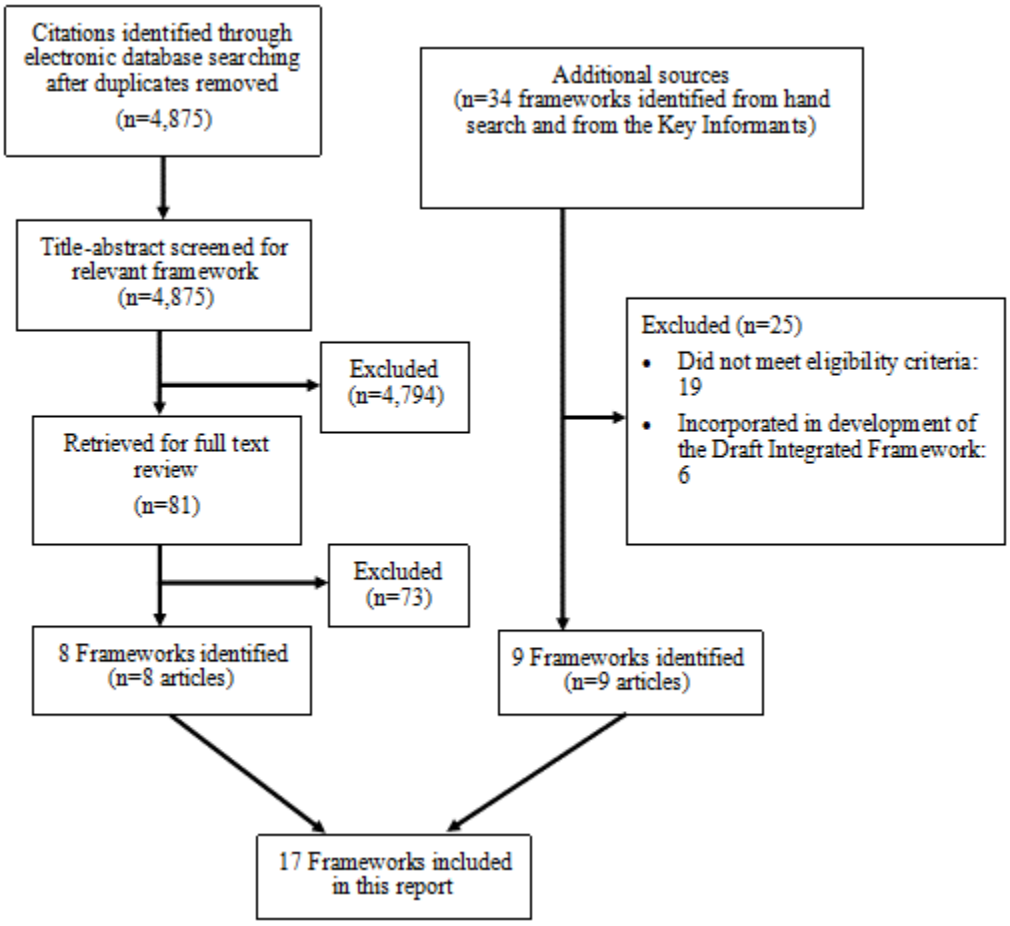
3.3 Findings, Results of the Published Literature Search

Framework, and the other 19 did not meet eligibility criteria. Thus, a total of 17 frameworks were included (eight from the literature review and nine from citation in articles from the literature review). All frameworks that were identified had been applied to cancer care delivery.

Figure 2 shows the search flow diagram for Guiding Questions 2-4, identifying approaches, designs, and measures that have been considered specifically in the case of cancer care delivery.

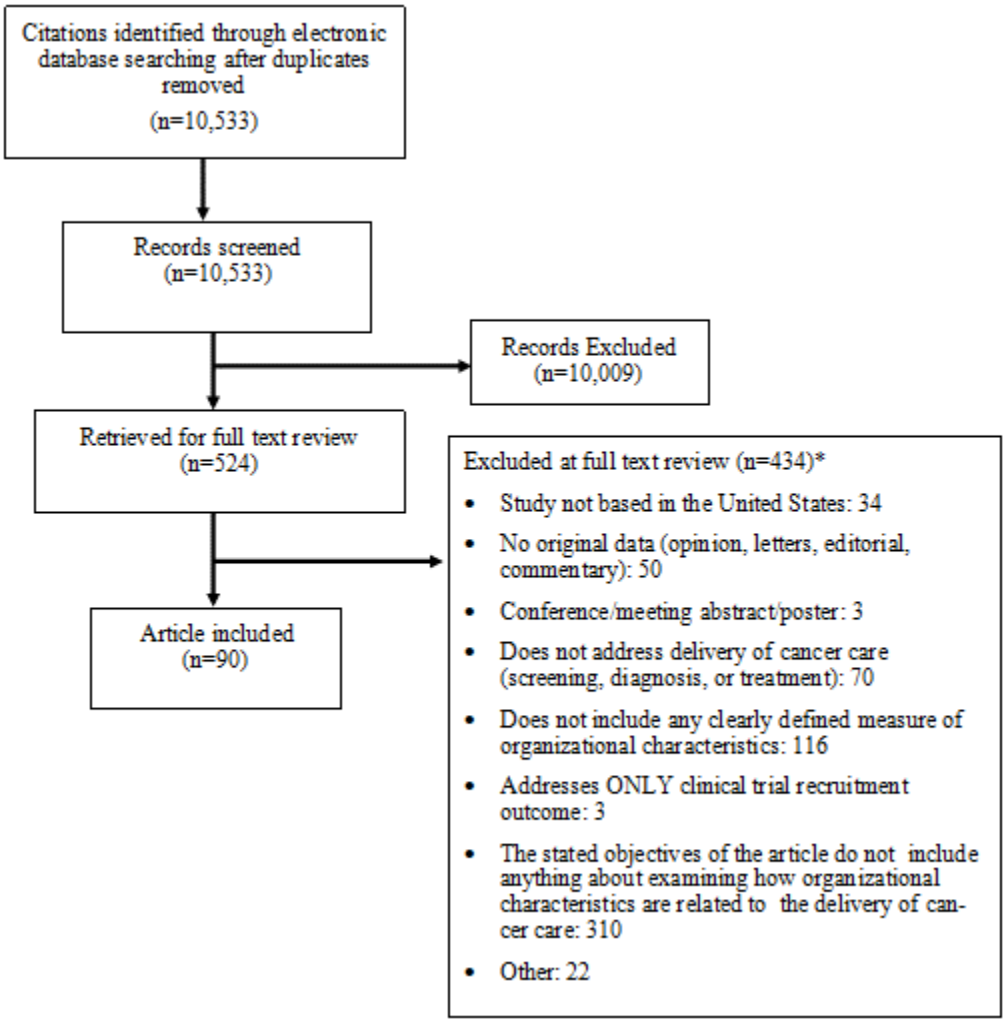
A listing of excluded studies is included in Appendix B, List of Excluded Studies.

Figure 1. Summary of results of the search for Guiding Question 1 (identifying relevant framework)



3.3 Findings, Results of the Published Literature Search

Figure 2. Summary of results of the published literature search for Guiding Questions 2-4



* Total exceeds the number of citations in the exclusion box, because citations could be excluded for more than one reason (i.e., reviewers did not need to agree on reason for exclusion.)

3.3.1 Findings, Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

3.3.1 Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

The 17 frameworks reviewed and abstracted were published between 1998 and 2022 (Table 3). They were developed for a number of purposes, including to describe how value can be defined and measured in care delivery,[35, 36] to advance the assessment of organizational characteristics in multilevel intervention research,[37-39] to inform measurement in quality and safety initiatives,[6, 7, 40-44] and to guide implementation efforts.[45-49] Some of the frameworks were developed in a very specific context (e.g., radiation oncology,[35, 40, 41] nursing,[45] or vaccination promotion[43]); others focused on organizational characteristic measurement more generally (i.e., not specific to a particular context or application of care delivery). Interestingly, a number of the frameworks referred to structure, process, and/or outcome categories as described by Donabedian.[35, 37, 40, 44] Some frameworks included detailed listings of organizational characteristics.[37, 45] Others included fewer organizational characteristics, though the framework as a whole may have been more extensive.[39, 41, 42] For example, from the Albert and Das framework for identifying and refining quality measures in oncology, only the hospital-level structure indicators were abstracted; the framework also includes process and outcome measures that were not related to organization characteristics.[41] The content of the frameworks varied depending on the purpose and the application.

3.3.1.1 Main Findings on Guiding Question 1

Our systematic analysis of 17 relevant frameworks supports the comprehensiveness of the Integrated Framework. The comparison of the Integrated Framework to other organizational characteristic frameworks from the literature supports the Integrated Framework's comprehensive coverage of key organizational context and process characteristics. Few characteristics were found in other frameworks that were not already reflected in the Integrated Framework.

3.3.1.1.1 Guiding Question 1a: How do these existing frameworks compare to the Integrated Framework developed by Weaver, Breslau, and colleagues?

The final column in Table 3 highlights the characteristics from the abstracted frameworks that are not currently reflected in the Integrated Framework. With the caveat that comparing the abstracted frameworks to the Integrated Framework was subject to interpretation, there were few characteristics in the abstracted frameworks that were not found in the Integrated Framework, either explicitly or implicitly through the subdomain categories. All the characteristics abstracted from six of the frameworks[39-42, 44, 48] were already included in the Integrated Framework (i.e., no new characteristics were identified in these six frameworks). For many of the other frameworks, where a characteristic was listed in an abstracted framework but not found in the Integrated Framework, the characteristic was a specific example of a subdomain in the Integrated Framework.

Characteristics included in multiple abstracted frameworks but not explicitly included in the Integrated Framework include accessibility,[35, 43] readiness for change,[6, 46] past experience with innovation and change,[37, 49] absorptive capacity,[46, 49] and complexity.[7, 37] Evidence-based care

3.3.1 Findings, Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

was included explicitly in two frameworks[35, 36] but is not explicitly included in the Integrated Framework. Arguably, the "standardization" domain, which includes guidelines and pathways, incorporates this element.

Notably, just because a characteristic is included in another framework but not the Integrated Framework does not mean that it should be added to the Integrated Framework. Some characteristics might be specific to the application of the abstracted framework. Rather, the developers of the Integrated Framework can evaluate whether the characteristics in column 4 of Table 3 are already implicitly included in the Integrated Framework, and if not, evaluate the characteristics' relevance and importance to determine whether they should be added.

Table 3. Comparison of abstracted frameworks of organizational characteristics to the Integrated Framework

Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Mitchell, 1998[44] Quality Health Outcomes Model. Image J Nurs Sch. 1998;30:43-6.	Quality Health Outcomes Model: Incorporates Donabedian framework into a dynamic model that incorporates feedback among clients, system/context, and interventions	*From System Characteristics and Interventions sections* **Structural Characteristics** • Size • Ownership • Skill mix • Client demographics • Technology **Interventions** • Work group interactions • Unit-level processes **Client Characteristics** • Health status • Demographics • Disease risk factors	NA
Wandersman, 2008[48] Bridging the Gap between Prevention Research and Practice: The Interactive Systems Framework for Dissemination and Implementation. Am J Community Psychol. 2008;41:171-181.	Interactive Systems Framework for Dissemination and Implementation: Examines the systems and processes involved in moving from innovation development and testing to widespread use, focused on prevention	*From Figure 2 "Prevention Support System"* • General capacity building • Innovation-specific capacity building *From Text Section "Organizational Factors that Influence Implementation" (excludes factors related to implementing specific innovations)* • Leadership • Program goals vision • Commitment • Size • Skills for planning, implementation, and evaluation • Climate • Structure • Organizational capacity for innovation • Resources • Decision-making structures	NA

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Pronovost, 2009[6] Framework for Patient Safety Research and Improvement. Circulation. 2009;119:330-337.	Framework for Patient Safety and Improvement: Discusses how organizational concepts and characteristics influence the patient safety and improvement framework	*Hospital- and Unit-Level Measures from Table 3* **Hospital** • Effective leadership for quality improvement • Spreading quality improvement to other units **Unit** • Perception of unit-level safety climate and teamwork • Sustainability of interventions *From Text Section "Evaluating the Association Between Organizational Characteristics and Clinical Outcomes"* • Organization-wide culture • Organizational design • Policies, procedures, and requirements • Rewards and incentives • Readiness-to-change and orientation to quality improvement, reliability, and patient-centeredness • Monetary resources, staffing infrastructure, and management of operations • Internal and external formal and informal communication networks • Skills, knowledge, and dedication of leaders	• Spreading quality improvement to other units • Sustainability of interventions • Rewards and incentives • Readiness for change

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Aarons, 2011[46] Advancing a Conceptual Model of Evidence-Based Practice Implementation in Public Service Sectors. Adm Policy Ment Health. 2011;38:4-23.	Exploration, Adoption/ Preparation, Implementation, Sustainment: Multilevel four-phase model of the implementation process	*From Figure 2 Organizational Characteristics* **Exploration** • Absorptive capacity (knowledge/skills, readiness for change, receptive context) • Culture • Climate • Leadership **Adoption Decision/Preparation** • Size • Role specification • Knowledge/skills expertise • Values **Active Implementation** • Structure • Priorities/goals • Readiness for change • Receptive context • Culture/climate **Sustainment** • Leadership • Embedded evidence-based practice culture • Critical mass of evidence-based practice provision • Social network support	• Absorptive capacity • Readiness for change • Receptive context
Taylor, 2011[7] What Context Features Might Be Important Determinants of the Effectiveness of Patient Safety Practice Interventions? BMJ Qual Saf. 2011;20:611-617.	Contexts for assessing and/or describing effects on patient safety practice implementations	*From Table 1* **Safety Culture, Teamwork, Leadership** • Safety Culture (organizational and unit level) • Teamwork (organizational and unit level) • Leadership (organizational and unit level) **Structural Organizational Characteristics** • Existing quality/safety infrastructure • Organizational complexity • Financial status • Size • Location • Date of study • Academic status • Volume of procedures • Space/physical environment • Past experience with information technology • Physician ownership • Command and control management structure	• Organizational complexity • Date of study

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Albert, 2012[41] Quality Assessment in Oncology. Int J Radiation Oncol Biol Phys. 2012;83:773-781.	Framework for identifying and refining quality measures	*From Table 1 Hospital Characteristics* • Accreditation • Other recognition • Facilities • Patient volume • Training/experience of non-physician staff • Other support services	NA

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Charns, 2012[37] Multilevel Interventions: Measurement and Measures. J Natl Cancer Inst Monogr. 2012;44:67-77.	Literature review that examines multilevel intervention cancer care literature to identify measures used, including group-, organizational-, and community-level measures	*From Table 2 on Organization Measures* **Environment/Structure** • Complexity • Work characteristics (uncertainty, interdependence) • Part of larger entity? (degree of autonomy, degree of independence) • Resources (financial, liquid asset availability, profitability, sufficiency of staffing, space, other resources, slack resources) • History (experience with prior innovations, interventions) **Structure** • Size • Structure/design • Centralization/decentralization • Differentiation • Characteristics of workforce: diversity • Formalization • Technology **Processes** • Communication • Coordination • Conflict resolution • Human resource management practices (compensation, reward, and recognition; training; performance feedback) • Alignment of goal setting and evaluation with implementation of focal practice • Leadership • Decision-making • Feedback mechanisms • Adjusting/reflecting mechanisms • Quality of service management and reporting **Emergent States** • Culture • Organizational climate (global) • Specific climates (perceived climate for communication, perceived climate for change [readiness for change], perceived climate for learning) • Empowerment of staff • Organizational health (staff satisfaction, staff stress, staff absenteeism, staff turnover) • Degree of adoption/fidelity of an innovation or practice **Outcomes Reporting** • Internal transparency of performance measures • Financial performance	• Complexity • Work characteristics (uncertainty, interdependence) • Part of larger entity? (degree of autonomy, degree of independence) • History (experience with prior innovations, interventions) • Conflict resolution • Human resource management practices (compensation, reward, and recognition; training; performance feedback) • Leadership • Adjusting/reflecting mechanisms • Empowerment of staff • Degree of adoption/fidelity of an innovation or practice • Functional diversity • Unionization

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
		Characteristics/Descriptors • Urban/rural location • Teaching status • Not-for-profit/for-profit • Functional diversity • Region/location • Unionization • Ownership/practice model	
Yano, 2012[39] Implementation and Spread of Interventions into the Multilevel Context of Routine Practice and Policy: Implications for the Cancer Care Continuum. J Natl Cancer Inst Monogr. 2012;44:86-99.	Concepts underlying the implementation and spread of multilevel interventions into routine practice and policy	*From Table 1 (organization-level characteristics only)* • Personnel • Financing and time allocation • Diversity of patients • Diversity/mix of providers	NA

3.3.1 Findings, Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Cullen, 2012[45] Planning for Implementation of Evidence-Based Practice. JONA. 2012;42:222-230.	Evidence-based practice implementation guide for clinicians and nursing leaders	*From Figure 1 Building Organizational System Support* **Create Awareness & Interest** • Knowledge broker(s) • Senior executives announcements • Publicize new equipment **Build Knowledge & Commitment** • Teamwork • Troubleshoot use/application • Benchmark data • Inform organizational leaders • Report within organizational infrastructure • Action plan • Report to senior leaders **Promotion & Adoption** • Audit key indicators • Actionable and timely feedback • Non-punitive discussion of results • Checklist • Documentation • Standing orders • Patient reminders • Patient decision aides • Rounding by unit and organizational leadership • Report into quality improvement program • Report to senior leaders • Action plan • Link to patient/family needs & organizational priorities • Unit orientation • Individual performance evaluation • **Pursue Integration & Sustained Use** • Audit and feedback • Report to senior leaders • Report into quality improvement program • Revise policy, procedure, or protocol • Competency metric for discontinuing training • Project responsibility in unit of organizational committee • Strategic plan • Trend results • Present in educational programs • Annual report • Financial incentives • Individual performance evaluation	• *Primarily provides specific examples of the general concepts already included in the Integrated Framework*

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Zapka, 2012[38] Multilevel Factors Affecting Quality: Examples from the Cancer Care Continuum. J Natl Cancer Inst Monogr. 2012;44:11-19.	Factors from multiple levels that affect the quality of care across the cancer continuum, illustrated using case scenarios	*From Table 1 Organization/Practice Setting Column* • Standard practice concerning patient contact • Outreach practices (e.g., reminders by organization/practice) • Opportunities for in-reach during routine visits • Systematic links between providers • Medical record system type and quality; Access to quality electronic health record • Patient education resources • Patient navigation to improve adherence • Extent of integrated care delivery • Incentives for care coordination • Availability of reminder systems • Standards for reporting, and surveillance plans	• Patient education resources • Patient navigation
Mazza, 2013[47] Refining a Taxonomy for Guideline Implementation: Results of an Exercise in Abstract Classification. Implement Sci. 2013;8:32.	Effective Practice and Organisation of Care Taxonomy: Classifies the nature and content of guideline implementation strategies	*From Table 2 Organisational Strategies* **Implementer** • Additional human resources • Reallocated roles • Creation of an implementation team • Communication between distant health professionals • Improved healthcare professional satisfaction • Other **Patient** • Consumer participation • Consumer feedback, suggestions, and complaints • Other **Structure** • Change in organizational structure • Change to the setting or site • Change in the physical structure, facilities, or equipment • Change in information & communication technology • Change in quality assurance, quality improvement and/or performance measurement systems • Change in the method • Change in the integration of services • Change in risk management provisions • Other	*Disregarding the emphasis on changes over time* • Risk management provisions

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Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Teckie, 2014[35] Value: A Framework for Radiation Oncology. J Clin Oncol. 2014;32:2864-2870	Value equation built on Porter (value = outcomes/cost) to add the Donabedian framework of structure, process, and outcomes so that value = quality [structure, process, outcome]/cost	*From Figure 1* **Structure** • Accredited • Integrated • Technology current • Safe **Process** • Patient-centered • Coordinated • Accessible • Evidence based **Costs** • Transparent • Measured through full cycle of care • Related to quality	• Accessible • Evidence based
Harvey, 2016[49] PARIHS revisited: from heuristic to integrated framework for the successful implementation of knowledge into practice. Implement Sci. 2016;11:33	Integrated Promoting Action on Research Implementation in Health Services: integrated framework to explain and predict the success of implementing evidence into practice	*From Table 3* **Context-Local Level** • Formal and informal leadership support • Culture • Past experience of innovation and change • Mechanisms for embedding change • Evaluation and feedback processes • Learning environment **Context-Organisational Level** • Organisational priorities • Senior leadership and management support • Culture • Structure and systems • History of innovation and change • Absorptive capacity • Learning networks	• Absorptive capacity • Past experience of innovation and change

3.3.1 Findings, Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Bednarczyk, 2018[43] Practice-, Provider-, and Patient-Level Interventions to Improve Preventive Care: Development of the P3 Model. Prev Med Rep. 2018;11:131-138.	P3 Model to improve preventive care at the practice, provider, and patient level	*From Table 2* *Healthcare Delivery/Organizational Factors* **Practice-level** • Use of standing orders • Vaccination promotion by all staff • Prevention/immunization champion • Vaccine supply **Provider-level** • Access to care • Availability of technology and personnel • Organizational priorities • Structure of office practice • Reimbursement • Coordination with community resources **Patient-level** • Access to care • Coordination of resources • Other Provider-level characteristics • Communication regarding practice vaccination policies • Culture of prevention • Flexibility to adapt to unscheduled/acute care visits for prevention promotion • Electronic medical record/information system prompts • Preventive service delivery rate feedback to practice	*Disregarding the vaccination-specific issues (e.g., vaccination promotion)* • Access to care
Modica, 2020[36] The Value Transformation Framework: An Approach to Value-Based Care in Federally Qualified Health Centers. J Healthc Qual. 2020;42:106-112.	Value Transformation Framework: Guides health center systems change toward high-value care	*From Figure 2* **Infrastructure** • Improvement strategy • Health information technology • Policy • Payment • Cost **Care Delivery** • Population health management • Patient-centered medical home • Evidence-based care • Care management • Social determinants of health **People** • Patients • Care teams • Leadership • Workforce • Partnerships	• Population health-management • Medical home *(patient-centeredness included)* • Evidence-based care

3.3.1 Findings, Guiding Question 1: What frameworks have been developed or applied to examine the effects of organizational characteristics on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

Author, Year, Title, Journal	Purpose of the Framework	Context and Process Organizational Characteristics Included in the Abstracted Framework*	Context and Process Characteristics Not in Integrated Framework
Wright, 2021[40] Safety First: Developing and Deploying a System to Promote Safety and Quality in Your Clinic. Pract Radiat Oncol. 2021;11:92-100.	Practical framework for improving or developing a Safety and Quality program in radiation oncology	*From Figure 1* • Culture of Safety • Accreditation • Organizational Structure, Leadership, Committee Oversight **Structure** • Staffing • Training • Professional Development **Process** • Policies and Procedures • Physics Quality Management • Peer Review	NA
Van Citters, 2022[42] Prioritizing Measures that Matter within a Person-Centered Oncology Learning Health System. JNCI Cancer Spectr. 2022;6:pkac037.	Measures to guide a person-centered oncology learning health system	*From abstract-contextual factors (also in Figure 1)* • Team Well-Being and Joy in Work • Learning Culture & Community • Scholarly Engagement and Productivity • Diversity, Equity, Inclusion, and Belonging	NA

* Taken directly from the paper sections specified. Only internal organizational characteristic categories related to context and process were abstracted; outcomes were not abstracted given the Integrated Framework's focus on context and process. Abstracted frameworks may have included other categories related to individual or external factors that were not abstracted as these factors are not covered in the Integrated Framework. For example, payment policy is an external factor that would not have been abstracted for Guiding Question 1, but an organization's payer mix is a characteristic of the organization that would be considered for Guiding Question 1.
NA = not applicable

3.3.2 Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

We defined "approaches" to mean: the organizational topics considered, whether process or context; the quantitative, qualitative or mixed data collection and analysis; and the study designs. To describe approaches taken in the literature since 2010 to understand organizational influences on cancer care, we analyzed 90 studies for themes and abstracted information most relevant to Guiding Question 2 (see Figure 3).

For Guiding Question 2, inductive thematic analysis yielded 12 categories (see Figure 4). Most commonly, 39 of 90 studies (43%) that mentioned or described organizational characteristics (including processes, structures, or context) were accounts of project implementation designed to improve quality of care or institute guidelines, electronic reminders, or other systems. Among the 90 studies, 35 (39%) were related to cancer screening, 7 (8%) to cancer diagnosis, 26 (30%) to cancer treatment, and 22 (24%) to other aspects of cancer care (e.g., financial integration between physicians and hospitals, innovation implementation, leadership skill building) or more than one aspect of cancer care. This categorization includes 25

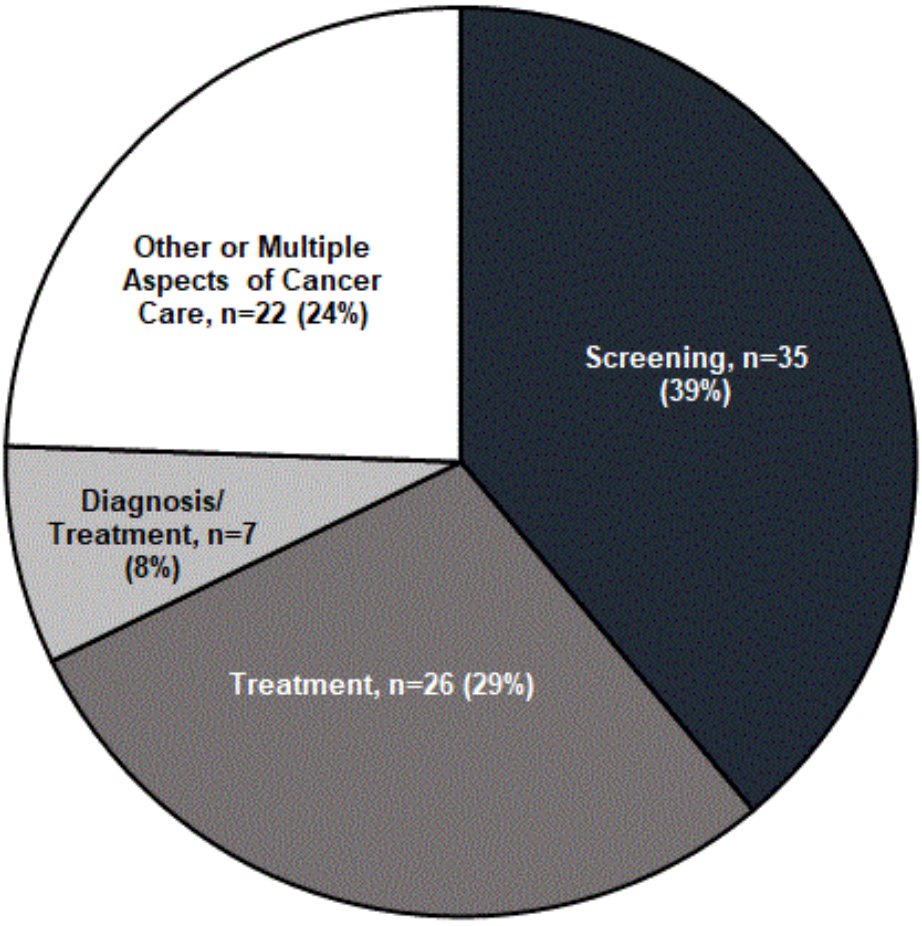
3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

studies that also were relevant to Guiding Question 3. Details can be found in Appendix D, Evidence Tables D-1 through D-4.

3.3.2.1 Main Findings on Guiding Question 2

Guiding Question 2 explains approaches that have been used to improve understanding of how organizational characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment. Studies that evaluated organizational measures in a cancer context mainly focused on screening or treatment, with few studies considering diagnosis. Topical themes in the studies included, among others: implementation of quality improvement projects and investigation of context and process barriers to implementation; evaluation of total care models; or structural and resource-related characteristics such as size, type, affiliation (e.g., with a network), or characteristics of the patient population. Few studies considered important organizational concepts such as leadership, psychological states and traits among organization members (e.g., risk aversion) and groups (e.g., hierarchy), team composition, or organizational readiness. Approaches to testing organizational influences on cancer care included qualitative and quantitative data collection (see Table 4) and study designs that ran the gamut from randomized controlled trial (RCTs) to case studies.

Figure 3. Cancer care delivery in studies relevant to Guiding Question 2



3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

Figure 4. Thematic categorization of studies relevant to Guiding Question 2

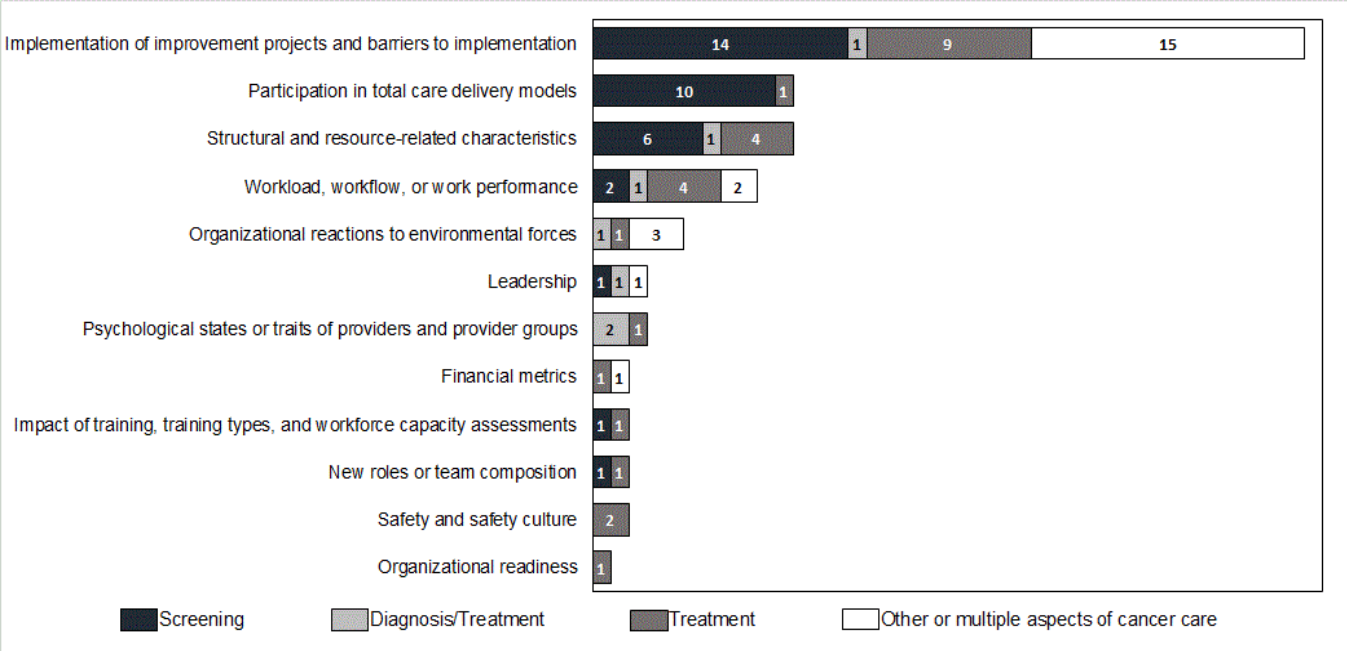


Table 4. Summary of approaches to testing organizational influences on cancer care of studies relevant to Guiding Question 2

Theme	Cancer Care Context	Approaches
Implementation of improvement projects and barriers to implementation	Screening	• Administered surveys • The Michigan Office of Health Information Technology provided summary data • Community sites were randomized to either tailored navigation from trained navigators or control • Utilized commercial insurance and Medicaid data for enrollees and the Johns Hopkins ACG system • Utilized the PRISM and PNSAT model • Consulted with leadership from the departments of radiology and information technology • Collected field notes • Interviews with Key Informants • Care providers received a continuing medical education–accredited academic detailing session • Utilized Medicaid administrative claims data • Obtained data from patient charts • Worked with clinic staff to select and implement policies and procedures from a tool kit • Data from the National Survey of Primary Care Physicians' Recommendations and Practices for Breast, Cervical, Colorectal, and Lung Cancer Screening
	Diagnosis/Treatment	• Conducted semi-structured interviews with oncologists, nurses, social workers, medical assistants, and front-desk staff

3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

Theme	Cancer Care Context	Approaches
	Treatment	• Quality and safety team developed an event-reporting system program • Administered surveys • Utilized an incident reporting system • Interviews with key informants • Merged data from the American Hospital Association's Annual Survey and Medicare claims • Tracked and extracted data from electronic health records
	Other cancer care context	• Used managed care penetration, hospital competition, and clinical trials competition • Comparisons of data pre and post work enhancement implementation • Developed a semi-structured interview guide based on the CFIR model • Teams participated in video conferencing training • Administered surveys • Utilized the MDC assessment tool • Sourced data from the CCOP Annual Progress Reports • Assessment of safety-net clinics • Structured interviews • Data collected by the Chicago Breast Cancer Quality Consortium • Obtained medical record data and reviewed patient cases • Compared practice self-report with external evaluation of implementation
Participation in total care delivery models	Screening	• Data taken from quarterly reports submitted to hospitals • Facilitators engaged physicians and staff on-site in a series of activities • Utilized surveys • Obtained data physician utilization of federal incentives • Utilized the NCQA recognition audit data • Identified comparison practices in the same geographic region • Utilized the Safety Net Medical Home Scale • Measures derived from expert consensus, clinical trial results that test anticancer therapies, and published guidelines
Structural and resource-related characteristics	Screening	• Merged patient level, organizational level, and area level data sources • Utilization of surveys • Information from administrative datasets • Collected data from the VA National Data Systems
	Diagnosis/Treatment	• Measures were refined after structured discussion and panels. The resulting set of quality indicators were then grouped into domains
	Treatment	• Interviews with key informants • Utilization of surveys • Review of patient medical records
Workload, workflow, or work performance	Screening	• Collected publicly reported data about coordinated care organizations • Utilized data from field notes, collaborative meetings, and medical record review
	Diagnosis/Treatment	• Pulled data from laboratory information system and chart review
	Treatment	• Prospective quantitative data were collected • Interview-based surveys were conducted with experienced oncology pharmacists • Assessments were performed in a simulation laboratory

3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

Theme	Cancer Care Context	Approaches
	Other cancer care context	• Obtained data on community-based networks of hospitals and physician practices from the CCOP • Utilized electronic health records used in in-person observations
Organizational reactions to environmental forces	Diagnosis/Treatment	• Use of National Cancer Database data
	Treatment	• Thematic analysis guided by Donabedian Quality of Care framework.
	Other cancer care context	• Utilized the ASTRO workforce survey • Applied the Herfindahl-Hirschman Index for practices of medical oncologists that billed Medicare
Leadership	Screening	• Interview with key informants
	Diagnosis/Treatment	• Web-based survey on the practice of quality assurance peer review chart rounds
	Other cancer care context	• Use of Evidence-based Practice Measurement Tools
Psychological states or traits of providers and provider groups	Diagnosis/Treatment	• Surveys covering job satisfaction, safety, communication, and burnout
	Treatment	• Online survey
Financial metrics	Treatment	• Identification strategy using administrative data
	Other cancer care context	• Utilized administrative data
Impact of training, training types, and workforce capacity assessments	Screening	• Interview with primary care practice team-members
	Treatment	• Multi-payer claims based, shared patient network measures
New roles or team composition	Screening	• Review of medical chart data
	Treatment	• Administered the ESAS questionnaire
Safety and safety culture	Treatment	• Used surveys and document review processes or did not specify approach
Organizational readiness	Treatment	• Emailed self-developed survey

ACG = Adjusted Clinical Group; ASTRO = American Society for Therapeutic Radiology and Oncology; CCOP = Community Clinical Oncology Program; CFIR = Consolidated Framework for Implementation Research; ESAS = Edmonton Symptom Assessment System; MDC = Multidisciplinary Care; NCQA = National Committee of Quality Assurance; PNSAT = Patient Navigation Sustainability Assessment Tool for Preventive Cancer Screening; PRISM = Practical, Robust Implementation and Sustainability Model; VA = Veterans Affairs

3.3.2.1.1 Guiding Question 2: Implementation of Improvement Projects and Barriers to Implementation

Among studies included for Guiding Question 2, thirty-nine addressed the implementation of a project and/or assessed barriers to and facilitators for implementing an intervention (an organizational process that becomes a contextual element after completion). The publication dates for these studies ranged from 2011 to 2023.

Despite the heterogeneity among studies, especially as related to the population, organizational characteristics, setting, and whether authors measured care delivery outcomes, most studies sought to measure the quality of cancer care delivery. In doing so, authors either defined quality metrics[50] or relied on quality metrics determined by outside organizations.[51] Though most studies examined other aspects or more than one aspect of cancer care,[52-64] several studies reported data on cancer screening[65-74] and cancer treatment.[50, 51, 66, 75-79]

Studies approached this topic using both qualitative (e.g., semi-structured interviews, surveys, assessments) and quantitative methods (e.g., retrospective analysis, prospective analysis, pre/post intervention analysis) to determine barriers and facilitators of interventions. For qualitative assessments, authors typically distributed surveys or conducted semi-structured

3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

interviews. Surveys allowed organizations to report on implementation standards, barriers, facilitators, approaches to sustainability and clinician/staff experiences of an intervention. Survey results were based on self-reports from leadership and staff within organizations. In addition, assessments were used to monitor implementation projects. For example, one study distributed the Patient Navigation Sustainability Assessment Tool for Preventive Cancer Screening (PNSAT) to determine potential barriers/facilitators of a Systems of Support patient navigation program.[70]

Studies in this group also reported qualitative observations of and interviews with oncology providers, organizational leadership, and other key informants. These methods provided a rich source of information pertaining to an organization's clinical practices, physical capacity, staff experiences, and quality of cancer care, to name a few.[51, 59-61, 64, 67, 80] For consistency, authors would generate codes/codebooks to analyze transcripts and recordings from interviews, relying on models such as the Consolidated Framework for Implementation Research (CFIR)[59, 81] or the Practical, Robust Implementation and Sustainability Model (PRISM).[70] Overall, the bulk of these approaches were used to identify organizational factors that relate to implementation sustainability and/or effectiveness.

To study implementation projects and barriers to implementation in cancer care delivery, authors analyzed prospective data, retrospective data, and data pre/post- intervention. Sources of data varied from annual progress reports[54] to electronic health records or medical records.[50, 82] Authors used these databases to measure quality metrics for compliance (e.g., Breast Imaging Center of Excellence [BICOE] status), processes (e.g., management plans), and effectiveness of an intervention (e.g., changes in screening rates). In some cases, the findings were related to clinical outcomes.[51, 72-74, 76, 78, 83, 84] In others, the authors reported organizational factors that supported or hindered an intervention[60, 85] and which factors related to organizational performance or adherence/compliance.[50, 51, 53, 55, 58, 64, 65, 68, 72, 73] In some of these studies the intervention's implementation was measured and outcome was assessed directly. These projects typically involved authors working within an organization to establish an improvement program aimed at raising clinical care quality.[56, 66, 75-77, 86] The interventions themselves often involved an electronic system that either reported adverse events/errors[77, 87, 88] or functioned as a clinical reminder with outcomes relating to patient safety and compliance.[66]

Supporting Guiding Question 2, Tables 5-7 list the organizational context measures, organizational process measures, and organizational models with measurements that appeared in studies categorized under the theme of Implementation of Improvement Projects and Barriers to Implementation. Tables 5-7 also list items according to whether the focus of the study was on cancer screening, diagnosis, or treatment.

Results from these studies typically looked at intermediate organizational outcomes: barriers/facilitators, organizational factors, implementation effectiveness/sustainability, and healthcare quality. Outcomes included changes in screening rates post intervention or related screening rates to an organizational care quality metric. Due to the heterogeneity of the data analysis and 'tools' employed, the studies reported varied results among cancer treatment centers. The individual studies were limited in their scope, reporting results only from a local health organization or a state's health system (e.g., Maryland's health system). Also, most studies did not measure patient-level outcomes or clinical practice (i.e., workflow). The purpose of these studies was not to determine how organizational factors affected patient outcomes, but they provide valuable insight to useful approaches, models, and measurements for studying

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organizational characteristics in the context of cancer care delivery. This theme, identified inductively, corresponds to the subdomain "Organizational Learning and Quality Improvement Activities" under the Organizational Process domain in the Integrated Framework.

Table 5. Summary of organizational context constructs related to cancer care screening, treatment, and diagnosis within the category of implementation projects and barriers

Screening	Diagnosis	Treatment
• Quality of care metrics • Vertical integration • Patient pool and patient care environment • Infrastructure • Type of organization/partnership (e.g., safety net clinic/system or training organization) • Meets specific benchmarks (Chicago Breast Cancer Quality Consortium (2006-2013)) (determined by recall rate, biopsy recommendation rate, cancer abnormal, cancer biopsied, screen detection rate, proportion minimal, proportion early stage) • Organizational maturity, size, and structure • Screening policies, practices. and beliefs • Colorectal cancer screening toolkit • Determined as a Federally Qualified Health Center • Participant of Community Ambassador Program	N/A	• Patient care environment • Ownership type • Type of organization/partnership (e.g., safety net clinic/system or training organization) • Organizational maturity, size, and structure • Compliance with patient-centered oncology standards (access, specialty practice responsibilities, practice team, comprehensive health assessment, evidence-based decision support, care planning and support self-care, medication management, coordinate care transition, implement and demonstrate) • Cultural and linguistic competence

N/A =Not available

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Table 6. Summary of organizational process constructs related to cancer care screening, treatment, and diagnosis within the category of implementation projects and barriers

Screening	Diagnosis	Treatment
• Use of electronic health records / medical records • Use of physician and patient reminder systems • Patient navigation • Use of electronic clinical reminders • Physician engagement and work environment • Staff facilitation • Patient-oriented and provider-oriented evidenced based practices • Use of nurse practitioner/physician assistants • Care management (administrative processes, referral protocol/schedule, treatment and diagnosis standards, screening procedures and health education)	N/A	• Near-miss risk index • Use of electronic event-reporting systems • Use of electronic health records /medical records, patient portals, patient-reported outcomes, and telemedicine services • Centralization • Primary Care Redesign team-based model • Treatment team integration • Integration of care coordinators • Palliative care consultation • Radiation management plan • Care management (administrative processes, referral protocol/schedule, treatment and diagnosis standards, screening procedures and health education) • Care coordination • Radiation oncology resident continuity clinic (faculty supervision, clinical environment, resident perception, and educational experience) • Medical specialty/access to specialist • Use of healthcare Failure Mode and Effect Analysis • Peer-review program • Work enhancement programs

N/A =Not available

Table 7. Summary of organizational models with measurements related to cancer care screening, treatment. and diagnosis within the category of implementation projects and barriers

Screening	Diagnosis	Treatment
• Practical, Robust Implementation and Sustainability Model • Patient Navigation Sustainability Assessment Tool for Preventative Cancer Screening • Consolidated Framework for Implementation Research constructs and subconstructs • The Chronic Care Model	N/A	• Participation in Oncology Care Model

N/A =Not available

3.3.2.1.2 Guiding Question 2: Participation in Total Care Delivery Models

We categorized eleven studies under Guiding Question 2 as examining impacts of an organizational context measure, participation in total care delivery models (that is, care models that set tenets and include structural features to drive the total care approach for all care, for all patients, such as the Patient-Centered Medical Home) on cancer care outcomes.[83, 89-98] These delivery models were: the Quality Oncology Practice Initiative (1 study in Michigan[99]), the Health Disparities Cancer Collaborative (1 study, multi-state[100]), the Northeastern Pennsylvania Chronic Care Initiative (1 study[101]), the Rhode Island Chronic Care Sustainability Initiative (1 study[83]), and the Patient-Centered Medical Home (PCMH) (7 studies, 1 in Colorado,[102] 1 nationwide,[103] 1 New England region,[104] and four in New York State[96-98, 105]). This topic was tied

3.3.2 Findings, Guiding Question 2: What approaches have been used to improve understanding of how organizational context and process characteristics are described, measured, and analyzed in the context of cancer screening, diagnosis, and treatment?

for the second most populous category in our review, indicating that cancer care outcomes are an important focus of many total care delivery models. The studies in this category were published between 2012 and 2021, with six published in 2015 and 2016 coinciding with the timeline of increased interest in evaluating PCMH models. The studies differed in their approaches to establishing pathways from an intervention (care model or program) to organizational process changes to organizational outcomes, to clinical process changes, to cancer care outcomes. Those with the most rigorous study designs tended to measure participation in the intervention (the only organizational characteristic) and cancer care process measures (e.g., screening rates) compared to a control group. The studies with cross-sectional approaches tended to measure intermediate points or mediators in the pathways as well as multiple organizational concepts and measures representing structures, processes, and context. Designs favored before-after studies with or without controls[92, 94, 105, 106] or cross-sectional studies with or without controls.[91, 103, 104] There was one RCT,[107] two longitudinal cohort studies with two[99] and three subgroups,[108] and one continuous quality improvement data collection with no control.[109] Most studies measured as their primary outcomes breast, cervical, and colorectal cancer screening rates.[83, 89, 91-98] The inclusion of all three of these outcomes was not consistent across these ten studies and findings were mixed, which might be explained by differences in study design, such as differing length of the observation period, differing use of electronic health records, and differing role of other organizational characteristics as mediators. The studies that found negative impacts of total care delivery model participation on primary outcomes tended to explore organizational characteristics more often, including as mediators, in their analyses generally searching for explanations for poorer outcomes than anticipated from applying the model.

As a group, this category of studies included discussion of 44 organizational concepts and measures representing structures, processes, and context, including: participation in the model in general, achieving high-level PCMH recognition, use of the chronic care model, teamwork, cancer care process improvement, performance feedback, registry use, care management, outreach systems to contact patients, electronic health record capabilities, access to care, career satisfaction, work-life balance, patient care processes, professional experience, improvements in resident continuity, care transitions, culturally competent care, improved access and coordination between primary and specialty care, care coordination and integration, type of screening performance reports, systems for patient reminders, and processes in 7 types of cancer care (that include 35 measures total[99]). Those 44 also included 9 areas of the National Committee for Quality Assurance (NCQA) Physician Practice Connections Standards[83] and 6 subscales (52 items) of the Safety Net Medical Home Scale.[103] Four studies measured organizational characteristics via self-constructed surveys[89, 93, 101] or a data entry tool[99] developed for those studies specifically. Four studies provided a brief description of their measured organizational concepts,[109] but in three of those studies[97, 98, 102] the only measured concept was PCMH participation.

This inductively revealed theme maps onto the Integrated Framework category of "Payment model and payment program participation" under Financial Structures within the Organizational Context domain.

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3.3.2.1.3 Guiding Question 2: Structural and Resource-Related Characteristics

The approach in another 11 studies under Guiding Question 2 was to report on organizational structure and resource-related characteristics in cancer care delivery, a construct within organizational context.[110-120] The studies in this group were published between 2013 and 2022. Designs employed were prospective or retrospective cohort and cross-sectional designs, with the majority of studies employing the latter.[110-112, 114, 116-119]

Six studies looked at the association between cancer screening and patient, practice, or health system characteristics such as appointment availability and frequency, academic affiliations, staffing mix, geographic location, and patient-panel race and ethnicity, age, and socio-economic variables.[110, 111, 113, 116, 120, 121] The remainder identified or described the effect of organizational factors and characteristics on quality of cancer care and patient enrollment, including type of facility (e.g., imaging center, outpatient center, diagnostic clinic, mobile unit), scheduling capacity, system support, and certification status.[112, 114, 115, 117, 119]

This category of studies included discussion of many organizational concepts and measures representing process and context, such as: organizational size and volume, use of patient portal or electronic records, academic arrangements, incentives for primary care performance, cost and payment methods, staffing, skill types, beliefs, and screening processes. Outcomes and measures were obtained by several methods including structured discussion with staff members, utilization of electronic health records, survey questionnaires, registered surveys such as the Veterans Health Administration Healthcare Analysis and Information Group survey, national databases such as the Veterans Affairs Decision Support System Laboratory Data Set, and Medicare claims. Notable drawbacks were the use of cross-sectional studies or designs which hinder making a causal inference. However, many of the studies used a large sample size of either participants, practices, or national databases which help with generalizability and reliability.

This revealed theme is closely aligned with the organizational structure and capacity subdomains of organizational context in the Integrated Framework.

3.3.2.1.4 Guiding Question 2: Workload/Workflow Design/Work Performance

Nine studies related to workload, workflow, or work performance themes.[90, 122-129] The studies in this group were published between 2013 and 2022. Designs employed were cross-sectional,[123-125] prospective cohort,[122, 126] pre/post comparison,[128, 129] comparative case study,[127] and RCT.[90] Studies in this category investigated the association of operational efficiency, staff workload, and performance with quality improvement, patient care, and screening efficiency. Outcomes and measures were obtained through collection of quantitative data from patient records, health system scheduling records, interview-based surveys, and national databases.

This category of studies included discussion of several organizational concepts and measures representing context and processes, such as: workload levels for clinicians and nursing staff, changes in workflow, treatment rates, standardization of staff functions, patient volumes, physician scheduling, frequency of clinical functions, trends of services, screening rates, team structure, and infrastructure development. Although this category does include an RCT, it was only one study with a limited number of participating practices.[90] In addition, this trial may be subject to reporting bias as the volunteer practices may have been more motivated to improve cancer screenings.

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Articles in this inductively identified theme tended to straddle concepts as presented in the Integrated Framework that were categorized either as Context or Process. This highlights the idea that studies often do not fall cleanly into one domain (as organized in a framework) but that studies considering a path to an outcome would likely include structure, process, and context contributors. The framework does cover this theme, however, in its organizational Outcomes domain which includes efficiency and workload and its process domain (e.g., "care management processes" (mentioning workflows) as well as "configuration" including workflow policies.

3.3.2.1.5 Guiding Question 2: Organizational Reactions to Environmental Forces

Also addressing Guiding Question 2, five studies examined organizational programs and features set up in response to external influences.[3, 130-133] One study had a clear definition of the environment (e.g., hospital-referral regions[87]) while others did not. The studies in this group were generally published in more recent years, between 2014 and 2022, with only one study before 2014. Designs employed were cross-sectional based on a survey or national databases, and one retrospective cohort.[133] Studies in this group examined market competition, or the participation in a peer performance-report-card program from an external agency as external or environmental influences on the organization.

This category of studies discussed organizational concepts and measures representing context, including: provider practice competition; implementation of a community breast center report card; accreditation status; workforce characteristics including demographic features; insurance coverage; and cancer care team support from the community. While some of the studies used nationally representative data,[3, 131, 133] others focused on a specific institution, limiting the generalizability or external validity of findings. The studies rarely demonstrated relationships of the measures with patient outcomes.

In the Integrated Framework, this inductive theme is not a distinct category of environmental influences on the organization or organizational efforts to control the environment. However, two Integrated Framework categories reflected related constructs: Participation in state or national quality improvement collaboratives under organizational learning and quality improvement activities in the Process domain and the competition-collaboration continuum under organizational culture, a Context subdomain.

3.3.2.1.6 Guiding Question 2: Leadership

Three studies were related to the theme of leadership and its impact on cancer care delivery and outcomes.[134-136] One study examined leadership perspectives on implementing a lung cancer screening program.[134] Another study assessed the impact of peer review quality assurance using chart reviews,[135] and the last study looked at the impact of an EBP leadership immersion intervention.[136] The studies in this group were published between 2012 and 2022. Study designs employed were two cross-sectional studies[134, 135] and one prospective cohort,[136] with the two cross-sectional studies collecting data through surveys and interviews.[134, 135]

The prospective cohort study which looked at the impact of an EBP leadership program used EBP belief and implementation scales for knowledge, beliefs, competencies, implementation, organizational culture, and readiness for system-wide integration.[136] All scales were tested for validity and reliability.

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This category of studies included discussion of allocation of resources, need for collaboration, facilitators, and barriers to program implementation, peer review of treatment modalities, use of technologies, organizational readiness, and leadership knowledge, beliefs, competencies, and behaviors. Notable limitations to these studies were the use of hand-written notes for interviews rather than recordings in one study,[134] dependence on memory and recollection with no method for validation in one study,[135] and low response rates for some measures in another study.[136] All three studies used self-reported outcome measures which may hinder reproducibility.

This emergent theme was partly represented in the Integrated Framework in the constructs of "knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes" under the culture subdomain of the Context domain and as "leadership structures" under the structure subdomain of the Context domain. However, the notion of leadership skill and tactics as an organizational asset, or as a process characteristic (the act of leading and making decisions for the organization) were not easily identified in the Framework.

3.3.2.1.7 Guiding Question 2: Psychological States/Traits of Providers and Provider Groups

Three studies answering Guiding Question 2 were related to psychological states or traits among or across providers and provider groups.[137-139] The studies were published between 2014 and 2022, with all three studies using a cross-sectional design. Two of the studies looked at burnout, with one observing the association of burnout with organizational context and practice models,[138] and the second study looking at burnout predictors among chairs of radiation oncology programs.[137] The third study observed factors associated with job satisfaction among clinicians in a medical oncology program.[139] All three studies used mailed or online questionnaires to collect and document outcome measures.

This category included discussion of stressors, level of exhaustion, organization characteristics that affect job satisfaction and burnout such as daily patient volume, role, communication domains, team structures, and workload support. Notable drawbacks to the included studies are the use of cross-sectional design and possible response bias from participants due to self-reporting measures.

This theme emerged from our reading of studies with some organizational process measurement. It is most closely aligned with the constructs of "knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes" and "organizational climate" under the organizational culture subdomain of the Context domain. However, aspects of the team processes subdomain under the organizational Process domain also apply, as does the "workforce" construct under the "other organizational outcomes" subdomain. As with other findings of incomplete overlap with the Integrated Framework, findings for this inductively identified theme point to variability within the organizational sciences field in how these ideas are named and classified.

3.3.2.1.8 Guiding Question 2: Financial Metrics or Financial Performance

Two studies measured financial metrics or financial performance.[140, 141] Both used multi-year data and assessed the role of financial integration and incentives on cancer-care related outcomes (e.g., service utilization and spending). Studies in this group were generally published in more recent years (2016 and 2019) and focused on the association of the outcomes with the financial

metrics of interest, using administrative claims data or payment data. Ownership status of physician practices and changes in Medicare payment rates were used as financial metrics. These studies used relatively large administrative datasets: one sourced from a large insurance company (Blue Cross/Blue Shield of Texas) and the other used nationally representative Medicare claims data.

Financial integration of billing through hospitals from private practices raised patient spending but did not improve quality of care.[142] Increasing physician fees in office-based practices resulted in an increase in procedures and spending.[141]

This theme may overlap with the "financial structure" subdomain of Context in the Integrated Framework (perhaps within the payment models construct), but financial metrics of performance are not specifically listed.

3.3.2.1.9 Guiding Question 2: Impact of Training, Training Types, Workforce Capacity Assessments

Two studies were categorized as observing the impact of training, training types, and workforce capacity assessments on cancer care delivery and outcomes.[143, 144] The studies used a cross-sectional design[143] and a retrospective cohort design,[144] and all were published between 2012 to 2018. The cross-sectional study observed the effect of team-based reflection on quality improvement implementation where primary practice team members were given training on reflective adaptive processes.[143] The retrospective cohort study looked at the association between provider and team experience and patient survival, utilization, and adherence to guidelines, focusing on workforce capacity with quality of care.[144]

Studies in this category included discussion of team-based communication, team-based motivation and process reflection, team structure, and relationships (e.g., shared consultations) on quality of care. Measures were obtained through interviews with primary care team members, patient charts, or medical claims data. Only one study used a state-wide cancer care database (North Carolina Central Cancer Registry),[144] while the cross-sectional study recorded interviews[143] which may limit the generalizability and reproducibility.

Although there is a "capacity" subdomain of Context in the Integrated Framework, it refers to human and capital assets and resources. This emergent theme described more a process of developing skills and capacity in the workforce, specifically for communication and quality improvement. The "organizational learning" and "team processes" subdomains of Process also overlap with this inductively identified theme.

3.3.2.2.0 Guiding Question 2: New Roles or Team Composition

Two studies were categorized to the theme of new roles or team composition.[145, 146] The studies were published in 2017 and 2019, and used a cross-sectional[146] and a pre/post design.[145] Both studies investigated effects of changing team composition, including the incorporation of specialties in team-based care. The cross-sectional study observed the impact of a pharmacist-embedded model on improving quality measures, integrating a full-time pharmacist as part of a team-based comprehensive care program.[146] The prospective cohort study looked to quantitatively describe palliative care referral rates and symptom burdens along with implementing a palliative care referral system in a single cancer center, with the objective of increasing integration of palliative care services in ambulatory oncology.[145]

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Together, these studies assessed quality measures such as patient vaccination rate and cancer screening rates, the use of tools to characterize symptom burden, and under-utilization of services by oncologists. Outcomes and measures were collected through use of medical records and the administration of the Edmonton Symptom Assessment System questionnaire. A notable drawback to the studies is they were only conducted in a single center and did not report on participant demographics, which limit the generalizability.

Although not explicitly listed in this way, this revealed theme would likely be a Context domain element under staffing and skill-mix in the Integrated Framework.

3.3.2.2.1 Guiding Question 2: Safety and Safety Culture

Two studies related to safety and safety culture.[147, 148] One study reported on the implementation of a comprehensive safety culture program and its association with staff safety knowledge and cancer care outcomes.[147] The other study assessed change in near-miss rates associated with the implementation of a Crew Resource Management program. The studies in this group were published in 2014 and 2016. Designs employed were simple pre/post comparisons, primarily descriptive -- using simple statistics based on survey or documented records of outcome measures.

This category of studies discussed five organizational concepts and measures representing process and context, including: implementation of an educational program; implementation of electronic peer review; frequency of safety communication by leadership; frequency of safety assessment; and implementation of resource management program. Notable drawbacks in these studies were that one was conducted in a single center[147], which reduces generalizability, while the other study did not report negative findings or study limitations which could be an indicator of reporting bias.

With reference to the Integrated Framework, a state of organizational safety itself likely fits under the “other organizational outcome” subdomain within the Outcomes domain. Safety culture would be classified under the “organizational climate” construct within the “organizational culture” subdomain of Context.

3.3.2.2.2 Guiding Question 2: Organizational Readiness

One study considered a kind of organizational readiness.[149] The cross-sectional study was published in 2021 and focused on the readiness of United States cancer care programs to provide age-friendly care and treatment.[149] This study included in the discussion an overall measure representing processes and context including: organization capacity to assess dementia, frailty, and track falls, nurse navigation, provision for non-medical programs for older adults, and service comprehensiveness. Outcomes and measures were obtained through a survey sent to ambulatory oncology program administrators, directors, chief medical officers, and practice administrators. Notable drawbacks of this study were its cross-sectional design and a low response rate, which affects its generalizability.[149]

This theme is not explicitly called out in the Integrated Framework but might be considered a blend of the subdomains of “capacity” and “organizational culture" under the Context domain, again possibly pointing to variations in conceptualization within organizational terminology.

3.3.3 Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

3.3.3.1 Main Findings on Guiding Question 3

We sought to detail which healthcare organization context and process characteristics have been examined in studies of cancer screening, diagnosis, and treatment, specifically by recounting design, setting, population, organizational measures, and primary and secondary clinical outcomes. Study designs among the selected studies included mostly prospective or retrospective cohort designs, and mostly measured organization- or unit-level outcomes rather than patient-level outcomes. We considered studies within the broad classifications of cancer screening, diagnosis, and treatment and noted some differences by those foci: screening-related studies were mostly categorized thematically as total care model studies and tended to be conducted in general medical settings (i.e., not cancer-specific), which makes sense for screening. Treatment-related studies covered a greater variety of settings, themes, and cancer types. Across all the studies, measured organizational characteristics tended to be the less complex notions of size, payment program participation, or patient-population demographics. Few studied in-depth organizational concepts of teamwork, provider attitudes and traits, or centralization.

3.3.3.1.1 Guiding Question 3a: For each identified study, what were the following: i) study design; ii) setting; iii) population; iv) measures of organizational context and process characteristics (measurement instrument name and type, number of items, references, etc.); and v) primary and secondary clinical outcomes studied?

We identified 25 studies that had strong relevance to the Guiding Questions and featured a description of the organizational concepts involved. The studies addressing Guiding Question 3 were spread primarily between addressing screening (12 studies) and treatment (9 studies) outcomes, while two studies explicitly considered diagnostic outcomes. Two studies considered the outcome of comprehensive cancer care.[129, 136] In each outcome category, we summarize study designs, settings, populations, the primary and secondary clinical outcomes studied, and the measures of organizational context and process used in these studies (Tables 8, 9a and 9b and Figures 5-6). Fifteen studies among those meeting criteria for Guiding Question 3 directly associated healthcare organization context and process characteristics with clinical outcomes of cancer screening, diagnosis, or treatment. Twelve tested organizational characteristics against a clinical primary outcome,[90, 99, 103, 113, 116, 117, 123, 133, 144, 150-152] and four included a clinical secondary outcome.[83, 115, 118, 133]

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

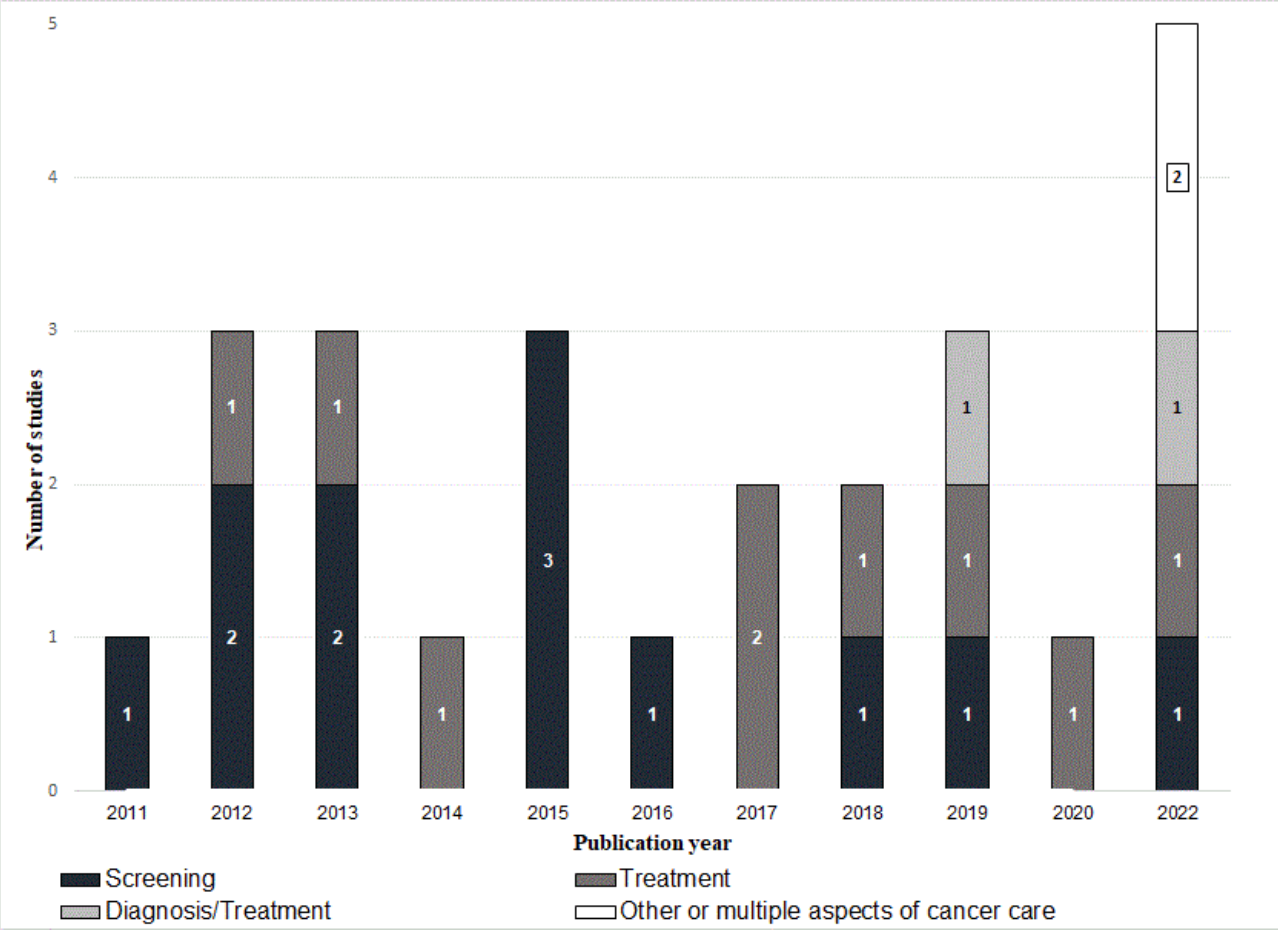
Table 8. Summary of studies on Guiding Question 3 (N=23)

Characteristics	Characteristic Type	Number of Studies
Study design	Randomized controlled trial	1
	Prospective cohort	3
	Retrospective cohort	11
	Cross-sectional	6
	Longitudinal qualitative case studies	1
	Comparative case study	1
	Pre/post comparison	2
Cancer care	Screening	12
	Diagnosis and Treatment	2
	Treatment	9
	Comprehensive cancer care	2
Level of organization	Individual practice or clinic	8
	National level of integrated delivery system (or multi-institutional system)	8
	Entity within a hospital	2
	Hospital	3
	Regional level of integrated delivery system (or multi-institutional system)	3
	Not reported	1
Setting	Academic cancer center	4
	Accountable care organizations	1
	Colorectal cancer control program awardees and partner clinics	1
	Community cancer center	2
	Includes academic centers, community cancer programs, other specified cancer programs	1
	Medical oncology practices	1
	National comprehensive cancer center	1
	Non-cancer center/General medical center	6
	Non-hospital-based office, hospital-based, community health center	1
	American Hospital Association survey pool	1
	Outpatient cancer center	1
	Psychiatric rehabilitation program	1
	Veterans Affairs medical center	1
	Veterans Affairs medical centers and community-based outpatient clinic	1
	Not reported	2
Data collection methods	Primary quantitative data collection	10
	Secondary data analysis	9
	Interviews	3
	Interviews and secondary data analysis	1
	Assessments/Questionnaires	1
	Survey	1
Primary outcomes	Accreditation	1
	Adherence to best practices	3
	Cancer screening rates	6
	Care utilization	1
	Collaboration and teamwork	2
	Complications or adverse events	1
	Organizational factors and processes	8
	Physician enrollment in National Cancer Institute Community Clinical Oncology Program	1
	Quality of care	1
	Workload	1
Secondary outcomes	5-year overall survival	1
	Adherence to best practices	1
	Cancer screening rates	3
	Complications or adverse events	4
	Number of surveillance radiology studies	1

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

Characteristics	Characteristic Type	Number of Studies
	Organizational factors and processes	2
	Quality of care	2

Figure 5. Studies on Guiding Question 3 by publication year



3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

Table 9a. Healthcare organizational context characteristics in studies on Guiding Question 3 related to screening, diagnosis, or treatment of cancer (N=23)

Organizational Characteristics Reported in the Included Studies*	Number of Screening Studies (7 Studies Total)	Number of Diagnosis/ Treatment Studies (1 Study Total)	Number of Treatment Studies (5 Studies Total)	Number of Studies on Other or Multiple Aspects of Cancer Care (1 Study Total)
Academic arrangements	1	0	0	0
Affiliations	1	0	2	0
Geographic characteristics	0	1	0	0
Health information technology infrastructure	1	0	0	0
Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	0	0	1	1
Location	2	1	2	0
Organization type	1	1	3	0
Ownership	1	0	0	0
Patient demographics	3	1	1	0
Patient financial status	2	1	0	0
Payment model and payment program participation	3	0	0	0
Service comprehensiveness	1	0	2	0
Size and volume	3	1	4	0
Staffing and skill-mix	2	0	0	0
Other- physical Assets, Human Capital	1	0	0	0

*Definitions are listed in Table 1a.
Total exceeds the number for overall because studies could be included for more than one characteristic.Gray is used to highlight areas with 0 studies.

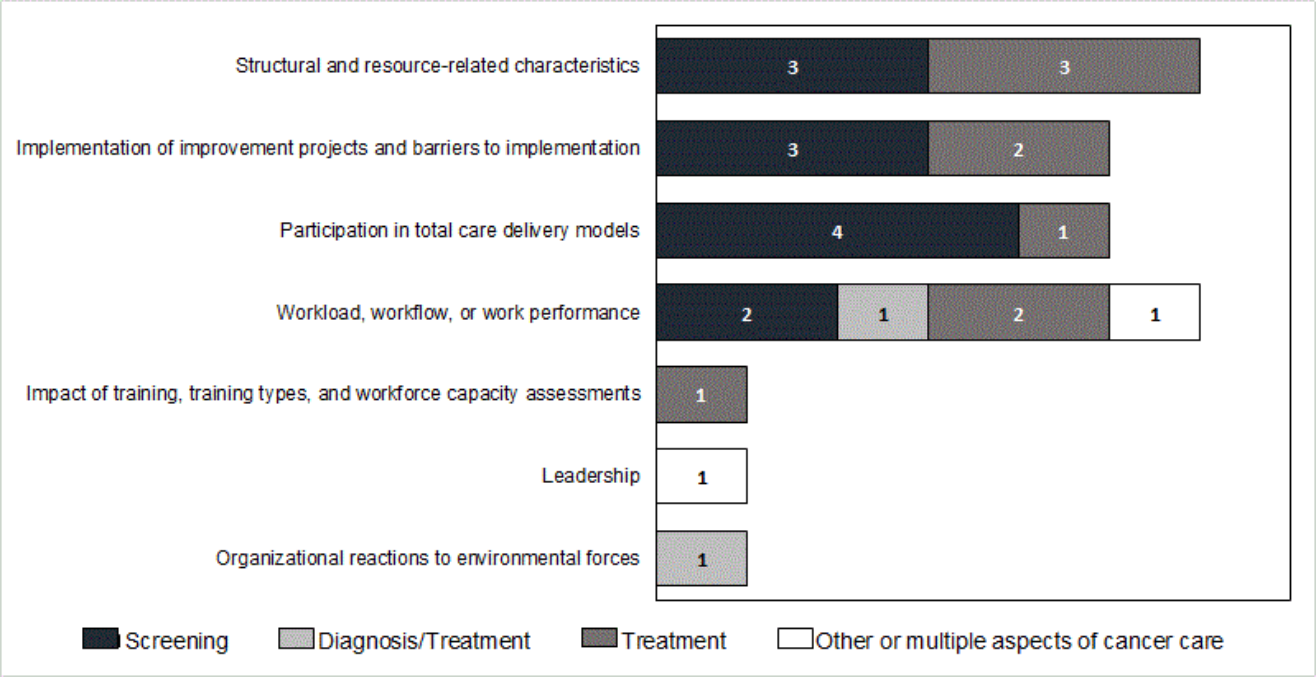
Table 9b. Healthcare organizational process characteristics in studies on Guiding Question 3 related to screening, diagnosis, or treatment of cancer (N=24)

Organizational Processes Reported in the Included Studies	Number of Screening Studies (12 Studies Total)	Number of Diagnosis/ Treatment Studies (2 Studies Total)	Number of Treatment Studies (8 Studies Total)	Number of Studies on Other or Multiple Aspects of Cancer Care (1 Study Total)
Care coordination	0	0	0	1
Care management processes	2	0	3	0
Clinical decision support	0	1	0	0
Communication	0	0	0	1
Participation in state or national quality improvement collaboratives	3	0	2	0
Referral processes	0	1	0	0
Screening processes	4	0	1	0
Use of health technology systems	0	1	0	1
Use of quality improvement or other improvement methods	1	1	1	0
Other- cross-sector partnerships, multilevel interventions, provider/team training	1	0	1	0

Total exceeds the number for overall because studies could be included for more than one characteristic.
Gray is used to highlight areas with 0 studies.

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

Figure 6. Thematic categorization of studies relevant to Guiding Question 3



3.3.3.1.1.1 Guiding Question 3a: Screening Outcomes

Twelve of the studies addressing Guiding Question 3 focused on cancer screening. Thematically, the largest number of studies in this group (4) addressed participation in total care delivery models, such as if participating health centers were more likely to implement organizational process changes, and the effect of participation in a total care delivery model on healthcare utilization and quality. These studies were conducted between 2011 and 2022, with nine published up to 2016 and three since 2018.

Screening-related studies included a range of designs, from an RCT[90] to prospective[113] and retrospective cohort designs,[95, 100, 106, 153-155] to cross-sectional inquiries,[89, 118, 156] and a comparative case study design.[127] The number of participating organizations ranged from 2 to 167. The RCT[90] was conducted in an academic cancer center and one other study was conducted in a community cancer center.[100] Other studies were set in general medical settings,[89, 103, 106, 153-159] including two Veterans Affairs centers[118, 157] and one psychiatric rehabilitation center.[152] Regarding populations studied, the screening-related studies were more heavily focused on patients with a history of cancer[95, 100, 106, 154-156, 158-160] versus other populations. The cancer types/sites considered were breast,[83, 89, 91, 153-155, 158] cervical,[83, 89, 91, 95, 153-155, 158] colon, rectal and colorectal,[83, 91, 153-155, 158-160] and, less often, lung.[118, 154, 155]

The screening-related studies related to Guiding Question 3 measured primary outcomes of colorectal screening rates;[90] probability of cancer screening;[150] reception of cancer screening reports;[104] breast cancer screening percentage;[116] cervical, breast, and colorectal cancer screening;[152] percentage of patients who received cervical cancer screening;[103] and percentage of men at risk who received prostate specific antigen screening.[113] Five studies included screening outcomes as secondary rather than primary measures.[83, 91, 154, 158, 159] For these studies, organizational process, structure, or context measures were the primary measures, including chronic care implementation and teamwork;[100] PCMH level I recognition;[83] organizational

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

factors (physical assets, human capital [staff mix], organizational competencies [authority in staff hiring, determining primary care components and processes, communication and cooperation], utilization of computerized patient record system, quality improvement orientation);[118] use of comprehensive systems strategies;[84] and finally, forming partnerships, sharing performance data, and establishing quality improvement process and infrastructure.[127] Not all studies listed secondary outcomes, but four specified additional screening or treatment measures.[91, 106, 118, 157]

In the screening-related studies, the measures of organizational context included most commonly were size/volume;[89, 116, 157] payment model and payment program participation;[106, 113, 153] and demographics and financial status of patient panel.[116, 153, 157] Less-often measured were organization type,[104] PCMH/not,[104] affiliation;[89, 113] organization location;[113, 155] staffing and skill mix;[116, 157] service comprehensiveness;[113] health information technology infrastructure;[116] physical assets and human capital;[118] and cross-sector partnerships and multilevel interventions.[127]

The measures used in these studies to evaluate organizational processes included: screening processes;[89, 116, 157] participation in state or national collaboratives;[90, 95, 106] care management processes;[118, 154] and use of quality improvement or other improvement methods (e.g., lean six sigma, or Comprehensive Unit Safety Program).[100] As an example, one study listed as contributing measures: access and communication, patient tracking and registry, care management, patient self-management support, electronic prescribing, test tracking, referral tracking, performance, and advanced electronic communication.[83] Instruments, where available, along with further study details, are described in Appendix D, Evidence Tables D-5 through D-8.

3.3.3.1.1.2 Guiding Question 3a: Diagnosis and Treatment Outcomes

Two studies that included both diagnostic and treatment outcomes met criteria for Guiding Question 3.[128, 133] The 2019 study used a retrospective cohort design in more than 1300 academic, community, and other specified cancer programs to study whether accreditation was associated with improved performance on primary outcomes of compliance with six breast cancer diagnosis and treatment quality measures for adjuvant treatment, needle/core biopsy, and breast conservation therapy.[133] We thematically categorized accreditation as an organizational characteristic that is a response to external or environmental influences. The study's organizational measures included: organization type; size and volume; geographic characteristics (patient distance to facility, rural/urban); location (in terms of United States Census region); and demographics and financial status of patient panels. No detailed instrumentation was provided with the study.[133] The 2022 study was thematically categorized in how organizational characteristics or processes affect workload, workflow design, or work performance, comparing the improvements of molecular order sets and precision before and after the roll-out of a pilot program improving precision oncology workflows.[128] The study was conducted in a regional cancer network and included organizational process such as use of hospital information technology systems, referral processes, and clinical decision support. Further study details are described in Appendix D, Evidence Tables D-9 through D-12.

3.3.3.1.1.3 Guiding Question 3a: Treatment Outcomes

Nine studies addressing Guiding Question 3 examined cancer treatment outcomes. Studies of treatment-related topics covered a range of thematic categories, including: impact of total care delivery models; workforce training or capacity assessment; implementation projects and barrier assessments; structural or resource characteristics; and workload, workflow, or work

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

performance. These studies were published between 2012 and 2022, most (6) since 2017. The designs for treatment-related studies were mostly retrospective or prospective cohort studies (5) and cross-sectional (3) designs. One was a longitudinal case study design.[161] Most studies used cancer-specific settings: outpatient or community cancer centers;[119, 162] medical oncology practices;[115] Colorectal Cancer Control Program awardees and partner clinics;[161] an academic cancer center;[126] and a hospital radiation oncology department.[123] Two studied noncancer settings including a general medical hospital[117] or hospital systems.[151] One setting was left unspecified.[144] Given the nature of these studies as focusing on treatment, all examined populations of patients with a history of cancer or providers/organizations[115, 163-165] treating patients with cancer. Cancer types examined included: breast;[117, 162] colon, rectal or colorectal;[161-163] lung;[99] non-Hodgkin's lymphoma;[99] and sarcoma.[126] In two studies the type of cancer was not specified,[119] or was only described as "cancers requiring surgery."[151]

The treatment-related studies used primary or secondary outcomes at the organization level for the most part. These included measures of: adherence to quality care processes or indicators;[115, 162] improvement of quality scores;[115] underuse of breast cancer care;[117] workload and procedural compliance and time-to-scenario completion;[126] organizational factors or conditions (e.g., electronic health record use, leadership support, patient-centered culture, information sharing);[117, 166] serious errors reaching the patient;[123] and physician enrollment in the National Cancer Institute (NCI) Community Clinical Oncology Program (CCOP).[119] Two studies focused on patient-level outcomes. One had as its primary outcome adherence to guidelines and included secondary outcomes of 5-year overall survival, number of surveillance radiology studies, any unplanned hospitalization, and any emergency department visit.[144] Another had a patient-level primary outcome of 30-day postoperative complications and a secondary outcome of 30-day mortality and readmissions.[151]

As shown in Table 9a, the organizational context measures evaluated in the treatment-related group included the typical consideration of size and volume[123, 156, 164, 167] and organization type,[117, 164, 167] as well as demographics of patient panels;[151] affiliation;[115, 167] location;[115, 167] and service comprehensiveness [see Table 1a for definition].[115, 164] With greater novelty, some assessed centralization (e.g., how consolidated units are or decision-making is);[151] provider and team experience;[144] organizational factors such as integration of evidence-based interventions, adoption of team-based approach, leadership support;[161] and knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes.[119] Examples of measurement and instrumentation along with other study details are included in Appendix D, Evidence Tables D-13 through D-16.

As also shown in Table 9b, the cancer treatment-related studies used several organizational process measures, including: care management processes;[117, 162, 163] participation in state or national quality improvement collaboratives;[119, 166] use of quality improvement or other improvement methods (e.g., Lean Six Sigma, Comprehensive Unit Safety Program);[115] provider/team training;[126] and workload as determined by hospital patient records and physician scheduling records.[123] Measurement of organizational phenomena within a category varied substantially, however. For example, care management processes were measured as a module score related to core processes, processes specific to cancer-type or disease-specific processes, processes relating to supportive care, and processes involved in end-of-life care.[99] In another study, care management processes were measured more as guideline compliance (e.g., consultation with a medical oncologist for stage III patients and initiation of chemotherapy within 120 days of surgery for colon cancer).[144]

3.3.3 Findings, Guiding Question 3: Which healthcare organization context and process characteristics have been examined in studies assessing the delivery of cancer screening, diagnosis, and treatment?

3.3.3.1.1.4 Guiding Question 3a: Comprehensive Cancer Care

Two studies met the criterion for Guiding Question 3 but did not consider screening, diagnosis, or treatment specifically.[129, 136] Instead, they addressed organizational influences on comprehensive cancer care. Thematically, the studies were classified under leadership[136] and workload, workflow design, or work performance.[129] The 2022 study focusing on leadership sought to test effects of an EBP leadership immersion intervention on EBP attributes over time among two cohorts of leaders at one national comprehensive cancer center. It relied on a prospective cohort design and studied providers rather than a patient population.[136]

The primary outcomes of the study focusing on leadership were EBP knowledge, implementation, and readiness assessed via a Likert-scaled survey.[136] The prospective cohort study which looked at the impact of an EBP leadership program used EBP beliefs and implementation scales such as: the EBP Knowledge Scale (25 multiple choice and 13 true/false questions), EBP Belief Scale (16 item scale), EBP Competency Scale (24 skills evaluated on 4-point Likert scale), EBP Implementation Scale (18-item frequency scale), and The Organizational Culture and Readiness System-wide Integration of EBP Scale. Specific items assessed knowledge, attitudes, and beliefs of managers, providers, and staff about organizational characteristics, policies, or processes. Instruments included the EBP Knowledge Scale; EBP Belief Scale; EBP Competency Scale; EBP Implementation Scale; and The Organizational Culture and Readiness System-wide Integration of EBP Scale.[136]

The 2022 study focusing on workload, workflow, or work performance looked at identifying and addressing inefficiencies in a high-volume radiation oncology clinic. This was done by comparing the before and after utilization of process maps and optimizing patient flow.[129] The study looked at waiting room times, waiting time for physicians, time in room to arrival of physician, and total cycle time as the primary outcomes. The measures were obtained from electronic health records and in-person observations. No further details were given on instrumentation. See Appendix D, Evidence Tables D-17 through D-20 for additional details on instrumentation.

3.3.4 Guiding Question 4: What are the evidence gaps and future research needs?

3.3.4.1 Main Findings on Guiding Question 4

To address what evidence gaps and future research needs are, we revisited advice of the Key Informants, our own overview of problems in adequately assessing organizational characteristics, and the results of our review of the literature. We identified the utility and importance of measuring organizational phenomena. We also highlight the need for additional high-quality measurement of organizational constructs, a lack of standardized measures, and a need for more complex and in-depth organizational measurement to improve understanding of organizational influences on cancer care.

3.3.4.1.1 Guiding Question 4a: What are the evidence gaps in the current understanding of how organizational characteristics impact cancer care delivery and cancer-related outcomes?

Based on input of KIs and our review of the literature on organizational characteristics that influence cancer care delivery, we identified several gaps and critiques regarding the

3.3.4 Findings, Guiding Question 4: What are the evidence gaps and future research needs?

relationships of organizational structure, context, and processes to how cancer care is delivered and the outcomes of screening, diagnosis, and treatment. KIs cautioned that the influence on organizations and patient care of the COVID-19 pandemic are just beginning to appear in the literature and questions remain about how organizations can remain vigilant and better prepare for future shocks to the system. In addition, they noted that terminology is not used consistently in the literature. As an example, "organization structure" is used inconsistently in the literature, having both a broad connotation following Donabedian and a more specific one referring to "the segmentation of an organization into sub-units and the integrating mechanisms that are intended to span those sub-units." Some organization characteristics would be considered structure by some authors and not by others. In turn, lack of consistent terms leads to difficulty in measurement due to the range of interpretations (e.g., creating ambiguity in survey responses).[168] Furthermore, KIs noted that additional attention to defining the unit of analysis in relevant frameworks may enhance their utility. For example, frameworks intended to represent person-level phenomena may be inappropriately assumed to apply to organizational decision-making. They also pointed to some ambiguity in traditional definitions of organizational types, e.g., that academic and community settings are becoming more homogenous as community hospitals expand into academic roles. KIs also pointed to the importance of considering temporal factors and structural and temporal complexity in current and future examinations of organizational characteristics. For example, team dynamics and leadership buy-in are understood to change over time but may be measured only once to minimize respondent burden; the resultant understanding of the influence of these organizational characteristics would thus be incomplete.

Our review of the literature highlighted other important lessons. This report was not designed to explore the extent to which the field includes and explores a broader set of cancer-related outcomes including palliative care, end-of-life care, and survivorship. For example, notably omitted by our predetermined scope is the Nekhlyudov survivorship framework.[169] Further, few studies focused on diagnosis as an outcome. These additional cancer-related outcomes are vital to understanding the full continuum of the cancer experience. Indeed, the trajectory of disease has become more varied with the advent of new technologies and medications, as well as the variation in people's health at any age.

In general, explicit reliance on theory or theoretical frameworks was unusual across the reviewed studies (e.g., Table 7 is somewhat sparse). We also found a wide range in the rigor of measurement and reporting of organizational characteristics. Notably, organizational ownership was reported in only three cases among the 23 selected studies for Guiding Question 3. We noted that studies may connect organizational characteristics and cancer outcomes but may not investigate mechanisms by which these effects are produced.[103] Theory is needed to guide interventions to accommodate or modify features of organizational context and processes based on clear understanding of mechanisms underlying the relationship between organizational characteristics and cancer outcomes. Theory would help to address the decisional dilemma we raised--of how we can define and measure organizational characteristics to improve research on cancer care delivery and enhance cancer care and outcomes--by identifying interventions that are likely to address the mechanisms underlying organizational characteristics' influence on cancer outcomes.

Studies we reviewed provided further insight into the state of the current literature. The studies differed in their approaches to establishing pathways from an intervention (e.g., intervention, care model, or program) to organizational process changes, to organizational outcomes, to clinical process changes, and to cancer care outcomes. Those with the most rigorous study designs tended to measure participation in an intervention (as the only

3.3.4 Findings, Guiding Question 4: What are the evidence gaps and future research needs?

organizational characteristic) and cancer care process measures (e.g., screening rates) compared to a control group. The studies with cross-sectional approaches measured intermediate points or mediators in the pathways (e.g., teamwork, access/communication),[100, 103] such as multiple organizational concepts and measures representing structures, processes, and context. In addition, the studies that found no association between primary outcomes and organizational characteristics explored organizational characteristics more often, including as mediators, in their analyses (for example, electronic health record use or patient tracking and registry functions).[83, 108] This suggests that authors recognize the disruptive or promotive effects that organizations and systems have on efforts to provide cancer care.

Other insights on gaps in the literature included a need for additional study on such topics as: multilevel interventions that consider provider-level factors such as training and practice-level factors including system design;[89, 123] the effects of accreditation on oncologic and patient-reported outcomes;[133] the effects of providing formal EBP education to healthcare leaders;[136] the impact of specific policies and economic incentives for specific organizational design choices such as centralization (consolidation of delivery sites) of care delivery;[151] and wide performance gaps that remain in some specific clinical areas.[115] In particular, the relative lack of organizational interventions such as longitudinal leadership training, institution of a quality management infrastructure, or a total care model, specifically for cancer care may be due to the difficulties of linking these interventions to outcomes and therefore, of obtaining funding for such research.

3.3.4.1.2 Guiding Question 4b: What methodologic approaches or measurement tools are needed to better understand the impact of organizational context and processes on the delivery of and outcomes associated with cancer screening, diagnosis, and treatment?

Research conducted to date reflects both the opportunities and challenges in assessing organizational characteristics. In their review of cancer care delivery research protocols from the NCI Community Oncology Research Program (NCORP), Weaver et al. found that assessment of organizational characteristics was common (15/19 protocols, 79%), with 15 of 19 protocols including some assessment of structural characteristics, 14 protocols assessing at least one process measure, and 12 protocols assessing organization-level outcomes.[3] While assessing organizational characteristics was common, the extent to which measurement approaches were based on organizational theories was more variable. Most intervention protocols referred to implementation science frameworks,[3] which call on many, although often not all, relevant healthcare organization characteristics or theories. In addition, many measures used to assess organizational characteristics were investigator-developed, with little or no information about the instrument's validity or psychometric performance.[3]

Studies we reviewed suggested the need to develop tools and incentives to inspire improvement in cancer care delivery.[115] We note that use of organizational theories to inform measurement approaches and tools is lacking in many cases. For example, organizational characteristics influencing the efficiency and quality of healthcare delivery involve multiple levels (e.g., clinic, system, and local community environment) and multiple perspectives (e.g., patient, provider, administrative),[3] but often only one, or a few levels and/or perspectives are addressed. The result is a dearth of evidence that applies well to complex, real world circumstances. Also, changes in care delivery models are influenced by contextual characteristics within the organization, system, and community surrounding the organization.[12] Measurement of these non-structural characteristics using externally valid constructs is difficult.[3] For example,

3.3.4 Findings, Guiding Question 4: What are the evidence gaps and future research needs?

while measuring the number of beds and patient volume may be straightforward, assessing organizational change (e.g., readiness to adopt a new healthcare delivery model) is a much more complex undertaking, generally requiring labor intensive surveying or interviewing to appropriately characterize. Even where solid instrumentation exists, *de novo* instruments are regularly developed due to lack of awareness of existing measures, differing disciplinary roots (e.g., psychology versus political science versus epidemiology) or to the incentives of grantsmanship and the emphasis on novelty and originality in academia. This proliferation of instruments, tools, and measure definitions makes it difficult to draw conclusions across the body of the literature. If measures are not comparable then one cannot easily compare effects of alternative interventions, for example.

Another measurement challenge stems from the findings that studies intended to measure the effects of organizational characteristics are often observational and highly variable in their design and methods. This finding can lead to difficulty homing in on generalizable information, especially since observational studies only provide evidence of associations between outcomes and organizational characteristics. Thus, stronger study designs are needed to measure associations, and any potential causal effects of organizational characteristics on cancer care outcomes.

Other challenges must be addressed when measuring the effects of organizational characteristics on cancer care.[3] Multiple types of organizations are involved in cancer care delivery, ranging from solo practices to large integrated health systems; no standard description of these organization types exists or perhaps could even effectively be developed. The Commission on Cancer categorizes different types of cancer programs using facility type, program structure, services offered, and caseload;[170] however, it only applies to centers that treat cancer (i.e., would not include the screening and, to a certain extent diagnosis, which are also addressed in this Technical Brief). For healthcare organizations more generally, the AHRQ Compendium paved the way by beginning a conversation about how to categorize different organization or system types.[26] Further, since the same patient may be seen and cared for by multiple types of organizations, analyses that do not account for different organizational types and designs will sometimes compare apples and oranges. For example, one breast cancer patient may be diagnosed at a stand-alone imaging facility, have surgery at an academic medical center, and receive chemotherapy close to home at a small medical oncology practice. A different breast cancer patient may experience her entire cancer journey in a single, integrated healthcare delivery system. This continuum between modular and integrated care delivery raises questions within and across delivery systems regarding how care will be coordinated within and between systems, who will be responsible for providing supportive services such as psychosocial care, which arrangement stands to provide the highest quality and best patient experience, or whether there exists a consistent "best" type of organizational design. Even more concerning, this complexity exists within variable organizational contexts (i.e., geographic areas, degrees of rurality, and so on). Thus, tools to evaluate coordination of multidisciplinary care are needed to better measure the effects of organizational characteristics including contextual factors on cancer care.[171, 172]

Not only are better organizational instruments, measures, and tools called for in cancer-related research, but there may be a case for standardization of assessments, terminology, and characteristics. Development of standardized measures may increase ease of use and expand the population of researchers able to collect and analyze organizational influences on cancer care. One downside of standardization, however, is that it can also be used to exclude (from publication and from funding) those who do not use the standard measures, stifling creativity and

3.3.4 Findings, Guiding Question 4: What are the evidence gaps and future research needs?

potentially reducing diversity among researchers. As issues and perspectives change over time, standardization can cause stagnation of a field. As an example, we are more aware now than ever of how organizational features can produce inequities in care. Thus, the field must consider how an increased focus on equity in healthcare delivery may alter the assessment of organizational characteristics and what aspects of organizations to attend to. The National Cancer Care Network (NCCN) has provided development of a report card assessing equitable care delivery, which could provide data to assess how this might change or improve over time.[173]

Although patient characteristics can explain some variance in cancer care delivery and outcomes, much of the variance may be attributable to hospitals' negotiating power with insurers, system-level infrastructure readiness, variable leadership and teamwork, organizational culture differences, or the clinical workforce network within the community. Therefore, efforts to measure the effects of organizational characteristics on cancer care must account for such variation in incorporating organizational characteristics, contextual elements, and processes in cancer care delivery research. Attention to methods improvement and standardization should perhaps precede investigations of which factors are most influential, in order to be sure such assessments are accurately made. Such efforts will help to enhance our knowledge of the context and environment where the care is delivered, improve the reliable performance of interventions as they are disseminated in new settings, and reduce waste in public investment. Ultimately, such knowledge will help to improve patient outcomes over the continuum of cancer care.

4. Summary and Implications

For Guiding Question 1, we abstracted 17 frameworks that covered a range of applications. Our comparison of these frameworks to the Integrated Framework supports the comprehensiveness of the Integrated Framework, though a few organizational characteristics (accessibility, readiness for change, experience with change, absorptive capacity, and complexity) were found in multiple abstracted frameworks and not explicitly identified in the Integrated Framework. In general, using a framework is essential for both research and practice, as it maps out the path by which outcomes are achieved. It describes our baseline understanding, governs measurement, guides the specification of expected relationships, and signals weak spots in organizational processes. Although the additional characteristics and phenomena we identified are important in other relevant frameworks, we did not compare their weight in producing outcomes with the existing Integrated Framework elements. Empiric testing would be the optimal method to make such claims. Further, it may be the case that the "missing" elements are included in the Integrated Framework under other terminology, which varies broadly across the cancer care and organizational fields. Providing the definitive explanation of terms, differentiating them from each other, and providing a complete classification scheme are important next steps as described more below. This Technical Brief findings provide important foundational information to support these discussions.

In the short-term, the Integrated Framework developers can use this Technical Brief's information to determine whether these characteristics are indeed missing and, if so, whether they warrant being added. Overall, the review provides reassurance that key domains and subdomains are already included in the Integrated Framework. Much remains to be considered with respect to the terms, classification, and anticipated relationships among organizational elements.

For Guiding Questions 2-4, we identified 90 studies offering approaches to understanding how organizational characteristics are described, measured, and tested in the context of cancer care delivery. After topically categorizing and describing these studies thematically for Guiding Question 2, we selected 25 studies with strong fit to Guiding Question 3 and sufficiently detailed description of measurement to permit replication. We sorted these studies by whether they focused on screening, diagnosis, or treatment, and detailed their study designs, primary and secondary outcomes, and organizational characteristics measured. We also reviewed 33 grey literature resources and summarized 8 relevant briefs, reports, or white papers. Overall, we found that cancer-related studies that include organizational measures have used approaches that include quantitative, qualitative, and mixed methods seeking to achieve both formative and summative purposes, a full range of study designs from case studies to randomized controlled trials, and examine organizational topic areas including project implementation and barrier assessment, participation in total care models, and relationships of structural characteristics such as organizational type and size with patient- and organization-level outcomes. We provide a catalog of organizational measures that have been examined in the cancer care literature, noting little standardization of measures across studies and variation in terms used.

For Guiding Question 4, we enumerated gaps remaining in the literature and identified fruitful areas for future research. Among the themes identified were continuing challenges in effectively measuring organizational factors, opacity of our understanding of how the multilevel aspects of organizational context and process might affect care, and a lack of standardization of terminology or measures in organizational research on cancer care. Together these gaps lead to the conclusion that organizational features of the system are influential and useful to assess when

precisely defined, but currently remain poorly understood and present a prime area for elucidation through further research (Table 10).

Table 10. Summary, implications, and next steps

Guiding Question	Summary and Implications	Next Steps

GQ1	• A framework is essential for both research and practice.
	• Findings largely support the Integrated Framework.
	• Variables for the Integrated Framework to consider (if not already included under different terminology):
	  ○ Accessibility
	  ○ Readiness for change
	  ○ Experience with change
	  ○ Absorptive capacity
	  ○ Complexity
		• Considerations should be made for definitive:
		  ○ Explanation of terms
		  ○ Classification of schemes
		  ○ Defining relationships among organizational elements

GQ2	• Approaches that have been utilized include quantitative, qualitative, and mixed methods.
	• A wide range of study designs utilized including case studies, observational studies, and RCTs.
	• Organizational topic areas include:
	  ○ Project implementation and barrier assessment
	  ○ Participation in total care models
	  ○ Relationships of structural characteristics
		• Further guidance needed, such as a compendium of measures, definitions, and measurement approaches.

GQ3	• Organizational measurement areas include:
	  ○ Size
	  ○ Payment program participation
	  ○ Demographics of the patient population
	  ○ Teamwork
	  ○ Provider attitudes
	  ○ Centralization
		• Need for definition of terms and measures.

GQ4	• Challenges in effectively measuring organizational factors.
	• Need for clarity of understanding on how multilevel aspects of organizational context and process affect care.
	• Lack of standardization of terminology.
	• Lack of standardization of measures in organizational research.
		• Additional investment needed to further the development and application of methods to study organizational characteristics.
		• Future investments should include:
		  ○ Training in multilevel analyses
		  ○ Structural equation modeling
		  ○ Handling mediators and moderators in analyses

GQ=Guiding Question; RCT = randomized controlled trial

4.1 Strengths and Limitations

To address the questions in this Technical Brief, we limited our literature search strategy to US-based cancer-related publications from 2010 forward (though Guiding Question 1 included frameworks published prior to 2010 if mentioned in publications since 2010). We focused on US-based studies as the organization, financing, and delivery of healthcare in the US is unique. However, publications from prior to 2010, in the organization's literature outside of cancer care delivery, and in other countries could have offered insights in addressing the Guiding Questions.

Despite these literature search restrictions, the broad literature search strategy resulted in many records. We used artificial intelligence (AI) to expedite the screening process. However, two reviewers screened 10 percent of the records, and this information informed the AI system's review. In addition, a single reviewer evaluated 10 percent of the AI reviewed records to ensure accuracy and consistency. It is possible that studies that might have qualified for inclusion were

missed, but it is unlikely that, given the methodologic nature of this topic, missed studies would substantively alter our findings.

For Guiding Question 1, two reviewers determined eligibility of frameworks for inclusion. It was not always clear what constitutes a framework. For the purposes of this project, we defined an organizational framework as "a framework or organization of the characteristics used to evaluate healthcare organizations." To be included, frameworks had to address multiple domains/subdomains of the Integrated Framework. Some topics were tangentially related but not included. For example, accreditation standards that evaluate organizational characteristics were generally not included. On the other hand, literature on multilevel research, if it included measurement of organizational characteristics, was generally included. Given that we found few characteristics in the 17 abstracted frameworks that were not already covered in the Integrated Framework, it is unlikely that any excluded frameworks would have substantially affected our findings. Arguably, some of the frameworks that were included could have been excluded. Again, this is a grey area.

Also, the comparison of the characteristics in the included frameworks to the Integrated Framework was subject to interpretation. While we are confident that the key concepts are covered, nuances in interpretation may vary. For example, the Integrated Framework includes the characteristic "financial solvency" whereas other frameworks included more specific characteristics such as profitability and liquid asset availability. Some specific terms might not be in the Integrated Framework but might be implied or incorporated in broader terms (e.g., the more specific "standard practice concerning patient contact" versus the more general "care management processes"). In addition, as noted previously, there is a lack of agreement regarding the definitions of key concepts in the field. For Guiding Question 1, Table 3, the abstracted categories and characteristics were taken directly from the papers to minimize the need to deduce framework components from the text. Some readers might question whether the characteristics abstracted truly qualify as organizational context or process. This ambiguity calls for further work to agree on terms and promote their use in further research, though such common terminology systems should not be used to limit intellectual diversity and innovation.

A second team member evaluated the comparison of the characteristics from the abstracted frameworks to the Integrated Framework so that the final column of Table 3 reflects the interpretation of two reviewers. However, all readers of the report can compare the characteristics listed in the third column of Table 3 to the Integrated Framework (Table 1a-1c) and make their own judgments about what is included and what may be missing.

For Guiding Questions 2-4, the chief limitation of this work was the need to involve a large team in screening, categorizing, reviewing, abstracting, and summarizing studies for feasibility, which may decrease consistency in how studies were categorized according to themes and what information was considered most relevant for reporting. We addressed this problem by using double review whenever possible, creating templates, and calibrating team members' understanding through discussion of conflicts and subsequent rounds of review. Despite this limitation, having multiple perspectives on each stage of the process likely strengthened the rigor and reliability of our research processes. We also found the pursuit of recommended grey literature sources to be challenging. Some expert recommendations pointed to websites that included interesting materials and many products relevant to organizational characteristics, but that had marginal relevance to cancer care or had so many individual items that comprehensive assessment was not feasible. We addressed this problem by targeting non-published written reports, briefs and white papers that included organizational characteristics and specifically addressed cancer care. For Guiding Question 4, the limited focus on organizational

characteristics in study design and measurement in the literature as a whole makes specifying gaps and identifying the most pressing research needs challenging.

4.2 Next Steps

Guiding Question 1 sought to compare the Integrated Framework to the content of other frameworks associated with cancer screening, diagnosis, and treatment to evaluate whether key organizational characteristics are missing. The Guiding Question 1 findings largely support the comprehensiveness of the Integrated Framework, because the overwhelming majority of characteristics found in other frameworks are already included in the Integrated Framework. A few variables, most notably accessibility, readiness for change, experience with change, absorptive capacity, and complexity, were identified from other frameworks and are arguably not explicitly included in the Integrated Framework. The Integrated Framework developers should evaluate the relevance and importance of variables found in other frameworks, perhaps through an expert panel approach, and determine whether they warrant inclusion in the Integrated Framework. Otherwise, the Integrated Framework should not require substantial revision. Further work could undertake a process of definitively describing, classifying, differentiating, serially ordering, and ultimately testing of organizational concepts as related to cancer care.

The goals of Guiding Questions 2-4 were to describe the field of current organizational research in the context of cancer care, to assess the state of measurement in the field and to identify gaps in the available literature. The findings for Guiding Questions 2-4 suggest that guidance on organizational characteristics used in cancer care research to date will permit progress toward our consolidating and applying best evidence in this complex and changing care area. Guidance in the form of a compendium of measures, suggested definitions and measurement approaches would be a welcome support to researchers who recognize the importance of organizational influences but are not sure how to manage the enormity of the task of meaningfully measuring them. Such a compendium could encourage rigorous research without stifling creativity in developing new and better measurement approaches to a wide array of important organizational concepts. Similarly, generation of scientific and/or publication guidelines (e.g., Consolidated Standards of Reporting Trials guidelines [CONSORT][174]) for these kinds of studies could prompt cancer researchers on reporting expectations that would make the consolidation of knowledge easier in the future.

The National Cancer Institute (NCI) and the Agency for Healthcare Research and Quality (AHRQ) could advance the field by convening an expert panel to review the Integrated Framework, this Technical Brief, and other sources and debate the included elements, final terminology, best practice measurement, and anticipated relationships among the elements included in the Integrated Framework. This could be conducted as a Delphi process in several rounds with a prioritization process that includes consideration of strength of anticipated associations, feasibility of measurement, and commonality in systems today. The findings of the panel could form a compendium of organizational phenomena that influence cancer screening, diagnosis, and treatment, possibly adding the important focus of survivorship (the latter of which may in fact implicate a different set of organizational concerns). Once a "state of the art" is defined, NCI alone or in collaboration with other parts of the National Institutes of Health, AHRQ. and the Department of Veterans Affairs could consider sponsoring a conference, similar to the NCI's pre-pandemic conference on Organizational Research in Healthcare, to disseminate findings and engage a broader array of researchers and other audiences in the work.

Other recommendations include additional investment to advance the development and application of methods to study organizational characteristics. Such investment could include

training in multilevel and hierarchical analyses, structural equation modeling, and handling mediators and moderators in analyses; efforts to change other training (e.g., in organizational science) and mentorship; incentives for multilevel/organizational interventions; and improvement of the caliber of scientific review in this arena, are all potential outcomes of this effort that could be realized.

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Appendix A. Methods

Search Strategies for Published Literature

Table A-1. Guiding Question 1 PubMed search strategy

#	String
1	"framework"[Title/Abstract]
2	"theory"[Title/Abstract]
3	"theory of change"[Title/Abstract]
4	"logistical framework"[Title/Abstract]
5	"log frame"[Title/Abstract]
6	#1 OR #2 OR #3 OR #4 OR #5
7	"medical oncology"[MeSH Terms]
8	"Early Detection of Cancer"[MeSH Terms]
9	"biomarkers, tumor"[MeSH Terms]
10	"Cancer Care Facilities"[MeSH Terms]
11	"oncology service, hospital"[MeSH Terms]
12	"Cancer Screening"[Title/Abstract]
13	"Cancer Early Detection"[Title/Abstract]
14	"Early Diagnosis of Cancer"[Title/Abstract]
15	"cancer early diagnos*"[Title/Abstract]
16	"tumor biomarker*"[Title/Abstract]
17	"biologic tumor marker*"[Title/Abstract]
18	"cancer biomarker*"[Title/Abstract]
19	"cancer care facilit*"[Title/Abstract]
20	"cancer hospital*"[Title/Abstract]
21	"hospital oncology service*"[Title/Abstract]
22	"cancer care unit*"[Title/Abstract]
23	"medical oncology"[Title/Abstract]
24	"cancer care delivery"[Title/Abstract]
25	#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24
26	2010/01/01:3000/12/31[Date - Publication]
27	"English"[Language]
28	"animals"[MeSH Terms]
29	"humans"[MeSH Terms]
30	(#26 AND #27) NOT (#28 NOT #29)
31	#6 AND #25 AND #30

Table A-2. Guiding Question 2 and Guiding Question 3 PubMed search strategy

#	String
1	"Organizational Culture"[MeSH Terms]
2	"Organizational Characteristics"[Title/Abstract]
3	"organizational innovation"[MeSH Terms]
4	"Leadership"[MeSH Terms]
5	"organization and administration"[MeSH Terms:noexp]
6	"knowledge management"[MeSH Terms]
7	"crew resource management, healthcare"[MeSH Terms]
8	"Health Workforce"[MeSH Terms]
9	"efficiency, organizational"[MeSH Terms]
10	"quality assurance, health care"[MeSH Terms:noexp]
11	"Health Resources"[MeSH Terms]
12	"Organization structure"[Title/Abstract]
13	"Organizational structure"[Title/Abstract]
14	"Structural characteristics"[Title/Abstract]
15	"Organization context"[Title/Abstract]

#	String
16	"Organizational context"[Title/Abstract]
17	"Organization climate"[Title/Abstract]
18	"Organizational climate"[Title/Abstract]
19	"Care coordination"[Title/Abstract]
20	"Organization design"[Title/Abstract]
21	"Organizational design"[Title/Abstract]
22	"Organization learning"[Title/Abstract]
23	"Organizational learning"[Title/Abstract]
24	"Organizational change"[Title/Abstract]
25	"Organization change"[Title/Abstract]
26	"Teamwork"[Title/Abstract]
27	"team work"[Title/Abstract]
28	"Team processes"[Title/Abstract]
29	"Team norms"[Title/Abstract]
30	"Team performance"[Title/Abstract]
31	("Team"[Title/Abstract] AND "coordination"[Title/Abstract])
32	("Team"[Title/Abstract] AND "communication"[Title/Abstract])
33	"organizational performance"[Title/Abstract]
34	"organization performance"[Title/Abstract]
35	"Program Evaluation"[MeSH Terms]
36	"Program Evaluation"[MeSH Terms]
37	"care delivery"[Title/Abstract]
38	"decision making, organizational"[MeSH Terms]
39	"Efficiency"[MeSH Terms]
40	"Health Facility Administration"[MeSH Terms]
41	"Hospital Administration"[MeSH Terms]
42	"Institutional Management Teams"[MeSH Terms]
43	"Management Information Systems"[MeSH Terms]
44	"Military Health Services"[MeSH Terms]
45	"models, organizational"[MeSH Terms]
46	"Multi-Institutional Systems"[MeSH Terms]
47	"Organizational Affiliation"[MeSH Terms]
48	"ownership"[MeSH Terms]
49	"Employee Incentive Plans"[MeSH Terms]
50	"Leadership"[MeSH Terms]
51	"Management Quality Circles"[MeSH Terms]
52	"personnel administration, hospital"[MeSH Terms]
53	"Personnel Delegation"[MeSH Terms]
54	"Personnel Downsizing"[MeSH Terms]
55	"Personnel Loyalty"[MeSH Terms]
56	"Personnel Selection"[MeSH Terms]
57	"Personnel Staffing and Scheduling"[MeSH Terms]
58	"Personnel Turnover"[MeSH Terms]
59	"Physician Incentive Plans"[MeSH Terms]
60	"Staff Development"[MeSH Terms]
61	"Work Engagement"[MeSH Terms]
62	"Workplace"[MeSH Terms]
63	"Strategic Planning"[MeSH Terms]
64	"Professional Practice"[MeSH Terms]
65	"Community-Institutional Relations"[MeSH Terms]
66	"Hospital-Patient Relations"[MeSH Terms]
67	"Hospital-Physician Relations"[MeSH Terms]
68	"Interdepartmental Relations"[MeSH Terms]
69	"Interinstitutional Relations"[MeSH Terms]
70	"Patient Satisfaction"[MeSH Terms]
71	"Risk Management"[MeSH Terms:noexp]
72	"shared governance, nursing"[MeSH Terms]
73	"Total Quality Management"[MeSH Terms]

#	String
74	"alert fatigue, health personnel"[MeSH Terms]
75	"benchmarking"[MeSH Terms]
76	"medical audit"[MeSH Terms]
77	"Nursing Audit"[MeSH Terms]
78	"near miss, healthcare"[MeSH Terms]
79	"Potentially Inappropriate Medication List"[MeSH Terms]
80	"Total Quality Management"[MeSH Terms]
81	"accreditation"[MeSH Terms]
82	"Pharmacy and Therapeutics Committee"[MeSH Terms]
83	"Public Reporting of Healthcare Data"[MeSH Terms]
84	"quality management"[Title/Abstract]
85	"Healthcare Quality Assurance"[Title/Abstract]
86	"Administration and Organization"[Title/Abstract]
87	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR #68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #79 OR #80 OR #81 OR #82 OR #83 OR #84 OR #85 OR #86
88	"medical oncology"[MeSH Terms]
89	"Early Detection of Cancer"[MeSH Terms]
90	"biomarkers, tumor"[MeSH Terms]
91	"Cancer Care Facilities"[MeSH Terms]
92	"oncology service, hospital"[MeSH Terms]
93	"Cancer Screening"[Title/Abstract]
94	"Cancer Early Detection"[Title/Abstract]
95	"Early Diagnosis of Cancer"[Title/Abstract]
96	"cancer early diagnos*"[Title/Abstract]
97	"tumor biomarker*"[Title/Abstract]
98	"biologic tumor marker*"[Title/Abstract]
99	"cancer biomarker*"[Title/Abstract]
100	"cancer care facilit*"[Title/Abstract]
101	"cancer hospital*"[Title/Abstract]
102	"hospital oncology service*"[Title/Abstract]
103	"cancer care unit*"[Title/Abstract]
104	"medical oncology"[Title/Abstract]
105	"cancer care delivery"[Title/Abstract]
106	#88 OR #89 OR #90 OR #91 OR #92 OR #93 OR #94 OR #95 OR #96 OR #97 OR #98 OR #99 OR #100 OR #101 OR #102 OR #103 OR #104 OR #105
107	2010/01/01:3000/12/31[Date - Publication]
108	"English"[Language]
109	"animals"[MeSH Terms]
110	"humans"[MeSH Terms]
111	(#107 AND #108) NOT (#109 NOT #110)
112	"review"[Publication Type]
113	"guideline"[Publication Type]
114	"practice guideline"[Publication Type]
115	"literature-review"[Title]
116	"systematic-review"[Publication Type]
117	"meta-analysis"[Publication Type]
118	"systematic-review"[Title]
119	"systematic-literature-review"[Title]
120	"scoping-review"[Title]
121	"cochrane-review"[Title]
122	"meta-analysis"[Title]
123	"meta-analysis"[Title]
124	"address"[Publication Type]
125	"autobiography"[Publication Type]

#	String
126	"bibliography"[Publication Type]
127	"biography"[Publication Type]
128	"comment"[Publication Type]
129	"dictionary"[Publication Type]
130	"directory"[Publication Type]
131	"lecture"[Publication Type]
132	"legal case"[Publication Type]
133	"legislation"[Publication Type]
134	"news"[Publication Type]
135	"newspaper article"[Publication Type]
136	"patient education handout"[Publication Type]
137	"periodical index"[Publication Type]
138	#112 OR #113 OR #114 OR #115 OR #116 OR #117 OR #118 OR #119 OR #120 OR #121 OR #122 OR #123 OR #124 OR #125 OR #126 OR #127 OR #128 OR #129 OR #130 OR #131 OR #132 OR #133 OR #134 OR #135 OR #136 OR #137
139	#87 AND #106 AND #111 NOT #138

Table A-3. Guiding Question 1 CINAHL and PsycInfo search strategy

#	CINAHL/Psycinfo
1	TI("framework" OR "theory" OR "theory of change" OR "logistical framework" OR "log frame")
2	AB("framework" OR "theory" OR "theory of change" OR "logistical framework" OR "log frame")
3	#1 OR #2
4	MM("medical oncology" OR "Early Detection of Cancer" OR "biomarkers, tumor" OR "Cancer Care Facilities" OR "oncology service, hospital")
5	TI("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
6	AB("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
7	#4 OR #5 OR #6
8	LA(English)
9	MM (Animals NOT human)
10	#6 NOT #7
11	#3 AND #7 AND #10
12	Date limit 2010 - present

Table A-4. Guiding Question 2 and Guiding Question 3 CINAHL and PsycInfo search strategy

#	CINAHL/Psycinfo
1	MM("Leadership" OR "knowledge management" OR "crew resource management, healthcare" OR "Health Workforce" OR "efficiency, organizational" OR "Health Resources" OR "Program Evaluation" OR "Program Evaluation" OR "decision making, organizational" OR "Efficiency" OR "Health Facility Administration" OR "Hospital Administration" OR "Institutional Management Teams" OR "Management Information Systems" OR "Military Health Services" OR "models, organizational" OR "Multi-Institutional Systems" OR "Organizational Affiliation" OR "ownership" OR "Employee Incentive Plans" OR "Leadership" OR "Management Quality Circles" OR "personnel administration, hospital" OR "Personnel Delegation" OR "Personnel Downsizing" OR "Personnel Loyalty" OR "Personnel Selection" OR "Personnel Staffing and Scheduling" OR "Personnel Turnover" OR "Physician Incentive Plans" OR "Staff Development" OR "Work Engagement" OR "Workplace" OR "Strategic Planning" OR "Professional Practice" OR "Community-Institutional Relations" OR "Hospital-Patient Relations" OR "Hospital-Physician Relations" OR "Interdepartmental Relations" OR "Interinstitutional Relations" OR "Patient Satisfaction" OR "shared governance, nursing" OR "Total Quality Management" OR "alert fatigue, health personnel" OR "benchmarking" OR "medical audit" OR "Nursing Audit" OR "near miss, healthcare" OR "Potentially Inappropriate Medication List" OR "Total Quality Management" OR "accreditation" OR "Pharmacy and Therapeutics Committee" OR "Public Reporting of Healthcare Data" OR "organization and administration" OR "quality assurance, health care" OR "Risk Management")
2	TI("Organizational Characteristics" OR "Organization structure" OR "Organizational structure" OR "Structural characteristics" OR "Organization context" OR "Organizational context" OR "Organization climate" OR "Organizational climate" OR "Care coordination" OR "Organization design" OR "Organizational design" OR "Organization learning" OR "Organizational learning" OR "Organizational change" OR "Organization change" OR "Teamwork" OR "team work" OR "Team processes" OR "Team norms" OR "Team performance" OR ("Team" AND "coordination") OR ("Team" AND "communication") OR "organizational performance" OR "organization performance" OR "care delivery" OR "quality management" OR "Healthcare Quality Assurance" OR "Administration and Organization")
3	AB("Organizational Characteristics" OR "Organization structure" OR "Organizational structure" OR "Structural characteristics" OR "Organization context" OR "Organizational context" OR "Organization climate" OR "Organizational climate" OR "Care coordination" OR "Organization design" OR "Organizational design" OR "Organization learning" OR "Organizational learning" OR "Organizational change" OR "Organization change" OR "Teamwork" OR "team work" OR "Team processes" OR "Team norms" OR "Team performance" OR ("Team" AND "coordination") OR ("Team" AND "communication") OR "organizational performance" OR "organization performance" OR "care delivery" OR "quality management" OR "Healthcare Quality Assurance" OR "Administration and Organization")
4	#1 OR #2 OR #3
5	MM("medical oncology" OR "Early Detection of Cancer" OR "biomarkers, tumor" OR "Cancer Care Facilities" OR "oncology service, hospital")
6	TI("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
7	AB("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
8	#5 OR #6 OR #7
9	LA(English)
10	MM (Animals NOT human)
10	#9 NOT #10
11	#4 AND #8 AND #11
12	Date limit 2010 – present
13	PT("review" OR "guideline" OR "practice guideline" OR "systematic-review" OR "meta-analysis" OR "address" OR "autobiography" OR "bibliography" OR "biography" OR "comment" OR "dictionary" OR "directory" OR "lecture" OR "legal case" OR "legislation" OR "news" OR "newspaper article" OR "patient education handout" OR "periodical index")
14	TI("systematic-review" OR "systematic-literature-review" OR "scoping-review" OR "cochrane-review" OR "meta-analysis" OR "meta-analysis" OR "literature-review")

#	CINAHL/Psycinfo
15	#13 OR #14
16	#12 NOT #15

Table A-5. Guiding Question 1 SCOPUS search strategy

#	SCOPUS
1	TITLE-ABS-KEY ("framework" OR "theory" OR "theory of change" OR "logistical framework" OR "log frame")
2	TITLE-ABS-KEY ("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
3	#1 AND #2
4	LANGUAGE(English)
5	#1 AND #2 AND #4
7	Date limit 2010 – present

Table A-6. Guiding Question 2 and Guiding Question 3 SCOPUS search strategy

#	SCOPUS
1	TITLE-ABS-KEY ("Organizational Characteristics" OR "Organization structure" OR "Organizational structure" OR "Structural characteristics" OR "Organization context" OR "Organizational context" OR "Organization climate" OR "Organizational climate" OR "Care coordination" OR "Organization design" OR "Organizational design" OR "Organization learning" OR "Organizational learning" OR "Organizational change" OR "Organization change" OR "Teamwork" OR "team work" OR "Team processes" OR "Team norms" OR "Team performance" OR ("Team" AND "coordination") OR ("Team" AND "communication") OR "organizational performance" OR "organization performance" OR "care delivery" OR "quality management" OR "Healthcare Quality Assurance" OR "Administration and Organization")
2	TITLE-ABS-KEY ("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
3	#1 AND #2
4	LANGUAGE(English)
5	#1 AND #2 AND #4
	PT("review" OR "guideline" OR "practice guideline" OR "systematic-review" OR "meta-analysis" OR "address" OR "autobiography" OR "bibliography" OR "biography" OR "comment" OR "dictionary" OR "directory" OR "lecture" OR "legal case" OR "legislation" OR "news" OR "newspaper article" OR "patient education handout" OR "periodical index")
	TITLE("systematic-review" OR "systematic-literature-review" OR "scoping-review" OR "cochrane-review" OR "meta-analysis" OR "meta-analysis" OR "literature-review")
	#13 OR #14
	#12 NOT #15
6	Date limit 2010 - present

Table A-7. Guiding Question 1 Cochrane search strategy

#	Cochrane
1	TI("framework" OR "theory" OR "theory of change" OR "logistical framework" OR "log frame")
2	AB("framework" OR "theory" OR "theory of change" OR "logistical framework" OR "log frame")
3	#1 OR #2
4	"medical oncology"[MeSH Terms]
5	"Early Detection of Cancer"[MeSH Terms]
6	"biomarkers, tumor"[MeSH Terms]
7	"Cancer Care Facilities"[MeSH Terms]
8	"oncology service, hospital"[MeSH Terms]
9	TI("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")

#	Cochrane
10	AB("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
11	#4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10
12	#1 AND #2
13	LG(English)
14	"animals"[MeSH Terms]
15	"humans"[MeSH Terms]
16	#13 NOT (#14 NOT #15)
17	
18	Date limit 2010 – present

Table A-8. Guiding Question 2 and Guiding Question 3 Cochrane search strategy

#	Cochrane
1	AB("Organizational Characteristics" OR #"Organization structure" OR #"Organizational structure" OR #"Structural characteristics" OR #"Organization context" OR #"Organizational context" OR #"Organization climate" OR #"Organizational climate" OR #"Care coordination" OR #"Organization design" OR #"Organizational design" OR #"Organization learning" OR #"Organizational learning" OR #"Organizational change" OR #"Organization change" OR #"Teamwork" OR #"team work" OR #"Team processes" OR #"Team norms" OR #"Team performance" OR #("Team" AND "coordination") OR #("Team" AND "communication") OR #"organizational performance" OR #"organization performance" OR #"care delivery" OR #"quality management" OR #"Healthcare Quality Assurance" OR #"Administration and Organization")
2	TI("Organizational Characteristics" OR #"Organization structure" OR #"Organizational structure" OR #"Structural characteristics" OR #"Organization context" OR #"Organizational context" OR #"Organization climate" OR #"Organizational climate" OR #"Care coordination" OR #"Organization design" OR #"Organizational design" OR #"Organization learning" OR #"Organizational learning" OR #"Organizational change" OR #"Organization change" OR #"Teamwork" OR #"team work" OR #"Team processes" OR #"Team norms" OR #"Team performance" OR #("Team" AND "coordination") OR #("Team" AND "communication") OR #"organizational performance" OR #"organization performance" OR #"care delivery" OR #"quality management" OR #"Healthcare Quality Assurance" OR #"Administration and Organization")
3	#1 OR #2
4	MeSH descriptor: [Organizational Culture] explode all trees
5	MeSH descriptor: [organizational innovation] explode all trees
6	MeSH descriptor: [Leadership] explode all trees
7	MeSH descriptor: [knowledge management] explode all trees
8	MeSH descriptor: [crew resource management, healthcare] explode all trees
9	MeSH descriptor: [Health Workforce] explode all trees
10	MeSH descriptor: [efficiency, organizational] explode all trees
11	MeSH descriptor: [Health Resources] explode all trees
12	MeSH descriptor: [Program Evaluation] explode all trees
13	MeSH descriptor: [decision making, organizational] explode all trees
14	MeSH descriptor: [Efficiency] explode all trees
15	MeSH descriptor: [Health Facility Administration] explode all trees
16	MeSH descriptor: [Hospital Administration] explode all trees
17	MeSH descriptor: [Institutional Management Teams] explode all trees
18	MeSH descriptor: [Management Information Systems] explode all trees
19	MeSH descriptor: [Military Health Services] explode all trees
20	MeSH descriptor: [models, organizational] explode all trees
21	MeSH descriptor: [Multi-Institutional Systems] explode all trees
22	MeSH descriptor: [Organizational Affiliation] explode all trees
23	MeSH descriptor: [ownership] explode all trees
24	MeSH descriptor: [Employee Incentive Plans] explode all trees
25	MeSH descriptor: [Management Quality Circles] explode all trees
26	MeSH descriptor: [personnel administration, hospital] explode all trees
27	MeSH descriptor: [Personnel Delegation] explode all trees
28	MeSH descriptor: [Personnel Downsizing] explode all trees
29	MeSH descriptor: [Personnel Loyalty] explode all trees
30	MeSH descriptor: [Personnel Selection] explode all trees

#	Cochrane
31	MeSH descriptor: [Personnel Staffing and Scheduling] explode all trees
32	MeSH descriptor: [Personnel Turnover] explode all trees
33	MeSH descriptor: [Physician Incentive Plans] explode all trees
34	MeSH descriptor: [Staff Development] explode all trees
35	MeSH descriptor: [Work Engagement] explode all trees
36	MeSH descriptor: [Workplace] explode all trees
37	MeSH descriptor: [Strategic Planning] explode all trees
38	MeSH descriptor: [Professional Practice] explode all trees
39	MeSH descriptor: [Community-Institutional Relations] explode all trees
40	MeSH descriptor: [Hospital-Patient Relations] explode all trees
41	MeSH descriptor: [Hospital-Physician Relations] explode all trees
42	MeSH descriptor: [Interdepartmental Relations] explode all trees
43	MeSH descriptor: [Interinstitutional Relations] explode all trees
44	MeSH descriptor: [Patient Satisfaction] explode all trees
45	MeSH descriptor: [shared governance, nursing] explode all trees
46	MeSH descriptor: [Total Quality Management] explode all trees
47	MeSH descriptor: [alert fatigue, health personnel] explode all trees
48	MeSH descriptor: [benchmarking] explode all trees
49	MeSH descriptor: [medical audit] explode all trees
50	MeSH descriptor: [Nursing Audit] explode all trees
51	MeSH descriptor: [near miss, healthcare] explode all trees
52	MeSH descriptor: [Potentially Inappropriate Medication List] explode all trees
53	MeSH descriptor: [accreditation] explode all trees
54	MeSH descriptor: [Pharmacy and Therapeutics Committee] explode all trees
55	MeSH descriptor: [Public Reporting of Healthcare Data] explode all trees
56	MeSH descriptor: [organization and administration] do not explode all trees
57	MeSH descriptor: [quality assurance, health care] do not explode all trees
58	MeSH descriptor: [Risk Management] do not explode all trees
59	#4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58
60	#3 AND #59
61	"medical oncology"[MeSH Terms]
62	"Early Detection of Cancer"[MeSH Terms]
63	"biomarkers, tumor"[MeSH Terms]
64	"Cancer Care Facilities"[MeSH Terms]
65	"oncology service, hospital"[MeSH Terms]
66	TI("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
67	AB("Cancer Screening" OR "Cancer Early Detection" OR "Early Diagnosis of Cancer" OR "cancer early diagnos*" OR "tumor biomarker*" OR "biologic tumor marker*" OR "cancer biomarker*" OR "cancer care facilit*" OR "cancer hospital*" OR "hospital oncology service*" OR "cancer care unit*" OR "medical oncology" OR "cancer care delivery")
68	#60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67
69	LG(English)
70	"animals"[MeSH Terms]
71	"humans"[MeSH Terms]
72	#69 NOT (#70 NOT #71)
73	#3 AND #59 AND #72
74	Date limit 2010 - present

Appendix B. List of Excluded Studies

Guiding Question 1 Excluded Articles

Excluded From Literature Search

A value framework for cancer screening. Annals of Internal Medicine. 2015;162(10):NA-NA. doi: 10.7326/P15-9023. PMID: 109828061. **- Does not describe/propose a framework with organizational characteristics**

Allen JD, Shelton RC, Kephart L, et al. Examining the external validity of the CRUZA study, a randomized trial to promote implementation of evidence-based cancer control programs by faith-based organizations. Transl Behav Med. 2020 Feb 3;10(1):213-22. doi: 10.1093/tbm/iby099. PMID: 30496532. **- Framework is not used in a cancer care context**

Angelis A, Kanavos P. Critique of the American Society of Clinical Oncology Value Assessment Framework for Cancer Treatments: Putting Methodologic Robustness First. J Clin Oncol. 2016 Aug 20;34(24):2935-6. doi: 10.1200/jco.2015.64.9673. PMID: 27298421. **- Does not describe/propose a framework with organizational characteristics**

ASCO Drafts Value Framework to Assist Patient-Physician Conversations. ASCO Connection. 2015;6(5):26-7. PMID: 110468456. **- Does not describe/propose a framework with organizational characteristics**

Ben-Aharon O, Goldstein DA. Improving on Tail-of-the-Curve Evaluation With the American Society of Clinical Oncology Value Framework-Reply. JAMA Oncol. 2018 Oct 1;4(10):1438-9. doi: 10.1001/jamaoncol.2018.3295. PMID: 30128500. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Bertagnolli M, Tabernero J. Value assessment frameworks in oncology: Championing concordance through shared standards. Annals of Oncology. 2019;30(4):505-6. doi: 10.1093/annonc/mdz057. **- Does not describe/propose a framework with organizational characteristics**

Bilodeau K, Tremblay D. How oncology teams can be patient-centred? opportunities for theoretical improvement through an empirical examination. Health Expect. 2019 Apr;22(2):235-44. doi: 10.1111/hex.12847. PMID: 30411450. **- Study focuses on a single NCI framework domain/subdomain**

Blayney DW. Measuring and improving quality of care in an academic medical center. J Oncol Pract. 2013 May;9(3):138-41. doi: 10.1200/jop.2013.000991. PMID: 23942492. **- Does not describe/propose a framework with organizational characteristics**

Carney TJ, Weaver M, McDaniel AM, et al. Organizational factors influencing the use of clinical decision support for improving cancer screening within community health centers. International Journal of Healthcare Information Systems and Informatics. 2014;9(1):1-29. doi: 10.4018/ijhisi.2014010101. **- Study focuses on a single NCI framework domain/subdomain**

Chera BS, Mazur L, Buchanan I, et al. Improving Patient Safety in Clinical Oncology: Applying Lessons From Normal Accident Theory. JAMA Oncol. 2015 Oct;1(7):958-64. doi: 10.1001/jamaoncol.2015.0891. PMID: 26182183. **- Study focuses on a single NCI framework domain/subdomain**

Cherny NI, de Vries EGE. Improving on Tail-of-the-Curve Evaluation With the American Society of Clinical Oncology Value Framework. JAMA Oncol. 2018 Oct 1;4(10):1437. doi: 10.1001/jamaoncol.2018.3264. PMID: 30128567. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Clauser SB, Taplin SH, Foster MK, et al. Multilevel intervention research: lessons learned and pathways forward. J Natl Cancer Inst Monogr. 2012 May;2012(44):127-33. doi: 10.1093/jncimonographs/lgs019. PMID: 22623606. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Cuaron JJ, Gillespie EF, Gomez DR, et al. From Orientation to Onboarding: A Survey-Based Departmental Improvement Program for New Radiation Oncology Faculty Physicians. JCO Oncol Pract. 2020 Apr;16(4):e395-e404. doi: 10.1200/jop.19.00641. PMID: 32048921. **- Does not**

describe/propose a framework with organizational characteristics

Del Paggio JC, Cheng S, Booth CM, et al. Reliability of Oncology Value Framework Outputs: Concordance Between Independent Research Groups. JNCI Cancer Spectr. 2018 Jul;2(3):pky050. doi: 10.1093/jncics/pky050. PMID: 31360865. **- Does not describe/propose a framework with organizational characteristics**

DiMartino LD, Birken SA, Hanson LC, et al. The influence of formal and informal policies and practices on health care innovation implementation: A mixed-methods analysis. Health Care Manage Rev. 2018 Jul/Sep;43(3):249-60. doi: 10.1097/hmr.0000000000000193. PMID: 29533270. **- Does not address KQ1 but relevant to KQ2-4**

Eddy D. David Eddy created the Archimedes model to predict and analyze care. Health Affairs. 2012;31(11):2451-2. doi: 10.1377/hlthaff.2012.1063. **- Does not describe/propose a framework with organizational characteristics**

Evans SB, Cain D, Kapur A, et al. Why Smart Oncology Clinicians do Dumb Things: A Review of Cognitive Bias in Radiation Oncology. Pract Radiat Oncol. 2019 Jul-Aug;9(4):e347-e55. doi: 10.1016/j.prro.2019.03.001. PMID: 30905730. **- Does not describe/propose a framework with organizational characteristics**

Fernandez ME, Walker TJ, Weiner BJ, et al. Developing measures to assess constructs from the Inner Setting domain of the Consolidated Framework for Implementation Research. Implement Sci. 2018 Mar 27;13(1):52. doi: 10.1186/s13012-018-0736-7. PMID: 29587804. **- Does not address KQ1 but relevant to KQ2-4**

Ganz PA, Levit LA. Charting a new course for the delivery of high-quality cancer care. Journal of Clinical Oncology. 2013;31(36):4485-7. doi: 10.1200/JCO.2013.53.7993. **- Does not describe/propose a framework with organizational characteristics**

Ganz PA. Institute of Medicine report on delivery of high-quality cancer care. Journal of Oncology Practice. 2014;10(3):193-5. doi: 10.1200/JOP.2013.001369. **- Does not describe/propose a framework with organizational characteristics**

Graystone R. The Value of Magnet® Recognition for Specialty Hospitals. J Nurs Adm. 2019 Jun;49(6):289-90. doi: 10.1097/nna.0000000000000753. PMID: 31135634. **- Does not describe/propose a framework with organizational characteristics**

Ha H, Kang JH, Kim DY, et al. The value measurement of emerging therapeutics in renal cell carcinoma: ASCO value framework and ESMO-MCBS. BMC Health Services Research. 2022;22(1)doi: 10.1186/s12913-022-08279-6. **- Does not describe/propose a framework with organizational characteristics**

Hack TF, Carlson L, Butler L, et al. Facilitating the implementation of empirically valid interventions in psychosocial oncology and supportive care. Support Care Cancer. 2011 Aug;19(8):1097-105. doi: 10.1007/s00520-011-1159-z. PMID: 21494781. **- Does not describe/propose a framework with organizational characteristics**

Hlávka JP, Lin PJ, Neumann PJ. Outcome measures for oncology alternative payment models: Practical considerations and recommendations. American Journal of Managed Care. 2019;25(12):E403-E9. **- Study focuses on a single NCI framework domain/subdomain**

Hoos A, Britten CM, Huber C, et al. A methodological framework to enhance the clinical success of cancer immunotherapy. Nat Biotechnol. 2011 Oct 13;29(10):867-70. doi: 10.1038/nbt.2000. PMID: 21997622. **- Does not describe/propose a framework with organizational characteristics**

Jacobs SR, Weiner BJ, Reeve BB, et al. Determining the predictors of innovation implementation in healthcare: a quantitative analysis of implementation effectiveness. BMC Health Serv Res. 2015 Jan 22;15:6. doi: 10.1186/s12913-014-0657-3. PMID: 25608564. **- Does not describe/propose a framework with organizational characteristics**

Jansen JP. Relevance of American Society of Clinical Oncology Value Framework Will Be Improved if It Is Based on Network Meta-Analyses. J Clin Oncol. 2017 Apr 1;35(10):1131-2. doi: 10.1200/jco.2016.69.4612. PMID: 28165901. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Jazieh AR, McClure JS, Carlson RW. Implementation Framework for NCCN Guidelines. J Natl Compr Canc Netw. 2017 Oct;15(10):1180-5. doi: 10.6004/jnccn.2017.7020. PMID: 28982742. **- Does not describe/propose a framework with organizational characteristics**

Kraft S, Carayon P, Weiss J, et al. A simple framework for complex system improvement. Am J Med Qual. 2015 May;30(3):223-31. doi: 10.1177/1062860614530184. PMID: 24723664. **-**

Study focuses on a single NCI framework domain/subdomain

Lam TK, Spitz M, Schully SD, et al. "Drivers" of translational cancer epidemiology in the 21st century: Needs and opportunities. Cancer Epidemiology Biomarkers and Prevention. 2013;22(2):181-8. doi: 10.1158/1055-9965.EPI-12-1262. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Lamort-Bouché M, Sarnin P, Kok G, et al. Interventions developed with the Intervention Mapping protocol in the field of cancer: A systematic review. Psychooncology. 2018 Apr;27(4):1138-49. doi: 10.1002/pon.4611. PMID: 29247578. **- Does not describe/propose a framework with organizational characteristics**

Leeman J, Baquero B, Bender M, et al. Advancing the use of organization theory in implementation science. Prev Med. 2019 Dec;129s:105832. doi: 10.1016/j.ypmed.2019.105832. PMID: 31521385. **– Foundational framework included in the Integrated Framework**

Leeman J, Birken SA, Powell BJ, et al. Beyond "implementation strategies": classifying the full range of strategies used in implementation science and practice. Implement Sci. 2017 Nov 3;12(1):125. doi: 10.1186/s13012-017-0657-x. PMID: 29100551. **- Does not describe/propose a framework with organizational characteristics**

Liang H, Tao L, Ford EW, et al. The patient-centered oncology care on health care utilization and cost: A systematic review and meta-analysis. Health Care Manage Rev. 2020 Oct/Dec;45(4):364-76. doi: 10.1097/hmr.0000000000000226. PMID: 30335617. **- Does not describe/propose a framework with organizational characteristics**

Luke J, Mirkin J, Bach P. Improving Quality and Addressing the Rising Costs of Cancer Care: Two Birds, One Stone. Journal of Oncology Practice. 2011;7(6):402-4. doi: 10.1200/JOP.2011.000419. PMID: 104486714. **-Study focuses on a single NCI framework domain/subdomain**

Mandelblatt JS, Ramsey SD, Lieu TA, et al. Evaluating Frameworks That Provide Value Measures for Health Care Interventions. Value Health. 2017 Feb;20(2):185-92. doi: 10.1016/j.jval.2016.11.013. PMID: 28237193.**- Does not describe/propose a framework with organizational characteristics**

McNiff KK, Jacobson JO. Aiming for ideal care: a proposed framework for cancer quality improvement. J Oncol Pract. 2014 Nov;10(6):339-44. doi: 10.1200/jop.2014.001305. PMID: 25398953. **- Study focuses on a single NCI framework domain/subdomain**

Modica C, Bay C, Lewis JH, et al. Applying the Value Transformation Framework in Federally Qualified Health Centers to Increase Clinical Measures Performance. Journal for Healthcare Quality. 2022;44(4):185-93. doi: 10.1097/JHQ.0000000000000340. **- Does not describe/propose a framework with organizational characteristics (different Value Transformation Framework article included)**

Newman-Toker DE. A unified conceptual model for diagnostic errors: Underdiagnosis, overdiagnosis, and misdiagnosis. Diagnosis. 2014;1(1):43-8. doi: 10.1515/dx-2013-0027. **- Does not describe/propose a framework with organizational characteristics**

Osarogiagbon RU. Achieving better quality of lung cancer care. Lung Cancer: A Practical Approach to Evidence-Based Clinical Evaluation and Management. 2018:167-82. **- Study focuses on a single NCI framework domain/subdomain**

Page RD, Newcomer LN, Sprandio JD, et al. The patient-centered medical home in oncology: from concept to reality. Am Soc Clin Oncol Educ Book. 2015:e82-9. doi: 10.14694/EdBook_AM.2015.35.e82. PMID: 25993243. **- Study focuses on a single NCI framework domain/subdomain**

Pirl WF, Greer JA, Gregorio SW, et al. Framework for planning the delivery of psychosocial oncology services: An American psychosocial oncology society task force report. Psychooncology. 2020 Dec;29(12):1982-7. doi: 10.1002/pon.5409. PMID: 32390322. **- Does not describe/propose a framework with organizational characteristics**

Raney L, McManaman J, Elsaid M, et al. Multisite quality improvement initiative to repa incomplete electronic medical record documentation as one of many causes of provider burnout. JCO Oncology Practice. 2020;16(11):E1412-E6. doi: 10.1200/OP.20.00294. **- Study focuses on a single NCI framework domain/subdomain**

Rapkin BD, Weiss ES, Lounsbury DW, et al. Using the interactive systems framework to support a quality improvement approach to dissemination of evidence-based strategies to promote early detection of breast cancer: planning a comprehensive dynamic trial. Am J Community Psychol. 2012 Dec;50(3-4):497-517. doi: 10.1007/s10464-012-9518-6. PMID: 22618023. **- Does not describe/propose a framework with organizational characteristics**

(different Interactive Systems Framework article included)

Reyna VF, Nelson WL, Han PK, et al. Decision making and cancer. Am Psychol. 2015 Feb-Mar;70(2):105-18. doi: 10.1037/a0036834. PMID: 25730718. **- Study focuses on a single NCI framework domain/subdomain**

Schilsky RL, Michels DL, Kearbey AH, et al. Building a rapid learning health care system for oncology: the regulatory framework of CancerLinQ. J Clin Oncol. 2014 Aug 1;32(22):2373-9. doi: 10.1200/jco.2014.56.2124. PMID: 24912897. **- Does not describe/propose a framework with organizational characteristics**

Schnipper LE, Davidson NE, Wollins DS, et al. Updating the American Society of Clinical Oncology Value Framework: Revisions and Reflections in Response to Comments Received. J Clin Oncol. 2016 Aug 20;34(24):2925-34. doi: 10.1200/jco.2016.68.2518. PMID: 27247218. **- Does not describe/propose a framework with organizational characteristics**

Schnipper LE, Schilsky RL. Converging on the value of value frameworks. Journal of Clinical Oncology. 2017;35(24):2732-4. doi: 10.1200/JCO.2017.73.5704. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Senier L, McBride CM, Ramsey AT, et al. Blending Insights from Implementation Science and the Social Sciences to Mitigate Inequities in Screening for Hereditary Cancer Syndromes. Int J Environ Res Public Health. 2019 Oct 15;16(20)doi: 10.3390/ijerph16203899. PMID: 31618814. **- Other: Article focuses on frameworks related to implementation sciences; the framework proposed draws upon CFIR, which is included as a foundational framework in the Integrated Framework**

Seymour EK, De Souza JA, Fendrick AM. Incorporating value-based care into oncology. Cancer Journal (United States). 2020;26(4):311-22. doi: 10.1097/PPO.0000000000000459. **- Does not describe/propose a framework with organizational characteristics**

Shelby M, Malloch K, Shellenberger T, et al. Addressing Falls Among Older Oncology Patients Through Complexity Science. Nurs Adm Q. 2019 Jul/Sep;43(3):280-8. doi: 10.1097/naq.0000000000000360. PMID: 31162348. **- Does not describe/propose a framework with organizational characteristics**

Sisk BA, Schulz GL, Kaye EC, et al. Clinicians' Perspectives on the Functions of Communication in Pediatric Oncology. J Palliat Med. 2021 Sep;24(10):1545-9. doi: 10.1089/jpm.2021.0090. PMID: 34255562. **- Study focuses on a single NCI framework domain/subdomain**

Socinski MA, Boehmer LM. A Framework for Defining High-Quality Care for Patients with NSCLC. Oncology Issues. 2021;36(6):62-8. doi: 10.1080/10463356.2021.1979879. **- Does not describe/propose a framework with organizational characteristics**

Spinks TE, Ganz PA, Sledge GW, et al. Delivering high-quality cancer care: The critical role of quality measurement. Healthcare. 2014;2(1):53-62. doi: 10.1016/j.hjdsi.2013.11.003. **- Does not describe/propose a framework with organizational characteristics**

Sprandio JD. Oncology patient-centered medical home. American Journal of Managed Care. 2012;18(SPECIAL ISSUE). **- Study focuses on a single NCI framework domain/subdomain**

Stange KC, Breslau ES, Dietrich AJ, et al. State-of-the-art and future directions in multilevel interventions across the cancer control continuum. 2012. **- Does not describe/propose a framework with organizational characteristics**

Subramanian R, Schorr K. Musings on value frameworks in cancer. Journal of Comparative Effectiveness Research. 2016;5(5):437-9. doi: 10.2217/cer-2016-0041. **- Does not describe/propose a framework with organizational characteristics**

Tappenden P, Chilcott J, Brennan A, et al. Whole disease modeling to inform resource allocation decisions in cancer: A methodological framework. Value in Health. 2012;15(8):1127-36. doi: 10.1016/j.jval.2012.07.008. **- Does not describe/propose a framework with organizational characteristics**

Teal R, Bergmire DM, Johnston M, et al. Implementing community-based provider participation in research: an empirical study. Implement Sci. 2012 May 8;7:41. doi: 10.1186/1748-5908-7-41. PMID: 22568935. **- Other: Article considers organizational factors that influence implementation/utilization of community-based provider participation in research (CBPPR)**

Tonges M, McCann M, Strickler J. Translating caring theory across the continuum from inpatient to ambulatory care. J Nurs Adm. 2014 Jun;44(6):326-32. doi: 10.1097/nna.0000000000000077. PMID:

24835143. **- Does not describe/propose a framework with organizational characteristics**

Tugwell P, Knottnerus JA, Idzerda L. Definitions and framework for knowledge translation to continue to evolve. Journal of Clinical Epidemiology. 2011;64(1):1-2. doi: 10.1016/j.jclinepi.2010.11.001. **- Does not describe/propose a framework with organizational characteristics**

Umaretiya PJ, Vinci RJ, Bona K. A Structural Racism Framework to Guide Health Equity Interventions in Pediatric Oncology. Pediatrics. 2022 May 1;149(5)doi: 10.1542/peds.2021-054634. PMID: 35490282. **- Does not describe/propose a framework with organizational characteristics**

Verhoeven DC, Chollette V, Lazzara EH, et al. The Anatomy and Physiology of Teaming in Cancer Care Delivery: A Conceptual Framework. J Natl Cancer Inst. 2021 Apr 6;113(4):360-70. doi: 10.1093/jnci/djaa166. PMID: 33107915. **- Study focuses on a single NCI framework domain/subdomain**

Verma AA, Razak F, Detsky AS. Understanding choice: Why physicians should learn prospect theory. JAMA. 2014;311(6):571-2. doi: 10.1001/jama.2013.285245. **- Study focuses on a single NCI framework domain/subdomain**

Vivot A, Créquit P, Porcher R. Improving on Tail-of-the-Curve Evaluation With the American Society of Clinical Oncology Value Framework. JAMA Oncol. 2018 Oct 1;4(10):1437-8. doi: 10.1001/jamaoncol.2018.3289. PMID: 30128475. **- No original data (opinion, descriptive data, letters, editorial, commentary)**

Walker TJ, Brandt HM, Wandersman A, et al. Development of a comprehensive measure of organizational readiness (motivation × capacity) for implementation: a study protocol. Implement Sci Commun. 2020 Nov 11;1(1):103. doi: 10.1186/s43058-020-00088-4. PMID: 33292840. **- Other: Included primary source**

Weaver SJ, Verhoeven DC, Castro KM, et al. Thematic Analysis of Organizational Characteristics in NCI Community Oncology Research Program Cancer Care Delivery Research. JNCI Cancer Spectr. 2022 Mar 2;6(2)doi: 10.1093/jncics/pkac008. PMID: 35603839. **-Other: Included in foundational framework**

Weaver SJ, Verhoeven DC, Castro KM, et al. Thematic Analysis of Organizational Characteristics in NCI Community Oncology Research Program Cancer Care Delivery Research. JNCI Cancer Spectrum. 2022;6(2)doi: 10.1093/jncics/pkac008. **- Other: Article already referenced in report**

Weiner BJ, Belden CM, Bergmire DM, et al. The meaning and measurement of implementation climate. Implementation Science. 2011;6(1)doi: 10.1186/1748-5908-6-78. **- Study focuses on a single NCI framework domain/subdomain**

Weiner BJ, Lewis MA, Clauser SB, et al. In search of synergy: Strategies for combining interventions at multiple levels. 2012. **- Does not describe/propose a framework with organizational characteristics**

Wheeler JCW, Keogh L, Sierra MA, et al. Heterogeneity in how women value risk-stratified breast screening. Genetics in Medicine. 2022;24(1):146-56. doi: 10.1016/j.gim.2021.09.002. **- Does not describe/propose a framework with organizational characteristics**

Zoellner J, Porter K, Thatcher E, et al. A Multilevel Approach to Understand the Context and Potential Solutions for Low Colorectal Cancer (CRC) Screening Rates in Rural Appalachia Clinics. J Rural Health. 2021 Jun;37(3):585-601. doi: 10.1111/jrh.12522. PMID: 33026682. **- Does not describe/propose a framework with organizational characteristics**

Zubkoff L, Dionne-Odom JN, Pisu M, et al. Developing a "toolkit" to measure implementation of concurrent palliative care in rural community cancer centers. Palliat Support Care. 2018 Feb;16(1):60-72. doi: 10.1017/s1478951517000323. PMID: 28566103. **- Does not describe/propose a framework with organizational characteristics**

Excluded From Additional Search

2020-2023 Value Assessment Framework Institute for Clinical and Economic Review. 2020. https://icer.org/wp-content/uploads/2020/10/ICER_2020_2023_VAF_102220.pdf**-Does not meet eligibility criteria**

Abt Associates. First Annual Report from the Evaluation of the Oncology Care Model: Baseline Period (Contract #HHSM-500-2014-00026I T0003) Centers for Medicare and Medicaid Services. Baltimore, MD: 2018. https://downloads.cms.gov/files/cmmi/ocm-baselinereport.pdf**-Does not meet eligibility criteria**

Alonso-Coello P, Schünemann HJ, Moberg J, et al. [GRADE Evidence to Decision (EtD) frameworks: a

systematic and transparent approach to making well informed healthcare choices. 1: Introduction]. Gac Sanit. 2018 Mar-Apr;32(2):166.e1-.e10. doi: 10.1016/j.gaceta.2017.02.010. PMID: 28822594. **- Does not meet eligibility criteria**

Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav. 1995 Mar;36(1):1-10. PMID: 7738325. **- Included as foundational framework**

Arksey H, O'Malley L. Scoping studies: towards a methodological framework. International Journal of Social Research Methodology. 2003;8:19-32. **-Does not meet eligibility criteria**

Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood). 2008 May-Jun;27(3):759-69. doi: 10.1377/hlthaff.27.3.759. PMID: 18474969. **-Does not meet eligibility criteria**

Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. Ann Fam Med. 2014 Nov-Dec;12(6):573-6. doi: 10.1370/afm.1713. PMID: 25384822. **-Does not meet eligibility criteria**

Boyer C, Selby M, Scherrer JR, et al. The Health On the Net Code of Conduct for medical and health Websites. Comput Biol Med. 1998 Sep;28(5):603-10. doi: 10.1016/s0010-4825(98)00037-7. PMID: 9861515. **-Does not meet eligibility criteria**

Charns MP, Young GJ, Radwin LE. Organization Design and Coordination. Burns, Bradley & Weiner, Shortell and Kaluzny's Health Care Management: Organizational Theory and Behavior. 7 ed.: Delmar; 2019:57-81. **-Does not meet eligibility criteria**

Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009 Aug 7;4:50. doi: 10.1186/1748-5908-4-50. PMID: 19664226. **-Included as foundational framework**

Donabedian A. Evaluating the quality of medical care. The Milbank Memorial Fund Quarterly. 1966;44(3):166-206. **-Included as foundational framework**

Framework for program evaluation in public health. MMWR Recomm Rep. 1999 Sep 17;48(Rr-11):1-40. PMID: 10499397. **-Does not meet eligibility criteria**

Gantner-Bär M, Meier F, Kolominsky-Rabas P, et al. Prospective Assessment of an innovative test for prostate cancer screening using the VITA process model framework. Stud Health Technol Inform. 2014;205:236-40. PMID: 25160181. **-Does not meet eligibility criteria**

Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. Am J Public Health. 1999 Sep;89(9):1322-7. doi: 10.2105/ajph.89.9.1322. PMID: 10474547. **-Does not meet eligibility criteria**

Graystone R. The 2019 Magnet® Application Manual: Nursing Excellence Standards Evolving With Practice. J Nurs Adm. 2017 Nov;47(11):527-8. doi: 10.1097/nna.0000000000000547. PMID: 29065067. **-Does not meet eligibility criteria**

Hovland C, Janis I, Kelley H. Communication and persuasion. New Haven, CT: Yale University Press; 1953. **-Does not meet eligibility criteria**

Kilo CM. A framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's Breakthrough Series. Qual Manag Health Care. 1998 Sep;6(4):1-13. doi: 10.1097/00019514-199806040-00001. PMID: 10339040. **-Does not meet eligibility criteria**

Klein KJ, Sorra JS. The Challenge of Innovation Implementation. The Academy of Management Review. 1996;21(4):1055-80. **-Does not meet eligibility criteria**

Kotter JP. Leading change: why transformation efforts fail. Harv Bus Rev. 1995;7(2):59–67. **-Does not meet eligibility criteria**

Leeman J, Baquero B, Bender M, et al. Advancing the use of organization theory in implementation science. Prev Med. 2019 Dec;129s:105832. doi: 10.1016/j.ypmed.2019.105832. PMID: 31521385. **- Included as foundational framework**

Michie S, Johnston M, Abraham C, et al. Making psychological theory useful for implementing evidence based practice: a consensus approach. Qual Saf Health Care. 2005 Feb;14(1):26-33. doi: 10.1136/qshc.2004.011155. PMID: 15692000. **-Does not meet eligibility criteria**

Piña IL, Cohen PD, Larson DB, et al. A framework for describing health care delivery organizations and systems. Am J Public Health. 2015 Apr;105(4):670-9. doi: 10.2105/ajph.2014.301926. PMID: 24922130. **-Included as foundational framework**

Proctor E, Silmere H, Raghavan R, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. Adm Policy Ment Health. 2011 Mar;38(2):65-76. doi: 10.1007/s10488-010-0319-7. PMID: 20957426. **- Does not meet eligibility criteria**

Shirey MR. Lewin's Theory of Planned Change as a strategic resource. J Nurs Adm. 2013 Feb;43(2):69-72. doi: 10.1097/NNA.0b013e31827f20a9. PMID: 23343723. **-Does not meet eligibility criteria**

Yano EM. The role of organizational research in implementing evidence-based practice: QUERI Series. Implement Sci. 2008 May 29;3:29. doi: 10.1186/1748-5908-3-29. PMID: 18510749. **- Included as foundational framework**

Guiding Question 2 and Guiding Question 3 Excluded Articles

Abdulla A, Schell KR, Schell MC. Comparing the Evolution of Risk Culture in Radiation Oncology, Aviation, and Nuclear Power. J Patient Saf. 2020 Dec;16(4):e352-e8. doi: 10.1097/pts.0000000000000560. PMID: 30608909. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Adamson L, Beldham-Collins R, Sykes J, et al. Evaluating incident learning systems and safety culture in two radiation oncology departments. J Med Radiat Sci. 2022 Jun;69(2):208-17. doi: 10.1002/jmrs.563. PMID: 34882982. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Akhtar A, Sosa E, Castro S, et al. A Lung Cancer Screening Education Program Impacts both Referral Rates and Provider and Medical Assistant Knowledge at Two Federally Qualified Health Centers. Clin Lung Cancer. 2022 Jun;23(4):356-63. doi: 10.1016/j.cllc.2021.12.002. PMID: 34991968. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Allen CG, Cotter MM, Smith RA, et al. Successes and challenges of implementing a lung cancer screening program in federally qualified health centers: a qualitative analysis using the Consolidated Framework for Implementation Research. Transl Behav Med. 2021 May 25;11(5):1088-98. doi: 10.1093/tbm/ibaa121. PMID: 33289828. **- Does not include any clearly defined measure of organizational characteristics**

Allen JD, Shelton RC, Kephart L, et al. Organizational characteristics conducive to the implementation of health programs among Latino churches. Implement Sci Commun. 2020;1:62. doi: 10.1186/s43058-020-00052-2. PMID: 32885217. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Allicock M, Johnson LS, Leone L, et al. Promoting fruit and vegetable consumption among members of black churches, Michigan and North Carolina, 2008-2010. Prev Chronic Dis. 2013;10:E33. doi: 10.5888/pcd10.120161. PMID: 23489638. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Arora S, Mate KS, Jones JL, et al. Enhancing Collaborative Learning for Quality Improvement: Evidence from the Improving Clinical Flow Project, a Breakthrough Series Collaborative with Project ECHO. Jt Comm J Qual Patient Saf. 2020 Aug;46(8):448-56. doi: 10.1016/j.jcjq.2020.04.013. PMID: 32507466. **- Does not include any clearly defined measure of organizational characteristics**

Arrossi S. Access to treatment in the Jujuy Demonstration Project. The Lancet Global Health. 2019;7(8):e1015-e6. doi: 10.1016/S2214-109X(19)30269-4.**- No original data (opinion, letters, editorial, commentary)**

Asrani SK, Ghabril MS, Kuo A, et al. Quality measures in HCC care by the Practice Metrics Committee of the American Association for the Study of Liver Diseases. Hepatology. 2022 May;75(5):1289-99. doi: 10.1002/hep.32240. PMID: 34778999. **- Does not include any clearly defined measure of organizational characteristics**

Austin C. Lung Cancer Screening: Development and Replication of a Decentralized Program to Increase Access. Clin J Oncol Nurs. 2021 Oct 1;25(5):523-9. doi: 10.1188/21.cjon.523-529. PMID: 34533508. **- The stated objectives of the article do not include anything about**

examining how organizational characteristics are related to the delivery of cancer care

Aversano J, Boehmer LM, Spira A. Improving Cancer Care Delivery: Learnings for Oncology Nurses and Patient Navigation From a National Quality Survey. J Adv Pract Oncol. 2022 Jul;13(5):484-93. doi: 10.6004/jadpro.2022.13.5.2. PMID: 35910500. - **The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Azar JM, Johnson CS, Frame AM, et al. Evaluation of interprofessional relational coordination and patients' perception of care in outpatient oncology teams. J Interprof Care. 2017 Mar;31(2):273-6. doi: 10.1080/13561820.2016.1248815. PMID: 27936991. - **Does not include any clearly defined measure of organizational characteristics**

Baker JN, Harper J, Kane JR, et al. Implementation and evaluation of an automated patient death notification policy at a tertiary pediatric oncology referral center. J Pain Symptom Manage. 2011 Nov;42(5):652-6. doi: 10.1016/j.jpainsymman.2011.07.002. PMID: 22045367. - **Does not include any clearly defined measure of organizational characteristics**

Bakhai S, Ahluwalia G, Nallapeta N, et al. Faecal immunochemical testing implementation to increase colorectal cancer screening in primary care. BMJ Open Qual. 2018;7(4):e000400. doi: 10.1136/bmjoq-2018-000400. PMID: 30397662. - **The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Balasubramanian BA, Higashi RT, Rodriguez SA, et al. Thematic Analysis of Challenges of Care Coordination for Underinsured and Uninsured Cancer Survivors With Chronic Conditions. JAMA Netw Open. 2021 Aug 2;4(8):e2119080. doi: 10.1001/jamanetworkopen.2021.19080. PMID: 34387681. - **The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Balch C, Ogle JD, Senese JL. The National Practice Benchmark for Oncology: 2015 Report for 2014 Data. J Oncol Pract. 2016 Apr;12(4):e437-75. doi: 10.1200/jop.2015.008458. PMID: 27006357. - **Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Barger S, Sullivan SD, Bell-Brown A, et al. Effective stakeholder engagement: design and implementation of a clinical trial (SWOG S1415CD) to improve cancer care. BMC Med Res Methodol. 2019 Jun 11;19(1):119. doi: 10.1186/s12874-019-0764-2. PMID: 31185918. - **The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Barr TR, Towle EL. Oncology practice trends from the national practice benchmark. J Oncol Pract. 2012 Sep;8(5):292-7. doi: 10.1200/jop.2012.000734. PMID: 23277766. - **Doesn't answer research question**

Battaglia TA, Fleisher L, Dwyer AJ, et al. Barriers and opportunities to measuring oncology patient navigation impact: Results from the National Navigation Roundtable survey. Cancer. 2022 Jul 1;128 Suppl 13:2568-77. doi: 10.1002/cncr.33805. PMID: 35699612. - **Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Bekmuratova S, Kim J, Wang H, et al. Clinic exploration of care processes to promote colorectal cancer screening in rural accountable care organization clinics: A qualitative case study. Qualitative Report. 2019;24(6):1442-59. - **Does not include any clearly defined measure of organizational characteristics**

Belkacemi Y, Colson-Durand L, Fayolle-Campana M, et al. A Wake-Up Call for Routine Morbidity and Mortality Review Meeting Procedures as Part of a Quality Governance Programs in Radiation Therapy Departments: Results of the PROUST Survey. Pract Radiat Oncol. 2019 Mar;9(2):108-14. doi: 10.1016/j.prro.2018.09.004. PMID: 30268430. - **Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Bellinger C, Foley KL, Dressler EV, et al. Organizational Characteristics and Smoking Cessation Support in Community-Based Lung Cancer Screening Programs. J Am Coll Radiol. 2022 Apr;19(4):529-33. doi: 10.1016/j.jacr.2022.01.014. PMID: 35247325. - **Does not include any clearly defined measure of organizational characteristics**

Benson AB, 3rd, Boehmer L, Mi X, et al. Resource and Reimbursement Barriers to Comprehensive Cancer Care Delivery: An Analysis of Association of Community Cancer Centers Survey Data. JCO Oncol Pract. 2022 Dec 15:Op2200417. doi: 10.1200/op.22.00417. PMID: 36521094. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Berger ER, Wang CE, Kaufman CS, et al. National Accreditation Program for Breast Centers Demonstrates Improved Compliance with Post-Mastectomy Radiation Therapy Quality Measure. J Am Coll Surg. 2017 Mar;224(3):236-44. doi: 10.1016/j.jamcollsurg.2016.11.006. PMID: 27993697. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Berlin NL, Offodile AC, II. Leveraging Implementation Science to Improve Delivery of Oncologic Reconstructive Surgery. Annals of Surgical Oncology. 2020;27(7):2117-9. doi: 10.1245/s10434-020-08465-y.**- No original data (opinion, letters, editorial, commentary)**

Bickel KE, McNiff K, Buss MK, et al. Defining High-Quality Palliative Care in Oncology Practice: An American Society of Clinical Oncology/American Academy of Hospice and Palliative Medicine Guidance Statement. J Oncol Pract. 2016 Sep;12(9):e828-38. doi: 10.1200/jop.2016.010686. PMID: 27531376. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Biddell CB, Spees LP, Petermann V, et al. Financial Assistance Processes and Mechanisms in Rural and Nonrural Oncology Care Settings. JCO Oncol Pract. 2022 Sep;18(9):e1392-e406. doi: 10.1200/op.21.00894. PMID: 35549521. **- Does not include any clearly defined measure of organizational characteristics**

Birken SA, Raskin S, Zhang Y, et al. Survivorship Care Plan Implementation in US Cancer Programs: a National Survey of Cancer Care Providers. J Cancer Educ. 2019 Jun;34(3):614-22. doi: 10.1007/s13187-018-1374-0. PMID: 29948925. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Blanchard J, Rhoades D, Nagykaldi Z, et al. Identifying Priorities and Strategies for Improving Colorectal Cancer Screening in Tribal Clinics. Cancer Control. 2022 Jan-Dec;29:10732748221132516. doi: 10.1177/10732748221132516. PMID: 36224082. **- Does not include any clearly defined measure of organizational characteristics**

Blayney DW, Simon MK, Podtschaske B, et al. Critical Lessons From High-Value Oncology Practices. JAMA Oncol. 2018 Feb 1;4(2):164-71. doi: 10.1001/jamaoncol.2017.3803. PMID: 29145584. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Blazin LJ, Cuviello A, Spraker-Perlman H, et al. Approaches for Discussing Clinical Trials with Pediatric Oncology Patients and Their Families. Current Oncology Reports. 2022;24(6):723-32. doi: 10.1007/s11912-022-01239-7. **- Does not include any clearly defined measure of organizational characteristics**

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10.1093/jncics/pkab081. PMID: 34738073. **- Does not include any clearly defined measure of organizational characteristics**

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Tran JH, Mouttapa M, Ichinose TY, et al. Sources of information that promote breast and cervical cancer knowledge and screening among native Hawaiians in Southern California. Journal of Cancer Education. 2010;25(4):588-94. doi: 10.1007/s13187-010-0078-x. **- Does not include any clearly defined measure of organizational characteristics**

Trankle SA, Metusela C, Reath J. Undertaking general practice quality improvement to improve cancer screening - a thematic analysis of provider experiences. BMC Fam Pract. 2021 Nov 17;22(1):230. doi: 10.1186/s12875-021-01581-y. PMID: 34789162. **- Non-USA based study**

Tremblay D, Prady C, Bilodeau K, et al. Optimizing clinical and organizational practice in cancer survivor transitions between specialized oncology and primary care teams: a realist evaluation of multiple case studies. BMC Health Serv Res. 2017 Dec 16;17(1):834. doi: 10.1186/s12913-017-2785-z. PMID: 29246224. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Trosman JR, Weldon CB, Rapkin BD, et al. Evaluation of the Novel 4R Oncology Care Planning Model in Breast Cancer: Impact on Patient Self-Management and Care Delivery in Safety-Net and Non-Safety-Net Centers. JCO Oncol Pract. 2021 Aug;17(8):e1202-e14. doi: 10.1200/op.21.00161. PMID: 34375560. **- Does not include any clearly defined measure of organizational characteristics**

Tu SP, Young VM, Coombs LJ, et al. Practice adaptive reserve and colorectal cancer screening best practices at community health center clinics in 7 states. Cancer. 2015;121(8):1241-8. doi: 10.1002/cncr.29176. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

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Tzelepis F, Hanna JH, Paul CL, et al. Quality of patient-centred care: Medical oncology patients' perceptions and characteristics associated with quality of care. Psycho-Oncology. 2017;26(11):1998-2001. doi: 10.1002/pon.4380. **- Does not include any clearly defined measure of organizational characteristics**

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Underhill M, Roper K, Siefert ML, et al. Evidence-based practice beliefs and implementation before and after an initiative to promote evidence-based nursing in an ambulatory oncology setting. Worldviews Evid Based Nurs. 2015 Apr;12(2):70-8. doi: 10.1111/wvn.12080. PMID: 25704058. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Underwood W, 3rd, Orom H, Poch M, et al. Multiple physician recommendations for prostate cancer treatment: a Pandora's box for patients? Can J Urol. 2010 Oct;17(5):5346-54. PMID: 20974025. **- Does not include any clearly defined measure of organizational characteristics**

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professionals' attitudes to the feasibility and acceptability of a shared care model. Psychooncology. 2019 Sep;28(9):1862-70. doi: 10.1002/pon.5165. PMID: 31257660. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Valuck T, Blaisdell D, Dugan DP, et al. Improving Oncology Quality Measurement in Accountable Care: Filling Gaps with Cross-Cutting Measures. J Manag Care Spec Pharm. 2017 Feb;23(2):174-81. doi: 10.18553/jmcp.2017.23.2.174. PMID: 28125364. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

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van Driel CM, de Bock GH, Arts HJ, et al. Stopping ovarian cancer screening in BRCA1/2 mutation carriers: effects on risk management decisions & outcome of risk-reducing salpingo-oophorectomy specimens. Maturitas. 2015 Mar;80(3):318-22. doi: 10.1016/j.maturitas.2014.12.009. PMID: 25600260. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Van Haren RM, Delman AM, Turner KM, et al. Impact of the COVID-19 Pandemic on Lung Cancer Screening Program and Subsequent Lung Cancer. J Am Coll Surg. 2021 Apr;232(4):600-5. doi: 10.1016/j.jamcollsurg.2020.12.002. PMID: 33346080. **- Does not include any clearly defined measure of organizational characteristics**

Vichare A, Washington R, Patton C, et al. An assessment of the current US radiation oncology workforce: methodology and global results of the American Society for Radiation Oncology 2012 Workforce Study. Int J Radiat Oncol Biol Phys. 2013 Dec 1;87(5):1129-34. doi: 10.1016/j.ijrobp.2013.08.050. PMID: 24210081. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Vicini F, Nancarrow-Tull J, Shah C, et al. Increasing accrual in cancer clinical trials with a focus on minority enrollment: The William Beaumont Hospital Community Clinical Oncology Program Experience. Cancer. 2011 Oct 15;117(20):4764-71. doi: 10.1002/cncr.26094. PMID: 21455995. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Viscariello N, Evans S, Parker S, et al. A multi-institutional assessment of COVID-19-related risk in radiation oncology. Radiother Oncol. 2020 Dec;153:296-302. doi: 10.1016/j.radonc.2020.10.013. PMID: 33096163. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Volpini ME, Lekx-Toniolo K, Mahon R, et al. The impact of COVID-19 workflow changes on radiation oncology incident reporting. J Appl Clin Med Phys. 2022 Nov;23(11):e13742. doi: 10.1002/acm2.13742. PMID: 35932177.**- Non-USA based study**

Vulaj V, Hough S, Bedard L, et al. Oncology pharmacist opportunities: Closing the gap in quality care. Journal of Oncology Practice. 2018;14(6):e403-e11. doi: 10.1200/JOP.2017.026666.**- No original data (opinion, letters, editorial, commentary)**

Walling AM, D'Ambruoso SF, Malin JL, et al. Effect and Efficiency of an Embedded Palliative Care Nurse Practitioner in an Oncology Clinic. J Oncol Pract. 2017 Sep;13(9):e792-e9. doi: 10.1200/jop.2017.020990. PMID: 28813191. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Wallington S, Oppong B, Dash C, et al. A Community-Based Outreach Navigator Approach to Establishing Partnerships for a Safety Net Mammography Screening Center. J Cancer Educ. 2018 Aug;33(4):782-7. doi: 10.1007/s13187-016-1152-9. PMID: 27995458. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Wallner LP, Abrahamse P, Gargaro JG, et al. Improving the delivery of team-based survivorship care after primary breast cancer treatment through a multi-level intervention: a pilot randomized controlled trial. Breast Cancer Res Treat. 2021 Aug;189(1):81-92. doi: 10.1007/s10549-021-06257-w. PMID: 34235608. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Walsh J, Potter M, Ozer E, et al. Evaluating the sustainability of a cancer screening intervention through a PRISM: The PreView experience. Prev Med Rep. 2021 Sep;23:101443. doi: 10.1016/j.pmedr.2021.101443. PMID: 34189023. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Walters RS. Opportunities for improvement: experience at one institution. J Natl Compr Canc Netw. 2014 Feb;12 Suppl 1:S36-9. doi: 10.6004/jnccn.2014.0213. PMID: 24614051.**- No original data (opinion, letters, editorial, commentary)**

Wasp GT, Alam SS, Brooks GA, et al. End-of-life quality metrics among medicare decedents at minority-serving cancer centers: A retrospective study. Cancer Med. 2020 Mar;9(5):1911-21. doi: 10.1002/cam4.2752. PMID: 31925998. **- Does not include any clearly defined measure of organizational characteristics**

Watabayashi KK, Bell-Brown A, Kreizenbeck K, et al. Successes and challenges of implementing a cancer care delivery intervention in community oncology practices: lessons learned from SWOG S1415CD. BMC Health Serv Res. 2022 Apr 1;22(1):432. doi: 10.1186/s12913-022-07835-4. PMID: 35365139. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Watabayashi KK, Bell-Brown A, Kreizenbeck K, et al. Successes and challenges of implementing a cancer care delivery intervention in community oncology practices: lessons learned from SWOG S1415CD. BMC Health Serv Res. 2022 Apr 1;22(1):432. doi: 10.1186/s12913-022-07835-4. PMID: 35365139. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Waters TM, Webster JA, Stevens LA, et al. Community Oncology Medical Homes: Physician-Driven Change to Improve Patient Care and Reduce Costs. J Oncol Pract. 2015 Nov;11(6):462-7. doi: 10.1200/jop.2015.005256. PMID: 26220931. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Weaver SJ, Verhoeven DC, Castro KM, et al. Thematic Analysis of Organizational Characteristics in NCI Community Oncology Research Program Cancer Care Delivery Research. JNCI Cancer Spectr. 2022 Mar 2;6(2)doi: 10.1093/jncics/pkac008. PMID: 35603839. **- Already included in report**

Weaver SJ, Verhoeven DC, Castro KM, et al. Thematic Analysis of Organizational Characteristics in NCI Community Oncology Research Program Cancer Care Delivery Research. JNCI Cancer Spectrum. 2022;6(2)doi: 10.1093/jncics/pkac008. **-Other: Framework covered in Guiding Question 1**

Weintraub SM, Salter BJ, Chevalier CL, et al. Human factor associations with safety events in radiation therapy. J Appl Clin Med Phys. 2021 Oct;22(10):288-94. doi: 10.1002/acm2.13420. PMID: 34505353. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Wells KJ, Wightman P, Cobian Aguilar R, et al. Comparing clinical and nonclinical cancer patient navigators: A national study in the United States. Cancer. 2022 Jul 1;128 Suppl 13(Suppl 13):2601-9. doi: 10.1002/cncr.33880. PMID: 35699618. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Whitson MJ, Bodian CA, Aisenberg J, et al. Is production pressure jeopardizing the quality of colonoscopy? A survey of U.S. endoscopists' practices and perceptions. Gastrointest Endosc. 2012 Mar;75(3):641-8. doi: 10.1016/j.gie.2011.10.032. PMID: 22341109. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Wholey DR, Finch M, Kreiger R, et al. Public Reporting of Primary Care Clinic Quality: Accounting for Sociodemographic Factors in Risk Adjustment and Performance Comparison.

Popul Health Manag. 2018 Oct;21(5):378-86. doi: 10.1089/pop.2017.0137. PMID: 29298402. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Wiencek C, Coyne P. Palliative Care Delivery Models. Seminars in Oncology Nursing. 2014;30(4):227-33. doi: 10.1016/j.soncn.2014.08.004.**- No original data (opinion, letters, editorial, commentary)**

Williams GR, Deal AM, Jolly TA, et al. Feasibility of geriatric assessment in community oncology clinics. J Geriatr Oncol. 2014 Jul;5(3):245-51. doi: 10.1016/j.jgo.2014.03.001. PMID: 24703978. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Withycombe JS, Alonzo TA, Wilkins-Sanchez MA, et al. The Children's Oncology Group: Organizational Structure, Membership, and Institutional Characteristics. J Pediatr Oncol Nurs. 2019 Jan/Feb;36(1):24-34. doi: 10.1177/1043454218810141. PMID: 30426816. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Woofter K, Kennedy EB, Adelson K, et al. Oncology medical home: ASCO and COA standards. JCO Oncology Practice. 2021;17(9):475-92. doi: 10.1200/OP.21.00167. **- Does not include any clearly defined measure of organizational characteristics**

Wright JL, Parekh A, Rhieu BH, et al. Real-time management of incident learning reports in a radiation oncology department. Pract Radiat Oncol. 2018 Sep-Oct;8(5):e337-e45. doi: 10.1016/j.prro.2018.04.016. PMID: 29907503. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Wright JL, Yom SS, Awan MJ, et al. Standardizing Normal Tissue Contouring for Radiation Therapy Treatment Planning: An ASTRO Consensus Paper. Pract Radiat Oncol. 2019 Mar;9(2):65-72. doi: 10.1016/j.prro.2018.12.003. PMID: 30576843. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Xu Z, Becerra AZ, Justiniano CF, et al. Is the distance worth it? Patients with rectal cancer traveling to high-volume centers experience improved outcomes. Diseases of the Colon and Rectum. 2017;60(12):1250-9. doi: 10.1097/DCR.0000000000000924. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Yang R, Wang J, Zhang X, et al. Implementation of incident learning in the safety and quality management of radiotherapy: the primary experience in a new established program with advanced technology. Biomed Res Int. 2014;2014:392596. doi: 10.1155/2014/392596. PMID: 25140309. **- Non-USA based study**

Yen TWF, Laud PW, McGinley EL, et al. Prevalence and scope of advanced practice provider oncology care among Medicare beneficiaries with breast cancer. Breast Cancer Research and Treatment. 2020;179(1):57-65. doi: 10.1007/s10549-019-05447-x. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Yip MP, Chun A, Edelson J, et al. Contexts for Sustainable Implementation of a Colorectal Cancer Screening Program at a Community Health Center. Health Promot Pract. 2016 Jan;17(1):48-56. doi: 10.1177/1524839915595592. PMID: 26202774. **- Does not include any clearly defined measure of organizational characteristics**

Young L, Kim J, Wang H, et al. Examining Factors Influencing Colorectal Cancer Screening of Rural Nebraskans Using Data from Clinics Participating in an Accountable Care Organization: A Study Protocol. F1000Research. 2015;4doi: 10.12688/f1000research.6782.1.**- No original data (opinion, letters, editorial, commentary)**

Yu C, Skootsky S, Grossman M, et al. A Multi-Level Fit-Based Quality Improvement Initiative to Improve Colorectal Cancer Screening in a Managed Care Population. Clinical and Translational Gastroenterology. 2018;9(8)doi: 10.1038/s41424-018-0046-z. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Yu N, Xia P, Mastroianni A, et al. Data-driven management using quantitative metric and automatic auditing program (QMAP) improves consistency of radiation oncology processes. Pract Radiat Oncol. 2017 May-Jun;7(3):e215-e22. doi: 10.1016/j.prro.2016.10.014. PMID: 28110939. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Zapka J, Taplin SH, Price RA, et al. Factors in quality care-the case of follow-up to abnormal cancer screening tests-problems in the steps and interfaces of care. 2010. **- Relevant but systematic review**

Zaren HA, Nair S, Go RS, et al. Early-phase clinical trials in the community: results from the national cancer institute community cancer centers program early-phase working group baseline assessment. J Oncol Pract. 2013 Mar;9(2):e55-61. doi: 10.1200/jop.2012.000695. PMID: 23814525. **- Addresses ONLY clinical trial recruitment outcome**

Zeliadt SB, Hoffman RM, Birkby G, et al. Challenges Implementing Lung Cancer Screening in Federally Qualified Health Centers. Am J Prev Med. 2018 Apr;54(4):568-75. doi: 10.1016/j.amepre.2018.01.001. PMID: 29429606. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Zerillo JA, Pham TH, Kadlubek P, et al. Administration of oral chemotherapy: results from three rounds of the quality oncology practice initiative. J Oncol Pract. 2015 Mar;11(2):e255-62. doi: 10.1200/jop.2014.001842. PMID: 25784581. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Zhong X, Song Y, Dennis C, et al. Patient safety culture in Peking University Cancer Hospital in China: baseline assessment and comparative analysis for quality improvement. BMC Health Serv Res. 2019 Dec 28;19(1):1008. doi: 10.1186/s12913-019-4837-z. PMID: 31883512.**- Non-USA based study**

Zhou J, Griffith KA, Hawley ST, et al. Surgeons' knowledge and practices regarding the role of radiation therapy in breast cancer management. Int J Radiat Oncol Biol Phys. 2013 Dec 1;87(5):1022-9. doi: 10.1016/j.ijrobp.2013.08.031. PMID: 24161426. **- Does not address delivery of cancer care (screening, diagnosis, or treatment)**

Zhu J, Zhang T, Shah R, et al. Comparison of Quality Oncology Practice Initiative (QOPI) Measure Adherence Between Oncology Fellows, Advanced Practice Providers, and Attending Physicians. J Cancer Educ. 2015 Dec;30(4):774-8. doi: 10.1007/s13187-015-0798-z. PMID: 25686787. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Zubkoff L, Dionne-Odom JN, Pisu M, et al. Developing a "toolkit" to measure implementation of concurrent palliative care in rural community cancer centers. Palliat Support Care. 2018 Feb;16(1):60-72. doi: 10.1017/s1478951517000323. PMID: 28566103. **- The stated objectives of the article do not include anything about examining how organizational characteristics are related to the delivery of cancer care**

Appendix C. Results

Guiding Question 2 and 3 Included Articles

Implementation of Improvement Projects and Barriers to Implementation

Brooks K, Polverento M, Houdeshell-Putt L, et al. Observing Provider Utilization of Electronic Health Records to Improve Clinical Quality Metrics. Perspect Health Inf Manag. 2022 Winter;19(1):1o. PMID: 35440927.

Bucho-Gonzalez J, Herman PM, Larkey L, et al. Startup and implementation costs of a colorectal cancer screening tailored navigation research study. Eval Program Plann. 2021 Apr;85:101907. doi: 10.1016/j.evalprogplan.2021.101907. PMID: 33561756.

Buehler KE, Wilshire CL, Gilbert CR, et al. Imaging Administrators: The Overlooked Barrier to Lung Cancer Screening Implementation. Chest. 2022;161(2):583-5. doi: 10.1016/j.chest.2021.07.005.

Carlin CS, Dowd B, Feldman R. Changes in Quality of Health Care Delivery after Vertical Integration. Health Serv Res. 2015 Aug;50(4):1043-68. doi: 10.1111/1475-6773.12274. PMID: 25529312.

Carpenter WR, Fortune-Greeley AK, Zullig LL, et al. Sustainability and performance of the National Cancer Institute's Community Clinical Oncology Program. Contemp Clin Trials. 2012 Jan;33(1):46-54. doi: 10.1016/j.cct.2011.09.007. PMID: 21986391.

Chao ST, Meier T, Hugebeck B, et al. Workflow enhancement (WE) improves safety in radiation oncology: putting the WE and team together. Int J Radiat Oncol Biol Phys. 2014 Jul 15;89(4):765-72. doi: 10.1016/j.ijrobp.2014.01.024. PMID: 24685444.

Cole AM, Esplin A, Baldwin LM. Adaptation of an Evidence-Based Colorectal Cancer Screening Program Using the Consolidated Framework for Implementation Research. Prev Chronic Dis. 2015 Dec 3;12:E213. doi: 10.5888/pcd12.150300. PMID: 26632954.

Denny DS, Allen DK, Worthington N, et al. The use of failure mode and effect analysis in a radiation oncology setting: the Cancer Treatment Centers of America experience. J Healthc Qual. 2014 Jan-Feb;36(1):18-28. doi: 10.1111/j.1945-1474.2011.00199.x. PMID: 22364244.

Deraniyagala R, Liu C, Mittauer K, et al. Implementing an Electronic Event-Reporting System in a Radiation Oncology Department: The Effect on Safety Culture and Near-Miss Prevention. J Am Coll Radiol. 2015 Nov;12(11):1191-5. doi: 10.1016/j.jacr.2015.04.014. PMID: 26541132.

DiMartino LD, Birken SA, Hanson LC, et al. The influence of formal and informal policies and practices on health care innovation implementation: A mixed-methods analysis. Health Care Manage Rev. 2018 Jul/Sep;43(3):249-60. doi: 10.1097/hmr.0000000000000193. PMID: 29533270.

Dwyer AJ, Weltzien ES, Harty NM, et al. What makes for successful patient navigation implementation in cancer prevention and screening programs using an evaluation and sustainability framework. Cancer. 2022 Jul 1;128 Suppl 13:2636-48. doi: 10.1002/cncr.34058. PMID: 35699619.

Federman DG, Kravetz JD, Lerz KA, et al. Implementation of an electronic clinical reminder to improve rates of lung cancer screening. Am J Med. 2014 Sep;127(9):813-6. doi: 10.1016/j.amjmed.2014.04.010. PMID: 24769298.

Fernandez ME, Walker TJ, Weiner BJ, et al. Developing measures to assess constructs from the Inner Setting domain of the Consolidated Framework for Implementation Research. Implementation Science. 2018;13(1)doi: 10.1186/s13012-018-0736-7.

Friedman EL, Chawla N, Morris PT, et al. Assessing the Development of Multidisciplinary Care: Experience of the National Cancer Institute Community Cancer Centers Program. J Oncol Pract. 2015 Jan;11(1):e36-43. doi: 10.1200/jop.2014.001535. PMID: 25336082.

Frosch DL, Singer KJ, Timmermans S. Conducting implementation research in community-based primary care: a qualitative study on integrating patient decision support interventions for cancer screening into routine practice. Health Expect. 2011 Mar;14 Suppl 1(Suppl 1):73-84. doi: 10.1111/j.1369-7625.2009.00579.x. PMID: 19906215.

Jacobs SR, Weiner BJ, Reeve BB, et al. Determining the predictors of innovation implementation in healthcare: a quantitative analysis of implementation effectiveness. BMC Health Serv Res. 2015 Jan 22;15:6. doi: 10.1186/s12913-014-0657-3. PMID: 25608564.

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Kegler MC, Beasley DD, Liang S, et al. Using the consolidated framework for implementation research to understand safety net health system efforts to increase colorectal cancer screening rates. Health Educ Res. 2018 Aug 1;33(4):315-26. doi: 10.1093/her/cyy019. PMID: 29982384.

Lamb GC, Smith MA, Weeks WB, et al. Publicly reported quality-of-care measures influenced Wisconsin physician groups to improve performance. Health Aff (Millwood). 2013 Mar;32(3):536-43. doi: 10.1377/hlthaff.2012.1275. PMID: 23459733.

Mader EM, Fox CH, Epling JW, et al. A practice facilitation and academic detailing intervention can improve cancer screening rates in primary care safety net clinics. Journal of the American Board of Family Medicine. 2016;29(5):533-42. doi: 10.3122/jabfm.2016.05.160109.

Maeda JL, Bradley JJ, Eissler SR, et al. Expanding Access to Care and Improving Quality in the Mid-Atlantic States Safety-Net Clinics: Kaiser Permanente's Community Ambassador Program. The Permanente journal. 2015;19(2):22-7. doi: 10.7812/TPP/14-109.

Mori S, Navarrete-Dechent C, Petukhova TA, et al. Tumor board conferences for multidisciplinary skin cancer management: A survey of US cancer centers. JNCCN Journal of the National Comprehensive Cancer Network. 2018;16(10):1209-15. doi: 10.6004/jnccn.2018.7044.

Murphy KA, Daumit GL, Bandara SN, et al. Association Between the Maryland Medicaid Behavioral Health Home Program and Cancer Screening in People With Serious Mental Illness. Psychiatr Serv. 2020 Jun 1;71(6):608-11. doi: 10.1176/appi.ps.201900299. PMID: 32019432.

Novak A, Nyflot MJ, Ermoian RP, et al. Targeting safety improvements through identification of incident origination and detection in a near-miss incident learning system. Med Phys. 2016 May;43(5):2053-62. doi: 10.1118/1.4944739. PMID: 27147317.

Palmer RC, Samson R, Batra A, et al. Breast cancer screening practices of safety net clinics: results of a needs assessment study. BMC Womens Health. 2011 Apr 2;11:9. doi: 10.1186/1472-6874-11-9. PMID: 21457575.

Patel MI, Murillo A, Agrawal M, et al. Health Care Professionals' Perspectives on Implementation, Adoption, and Maintenance of a Community Health Worker-Led Advance Care Planning and Cancer Symptom Screening Intervention: A Qualitative Study. JCO Oncol Pract. 2023 Jan;19(1):e138-e49. doi: 10.1200/op.22.00209. PMID: 36201710.

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Key Informant (KI) Call Discussion and Themes

Question 1: Do you have any questions or concerns about the preliminary literature search strategy and methods described in the protocol?

- Some of the literature out there is about what should be done, not what has been done. There are a number of white papers about lessons learned or more of what needs to be done, that hasn't been as tested
- Should consider articles on service lines, which include empirical articles. One Key Informant found eight variations of service lines, by the degree of which they put people together. Terms are not used consistently.
- On the 2010 publication cutoff, the introduction of the Affordable Care Act (ACA) is important, but also should think about the pandemic. Particularly the shift in healthcare during and around the pandemic and this could be a separate/called out issue. Additional changes have been made in the past two and a half years, and should be considered within the framework, as the pandemic is also going to be important in helping to define organizational culture and structures.
- Current publications are more on what should have been done, not so much on what has been done and tested due to the short timeframe since the pandemic started.
    - Examples: Increase in telemedicine and reimbursement, expansion of remote working and roles like nurse navigation, staffing mix, and how much the changes in staffing have played a role in patient outcomes.
    - These could go toward future research needs.

Question 2: Which governmental/nongovernmental organizations are most likely to have relevant reports that we might not find in the peer-reviewed literature?

- Relational Coordination Analytics
- National Coalition for Cancer Survivorship (NCCS) shared link to survey: https://canceradvocacy.org/2022-state-of-cancer-survivorship-survey/
- Accreditation agencies report metrics on measurements of cancer centers that matter to cancer centers: Commission on Cancer, National Cancer Database, Association of Community Cancer Centers, National Accreditation Program for Breast Centers
- Quinte Health Care (QHC): can see what they use for measurements especially for screening, but also for cancer care.
- Sometimes people use the term "integrated care" rather than care coordination or coordination care. Example: Sarah Singer developed a survey on patient perspectives of integrated care.
- The Center for Medicare and Medicaid Innovation: Models of care delivery.
- Center for Qualitative Inquiry (C4QI): http://www.c4qi.net/
- Alliance of Dedicated Cancer Centers (ADCC): www.adcc.org
- American Society of Clinical Oncology (ASCO) pilot project: https://old-prod.asco.org/news-initiatives/policy-news-analysis/new-certification-pilot-focuses-patient-centered-cancer-care

- ASCO has a pilot project entitled Patient-Centered Cancer Care that is a collaboration with the Community Oncology Alliance and contains elements of the Oncology Medical Home
- Assistant Secretary for Planning and Evaluation (ASPE)
- Commonwealth
- Robert Wood Johnson Foundation
- National Institute for Health Care Management
- Medical Group Management Association surveys
- Health Care Systems Research Network

Question 3: What specific frameworks, models or theories (other than the draft integrated framework) do you suggest we review that describe how organizational characteristics may influence cancer care (screening, diagnosis, or treatment) or health care delivery in general?

- Organization Theory for Implementation Science (OTIS)
- Continuum framework
- Way of classifying organization designs, that takes into account traditional organizational structure where people are grouped by profession and discipline and adding coordinating structures, until the ninth alternative, which is completely reorganizing into institutes and centers, where all of the staff providing care for patients with cancer including all the way across the cancer care continuum are members of the Institute/Center.
- This work is difficult because the unit of analysis is the organization and getting enough organizations for a good empirical study is a challenge.
- Reach, Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) framework
- Triple Aim
- Quadruple Aim
- Consolidated Framework for Implementation Research

Question 4: Do you foresee any difficulties in using the draft integrated framework to guide our approach to answering the Key Questions?

- When categorizing the characteristics, or resources and delivery, it gets to this concept of what the unit of analysis are in these frameworks, and how is it defined? It gets more complicated in getting a representation as this isn't defined. Secondly, how do the frameworks consider the temporal factors? Structural and temporal complexity are important factors. These challenges could be highlighted in future research needs
- Organizations don't operate in vacuums. An example is an organization as a corporate entity, but their cancer care facility is an amalgamation of two separate entities. What is the unit of analysis and how do they relate to one another?
- The ownership models are difficult to prioritize. Historically it has been academic vs community, but now community can include academic-like roles. So, what is important about being academic? ASCO defined it as having fellowship program or connected to medical school, but this also has many grey areas. Some of the practices are traditional others are not. It's a very dynamic field.
- Even just regional differences are very different, is the framework tested for regional differences as well?

- Some frameworks are easy to understand and not complex. More complex ones are harder to implement, if it gets too complex it gets overwhelming for the user. There needs to be a balance between completeness of the framework and complexity.

Question 5: Do you foresee any challenges with our inclusion/exclusion criteria for our literature search and selection?

- Might be hard to find studies that are generalizable to a whole population of cancer patients, but I think these types of resources impact a patient's cancer screening/diagnosis, etc. and therefore, their outcome.

Other Comments

- These are opportunities to think of new questions, hope it forces investigators to consider things in areas not directly related to organizations, but which have huge implications for organizations. What are we attributing to individuals that is actually related to things that are totally beyond individual control?

Table C-1. Grey literature search results

Source Title (Link)	Type of Grey Literature Type of Information	General Summary Information	Measurement of Organizational Characteristics	Measurements/Variables	Measurement Instrument
Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis[1] (https://www.ncbi.nlm.nih.gov/books/NBK202150/)	Book Descriptive Summary of Concepts	Table 2 in Chapter 7 provides a summary of the advantages and disadvantages of various measures used in assessing the quality of cancer care.	NA	(1) Structure: Measures the settings in which clinicians deliver health care, including material resources, human resources, and organizational structure (e.g., types of services available, qualifications of clinicians, and staffing hierarchies) (2) Process: Measures the delivery of care in defined circumstances (e.g., screening the general population, psychosocial evaluations of all newly diagnosed patients, care planning before starting chemotherapy) (3) Clinical Outcome: Measures personal health and functional status as a consequence of contact with the health care system (e.g., survival, success of treatment) (4) Patient-Reported Outcome: Measures patients' perceived physical, mental, and social well-being based on information that comes directly from the patient (e.g., quality of life, time to return to normal activity, symptom burden) (5) Patients' Perspective on Care: Measures patients' satisfaction with the health care they received (6) Cost: Measures the resources required for the health care system to deliver care and the economic impact on patients, their families, and governmental and private payers (7) Efficiency: Measures the time, effort, or cost to produce a specific output in the health care system (e.g., time to initiate therapy after diagnosis, coordination of care) (8) Cross-Cutting: Measures issues that cross cancer or disease types (e.g., patient safety, care coordination, equity, and patients' perspective on care) (9) Disease-Specific: Measures issues within a specific cancer type (e.g., clinicians' concordance with clinical practice guidelines for breast, prostate, and colon cancer)	NA

Source Title (Link)	Type of Grey Literature Type of Information	General Summary Information	Measurement of Organizational Characteristics	Measurements/Variables	Measurement Instrument
Transforming Cancer Care and the Role of Payment Reform: Lessons from the New Mexico Cancer Center[2] (https://www.brookings.edu/wp-content/uploads/2016/06/Oncology-Case-Study-August-2014-FINAL-WEB.pdf)	Report Descriptive Summary of Concepts	The report describes innovations in care delivery and includes a list of structural, process, and outcome measures that the New Mexico Cancer Center uses to promote clinical actions that improve the quality of cancer care.	NA	Structural Measures: (1) extended hours, (2) number of same day appointment slots available, (3) EHR down-time, (4) pulls of data from EHR into other systems, and (5) missing records and incomplete data. Process Measures: (1) compliance reports of triage for symptom management pathways, (2) treatment dashboards for adherence to clinical pathways, (3) number of extended hours visits per month, (4) number of calls triaged per month, (5) number of calls triaged per month, (6) number of triage pathways used, and (7) percentage of patients staged within one month of diagnosis. Outcome Measures: (1) patient satisfaction survey (see next): (1A) getting an appointment and starting treatment for a condition that needed care right away, (2) emergency department utilization, (3) real-time comparative effectiveness research of clinical pathways (see next): (3A) percentage of patients completing regimen on time, and (3B) percentage of patients who accessed required auxiliary pathways (nausea, diarrhea, etc.)	NA

Source Title (Link)	Type of Grey Literature Type of Information	General Summary Information	Measurement of Organizational Characteristics	Measurements/Variables	Measurement Instrument
American Society of Clinical Oncology – State of Cancer Care[3] (https://ascopubs.org/pb-assets/pdfs/2018-SOCCA-Census-Article-Infographic-Web-1650552446517.pdf)	Issue or Data Brief Data Brief	The American Society of Clinical Oncology – State of Cancer Care issue briefs identified potential barriers to providing oncology care in the United States. The major concerns by practices relate to payer pressures, including prior authorizations and denials and appeals for coverage. Other environmental pressures reported by practices are competitive pressures, concerns around staffing shortages, electronic health records, and increasing costs.	NA	(1) Prior authorizations, (2) coverage denials/appeals, (3) competitive pressures, (4) staffing issues, (5) electronic health records, and (6) increasing costs.	NA

Source Title (Link)	Type of Grey Literature Type of Information	General Summary Information	Measurement of Organizational Characteristics	Measurements/Variables	Measurement Instrument
AHRQ's Comparative Health System Performance (CHSP) Initiative[4] (https://www.ahrq.gov/sites/default/files/wysiwyg/chsp/compendium/2018-Compendium-TechDoc-update.pdf)	Technical documentation Descriptive Summary of Concepts	This is a website providing information on AHRQ's comparative health system performance compendium. It provides health-system level aggregated data on structural features of provider organizations.	NA	(1) Number of hospitals in systems, (2) Number of general acute care hospitals in systems, (3) Number of total physicians, (4) Number of primary care physicians, (5) Number of nurse practitioners, (6) Number of physician assistants, (7) Number of medical groups, (8) Multistate system, (9) Number of beds in systems, (10) Number of discharges in systems, (11) Number of residents in systems, (12) System offers any insurance product, (13) System offers an MA product, (14) System offers a Medicaid managed care product, (15) System offers a Health Insurance Marketplace product, (16) List of MA contracts offered by the system, (17) Total enrollment across all MA contracts owned by the system, (18) System participates in a Medicare APM, (19) Number of system-affiliated physicians participating in a Medicare ACO, (20) Number of system-affiliated physicians participating in a Medicare primary care transformation model, (21) Number of system-affiliated nursing home	NA
Oncology Care Model Evaluation Reports[5] (https://innovation.cms.gov/data-and-reports/2022/ocm-ar4-eval-payment-impacts-app)	Technical documentation Descriptive Summary of Concepts	These reports used multilevel sociodemographic and market-supply characteristics variables – beneficiary, practice, and market-levels - as control variables in their analyses.	NA	(1) CMS program alignment, (2) Beneficiary clinical characteristics, (3) Practice organization and affiliations, (4) Practice size and volume, (5) Practice specialty type, (6) Market size, (7) Market demographics, (8) Market exposure to Medicare Alternative Payment Models, (9) Market provider supply, (10) Market health services utilization	NA

ACO = Accountable Care Organization; AHRQ = Agency for Healthcare Research and Quality; APM = Alternative Payment Model; CHSP = Comparative Health System Performance; CMS = Centers for Medicare & Medicaid Services; EHR = electronic health record; MA = Medicare Advantage; NA = not available or not applicable

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Appendix D. Evidence Tables

Evidence Table D-1. Approaches to measure organizational context and process characteristics for cancer screening (Guiding Question 2)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Impact of training, training types, workforce capacity assessments	Shaw, 2012[1]	Cross-sectional	Interview with primary care practice team-members, using template approach to code transcribed data for themes and patterns.	Team-based reflections' effect on quality improvement	Organizational reflection promoted buy-in, motivation, and feelings of inspiration; Process reflection enhanced team problem solving and change management; Relational reflection enhanced discussions of Relational dynamics necessary to implement desired QI changes
Implementation of improvement projects and barriers to implementation	Beuhler, 2021[2]	Mixed-Methods	Used surveys developed as part of a quality indicator project to identify barriers faced by imaging administrators and LCS coordinators.	Support, barriers, and motivation as it relates to lung cancer screening implementation	Of the 76 sites contacted, only eight sites, which are different from the eight highlighted herein, reported that they did not face any barriers to screening, identified a gap between support and resources given to the CT imaging sites and motivation and commitment from the local LCS leaders.
	Brooks, 2022[3]	Retrospective Cohort	The Michigan Office of Health Information Technology provided summary data on all eligible MD and DO physicians who participated in its Medicaid MU program. Also utilized the Michigan Medicaid data warehouse.	12 CQMs - for preventive care, cancer screening and chronic illness; providers performance	Improvements in quality of infant well-child visits (mean difference = 10.2) and colorectal cancer screening (mean difference = 8.0 percent) were observed. Found no change or slight decreases for the other selected measures.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Bucho-Gonzalez, 2021[4]	Prospective Cohort	In Phase 1, community sites were randomized to either tailored navigation from trained navigators or control. All participants reaching Phase II were navigated to complete their CRC screening; Staff hours for all study staff were tracked by activity using an Outlook© calendar-based tracking system.	The Phase 1 outcome was attendance at a clinic visit; screening competition; unit costs	The largest component of startup costs (32% of total) was community site recruitment. Implementation costs per class attendee were higher in the navigation group ($1084) than control ($798). But costs per participant who made a clinic appointment ($3573 versus $6292) and per participant who completed screening ($4083 versus $7640) were lower in the navigation group
	Carlin, 2015[5]	Retrospective cohort	Utilized commercial insurance and Medicaid data for enrollees and the Johns Hopkins ACG system to capture prior-year health status. Demographic data was captured from US Census Bureau data.	Screening rates, inpatient admissions, ACS admissions, readmissions, emergency department visits.	Moving a clinic system into a vertically integrated delivery system resulted in limited increases in quality of care indicators.
	Dwyer, 2022[6]	Prospective Cohort	Utilized the Practical, Robust Implementation and Sustainability Model (PRISM) model and the Patient Navigation Sustainability Assessment Tool for Preventive Cancer Screening (PNSAT).	PNSAT Scores; facilitators and barriers to implementation and sustainability of patient Colorado Cancer Screening Program (CCSP)(i.e., patient navigation)	The domains most frequently targeted for improvement in the sustainability plans were Workflow Integration (8 clinics), Communication, Planning, and Implementation (8 clinics), and Funding Stability (5 clinics).
	Frederman, 2014[7]	Retrospective Cohort	Consulted with leadership from the departments of radiology and information technology, and sections of primary care, pulmonary, cardiothoracic surgery, and oncology, an electronic clinical reminder was created.	Patients eligible for lung cancer screening; patients who received lung cancer screening with low-dose computed tomography (CT)	During the study period, 1082 patients (76.4%) who agreed to screening had completed the low-dose CT. Of the 1082 patients who underwent low-dose CT, initial screening CT results were abnormal in 689 (63.7%) and normal in only 393 (36.3%)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Frosch, 2011[8]	Feasibility Study	Qualitative field notes and ethnographic field methods.	Staff/physicians practices and work-flow	Practices that were better able to integrate the project had adequate clinic infrastructure, a relatively well-matched patient pool, and positive work and patient care environments.
	Kegler, 2018[9]	Semi-structured Interviews	Semi-structured interviews with key informants using a codebook developed based on the CFIR constructs, and used quarterly reports to ACS through an online tracking tool.	CFIR construct, used NVivo 10 to generate a report that included all text coded for each construct from all transcripts within each site; Completed a cross-case analysis to identify CFIR constructs that demonstrated salience in implementing EBPs across sites; screening targets and the actual number of patients screened	Of the five CFIR domains, constructs within four CFIR domains (inner setting, outer setting, individual characteristics and process domains) were particularly salient in discussions of implementation while constructs within one CFIR domain (characteristics of the intervention) were not.
	Mader, 2016[10]	Prospective Cohort	Physicians, nurses, and other care providers at each practice received a continuing medical education–accredited academic detailing session (ADS) presented by a primary care physician with expertise in cancer prevention recommendations.	Changes in screening rates, practice staff attitudes and experiences, readiness for transformation	Average screening rates for breast cancer increased by 13% ($p<.001$), and rates for colorectal cancer increased by 5.6% ($p<001$). Practices implemented a mix of electronic health record data cleaning workflows, provider audits and feedback, reminder systems streamlining, and patient education and outreach interventions.
	Murphy, 2022[11]	Retrospective cohort	Used Maryland Medicaid administrative claims data.	Cancer screening measures: receipt of pap smear, mammography, colonoscopy, sigmoidoscopy, or fecal occult blood test	Maryland Medicaid behavioral health home (BHH) enrollment associated with increased screening for cervical and breast cancer but not for colorectal cancer

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Rauscher, 2020[12]	Secondary Data Analysis	Data submitted by facilities across the state of Illinois for screening mammograms performed in 2006, 2009, 2010, 2011 and 2013; Calculated the proportion of facilities meeting each specific benchmark by time point and examined trends in these proportions.	Trends for meeting benchmarks by Breast Imaging Center of Excellence (BICOE) status, Recall Rate, Biopsy recommendation rate, cancers from abnormal screen (PPV1), cancer from biopsied (PPV3), Cancer detection rate, Proportion minimal, Proportion early stage, Timely follow-up imagining, Timely biopsy, Not lost at imaging, Not lost at biopsy, Known minimal status, Known stage at diagnosis.	The number of facilities able to show that they met specific benchmarks increased with length of participation for many but not all measures. Trends towards meeting more benchmarks were apparent for cancer detection, timely imaging, not lost at biopsy, known minimal status ($p<0.01$ for all), and proportion of screen-detected cancers that were minimal and early stage ($p<0.001$ for both).
	Shih, 2011[13]	Retrospective Cohort	Practices were recruited by phone, and signed a letter of consent allowing independent medical reviewers to conduct EHR-based patient chart abstraction.	Quality measures for breast cancer screening and smoking-cessation intervention	More than half of the practices increased their patients' blood pressure control, recorded BMI, breast cancer screening, and HbA1c screening by 5 percentage points.
	Weiner, 2017[14]	Pre-Post	Practice facilitator worked with clinic staff to select and implement policies and procedures from a tool kit developed by the National Colorectal Cancer Roundtable. Data collected through semi-structured interviews.	Recommendation for CRC screening; facilitators of and barriers to implementing office systems changes using the tool kit (implementation policies and practices); satisfaction with the amount and quality of support provided by the practice facilitators (implementation support); and the extent to which systematic CRC screening was expected, supported, and rewarded (implementation climate)	Overall, the percentage of eligible patients who received a documented recommendation for CRC screening increased from 15% preintervention to 29% postintervention ($p < .001$). Nonwhite patients were significantly more likely to receive a recommendation during the preintervention period (22% vs 12%, $p< .001$),
	Yabroff, 2011[15]	Retrospective cohort	Used data from the 2006–2007 National Survey of Primary Care Physicians' Recommendations and Practices for Breast, Cervical, Colorectal, and Lung Cancer Screening.	Clinical information systems strategy, delivery system design strategy, decision support strategy, physician and practice characteristics	Few physicians report using a comprehensive set of strategies to support cancer screening

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Leadership	Mejia, 2022[16]	Cross-sectional	53 key informants were interviewed to discuss perceptions of adoption of screening and referral practices across 15 community health centers. Interview topics informed by the CFIR framework.	Factors associated with feasibility and potential facilitators and barriers of a new evidence based comprehensive primary care and community health–based program aiming to delivery of Lung Cancer Screening and Tobacco Cessation (LCS-TC)	Three major themes representing facilitators and barriers were identified: (1) Allocation of resources and services coverage (2) need for a collaborative process to engage stakeholders and identify champions (3) stakeholders need different types of evidence to support implementation.
New roles or team composition	Sinclair, 2019[17]	Cross-sectional	Medical chart data was collected from the Amity Medical Group for pharmacist integrated and non-pharmacist integrated cohorts.	The impact of a pharmacist embedded within a primary care practice on quality measures of the Merit-Based Incentive Payment System	Colorectal cancer screening (55% of pharmacist cohort vs. 28% of non-pharmacist cohort)
Participation in total care delivery models	Angelotti, 2015[18]	Continuous quality improvement data collection, 24-month, no control	Data from quarterly narrative reports submitted by hospitals and residency programs were used to assess achievement of outcomes. A resident survey was created and included questions regarding residents knowledge and attitudes toward PCMH, quality measurement, and team-based care.	Number of sites achieving high-level PCMH recognition under NCQA's 2011 standards; Improvements in resident continuity; implementation and improvement in at least one care coordination and integration project chosen from a predetermined list: care transitions, culturally competent care, Improved access and coordination between primary and specialty care, care coordination and integration project composites	All sites enhanced resident education using PCMH principles through patient empanelment, development of quality dashboards, and transforming resident scheduling and training. Clinical quality outcomes showed improvement across the demonstration, including better performance on colorectal and breast cancer screening rates (rate increases of 13%, $p< .001$, and 11%, $p< .011$, respectively).
	Fifield, 2013[19]	RCT	Intervention received a tailored practice redesign support. Facilitators engaged physicians and staff on-site in a series of activities to implement the PCMH model.	PCMH participation; qualitative assessment of the amount of practice redesign, received by practices revealed that most practices (78%); received the maximum amount, while the other 22%, received some or very little support	Compared to control physicians, intervention physicians significantly improved quality indicator breast cancer screening over 3 years (intervention +3.5 percentage points, control −0.4 percentage points, $p=0.03$).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Fortuna, 2021[20]	Pre-Post	Survey responses for each individual variable were collected with either ‘‘Satisfaction’’ or ‘‘Agreement’’ scales (range of 1 to 10). Composite variables were created for each domain by taking an average of the individual variables within the composite category.	Experiences with PMCH across 5 domains: career, satisfaction, work-life balance, patient care, professional experience, and teamwork	Implementation of the PCMH model did not result in changes in provider, nurse, and staff responses to composite measures of satisfaction (P = 0.45), work-life balance (P = 0.68), teamwork (P = 0.26), patient care (P = 0.62), or professional experience (P = 0.14). Physicians experienced a negative, but mostly nonsignificant, change in all composite measures with implementation of the PCMH model. Quality markers improved for breast cancer screening (53.9% to 77.4%; p< 0.001), and colorectal cancer screening (43.9% to 70.3%; p< 0.001).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Friedberg, 2015[21]	Pre-Post	Developed a survey instrument to measure practices' structural capabilities, including use of disease management, registries, and electronic health records.	Performance feedback: Quality feedback to PCPs; Utilization or cost feedback to PCPs; monthly or more frequent meetings about quality; monthly or more frequent meetings about utilization; registry use: registry of patients who are overdue for screening services, registry of patients who are overdue for chronic disease services, registry of patients who are out of target range for chronic disease laboratory values, registry of patients at high risk of disease complications or hospitalization; care management: care management for patients at high risk of disease complications or hospitalization, specially-trained non-physician staff who help patients better manage their diabetes; Specially-trained non-physician staff who help patients better manage their asthma; routine assessment of self-management needs of chronically ill patients; referral system for linking patients to community programs; outreach systems to contact patients due for services; other outreach systems; electronic health record capabilities; access: weekend care offered regularly; evening care offered ≥2 nights per week; appointments for new patients within 2 weeks.	All pilot practices received recognition as medical homes during the intervention. By intervention year 3, relative to comparison practices, pilot practices had statistically significantly better performance on process measures of breast cancer screening but not colorectal cancer screening

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Haggstrom, 2012[22]	Cross-sectional	Self-reporting surveys where several domains were measured with Likert scales.	Six components of the chronic care model: self-management support, clinical decision support, delivery system design, clinical information systems, health care organization, community resources, cancer care process improvement	Implementation of Chronic Care Model (CCM), not solely Health Disparities Cancer Collaborative (HDCC) participation, was associated with cancer care process improvement. Organizational and individual change is challenging among the large, healthy populations. Furthermore, CCM implementation appeared to be the mechanism for improved cancer screening and follow-up in the final models. Establishes pathways from a quality improvement intervention to organizational process changes (chronic care model implementation) to organizational outcomes (improved teamwork) to clinical process changes (breast, cervical, and colorectal cancer screening and follow-up).
	Kern, 2016[23]	Longitudinal cohort	Obtained data on which physicians received payments through the federal EHR Incentive.	PCMH participation controlled for EHR use; physicians who implemented the PCMH, those who used EHRs but did not implement the PCMH; those who used paper records without the PCMH	There were no significant differences between the PCMH group and the control groups for the 2 measures - breast cancer screening for women, colorectal cancer screening - compared with EHRs and paper records

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Rosenthal, 2013[24]	Interrupted time series	Used the NCQA recognition audit data to summarize mean and median scores in each domain at baseline and at the end of year 2.	Patient-centered medical home structures and processes used by the NCQA's recognition process from the NCQA; recognition audit; NCQA Physician Practice Connections Standards in 9 areas: access and communication, patient tracking and registry functions, care management, patient self-management support, electronic prescribing, test tracking, referral tracking, performance reporting and improvement, advanced electronic communication	The Chronic Care Sustainability Initiative pilot program was associated with no significant improvements in any of the cancer-related quality measures: colon cancer screening, breast cancer screening, and cervical cancer screening. At the end of the pilot program, all five practices had reached level III status (attaining 75- 100 points). Pilot practices made notable progress in patient self-management support, electronic prescribing, and the tracking of laboratory tests and results. For advanced electronic communication, which includes the ability to message patients through secure e-mail, scores were little changed.
	Rosenthal, 2016[25]	Difference-in-difference analyses	Identified comparison practices in the same geographic region through propensity score matching using the claims data.	PCMH participation	The pilot was associated with increased cervical cancer screening after two (12.5 % increase, $p<0.001$) and three years (9.0 % increase, $p<0.001$), but lower rates of colon cancer screening (21.1 % and 18.1%at two and three years, respectively, $p<0.001$). No changes in breast cancer screening.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Schapira, 2016[26]	Cross-sectional	Survey fielded using email with a link to a Web-based survey and mailed versions. The questionnaire content was adapted from the NCI-sponsored National Survey of Primary Care Physicians' Cancer Screening Recommendations and Practices.	PCMH participation, EHR decision support, type of screening performance report (comparative, automated routine or automated follow-up), system for patient reminders (verbal, US mail, patient portal, phone, e-mail, navigator)	Less than half reported EHR decision support for breast (48.8 %) or cervical cancer (46.2 %) screening. A minority received comparative performance reports for breast (26.2 %) or cervical (19.7 %) cancer screening, automated reports of patients overdue for breast (18.7 %) or cervical (16.4 %) cancer screening, or follow-up of abnormal breast (18.1 %) or cervical (17.6 %) cancer screening tests. In multivariate analysis, reported NCQA recognition as a PCMH was associated with greater use of comparative performance reports of guideline adherent breast (OR 3.23, 95 % CI 1.58–6.61) or cervical (OR 2.56, 95 % CI 1.32–4.96) cancer screening and automated reports of patients overdue for breast (OR 2.19, 95 %CI 1.15–41.7) or cervical (OR. 2.56, 95 % CI 1.26–5.26) cancer screening.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Shi, 2015[27]	Cross-sectional	Utilized the Safety Net Medical Home Scale (SNMHS) evidenced adequate reliability and validity in the development sample	The Safety Net Medical Home Scale (SNMHS) with 52 items across 6 subscales: Access and communication, patient tracking and registry (ability to list patients by clinical characteristics), care management (ability to manage patient care through reminders, education, care coordination), test and referral tracking (ability to monitor from point of order until result is received), quality improvement (ability to systematically collect performance data and improve care), external coordination (ability to refer and receive external updates on patients)	The mixed results highlight the importance of examining relationships between specific PCMH domains and specific clinical quality measures, in addition to analyzing overall PCMH scores which could yield distorted findings. One process measure is cervical cancer screening. Findings showed different directional relationships, with some PCMH domains (care management, test/referral tracking, quality improvement, and external coordination) showing little or no effect on outcome measures of interest, One domain (access/communication) associated with improved outcomes, and one domain (patient tracking/registry) associated with worse outcomes
Structural and resource-related characteristics	Chou, 2015[28]	Cross-sectional	Merged patient level, organizational level, and area level data sources including External Peer Review Program, Primary Care Module of the Clinical Practice Organizational Survey, the VHA Survey of Women Veterans Health Programs and Practices, and US Department of Health and Human Services Area Resource File.	Organizational factors, mammograms and cervical/colorectal screenings	Resource sufficiency led to increased odds of screening. Findings identified organizational processes associated with better performance.
	Collie-Akers, 2012[29]	Cross-sectional	Used a 24-item survey of mammography facilities.	Description of provider characteristics among screening facilities	This survey indicate that the capacity of mammography facilities vary dramatically across many characteristics of capacity.
	Gawron 2021[30]	Cross-sectional	Definitions in Medical Expenditure Panel Survey.	Health Insurance coverage, poverty (annual income by FPL), comorbidities, and provider characteristics	A positive effect of educational efforts and healthcare reform with coverage of screening

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Onega, 2018[31]	Cross-sectional	Utilized a web-based survey completed by 15 primary care practices.	Breast cancer screening percentage	After accounting for woman-level characteristics, the remaining variation in breast cancer screening was largely due to provider and health system variation.
	Smieliauskas, 2014[32]	Cross-sectional	Combined information from health interview surveys to estimate the numbers of smokers who meet the USPSTF eligibility criteria, and information from administrative datasets to estimate the numbers of radiologists and the numbers of scans they currently interpret in Health Service Areas (HSAs) nationwide.	The prevalence of capacity constraints in the radiologist workforce and resulting potential disparities in access to lung cancer screening	1,023,943 lived in HSAs with increases of at least 5%. HSAs that were rural, with many eligible smokers, and disproportionately Hispanic or low-income, smokers had significantly higher odds of facing capacity constraints.
	So, 2012[33]	Prospective cohort	Collected data from the VA National Data Systems, linked with Medicare claims data.	Percentage of men at who received prostate specific antigen screening, medical center and patient factors associated with prostate specific antigen screening	Substantial practice variation exists for PSA screening in older men with limited life expectancy across VAs. The high center-specific correlation of screening among men with limited and favorable life expectancies indicates that PSA screening is poorly targeted according to life expectancy.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Workload/Workflow Design/Work Performance	Davis, 2019[34]	Comparative case study	Collected publicly reported data about coordinated care organizations (CCO) characteristics and CRC screening performance in early 2016. Conducted CRC technical assistance consultation meetings with CCO leadership and quality improvement teams during June and July of 2016. Conducted key informant interviews with a purposive sample of stakeholders from CCOs, primary care clinics, and the state from February 2016 through August 2016.	Establishing relationships and building partnerships; producing and sharing performance data; developing a process and infrastructure to support quality improvement	Findings identified partnership, performance data, and quality improvement infrastructure as critical dimensions.
	Shaw, 2013[35]	RCT	Qualitative data included field notes and audiotaped RAP and learning collaborative meetings. CRC screening rates and physician recommendation for CRC screening were determined by medical record reviews.	CRC Screening rates, Quality Improvement contributing factors (practice, team structure, leadership, engagement, psychological safety, intra-/inter-communication)	Incremental quality indicator interventions can be effective, practice transformation requires enhanced organizational learning and change capacities. The SCOPE model of quality indicators may not be an optimal strategy if short-term guideline concordant numerical gains are the goal.

ACG = Adjusted Clinical Group; ACS = American Cancer Society; ADS = academic detailing session; BHH = behavioral health home; BICOE = Breast Imaging Center of Excellence; BMI = body mass index; CCM = chronic care model; CCO = coordinated care organizations; CCSP = Colorado Cancer Screening Program; CFIR = Consolidated Framework for Implementation Research; CI = confidence interval; CQM = clinical quality measure; CRC = colorectal cancer; CT = computed tomography; DO = Doctor of Osteopathic Medicine; EBP = evidence-based practice; EHR = electronic health record; FPL = federal poverty level; HAS = health services area; HbA1c = glycated hemoglobin; HC = health centers; LCS = lung cancer screening; LCS-TC = Lung Cancer Screening and Tobacco Cessation; MD = Doctor of Medicine; NCI = National Cancer Institute; NCQA = National Committee for Quality Assurance; OR = odds ratio; PCMH = patient-centered medical home; PCP = primary care physician; PNSAT = Patient Navigation Sustainability Assessment Tool for Preventive Cancer Screening; PPV = positive predictive value; PRISM = Practical, Robust Implementation and Sustainability Model; PSA = prostate-specific antigen; QI = quality improvement; RAP = reflective adaptive process; RCT = randomized controlled trial; SCOPE = Supporting Colorectal Cancer Outcomes through Participatory Enhancements; SNMHS = Safety Net Medical Home Scale; USPSTF = United States Preventive Services Task Force; VA = Veterans Administration; VHA = Veterans Health Administration

Evidence Table D-2. Approaches to measure organizational context and process characteristics for cancer diagnosis and treatment (Guiding Question 2)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Implementation of Improvement Projects and Barriers to Implementation	Patel, 2023[36]	Qualitative	Conducted semi-structured interviews with oncologists, nurses, social workers, medical assistants, and front-desk staff.	Interviews focused on perspectives on: reach, effectiveness, adoption, effectiveness data, flexibility financial implications, implementation, care coordination, evaluation, maintenance, leadership, retention and staffing, and continuous evaluation.	Noted positive shift in perception of advance care planning and symptom management approach. Most participants agreed a combination of top-down and bottom-up approaches was most effective and promoted team-based care.
Leadership	Lawerence, 2012[37]	Cross-sectional	A web-based survey on the practice of quality assurance peer review chart rounds was sent to the chief resident of each institution across the United States.	Departmental demographics, attendance at quality assurance meetings by various disciplines, the thoroughness with which different treatment modalities were peer reviewed, use of advanced technologies within the department, depth of discussion regarding patient's history and staging workup, and frequency with which treatment changes were recommended	Chart rounds led to both minor and major treatment changes. Whereas at the majority of institutions changes were rare (<10% of cases), 39% and 11% of institutions reported that minor and major changes, respectively, were made to more than 10% of cases.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Organizational reactions to environmental forces	Miller, 2019[38]	Retrospective cohort	National Cancer Database 2015 data were retrospectively reviewed to compare patients treated at CoC centers with and without NAPBC accreditation for compliance on six breast cancer quality measures.	Six breast specific quality measures including: was radiation therapy administered within 1 year, was combination chemotherapy is considered or administered within 4 months, was Tamoxifen or third-generation aromatase inhibitor considered or administered within 1 year, was needle/core biopsy performed, and target rate of 50% eligible patients treated with breast-conserving surgery.	NAPBC centers were twice as likely as non-NAPBC centers to perform at the level expected by the CoC. NAPBC centers achieved significantly higher performance on four of the five quality measures at the patient level and on five of six measures at the facility compared to non-NAPBC centers.
Psychological states/traits of providers and provider groups	Friese, 2021[39]	Cross-sectional	Survey for job satisfaction, safety organizing scale, Nurse-Physician Communication Questionnaire.	Job Satisfaction, Safety Organizing Scale, quality of clinician communication, electronic health record capability	85% reported they were satisfied or very satisfied with their current position. Patient safety and accuracy of clinician communication were positively and significantly associated with job satisfaction.
	Tetzlaff, 2022[40]	Cross-sectional	Maslach Burnout Inventory (22 items), Areas of Worklife Survey (18-items).	Measured work life and burnout	The association between workload and burnout was significant with nearly a 100%increase in the odds of burnout associated with a lack of job fit for the workload domain (odds ratio [OR] for burnout 1.99, P< .001).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Structural/Resource-related characteristics	Ryoo, 2014[41]	Cross-sectional	Existing quality indicators and guidelines available pertaining to management of NSCLC and SCLC were identified by systematic literature review. Measures were refined after structured discussion and panels. The resulting set of quality indicators were then grouped into domains of Diagnosis and Staging, Treatment, Supportive Care, and End- of-Life Care.	Adherence to 23 quality indicators across four domains (Diagnosis and Staging, Treatment, Supportive Care, End-of-Life Care)	No facility performed consistently well across all domains. Less than 1% performed in the lowest quartile for all. Few facility-level characteristics were associated with care quality. For End-of-Life Care, diagnosis and treatment within the same facility, availability of cancer psychiatry/psychology consultation services, and availability of both inpatient and outpatient palliative care consultation services were associated with better adherence.
Workload/Workflow Design/Work Performance	Dias-Santagata, 2022[42]	Pre-post	Pulled data from laboratory information system, and chart review	Number of tests, average number of tests per order, number of tests by primary site, test results (normal vs abnormal), test recommendation.	Significant increase in requests for gastrointestinal and hepatopancreatobiliary patients, increase in compliance testing recommendations, and increase in the fraction of abnormal results. No indication the rollouts did not negatively affect patient treatments.

CoC = Commission on Cancer; NAPBC = National Accreditation Program for Breast Centers; NSCLC = non-small cell lung cancer; OR = odds ratio; SCLC = small cell lung cancer

Evidence Table D-3. Approaches to measure organizational context and process characteristics for cancer treatment only (Guiding Question 2)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Financial metrics	O'Neil 2016[43]	Interrupted time series	Utilized administrative data (Medicare FFS fee schedule).	Changes in Medicare fee schedule payment for Minor cystoscopic procedure	Financial incentives in bladder cancer care have unintended and costly consequences in the current FFS environment.
Impact of training, training types, workforce capacity assessments	Trogdon, 2018[44]	Retrospective cohort	Used multi-payer claims-based, shared patient network measures to investigate the influence of care coordination on adherence to guidelines, survival, and utilization among colorectal cancer patients.	Adherence to guidelines: consultation with a medical oncologist (stage III), receipt of adjuvant chemotherapy (stage III), and receipt of surveillance colonoscopy posttreatment, 5-year overall survival, number of surveillance radiology studies, any unplanned hospitalization, and any emergency department visit	Team experience is associated with patients' quality of care, survival, and utilization.
Implementation of improvement projects and barriers to implementation	Deraniyagala, 2015[45]	Prospective Cohort	Quality and safety team developed an event-reporting system program and utilization of Likert-scale survey.	Number of reported [adverse safety] events; staff opinion on safety culture and effectiveness of event-reporting system	An electronic event-reporting system streamlines quality and safety in a radiation oncology department by increasing reported events and promoting a safety culture
	Lamb, 2013[46]	Retrospective Cohort	A survey was used at each clinic site to assess how participants responded to the information reported. Utilized the Dartmouth Atlas Project through the Dartmouth Institute for Health Policy and Clinical Practice to obtain an independent, external measurement of Collaborative performance over time and compare it to areas not participating in the Collaborative.	Screening Preventive Measures for breast, cervical and colorectal cancer	The outcomes demonstrated that public reporting was associated with improvement in health quality and that large physician group practices will engage in improvement efforts in response.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Novak, 2016[47]	Prospective Cohort	Utilized an incident reporting system to identify the origination and detection points of near-miss errors, and near-miss risk index (NMRI)	Point of [error] origination within each of the broad workflow areas and average NMRI of events	Analysis revealed that the workflow within treatment planning was the most frequent area of event origination (33%).; Found that events originating in the simulation process were of higher severity than events originating in other workflow areas.
	Schulueter, 2022[48]	longitudinal qualitative case studies	Two sequential rounds of qualitative interviews with key stakeholders in awardee programs, implementation partner organizations, and partner clinics (all FQHCs).	Emerging themes across awardees and clinics: structural characteristics, readiness for implementation, networks/communication, culture, readiness assessments to tailor implementation, funding, clinic champions, leadership support, team-based care, workflow, clinic policies and procedures, and evidence-based interventions and supporting activities.	Themes related to sustainability included the importance of ongoing electronic health record (EHR) support, clinic leadership support, team-based care, and EBI and SA integration with clinic policies, workflows, and procedures.
	Sheetz, 2019[49]	Retrospective cohort	Merged data from the American Hospital Association's annual survey on hospital system affiliation with Medicare claims.	Degree of centralization, postoperative complications and death, 30-day mortality	Greater centralization of complex surgery associated wth better outcomes

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Siegel, 2014[50]	Retrospective Cohort	Representatives from the 11 oncology sites participating in FIQCC identified quality measures consistent with evidence-, consensus-, and safety-based guidelines that could be abstracted from medical records of breast, colorectal, and non–small cell lung cancer patients; Medical chart reviews were conducted on all patients diagnosed with CRC with a medical oncology appointment in 2006 and 2009.	35 Quality indicators determined by representative oncology experts [represented in table. 2-3]	Significant improvements were noted from 2006 to 2009, with large gains in surgical/pathological QCIs (eg, documenting rectal radial margin status, lymphovascular invasion, and the review of ≥12 lymph nodes) and medical oncology QCIs (documenting planned treatment regimen and providing recommended neoadjuvant regimens). Documentation of perineural invasion and radial margins significantly improved; however, adherence remained low (47% and 71%, respectively). There was significant variability in adherence for some QCIs across institutions at follow-up
	Smith, 2019[51]	Pre-Post	Author defined measures to evaluate the PCR (e.g., access), tracked and extracted data from EHR records, tracked staff hours using Kronos Time Solution System, conducted surveys to determine clinicians/staff experiences and utilized the Physician Worklife Study to assess burnout.	Access (e.g., patient appointments) , Clinical Quality Metrics (colorectal cancer screening) and staffings (staff hours per visit), clinician/staff experiences and burnout	The PCR model is associated with simultaneous improvements in quality, access, and clinician experience, as well as reductions in burnout, while maintaining staffing costs.
	Williams, 2020[52]	Secondary Data Analysis	Electronic survey on the availability of specialty providers, supportive services, and practice characteristics.	Availability of clinical practices/specialties and clinical providers specific for geriatric care	Only a third of community oncology practices have access to a geriatrician within their group and only 5% of community sites have access within the oncology clinic.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Yoo, 2018[53]	Retrospective Cohort	Data collected from patient-visits and survey of residents.	Clinic compliance; patient adherence; resident experience	This analysis confirms previous reports that the incorporation of continuity care improves patient compliance. Clinic adherence increased by 9.4% in a large safety-net hospital population with traditionally high rates of no-shows.
New roles or team composition	Rauenzahn, 2017[54]	Pre-Post	The ESAS questionnaire was administered by trained medical assistants at each clinic visit, regardless of disease status or prior responses or referrals. The completed ESAS form was reviewed by the provider during each visit to decide if a palliative referral was appropriate based on patient-reported symptom burden.	Quantitatively describe the palliative referral rates and symptom burden in a South Texas cancer center and establish a palliative referral system by implementing the Edmonton Symptom Assessment Scale (ESAS)	Improved referral rates 10-fold (pre: 0.07%, post: 0.8%). Assessment of the ESAS scores suggests that symptom burden remains similarly high from initial to follow-up encounters.
Organizational reactions to environmental forces	Patel 2022[55]	Cross-sectional	Thematic analysis guided by Donabedian Quality of Care framework.	Psychological Unmet Needs, Lack of understanding regarding precision medicine and associated costs, undertreated symptoms, financial concerns, trusting relationship with the cancer care team and support from the community	This study identified modifiable health system lung cancer care delivery barriers that contribute to persistent disparities.
Organizational Readiness	Lynch 2021[56]	Cross-sectional	Self-developed survey (24-item multiple choice and open-ended questions) was emailed to 567 ambulatory oncology leaders.	Cancer program's reported readiness and 4Ms domains (from the 4M framework): what matters, medication, mentation, mobility	67% of respondents reported that their program could deliver age-friendly cancer care within five years. Respondents less frequently indicated that they employed specific 4Ms elements: medications (41%), mobility (32%), mentation (14%), and what matters (11%).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Participation in total care delivery models	Blayney, 2012[57]	Longitudinal cohort	The measures derived from expert consensus, clinical trial results that test anticancer therapies, and published guidelines. Data collected retrospectively by office personnel using a structured data entry tool.	Measures are grouped into the following 7 modules: core processes, processes specific to a particular cancer type, or disease-specific processes, processes relating to supportive care, including symptom and toxicity management, processes involved in caring for patients at the end of life	For breast and colorectal cancer care, there was a more than 85 percent rate of adherence to quality care processes. For end-of- life care processes, the adherence rate was 73 percent, and for symptom and toxicity management care processes, adherence was 56 percent. In particular, Found variations in care around the fundamental oncologic task of management of cancer pain.
Psychological states/traits of providers and provider groups	Kusano, 2014[58]	Cross-sectional	Online survey was administered to the membership of the Society of Chairs of Academic Radiation Oncology Programs (SCAROP). Burnout was measured with the Maslach Burnout Inventory-Human Services Survey (MBI-HSS).	Burnout in chairs of academic radiation oncology departments	The most frequently reported stressors rated as “large” or “extreme” were hospital or department budget deficits, followed by faculty recruitment and retention. The mean MBI-HSS subscale scores of radiation oncology chairs compared favorably with those of chairs of other specialties
Safety and safety culture	Sundararaman 2014[59]	Pre-Post	Not specified.	Use of EMR-based CRM program, implementation of Crew Resource Management	Near miss-rates (safety measure) have improved as a result of the CRM implementation.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Woodhouse, 2016[60]	Pre-Post	Multifaceted approach for each initiative of the SC program using surveys and document review process. Evaluation of Patient Safety Culture based on AHRQ survey's safety grade.	A combination of 6 quality initiatives in a comprehensive safety culture program: implementation of quality and safety culture educational curriculum, hard stop policy to standardize patient safety checks, automated electronic system for peer review, increased leadership oversight through a safety committee, electronic condition reporting system, routine assessment of serious events, evaluation of state-reported medical events	Comprehensive safety culture (SC) program at the University of Pennsylvania increased staff fundamental safety knowledge, enhanced peer review with an electronic system, and special cause variation of SRMEs on control chart analysis.
Structural and resource-related characteristics	Bickell, 2017[61]	Cross-sectional	Used qualitative comparative analysis from interviews with key informants.	Underuse of breast cancer care, organizational conditions	At safety-net hospitals, underuse of needed cancer therapies is associated with organizational approaches to track and follow-up treatment. Findings provide varying approaches to safety nets to improve cancer care delivery.
	Cha, 2022[62]	Cross-sectional	Retrospective analysis of patient experience survey data for adult patients seen in consultation at two large cancer centers. Five survey questions regarding physician-patient communication and practice experience that were used on both institutions' patient experience surveys were selected for the study to examine the association of patient, practice, and practice related factors and patient experience scores.	Patient-, physician-, and practice-level predictors of patient experience scores in patients undergoing radiation therapy	Physician gender was not associated with any measured patient experience outcomes ($P > 0.40$ for all). Independent predictors of higher score included a wait-time experience classified as "good" compared with "not good" ($q < .001$ for all).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Jacobs, 2014[63]	Cross-sectional	The sample is comprised of physicians who responded to the 2011 CCOP Physician Survey.	Physician enrollment in NCI Community Clinical Oncology Program (CCOP)	Physician attitudes and CCOP organizational factors had positive direct effects, but not indirect effects, on physician enrollment of patients.
	Neuss, 2013[64]	Retrospective cohort	Reviewed medical records of patients diagnosed with invasive malignancy, including submission of data on core domain module measures.	Improvement of quality scores, adherence to quality indicators	Participation over time was highly correlated with improvement in measured performance. Greater and faster improvement was seen in measures concerning newly introduced clinical information. Some measures showed no change despite opportunity for improvement.
Workload/Workflow Design/Work Performance	Chera, 2014[65]	Prospective cohort	Prospective quantitative data were collected in order to assess if the initiative was operating as intended (ie, measuring the process), and/or assess if the initiative was having the desired result (ie, measuring the outcome).	Workload levels for nurses, changes in work flow, treatment rate, rates of rescheduling/replanning, standardized nursing/resident functions, patient wait time, standardizing pre-simulation instructions, overall changes in patient safety culture	Quality improvement initiatives can be successfully implemented in an academic radiation oncology department to yield measurable improvements in operations resulting in improvement in patient safety culture.
	Ignoffo, 2021[66]	Cross-sectional	Interview-based surveys were conducted with experienced oncology pharmacists in leadership roles (49-item survey) at 20 organizations balanced by geographic region and type of practice site.	Characteristics and frequency of clinical functions; education of healthcare professionals; anticipated trends of services; characteristic of participating sites (volume, size, academic/nonacademic, payment models)	Anticipated increases in demand for oncology pharmacists strongly suggest the need for more PGY2 oncology residency programs and on-the-job oncology training programs.
	Mazur, 2017[67]	Prospective cohort	Assessments were performed in a simulation laboratory that replicated the RT professionals' (radiation oncologists, physicists, dosimetrists) typical working environment. Utilized the NASA-TLX global and individual dimensions scores to review workload.	Workload, procedural compliance and time-to-scenario completion	Simulation-based training may be a tool to improve procedural compliance of RT professionals and to acquire new skills and knowledge to proactively maintain RT professionals' preoccupation with patient safety.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Tariq, 2020[68]	Cross-sectional	The data were recorded quantitatively noting number, type, severity, and date of errors and incidents. Workload calculated based on patients per staff with rolling averages utilized for 2 week time periods.	Workload measures including patient volumes, physician schedules. Incidence of serious errors	Increases in departmental workload, especially rapid changes, may lead to higher occurrence of errors and incidents in radiation oncology.

AHRQ = Agency for Healthcare Research and Quality; CCOP = Community Clinical Oncology Program; CRC = colorectal cancer; CRM = Crew Resource Management; EBI = evidence-based intervention; EHR = electronic health record; EMR = electronic medical records; ESAS = Edmonton Symptom Assessment Scale; FFS = fee-for-service; FIQCC = Florida Initiative for Quality Cancer Care; FQHC = Federally Qualified Health Center; MBI-HSS = Maslach Burnout Inventory-Human Services Survey; NASA-TLX = NASA Task Load Index; NCI = National Cancer Institute; NMRI = near-miss risk index; PCR = Primary Care Redesign; PGY = post-graduate year; QCI = quality of care indicators; RT = respiratory therapist; SA = supporting activities; SC = safety culture; SCAROP = Society of Chairs of Academic Radiation Oncology Programs; SRME = state-reported medical safety events

Evidence Table D-4. Approaches to measure organizational context and process characteristics for other or more than one cancer care context (Guiding Question 2)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Financial metrics	Ho 2019[69]	Cross-sectional	Identification strategy using administrative data sourced from BCBS TX.	Ownership status of physicians based on their recorded network for reimbursement in the internal data base	Financial integration between physicians and hospitals raises patient spending, but not care quality.
Implementation of improvement projects and barriers to implementation	Carpenter, 2012[70]	Longitudinal quasi-experimental study	Used managed care penetration, hospital competition, and clinical trials competition.	Three dependent variables were separately examined as markers of CCOP performance: treatment trial accrual, CP/C trial accrual, and total trial accrual. Independent variables included CCOP characteristics, CCOP-Research Base (RB)1 network characteristics, and environmental characteristics	Results—For total trial accrual and treatment trial accrual, the number of active CCOP physicians and the number of trials were associated with CCOP performance.
	Choa, 2014[71]	Pre-Post	The Kruskal-Wallis test was used to make comparisons among the 6 month prior to the PIT's hiatus, the 6 months while the team was on hiatus, and the initial 6 months of the WE [workflow enhancement] team and utilized the Gallup Survey.	WE team forms; 'employees committed to quality' score	After the WE team, employee satisfaction and commitment to quality increased as demonstrated by Gallup surveys, suggesting a correlation to the WE team.
	Cole, 2015[72]	Semi-structured Interviews	Developed a semi-structured interview guide based on the Consolidated Framework for Implementation Research (CFIR) model.	The facilitators of and barriers to implementation of the Systems of Support (SOS) intervention	For all tumor types, sites that reached this level increased in six elements: case planning, clinical trials, integration of care coordination, physician engagement, quality improvement, and treatment team integration. Factors that enabled improvement inc

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Denny, 2014[73]	Prospective Cohort	Teams participated in video conferencing training on the FMEA tool selected.	Ratings for failure's severity, occurrence and detection; Process (consult to treatment, treatment, quality assurance), step in process , failure mode, failure effect	Demonstrated that FMEA can be used across hospitals as a tool for collaboration and action planning (as opposed to being limiting in scope to a single institution application)
	DiMartino, 2018[74]	Mixed-Methods Analysis	Gathered qualitative data through in-person interviews with inpatient medical oncology and gynecologic oncology clinicians (attendings, house-staff). Palliative care clinicians interviewed to gain additional insights on implementation context.	Implementation effectiveness, defined as aggregated palliative care consult rates within oncology services from 2010–2016	Briefly, medical oncology employed multiple formal implementation policies and practices to support palliative care consultation, yet most clinicians were unaware of the implementation policies and practices, contributing to a weak implementation climate. In contrast, gynecologic oncology employed one formal implementation policies and practices but also relied on multiple informal implementation policies and practices, which contributed to broader clinician awareness and a strong implementation climate
	Fernandez, 2018[75]	Retrospective Cohort	Survey administration was customized, recruitment protocols were tailored based on the CPCRN existing partnerships with FQHCs in each participating state.	Identified constructs of interest and compiled existing measures for those constructs; Generated items for each construct of interest by adapting items from existing measures and developing new items; Pilot-tested and refined the preliminary measures; Conducted a validation study with the refined measures.	Findings suggest that these measures exhibit adequate or good psychometric properties. More specifically, CFAs, inter-item consistencies, and correlation analyses indicated the Inner Setting measures have structural validity, reliability, and discriminant validity.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Friedman, 2015[76]	Prospective Cohort	Utilized the MDC assessment tool.	Assessment scores - in areas of case planning, physician engagement, treatment team integration, integration of care coordinators, infrastructure, financial, clinical trials, quality improvement and medical records	For all tumor types, sites that reached this level increased in six elements: case planning, clinical trials, integration of care coordination, physician engagement, quality improvement, and treatment team integration. Factors that enabled improvement included increasing organizational support, ensuring appropriate physician participation, increasing patient navigation, increasing participation in national quality initiatives, targeting genetics referrals, engaging primary care providers, and integrating clinical trial staff.
	Jacobs, 2015[77]	Cross-sectional Study	Sourced data from the 2011 CCOP Annual Progress Reports, surveys of CCOP physician participants and administrators, and the American Medical Association Physician Masterfile.	Implementation effectiveness	Demonstrated that perceptions of implementation climate have a statistically significant direct effect on implementation effectiveness. Physicians' perceptions of implementation climate also mediated the relationship between organizational implementation policies and practices (IPP) and enrollment ($p < 0.05$)

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Jhaveri, 2012[78]	Secondary Data Analysis	Used a telephone survey to identify integrated urology-RO practices. Geographic information software was used to determine the proximity of integrated urology-RO clinic sites with respect to the state's population. Patient travel time and distance calculated from each integrated urology- RO clinic offering urologic services to the RO treatment facility owned by the integrated practice and to the nearest nonintegrated (independent) RO facility.	Emergence of integrated urology-RO practices, extent of physical integration, and potential effect on patient travel times for radiation therapy; patient travel time and distance from each integrated urology-RO clinic offering urologic services to the RO treatment facility owned by the integrated urology-RO practice; travel time and distance from each integrated urology-RO clinic offering urologic services to the nearest nonintegrated RO clinic	Of 229 urology practices identified, 12 (5%) offered integrated RO services, and 182 (28%) of 640 Texas urologists worked in such practices. Approximately 53% of the state population resides within 10 miles of an integrated urology-RO clinic site.
	Meada, 2015[79]	Retrospective Cohort	Conducted an assessment of the 18 safety-net clinics that participated to determine the program's early impact in expanding health care access and improving quality of care in the year following program expansion.	Quality measures for breast and cervical cancer screening among women and smoking-cessation intervention	Performance by the Community Ambassadors was at or near 90% for 2 adult quality measures (weight screening and tobacco use assessment). For breast cancer screenings, however, performance among the Community Ambassadors was much lower (48%).

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Mori, 2018[80]	Cross-sectional Study	The survey of 26 questions. Questions were grouped into 3 categories: (1) structure, (2) function, and (3) impact.	Structure/function: conference activities and actions, impact: value and barriers of conferences	TBCs had a moderate to significant impact on patient care according to 97% of respondents. All respondents indicated that the meetings enhanced communication among physicians and provided an opportunity for involved specialists and professionals to discuss cases. The most frequently cited barrier to organizing TBCs was determining a common available date and time for attendees (62%)
	Palmer, 2011[81]	Needs Assessment	Structured face-to-face and telephone in-depth interviews.	Barriers to breast cancer screening in terms of referral procedure, treatment and diagnosis standards, cultural and linguistic competence screening results and breast health education	Overall, screening barriers were common in the safety net system and only a few procedures were in place to help women overcome these barriers.
	Rauscher, 2014[82]	Secondary Data Analysis	Data collected by the Chicago Breast Cancer Quality Consortium. Benchmarks for measures were established by consulting American College of Radiology benchmarks, and through consultation with clinical experts.	Recall rate, not lost at imaging, timely follow-up imaging, biopsy recommendation rate, not lost at biopsy, timely biopsy, cancer if abnormal screen, cancer if biopsied, cancer detection rate, proportion minimal, proportion early stage	The percentage of institutions meeting each benchmark varied from 27% to 83%. Facilities with American College of Surgeons or National Comprehensive Cancer Network designation were more likely to meet benchmarks pertaining to cancer detection and early detection, and Disproportionate Share facilities were less likely to meet benchmarks pertaining to timeliness of care

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
	Thaker, 2016[83]	Retrospective Cohort	Obtained medical record data and reviewed patient cases for its overall management plan, radiation management plan, RT technical components, staging documentation and accuracy, evidence of prospective multidisciplinary management, and disease site– specific quality indicators.	Management plan, radiation management plan, RT technical components, staging documentation and accuracy, evidence of prospective multidisciplinary management, disease site and concordance	Of 14% of patients audited, 17% (18 of 104) were deemed non-concordant. Non-concordance rates were lowest in prevalent disease sites, such as breast (16%), colorectal (14%), and lung (12%), whereas rates were highest in lymphoma (50%), brain (44%), and gynecology (27%). Deficiencies included incomplete staging work-up, incorrect target and normal tissue delineation, and nonadherence to accepted dose-volume constraints.
	Tirodkar, 2020[84]	Retrospective Cohort	Examined how adoption of the standards varies across a variety of practices and compared practice self-report with external evaluation of implementation.	Self-assessments of implementing standards; standards audit data	Oncology practices showed some progress in their implementation of patient-centered care processes over the course of the pilot program. Systems for tracking and documenting improvement, training for staff and clinicians, leadership support, and alignment of financial incentives are critical to transformation

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Leadership	Tucker, 2022[85]	Prospective cohort	Used the Evidence-based Practice (EBP) Knowledge Scale (25 multiple choice and 13 true/false questions), EBP Belief Scale (16 item scale), EBP Competency Scale (24 skills evaluated on 4-point Likert scale), EBP Implementation Scale (18-item frequency scale), and The Organizational Culture and Readiness System-wide Integration of Evidence-based Practice Scale. All scales tested for validity and reliability.	Effects of an evidence-based practice leadership immersion intervention on evidence-based practice attributes: knowledge, beliefs, competencies, implementation self-efficacy, implementation behaviors, and organizational readiness	Demonstrated significant changes in evidence-based practice attributes (except organizational readiness) post-intervention.
Organizational reactions to environmental forces	Fung 2018[86]	Cross-sectional	Utilized the ASTRO workforce survey.	Workforce characteristics-age, sex, region, work schedule, race, community type, employer, work setting, technology utilization	Race and gender gaps in the workforce narrowed, but geographic disparities persisted, with ROs gravitating toward suburban and urban locations over rural practices. Workforce shifted from predominantly private practice to more equal balance with academic/university systems.
	Jalali 2020[87]	Cross-sectional	Herfindahl-Hirschman Index (HHI), a measure of competition by Hospital Referral Regions, for practices of medical oncologists that billed Medicare in 2015.	Provider Practice Competition in Hospital Referral Regions	OCM was adopted in 114 (37%) of the 306 HRRs. Practices in competitive healthcare markets were more likely to adopt OCM than in non-competitive markets.
	Landercasper 2010[88]	Cross-sectional	Not specified.	Implementation of a community breast center	A community breast center can establish a voluntary interdisciplinary quality program, participate in a national quality initiative, improve care in selected categories and have transparency is demonstrated.

Theme	Author, Year	Study Design	Approach to Measurement	Organizational Characteristics Measured	Brief Summary of the Pertinent Findings
Workload/Workflow Design/Work Performance	Weiner, 2012[89]	Cross-sectional	Obtained data on community-based networks of hospitals and physician practices (CCOP) volume of patients with cancer, affiliated physicians, and organizational structure from the progress reports that CCOPs submit to the NCI. Obtained data on CCOP 2010 patient enrollment onto NCI treatment trials and the 2010 treatment trial menu from the NCI CCOP, minority-based CCOP, and research base management system.	Number of open treatment trials with at least one patient enrolled, number of newly diagnosed patients with cancer, number of CCOP-affiliated physicians, and number of CCOP-affiliated hospitals	Two recipes were consistently associated with high levels of patient enrollment onto NCI treatment trials in 2010: having many open treatment trials and many new patients with cancer, and having many open treatment trials and many affiliated hospitals or practices.
	Mesko, 2022[90]	Pre-post	Utilized electronic health records used in in-person observations.	Waiting room time, rooming time, wait for physician time, total wait time, visit times.	Patient flow analysis recommendations reduced median cycle tie, cumulative waiting time (waiting room and wait for physician time). Also showed reduced >2 hour consult visits. Proportion of visits requiring <1 hour increased.

ASTRO = American Society for Radiation Oncology; BCBS TX = Blue Cross Blue Shield of Texas; CCOP = Community Clinical Oncology Program; CFA = confirmatory factor analysis; CP/C = cancer prevention and control; CPCRN = Cancer Prevention and Control Research Network; EBP = evidence-based practice; FMEA = failure modes and effects analysis; FQHC = Federally Qualified Health Center; HHI = Herfindahl-Hirschman Index; HRR = hospital referral regions; IPP = implementation policies and practices; MDC = multidisciplinary care; NCI = National Cancer Institute; OCM = Oncology Care Model; PIT = process improvement team; RB = research base; RO = radiation oncologist; RT = radiation therapy; SOS = Systems of Support; TBC = Tumor board conferences; WE = workflow enhancement

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Evidence Table D-5. Study characteristics of studies exemplifying examination of health care organization context and process characteristics assessing cancer screening (Guiding Question 3)

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Carlin, 2015[5]	"To fill an empirical gap in the literature by examining changes in quality of care measures occurring when multispecialty clinic systems were acquired by hospital-owned, vertically integrated health care delivery systems in the Twin Cities area."	Retrospective cohort	Non-cancer center/General medical center	Patients without cancer: no history of cancer diagnosis Cancer type: Breast cancer, colorectal cancer, cervical cancer	Regional level of integrated delivery system (or multi-institutional system)	3	NR
Chou, 2015[28]	"This study aims to understand the association between organizational factors and adherence to cancer screenings."	Cross-sectional	VA Medical Centers, community-based outpatient clinic	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast Cancer, Cervical Cancer & Colorectal Cancer	National level of integrated delivery system or (multi-institutional system)	167	NR
Davis, 2019[34]	"Our study was designed to be hypothesis generating and to suggest promising practices to facilitate effective ACO–clinic partnerships to achieve performance benchmarks for CRC screening."	Comparative case study	Accountable Care Organizations (ACOs)	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Colon and Rectal Cancer	National level of integrated delivery system or (multi-institutional system)	16	NR

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Haggstrom, 2012[22]	"[evaluated whether] ... community health centers who participated in the HDCC more likely to implement organizational process changes consistent with the chronic care model (CCM implementation)? As a secondary question, we asked whether community health centers who participated in the HDCC were more likely to report changes in cancer care processes."	Retrospective cohort	Community cancer center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast, Cervical and Colorectal Cancer	National level of integrated delivery system or (multi-institutional system)	40	NR
Murphy, 2022[11]	"This study evaluated the association of the Maryland Medicaid behavioral health home (BHH) integrated care program on cancer screening."	Retrospective cohort	Psychiatric Rehabilitation Programs	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast cancer, cervical cancer & colorectal cancer	Individual practice or clinic	Unclear	NR

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Onega, 2018[31]	"Examined the relative effects of these nested levels on four breast cancer screening metrics."	Cross-sectional	Non-cancer center/General medical center	Patients without cancer: no history of cancer diagnosis Cancer type: Breast Cancer	Individual practice or clinic	2	Not-for-profit
Rosenthal, 2013[24]	"To evaluate the effects of the pilot program of a multi-payer patient-centered medical home on health care utilization and quality."	Retrospective cohort	Non-cancer center/General medical center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast, Colon, and Cervical Cancer	National level of integrated delivery system or (multi-institutional system)	5	NR
Shapira, 2016[26]	"To characterize the prevalence and correlates of practice-based systems to support breast and cervical cancer screening, with a focus on the patient centered medical home."	Cross-sectional	Non-hospital based office, hospital-based, community health center	Providers Cancer type: Breast and cervical cancer screening	Individual practice or clinic	133	NR
Shaw, 2013[35]	"The purpose of this study was to evaluate a primary care practice–based quality improvement (QI) intervention aimed at improving colorectal cancer screening rates."	RCT	Academic cancer center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Colon and Rectal Cancer	Individual practice or clinic	23	NR

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Shi, 2015[27]	"The current study evaluated the relationship between PCMH model adoption in HCs [as determined by the Safety Net Medical Home Scale (SNMHS)] and clinical performance measures, to determine if adoption of PCMH characteristics is associated with better clinical performance."	Retrospective cohort	Non-cancer center/General medical center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Cervical	National level of integrated delivery system or (multi-institutional system)	NR	NR
So, 2012[33]	"To identify medical center characteristics associated with screening in this population."	Prospective cohort	VA medical center	Patients without cancer: no history of cancer diagnosis Cancer type: No prior history; Prostate cancer screening	National level of integrated delivery system or (multi-institutional system)	NR	Government
Yabroff, 2011[15]	"In this study, we used data from a national survey of PCPs to describe and explore the following: (i) the adoption of multiple systems strategies which may improve cancer screening performance and (ii) whether the use of systems strategies varies for breast, cervical, and CRC screening."	Retrospective cohort	Non-cancer center/General medical center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast, cervical, colorectal, and lung cancer	Individual practice or clinic	NR	NR

ACO = Accountable Care Organizations; BHH = behavioral health home; CCM = chronic care model; CRC = colorectal cancer; HC = health center; HDCC = Health Disparities Cancer Collaborative; NR = not reported; PCMH = patient-centered medical home; PCP = primary care physician; PRP = psychiatric rehabilitation programs; QI = quality improvement; RCT = randomized controlled trial; SNMHS = Safety Net Medical Home Scale; VA = Veterans Administration

Evidence Table D-6. Organizational characteristics of studies exemplifying measurement and instrumentation assessing cancer screening (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Context*	Measurement Instrument Used [Name, Type, Number of Items]
Carlin, 2015[5]	Primary data collection (non-qualitative)	Patient demographics	NR
Carlin, 2015[5]	Primary data collection (non-qualitative)	Patient financial status	NR
Carlin, 2015[5]	Primary data collection (non-qualitative)	Ownership	NR
Carlin, 2015[5]	Primary data collection (non-qualitative)	Payment model and payment program participation	NR
Chou, 2015[28]	Secondary data analysis	Not specified	Primary Care Module of the Clinical Practice Organizational Survey (CPOS), "VHA Survey of Women Veterans Health Programs and Practices" (DVAHS) Type: 7-factor solution, 9-point scale Number of items: NR
Murphy, 2022[11]	Secondary data analysis	Location	NR
Onega, 2018[31]	Primary data collection (non-qualitative)	Staffing and skill-mix	NR
Onega, 2018[31]	Primary data collection (non-qualitative)	HIT infrastructure	NR
Onega, 2018[31]	Primary data collection (non-qualitative)	Patient demographics	NR
Onega, 2018[31]	Primary data collection (non-qualitative)	Size and volume	NR
Rosenthal, 2013[24]	Secondary data analysis	Payment model and payment program participation	NCQA Physician Practice Connections Standards assessment Type: NR Number of items: 9
Shapira, 2016[26]	Primary data collection (non-qualitative)	Organization type	NR
Shapira, 2016[26]	Primary data collection (non-qualitative)	Size and volume	NR

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Context*	Measurement Instrument Used [Name, Type, Number of Items]
Shapira, 2016[26]	Primary data collection (non-qualitative)	Affiliations	NR
So, 2012[33]	Primary data collection (non-qualitative)	Patient demographics	NR
So, 2012[33]	Primary data collection (non-qualitative)	Patient financial status	NR
So, 2012[33]	Primary data collection (non-qualitative)	Location	NR
So, 2012[33]	Primary data collection (non-qualitative)	Academic arrangements	NR
So, 2012[33]	Primary data collection (non-qualitative)	Payment model and payment program participation	NR
So, 2012[33]	Primary data collection (non-qualitative)	Service comprehensiveness	NR
So, 2012[33]	Primary data collection (non-qualitative)	Size and volume	NR
So, 2012[33]	Primary data collection (non-qualitative)	Staffing and skill-mix	NR

*According to the Weaver and Breslau framework[91]

CPOS = Clinical Practice Organizational Survey; DVAHS = VHA Survey of Women Veterans Health Programs and Practices; HIT = health information technology; NCQA = National Committee for Quality Assurance; NR = not reported; VHA = Veterans Health Administration

Evidence Table D-7. Organizational processes of studies exemplifying measurement and instrumentation assessing cancer screening (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Process*	Study's Definition or Description of the Characteristic	Measurement Instrument Used [Name, Type, Number of Items]
Carlin, 2015[5]	Primary data collection (non-qualitative)	Screening processes	Probability of cancer screening	NR
Chou, 2015[28]	Secondary data analysis	Care management processes	organizational competencies, QI orientation, Utility of computerized patient record system (CPRS) - refer to article for more detail of each category	External Peer Review Program (EPRP), US Department of Health and Human Services Area Resource File (ARF) Type: 7-factor solution, 9-point scale Number of items: NR
Davis, 2019[34]	Interviews	Cross-sector partnerships and multi-level interventions	CCO characteristics and CRC screening performance	Public performance data, transcripts from key informant interviews, and field notes Type: NR Number of items: NR
Haggstrom, 2012[22]	Survey	Use of QI or other improvement methods (e.g., lean six sigma, etc.)	Chronic Care Model Implementation; teamwork; cancer care process improvement	Survey Type: Likert Scale Number of items: 9
Murphy, 2022[11]	Secondary data analysis	Screening processes	Receipt of cancer screening - determined by procedure and diagnostic codes	Maryland Medicaid administrative claims data Type: NR Number of items: NR
Onega, 2018[31]	Primary data collection (non-qualitative)	Screening processes	Breast cancer screening percentages	NR
Rosenthal, 2013[24]	Secondary data analysis	Participation in state or national QI collaboratives	3 preventive care measures—colon, breast, and cervical cancer screening	Administrative claims data; NCQA Physician Practice Connections Standards assessment Type: NR Number of items: 9
Shapira, 2016[26]	Primary data collection (non-qualitative)	Screening processes	Reception of cancer screening reports	NR
Shaw, 2013[35]	Interviews and secondary data analysis	Participation in state or national QI collaboratives	CRC screening rates and physician recommendation for CRC screening	Medical records, MAP field notes, audio-graphed MAP Type: NR Number of items: NR

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Process*	Study's Definition or Description of the Characteristic	Measurement Instrument Used [Name, Type, Number of Items]
Shi, 2015[27]	Secondary data analysis	Participation in state or national QI collaboratives	Clinical Performance (% children received vaccine by age 2; % female patient s(24-64 who receive 1 pap test in 3yrs; % patients (18-75) diagnoses with diabetes; % patients (18-85) diagnosed with hypertension	HRSA Uniform Data System (UDS); Commonwealth Fund National Survey of Federally Qualified Health Centers Type: Safety Net Medical Home Scale (SNMHS) Number of items:
So, 2012[33]	Primary data collection (non-qualitative)	Screening processes	Performance on Colorectal Cancer Screening	VA Office of Quality and Performance Type: NR Number of items: NR
Yabroff, 2011[15]	Secondary data analysis	Care management processes	reported answers related to: system's strategies for patient and physician screening reminders, performance reports of screening rates, electronic medical records, implementation of in-practice guidelines, and use of nurse practitioners/ physician assistants	National Survey of Primary Care Physicians' Recommendations and Practices for Breast, Cervical, Colorectal, and Lung Cancer Screening Type: NR Number of items: NR

*According to the Weaver and Breslau framework[91]

ARF = Area Resource File; CCO = coordinated care organizations; CPRS = computerized patient record system; CRC = colorectal cancer; EPRP = External Peer Review Program; HRSA = Health Resources and Services Administration; MAP = multimethod assessment process; NCQA = National Committee for Quality Assurance; NR = not reported; QI = quality improvement; SNMHS = Safety Net Medical Home Scale; UDS = Uniform Data System; VA = Veterans Administration

Evidence Table D-8. Reported outcomes of studies exemplifying examination of healthcare organizational context and process characteristics assessing cancer screening (Guiding Question 3)

Author, Year	Primary Outcome Description	Primary Outcome Organizational Context	Environmental Influence	Secondary Outcome Description	Secondary Outcome Organizational Context	Environmental Influence
Carlin, 2015[5]	Probability of cancer screening	Process	Yes	NR	NR	NR
Chou, 2015[28]	Organizational factors: physical assets, human capital (staff mix), organizational competencies (authority in staff hiring, determining primary care components and processes, communication and cooperation), utilization of computerized patient record system, quality improvement orientation - refer to article for more detail of each category	Organizational characteristics	Yes	Mammograms & cervical/colorectal screenings	Process	Yes
Davis, 2019[34]	1) Establishing relationships and building partnerships 2) Producing and sharing performance data 3) Developing a process and infrastructure to support quality improvement (Figure).	Process	Yes	NR	NR	NR
Haggstrom, 2012[22]	Chronic Care Implementation; Teamwork	Organizational characteristics	NR	Cancer care process improvement	Process	NR
Murphy, 2022[11]	Cervical, breast and colorectal cancer screening	Organizational characteristics	Yes	NR	NR	NR
Onega, 2018[31]	Breast cancer screening percentage	Process	No	NR	NR	NR
Rosenthal, 2013[24]	NCQA Physician Practice Connections–Patient Centered Medical Home level I recognition	Organizational characteristics	NR	Percent of patients who received screening for breast, colon and cervical cancer	Process	NR
Shapira, 2016[26]	Reception of cancer screening reports	Process	Yes	NR	NR	NR
Shaw, 2013[35]	CRC Screening rates	Process	No	Quality Improvement contributing factors (practice, team structure, leadership, engagement, psychological safety, intra-/inter- communication)	Process	No
Shi, 2015[27]	% patients who received cervical cancer screening	Process	NR	NR	NR	NR

Author, Year	Primary Outcome Description	Primary Outcome Organizational Context	Environmental Influence	Secondary Outcome Description	Secondary Outcome Organizational Context	Environmental Influence
So, 2012[33]	Percentage of men at who received prostate specific antigen screening	Process	Yes	Medical center and patient factors associated with prostate specific antigen screening	Organizational characteristics	Yes
Yabroff, 2011[15]	Use of comprehensive systems strategies	Process	No	NR	NR	NR

CRC = colorectal cancer; NCQA =; NR = not reported

Evidence Table D-9. Study characteristics of studies exemplifying examination of health care organization context and process characteristics assessing for cancer diagnosis and treatment (Guiding Question 3)

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Dias-Santagata, 2022[42]	"Present the results of a clinical pilot to standardize precision oncology workflows."	Before-after	Community cancer center associated with academic cancer center network	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Gastrointestinal cancer	Regional level of integrated delivery system (or multi-institutional system)	Not specified	NR
Miller, 2019[38]	"To determine whether accreditation by the National Accreditation Program for Breast Centers (NAPBC) is associated with improved performance on six breast quality measures pertaining to Adjuvant treatment, needle/core biopsy, and breast conservation therapy rates at Commission on Cancer (CoC) centers."	Retrospective cohort	Academic centers, community cancer programs, other specified cancer programs	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast Cancer	Individual practice or clinic	1,308	NR

CoC = Commission on Cancer; NAPBC = National Accreditation Program for Breast Centers; NR = not reported

Evidence Table D-10. Organizational characteristics of studies exemplifying measurement and instrumentation assessing for cancer diagnosis and treatment (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Context*	Measurement Instrument Used [Name, Type, Number of Items]
Miller, 2019[38]	Secondary data analysis	Organization type	NR
Miller, 2019[38]	Secondary data analysis	Size and volume	NR
Miller, 2019[38]	Secondary data analysis	Geographic characteristics	NR
Miller, 2019[38]	Secondary data analysis	Location	NR
Miller, 2019[38]	Secondary data analysis	Patient demographics	NR
Miller, 2019[38]	Secondary data analysis	Patient financial status	NR

NR = not reported

Evidence Table D-11. Organizational processes of studies exemplifying measurement and instrumentation assessing for cancer diagnosis and treatment (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Process*	Study's Definition or Description of the Characteristic	Measurement Instrument Used [Name, Type, Number of Items]
Dias-Santagata, 2022[42]	Primary data collection (non-qualitative)	Use of HIT system	Number of molecular requests submitted to the lab before and after order set roll-out	NR
Dias-Santagata, 2022[42]	Primary data collection (non-qualitative)	Referral processes	Changes in total volume of patients referred to molecular testing	NR
Dias-Santagata, 2022[42]	Primary data collection (non-qualitative)	Clinical decision support	Rates of "abnormal" test results and rates of actionable results of non-recommended tests	NR
Miller, 2019[38]	Secondary data analysis	Use of QI or other improvement methods (e.g., lean six sigma etc.)	Breast-specific quality measures monitored by non-NAPBC and NAPBC centers	NR Type: Quality measure scale Number of items: 6

*according to the Weaver and Breslau framework[91]

HIT = health information technology; NAPBC = National Accreditation Program for Breast Centers; NR = not reported; QI = quality improvement

Evidence Table D-12. Reported outcomes of studies exemplifying examination of healthcare organizational context and process characteristics assessing for cancer diagnosis and treatment (Guiding Question 3)

Author, Year	Primary Outcome Description	Primary Outcome Organizational Context	Environmental Influence	Secondary Outcome Description	Secondary Outcome Organizational Context	Environmental Influence
Dias-Santagata, 2022[42]	Total number of tests compared before and after roll-out of order set	Process	No	Number of actionable alterations before and after roll-out	Process	No
Miller, 2019[38]	Compliance on six breast cancer quality measures	Process	Yes	NR	NR	NR

NR = not reported

Evidence Table D-13. Study characteristics of studies exemplifying examination of health care organization context and process characteristics assessing cancer treatment only (Guiding Question 3)

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Bickell, 2017[61]	"To identify key organizational approaches associated with underuse of breast cancer care."	Cross-sectional	Non-cancer center/General medical center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast Cancer	Hospital	9	NR
Blayney, 2012[57]	"We conducted an initial analysis of medical practice characteristics and of how the practices' adherence to processes was related to valuable patient outcomes."	Retrospective cohort	Outpatient Cancer Center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Breast Cancer, Colorectal Cancer, Lung Cancer, Non-Hodgkin's Lymphoma	Individual practice or clinic	26	NR
Jacobs, 2014[63]	"To identify physicians' individual characteristics, attitudes, and organizational contextual factors associated with higher enrollment of patients in cancer clinical trials among physician participants in the National Cancer Institute's Community Clinical Oncology Program (CCOP)."	Cross-sectional	Community cancer center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Not specified	National level of integrated delivery system or (multi-institutional system)	47	NR
Mazur, 2017[67]	"The objective of this research was to develop and assess the impact of a simulation-based training intervention on radiation oncology providers' workload and performance during treatment planning and quality assurance (QA) tasks."	Prospective cohort	Academic cancer center	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Sarcoma	Entity within a hospital	1	NR

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Neuss, 2013[64]	"To determine whether QOPI scores showed improvement in measured quality over time and, if change was demonstrated, which factors in either the measures or participants were associated with improvement."	Retrospective cohort	Medical oncology practices	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Not specified	Individual practice or clinic	156	NR
Schulueter, 2022[48]	"This study identified factors that facilitated early implementation and sustainability within partner clinics."	Longitudinal qualitative case studies	Colorectal Cancer Control Program (CRCCP) awardees and partner clinics	NR Cancer type: Colon and Rectal Cancer	National level of integrated delivery system or (multi-institutional system)	4	NR
Sheetz, 2019[49]	"Evaluated the extent to which existing hospital systems centralize high-risk cancer surgery and whether centralization is associated with short-term clinical outcomes."	Retrospective cohort	Not specified, American Hospital Association survey pool	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Not specified	Regional level of integrated delivery system (or multi-institutional system)	4,390	NR
Tariq, 2020[68]	"To evaluate measures of increased departmental workload in relation to the occurrence of physician-related errors and incidents reaching the patient in radiation oncology."	Cross-sectional	Not specified	Providers Cancer type: Not specified	Entity within a hospital	NA	NA
Trogdon, 2018[44]	"To estimate the association between provider and team experience and adherence to guidelines, survival, and utilization among colorectal cancer patients in North Carolina."	Retrospective cohort	NR	Patients with cancer: history of cancer (even if no current evidence of disease) Cancer type: Colon and Rectal Cancer	NR	NR	NR

CCOP = Community Clinical Oncology Program; CRCCP = Colorectal Cancer Control Program; NA = not available; NR = not reported; QA = quality assurance; QOPI = Quality Oncology Practice Initiative

Evidence Table D-14. Organizational characteristics of studies exemplifying measurement and instrumentation assessing cancer treatment only (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Context*	Measurement Instrument Used [Name, Type, Number of Items]
Bickell, 2017[61]	Interviews	Organization type	NR
Jacobs, 2014[63]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	NR
Jacobs, 2014[63]	Primary data collection (non-qualitative)	Service comprehensiveness	NR
Jacobs, 2014[63]	Primary data collection (non-qualitative)	Size and volume	NR
Jacobs, 2014[63]	Primary data collection (non-qualitative)	Organization type	NR
Neuss, 2013[64]	Primary data collection (non-qualitative)	Service comprehensiveness	NR
Neuss, 2013[64]	Primary data collection (non-qualitative)	Size and volume	NR
Neuss, 2013[64]	Primary data collection (non-qualitative)	Affiliations	NR
Neuss, 2013[64]	Primary data collection (non-qualitative)	Location	NR
Sheetz, 2019[49]	Secondary data analysis	Size and volume	NR
Sheetz, 2019[49]	Secondary data analysis	Patient demographics	NR
Sheetz, 2019[49]	Secondary data analysis	Organization type	NR
Sheetz, 2019[49]	Secondary data analysis	Affiliations	NR
Sheetz, 2019[49]	Secondary data analysis	Location	NR
Tariq, 2020[68]	Secondary data analysis	Size and volume	Workload determined by hospital patient records and physician scheduling records. Type: NA Number of items: NA

*according to the Weaver and Breslau framework[91]

NA = not available; NR = not reported

Evidence Table D-15. Organizational processes of studies exemplifying measurement and instrumentation assessing cancer treatment only (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Process*	Study's Definition or Description of the Characteristic	Measurement Instrument Used [Name, Type, Number of Items]
Bickell, 2017[61]	Interviews	Care management processes	Cancer care coordination & associated organizational characteristics	Qualitative comparative analysis Type: NR Number of items: 5
Blayney, 2012[57]	Primary data collection (non-qualitative)	Care management processes	Module score related to: core processes, processes specific to particular cancer type or disease-specific processes, processes relating to supportive care, and processes involved in end-of-life care	The Quality Oncology Practice Initiative Type: NR Number of items: 52
Jacobs, 2014[63]	Primary data collection (non-qualitative)	Participation in state or national QI collaboratives	Participation in the NCI Community Clinical Oncology Program	NR
Mazur, 2017[67]	Assessments/Questionnaires	Provider/Team Training	Scores representing: subjective workload, procedural compliance, time-to-scenario completion, and clinical evaluation	Compliance Assessments, NASA-TLX questionnaire Type: NR Number of items: NR
Neuss, 2013[64]	Primary data collection (non-qualitative)	Use of QI or other improvement methods (e.g., lean six sigma etc.)	Quality Oncology Practice Initiative (QOPI)	Quality Oncology Practice Initiative (QOPI) Type: NR Number of items: NR
Schlueter, 2022[48]	Interviews	Participation in state or national QI collaboratives	Coding dictionary	Qualitative software Nvivo QSR versions 10.0 and 11.0. Type: NR Number of items: NR
Sheetz, 2019[49]	Secondary data analysis	Screening processes	Probability of cancer screening	NR
Trogdon, 2018[44]	Secondary data analysis	Care management processes	Guideline-recommended care: consultation with a medical oncologist for stage III patients, initiation of chemotherapy within 120 days of surgery for colon cancer and within 120 days before or after surgery for rectal cancer, and receipt of surveillance colonoscopy within 12 and 18 months of completion of treatment for all patients younger than 80 years	North Carolina Central Cancer Registry, NC Health Professions Data System, and fee-for-service claims (Medicare, Medicaid and privately insured individuals) Type: NR Number of items: NR

*according to the Weaver and Breslau framework[91]

NASA-TLX = NASA Task Load Index; NC = North Carolina; NCI = National Cancer Institute; NR = not reported; QI = quality improvement; QOPI = Quality Oncology Practice Initiative; QSR = Qualitative Research Software

Evidence Table D-16. Reported outcomes of studies exemplifying examination of healthcare organizational context and process characteristics assessing cancer treatment only (Guiding Question 3)

Author, Year	Primary Outcome Description	Primary Outcome Organizational Context	Environmental Influence	Secondary Outcome Description	Secondary Outcome Organizational Context	Environmental Influence
Bickell, 2017[61]	Underuse of breast cancer care	Process	No	Organizational 'Conditions: Information sharing, tracking follow-up, system support, patient-centered culture, flexibility, and whether private practice	Process	No
Blayney, 2012[57]	Adherence to quality care processes	Process	No	NR	NR	NR
Jacobs, 2014[63]	Physician enrollment in NCI Community Clinical Oncology Program (CCOP)	Process	No	NR	NR	NR
Mazur, 2017[67]	Workload	Process	No	Procedural compliance & time-to-scenario completion	Process	No
Neuss, 2013[64]	Improvement of quality scores	Process	No	Adherence to quality indicators	Process	No
Schlueter, 2022[48]	Organizational Factors: EHR use, readiness for implementation, leadership support, adoption of team-based approach, integration of evidence-based interventions	Organizational characteristics	No	NR	NR	NR
Sheetz, 2019[49]	30-day postoperative complications	NA	Yes	30-day mortality and readmissions	NA	Yes
Tariq, 2020[68]	Serious errors reaching the patient requiring appropriate action	Organizational characteristics	Yes	NR	NR	NR
Trogdon, 2018[44]	Adherence to guidelines	Process	No	5-year overall survival, number of surveillance radiology studies, any unplanned hospitalization, and any emergency department visit.	Process	No

CCOP = Community Clinical Oncology Program; EHR = electronic health record; NA = not available; NCI = National Cancer Institute; NR = not reported

Evidence Table D-17. Study characteristics of studies exemplifying examination of health care organization context and process characteristics assessing for other or more than one cancer care aspect (Guiding Question 3)

Author, Year	Study Aim	Study Design	Setting	Population	Organizational Level	Number of Organizations in the Study	Organization Ownership
Mesko, 2022[90]	"The purpose of this study was to identify and address inefficiencies at a high-volume radiation oncology clinic."	Before-after	Community cancer center associated with academic cancer center network	Patients with cancer: History of cancer (even if no current evidence of disease) Cancer type: Gastrointestinal cancer	Hospital	NA	Not-for-profit
Tucker, 2022[85]	"Test effects of an evidence-based practice (EBP) leadership immersion intervention on EBP attributes over time among two cohorts of leaders at a national comprehensive cancer center."	Prospective cohort	National comprehensive cancer center	Providers Cancer type: Not specified	Hospital	1	Not-for-profit

EBP = evidence-based practice; NA = not available

Evidence Table D-18. Organizational characteristics of studies exemplifying measurement and instrumentation assessing for other or more than one cancer care aspect (Guiding Question 3)

Author, Year	Data Collection Method	Classification of the Characteristic as Organizational Context*	Measurement Instrument Used [Name, Type, Number of Items]
Tucker, 2022[85]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	Evidence-based Practice (EBP) Knowledge Scale Type: NR Number of items: 38
Tucker, 2022[85]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	Evidence-based Practice (EBP) Belief Scale Type: NR Number of items: 16
Tucker, 2022[85]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	Evidence-based Practice (EBP) Competency Scale Type: Likert Number of items: 24
Tucker, 2022[85]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	Evidence-based Practice (EBP) Implementation Scale Type: NR Number of items: 18
Tucker, 2022[85]	Primary data collection (non-qualitative)	Knowledge, attitudes, beliefs of managers, providers, staff about organizational characteristics, policies, or processes	The Organizational Culture and Readiness System-wide Integration of Evidence-based Practice Scale Type: NR Number of items: NR

*According to the Weaver and Breslau framework[91]

EBP = evidence-based practice; NR = not reported

Evidence Table D-19. Organizational processes of studies exemplifying measurement and instrumentation assessing for other or more than one cancer care aspect (Guiding Question 3)

Author,Year	Data Collection Method	Classification of the Characteristic as Organizational Process*	Study's Definition or Description of the Characteristic	Measurement Instrument Used [Name, Type, Number of Items]
Mesko, 2022[90]	Primary data collection (non-qualitative)	Use of HIT system	Waiting room times, waiting time for physicians, time in room to arrival of physician, total cycle time	NR
Mesko, 2022[90]	Primary data collection (non-qualitative)	Communication	Waiting room times, waiting time for physicians, time in room to arrival of physician, total cycle time	NR
Mesko, 2022[90]	Primary data collection (non-qualitative)	Care coordination	Waiting room times, waiting time for physicians, time in room to arrival of physician, total cycle time	NR

*According to the Weaver and Breslau framework[91]

HIT = health information technology

Evidence Table D-20. Reported outcomes of studies exemplifying examination of healthcare organizational context and process characteristics assessing for other or more than one cancer care aspect (Guiding Question 3)

Author, Year	Primary Outcome Description	Primary Outcome Organizational Context	Environmental Influence	Secondary Outcome Description	Secondary Outcome Organizational Context	Environmental Influence
Mesko, 2022[90]	Waiting room times, waiting time for physicians, time in room to arrival of physician, total cycle time	Process	No	NR	NR	NR
Tucker, 2022[85]	Evidence-based Practices knowledge, implementation, readiness	Organizational characteristics	No	NR	NR	NR

NR = not reported

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