In 2013, the Institute of Medicine (IOM) concluded that cancer care in the United States is in crisis. Patients and their families are not receiving the information that they need to make informed decisions about their cancer care. Many patients do not have access to palliative care and too few are referred to hospice at the appropriate point in their disease trajectory. Simultaneously, there is a growing demand for cancer care with increases in new cancer diagnoses and the number of patients surviving cancer. Furthermore, there is a workforce shortage to care for this growing and elderly population. The IOM’s report, Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis, outlined recommendations to improve the quality of cancer care. This article provides an overview of the IOM report and highlights the recommendations that are most relevant to practicing clinicians who care for patients with cancer across the continuum. The implementation of the recommendations in clinical practice will require better patient-clinician communication, improved care coordination, targeted clinician training, effective dissemination of evidence-based guidelines and strategies for eliminating waste, and continuous quality assessment and improvement efforts.

Keywords: cancer, patient-centered care, communication, decision-making, quality of health care, evidence-based health care.

Introduction
In 2013, the Institute of Medicine (IOM) concluded that cancer care in the United States is in crisis. The current cancer care delivery system faces many challenges in meeting the needs of patients with cancer and their families. Patients require additional support to make decisions that are consistent with their needs, values, and preferences. Information that could help patients understand their disease, treatment options, and the cost of care is often unavailable or not communicated. As a result, patients often do not know the goals of their treatment, what treatments they have received, or the consequences of their treatments on their future health. Many patients also do not have access to palliative care to manage their symptoms and side effects, and too few patients are referred to hospice at the appropriate point in the trajectory of care.

Simultaneously, there is a growing demand for cancer care. The United States currently has 14.5 million individuals living with a cancer diagnosis and this number is projected to increase to 19 million by 2024. Each year, 1.6 million individuals are diagnosed with cancer and the annual rate is expected to increase to 2.3 million by 2030. Furthermore, there is a workforce shortage to care for this growing population, which is projected to increase in the decade to come.

The aging population is contributing to the crisis in cancer care. The majority of cancer diagnoses and cancer deaths occur in individuals aged older than 65 years, and the majority of cancer survivors are older adults. Patients with cancer who are older are likely to have a number of characteristics that make their disease more complex to treat, such as altered physiology, functional and cognitive impairment, multiple coexisting comorbidities, increased side effects of treatment, distinct goals of care,
and increased need for social support. Furthermore, older patients may require care from numerous medical clinicians, thus putting them at risk for deficiencies in care coordination and communication.9 This is further complicated by a low proportion of health care workers who have specialized training in geriatrics to meet the needs of the aging population.10 Last, the evidence base supporting the treatment of older adults with cancer is limited because this population is regularly underrepresented in cancer clinical trials that set the standard for cancer care.11

Cancer care is becoming more complex, with many new treatments relying on molecularly targeted agents and immunotherapies.12 In addition, the cost of cancer care is rapidly rising. The United States is projected to spend $120 billion per year on cancer care in 2020.13 The tools that exist for improving the quality of cancer care, such as quality metrics and health information technology (IT), are inadequate to address the enormous challenges that the delivery system is confronting.

In 2012, the IOM convened a multidisciplinary committee to examine challenges to and opportunities for the delivery of high-quality cancer care and to formulate recommendations for improvement. The committee’s report, Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis,1 presents a conceptual framework for improving the quality of cancer care. This article provides an overview of the IOM report and highlights the recommendations most relevant to practicing clinicians. The first section summarizes the IOM’s conceptual framework and recommendations for action. The remainder of the article discusses how the recommendations are applicable to clinical practice across the cancer care continuum.

**Overview of IOM Report**

The IOM developed a conceptual framework for improving the quality of cancer care. The goal of the framework is ensuring the delivery of “comprehensive, patient-centered, evidence-based, high-quality cancer care that is accessible and affordable to the entire US population.”1 It consists of 6 interconnected components (Fig. 1):

1. Engaged patients: a system that supports all patients in making informed medical decisions consistent with their needs, values, and preferences in consultation with their clinicians who have expertise in patient-centered communication and shared decision-making.
2. An adequately staffed, trained, and coordinated workforce: a system that provides competent, trusted, interprofessional cancer care teams that are aligned with patients’ needs, values, and preferences, as well as coordinated with the patients’ noncancer care teams and their caregivers.
3. Evidence-based cancer care: a system that uses scientific research, such as clinical trials and comparative effectiveness research, to inform medical decisions.
4. A learning health care IT system for cancer: a system that uses advances in IT to enhance the quality and delivery of cancer care, patient outcomes, innovative research, quality measurement, and performance improvement.
5. Translation of evidence into clinical practice, quality measurement, and performance improvement: a system that rapidly and efficiently incorporates new medical knowledge into clinical practice guidelines, measures and assesses progress in improving the delivery of cancer care and publicly reports performance information, and develops innovative strategies for further improvement.

6. Accessible, affordable cancer care: a system that is accessible to all patients and uses new payment models to align reimbursement to reward care teams for providing patient-centered, high-quality care and eliminating wasteful interventions.

The IOM structured its recommendations for action around the 6 components of the conceptual framework. The recommendations have 10 distinct goals:

1. Provide patients and their families with understandable information about cancer prognosis, treatment benefits and harms, palliative care, psychosocial support, and costs.
2. Provide patients with end-of-life care that meets their needs, values, and preferences.
3. Ensure coordinated and comprehensive patient-centered care.
4. Ensure that all individuals caring for patients with cancer have appropriate core competencies.
5. Expand the breadth of data collected in cancer research for older adults and patients with multiple comorbid conditions.
6. Expand the depth of data collected in cancer research through a common set of data elements that capture patient-reported outcomes, relevant patient characteristics, and health behaviors.
7. Develop a learning health care IT system for cancer that enables real-time analysis of data from patients with cancer in a variety of care settings.
8. Develop a national quality reporting program for cancer care as part of a learning health care system.
9. Implement a national strategy to reduce disparities in access to cancer care for underserved populations by leveraging community interventions.
10. Improve the affordability of cancer care by leveraging existing efforts to reform payment and eliminate waste.

This article focuses on those recommendations that clinicians have a role in implementing, specifically patient-centered communication and decision-making (recommendations 1 and 2); coordinated professional care and well-trained caregivers (recommendations 3 and 4); continuous quality assessment and improvement (recommendations 7 and 8); and evidence-based, cost-conscious care (recommendation 10). The clinical implications of each of these recommendations are discussed in more detail below.

Application to Clinical Practice

The IOM recommendations on improving the quality of cancer care address a broad spectrum of issues in the cancer care delivery system. They include many concrete recommendations and identify multiple organizations and stakeholders that have a role in translating the recommendations into practice. For example, these include federal and private payers, research funders, and professional organizations and hospitals, as well as patient advocacy groups. Many of the recommendations pertain directly to practicing clinicians who may play an active role in the implementation of these recommendations. This section of the article highlights areas of the recommendations that are particularly relevant to all clinicians caring for patients with cancer across the cancer continuum. Specifically, we focus on recommendations that aim to promote patient-clinician communication and decision-making, enhance clinician-clinician communication and care coordination, ensure adequate training for clinicians, disseminate evidence-based guidelines and eliminate waste, and implement continuous quality assessment and improvement.

Promote Patient-Clinician Communication and Decision-Making

The primary goal of the IOM’s recommendations is to ensure that the cancer care delivery system meets the needs of patients and their families. To achieve this aim, the IOM’s first recommendation is that the cancer care team should provide patients and their families with understandable information about their cancer prognosis, treatment benefits and harms, the importance of palliative care and psychosocial support, and the cost of care. This information should be personalized for patients at key decision points along the continuum of cancer care and the cancer care team should use existing decision aids when possible. The process of communication and decision-making should lead to the development of a cancer care plan that reflects the needs, values, and preferences of the patient. The plan should address the patient’s need for cancer therapy, palliative care, and psychosocial support across the cancer care continuum. When treating patients with advanced cancer, the cancer care team should revisit the patients’ advance care plans, and emphasize providing palliative care, psychosocial support, and timely referral to hospice for care at the end of life.

Challenges in patient-centered communication and shared decision-making have been previously documented.14 Patient barriers include difficulty speaking openly about their concerns, feeling that the clinician may disapprove of their decision, insufficient understanding or knowledge, low health literacy, and language barriers, among others. Clinician barriers include lack of time, avoidance of difficult conversations, lack of insight into the patients’ concerns, and fatigue, among others. Shared decision-making further requires clinicians to apply the evidence base and elicit
TABLE 1. Decision Aids for Cancer Prevention, Screening, and Treatment

| Topic                                      | Description                                                                 |
|--------------------------------------------|-----------------------------------------------------------------------------|
| Breast Cancer Prevention, Screening, and Treatment | BRC A1 And BRC A2: Cancer Risk And Genetic Testing (National Cancer Institute) |
| Breast Cancer: Should I Have A BRCA Gene Test? (Healthwise) |
| • A Patchwork of Life: One Woman’s Story, For Women Making Breast Cancer Treatment Decisions (Dan L. Duncan Cancer Center at Baylor College of Medicine) |
| • Adjvant Endocrine Therapy For Hormone Receptor-Positive Breast Cancer (American Society of Clinical Oncology) |
| Breast Cancer Screening And Dense Breasts: What Are My Options? (Healthwise) |
| Breast Cancer Screening: When Should I Start Having Mammograms? (Healthwise) |
| Breast Cancer Surgery: Option Grid Collaborative |
| Breast Cancer: Should I Have Breast-Conserving Surgery Or A Mastectomy For Early-Stage Cancer? (Healthwise) |
| Breast Cancer: Should I Have Chemotherapy For Early-Stage Breast Cancer? (Healthwise) |
| Breast Cancer: What Should I Do If I’m At High Risk? (Healthwise) |
| BresDex: Breast Cancer Decision Explorer (Decision Laboratory, Cardiff University) |
| Choosing Whether to Continue or Stop Mammography Screening At 70 (University of Sydney) |
| Information on Mammography For Women Aged 40 And Older: A Decision Aid For Breast Cancer Screening In Canada (Public Health Agency of Canada) |
| Making Decisions About Your Breast Cancer Treatment: A Decision Aid For Women with Early Breast Cancer (Department of Primary Care Medicine, Faculty of Medicine, University of Malaysia) |
| • Prophylactic Oophorectomy: Preventing Cancer by Surgically Removing Your Ovaries (Mayo Clinic) |
| • Reducing the Risk of Breast Cancer With Medicine: A Guide For Women (Agency for Healthcare Research and Quality) |
| • Should I Start Having Mammograms To Screen For Breast Cancer? (University of Sydney) |
| • Surgery Choices For Women With DCIS Or Breast Cancer (National Cancer Institute) |
| Breast Cancer: Should I Have Breast Reconstruction After A Mastectomy? (Healthwise) |
| • Prophylactic Mastectomy: Breast Cancer Prevention For High-Risk Women (Mayo Clinic) |
| • Childhood Cancer Bone Marrow Transplantation |
| • Bone Marrow Or Blood Stem Cell Transplants in Children With Severe Forms of Autoimmune Disorders or Certain Types of Cancer (Agency for Healthcare Research and Quality) |
| Colon Cancer Screening |
| • Colon Cancer: Which Screening Test Should I Have? (Healthwise) |
| • Making Decisions: Should I Have a Screening Test for Bowel Cancer? (University of Sydney) |
| Cervical Cancer Screening |
| • HPV: Should I Get The Vaccine? (Healthwise) |
| • What Can You Do To Prevent HPV And Cervical Cancer? A Decision Aid For Parents/Guardians Of Girls In Grade 8 In Ontario (Ottawa Patient Decision Aid Research Group) |
| Head and Neck Cancer Treatment |
| • Understanding Radiotherapy For Head And Neck Cancer: A Guide For Adults And Their Caregivers (Agency for Healthcare Research and Quality) |
| Lung Cancer Screening and Treatment |
| • Lung Cancer Screening (Option Grid Collaborative) |
| • Stage IB, II, III Non-Small Cell Lung Cancer Cisplatin Plus Vinorelbine Chemotherapy After Surgery (American Society of Clinical Oncology) |
| • Stage IV Non-Small Cell Lung Cancer: First-Line Chemotherapy; Second-Line Chemotherapy; Second- Or Third-Line Chemotherapy with Erlotinib; Third-Line and Fourth-Line Chemotherapy: Decision Aid Set (American Society of Clinical Oncology) |
| Ovarian Cancer Prevention |
| • BRC A1 And BRC A2: Cancer Risk And Genetic Testing (National Cancer Institute) |
| • Oophorectomy for Risk of Ovarian Cancer—Before The Menopause (Option Grid Collaborative) |
| • Oophorectomy for Risk of Ovarian Cancer—After The Menopause (Option Grid Collaborative) |
| • Ovarian Cancer: Should I Have My Ovaries Removed To Prevent Ovarian Cancer? (Healthwise) |
| • Risk Management Options For Women at Increased Risk of Developing Ovarian Cancer (Prince Of Wales Hospital) |
| Prostate Cancer Screening and Treatment |
| • Choosing the Radiation Dose in the Treatment of Prostate Cancer (Radboud University Nijmegen Medical Center) |
| • Decision Aid: Treatment Of Early-Stage Prostate Cancer (Division of Cancer Care and Epidemiology, Cancer Research Institute, Queen’s University) |
| • Knowing Your Options: A Decision Aid For Men With Clinically Localized Prostate Cancer (Agency for Healthcare Research and Quality) |
| • Localised Prostate Cancer-Low Risk (Option Grid Collaborative) |
| • Prostate Cancer Decision Aid (Decision Laboratory, Cardiff University) |
| • Prostate Cancer Risk Reduction With Finasteride: Discussion Guide For Doctor And Patient (American Society of Clinical Oncology) |
| • Prostate Cancer Screening With PSA Testing (American Society of Clinical Oncology) |
| • Prostate Cancer Screening: Should You Get A PSA Test? (Mayo Clinic) |
| • Prostate Cancer: Should I Choose Active Surveillance? (Healthwise) |
| • Prostate Cancer: Should I Have Radiation Or Surgery For Localized Prostate Cancer? (Healthwise) |
| • Prostate Specific Antigen (PSA) Test (Option Grid Collaborative) |
| • PSA (Prostate Specific Antigen) Testing For Prostate Cancer: An Information Sheet For Men Considering A PSA Test (University of Oxford) |
| • Should I Have A PSA Test? (University of Sydney) |
| • Should You Get A PSA Test? A Patient-Doctor Decision (Virginia Commonwealth University) |
| • Treating Prostate Cancer: A Guide For Men With Localized Prostate Cancer (Agency for Healthcare Research and Quality) |
| • Treatment Choices For Men With Early-Stage Prostate Cancer (National Cancer Institute) |
| Testicular Cancer Treatment |
| • Testicular Cancer: Which Treatment Should I Have For Stage I Nonseminoma Testicular Cancer After My Surgery? (Healthwise) |
| • Testicular Cancer: Which Treatment Should I Have For Stage II Seminoma Testicular Cancer After My Surgery? (Healthwise) |
| Thyroid Cancer Screening |
| • Making Choices: Screening For Thyroid Disease (National Cancer Institute) |

DCIS indicates ductal carcinoma in situ; HPV, human papillomavirus; PSA, prostate-specific antigen. Reproduced with permission from the Ottawa Hospital Research Institute. A to Z Inventory of Decision Aids. decisionaid.ohri.ca/azinventory.php. Accessed July 1, 2014. \*\* NOTE: For Web site links, please refer directly to the OHRI Web site. The decision aids on this Web site were not developed by the OHRI; the inventory is constantly updated. Some developers have provided access for evaluation but not for patient use. Some decision aids require payment to access, either via a license or membership in an insurance or health care plan.
patient needs, preferences, and values. Clinical settings may also lack support systems for facilitating this process (eg, insufficient time and lack of electronic medical records). These and other resources are necessary to provide patients and clinicians with the opportunity to engage in patient-centered communication and shared decision-making.

To promote patient engagement in decision-making in clinical practice, decision aids have been developed across the cancer care continuum (decisionaid.ohri.ca/AZsearch.php?criteria=cancer) (Table 1). However, their use in clinical practice is suboptimal. The Patient Protection and Affordable Care Act included a provision to develop and promote shared decision-making with the use of decision aids. In cancer screening, decision aids have focused on prostate cancer, breast cancer, and colorectal cancer. Such tools have enhanced patient understanding of the risks and benefits of screening and have led to more informed decision-making. For example, in breast cancer screening, a sample dialogue for engaging with patients in discussions about the benefits and potential harms of screening has been published.

To guide cancer treatment decision-making, a number of cancer prognosis tools have been developed, many of which are available online (cancercalculators.org/index.aspx). A recent systematic review identified 22 risk prognostic tools across numerous cancer types. The most common cancers included prostate, colorectal, breast, and genitourinary cancers as well as melanoma (Table 2). For example, Adjuvant! Online includes calculators for breast, colorectal, and lung cancer; the National Cancer Institute Cancer Survival Query System includes calculators for prostate and colorectal cancers; and the Memorial Sloan-Kettering Cancer Center has developed numerous calculators for different cancer types. Single-disease–based calculators have also been developed. The tools vary in terms of their intended use, input and output variables, and whether comorbid conditions are taken into account. Despite their limitations, these tools are readily available and should be used in clinical practice. Furthermore, tools have also been developed to assess the risk of chemotherapy toxicity in older adults, taking into account objective measures of functional status and cognitive function as well as self-reported measures of functional status, comorbidity, medications, nutrition, psychological state, and social support/function.

Shared decision-making is important in guiding end-of-life discussions and has been shown to alter care. A number of tools have been developed to facilitate clinicians in discussions to elicit patients’ needs, preferences, and goals. Palliative care in oncology offices may be enhanced by the “ask, tell, ask” approach, including asking patients what they already know and how much they want to know, providing them with the information in understandable words, and then asking “What is your understanding of your situation now, after our discussion? What are some key points you take away from our conversation?” Furthermore, at each transition point (such as when changing treatment or prognosis), questions such as “What are you hoping for?” and “What is your understanding of your situation?” may be used as prompts to communicate with patients with advanced cancer (Table 3).

In addition to communicating cancer prognosis, the IOM recommended that the cancer care team inform patients about the total and out-of-pocket costs of care. This echoed an early guidance statement by the American Society of Clinical Oncology (ASCO), which stated that “communication with patients about the cost of care is a key component of high quality care.” However, this is an emerging area of clinical practice and there are limited resources available to facilitate clinicians in community or academic practices having these difficult conversations with their patients, nor is information about costs of care readily available to clinicians treating the patient. Furthermore, there are other aspects of cost that are indirect and difficult to measure, such as the cost of transportation and parking, time off from work, and lost productivity, among others. ASCO has developed a resource booklet for patients containing questions they should ask their clinicians about the costs of care.

Across the spectrum of cancer care, clinicians could benefit from training programs aimed at improving their communication skills to enhance patient-centered communication and decision-making. Examples of existing programs include Oncotalk, which was developed by clinicians at the University of Washington (depts.washington.edu/oncotalk); Centering Communication in Palliative Care, which was developed by the Clinical Communication Collaborative (clinicalcc.com); and the Interpersonal Communication And Relationship Enhancement (I*CARE) program, which was developed by The University of Texas MD Anderson Cancer Center (mdanderson.org/education-and-research/resources-for-professionals/professional-educational-resources/i-care/index.html). The IOM committee recommended that professional educational programs for all members of the cancer team should provide comprehensive and formal training in communication.
| TOOL NAME                                           | CANCER SITES                                                                 |
|----------------------------------------------------|------------------------------------------------------------------------------|
| Adjuvant! Online²                                   | +                              | +                              | +                              | +                              |
| AJCC Individuated Melanoma Patient Outcome Prediction Tools |                                |                                |                                |                                |
| Artificial Neural Networks in Prostate Cancer       | +                              |                                |                                |                                |
| Biochemical Recurrence-free Survival Prediction Model| +                              |                                |                                |                                |
| CancerMath                                         |                                | +                              | +                              | +                              | +                              | +                              | +                              |
| UCSF Capra Score                                   |                                |                                |                                |                                | +                              |
| Disease free survival calculator for EBRT, brachytherapy, and combinations of the 2 |                                | +                              |                                |                                | +                              |
| FinProg Online                                     |                                |                                |                                |                                | +                              |
| Nomograms for predicting survival of patients with GBM|                                |                                |                                |                                | +                              |
| The Han tables                                     |                                |                                |                                |                                | +                              |
| IBTR-Breast Cancer Module, Version 2.0             |                                |                                |                                |                                | +                              |
| Knight Cancer Institute Survival Prediction Tools   |                                | +                              |                                |                                |                                |                                | +                              | +                              |
| Lerner Research Institute Risk Calculators         |                                | +                              | +                              | +                              | +                              | +                              | +                              | +                              |
| MASTSTRO prediction Web site                       |                                | +                              |                                |                                | +                              |                                |                                | +                              |
| The University of Texas MD Anderson Cancer Center clinical calculators |                                |                                | +                              | +                              |                                |                                |                                | +                              |
| Memorial Sloan-Kettering Prediction Tools²         |                                | +                              | +                              | +                              | +                              | +                              | +                              | +                              |
| University of Montreal-Nomograms                   |                                |                                |                                | +                              |                                |                                |                                | +                              |
| Mayo Clinic Adjuvant Tool (Numeracy)               |                                |                                |                                | +                              |                                |                                |                                | +                              |
| Prognostigram                                      |                                | +                              | +                              | +                              | +                              | +                              | +                              | +                              | +                              |
| QnMD–Calculate¹                                    |                                |                                |                                | +                              |                                |                                |                                | +                              | +                              |
| Calculator for Estimating Overall Life Expectancy and Lifetime Risk for Prostate Cancer Death in Newly Diagnosed Men Managed without Definitive Local Therapy |                                |                                |                                |                                | +                              | +                              | +                              | +                              | +                              |

AJCC indicates American Joint Committee on Cancer; UCSF, University of California at San Francisco; EBRT, external beam radiotherapy; GBM, glioblastoma multiforme; IBTR, ipsilateral breast tumor recurrence; Colon, rectum, colorectal, cecum, hepatic flexure, splenic flexure, sigmoid colon, large intestine, rectosigmoid, anus, and anal cavity; Bladder, kidney/renal cell, penile, testis, other male genital organs, ureter, and other urinary organs; Gastric, esophageal, pancreas, gallbladder, stomach, small intestine, liver, bile duct, other biliary, retroperitoneum, peritoneum, omentum, and appendix; Lung, mesothelioma, bronchus, pleura, trachea, and mediastinum; Oral, larynx, lip, tongue, salivary gland, floor of mouth, gums, nasopharynx, tonsil, oropharynx, hypopharynx, other buccal and pharynx, nasal cavity, middle ear, sinus, eye, and orbit; Ovarian, endometrial, cervix, uterus, ovary, vagina, vulva, and other female genital organs; Bones and joints, Kaposi sarcoma, soft tissue sarcoma, and uterine leiomyosarcoma; Adrenal, thyroid, and other endocrine; Lymphoma, myeloma, leukemia, Hodgkin lymphoma disease/lymph node, non-Hodgkin lymphoma, multiple myeloma, acute lymphocytic leukemia, chronic lymphocytic leukemia, acute granulocytic leukemia, chronic granulocytic leukemia, other acute leukemias, and other chronic leukemias; Brain and other nervous system; Need to create on-site login to access; Need to contact developer for access; Need to create on-site login to access. Modified from Rabin BA, Gagliò B, Sanders T, et al. Predicting cancer prognosis using interactive online tools: a systematic review and implications for cancer care providers. Cancer Epidemiol Biomarkers Prev. 2013;22:1645-1656. Also available on cancercalculators.org.
TABLE 3. Using a Question Prompt List as a Communication Aid in Advanced Cancer Care Question Prompt List for Patients

| Questions                                                                 |
|--------------------------------------------------------------------------|
| People who see their doctor for the first time often have questions and  |
| concerns, but may feel nervous about bringing them up. We want you to   |
| feel comfortable talking to your doctor about whatever matters to you.  |
| The purpose of this form is to help you get information about your      |
| treatment and the quality of your life. Please take a few minutes to    |
| read this form. Indicate the questions you’d like to discuss and write  |
| down any other questions you have in the space provided. You can keep   |
| this sheet with you when you see the doctor.                            |
|                                                                          |
| Exactly what kind of illness do I have?                                  |
| Will the illness get worse or spread?                                    |
| What are the treatment options? Do they have side effects?              |
| How long will it be before I know if the treatment is working?          |
| What are the chances of completely curing my illness?                    |
| What will I be able to do on a daily basis?                              |
| What are the best and worst days going to be like?                      |
| Are there services to help me or my family cope with this illness?      |
| The following questions may or may not be relevant to you, but we       |
| know that patients and their doctors often have a hard time discussing  |
| them. If you are concerned about any of these issues, we encourage you  |
| to please indicate them below:                                           |
|                                                                          |
| How long am I likely to live?                                            |
| Who can I talk to about the medical care that I want in the event that  |
| I am no longer able to speak for myself in the future?                   |
| How do I get my affairs in order and write a will?                      |
| Is it feasible for me to die at home and in comfort?                    |
|                                                                           |

Reproduced with permission from Yeh JC, Cheng MJ, Chung CH, Smith TJ. Using a question prompt list as a communication aid in advanced cancer care. J Oncol Pract. 2014;10:e137-e141.31

**Promote Clinician-Clinician Communication and Care Coordination**

Cancer care is provided by a diverse team of professionals, including medical oncologists, radiation oncologists, surgeons, primary care clinicians, and geriatricians, as well as nurses, nurse practitioners, physician assistants, psychosocial workers, pharmacists, rehabilitation clinicians, nutritionists, spiritual workers, and other professionals (Figs. 2A and 2B). The IOM recommends that the members of the cancer care team coordinate with each other and with primary, geriatric, and specialists care teams to implement patients’ care plans and deliver comprehensive, efficient, and patient-centered care. It is also important that all of the members of a patient’s care team have the necessary core competencies to provide high-quality cancer care. There are distinct sets of skills for both the professionals trained in oncology and for professionals trained in primary care or other specialties who provide care to patients with cancer. The professional organizations that represent these clinicians should define the cancer core competencies for their memberships.

Challenges in clinician communication and care coordination for patients with cancer have been described. Patients with cancer interact with numerous health care clinicians during the continuum of cancer care.5,6 These include cancer clinicians, primary care clinicians, and other disease specialists. There is often a lack of communication among these clinicians, resulting in potential gaps or redundancies in care. Although recent attention has focused on transitions of care from inpatient to outpatient settings,35 care of the patient with cancer involves numerous transitions, with multiple sites of outpatient and inpatient care that often occur without a common medical record, during which clear communication and coordination are critical (Fig. 3).36,37

The first phase in the transition of care occurs at the time of the cancer diagnosis. Cancer diagnoses are commonly made in primary care settings. As such, primary care clinicians have a direct role in addressing the initial diagnosis, providing guidance on the next steps, and directing referrals to appropriate clinicians. The referral process may be driven by geography, insurance, patient preferences, and/or primary care clinicians’ prior experience with the specialist. As such, primary care clinicians may have a direct role in referring patients to those oncology specialists with whom they have an established communication pattern, trust, and a shared patient-centered approach. If communication patterns have not yet been established, doing so early on may be advisable. At the time of transition from symptoms to cancer diagnosis, communication between the primary care clinician and the cancer specialist is critical, and can be improved through direct interactions and/or electronic supports.38

During the transition to treatment, it is important to establish clarity in the role of each clinician involved in the patient’s care as well as the timely and adequate transfer of knowledge between clinicians.39 Multispecialty tumor boards may bring cancer clinicians together to discuss care planning, and may also offer an opportunity for the primary care clinician to give a unique insight to guide decision-making. This is especially important for patients with multiple comorbid medical conditions, and in discussions of psychosocial issues and patient preferences. The feasibility of virtual tumor boards (ie, via Skype) should be assessed in both clinical practices and research.

In the transition to survivorship, the clarification of roles is again important, as is the development of a survivorship care plan (end product of a planning process) that includes a delineation of what needs to be done, who is doing it, and when it should be completed.40 Last, in the transition to end-of-life care, communication between clinicians is needed to help elucidate patient needs, values, and preferences and, specifically, how comorbid...
medical conditions play a role in the decision-making process. Across each of the transition phases, electronic medical records may be beneficial, but are unlikely to solve the communication gaps entirely. The current national focus on health IT is the first step toward improving communication and care coordination, but in order for the use of health IT to be truly “meaningful,” there must be concerted efforts to integrate systems used by primary care, cancer care, and specialty care clinicians to serve as a “time-sensitive coordination system for the health care enterprise.”

The American College of Physicians (ACP) launched a High Value Care Coordination project (hvc.acponline.org/physres_care_coordinaton.html) in an effort to develop a toolkit to facilitate more effective, high-value, patient-centered care coordination between primary care and subspecialty/specialty practices. The project includes a toolkit that provides: 1) a checklist of information to include in a generic referral to a subspecialist/specialist practice; 2) a checklist of information to include in a subspecialist/specialist’s response after responding to a referral request; 3) pertinent data sets reflecting specific information, in addition to that found on
the generic referral request, to include in a referral for a number of specific common conditions to help ensure an effective and high-value engagement; 4) model care coordination agreement templates between primary care and subspecialty/specialty practices, and between primary care and hospitalist practices; and 5) an outline of recommendations to clinicians on preparing a patient for a referral in a patient-centered manner. Numerous medical professional organizations participated in this effort, including ASCO. ACP recommended information for clinicians to include in their consultation request for newly diagnosed patients with cancer.

In addition, ACP outlined several models of disease comanagement approaches for patients receiving shared medical care in a patient-centered medical home (PCMH) and specialty practices, emphasizing a clear a delineation of responsibilities (acponline.org/advocacy/current_policy_papers/assets/pcmh_neighbors.pdf). First, patients with cancer may be comanaged by a PCMH and a specialty practice with shared management of the cancer-specific needs. For example, the oncology practice provides ongoing management of a patient with advanced prostate cancer, whereas the PCMH manages the patient’s day-to-day medical needs. Second, patients may be comanaged with the PCMH providing the principal care of the patient’s cancer-related needs. For example, a patient with localized breast cancer has completed active treatment and is now in the surveillance phase of care. The oncologist provides a written summary of the patient’s treatment, risk assessment, and surveillance needs. Although the patient may have occasional follow-up with the oncology practice, the PCMH coordinates all follow-up care. Last, patients may be comanaged with the specialty care practice becoming the principal care clinician for the patient for a limited period of time. For example, a patient with stage III colon cancer initiates active chemotherapy and receives all care related to the treatment through the oncology practice. During the active period of treatment, the oncologist is the first contact for all issues. The oncologist directs the care of ongoing medical conditions, such as hypertension, to the PCMH. Once treatment is completed, the PCMH resumes as the main point of contact, and any additional follow-up with oncology is coordinated by the PCMH.

Although the ACP model focuses on the PCMH, the development of oncology-based medical homes for the coordination of care has also been proposed. With the growing population of cancer survivors, coordination between oncology and primary care will become more critical. Several models of care have been proposed. Ensuring Adequate Training for All Clinicians Involved in Cancer Care

As previously noted, the IOM recognized that patients with cancer are cared for by a wide variety of clinicians across the continuum of cancer (Figs. 2A and 2B), and thus recommended that all individuals caring for patients with cancer should have appropriate core competencies. It suggested that professional organizations representing clinicians who care for patients with cancer define cancer core competencies for their membership. It also advised cancer care delivery organizations to require the members of the cancer care team to have the necessary competencies to deliver high-quality cancer care, as demonstrated through training, certification, or credentials. Last, it recommended that organizations responsible for the accreditation, certification, and training of clinicians on the primary care or other specialty care teams promote the development of relevant core competencies across the cancer care continuum. Ultimately, cross-talk between these organizations would
be needed to formalize these competencies and identify how these competencies could foster the transitions of care across the cancer care continuum. The core competencies should include knowledge of clinical information and communication and coordination of care, the latter of which requires working across medical specialties and disciplines. Because the population of patients with cancer is aging, further competencies in geriatrics are also needed. The majority of patients cared for in the oncology setting are older adults; however, only a small percentage of health care clinicians have training in geriatric medicine. Therefore, the essential principles of geriatrics need to be included as a part of the core competencies across disciplines caring for older adults with cancer.

C-Change is a nonprofit organization founded in 1998 that is comprised of cancer leaders from the private, public, and not-for-profit sectors (c-changetogether.org). In attempts to improve cancer care across the continuum, the organization developed a list of core competencies across the cancer care continuum, focusing on both oncology and nononcology clinicians. Specifically, the standards focus on 3 domains. Continuum of care describes the topic areas along the continuum of care that a health care professional could work within, ranging from prevention and behavioral risks, screening and early detection, treatment, survivorship, and palliative and end-of-life care. Basic cancer science describes topic areas in which a health care professional should be knowledgeable, including incorporating general cancer knowledge into practice, describing the biologic attributes of cancer etiology, applying cancer epidemiology and risk factor data for individuals and specific communities, discussing complementary and alternative therapies, supporting participation in clinical trials, and adhering to data collection standards in reporting cancer cases to surveillance registries. Collaboration and communication describes ways in which health care professionals can work together, focusing on participating within interdisciplinary cancer teams, incorporating psychosocial communication strategies in conveying cancer information, incorporating cross-cultural communication strategies in conveying cancer information, describing common ethical and legal issues in cancer care, and incorporating communication strategies that encourage the process of grieving (cancercorecompetency.org).

### Disseminate Evidence-Based Guidelines and Eliminate Waste

Disseminating evidence-based guidelines and eliminating waste are critical components of improving the quality of cancer care. The IOM addressed this area by recommending that clinicians leverage existing efforts to improve the affordability of cancer care. For example, the IOM report highlighted the potential of the Choosing Wisely campaign, a clinician-led effort to discourage wasteful interventions, to make cancer care more accessible and affordable to patients. It noted that additional efforts will be needed to publicly disseminate evidence-based information about cancer care practices that are unnecessary or in which the harm may outweigh the benefits. In addition, the IOM recommended that clinicians participate in efforts to design and evaluate new payment models that incentivize the cancer care team to provide cancer care that is based on
### TABLE 5. Choosing Wisely Recommendations by Organization Across the Cancer Care Continuum

| SCREENING |
| --- |
| **RECOMMENDATION** |
| Do not perform PSA testing for prostate cancer screening in men with no symptoms of the disease when they are expected to survive <10 y. | American Society of Clinical Oncology |
| Do not perform Pap tests on women aged <21 y or who have undergone a hysterectomy for noncancer disease. | American Academy of Family Physicians |
| Do not screen women aged >65 y for cervical cancer who have had adequate prior screening and are not otherwise at high risk of developing cervical cancer. | American Academy of Family Physicians |
| Do not screen women aged <30 y for cervical cancer with HPV testing, alone or in combination with cytology. | American Academy of Family Physicians |
| Do not routinely screen for prostate cancer using a PSA test or digital rectal examination. | American Academy of Family Physicians |
| Do not perform CT screening for lung cancer among patients at low risk of lung cancer. | American College of Chest Physicians and American Thoracic Society |
| Avoid colorectal cancer screening tests in asymptomatic patients with a life expectancy of <10 y and no family or personal history of colorectal neoplasia. | American College of Surgeons |
| Do not recommend screening for breast or colorectal cancer nor prostate cancer (with the PSA test) without considering life expectancy and the risks of testing, overscreening, and overtreatment. | American Geriatrics Society |
| Do not screen low-risk women with CA 125 or ultrasound for ovarian cancer. | Society of Gynecologic Oncology |
| Do not screen for ovarian cancer in asymptomatic women at average risk. | American Congress of Obstetricians and Gynecologists |
| Do not repeat colorectal cancer screening (by any method) for 10 y after a high-quality colonoscopy is negative in average-risk individuals. | American Gastroenterological Association |
| Do not repeat colonoscopy for at least 5 y for patients who have 1 or 2 small (<1 cm) adenomatous polyps, without high-grade dysplasia, completely removed via a high-quality colonoscopy. | American Gastroenterological Association |
| Do not recommend cancer screening in adults with a life expectancy of <10 y. | Society of General Internal Medicine |

| DIAGNOSIS |
| --- |
| **RECOMMENDATION** |
| Do not perform PET, CT, and radionuclide bone scans in the staging of patients with early prostate cancer at low risk of metastasis. | American Society of Clinical Oncology |
| Do not perform PET, CT, and radionuclide bone scans in the staging of patients with early breast cancer at low risk of metastasis. | American Society of Clinical Oncology |
| Do not perform surgery to remove a breast lump for suspicious findings unless core needle biopsy cannot be done. | American College of Surgeons Commission on Cancer |
| Patients with suspected or biopsy-proven stage I NSCLC do not require brain imaging prior to definitive care in the absence of neurologic symptoms. | American Society for Thoracic Surgery |
| Do not perform sentinel lymph node biopsy or other diagnostic tests for the evaluation of early, thin melanoma because they do not improve survival. | American Academy of Dermatology |
| Do not treat uncomplicated, nonmelanoma skin cancer measuring <1 cm on the trunk and extremities with Mohs micrographic surgery. | American Academy of Dermatology |
| A routine bone scan is unnecessary in men with low-risk prostate cancer. | American Urological Association |

| TREATMENT |
| --- |
| **RECOMMENDATION** |
| Do not use cancer-directed therapy for patients with solid tumors with the following characteristics: low performance status (3 or 4), no benefit from prior evidence-based interventions, not eligible for a clinical trial, and no strong evidence supporting the clinical value of further anticancer treatment. | American Society of Clinical Oncology |
| Do not use white cell-stimulating factors for primary prevention of febrile neutropenia for patients with a <20% risk of this complication. | American Society of Clinical Oncology |
| Do not give patients initiating a chemotherapy regimen that has a low or moderate risk of causing nausea and vomiting antiemetic drugs intended for use with a regimen that has a high risk of causing nausea and vomiting. | American Society of Clinical Oncology |
### TABLE 5. Continued

| TREATMENT | RECOMMENDATION | ORGANIZATION |
|-----------|----------------|--------------|
| Do not use combination chemotherapy (multiple drugs) instead of chemotherapy with one drug when treating an individual for metastatic breast cancer unless the patient needs a rapid response to relieve tumor-related symptoms. | American Society of Clinical Oncology |
| Do not use a targeted therapy intended for use against a specific genetic aberration unless a patient’s tumor cells have a specific biomarker that predicts an effective response to the targeted therapy. | American Society of Clinical Oncology |
| Do not perform axillary lymph node dissection for patients with clinical stages I and II breast cancer with clinically negative lymph nodes without attempting sentinel lymph node biopsy. | American College of Surgeons |
| Do not use surgery as the initial treatment without considering presurgical (neoadjuvant) systemic and/or radiation for cancer types and stage in which it is effective at improving local cancer control, quality of life, or survival. | American College of Surgeons Commission on Cancer |
| Do not initiate cancer treatment without defining the extent of the cancer (through clinical staging) and discussing with the patient the intent of treatment. | American College of Surgeons Commission on Cancer |
| Do not initiate whole-breast radiotherapy as a part of breast-conserving therapy in women age ≥50 y with early-stage, invasive breast cancer without considering shorter treatment schedules. | American Society of Radiation Oncology |
| Do not initiate management of low-risk prostate cancer without discussing active surveillance. | American Society of Radiation Oncology |
| Do not routinely recommend proton beam therapy for prostate cancer outside of a prospective clinical trial or registry. | American Society of Radiation Oncology |
| Do not routinely use IMRT to deliver whole-breast radiotherapy as part of breast-conserving therapy. | American Society of Radiation Oncology |

### SURVIVORSHIP

| RECOMMENDATION | ORGANIZATION |
|----------------|--------------|
| Do not perform surveillance testing (biomarkers) or imaging (PET, CT, and radionuclide bone scans) for asymptomatic individuals who have been treated for breast cancer with curative intent. | American Society of Clinical Oncology |
| Avoid using PET or PET-CT scanning as part of routine follow-up care to monitor for a cancer recurrence in asymptomatic patients who have finished initial treatment to eliminate the cancer unless there is high-level evidence that such imaging will change the outcome. | American Society of Clinical Oncology |
| Do not initiate surveillance testing after cancer treatment without providing the patient with a survivorship care plan. | American College of Surgeons Commission on Cancer |
| Do not perform Pap tests for the surveillance of women with a history of endometrial cancer. | Society of Gynecologic Oncology |
| Avoid routine imaging for cancer surveillance in women with gynecologic cancer, specifically ovarian, endometrial, cervical, vulvar, and vaginal cancer. | Society of Gynecologic Oncology |

### PALLIATIVE CARE

| RECOMMENDATION | ORGANIZATION |
|----------------|--------------|
| Do not delay basic-level palliative care for women with advanced or recurrent gynecologic cancer and, when appropriate, refer to specialty-level palliative medicine. | Society of Gynecologic Oncology |
| Do not routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases. | American Society of Radiation Oncology |
| Do not delay palliative care for a patient with serious illness who has physical, psychological, social, or spiritual distress because they are pursuing disease-directed treatment. | American Academy of Hospice and Palliative Medicine |
| Do not recommend more than a single fraction of palliative radiation for an uncomplicated painful bone metastasis. | American Academy of Hospice and Palliative Medicine |
| Do not delay engaging available palliative and hospice care services in the emergency department for patients likely to benefit. | American College of Emergency Physicians |

PSA indicates prostate-specific antigen; Pap, Papanicolaou; HPV, human papillomavirus; CT, computed tomography; PET, positron emission tomography; NSCLC, non-small cell lung cancer; IMRT, intensity-modulated radiotherapy. NOTE: Based on review of cancer-related recommendations on Choosing Wisely (choosingwisely.org), conducted in May 2014. List may not be comprehensive.
the best available evidence and aligns with their patients’ needs, values, and preferences.

Numerous professional organizations across medical specialties provide recommendations throughout the cancer continuum (Table 4). The Choosing Wisely campaign, initiated by the American Board of Internal Medicine Foundation, has recently released recommendations from greater than 50 organizations (choosingwisely.org/doctor-patient-lists). Although most cancer recommendations were made by oncology organizations, numerous nononcology-based recommendations have also been released by other organizations (Table 5).48 For example, in cancer screening, a number of organizations have focused on risk-based screening, and advised against the screening of older patients with a limited life expectancy as well as against ovarian and lung cancer screening for patients at average or low risk. At the time of diagnosis, the organizations have advised against initiating a metastatic workup/staging among patients at low risk, such as those with early-stage breast cancer, prostate cancer, and melanoma. During treatment, organizations have advised against aggressive or multimodal anticancer treatment plans when that approach may not provide additional benefit to the patient. Among cancer survivors, organizations have recommended that asymptomatic patients should not undergo unnecessary surveillance testing for metastases (eg, women with a history of breast cancer and/or men with a history of prostate cancer). Recommendations addressing palliative or end-of-life care have universally focused on not delaying discussions related to advance care planning.

Continuous Quality Assessment and Improvement
The IOM recommended that professional societies develop the digital infrastructure and analytics necessary for a learning health care system in cancer that enables real-time analysis of data from patients in a variety of care settings. Such a system would allow for the collection and analysis of care outcomes and costs from electronic health records, facilitate the implementation of any knowledge gained from these analyses into clinical practice, and provide an evaluation of any improvements in outcomes that result from changes in practice. The success of a learning health care system will depend on clinician contribution of patient data and clinician participation in quality improvement initiatives. Currently, ASCO is developing CancerLinQ, which will be a learning health care system for oncology practices.49 It is expected to be fully functional in 2015 and will allow participating practices to share data stored in their patients’ electronic health records with ASCO for quality improvement purposes.

A component of achieving a learning health care system is better-quality metrics. Thus, the IOM also recommended that all stakeholders work together to develop a national quality reporting program for cancer care as part of this learning health care system. This will require the development of new quality measures that focus on outcome measures, as well as a reporting infrastructure that improves transparency around the quality of cancer care. This could be done through existing quality metrics programs such as ASCO’s Quality Oncology Practice Initiative (QOPI), the American College of Surgeons Commission on Cancer’s National Cancer Data Base (facs.org/quality-programs/cancer/ncdb), the American College of Surgeons National Surgical Quality Improvement Program (site.acsnqip.org), and the American Medical Association’s Physician Consortium for Performance Improvement (ama-assn.org/ama/pub/physician-resources/physician-consortium-performance-improvement.page).50

For example, QOPI includes over 160 measures relevant to outpatient cancer care and is being expanded to include radiation oncology, palliative care, and patient-reported outcomes. Practices participating in QOPI retrospectively extract data from their medical charts. ASCO then reviews these data and provides practices with a quality assessment report. These reports are intended to be used a practice for self-examination, such as how concordant its care is with existing clinical practice guidelines, and to target its quality improvement initiatives. These initiatives have the potential to quickly evaluate medical practices and provide feedback on quality improvement.

Conclusions
In summary, the IOM has laid out a guiding framework for improving the quality of cancer care in the United States. It recognizes that changes are urgently needed across the board and that multiple stakeholders will need to work together to develop a high-quality cancer care delivery system. This article highlights the actions that the IOM recommends that clinicians can continue or start taking in their practices to improve the quality of life and outcomes for patients with cancer. Implementation of the recommendations will require better patient-clinician communication, improved care coordination, targeted clinician training, effective dissemination of evidence-based guidelines and strategies for eliminating waste, and continuous quality assessment and improvement efforts. ■
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