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# Physician, Patient, and Contextual Factors Affecting Treatment Decisions in Older Adults With Cancer and Models of Decision Making: A Literature Review

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**D**ecision making has been defined as the cognitive process of reaching a decision (Yates, 1990). Often, it involves balancing the risks and benefits among multiple options. In geriatric oncology, balancing risks and benefits generally is difficult because of the lack of data on survival and quality of life (Bennahum, Forman, Vellas, & Albarede, 1997; Repetto, Comandini, & Mammoliti, 2001). In addition, older patients with cancer have among the lowest health literacy and numeracy rates and often suffer from poor physician-patient communication (Amalraj, Starkweather, Nguyen, & Naeim, 2009). Those deficiencies could lead to poor understanding and judgment concerning treatment risk and benefit. The knowledge level of the decision maker, quality of the available options, and potential consequences of a decision also affect the process of treatment decision making. Yates (1990), a cognitive psychologist, defined *decision* as a commitment to a course of action that is intended to produce a satisfying state of affairs (Yates, Veinott, & Patalano, 2003). For the purpose of this article, treatment decision making in older adults with cancer refers to a complex, multidimensional cognitive process of making a decision regarding cancer treatment options.

The treatment decision-making process in older adults with cancer is not understood clearly, in part because of the limited number of studies that systematically examined the internal (patient-related) and external (physician or system) factors that influence the decision-making process. This unclear understanding of treatment decision making is true particularly for older adults, who are underrepresented in cancer clinical trials (Di Maio & Perrone, 2003). In addition, older patients present with gerontologic issues such

**Purpose/Objectives:** To review physician, patient, and contextual factors that affect treatment decision making in older adults diagnosed with cancer, and to relate those factors to theoretical models of decision making.

**Data Sources:** PubMed (1966 to April 2010), PsycINFO (1967 to April 2010) and CINAHL<sup>®</sup> (1982 to April 2010) databases were searched to access relevant medical, psychological, and nursing literature.

**Data Synthesis:** Physician factors in treatment decisions included physician's personal beliefs and values, medical expertise, practice type, perception of lowered life expectancy, medical factors, power, and communication style. Patient factors included personal beliefs and values, ethnicity, decisional control preferences, previous health-related experience, perception of the decision-making process, and personal factors. Contextual factors included availability of caregiver, insurance, financial status, and geographical barrier.

**Conclusions:** A diverse group of factors were identified, which are likely to form a unique framework to understand clinical decision making and plan future investigations in older adult patient populations. Using longitudinal and prospective designs to examine the real-time interplay of patient, physician, and contextual factors will enable a better understanding of how those divergent factors influence actual treatment decisions.

**Implications for Nursing:** Oncology nurses can advocate autonomous (patient-driven), shared, or family-controlled treatment decisions, depending on an older patient's decisional role preference. Nurses can support patient autonomy during treatment decision making by coaching patients to engage in discussion of various evidence-based treatment options and a comprehensive discussion of the probability of success for each option with specialist providers. Oncology nurses may be able to promote treatment decisions that are consistent with a patient's personal preferences and values, with strong consideration of the patient's personal contexts.

as multiple comorbidities, frailty, and polypharmacy, which can further complicate treatment decision making (Tabloski, 2006). Nurses interact with patients frequently and often are asked by patients about treatment options. A better understanding of the various factors influencing treatment decisions can equip oncology nurses with the information needed to effectively support patients throughout the decision-making process.

This article has three aims. First, the different theoretical models or frameworks of decision making will be discussed. Second, physician, patient, and contextual factors that affect treatment decision making in older patients with cancer will be reviewed in relation to the different theoretical models of decision making. Finally, nursing practice implications related to cancer treatment decision-making will be identified.

## Methods

A systematic review of the research literature was performed to identify studies that examined patient, physician, and contextual factors influencing treatment decisions in older adults with cancer. PubMed (1966 to April 2010), PsycINFO (1967 to April 2010) and CINAHL® (1982 to April 2010) databases were searched to access relevant medical, psychological, and nursing literature. The medical subject heading terms used during the search were *decision making*, *shared decision making*, *patient participation*, *geriatrics*, *hematology*, and *medical oncology*. The searches were limited to English-language articles concerning older adults aged 65 years or older. Two-hundred thirteen articles initially were retrieved, and related abstracts were individually reviewed for any report of patient, physician, and contextual factors affecting cancer treatment decisions in older adults. If one of those factors was reported, full-text copies of the articles then were retrieved and reviewed completely. Of the 213 articles, 80 full-text articles were retrieved and included in this literature review.

## Theoretical Models or Frameworks of Decision Making

Treatment decision making typically happens within the context of the physician-patient relationship. Because of this relationship, several models of decision making have been proposed in the clinical literature based on the various rights and roles of both parties in information gathering and exchange and, ultimately, in making the treatment decision. Table 1 outlines a summary of the different models or frameworks of decision making and their applications in health care.

The models often have provided the conceptual foundation for studies on factors relevant to decision making; therefore, a brief description of the models (or assumptions) that inform the relationships among

factors and treatment decision-making outcomes is presented. In addition, the models provide some explanation for the relationships of various factors in decision making.

“The doctor knows best” is the rubric of the paternalistic model. The patient is in a passive, dependent role, and the physician is the expert. Patient involvement is limited to providing consent to the treatment advocated by the physician (McKinstry, 1992; Wilson, 1986). In this model, physicians exert control over information and treatment decision making, and the patient simply complies with the doctor’s orders. This model is used widely by physicians during emergency conditions. However, the approach has been criticized by medical ethicists who espouse the patient’s autonomy as a fundamental right of an individual (Wilson, 1986) and by clinicians who emphasize that even the irrational choices of a competent patient must be respected if the patient cannot be persuaded to change them (Brock & Wartman, 1990).

In the informative model, the patient is in an active, autonomous role; the physician’s treatment preferences for the patient do not enter into the decision-making process. However, the physician still provides the patient with all relevant information to select an option (Emanuel & Emanuel, 1992). An important premise of this model is the assumption that information is an enabling strategy, empowering the patient to become a more autonomous decision maker (Charles, Gafni, & Whelan, 1997).

The doctor-as-agent model describes the physician as an agent helping the patient choose a treatment option that the patient would have chosen if he or she had been as well-informed as the professional (Charles et al., 1997; Charles, Gafni, & Whelan, 1999; McKinstry, 1992). Charles et al. (1999) described this model as the alternate side of the informative model of treatment decision making. Ultimately, the physician makes the treatment decision for the patient, assuming patient preferences have been elicited and are known.

The shared decision-making (SDM) model involves a two-way exchange of information, as well as treatment preferences. Charles et al. (1997, 1999) identified the following important criteria of SDM.

- Two participants—the physician and patient—are involved in the treatment decision making.
- The physician and patient take steps to participate in the process of treatment decision making by expressing treatment preferences.
- Information is exchanged between the physician and patient.
- Both parties agree on the treatment to implement.

This model evolved largely because of forces within and outside the medical profession that have challenged the paternalistic approach during the past several decades (Brock & Wartman, 1990). One important force has been

**Table 1. Summary of Decision-Making Models and Frameworks**

Model or Framework	Main Tenet	Applications
Behavioral decision making (Tversky & Kahneman, 1981)	Variations in the decision frames and vagaries in the values individuals place on different choices can cause predictable shifts of preference that are not rational.	The way physicians frame a decision problem to a patient could affect the patient's preference. This is demonstrated when the benefits of a treatment are emphasized overtly and the risks are downplayed.
Coherent likelihood judgments (Yates, 1990)	Adheres to principles of probability theory that include unity summation, generalized disjunction principle, extension principle, conjunction rule (joint and marginal probabilities), general product rule, independence product rule, and Baye's rule	The theory is best demonstrated when two cancer therapies are compared in a randomized, controlled trial and a treatment is chosen based on the superior outcome of one therapy over the other in terms of survival benefit or improvement in quality of life.
Communication model of shared decision making (SDM) (Siminoff & Step, 2005)	Explicitly identifies the communication process as a vehicle for decision making in cancer treatment	Applicable in all types of treatment decision making in patients diagnosed with cancer Needs empirical testing of the model in actual clinical encounters
Conflict theory model of decision making (Janis & Mann, 1977)	Posits decisional conflicts as sources of stress and describes five basic coping patterns of decision making: unconflicted adherence, unconflicted change, defensive avoidance, hypervigilance, and vigilance	Highly applicable to all consequential decision-making processes, particularly during emergency conditions
Decisional model of stress and coping (Balneaves & Long, 1999; Janis & Mann, 1977; Lazarus & Folkman, 1984)	Decision conflict occurs when a choice of options is personal, transactional, and relational in nature.	The model has been tested empirically in women with breast cancer.
Decision support framework (DSF) (O'Connor et al., 1998)	The three stages are (a) assessment of patient and physician determinants of decisions, (b) delivery of decision support interventions that address the determinants of decisions and preparation of patient and the physician for decision making through a structured follow-up interaction, and (c) evaluation of the decision, support, and its success in improving the quality of the decision-making process, decision, and outcomes of the decision.	Highly applicable in decision-making conditions in which time is ample to deliberate on choices and involve the use of decisional aids The DSF is less useful for decisions with no immediate stimulus for deliberation; when the decision's key challenge is implementing and maintaining the decisions; and when decisions are rapid, repetitive, automatic, impulsive, or deferential to authority.
Doctor as agent (McKinstry, 1992)	Physician provides complete information, elicits a patient preference, and makes decision based on a patient's preference.	Applicable in situations when a patient expresses his or her desires, wants, and values, but leaves the final decision making to the physician
Family centered (Hyun, 2003; Schafer et al., 2006)	A patient prefers that his or her family handles medical decision matters.	The framework of decision making is commonly seen in Asian American and Latino patient populations.
Heuristic-systematic processing model (Chaiken, 1980; Chaiken & Maheswaran, 1994)	Involves heuristic processing and systematic processing in arriving to a decision	Applicable in patients with prostate cancer who were found to use expert opinion heuristics because of decisional uncertainty and systematic information processing to cope with the diagnosis.
Informative (Emanuel & Emanuel, 1992)	Physician provides complete information to help a patient discern what is best for him or her.	Applicable during patient participation in randomized, clinical trials Best demonstrated when a patient signs an informed consent before receiving any treatment (e.g., stem cell transplantation)
Integrative model of SDM (Makoul & Clayman, 2006)	Combines the essential elements (e.g., define or explain problem; present options; discuss benefits, risks, or costs), ideal elements (e.g., unbiased information, define desire for involvement, present evidence, mutual agreement), and general qualities (e.g., deliberation or negotiation, individualized approach, information exchange) of SDM.	Highly applicable in all types of medical decision making; however, empirical testing of this model has not been reported.

*(Continued on the next page)*

**Table 1. Summary of Decision-Making Models and Frameworks (Continued)**

Model or Framework	Main Tenet	Applications
Naturalistic (Zsombok, 1997)	Decisions are made in an uncertain and constantly changing environment based on different personal and situational factors.	Highly applicable in patients with newly diagnosed prostate or breast cancer, for whom personal factors were found to be influential in the treatment decision process.
Normative theory (Hansson, 2005)	Decisions are made relative to a clearly recognized probability of benefits and consequences from all possible options.	Increasing applicability in oncology treatment decisions as reflected by the rising number of cost-effectiveness analyses comparing one cancer treatment option to others, largely driven by limited resources in health care.
Paternalistic (Emanuel & Emanuel, 1992; McKinstry, 1992)	Physician selects information and decides treatments.	Highly applicable in medical emergency situations Criticized by bioethicists because of lack of respect for patient autonomy Still pervasive in some countries, particularly in Asian and some European countries
Patterns of decision making (Degner & Beaton, 1987)	The framework includes four major patterns of decision making: physician controlled, patient controlled, jointly controlled, and family controlled.	Highly applicable in populations of patients with cancer in which huge variations in patient level of participation in decision making are well documented
Prospect theory (Kahneman & Tversky, 1979)	Describes how (a) individuals regularly assess potential losses and gains and (b) the framing of outcomes influences the preferences of the decision maker	Prospect theory has controversial applicability in cancer treatment decision making, particularly when monetary gains or losses are considered because of the argument that no one should decide about cancer treatments based on monetary values. Putting a monetary value on someone's life poses a major ethical debate.
SDM (Charles et al., 1997, 1999)	Involves two-way information exchange, deliberation between physician and patient, and joint decision making on treatment to implement, with emphasis on respecting individual differences in patient preferences	Highly applicable in situations when clinical uncertainty exists Examples include treatment decision making in patients with newly diagnosed localized prostate cancer, in which treatment options have different risks and associated uncertainty. In a qualitative study sampling patients with prostate cancer and their physicians, Berry et al. (2006) documented four distinct physician roles during treatment decision making (expert, educator, navigator, and partner), which are reflective of the principles of the SDM model.
Social decision theory (Hansson, 2005)	Combining individual choices into collective decisions	Limited applicability in individual healthcare decision making, except at the policy level involving a specific patient population In countries with national health insurance, social decision theory guides the policy maker's decision on what treatment to cover or deny and at what cost.

the increasing number of treatment options for a particular disease with different risk-benefit tradeoffs, as seen in patients with cancer (Charles et al., 1999; Gilbar & Gilbar, 2009).

Several modifications of SDM have been proposed, including the integrative and communication models. The integrative model of SDM combines the essential elements, ideal elements, and general qualities of SDM that were derived from the extant literature (Makoul & Clayman, 2006), whereas the communication model highlights the role of the communication climate during

physician-patient interactions (Siminoff & Step, 2005). A major limitation of the two modifications is the lack of empirical support. For example, the role of the communication climate during shared decision making and how it affects a patient's level of participation have not been studied systematically. In addition, valid and reliable instruments to measure the constructs of those two models have not been developed and tested.

The family-centered model resulted from the concept of family as a surrogate in decision making, with the patient's acceptance (Hyun, 2003). The main tenet of

the model is that physicians ask patients whether they wish to receive information and participate in decision making or whether they prefer their families to handle such matters. Family-centered decisions are made when patients select the latter (Back & Huak, 2005; Freedman, 1993; Schafer et al., 2006).

Degner and Beaton (1987) identified four patterns of decision making: physician controlled, patient controlled, jointly controlled, and family controlled. This seminal framework of decisional role patterns was developed based on a four-year qualitative study of patients' decision-making roles in life-threatening situations, such as cancer. A physician-controlled pattern emerges when patients refuse to become involved in selecting their own treatment, even when urged to do so by the physician. However, a patient-controlled pattern occurs when patients expound that their lives and their bodies are at stake and they will make their own treatment choices. When patients indicate a need to discuss the available options with their physician and ask for an opportunity to think about it before making the final treatment decision with the physician on succeeding visits, a jointly-controlled decision-making pattern occurs. When patients are incapable of making treatment decisions and the family decides instead, a family-controlled pattern emerges (Degner & Beaton, 1987). The patterns of decision making described by Degner and Beaton (1987) overlap with the paternalistic, shared, and informed models of decision making described previously.

O'Connor et al. (1998) developed the decision support framework based on expectancy value, decisional conflict, and social support theories. The framework can serve as a guide for developing decision-support interventions. The first stage of the framework is the assessment of patient and physician determinants of decisions, which include sociodemographic and clinical characteristics, patients' and significant others' perceptions of the decisions, and the resources needed to make the decision. Once the first stage is completed, decision-support interventions (second stage), which address the determinants of decisions, can be delivered. The second stage also includes the preparation of the patient and physician for decision making with a structured follow-up interaction. The third stage involves evaluation of the decision support and its success in improving the quality of the decision-making process, decisions, and outcomes of the decision (O'Connor et al., 1998).

The decisional model of stress and coping postulates that decision conflict occurs when a choice of options is personal, transactional, and relational in nature. Examples include decisions that are influenced by values, beliefs, goals, commitments, and environmental variables (Balneaves & Long, 1999). This model is based on the conflict theory model of decision making (Janis &

Mann, 1977) and transactional framework of stress and coping (Lazarus & Folkman, 1984).

## Decision-Making Models Outside Health Care

Researchers in several other fields, including psychology, sociology, and economics, have examined how people make decisions about risks, benefits, and probabilities. Many relevant theories exist, but only the most notable will be discussed.

The conflict theory model of decision making (Janis & Mann, 1977) is a descriptive theory from psychology that depicts decision making as a stressful process and describes how people cope with vital decisions. The premise of this model includes five basic patterns of decision making: unconflicted adherence, unconflicted change, defensive avoidance, hypervigilance, and vigilance. Unconflicted adherence occurs when the decision maker ignores the need to make a decision and continues with the current course of action. When a decision maker accepts one choice from a set of choices without serious deliberation, an unconflicted change pattern emerges. Defensive avoidance happens when the decision maker avoids making a decision by delaying it or by shifting the responsibility to others. Hypervigilance occurs when the decision maker searches for a decision and acts hastily without full deliberation. In contrast to hypervigilance, a vigilance pattern appears when the decision maker evaluates choices before making a decision (Janis & Mann, 1977).

The normative theory of decision making is a major approach to decision making by physicians, often referred to as classical decision-making theory. The theory concerns how decisions should be made and ascribes to the prerequisites of rational decision making (Hansson, 2005). The normative theory is rooted in expected utility theory from economics, in which a rational decision maker chooses the option that offers the highest expected utility. According to the normative theory, decisions are made relative to a clearly recognized probability of benefits and consequences from all possible options. The theory is highly prescriptive; as a result, a major critique is that it often fails to mirror decision making in the real world, particularly in accounting for patients' preferences (Siminoff & Step, 2005).

The behavioral decision-making model accounts for the deviation of decision makers from the normative model. The model posits that the decision frame, which refers to the decision maker's conception of the acts, outcomes, and contingencies associated with a particular choice, has a significant effect on the behavior of a rational decision maker (Tversky & Kahneman, 1981). This landmark work from psychology demonstrated that rational decision makers deviate from principles of the normative model, in part, because of cognitive bias perceived by individuals in those contingencies and outcomes (Tversky & Kahneman, 1981).

The development of an adequate theory of human likelihood judgment has been the goal of judgment psychology (Yates, 1990). Psychologists have taken probability theory as a starting point in the search for a simple but sufficient theory that explains how people make judgments. A major interest in the field of judgment psychology is the study of coherent likelihood judgments. Those judgments are embedded deeply in the principles of coherence, which are tightly linked to the principles of probability theory. Coherent likelihood judgments are believed to be made when decision makers do not violate the principles of probability theory, which include unity summation, generalized disjunction principle, extension principle, conjunction rule (joint and marginal probabilities), general product rule, independence product rule, and Baye's rule (Yates, 1990). When an individual's judgment is *not* coherent, it implies that some aspects of judgment likely are inaccurate, with possible severe repercussions in terms of the outcomes of the decision.

The naturalistic model from cognitive psychology posits that decisions are made in an uncertain and constantly changing environment, based on different personal and situational factors (Zsombok, 1997). The model emphasizes three important factors of decision making: the decision maker's knowledge and experience, the level of complexity of a decision problem, and environmental variables. The naturalistic model is highly descriptive rather than prescriptive and, therefore, rooted in descriptive decision theory, which addresses how decisions are actually made (Hansson, 2005).

The heuristic-systematic processing model of decision making (Steginga & Occhipinti, 2004) allows the examination of patient decision making from systematic and nonsystematic (heuristic) decision processes. The model encompasses two broad information processing strategies: heuristic processing and systematic processing. Heuristic processing is a relatively effortless way of processing information that relies on schemas, stereotypes, prior knowledge, or expectancies, whereas systematic processing involves a more analytic and purposeful gathering of information and examination of thoughts and feelings to arrive at a decision (Chaiken, 1980). Additional work on the model revealed that heuristic processing can bias systematic processing when evidence is ambiguous (Chaiken & Maheswaran, 1994).

Several other models of decision making in the literature include prospect theory and social decision theory. Prospect theory (Kahneman & Tversky, 1979) from the field of psychology involves regular evaluation in which the decision maker (patient or physician) assesses gains and losses relative to a movable reference point depending on the perspective of the decision maker. Social decision theory from sociology largely is applicable to group decisions such as voting, bargaining, and other methods of combining individual choices into collective decisions

(Hansson, 2005). Social decision theory has limited applicability in cancer treatment decision making.

## Physician-Centered Factors That Affect Cancer Treatment Decision Making

Physician-centered factors are defined conceptually as those aspects of the physicians' lives and contexts, both personal and professional, that influence how they make treatment recommendations and decisions. The factors include physician's beliefs and values, medical expertise and practice type, physician's perception of older adult's life expectancy, medical factors, and power.

**Physician's beliefs and values:** The physician's personal belief that he or she should have the dominant role in decision making can have a significant effect on physician-patient interaction during the decision-making process and also can influence its outcome (Beisecker, 1994). One systematic review of research on treatment outcomes in older women with cancer found that this factor played an important role in the undertreatment of older women with breast and ovarian cancers (Bouchardy, Rapiti, Blagojevic, Vlastos, & Vlastos, 2007). Those authors evaluated the importance of substandard treatments and their effect on outcomes in women older than 65 years. The review included 32 studies on breast cancer treatment outcomes, 18 on ovarian cancer, 7 on cervical cancer, 4 on endometrial cancer, and 4 on vulvar cancer. Some studies had a small number of participants (fewer than 100), but some had more than 20,000. The undertreated older women with breast and gynecologic cancers had significantly decreased prognosis. Overall, the systematic review raised concerns about older women with breast and gynecologic cancers being undertreated as a result of physicians' beliefs that those patients have lowered life expectancy because of older age and comorbidities. That study must be interpreted with caution, given current trends in clinical practice toward shared decision making, exemplified by an agreement among all physician participants that cancer treatment decisions should be the outcome of a shared process (Pieterse, Baas-Thijssen, Marijnen, & Stiggelbout, 2008).

In an ethnographic study conducted over two unspecified years involving 25 women with breast cancer, Freedman (2002) discovered that physicians' values and ability to choose what is told to the patient and what is withheld are powerful determinants in the medical decision-making process among women with breast cancer. Although the finding was supported by only two illustrative cases mentioned in the study, it underscored the importance of full disclosure so patients can make a truly informed decision.

Normative values (e.g., treatment response rates, overall survival data) among physicians also are integral to the decision-making process and outcomes. For example, three studies have found that physicians rank comorbidities and the medical literature as important

factors in treatment decision making (Klepin & Hurd, 2006; Kutner, Vu, Prindiville, & Byers, 2000; Muss, Biganzoli, Sargent, & Aapro, 2007). Those studies involved older men and women with multiple myeloma or breast, colon, and non-small cell lung cancer. However, some important methodologic considerations are relevant to those studies' findings. For example, in Kutner et al.'s (2000) study, patients were contacted only with physician permission, which introduced a selection bias resulting in the omission of 57% of potentially eligible patients.

Some oncologists place a high value on any improvements in survival compared to their patients, who value quality of life. Ravdin, Siminoff, and Harvey (1998) surveyed members of the National Alliance of Breast Cancer Organizations, and 562 individual members responded. Of those, 318 women (57% response rate) had a median age of 49. Most of the participants were Caucasian, had some college education, and received adjuvant chemotherapy. When asked what degree of absolute benefit they would have found acceptable for a treatment option, participants' median acceptable extension of life expectancy was three to six months. The researchers noted considerable variability in the data, with 27% of women not accepting less than one year and 26% not accepting less than a 5% reduction in recurrence risk. Most limitations of the study included problems with participant recall and limited generalizability because of the characteristics of the sample, which comprised mostly Caucasian women who were active in breast cancer organizations, younger, and better educated compared to overall demographic trends in woman with breast cancer.

A study by O'Toole, Step, Engelhardt, Lewis, and Rose (2009) showed that oncologists have various perspectives on how involved primary care physicians (PCPs) should be in terms of treatment and procedure-related decisions for older adults with cancer. For decisions about treatments or procedures, 14% of the oncologists believed that PCPs should be more involved. In addition, O'Toole et al. (2009) found variability in oncologists' report on the frequency of communication with PCPs about goals or treatment decision making. This variability indicated that the oncologists had different preferences for PCPs' participation in treatment or procedure-related decision making. The paternalistic and shared decision-making models explicate the varied physician's decisional preferences for PCP participation in decision making.

**Medical expertise and practice type:** Experience and practice type may, in part, explain variation in treatment choice. In a survey of physicians, Hodgkin disease experts were more likely to tailor therapy according to individual patient factors, whereas decisions of non-expert physicians were influenced by high Hodgkin disease case load. In addition, academic physicians were more likely to choose combined modality therapy over

radiation therapy or chemotherapy alone (Ng et al., 2004). Those findings were based on survey responses from 81 Hodgkin disease experts and 73 randomly selected physicians from American Society for Therapeutic Radiology and Oncology and American Society of Clinical Oncology membership lists. The overall survey response rate was 50% (58% among Hodgkin disease experts and 43% for randomly selected oncologists). Of note, 92% of Hodgkin disease experts were in academic practice settings, which typically follow established treatment guidelines for Hodgkin disease such as combined modality therapy. The major limitations of the study included the limited amount of treatment choices provided to the respondents and inadequate data on individual contextual factors that could have influenced the physicians' treatment choices.

The findings of a national survey documented that urologists tended to favor surgery in managing patients with localized prostate cancer, whereas radiation oncologists tended to favor radiation therapy over surgery (Fowler et al., 2000). In an international survey, gastroenterologists tended to favor surgery for the management of gastric lymphoma, whereas hematologists and oncologists tended to favor conservative therapy (de Jong, Aleman, Taal, & Boot, 1999). The doctor-as-agent decision-making model provides a useful framework to explicate some of the treatment choices that are influenced by the physician's expertise.

**Physician's perception of older adults' life expectancy:** In the absence of cure, which is the case in many diagnoses of cancer, life expectancy and quality of life are two major factors in treatment decision making (Repetto et al., 2001). Unfortunately, the physician's perception of older patients' short, natural life expectancy has led to decreased adjuvant chemotherapy use among older adults diagnosed with stage III colon, breast, and non-small cell lung cancers (Muss et al., 2007; Schrag, Cramer, Bach, & Begg, 2001). In a retrospective cohort study using the Surveillance, Epidemiology, and End Results–Medicare Linked Database, researchers found that physicians used implicit judgments about age to decide whether or not to use adjuvant chemotherapy after surgery for stage III colon cancer (Schrag et al., 2001) and breast cancer (Hurria et al., 2003). Schrag et al. (2001) reviewed the record of 6,262 Medicare beneficiaries diagnosed with stage III colon cancer from 1991–1996. Study participants were 84% Caucasian, 7% African American, and 9% other races, aged 65–90 years (mean age not reported), and 24% were in the bottom quartile of the median income in the census tract of residence. Schrag et al. (2001) found that the use of adjuvant chemotherapy after surgery declined dramatically with increasing chronologic age after adjustment for potential confounders such as comorbidities. Among 3,391 patients with no comorbidities, the use of adjuvant chemotherapy was 80% for patients aged 65–69 years, 64% for those aged 75–79 years, and 13%

for those aged 85–89 years. The findings were consistent with a prospective study of patients with colorectal cancer, which revealed that a smaller proportion of patients older than 75 years received surgery with chemotherapy compared to those younger than 75 (Bailey et al., 2003). The researchers suggested that older patients should have received adjuvant therapy because patients aged 70–80 years continue to have a reasonable life expectancy (Bailey et al., 2003). However, because of the retrospective nature of the study, accounting for nonmedical barriers such as financial and caregiver issues was difficult. Schrag et al. (2001) demonstrated that physicians' beliefs and attitudes may explain the low use of adjuvant chemotherapy among older adults with colon cancer.

A retrospective study examining the factors that influenced treatment decisions in older patients with breast cancer at a single center found similar underuse of treatments in this patient population. Hurria et al. (2003) reviewed records of 216 patients at Memorial Sloan-Kettering Cancer Center, stratified into two age groups. They found treatment differences in women with breast cancer aged 75–79 years compared to patients aged 80 years or older. Patients in the older age group were less likely to receive an axillary lymph node dissection and radiation therapy. The major limitation of the study was the lack of data on nonmedical factors that might have influenced a patient's preference for not receiving therapy. In addition, the number of patients included in the record review was modest. The study was limited by data from one diagnosis at a single institution. Differences in the treatment patterns for older patients with cancer may be higher in other geographic locations.

**Medical factors:** Tumor type, cytogenetic profile, age-related physiologic decline, and other illnesses influence treatment decisions (Klepin & Hurd, 2006; Kutner et al., 2000). Specifically, chemotherapy is of greatest value in older adults with node-positive, estrogen receptor-negative, and progesterone receptor-negative breast cancer (Giordano, Duan, Kuo, Hortobagyi, & Goodwin, 2006; Muss et al., 2007). Chemotherapy decisions among older patients with cancer involve adjustment of the dose to renal function, prophylactic use of growth factors, maintenance of hemoglobin levels near 12 g/dl, and proper drug selection based on age-related pharmacokinetics (Balducci, 2006). The normative and coherent likelihood judgment models provide reasonable frameworks for decision making when physicians' treatment choices are made based on rational decisions, such as using clinical trial data in the treatment decision-making process.

**Power:** Power relationships may have a significant effect on treatment choice. The framing of a decision problem and the individual who frames that problem for the decision maker may have a significant influence on how the information is processed and used by the decision maker (Tversky & Kahneman, 1981). Unequal power relations in treatment decision making are well

documented in qualitative studies of men and women with cancer. For example, in a study of 21 women with ovarian cancer aged 47–77 years ( $\bar{X}$  = 60.6 years), participants perceived that the physician largely directed the interaction during the medical encounter, and some perceived that no treatment choices were offered except for one treatment versus no treatment (Elit et al., 2003).

Men with newly diagnosed localized prostate cancer (LPC) also have reported that the decision-making process is physician led, with themselves being passive recipients. Cohen and Britten (2003) interviewed 19 men with LPC aged 58–88 years ( $\bar{X}$  = 74.4 years) using a semistructured interview and found that patients perceived that their treatment plans were mostly decided by their clinicians. The major limitation of the study was the lack of participant diversity (18 were Caucasian and only one was African American) and use of a single center site in the United Kingdom, where the healthcare system differs greatly from that in the United States. This perception of physician-led decision making can be explicated largely by the behavioral and paternalistic models of decision making.

**Communication style:** A study of older patients with early-stage breast cancer showed that oncologists were significantly more verbal and more direct with patients who were aged 65 years or older, with a trend toward expressing their own treatment preferences more with older patients (Step, Siminoff, & Rose, 2009). According to Step et al. (2009), older adults considering adjuvant therapy felt that their decision-making involvement may have been challenged by the oncologists' perception of deficiencies in their cognition or communication. Step et al. (2009) warned oncologists to carefully assess patient decision-making preferences and to be mindful of how their own speech reflected biases about older adult cognition. The paternalistic and communication models of decision making relate well with the findings of this study.

### Patient-Centered Factors That Affect Cancer Treatment Decision Making

Patient-centered factors include those aspects of older adults' lives and personal contexts that influence their decisions. Based on the extant literature, the factors include patient beliefs and values, ethnicity, decisional-control preferences, health-related experience, patient perception of the decision-making process, and personal factors.

**Patients' beliefs and values:** Although physicians rank comorbid conditions and the medical literature as important factors in treatment decision making, patients rank family preference, family burden, and physician's opinion as important (Kutner et al., 2000). Those findings were corroborated by Fried, Bradley, Towle, and Allore (2002), who found that older adults with cancer chose their treatment decisions depending on the burden of the treatment, possible outcomes, and likelihood



of adverse functional and cognitive outcomes. Fried et al. (2002) interviewed 200 patients who were aged 60 years or older ( $\bar{X} = 72.8$  years) and had limited life expectancy because of cancer, congestive heart failure, or chronic obstructive disease. Among those 200 patients, 79 had cancer ( $\bar{X} = 71.7$ ) and were interviewed at home about treatment preferences according to three components of therapy: burden imposed, possible outcomes, and likelihood of those outcomes. When the possible outcome was survival with severe functional or cognitive impairment, respondents no longer wanted the therapy (Fried et al., 2002). The study indicated that older adult patients' preferences vary in response to changes in therapy components. The main limitation of Fried et al.'s (2002) study was that it did not capture real-life alternative approaches such as palliative therapies in patients with cancer. In addition, respondents were forced to choose the specific treatment or outcome in the questionnaire.

Quality of life is another important value that older adults have ranked consistently at the top of their priorities (Martin & Roberto, 2006). Among older adults with acute myeloid leukemia or advanced myelodysplastic syndrome ( $N = 42$ ), 97% agreed that quality of life was more important than length of life, regardless of their therapy choice during postdecision interviews (Sekeres et al., 2004). The informative and shared models provide a useful framework for incorporating patients' values and beliefs in treatment decision making to ultimately arrive at a decision that respects a patient's wishes. The Sekeres et al. (2004) study included only patients aged 60–85 years ( $\bar{X} = 71$  years) at a single center; therefore, the generalizability of the findings is limited. The strength of the study is its prospective, longitudinal design, which allowed an examination of issues related to treatment decision making and quality of life.

**Ethnicity:** Korean Americans and Mexican Americans are more likely to believe that the family should make decisions about the use of life support and, therefore, are likely to hold a family-centered model of decision making (Blackhall, Murphy, Frank, Michel, & Azen, 1995). Caucasians value individualistic beliefs (self-reliance, self-responsibility, and control) and are likely to hold an informative or shared model of decision making (Blackhall et al., 1995), whereas Hispanic and African American patients are more likely to value collectivism and to hold a family-centered or paternalistic model of decision making (Friedman, Bowden, & Jones, 2003). Those generalizations should be interpreted with caution because they are based on small studies with participants from a specific geographical location such as urban Southern California (Blackhall et al., 1995), which may differ significantly in terms of personal and cultural values from other geographic regions. Nonetheless, those findings highlight the importance of patients' preferences for being involved with decision making; therefore, patients'

preferences for participation should be elicited during medical encounters, particularly among patients with different ethnic backgrounds. In addition, physicians should raise their sensitivity to differing values when seeing patients from specific ethnic populations.

**Decisional control (role) preferences:** Older adults express a desire for shared decision making, but the variation in their desire to participate in decision making is substantial (Elkin, Kim, Casper, Kissane, & Schrag, 2007; Gaston & Mitchell, 2005; Nease & Brooks, 1995; Robinson & Thomson, 2001). A study by Elkin et al. (2007) of 73 patients aged 70–89 years ( $\bar{X} = 76$  years) and diagnosed with metastatic colorectal cancer reported that 23% preferred a collaborative role, 25% preferred an active role, and 52% preferred a passive role. A major limitation of the study was its small sample, which was almost all Caucasian, non-Hispanic, and well educated. Older age was significantly associated with preference for a passive role. Other studies of patients with cancer also have shown that older and less-educated patients were most likely to prefer passive roles (Deber, Kraetschmer, Urowitz, & Sharpe, 2007; Elkin et al., 2007), whereas younger, more educated women were most likely to prefer participatory decision making (Bruera, Sweeney, Calder, Palmer, & Benisch-Tolley, 2001; Degner et al., 1997; Gaston & Mitchell, 2005; Ryan & Sysko, 2007). Gender may have been a factor in decision-making roles in a study conducted in England involving older men with prostate cancer, aged 58–88 years ( $\bar{X} = 74$  years), in which men took a passive role during a treatment discussion, but later wanted to revisit the decision-making process (Cohen & Britten, 2003). Role preferences also change with time. Butow, Maclean, Dunn, Tattersall, and Boyer (1997) described the dynamic nature of role preferences in that patients' preference for involvement declined when their cancer worsened. Because patients' preferences for participation in decision making vary significantly and are not stable, a need exists to ascertain their decisional role preferences over time rather than make an assumption about their preferred role. Degner and Beaton's (1987) patterns of decision making, as well as the informed and shared models of decision making, offer powerful frameworks for understanding the different role preferences of patients during a serious illness such as cancer.

A study of patients with breast cancer showed that, for all racial and ethnic groups, greater patient involvement in decision making was associated with having a mastectomy (Hawley et al., 2009). In addition, patient attitudes about surgery and the opinions of family and friends also have contributed to surgical choices made by women with breast cancer. The sample was 24% Latina (12% low acculturated, 12% high acculturated), 27% African American, and 49% Caucasian; in addition, 17% had a mastectomy. For each racial or ethnic group, more women who reported a patient-based decision

had a mastectomy than those who reported a shared or surgeon-based decision ( $p = 0.022$  for low-aculturated Latinas;  $p < 0.001$  for other groups). Hawley et al. (2009) demonstrated how patients' decisional control preferences influence actual treatment choice. The shared decision-making model provides a helpful framework for this study.

**Health-related experience:** Previous health-related experiences or familiarity with treatment options can influence treatment choice (Berry et al., 2003; Kelly-Powell, 1997; Mazur & Merz, 1996). The heuristic-systematic model provides some explanation on the influence of previous health-related experience because the model involves the basic principle of knowledge activation for heuristic processing. According to this principle, heuristics are stored in memory and retrieved when they are relevant to the decisions that must be made.

**Patients' perception of decision-making process:** Using hermeneutic approaches, researchers have learned that patients participate in health care when information is provided based on their individual needs, when they receive the knowledge needed, and when decisions are made based on their knowledge and needs (Eldh, Ekman, & Ehnfors, 2006). Those conclusions were drawn from a study that was conducted specifically to explore conditions for participation and nonparticipation in decision making (Eldh et al., 2006). A questionnaire was distributed to 300 inpatients and 600 outpatients in a medium-sized medical center in Sweden. The respondents were aged 29–80 years or older (mean age not reported), with most patients having a symptom or disease for at least one month or more. The study had only a 40% response rate, which could indicate a nonresponse bias. The researchers also encountered nonrelevant responses, which they hypothesized might have been caused by a recent annual survey conducted by the same institution where the research study was conducted. No follow-up on those nonrelevant responses was conducted by Eldh et al. (2006). The major strength of the study was the pilot testing of the questionnaire to 20 outpatient clients, which enhanced the clarity of questions and helped to improve the validity of the questionnaire.

Older women with breast cancer also have reported higher participation in decision making when they have ample time to exchange information and when their family members are included in the decision-making process. Kreling, Figueiredo, Sheppard, & Mandelblatt (2006) conducted a focus group interview with 34 older women with breast cancer from different ethnic backgrounds (29% African American, 53% Caucasian, and 18% Latina) to explore the barriers and promoters of chemotherapy use. Kreling et al. (2006) noted less physician communication, particularly among African American and Latina women, which acted as a barrier

to use of chemotherapy. The generalizability of those findings was limited because the study included only participants in a single area who volunteered for and were mobile enough to attend the focus group session. Mutual respect, confidence, and trust between the physician and the patient are important considerations in increasing patient participation in health care (Eldh et al., 2006).

**Personal factors:** Among men with LPC, personal factors can influence treatment decision making. Personal factors include self-description, potential treatment outcomes, past experience with cancer, and influential individuals, such as a physician they visited or other men who shared their belief, perspective, or characteristics (Berry et al., 2003). Using a grounded theory approach, Berry et al. (2003) were the first to include a systemic description of "who I am and what I do," and "making the best choice for me" as influential aspects of decision making among men with LPC. Those descriptive data were obtained from focus groups and individual interviews of 44 men ( $\bar{X}$  age = 64.8 years,  $SD = 9.3$ ) who were within six months of diagnosis. The exploratory nature of this study and sample characteristics (84% Caucasian, 14% African American, and 2% Asian American) limited the generalizability of the findings but provided a foundation for the researchers' future quantitative work (Berry et al., 2006), in which personal characteristics were predictive of satisfaction with decision making and the actual treatment choice for LPC.

Denberg, Melhado, and Steiner (2006) also found that emotions, misconceptions, and anecdotes influence treatment preferences in patients with LPC. They explored the personal beliefs and attitudes of 20 men, aged 55–80 years ( $\bar{X} = 65$  years), with clinically localized prostate cancer following their first consultation with urologists and before treatments were initiated. Using semistructured interviews and grounded theory, Denberg et al. (2006) analyzed patients' personal views about prostate cancer and treatment options, emotional reactions to the diagnosis, treatment preferences, information sources, and perceptions of interactions. Denberg et al. (2006) concluded that patients' personal factors had an important influence on treatment choice in men with LPC. A major strength of the study was the rigorous process employed to ensure the validity of findings. The process included comparative analyses, discussing divergent coding, resolving differences in interpretation, and iterative analyses to develop synopses of recurrent themes that were applicable to the entire sample. The main limitation was its small sample from a single Veterans Affairs medical center, which differs from the health and socioeconomic resources available to the general population and may have caused response bias. Personal factors were found to influence treatment decision making among men with

LPC; therefore, healthcare providers should promote an informed or shared model of decision making during the medical encounter, particularly when desired by patients.

## Contextual Factors That Affect Cancer Treatment Decision Making

The availability of a caregiver or a family member influences treatment decisions (Kreling et al., 2006) and, to some extent, could lead to disagreement among family members (Schafer et al., 2006; Zhang & Siminoff, 2003). In a cross-sectional survey study that achieved a 64% response rate, 67 patients with colorectal cancer aged 65–92 years ( $\bar{X} = 75.8$  years) ranked family preference, family burden, and traveling for treatment as important factors influencing their treatment decisions (Kutner et al., 2000). A major limitation of the study was that 90% of the respondents were Caucasian, which limited the generalizability of the findings.

When differences in opinions between patients and families arise, a family-centered decision model may help integrate family members who are influential in treatment decisions. Lack of insurance, poor financial status, and geographical barriers are important contextual factors that also can influence treatment choice (Bailey et al., 2003; Mandelblatt, Yabroff, & Kerner, 1999; Schrag et al., 2001). The naturalistic model offers a useful framework in understanding the role of patient context in treatment decision making.

## Discussion

### Models of Decision Making

The models of treatment decision making have emerged from a wide range of decision theories and physician-patient relationships. However, few models have simultaneously accounted for physician and patient factors involved in the treatment decision-making processes and outcomes. Valid and reliable tools that quantitatively measure personal and physician factors as predictor variables of decision-making outcomes are lacking. Kaplan and Frosch (2005) identified the need for studies focusing on the measurement and outcomes of shared decision making. Exploring the interplay between physician and patient factors may provide new insights about the treatment decision-making process in older adults with cancer.

The models of decision making discussed in this review do not account for how all observed treatment decisions were made. Any new model that can explicate all possible cancer treatment decisions would be intricate because of the increasing complexity and vast array of emotional, personal, and social contexts influencing cancer treatment decisions. Although the shared decision-making model is promising, adhering to or advocating

for this particular model is a challenge because of the dynamic nature of cancer treatment decision making. Pierce and Hicks (2001) have acknowledged limitations in the understanding of how various health-related contexts influence decision behavior because of a lack of clinical studies designed to capture those dynamic influences.

Understanding the limitations of existing models of decision making can serve as a starting point when looking for new ways to examine the treatment decision-making process. Yates (1990) has advocated that studies of decision behavior should include specific aims to understand how people make decisions, improve the quality of decisions, and enhance decision-making behavior.

### Physician and Patient Factors

Nurses have frequent interactions with patients and often are asked about their perspectives of the treatment decisions. Expanding the nurses' knowledge and understanding of the various factors influencing treatment decisions may help patients achieve the best possible decision. A variety of physician and patient factors affect treatment decision making. Arguably, the true concern of the physician is to put the patient's interest first before his or her own to make the best possible decision for the patient. However, a physician's true concerns for patients may be overshadowed by his or her own personal self-interest or values. The possibility is supported by research findings included in this review, which suggest that personal preferences are pervasive influencing factors for patients, as well as their physicians. Oncology nurses can help patients effectively put forward their personal values and preferences during decision making.

Each physician or patient brings his or her own personal values and beliefs to the decision-making process, which underscores the importance of providing patients with a communication climate that allows them to express their personal views. Unfortunately, patients with cancer continue to have unmet communication needs (Hack, Degner, & Parker, 2005). Physicians, nurses, and other clinicians should establish open communications during medical encounters to ensure that patients' concerns and wishes are elicited. Systems support (e.g., nurse navigators, libraries, health learning center, computers) also must be in place to provide critical information to patients and enable them to communicate their issues, concerns, and priorities to their physician (Sepucha, Ozanne, & Mulley, 2006).

### Contextual Factors

The understanding of how social and cultural factors influence treatment decision making in older adults with cancer is limited. More research is needed

to elaborate the role of social and cultural contexts for decisions in this patient population. The multidimensionality of social and cultural factors makes such contexts difficult to investigate. However, the complex challenges of treatment decision research should be faced to advance knowledge of this topic. Decision researchers have recommended that one must avoid becoming paralyzed by this complexity or the uncertainty of decision making, but instead conduct more rigorous research on decision making and expand scientific knowledge about different patient populations to promote respect of the individual differences and diversity among groups of patients (Kaplan & Frosch, 2005).

As the population continues to age and baby boomers enter their older adult years, more older patients with cancer will face challenging treatment decisions. This trend makes the development of interventions that can improve the decision-making process and its outcomes even more critical, particularly in older patients with diverse social and cultural backgrounds and multiple medical conditions. Oncology nurses should encourage older adults to participate in cancer clinical trials and increase efforts to recruit older patients from minority populations to expand the evidence base on treatment outcomes in older adults.

## Implications for Nursing Practice

The interplay of physician, patient, and contextual factors that influence treatment decision making is not well-studied. Given the complexities of cancer treatment decisions, assisting patients with treatment decisions is particularly challenging for oncology nurses. However, oncology nurses should advocate autonomous (patient-driven), shared, or family-controlled treatment decisions depending on a patient's decisional role preference. Patient-driven treatment decisions require that adequate information on risks and benefits is provided to patients. Oncology nurses typically are available to discuss patient and family goals, examine patient and family expectations, and maintain reasonable hopefulness. Oncology nurses can support patients' decision making by engaging in evidence-based discus-

sion of various treatment options, assessment of benefits and risks, and a comprehensive discussion of the probability of success for each treatment option.

## Conclusion

This review provides relevant insights on the various models of treatment decision making and how those models relate to the physician, patient, and contextual factors that influence treatment decisions for older adults with cancer. Some gaps in the understanding of treatment decision making also have been identified, such as the need for additional research to understand patient behavior and how it influences treatment decision-making. More studies also are needed to guide the development of interventions geared towards improving patients' communication of treatment preferences and personal values to their clinicians. In addition, clinical studies should be conducted specifically in older adult patient populations using longitudinal and prospective designs to examine the real-time interplay of physician, patient, and contextual factors and how those divergent factors influence actual treatment decisions. Oncology nurses often are asked to assist patients with decision making; therefore, nurses are ideally positioned to promote informed treatment decisions that are consistent with patients' personal preferences and values, with strong consideration of patients' personal contexts.

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