Research Paper

Geriatric-specific considerations in treatment conversations with older adults with early-stage hormone receptor-positive breast cancer

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ABSTRACT

Introduction: Women ≥70 years with low-risk breast cancer face nuanced therapy decisions. Using qualitative analysis, we aimed to determine how oncologists and patients integrate geriatric considerations into complex treatment conversations.
Materials and Methods: We recruited women aged ≥70, newly diagnosed with clinical T1–2N0 hormone receptor-positive/HER2-negative disease between October 2020 and March 2023 from a large cancer center and audio-recorded and transcribed their consults with surgical, medical, and radiation oncologists. We identified geriatric issues included in conversational content and the dynamics of patient/oncologist communication. Data collection and analysis were simultaneously performed. We also assessed participant decision-making preferences, frailty, and life expectancy.
Results: Of 48 eligible patients approached, 27 (56 %) participated with eight surgical oncologists, 17 with 11 medical oncologists, and four with three radiation oncologists ($n = 48$ consultations recorded). Fourteen patients (48 %) were ≥ 75 years, 23 were non-Hispanic White (76 %). Patients preferred to share ($n = 15$, 58 %) or make their own treatment decisions ($n = 10$, 39 %), rather than defer to the oncologist. Oncologists presented an explicit treatment choice in 16 conversations (35 %). Chronological age was discussed in 27 (56 %) conversations, comorbidities in 44 (92 %), and multimorbidity in two (4 %). Other geriatric considerations were discussed in the minority of conversations [physiologic age: 20 (42 %); function: 20 (42 %); quality-of-life: 5 (10 %); life expectancy: 5 (10 %); polypharmacy: 2 (4 %)].
Discussion: Despite numerous treatment options, oncologists neither commonly offer older women with low-risk breast cancer explicit treatment choices, nor discuss geriatric issues besides comorbidity. Training oncologists in communication around geriatric issues may lead to more person-centered breast cancer care.

1. Introduction

More than 80,000 new breast cancer cases are diagnosed annually in the United States in women aged ≥70 years, representing approximately 30 % of new breast cancer diagnoses, and approximately 60 % of those women have low-risk (early-stage, hormone receptor-positive [HR+]/human epidermal growth factor receptor 2 [HER-2]-negative) disease [1]. Overtreatment of older women with low-risk disease is a growing concern, as existing data demonstrate that less-intense locoregional

therapy (i.e., de-escalated therapy) does not decrease overall survival. It is well-established that mastectomy does not confer a survival benefit over breast-conserving therapy in women of all ages [2,3], and trial data also support safe omission of radiation therapy (RT) [4,5] and axillary lymph node surgery [5–7] in older adults. Proceeding with RT and axillary lymph node surgery comes with an increased risk of surgical site infection, bleeding, chronic pain, lymphedema, and radiation-induced malignancy [8–10]. Omitting these treatments, however, may be associated with a small (approximately 8 %) increase in locoregional

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recurrence at 10-year follow-up [4,5].

Women aged ≥70 years with low-risk breast cancer have multiple locoregional treatment options (lumpectomy with or without sentinel lymph node biopsy [SLNB], with or without RT, or mastectomy with or without SLNB). These already complex treatment decisions can be further complicated by the presence of geriatric-specific issues, such as comorbidities, limited life expectancy, limited social support, impaired functional status, polypharmacy, and impaired cognitive status, which can result in a higher risk of complications [11] or a decreased likelihood to survive long enough to realize the modest reduction in locoregional recurrence.

Though oncologic professional societies such as the American Society of Clinical Oncology and the International Society of Geriatric Oncology endorse integration of geriatric-specific concerns into treatment decision-making [12,13], it is unclear to what extent clinicians are actually discussing these with their patients. While previous work has sought to understand decision-making by analyzing data from encounter notes [14] or from semi-structured interviews with oncologists [15] and patients [16], we sought to capture the true conversational content and dynamics with respect to geriatric considerations in consultations between breast surgical, medical, and radiation oncologists with older women who have low-risk breast cancer.

2. Materials and Methods

2.1. Sample

Women aged ≥70 with clinical T1–2 (tumor ≤3 cm), node-negative, HR+/HER-2- disease presenting for an initial consultation with a breast surgical, medical, or radiation oncologist were recruited between October 2020 and March 2023 at the two main clinic sites of a large academic cancer center. Patients with tumors up to 3 cm were eligible for participation given the inclusion criteria of the PRIME II trial, which supports omission of RT in older women [4]. Men, women with non-ductal or lobular histologies, those who were non-English speaking, and those with a score of <9 on the Orientation-Memory-Concentration Test (a score indicative of dementia) [17] were excluded. To increase diversity of age and race/ethnicity, participation of non-Hispanic White women was capped at $n = 20$ and participation of adults age 70–74 was capped at $n = 15$. Participant flow is summarized in Supplementary Fig. 1.

2.2. Study procedures

After confirming eligibility with their treating oncology clinicians, patients were screened by a trained research assistant face-to-face and written consent was obtained prior to their new patient consultation. Support persons present at the time of the discussion were also required to give verbal consent to be audio-recorded. Of note, this study period included approximately six months when the presence of support persons were limited due to COVID-19-related protocols. Given the limited number of oncology clinicians within each subspecialty and their variable levels of clinical activity, no limit was placed on the number of patient participants that a given oncology provider could have.

Usual clinical processes involve a pre-operative consult with a breast surgical and medical oncologist, with post-operative referral to a radiation oncologist if deemed necessary. Radiation oncology consults for the study participants were limited given that the majority of patients were referred to radiation oncologists outside of the two clinic sites. Two weeks prior to the start of this study, routine frailty (Geriatric-8) and limited life expectancy (Schonberg Index) screening for all patients ≥70 were instituted in the breast surgical oncology clinics. The surgeons in this study were thus provided with the data from these two screening tests prior to entering the room and could use this information in communications about treatment planning with the patient and with their medical and radiation oncology colleagues if they chose, although this

was not mandated. The Orientation-Memory-Concentration test was administered only as part of study procedures and was not part of routine clinical care. No other routine geriatric-specific screening or assessment done prior to the medical or radiation oncology consults.

We attempted to capture all oncology treatment consults with consented study participants. A research assistant placed an audio recorder in the room prior to the start of the encounter ($n = 28$) or gave physicians the audio recorder to use themselves if they preferred ($n = 20$). No study personnel were present at the time of the conversations and no field notes were taken.

2.3. Study measures

Questionnaires were used to assess demographics, frailty (Geriatric-8) [18], life expectancy (Schonberg Index) [19], decision-making preferences (Control Preferences Scale [CPS], a 5-item scale that allows respondents to denote their preferences with regards to healthcare decision participation) [20], and preferences regarding health care use (Medical Maximizer-Minimizer Scale, a 10-item scale with items scored on a 1–7 Likert scale; scores ≤4 indicate medical minimizing and scores >4 indicate medical maximizing [21]). As this study was investigating treatment decision making, the latter two measures were included to understand the study population's baseline attitudes toward decision making and healthcare utilization. These measures were gathered either prior to the start of the treatment consultation or up to one week following consultation. As geriatric-specific considerations should, per societal guidelines, play a role in treatment decision making, data on treatment received were abstracted from charts. Type of breast surgery (lumpectomy vs mastectomy), inclusion of axillary surgery (SLNB vs no SLNB), and receipt of any RT (yes/no) were included. Endocrine therapy receipt (yes/no) was credited if a patient started endocrine therapy; longitudinal endocrine therapy adherence was not assessed in this study.

2.4. Data analysis

Baseline questionnaire data were analyzed using basic descriptive statistics. The audio-recorded conversations were anonymized and professionally transcribed. Transcripts were not provided back to the study participants. Data collection and analysis were performed concurrently to determine when thematic saturation (the point at which code definitions remained stable and no new themes emerged) had been reached [22]. To facilitate a broad array of potential analyses, the study team (CM, AR, BNC) coded transcripts for conversational content, such as treatment-specific information as well as conversational dynamics, which included, but were not limited to codes relating to informational flow and turn taking [23,24]. Conversational data from all participants (patients, support persons, and clinicians) were all coded in the same manner, and the speakers' roles were noted. The initial codebook was created by all three team members (Supplementary Material) and included both deductive codes from the domains of the comprehensive geriatric assessment, and inductive codes identified during transcript review. Six conversations were coded by all three study team members, which facilitated exploration and interrogation of the draft codebook to identify any differences in interpretation of or application of codes [21,25]. The codebook was refined, and a finalized codebook was applied to all transcripts. Subsequently, each transcript was coded by one team member (either AR, CM, or BNC) with frequent team meetings to ensure coding consensus and to resolve any areas of uncertainty or disagreement. The research team met to iteratively discuss the salient themes and to determine when saturation had been reached. The team utilized the coded data to create matrices examining the intersection between a priori selected geriatric-specific concerns (e.g., comorbidities, life expectancy, social support, functional status, polypharmacy, and cognitive status) and conversational dynamics (e.g., patient-initiated vs. physician-initiated discussion of geriatric-specific concerns, patient-initiated de novo questions, patient follow-up questions, and explicit

treatment choice).

While the initial coding approach was undertaken to facilitate a discourse analysis approach, for this report, we chose to report counts, given the relative infrequency of discussion of geriatric-specific concerns. Discourse analysis-specific results will be reported in future work. Conversation-level frequency counts of geriatric-specific concerns, which included the domains of a comprehensive geriatric assessment in addition to a priori chosen age-related concerns emergent from our past work (e.g., chronological age and physiologic age) were determined by an investigator who is a practicing surgical oncologist (CM). Frequency of who initiated discussion of geriatric-specific concerns was also captured. Explicit treatment choice was initially coded by the study team, but CM was a final reviewer to ensure clinical accuracy. A sensitivity analysis of this code was performed excluding medical oncologists, as these conversations took place pre-operatively, well before the time when the choice regarding endocrine therapy needed to be made. Participants did not give feedback on the findings. Coding was performed using NVivo software, version 12.5.0 (QSR International) and the matrix was created in Excel. Reporting was guided by the Consolidated Criteria for Reporting Qualitative Research Checklist [26]. Institutional review board approval for the study was obtained from the Dana-Farber/Harvard Cancer Center Institutional Review (IRB#: 20–610).

3. Results

Of 48 eligible patients approached, 27 (56 %) participated and had usable recorded treatment conversations with 22 different physicians. With respect to age distribution and race/ethnicity, patients who refused to participate were similar to those who agreed during the open recruitment period. Overall, 48 treatment consults were audio-recorded; 27 were with surgical oncologists ($n = 8$), 17 with medical oncologists ($n = 11$), and four with radiation oncologists ($n = 3$) (Supplementary Fig. 2a, b, c). The mean length of conversations was 44:36 (range: 15:47–90:57). This did differ slightly by subspecialty: medical oncology mean length 43:15 (range 24:40–90:57), surgical oncology mean length: 44:54 (range 17:34–1:06:40), and radiation oncology mean length: 36:24 (range 15:47–59:52). Twenty-one patients had a support person present at 41 consultations. Overall, 14 patients (48 %) were ≥ 75 years, 20 were non-Hispanic White (76 %), and seven were non-Hispanic Black (24 %) (Table 1). Nine (31 %) had <10-year life expectancy and 12 (41 %) were at risk for frailty. Twenty (74 %) were medical maximizers, meaning they were predisposed to seek health care for even minor problems [21]. Per the Controlled Preferences Scale, patients preferred to share ($n = 15$, 58 %) or make their own treatment decisions ($n = 10$, 39 %), rather than defer to the oncologist.

Oncologists presented an explicit treatment choice in 16 conversations (35 %); representative quotes of presented treatment choices are listed in Supplementary Table 1. Excluding medical oncology conversations, explicit treatment choices were noted in 52 % of the surgical and radiation oncology consults (9/11 oncologists).

When analyzing the conversational content, at least one geriatric consideration was discussed in 67 % (32/48) of conversations. Specifically, functional status, social support, and comorbidities were discussed, while nutrition, cognition, and psychological status were not mentioned in any conversation, Fig. 1. Chronologic age was discussed in 56 % (27/48) of conversations and physiologic age in 42 % (20/48). Most referrals to physiologic age drew on the lack of comorbidity ("You're also very robust. You don't have a lot of other medical problems" [MO6]) and physical appearance ("you look much younger than your stated age" [SO2]) (Table 2). Chronologic age and physiologic age often coincided in the same conversation, as oncologists tended to present physiologic age in contrast to chronologic age.

Comorbidities were discussed in 92 % (44/48) of consultations but discussion of treatment planning within the context of multimorbidity was only discussed in 4 % (2/48) of conversations ("…when we're talking about…complications with healing…with the diabetes, a bigger

Table 1

Patient and provider characteristics.

Patient Characteristics ($n = 27$)	
Mean age, years (SD) (age range 70–84)	76.9 (+/− 5.1)
Age: n (%)	
70–74	13 (44)
75–79	7 (26)
80–84	4 (15)
>85	3 (11)
Race: n (%)	
Black or African American	7 (26)
Non-Hispanic White	20 (74)
Education: n (%)	
High school graduate or GED	2 (9)
Some college or technical degree	6 (23)
Completed college	10 (39)
Graduate degree	6 (23)
Post-graduate degree	2 (8)
Income: n (%)	
< $20,000	2 (8)
$20,001–40,000	2 (8)
$40,001–60,000	4 (15)
$80,001–100,000	1 (4)
>$100,000	9 (35)
Prefer not to say	8 (31)
Employment: n (%)	
Retired	21 (81)
Employed < 32 h/week	3 (12)
Employed ≥32 h/week	1 (4)
Unemployed	1 (4)
Marital Status: n (%)	
Currently married	16 (62)
Widowed	5 (20)
Divorced	5 (20)
Living Situation: n (%)	
Alone	4 (15.4)
With spouse/partner	18 (69.2)
With children over 18	5 (19.2)
With parents/parents-in-law	1 (3.8)
With Other: grandson over 18	1 (3.8)
Living Location: n (%)	
Urban	6 (23)
Suburban	18 (69)
Rural	2 (8)
Control Preferences Scale: n (%)	
"You prefer that your doctors make the decisions with little or no input from you"	0 (0)
"You prefer that your doctors make the decisions after considering your opinion"	0 (0)
"You prefer that you and your doctor make decision together"	15 (56)
"You prefer to make the final treatment decision after considering your doctor's opinion"	10 (37)
"You prefer that you make the decisions with little or no input from your doctors"	0 (0)
Did not answer	2 (7)
Medical Maximizer-Minimizer Scale: n (%)[a]	
Maximizer	20 (74)
Minimizer	6 (22)
Unknown	1 (4)
Life Expectancy: n (%)[b]	
<5 years	5 (19)
5- < 10 years	4 (15)
10–14 years	6 (22)
>14 years	12 (44)
Frailty Status: n (%)[c]	
At risk of being frail	12 (44)
Not Frail	15 (56)
Blessed Orientation Memory Concentration scores: n(%)[d]	
4–6	7 (26)
≤3	20 (74)
Number of Treatment Conversations Captured	
1	11 (41)
2	14 (52)
3	2 (7)
Provider Characteristics	

Table 1 (*continued*)

Patient Characteristics (*n* = 27)	
Mean Age, years (SD), age range (31–65)	45.1 (+/− 8.0)
Age: n(%)	
30–40	6 (27)
40–50	9 (41)
50–60	6 (27)
60–70	1 (5)
Sex, n (%)	
Female	19 (86)
Male	3 (14)
Subspecialty, n (%)	
Surgical oncology	8 (36)
Medical oncology	11 (50)
Radiation oncology	3 (14)
Years in practice, n (%)	
0–5	8 (36)
6–10	2 (9)
11–20	8 (36)
>20	4 (18)

Abbreviations: SD: standard deviation; GED: General Educational Development.

[a] Ten-item scale; items scored on a 1–7 Likert scale with scores below 4 indicating medical minimizing and scores above 4 indicating more medical maximizing [21].

[b] Schonberg Index: 11-item scale, giving mortality risks at 5, 10, and 14 years. Patients with a mortality risk of ≥50 % in a given time interval has a life expectancy less than that interval [19,27].

[c] Geriatric-8: score of <14 indicates being at risk for being frail [18].

[d] 6-item scale, total score out of 28, score > 10 considered abnormal.
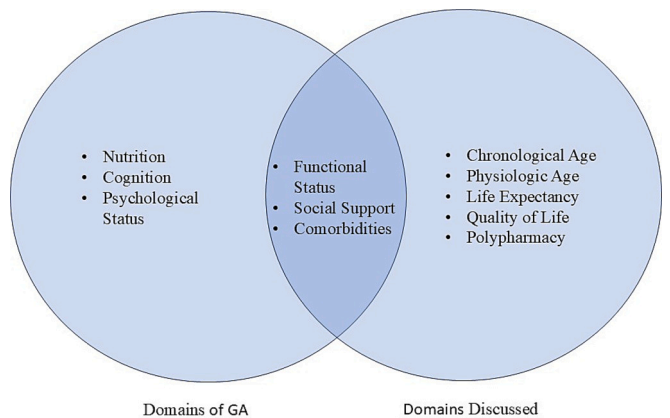

Fig. 1. Venn Diagram of Domains of the Geriatric Assessment (GA) and Domains Discussed.

surgery isn't necessarily something that you need to do" [SO7]. More frequently, oncologists gave reasons for treatment recommendations due to *lack* of comorbidities. Functional status was the second most commonly discussed geriatric-specific consideration (42 %, 20/48 conversations), in which multiple providers asked about patients' abilities to ambulate certain distances or to carry out activities of daily living. Other geriatric considerations were discussed in the minority of conversations (quality of life: 10 % [5/48]; life expectancy: 10 % [5/48], polypharmacy: 4 % [2/48]).

Oncologists tended to be more likely to initiate discussion of geriatric domains than patients/supporters. Overall, geriatric considerations were brought up by all 22 clinicians in 47 of 48 interviews, by seven patients in eight interviews, and two support persons in four of 41 interviews where one was present. However, patients commonly initiated conversation about impact on quality of life (*n* = 4/9) (Fig. 2). All other mentions of geriatric-specific concerns were initiated by the oncologist. Participant life expectancy was only mentioned in 4 of 48 conversations and was always initiated by the oncologist.

Table 2

Representative quotes by geriatric-specific concerns and initiating party.

Geriatric-Specific Concern	Initiating Party	Representative Quotes
Functional Status	Oncologist-initiated	SO2:…Reading your survey about your activity, it doesn't sound like you really are limited, right?…you can walk up a flight of stairs with a laundry basket? SO7: Got it. And then I have – I know you just mentioned potentially having asthma and diabetes of course, and the blood pressure. Any other medical problems, heart problems or other?
Comorbidities	Oncologist-initiated	P26: Acid reflux. SO7: Reflux. Okay. P26: Yeah. Because at night this stuff builds up in my – and I have to get up… SO7: Got it. And do you take anything for that regularly? P26: No. [My doctor], I told her I didn't wanna take any more pills if I didn't have to. So I just work with it, sleep on a bunch of pillows, elevated myself. … SO7: I think those are all the things I wanted to ask. Do you mind if I examine you next?
Social Support	Oncologist-initiated	SO1: And then obviously your daughter can take you home. She'll need to bring you to the hospital and take you home. And then some of my patients, afterwards they just sleep at their house and they don't really need anyone around. If your daughter wanted to stay one night, I think that's fine. P8: We live in the same house. SO1: Oh, that's great. That's even better. … SO1:…it seems like you have good social support with your daughter, but sometimes it's nice just to be able to talk to someone else. And so we have some really great SoulMates. A lot of my patients sort of took advantage of it when they were diagnosed, and so they give back. So you can always call and see whether they can connect you with someone else who's similar to you who's undergoing a lumpectomy. We also have [a social worker] who's wonderful. So, for example, sometimes your daughter's just busy. If you have appointments or visits, she could sort of help you – you know, see whether she can help you arrange for rides or things like that. Okay?
Physiologic Age	Oncologist-initiated	SO1:…I always think of my patients in terms of both your chronologic age and your physiologic age… And you're more in the category of the 72, going on 50 kind of category…You do not have a risk of being frail if you're out playing golf every day.
Chronologic Age	Oncologist-initiated	MO11: There's data to suggest that in people in a very similar situation that you are, given your age and what we know about the cancer so far that we think it's very acceptable to not do the radiation because if there were a local problem in the future that arose that we would be able to deal with it then in a way that wouldn't change your lifespan. P29: Okay. I'm 82 years old, so – MO11: What do you mean by that? P29: [Laughs] May – you know, I'm 82, so I don't – maybe I won't need…any radiation…treatments. … MO11: And for women in your age group we almost always think the risks [of

Table 2 (*continued*)

Geriatric-Specific Concern	Initiating Party	Representative Quotes
Life Expectancy	Oncologist-initiated	radiation therapy] are going to outweigh the benefits. MO11: So even without a cancer diagnoses, people only live for so long. Right? P29: Right. Mm-hmm. MO11: We have a natural lifespan. And – P29: …I'm already 90, or something like that, so what the heck…let it go. MO11: I hear what you're saying…so it's different treating someone with breast cancer who's very young …– in terms of… how that's going to impact the rest of their lives compared to someone who just naturally has a different life expectancy.
Quality of Life	Oncologist-initiated	MO7:…the letrozole medicine, is a very safe medicine and…we would expect it – for you to have the same quality of life that you had before. We wouldn't want you to take it with it causing you to be bedridden or something. That almost never happens, but…we wanna maintain your high quality of life.
Functional Status	Patient-initiated	RO1: So I would say the radiation is a little bit of a logistical pain in the short-term because it is three weeks of daily treatment. That said, then it's done. As I imagine Dr. X will mention to you, he typically tries to get through five years of medication, but again, life happens, and you see how you do on the pills, in terms of the side effects with the pills. P29: He told me that the side effects of the pills are joint problems too. RO1: Yeah. Yeah, the radiation side effects tend to be focused just on the area we're treating. So they're really just the skin gets a little bit darker, a little bit itchy. You may feel a little tired, of course, because we're shoehorning a visit into your day. You never want it. But those are the major side effects. P29: And this is going to disable me more. I won't be able to stay by myself. I can't do my work. RO1: Yeah. I would say most people with radiation don't feel – P29: I'm just going to go for the pills. I'm already there. RO1: That's totally fine. I think that's a fine thing. I do want to say, most people who get the radiation work the entire time, take care of their things at home. They don't actually get particularly disabled. But again, I don't feel super strongly about the radiation.
Comorbidities	Support-person-initiated	P30: My mother is 90…she had retinitis pigmentosa and a little bit of knee pain, but otherwise she's in very good health, and so it really is about choosing the facility with the best recommendations for treatment of this.
Social Support	Patient-initiated	P12: Do you have recommendations as far as support groups?
Physiologic Age	Patient-initiated	P29: I've worked all my life, and I live by myself. I'm very independent. And I feel healthy…for 82…and I feel and look better than some of my friends.
Chronologic Age	Patient-initiated	P2: At 72, body image is no longer my priority. Never really was…just want to take care of my health.
Life Expectancy	Patient-initiated	P13: I read something online that said if you had breast cancer, you have ten years to live. SO2: It depends on a few things, right? It depends on the size of the tumor, the type

Geriatric-Specific Concern	Initiating Party	Representative Quotes
Quality of Life	Patient-initiated	of tumor, the type of treatment, right? But absolutely, I have patients – P13: I want to live longer than that. SO2: Absolutely. That's the thing. I would say that you could live longer than that. I've got people who don't ever have a problem with their cancer again, throughout their life. P18: I know I have the – basically, I'll still be moving around, I won't be bedridden or nothing like that, will I? MO7: No, no…the goal is for you to have the same quality of life that you had before all of it…the medicine that I'm talking about, the letrozole medicine, is a very safe medicine and…we would expect it – for you to have the same quality of life that you had before. We wouldn't want you to take it with it causing you to be bedridden or something. That almost never happens, but…we wanna maintain your high quality of life.

Abbreviations: SO: surgical oncologist; MO: medical oncologist, P: patient.

Treatment data were able to abstracted from the record for 24 of 27 patients. Of these 24, 23 underwent surgery of which 22 were lumpectomies (Table 3). The one patient who underwent mastectomy did so due to the extent of her disease. Only two patients (7 %) underwent SLNB—one had an abnormal node seen on imaging with an unsuccessful needle biopsy and a SLNB was recommended. The other patient was recommended a SLNB because it was thought she could tolerate chemotherapy if needed, and thus her nodal status would be helpful in medical oncology's treatment recommendation ("Because you seem to be much younger than your stated age, that we can actually [use] what the results of your lymph nodes are to be able to say…if you needed chemotherapy, we think you could tolerate it." [SO2]). Nine patients out of the 22 patients who underwent lumpectomy had adjuvant RT (41 %). Among the four radiation oncology conversations captured, three patients underwent RT. Twenty-one of the 24 patients who reported receiving treatments were initiated on endocrine therapy (ET); one of these patients received ET only without any surgery or radiation.

The 20 medical maximizers were treated similarly to the overall population, with the majority of patients undergoing lumpectomy + ET (7, 35 %) or a lumpectomy + RT (6, 30 %). Similarly, among robust patients, five (33 %) underwent lumpectomy + ET and four (27 %) underwent lumpectomy + RT (Supplementary Table 2). Of the patients with life expectancies less than 10 years and known treatment data, four (44 %) underwent lumpectomy + ET and four (44 %) underwent lumpectomy + RT. There were no significant differences with respect to the mean number of geriatric-specific considerations discussed between the overall cohort, medical maximizers, and minimizers. Similarly, there were no significant differences in discussions of geriatric-specific conditions by robust vs. frail patients or patients with or without life expectancies <10 years.

4. Discussion

In this qualitative analysis of audio-recorded treatment conversations between surgical, medical, radiation oncologists and women aged ≥70 years with early-stage, HR+ breast cancer, we found that oncologists uncommonly offered these women explicit treatment choices despite older women having multiple treatment options and wanting to be actively involved in treatment decision-making. We also found that while oncologists included discussion of comorbidity in their treatment recommendations, they discussed patient functional status less commonly, and rarely discussed other geriatric issues like nutrition or
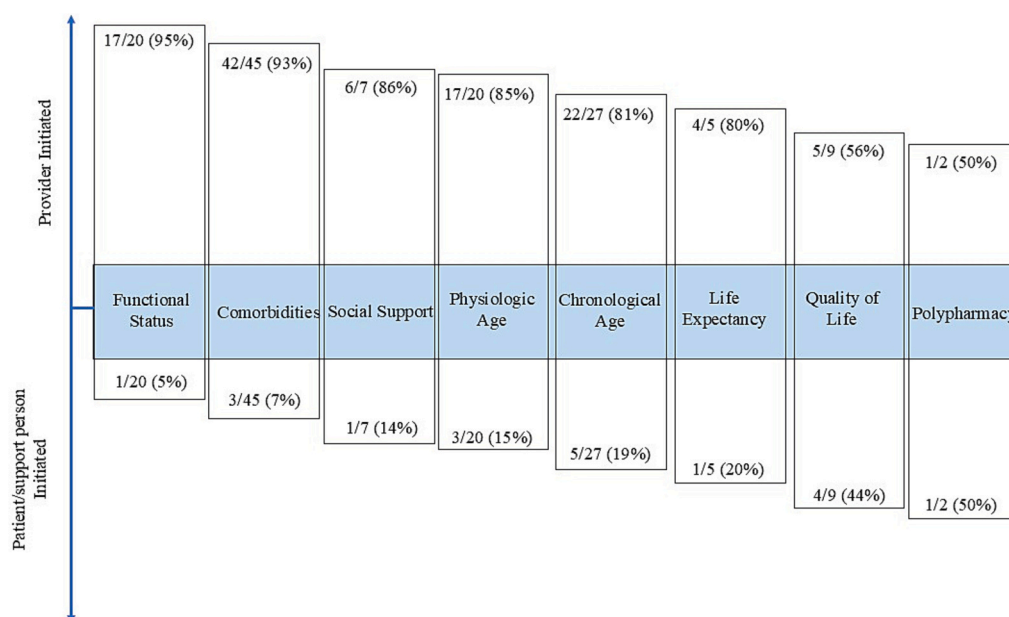
Fig. 2. Oncologist-Initiated versus Patient-Initiated Geriatric-Focused Domains Discussed (by Conversation).

Table 3
Locoregional therapy received by conversational content and patient decision-making preferences.

	N (%)	# Geriatric –focused domains per patient (mean)	Controlled Preference Score[a]	Medical Maximizer/ Minimizer[b] (n, %) (total: 20 maximizers, 6 minimizers, 1 unknown)
ET alone (no locoregional therapy)*	1 (4)	0	Shared: 1	Maximizer: 1 (100)
Lumpectomy only	3 (11)	2.3	Shared: 3	Maximizer: 2 (67) Minimizer: 1 (33)
Lumpectomy + ET	9 (33)	2.2	Shared: 6 Active: 3	Maximizer: 7 (78) Minimizer: 2 (22)
Lumpectomy + SLNB*	1 (4)	2	Shared: 1	Maximizer: 1 (100)
Lumpectomy + RT*	8 (30)	1.9	Shared: 3 Active: 5	Maximizer: 6 (75) Minimizer: 2 (25)
Lumpectomy + SLNB + RT*	1 (4)	1	Shared: 1	Maximizer: 1 (100)
Mastectomy*	1 (4)	0	Unknown: 1	Maximizer: 1 (100)
Unknown	3 (11)	1.3	Active: 2 Unknown: 1	Maximizer: 1 (33) Minimizer: 1 (33) Unknown: 1 (33)

Abbreviations: ET: endocrine therapy; SLNB: sentinel lymph node biopsy; RT: radiation therapy.

[a]Control Preferences Scale: Active: "You prefer to make the final treatment decision after considering your doctor's opinion", "You prefer that you make the decisions with little or no input from your doctors".
Shared: "You prefer that you and your doctor make decision together".
Passive: "You prefer that your doctors make the decisions with little or no input from you", or "You prefer that your doctors make the decisions after considering your opinion".
Answer choices:
[b]Ten-item scale; items scored on a 1–7 Likert scale with scores 4 or below indicating medical minimizing and scores above 4 indicating more medical maximizing [21].
* Other than patient who underwent lumpectomy-only, all pts. initiated endocrine therapy.

life expectancy. Patients and their support persons also rarely brought up geriatric issues during these consultations. Despite guidelines recommending inclusion of these topics in discussions, oncologists may either lack the training to incorporate these topics or feel as if they are irrelevant.

Oncologists commonly included discussion of chronological age in treatment discussions, possible due to the use of chronological age as a key inclusion criterion of randomized controlled trials that help to guide viable treatment options. For instance, the PRIME II trial, which was a trial of omission of RT, included women ≥65 [4], and the CALGB 9343 trial, a trial of RT omission that is also used to support omission of axillary surgery, included women ≥70 years [5]. This is in contrast to qualitative work analyzing semi-structured interviews with oncologists, in which the physicians state that physiologic age is much more important than chronologic age to decision making [15,28]. Thus, while physiologic age, captured here as an allusion to age beyond or despite a chronologic number, may indeed fit into the thought processes of a given physician, these cognitions may not necessarily be expressed in conversation with patients.

The more rarely discussed geriatric domains in this study included social support, life expectancy, polypharmacy, and quality of life. Of these, patients more often initiated conversations regarding quality of life than oncologists. While patient satisfaction with these conversations were not a part of this study, previous studies have demonstrated high patient satisfaction with communication about aging concerns when geriatric assessment interventions helped to prompt more discussion [29–31]. Often mentioned in passing, discussion of these issues may have been given less attention because of lack of perceived relevancy to the discussion at hand. Similarly, the domains that were never discussed (cognition, psychological status, and nutrition) were likely perceived as being ancillary to the treatment plans at hand. Time required to take a holistic approach to a given patient can be considerable, and thus may also factor into the breadth of discussions.

It is also possible that some of these issues were rarely discussed due to oncologists' lack of training eliciting these issues [32] and discomfort with discussion of the subject [33]; after all, especially outside of highly academic settings, oncologists rarely feel confident with geriatric assessments, such as conducting functional or fall risk assessments [32]. Discussion of life expectancy is another conversational area that can be uncomfortable for clinicians [15,34]; for instance, in the setting of

cancer screening, physicians may prefer to discuss risk/benefit ratios [35,36] and feel more comfortable with these conversations with patients with whom a long-term relationship has been established, or when the subject was initiated by the patient [15,34,37]. Despite this, patients can be open to these discussions [38–40], even as both parties recognize the uncertainty inherent in any life expectancy estimate. As the modest benefits of certain treatments, such as RT, are only realized over a relatively long timeframe (e.g., 10 years), incorporation of life expectancy data may help oncologists to contextualize the expected benefit of a given treatment for each patient.

An explicit treatment option was also absent from the majority of these discussions. All patient participants in this study preferred to actively participate in treatment decision making. However, the lack of transparency by oncologists regarding what was truly a viable treatment choice was notable, which is consistent with overall low rates of patient choice awareness documented in the wider medical literature [41–47]. Shared decision making requires elicitation of patient values, an invitation of patient participation, discussion of treatment options/alternatives, and integration of patient values/preferences into the final decision [48,49]. Although the lack of explicit treatment options across conversations could have been in part due to incomplete information at the time of initial consult (thus rendering a final treatment choice impossible) or due to the timing of the consult with respect to the treatment decision (e.g., some of the medical oncology conversations took place pre-operatively, well before the time when a treatment choice regarding endocrine therapy needed to be made), there was a notable lack of elicitation of patient values and invitations of patient participation throughout.

Addressing the potential discomfort with discussion of geriatric-specific concerns and improving the presentation of explicit treatment choice to patients, requires structural changes to patient-clinician communication. First, patient activation needs to be addressed; this can be as simple as ensuring all providers invite patient participation at the beginning of each encounter [50], but may also be augmented by providing patients with decision aids specific to this breast cancer population prior to or at the point of consultation [51,52]. Second, clinician training in models in shared decision making, such as the Six Steps of SDM (shared decision making) and collaborative deliberation, should be implemented. Both offer conversational structures focused on integrating individual preferences into decisions after consideration of alternative courses of action [53], and the Six Steps framework also allows for measurement of implementation [50]. Tailoring these approaches to older adults in particular should incorporate identification of and communication regarding patients' health priorities and trajectories, as recommended by the American Geriatrics Society's published framework on decision making in patients with multimorbidity [54]. Changing practice to incorporate these models can be difficult for any clinician along the spectrum of his/her career, but may help to increase the number of explicit treatment decisions perceived by older women.

4.1. Limitations

This study had several limitations. First, the study had a relatively homogenous study population drawn from a single institution. Second, only the initial treatment consults were captured, and treatment decisions may often be made over the course of several conversations, especially in circumstances in which all necessary diagnostic data are not available at initial consult. It is possible that geriatric-specific considerations were introduced in subsequent conversations and thus went uncaptured. Third, we were unable to capture conversations across all subspecialties involved in a participant's care, sometimes due to patients seeking opinions at another institution or due to technical ability to capture a given conversation. Fourth, the audio-recorded nature of the conversation could have introduced a potential Hawthorne effect. Prior work, however, has demonstrated that audio recordings may not have significant effect on conversational content [55]. In addition, non-verbal

communication could not be analyzed in this study. Fourth, COVID-related protocols limited the presence of support person(s) initially but changed over the course of the study period, thus making for variable support person involvement. Last, although the initial codebook was formulated and iteratively refined by all coders, with frequent team meetings throughout the coding process, the majority of the transcripts were not double-coded, potentially introducing individual bias.

5. Conclusion

For older adults with cancer, patient-centered care requires consideration of aging-related concerns. However, geriatric-specific considerations are omitted in many treatment conversations in a population of older patients who face nuanced treatment options that can be significantly influenced by their competing risks and life expectancy. While relatively low-intensity locoregional therapy was received by the vast majority of patients in this study, the lack of explicit treatment choice presented in many of these conversations may be indicative of a lack of shared decision making, despite patients' preferences for active decision-making roles. Future communication interventions should target these conversational needs to improve shared decision making in older adults with low-risk breast cancer.

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CRediT authorship contribution statement

Christina A. Minami: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Visualization, Writing – original draft, Writing – review & editing. **Anna C. Revette:** Formal analysis, Investigation, Methodology, Writing – review & editing. **Brett Nava-Coulter:** Formal analysis, Investigation, Writing – review & editing. **Kenny Nguyen:** Data curation, Project administration, Writing – review & editing. **Eliza H. Lorentzen:** Formal analysis, Visualization, Writing – review & editing. **Mara A. Schonberg:** Conceptualization, Methodology, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Appendix A. Supplementary Data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jgo.2025.102778.

Data Availability

The data underlying this article cannot be shared publicly for ethical/privacy reasons, due to the data's sensitive nature and the need to protect the privacy of individuals who participated in this study.

References

[1] Howlader N, Altekruse SF, Li CI, Chen VW, Clarke CA, Ries LA, et al. US incidence of breast cancer subtypes defined by joint hormone receptor and HER2 status. J Natl Cancer Inst 2014:106. https://doi.org/10.1093/jnci/dju055.

[2] Fisher B, Anderson S, Bryant J, Margolese RG, Deutsch M, Fisher ER, et al. Twenty-year follow-up of a randomized trial comparing total mastectomy, lumpectomy, and lumpectomy plus irradiation for the treatment of invasive breast cancer. N Engl J Med 2002;347:1233–41. https://doi.org/10.1056/NEJMoa022152.

[3] Early breast Cancer Trialists' collaborative group. Effects of radiotherapy and surgery in early breast cancer. An overview of the randomized trials. N Engl J Med 1995;333:1444–55. https://doi.org/10.1056/NEJM199511303332202.

[4] Kunkler IH, Williams LJ, Jack WJL, Cameron DA, Dixon JM. Breast-conserving surgery with or without irradiation in early breast Cancer. N Engl J Med 2023;388:585–94. https://doi.org/10.1056/NEJMoa2207586.

[5] Hughes KS, Schnaper LA, Bellon JR, Cirrincione CT, Berry DA, McCormick B, et al. Lumpectomy plus tamoxifen with or without irradiation in women age 70 years or older with early breast cancer: long-term follow-up of CALGB 9343. J Clin Oncol 2013;31:2382–7. https://doi.org/10.1200/jco.2012.45.2615.

[6] Martelli G, Boracchi P, Ardoino I, Lozza L, Bohm S, Vetrella G, et al. Axillary dissection versus no axillary dissection in older patients with T1N0 breast cancer: 15-year results of a randomized controlled trial. Ann Surg 2012;256:920–4. https://doi.org/10.1097/SLA.0b013e31827660a8.

[7] Rudenstam CM, Zahrieh D, Forbes JF, Crivellari D, Holmberg SB, Rey P, et al. Randomized trial comparing axillary clearance versus no axillary clearance in older patients with breast cancer: first results of international breast cancer study group trial 10-93. J Clin Oncol 2006;24:337–44. https://doi.org/10.1200/jco.2005.01.5784.

[8] Chatterjee A, Pyfer B, Czerniecki B, Rosenkranz K, Tchou J, Fisher C. Early postoperative outcomes in lumpectomy versus simple mastectomy. J Surg Res 2015;198:143–8. https://doi.org/10.1016/j.jss.2015.01.054.

[9] Purushotham AD, Upponi S, Klevesath MB, Bobrow L, Millar K, Myles JP, et al. Morbidity after sentinel lymph node biopsy in primary breast cancer: results from a randomized controlled trial. J Clin Oncol 2005;23:4312–21. https://doi.org/10.1200/jco.2005.03.228.

[10] Whelan TJ, Levine M, Julian J, Kirkbride P, Skingley P. The effects of radiation therapy on quality of life of women with breast carcinoma: results of a randomized trial. Ontario Clinical Oncology Group Cancer 2000;88:2260–6.

[11] Morgan JL, George J, Holmes G, Martin C, Reed MWR, Ward S, et al. Breast cancer surgery in older women: outcomes of the bridging age gap in breast cancer study. Br J Surg 2020;107:1468–79. https://doi.org/10.1002/bjs.11617.

[12] Mohile SG, Dale W, Somerfield MR, Schonberg MA, Boyd CM, Burhenn PS, et al. Practical assessment and management of vulnerabilities in older patients receiving chemotherapy: ASCO guideline for geriatric oncology. J Clin Oncol 2018;36:2326–47. https://doi.org/10.1200/jco.2018.78.8687.

[13] Biganzoli L, Battisti NML, Wildiers H, McCartney A, Colloca G, Kunkler IH, et al. Updated recommendations regarding the management of older patients with breast cancer: a joint paper from the European Society of Breast Cancer Specialists (EUSOMA) and the International Society of Geriatric Oncology (SIOG). Lancet Oncol 2021;22:e327–40. https://doi.org/10.1016/S1470-2045(20)30741-5.

[14] Schonberg MA, Silliman RA, McCarthy EP, Marcantonio ER. Factors noted to affect breast cancer treatment decisions of women aged 80 and older. J Am Geriatr Soc 2012;60:538–44. https://doi.org/10.1111/j.1532-5415.2011.03820.x.

[15] Minami CA, Bryan AF, Freedman RA, Revette AC, Schonberg MA, King TA, et al. Assessment of oncologists' perspectives on omission of sentinel lymph node biopsy in women 70 years and older with early-stage hormone receptor-positive breast cancer. JAMA Netw Open 2022;5:e2228524. https://doi.org/10.1001/jamanetworkopen.2022.28524.

[16] Schonberg MA, Birdwell RL, Bychkovsky BL, Hintz L, Fein-Zachary V, Wertheimer MD, et al. Older women's experience with breast cancer treatment decisions. Breast Cancer Res Treat 2014;145:211–23. https://doi.org/10.1007/s10549-014-2921-y.

[17] Katzman R, Brown T, Fuld P, Peck A, Schechter R, Schimmel H. Validation of a short orientation-memory-concentration test of cognitive impairment. Am J Psychiatry 1983;140:734–9. https://doi.org/10.1176/ajp.140.6.734.

[18] Bellera CA, Rainfray M, Mathoulin-Pélissier S, Mertens C, Delva F, Fonck M, et al. Screening older cancer patients: first evaluation of the G-8 geriatric screening tool. Ann Oncol 2012;23:2166–72. https://doi.org/10.1093/annonc/mdr587.

[19] Schonberg MA, Davis RB, McCarthy EP, Marcantonio ER. External validation of an index to predict up to 9-year mortality of community-dwelling adults aged 65 and older. J Am Geriatr Soc 2011;59:1444–51. https://doi.org/10.1111/j.1532-5415.2011.03523.x.

[20] Degner LF, Sloan JA, Venkatesh P. The control preferences scale. Can J Nurs Res 1997;29:21–43.

[21] Scherer LD, Caverly TJ, Burke J, Zikmund-Fisher BJ, Kullgren JT, Steinley D, et al. Development of the medical maximizer-minimizer scale. Health Psychol 2016;35:1276–87. https://doi.org/10.1037/hea0000417.

[22] Bradley EH, Curry LA, Devers KJ. Qualitative data analysis for health services research: developing taxonomy, themes, and theory. Health Serv Res 2007;42:1758–72. https://doi.org/10.1111/j.1475-6773.2006.00684.x.

[23] Clarfeld LA, Gramling R, Rizzo DM, Eppstein MJ. A general model of conversational dynamics and an example application in serious illness communication. PloS One 2021;16:e0253124. https://doi.org/10.1371/journal.pone.0253124.

[24] Alejandro A, Zhao L. Multi-method qualitative text and discourse analysis: a methodological framework. Qualitative Inquiry 2024;30:461–73. https://doi.org/10.1177/10778004231184421.

[25] O'Connor C, Joffe H. Intercoder reliability in qualitative research: debates and practical guidelines. Int J Qual Methods 2020;19. https://doi.org/10.1177/1609406919899220. 1609406919899220.

[26] Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International J Qual Health Care 2007;19:349–57. https://doi.org/10.1093/intqhc/mzm042.

[27] Schonberg MA, Davis RB, McCarthy EP, Marcantonio ER. Index to predict 5-year mortality of community-dwelling adults aged 65 and older using data from the National Health Interview Survey. J Gen Intern Med 2009;24:1115–22. https://doi.org/10.1007/s11606-009-1073-y.

[28] Smith ME, Vitous CA, Hughes TM, Shubeck SP, Jagsi R, Dossett LA. Barriers and facilitators to de-implementation of the choosing wisely(®) guidelines for low-value breast cancer surgery. Ann Surg Oncol 2020;27:2653–63. https://doi.org/10.1245/s10434-020-08285-0.

[29] Jensen-Battaglia M, Lei L, Xu H, Kehoe L, Patil A, Loh KP, et al. Association of oncologist-patient communication with functional status and physical performance in older adults: a secondary analysis of a cluster randomized clinical trial. JAMA Netw Open 2022;5:e223039. https://doi.org/10.1001/jamanetworkopen.2022.3039.

[30] Mohile SG, Epstein RM, Hurria A, Heckler CE, Canin B, Culakova E, et al. Communication with older patients with cancer using geriatric assessment: a cluster-randomized clinical trial from the National Cancer Institute Community Oncology Research Program. JAMA Oncol 2020;6:196–204. https://doi.org/10.1001/jamaoncol.2019.4728.

[31] Jensen-Battaglia M, Lei L, Xu H, Loh KP, Wells M, Tylock R, et al. Communication about fall risk in community oncology practice: the role of geriatric assessment. JCO Oncol Pract 2022;18:e1630–40. https://doi.org/10.1200/OP.22.00173.

[32] Mohile SG, Magnuson A, Pandya C, Velarde C, Duberstein P, Hurria A, et al. Community oncologists' decision-making for treatment of older patients with cancer. J Natl Compr Canc Netw 2018;16:301–9. https://doi.org/10.6004/jnccn.2017.7047.

[33] Lowenstein LM, Volk RJ, Street R, Flannery M, Magnuson A, Epstein R, et al. Communication about geriatric assessment domains in advanced cancer settings: "Missed opportunities". J Geriatr Oncol 2019;10:68–73. https://doi.org/10.1016/j.jgo.2018.05.014.

[34] Jindal SK, Karamourtopoulos M, Jacobson AR, Pinheiro A, Smith AK, Hamel MB, et al. Strategies for discussing long-term prognosis when deciding on cancer screening for adults over age 75. J Am Geriatr Soc 2022;70:1734–44. https://doi.org/10.1111/jgs.17723.

[35] Schoenborn NL, Bowman TL, Cayea D, Pollack CE, Feeser S, Boyd C. Primary care practitioners' views on incorporating long-term prognosis in the care of older adults. JAMA Intern Med 2016;176:671–8. https://doi.org/10.1001/jamainternmed.2016.0670.

[36] Schoenborn NL, Boyd CM, Pollack CE. Physician attitudes about using life expectancy to inform cancer screening cessation in older adults-results from a National Survey. JAMA Intern Med 2022;182:1229–31. https://doi.org/10.1001/jamainternmed.2022.4316.

[37] Schonberg MA, Jacobson AR, Karamourtopoulos M, Aliberti GM, Pinheiro A, Smith AK, et al. Scripts and strategies for discussing stopping cancer screening with adults > 75 years: a qualitative study. J Gen Intern Med 2020;35:2076–83. https://doi.org/10.1007/s11606-020-05735-z.

[38] Schonberg MA, Walter LC. Talking about stopping cancer screening-not so easy. JAMA Intern Med 2013;173:532–3. https://doi.org/10.1001/jamainternmed.2013.3233.

[39] Smith AK, Williams BA, Lo B. Discussing overall prognosis with the very elderly. N Engl J Med 2011;365:2149–51. https://doi.org/10.1056/NEJMp1109990.

[40] Schonberg MA. Decision-making regarding mammography screening for older women. J Am Geriatr Soc 2016;64:2413–8. https://doi.org/10.1111/jgs.14503.

[41] Kunneman M, Branda ME, Hargraves I, Pieterse AH, Montori VM. Fostering choice awareness for shared decision making: a secondary analysis of video-recorded clinical encounters. Mayo Clin Proc Innov Qual Outcomes 2018;2:60–8. https://doi.org/10.1016/j.mayocpiqo.2017.12.002.

[42] Kunneman M, Engelhardt EG, Ten Hove FLL, Marijnen CAM, Portielje JEA, Smets EMA, et al. Deciding about (neo-)adjuvant rectal and breast cancer treatment: missed opportunities for shared decision making. Acta Oncol 2016;55:134–9. https://doi.org/10.3109/0284186X.2015.1068447.

[43] Couët N, Desroches S, Robitaille H, Vaillancourt H, Leblanc A, Turcotte S, et al. Assessments of the extent to which health-care providers involve patients in decision making: a systematic review of studies using the OPTION instrument. Health Expect 2015;18:542–61. https://doi.org/10.1111/hex.12054.

[44] Wasp GT, Knutzen KE, Murray GF, Brody-Bizar OC, Liu MA, Pollak KI, et al. Systemic therapy decision making in advanced cancer: a qualitative analysis of patient-oncologist encounters. JCO Oncol Pract 2022;18:e1357–66. https://doi.org/10.1200/OP.21.00377.

[45] Leppin AL, Humeniuk KM, Fernandez C, Montori VM, Yost K, Kumbamu A, et al. Was a decision made? An assessment of patient-clinician discordance in medical oncology encounters. Health Expect 2015;18:3374–81. https://doi.org/10.1111/hex.12340.

[46] Winkler EC, Reiter-Theil S, Lange-Riess D, Schmahl-Menges N, Hiddemann W. Patient involvement in decisions to limit treatment: the crucial role of agreement between physician and patient. J Clin Oncol 2009;27:2225–30. https://doi.org/10.1200/JCO.2008.17.9515.

[47] Brom L, Hopmans W, Pasman HR, Timmermans DR, Widdershoven GA, Onwuteaka-Philipsen BD. Congruence between patients' preferred and perceived participation in medical decision-making: a review of the literature. BMC Med Inform Decis Mak 2014;14:25. https://doi.org/10.1186/1472-6947-14-25.

[48] Bomhof-Roordink H, Gärtner FR, Stiggelbout AM, Pieterse AH. Key components of shared decision making models: a systematic review. BMJ Open 2019;9:e031763. https://doi.org/10.1136/bmjopen-2019-031763.

[49] Elwyn G, Durand MA, Song J, Aarts J, Barr PJ, Berger Z, et al. A three-talk model for shared decision making: multistage consultation process. BMJ 2017;359:j4891. https://doi.org/10.1136/bmj.j4891.

[50] Clayman ML, Scheibler F, Rüffer JU, Wehkamp K, Geiger F. The six steps of SDM: linking theory to practice, measurement and implementation. BMJ Evid Based Med 2024;29:75–8. https://doi.org/10.1136/bmjebm-2023-112289.

[51] Schonberg MA, Freedman RA, Recht AR, Jacobson AR, Aliberti GM, Karamourtopoulos M, et al. Developing a patient decision aid for women aged 70 and older with early stage, estrogen receptor positive, HER2 negative, breast cancer. J Geriatr Oncol 2019;10:980–6. https://doi.org/10.1016/j.jgo.2019.05.004.

[52] Minami CA, Freedman RA, Karamourtopoulos M, Pinheiro A, Gilliam E, Aliberti G, et al. Acceptability of a patient decision aid for women aged 70 and older with stage I, estrogen receptor-positive, HER2-negative breast cancer. J Geriatr Oncol 2021;12:724–30. https://doi.org/10.1016/j.jgo.2021.02.028.

[53] Elwyn G, Lloyd A, May C, van der Weijden T, Stiggelbout A, Edwards A, et al. Collaborative deliberation: a model for patient care. Patient Educ Couns 2014;97:158–64. https://doi.org/10.1016/j.pec.2014.07.027.

[54] Boyd C, Smith CD, Masoudi FA, Blaum CS, Dodson JA, Green AR, et al. Decision making for older adults with multiple chronic conditions: executive summary for the American Geriatrics Society guiding principles on the care of older adults with multimorbidity. J Am Geriatr Soc 2019;67:665–73. https://doi.org/10.1111/jgs.15809.

[55] Henry SG, Jerant A, Iosif A-M, Feldman MD, Cipri C, Kravitz RL. Analysis of threats to research validity introduced by audio recording clinic visits: selection bias, Hawthorne effect, both, or neither? Patient Educ Couns 2015;98:849–56. https://doi.org/10.1016/j.pec.2015.03.006.