



ORIGINAL ARTICLE – BREAST ONCOLOGY

Evaluation of Surgeon Attitudes Toward Frailty Screening in Breast Oncology Patients

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ABSTRACT

Purpose. The American Society of Clinical Oncology recommends integration of geriatric-specific screening tools in the evaluation of older adults undergoing systemic therapy. How these data affect surgical oncology care is underexplored. We evaluated the effect of these data on preoperative surgical decision-making and communication.

Methods. Patients ≥ 70 years, who presented to a breast surgical oncology clinic from October 2021 to May 2024 were screened for frailty using the Geriatric-8 (G8) and limited life expectancy using the Schonberg Index. Surgeons received the results prior to consultation with the patient. Post-visit surveys assessed whether the tools influenced treatment decisions or conversations. Semistructured interviews were conducted pre- and postimplementation to capture surgeon perspectives. Survey data were analyzed descriptively; interviews were analyzed by using a thematic analysis approach.

Results. Thirteen surgeons participated; 92% were fellowship-trained. Among 233 patient encounters, results altered treatment plans a minority of the time (G8: 4%, Schonberg Index: 4%). However, approximately 30% of surgeons stated the results shifted discussion, and 10% discussed results explicitly with patients. Three themes emerged in interviews: (1) the tools often reinforced providers' subjective assessments and were most valuable in "borderline" cases; (2)

surgeons desired better language to discuss frailty and life expectancy; and (3) structural factors affect tool utilization.

Conclusions. Routine frailty and limited life expectancy screening in an academic breast surgery clinic infrequently altered clinical management but did have the potential to inform conversations regarding tailoring locoregional therapy in older adults. Continued work on supporting surgeons in the integration of these tools into treatment conversations, and disseminating similar efforts in different clinical environments, is needed.

Keywords Breast cancer · Frailty · Life expectancy · Geriatric screening · Overtreatment · Undertreatment

The aging process is heterogeneous, requiring nuanced decision-making in oncologic care for older adults. As such, the American Society of Clinical Oncology guidelines for geriatric oncology and the International Society of Geriatric Oncology consensus on geriatric assessment recommend screening for limited life expectancy and performing a geriatric screening assessment in all older adults with cancer undergoing systemic therapy.^{1,2} However, no such guidelines exist in breast surgical oncology, where numerous locoregional treatment options make preoperative decision-making particularly complex.

Although breast surgeries are generally lower-risk operations, measuring frailty and life expectancy may be especially valuable in guiding treatment in this population. In low-risk breast cancers, there is the potential to prevent overtreatment. For example, in patients ≥ 70 years of age with early-stage, hormone receptor-positive disease, although certain interventions, such as sentinel lymph node biopsy or radiation therapy, may serve to

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decrease locoregional recurrence, they do not improve overall survival in this cohort.³⁻⁵ In high-risk breast cancers, there is the opportunity to prevent undertreatment by properly identifying patients who may be able to tolerate multimodal therapy despite their chronologic age.⁶⁻⁸ Despite this, few studies have sought to analyze how geriatric-specific metrics impact locoregional treatment decision-making, and existing evidence remains inconsistent.⁹⁻¹³ To address this gap, we evaluated the impact of receipt of objective life expectancy data and frailty screening prior to consultation with patients ≥ 70 years on surgeon perspectives and treatment recommendations.

METHODS

Study Design

In this explanatory mixed-methods study,¹⁴ we examined the acceptability of geriatric-specific frailty (Geriatric 8 (G8))¹⁵ and limited life expectancy (Schonberg Index) screening tools in a breast surgical oncology clinic. The study timeline and schema are represented in Fig. 1. First, baseline interviews were conducted to assess how providers integrate geriatric-specific metrics into their clinical decision-making. After the implementation of the intervention, survey data were collected to assess the utility of the G8 and Schonberg Index. Finally, postintervention semistructured interviews were conducted to understand the surgeon attitudes and perspectives that may have driven the survey results. The survey tool and subsequent interviews were approved by the Dana-Farber/Brigham Cancer Center Institutional Review Board and adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) reporting guidelines.¹⁶

Intervention and Sample

Routine screening for geriatric-specific frailty and limited life expectancy was initiated in October 2021 at our institution. From October 2021 to May 2024, patients ≥ 75 presenting for a breast surgical oncology consultation were captured prior to their conversation with their treating surgeon. Research staff, who were otherwise not involved in the clinical care of these patients, interviewed patients to calculate the Geriatric-8 (frailty) and Schonberg Index (life expectancy), which is predictive of life expectancy at 5, 10, and 14 years.^{15,17,18} These tools take less than 10 min to administer in clinic.^{19,20} The itemized scores produced by each of these tools were provided to surgeons prior to them walking into the patient consult.

This intervention was instituted as part of routine clinical care, but research staff were leveraged to ease the burden of initial implementation on clinical staff. In May 2024, this screening process was integrated into the standard nursing intake process. While only patients ≥ 75 years were initially captured to pilot the intervention, in February 2022, the age cutoff was lowered to ≥ 70 years to capture a wider pool of patients.

Surveys

After provision of the screening data, all surgeons were administered short surveys by the research assistants following each surgeon-patient encounter. The surveys consisted of four multiple choice questions pertaining to the effect of the frailty and life expectancy data on treatment recommendation and on treatment conversation. These survey items were developed and tested by the study team, because a validated instrument for this purpose does not exist. Surgeons were first asked whether the frailty and life expectancy data, respectively, (1) changed treatment recommendations; (2) reinforced treatment recommendations; or (3) did not affect treatment recommendations. Surgeons

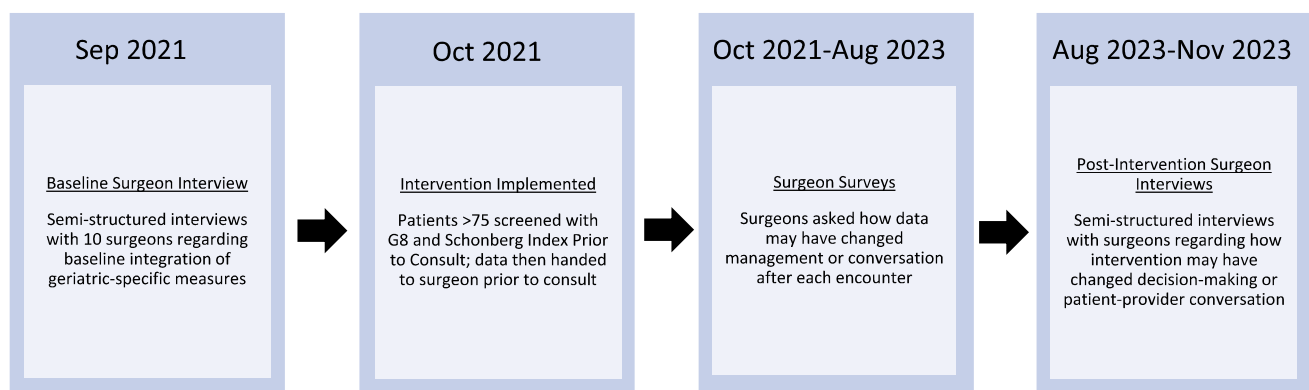


FIG. 1 Study schema and timeline

were then asked whether the frailty and life expectancy data, respectively, influenced their conversation with the patient: (1) yes, we explicitly spoke about the measures; (2) yes, we did not speak explicitly about the measures, but the information changed the direction of the conversations; or (3) no, this information had no bearing on the conversation.

Semistructured Interviews

Prior to the initiation of this intervention, all surgeons in the Division of Breast Surgery participated in semistructured interviews by C.A.M., a female breast surgeon (MD, MS) with qualitative research experience, to evaluate baseline integration of frailty and life expectancy measures into clinical practice. Follow-up interviews with 12 surgeons were performed by E.H.L., a female surgical resident (MD), and/or A.J.R., a female qualitative researcher (PhD), at the end of the first 24 months of the geriatric screening program.

Verbal informed consent was obtained to audio record the interviews, which were transcribed verbatim and entered into ATLAS.ti (Lumivero/Scientific Software Development GmbH, Berlin, Germany) for qualitative data analysis by the study team. All interviews were less than 1 hr in length. Field notes were then reviewed by the team during biweekly meetings, and saturation of themes was confirmed upon completion of all interviews. Acceptability of intervention measures (AIM) were also collected at the end of the intervention.²¹

Analysis

Survey data were analyzed in aggregate and for each individual surgeon using descriptive statistics. Qualitative thematic analysis was performed in the same fashion for baseline and post-intervention interviews, with transcripts organized in ATLAS.ti. A deductive codebook was first developed by C.A.M., A.J.R., E.H.L., and K.N. (male research assistant (BA)) based on the interview guides and using four randomly selected transcripts. The codebook was iteratively revised based on team discussion of each transcript. E.H.L. and K.N. then coded all transcripts using the final codebook. The study team met biweekly to resolve discrepancies and to discuss the emergent themes. Participants were not involved in qualitative data analysis.

RESULTS

Surgeon Participants

Thirteen female surgeons at Brigham and Women's Hospital/Dana-Farber Brigham Cancer Center participated in the study: ten surgeons in the quantitative data collection and 12 in the qualitative semistructured interviews (nine

participated in both). The average number of years in practice was 11.4 (range 1–25 years). Seventy-seven percent of surgeons classified their practice as academic, and 92% had completed fellowship training in either breast surgical oncology or complex general surgical oncology. Each physician experienced the intervention with an average of 23 patients (range 4–48); in total, 233 patients were screened using the G8 and Schonberg Index in this timeframe.

Postintervention Survey Data

Overall, most surgeons reported that the frailty and life expectancy information did not change their treatment recommendations (frailty: 58%, life expectancy: 57%). In 37% (frailty) and 39% (life expectancy) of cases, the information reinforced treatment recommendations. In a minority of cases, the information provided changed treatment recommendations (frailty: 4%; and life expectancy: 4%).

When considering whether the interventions influenced conversation, while 60% of surgeons reported that the frailty information and life expectancy information had no bearing on conversation, 30% did report that the information changed the direction of the conversation, though it was not discussed explicitly, and 10% did explicitly speak about each measure with patients (Fig. 2).

Qualitative Results

Acceptability of the intervention was high across all domains for surgeons that participated in the acceptability of intervention measure at or after the time of their postintervention interview (Table 1). Three major themes emerged from the qualitative interviews: (1) the tool is a useful adjunct to, but not a replacement for, clinical judgement; (2) surgeons' desire better language with which they can discuss the results of the screening tools; and (3) structural factors affect tool utilization. Representative quotes for each theme are displayed in Table 2.

Theme 1: Most Often, the Tool is a Useful Adjunct to, but Not a Replacement for, Clinical Judgment

In general, participants identified the tool as a helpful adjunct to, but not a replacement for, clinical judgement. The data gleaned from the G8 and Schonberg Index most often corroborated the subjective "eye-ball" impression of the surgeon. Physicians felt that having the data may have instilled more confidence in their decision-making. However, because of the frequent concordance between their objective and subjective impressions, it rarely changed treatment decisions. Nonetheless, it did allow for better previsit preparation, with surgeons noting that it was "helpful to have that information

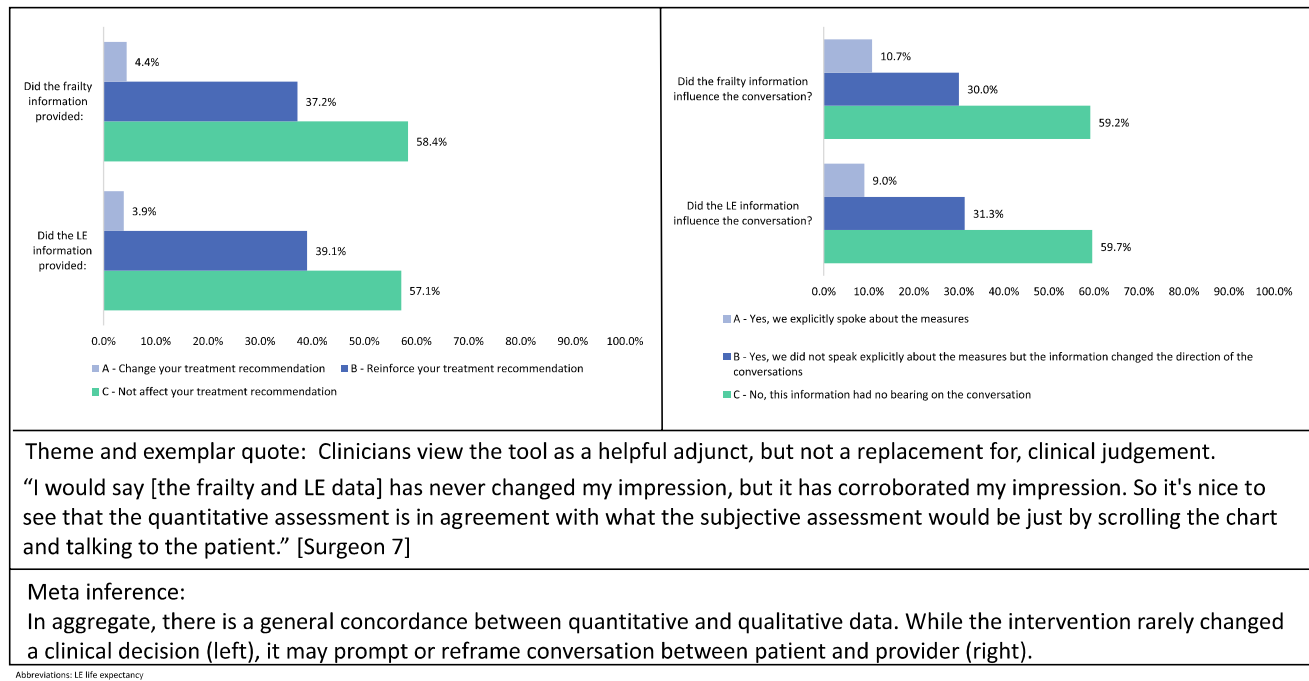


FIG 2 Joint display of aggregate qualitative and quantitative surgeon data

TABLE 1 Acceptability of intervention measure

	Percentage of participants (%) <i>N</i> = 10				
	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
The geriatric screening meets my approval.	0	0	0	20	80
The geriatric screening is appealing to me.	0	0	0	40	60
I like the geriatric screening.	0	0	0	40	60
I welcome the geriatric screening.	0	0	10	20	70

even before meeting the patient so that you have a little bit of an expectation of how to frame your conversation with the patient” [Surgeon 3] (Fig. 2).

Where there may have been a discordance between a surgeon’s subjective impression of the patient and the objective data from the assessments, surgeons felt that the information was helpful. As one surgeon described, the data are most useful in “borderline cases where...it could go either way. Like it’s a gray zone where you could do more or you could potentially de-escalate and do less”, [Surgeon 3] and thus use the information as a guide. In addition, in cases in which the data showed that a patient was less frail with a longer life-expectancy than the surgeon’s own subjective assessment, surgeons shifted away from treatment de-escalation. For example, a 79-year-old patient who, by the Schonberg Index had a very low projected mortality at 14 years, presented with a recurrence. The patient initially desired no treatment or lumpectomy, but because of the screening

information, the surgeon said to her: “...When you look at this data, you’re going to be here in 15 years, and I think we should treat you with standard of care, which is a mastectomy” [Surgeon 13]. In this case, the surgeon noted that she otherwise would have “pushed for maybe doing a lumpectomy, omitting radiation, and that kind of thing” [Surgeon 13] (Fig. 3).

Theme 2: Surgeons Desire Better Language to Discuss Frailty and Life Expectancy with Patients

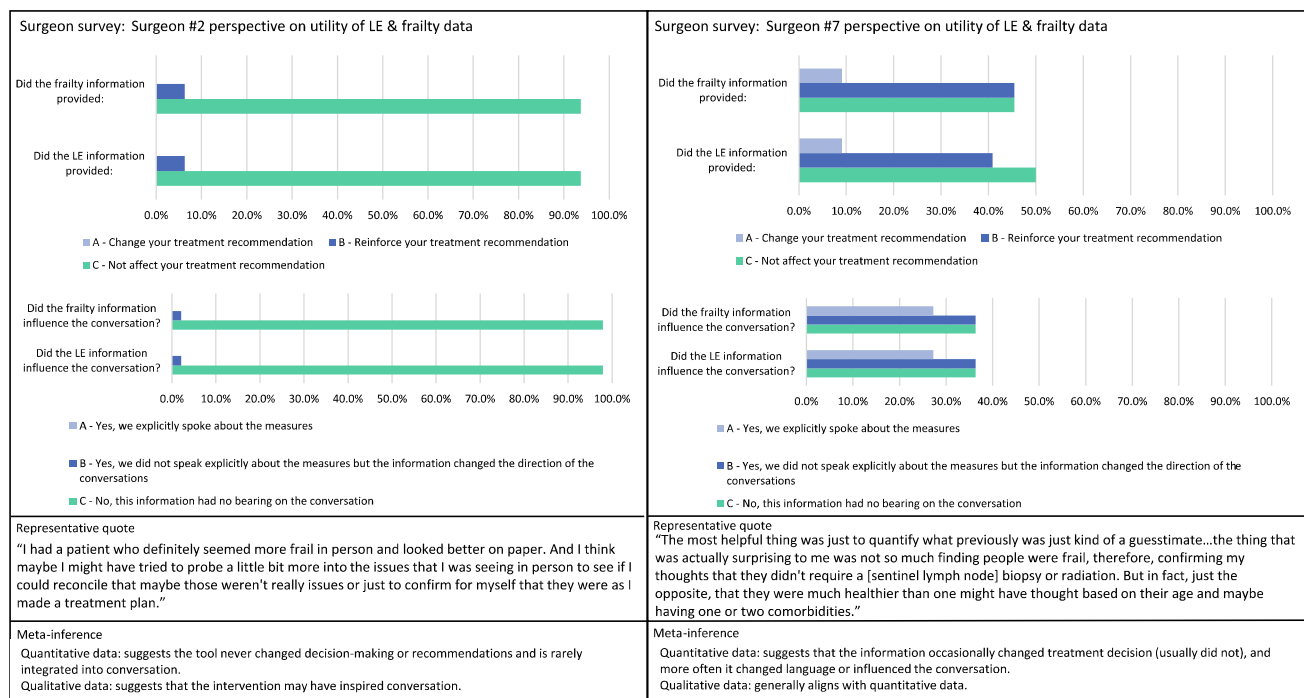
While the tool did not often change treatment course, it did occasionally play a role in opening conversations between patient and provider. Knowing that the patient was approached with these questions created an opportunity for discussion. Whether the measure was explicitly discussed during the consult, however, was surgeon-dependent.

TABLE 2 Qualitative themes and notable quotations

Theme	Representative quotations
<i>Theme 1: Utility of the tool</i>	
Clinicians view the tool as a helpful adjunct, but not a replacement for, clinical judgement	I would say [the data] has never changed my impression, but it has corroborated my impression. So it's nice to see that the quantitative assessment is in agreement with what the subjective assessment would be [Surgeon 8]. [T]he force of mortality for most elderly women is not their breast cancer diagnosis. And so being able to quantify that for myself internally as I'm talking about the pros and cons of different treatment strategies, I found helpful [Surgeon 4].
The data is most helpful at the margins	[The tool] is useful in more borderline cases where there is maybe like...a gray zone where you could do more or you could potentially de-escalate and do less or kind of in those surgical timing decisions [Surgeon 3]. I had a patient who screened in as quite frail who was very inclined to have a mastectomy or even a double mastectomy for her very early breast cancer. And that was the case where I tried to use the quantitative data from the frailty scale to sort of help reinforce why I did not favor the patient having a more aggressive therapy [Surgeon 2]. [I]t was good to have numbers and data to kind of further inform the recommendations...the thing that was actually surprising to me was not so much finding people were frail, therefore, confirming my thoughts that they didn't require a biopsy or radiation. But in fact, just the opposite, that they were much healthier than one might have thought based on their age and maybe having one or two comorbidities. And so made me more inclined to do those node and radiation. So it kind of did help inform some of my conversations, but in the opposite direction of what I would have hypothesized [Surgeon 7].
<i>Theme 2: Desire for language</i>	
Fear of frailty: how to incorporate data into conversation?	Maybe I should try to use the term frail, but I just think facing the patient, it may sound a little bit of, you know, a strong term [Surgeon 8]. I do still have a little bit of angst in telling somebody your mortality in the next 10 years is X, because almost no matter what it is, it's not 100; you know it's not like a 0% mortality. So that's something that I and maybe I need to think about how to incorporate that in the conversations, but it's not something that I feel particularly comfortable with in part because what I'm going to do to them is not likely going to cause a fatal event...[H]ow do the people who do give the numbers to the patients? How do they do so? And then what kind of presumably people who do it routinely have now gotten a rhythm or a flow, basically a script that they use or a spiel, as I call it, that they're very comfortable with. It'd be helpful to know what they do or say [Surgeon 7]. [I]t's not to say that I threw cancer outcomes completely out the door, but I think it really does kind of change the whole way that I even would start the conversation. I often do just sort of explicitly say something along the lines of, "you know listen, you're an older individual. You've got other medical problems going on. And so we really need to think about this breast cancer in the context of everything else and think about making sure that we keep this disease under control, but recognizing that we're not necessarily so worried about you know what we need to do to keep this cancer from coming back 25 years down the road" [Surgeon 5].
The tool is a lens for ageism	I have had concerns about ageism come up in patients...I think their perception, especially their family member's perception, is that you're giving up on them, whereas something that they are inquiring about is clearly too risky to contemplate. So I think having more information about why the assessment is made the way it has been is helpful. So you're not just discriminating basis of their age...it's the comorbidities. It's other factors that drive these assessments [Surgeon 8]. The word frail, I think, for some [patients], especially those that are more towards the 65–70 age group being labeled as frail, I worry a little bit about that [Surgeon 12]. I am always mindful about not wanting to give a patient the impression that I'm not properly treating their cancer because of their age or because of the fact that they're maybe a little bit more frail or have underlying medical problems. I don't want to give off the impression that I'm sort of "under-treating" them because of those things and so I guess that's why—part of the reason why—I maybe don't more explicitly talk about it and how it's influencing my decision making [Surgeon 5].
<i>Theme 3: Structural factors affect tool utilization</i>	

Table 2 (continued)

Theme	Representative quotations
Context matters: institutional setting and workflow will impact tool utility/utilization	I think the data is nice to have, but I also recognize that there are some downsides, one of them being clinic flow, and then one of them just being you know ultimately cost and manpower issues...the reality is that the information didn't frequently change my management plan. And so depending on the environment, I think if the resources are there to support the implementation of these tools, I certainly welcome the information [Surgeon 5]. I think the highest impact would be a rescue, for lack of a better word. And so if a patient is truly so frail that they should not undergo whatever intervention without getting whatever that prehabilitation should be, then I think that's where the biggest impact because then you're rescuing a patient is how I think of it [Surgeon 11]. [M]aybe we should start integrating [the data] into tumor board for at least these older patients, but we don't routinely, I would say. But it would be a potential role [Surgeon 3]. [M]aybe that tool is more of a shared language that then those clinicians can use to figure out what's appropriate sort of a pathway, what's appropriate to leave out if a patient's frail or not [Surgeon 2].



Abbreviations: LE life expectancy

FIG. 3 Joint display of individual Surgeon 2 and Surgeon 7 qualitative and quantitative data

Surgeons who did feel comfortable discussing these metrics with patients tended to do so by contextualizing a patient's breast cancer diagnosis within her other health conditions. However, most surgeons reported discomfort with discussions about frailty and life expectancy. They shared that they do not use the term "frail" or explicitly discuss mortality for fear of evoking ageism. Specifically, they sought to avoid being perceived as though they may be undertreating disease based on age. Those who did

not feel comfortable including these data in conversation expressed interest in having a language guide developed by those who regularly incorporate these metrics into their conversations with patients.

Theme 3: Structural Factors Affect Tool Utilization

Surgeons also acknowledged structural factors that may contribute to the success or utility of this intervention. For

example, some surgeons hypothesized that this intervention would be difficult to implement in a lower-resource hospital setting without adequate staffing to facilitate screening prior to consultation. Surgeons also discussed formalizing the integration of these tools into multidisciplinary care, such as using the scores as a shared language in tumor board or including it in the medical record. Ideally, this would ensure geriatric-specific care delivery across the entire treatment course to improve cross-disciplinary decision-making. It was also suggested that the screening could serve as potential “rescue” for patients, for example, if the intervention could “trickle into patient care outside of just their breast cancer management” [Surgeon 11].

Integrated Mixed-Methods Results

In our joint display analyses, qualitative findings were largely concordant with the quantitative data (Fig. 2). Survey responses revealed that frailty and life expectancy information rarely changed treatment recommendations, a finding echoed in interviews where surgeons described the tools as reinforcing, rather than replacing, their clinical judgment. While survey data indicated that these measures seldom directly altered patient-provider conversations, interviews provided greater nuance: some surgeons noted that the tools helped shape the tone or direction of discussions, even if the scores were not explicitly referenced (Fig. 3). Several surgeons expressed that their limited use of the data in conversation may stem from discomfort or lack of appropriate language, suggesting that the gap between data availability and its clinical integration may be, in part, a communication barrier.

DISCUSSION

Our explanatory mixed-methods study demonstrates that inclusion of geriatric-specific screening in the surgical clinic setting was acceptable among surgeons. Overall, for most surgeons, the results of the G8 screening tool and Schonberg Index rarely changed clinical decision-making. However, a proportion of surgeons reported in surveys that the results of the intervention had the potential to reshape conversation with their patients. Semi-structured interviews revealed the nuances of applying these data in clinical situations, highlighting that many surgeons struggle with the appropriate language to use when discussing sensitive topics, such as frailty and life expectancy to avoid ageism. Furthermore, contextual factors can strongly affect the application of these data.

These findings align with evidence demonstrating that measures of physiologic age, such as frailty and estimated life expectancy, identify substantial heterogeneity among older adults with early-stage breast cancer. Often, however,

these measures have limited observable influence on treatment pattern. Prior work in this clinical setting evaluating how G8 and Schonberg scores relate to clinical management has shown that even when a sizable proportion of older adults screen as frail or as having limited life expectancy, surgical and adjuvant treatment decisions tend to follow traditional paradigms rather than incorporate geriatric risk stratification.¹³ Our study extends this literature by exploring surgeon perspectives and contextual factors that influence whether and how geriatric assessments are used during real-time decision-making, helping to clarify why objective measures may not consistently translate into individualized treatment recommendations.

The majority of the study surgeons felt that the tool reinforced their subjective impressions of a patient’s frailty, suggesting that clinical gestalt—particularly among fellowship-trained breast surgeons—may align with objective frailty and life expectancy data. Nonetheless, these findings may not be generalizable to surgeons without subspecialty training, where the integration of such tools could have a larger impact. There are data that demonstrate that these objective measures consistently outperform a provider’s “eyeball” test.²²⁻²⁴ In fact, oncologists may miss almost half of patients who are deemed frail according to a modified geriatric assessment,²³ potentially due to inadequate training on how to use these data in clinical decision-making and conversation.²⁵⁻²⁷ Misinterpreting a patient’s frailty status poses a risk of over- or undertreatment of a patient’s disease.²⁸ Frail patients are at greater risk for adverse treatment outcomes, such as post-operative morbidity, chemotherapy-related toxicity, and have worse breast cancer-specific and overall survival.²⁹⁻³² In the surgical literature, frailty has also been shown to be associated with higher mortality, even in low-risk surgeries.³³⁻³⁶ Our interviews suggest that in cases in which the tool reinforced or exposed a patient’s frailty, providers were both more willing and better equipped to avoid unnecessary surgery. In cases where patients were less frail with a longer life expectancy, providers were more likely to consider offering additional locoregional treatment, the benefits of which can be realized over a longer lifespan. These potential changes in provider recommendations have important implications, as older age has been associated with a preference for allowing physicians to make decisions in their care,³⁷ and using geriatric assessments in oncology have been associated with improved outcomes.^{32,38,39}

More consistently, the screening tools opened the door for additional patient-provider discussion, whether the results were explicitly included in the dialogue or not. Consistent with our findings, there are existing data that life expectancy and frailty are challenging for all physicians to discuss with patients, from primary care to cancer care.^{25,26,40,41} The major concerns expressed by study participants pertained to ageism by using language with potentially negative

connotations, such as “frail”. While clinicians do not perceive that chronologic age influences their treatment recommendations, it does have significant bearing on what they recommend to patient,^{42–45} although previous studies show clinicians fear being perceived as judgmental or giving up on their patients if age-related prognosis is incorporated into their decision-making.⁴¹ Healthcare professionals treating older adults with breast cancer may assume that older patients have greater difficulty understanding treatment options, that it will take more time to explain things to older patients, and that patients prioritize quality of life over length of life.⁴⁴ However, patient data suggest that older breast cancer patients want to be involved in decision-making,^{46–48} but they feel ignored or misunderstood,^{48–50} preventing them from making well-informed choices. Thus, in some ways, the intervention may reduce ageism by extending the conversation beyond chronologic age, as incorporation of geriatric assessments and shared decision-making does optimize outcomes in this patient population.^{51,52}

Surgeons who did not feel comfortable sharing the results of the frailty and life expectancy screening expressed an interest in having a language guide or script to facilitate discussion. While there exist validated patient decision aids for older women with breast cancer,^{53,54} there is still need for support in these patient-physician interfaces. Leveraging communication frameworks, such as the American Geriatrics Society decision-making framework for patients with multimorbidity,⁵⁵ or borrowing strategies from established physician conversation guides developed in other areas, such as in conversations surrounding the cessation of breast and colon cancer screening,²⁶ may be helpful.

Lastly, apart from the tools’ role in patient-provider communication, most surgeons acknowledged that implementation of this intervention would depend on institutional setting. Although completing some form of geriatric assessment is recommended for older adults with cancer, this is infrequently done in practice.^{1,56} Our tertiary care center was equipped with additional research and clinic staff that allowed for integration of these tools without significant disruption to clinic flow. However, barriers in diverse practice settings include: time constraints in a busy clinical practice,^{56,57} and the belief that the tool does not add meaningful value.⁵⁷ Moreover, uncovering vulnerabilities in older patients leads to further questions (e.g., how to support them through treatment,^{58,59} and how to promote engagement in established geriatric programs⁵⁹) that may ultimately stall screening implementation. Improving tool accessibility via online access or through the electronic medical record, creating structural or financial incentives to integrate them, and a greater focus on educational initiatives to stress the tools’ value are potential strategies to increase uptake.⁵⁶ Nonetheless, institutions will have to work to

understand how these initiatives can be implemented to their specific cultures.

Although this study supports implementation of these screening tools, it is not without limitations. The intervention was conducted at a single, high-resource institution, which affects its potential generalizability. The use of a research assistant to carry out the screening at the beginning of the intervention reflects this setting, although by the end of the intervention, the screening had been transitioned to clinic staff to ensure longevity. Each surgeon performed a variable number of patient evaluations, which may have skewed survey results towards the perspectives of the high-volume practitioners. Lastly, these tools rely on self-reported data from patients, which may affect their accuracy.

CONCLUSIONS

The implementation of frailty and life expectancy screening in a single-institution breast surgery clinic is acceptable among surgeons and has the potential to change decision-making and inform conversations regarding tailoring locoregional therapy for older adults. Future work should focus on developing support for clinicians in these potentially difficult conversations, evaluating implementation in more diverse surgical settings, and determining in which practice environments frailty and life expectancy screening provides the greatest added value.

SUPPLEMENTARY INFORMATION The online version contains supplementary material available at <https://doi.org/10.1245/s10434-025-18900-7>.

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AUTHOR CONTRIBUTIONS Conceptualization: Minami, Data curation: Minami, Lorentzen, Reich, Nguyen, Formal analysis: Minami, Lorentzen, Reich, Nguyen, Funding acquisition: Minami, Investigation: Minami, Lorentzen, Reich, Nguyen, Methodology: Minami, Lorentzen, Reich, Project administration: Minami, Lorentzen, Reich, Resources: Minami, Reich, Software: Reich, Visualization: Minami, Lorentzen, Reich, Writing—original draft: Lorentzen, Minami, Writing—review & editing: Minami, Lorentzen, Reich, Nguyen, Supervision: Minami, Reich, Validation: Minami, Lorentzen, Reich.

DATA AVAILABILITY Dr. Minami had full access to all the data in the study and takes responsibility for the integrity of the data and accuracy of the data analysis.

DISCLOSURE All other authors report no disclosures or conflicts of interest.

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