



# A Prospective Comparison of Younger and Older Patients' Preferences for Adjuvant Chemotherapy and Hormonal Therapy in Early Breast Cancer

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## Abstract

**This study prospectively compared the preferences for adjuvant systemic therapy of younger and older patients with early breast cancer. Older patients accepted adjuvant chemotherapy less often than younger patients. No significant difference was found for adjuvant hormonal therapy. The majority of older patients would still accept therapy. Both age groups required similar benefits in disease-free survival to accept therapy.**

**Background:** It is unknown what minimal benefit in disease-free survival older patients with breast cancer require from adjuvant systemic therapy, and if this differs from that required by younger patients. We prospectively examined patients' preferences for adjuvant chemotherapy (aCT) and adjuvant hormonal therapy (aHT), factors related to minimally-required benefit, and patients' self-reported motivations. **Patients and Methods:** Fifty-two younger (40-64 years) and 29 older ( $\geq 65$  years) women with a first primary, invasive tumor were interviewed post-surgery, prior to receiving aCT/aHT recommendation. **Results:** The proportions of younger versus older participants who would accept, refuse, or were undecided about therapy were 92% versus 62%, 4% versus 24%, and 4% versus 14% for aCT, and 92% versus 59%, 8% versus 17%, and 0% versus 24% for aHT. The proportion of older participants who would refuse rather than accept aCT was larger than that of younger participants ( $P = .005$ ). No significant difference was found for aHT ( $P = .12$ ). Younger and older participants' minimally-required benefit, in terms of additional 10-year disease-free survival, to accept aCT (median, 5% vs. 4%;  $P = .13$ ) or aHT (median, 10% vs. 8%;  $P = .15$ ) did not differ. Being single/divorced/widowed (odds ratio [OR], 0.16;  $P = .005$ ), presence of geriatric condition (inability to perform daily activities, incontinence, severe sensory impairment, depression, polypharmacy, difficulties with walking; OR, 0.27;  $P = .047$ ), and having a preference to make the treatment decision either alone or after considering the clinician's opinion (active role; OR, 0.15;  $P = .012$ ) were independently related to requiring larger benefits from aCT. The most frequent motivations for/against therapy included the wish to survive/avoid recurrence, clinician's recommendation, side effects, and treatment duration (only aHT). **Conclusion:** Whereas older participants were less willing to accept aCT than younger participants, no significant difference was found for aHT. However, a majority of older participants would still accept both therapies. Adjuvant systemic therapy should be discussed with eligible patients regardless of age.

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# Younger and Older Patients' Preferences for Adjuvant Systemic Treatment

## Introduction

Breast cancer (BC) is a disease affecting a large proportion of women over 65 years of age. In Western countries, approximately 40% of new cases occur in older women.<sup>1</sup> As the risk of developing BC increases with age and the general population is aging, the number of older patients is expected to rise significantly.<sup>1</sup>

In most cases of early stage (I-II) BC, adjuvant systemic therapy is recommended in addition to primary surgery with or without postoperative radiotherapy. The addition of adjuvant chemotherapy (aCT) or adjuvant hormonal therapy (aHT) can lower the risk of BC relapse and mortality.<sup>2</sup> However, these therapies are associated with short- and long-term side effects, which, in turn, can cause physical, psychological, and social problems.<sup>3</sup> Therefore, the expected benefits need to be carefully weighed against the side effects. With regard to older patients, making the decision for or against systemic therapy is generally difficult. Benefits of adjuvant systemic therapy in older patients, especially those of aCT, are uncertain because of small numbers of older women in trials.<sup>2,4</sup> Moreover, high rates of comorbid conditions and polypharmacy in this patient group pose additional challenges.<sup>4</sup> Consequently, treatment decisions in older patients should incorporate their valuation of potential benefits and side effects of treatment strategies.<sup>5</sup>

So far, data on older patients' preferences for aCT and aHT are limited. We performed a systematic review of patients' preferences,<sup>6</sup> and found that most patients judged small to modest survival benefits sufficient to consider these therapies worthwhile, regardless of the consequences. A limitation of the reviewed studies was that the women surveyed had already been treated or had already received a treatment recommendation, which could have had a strong influence on their reported treatment preferences.<sup>7</sup> Moreover, most patients were young or middle-aged (mean/median age of 36-55 years),<sup>7-12</sup> and none of the studies on aHT included patients aged  $\geq 65$  years.<sup>8,12</sup>

A few studies have retrospectively explored factors that may affect the decisions about adjuvant systemic treatment of older patients with BC.<sup>13-15</sup> These studies involved only patients aged 65 to 70 years and over, making it difficult to determine whether older patients place different values on benefits versus side effects of adjuvant systemic therapy than younger patients. To our knowledge, solely 1 retrospective study examined age differences in factors influencing treatment decisions for aCT and aHT.<sup>16</sup> Of the other existing studies involving patients of all ages, none specifically focused on differences in motivations between younger and older patients.<sup>17-19</sup>

Given the growing incidence of BC in older women, it will become increasingly relevant to establish a more complete picture of treatment preferences in this patient group, and to determine whether their preferences differ from those of younger women. A better understanding of older patients' preferences and the factors that distinctively affect their preferences will assist clinicians in determining the set of treatment options relevant to older patients and in tailoring their information provision better.

The objectives of this prospective study were three-fold. First, to examine whether there are differences in the benefit that younger and older patients minimally require from aCT and aHT to

consider it worthwhile. Second, to determine which factors are related to the minimally-required benefit. Lastly, to examine whether motivations for and against therapy differ between younger and older patients.

## Patients and Methods

### Participants

This study took place at 1 academic and 2 non-academic teaching hospitals in the Netherlands. Between January 2012 and December 2013, women aged  $\geq 40$  years with a primary invasive tumor (clinical T<sub>1-2</sub>) scheduled to undergo surgery with curative intent, were included. Exclusion criteria were bilateral BC, BRCA 1/2 mutation, history of (non)invasive BC, history of other malignancies (other than nonmelanoma skin cancer or cervical carcinoma in situ) within the past 5 years, insufficient knowledge of the Dutch language, cognitive/mental problems, inability to participate in a telephone interview (eg, hearing impairment), and a diagnosis of metastatic BC after resection. The Medical Ethical Committee of the Leiden University Medical Center and the institutional review boards of the participating hospitals approved the study. All participants provided informed consent.

### Procedure

In a telephone interview, we determined participants' minimally-required benefit from aCT and aHT and their motivations for/against both therapies. Eligible participants were approached following their diagnosis, and they received an informed consent form and a self-administered questionnaire on sociodemographic background. After the presurgical consultation and before surgery, consenting patients were handed out a questionnaire about their preferred involvement in decision-making as well as information to prepare for a telephone interview scheduled after their surgery. Participants were asked to read the information right before the interview. Patients usually receive a recommendation for or against adjuvant systemic therapy based on pathologic findings following surgery, during a post-surgical consultation. To rule out that this recommendation could influence the participant's adjuvant treatment preference, the interview was held before that postsurgical consultation. Three trained interviewers conducted the interviews, strictly adhering to a script.

### Measures

*Minimally-Required Benefit and Motivations for/Against Adjuvant Systemic Therapy.* The minimally-required absolute benefit, in terms of additional 10-year disease-free survival, from aCT and aHT was assessed using the probability trade-off method.<sup>20</sup> As part of this method, we developed 2 hypothetical scenarios: no aCT versus aCT, and no aHT versus aHT (see [Supplemental Figure 1](#) in the online version for details). The scenarios were provided to the participant and included information about the treatment strategies and the accompanying health consequences and recurrence risks. During the interview, we read aloud the information, and asked the participant to read along. Next, participants were asked to imagine that their clinician had offered them 2 treatment strategies. We presented a 10% difference in BC recurrence risk at 10 years between no aCT (25 out of 100 women with a recurrence) and aCT

(15 out of 100 with a recurrence), and asked the participants which treatment they preferred at this benefit of aCT of 10%. The participants were asked to indicate their preference each time in subsequent comparisons, in which the absolute benefit from aCT was systematically increased or decreased, depending on their answer. If their initial preference was aCT, we searched for their minimally-required benefit between the range of 0% (no benefit) and 10%. If their initial preference was no aCT, we searched for the minimally-required benefit between the ranges of 11% and 25% (maximum benefit). Participants could indicate to refuse aCT if they considered that, for a benefit of 25%, aCT was not worthwhile. After the aCT scenario, we similarly assessed participants' preferred benefit from aHT, except that we presented a 15% difference in 10-year recurrence risk between no aHT and aHT in the initial question. At the end of each scenario, we asked participants about their motivations for their preference.

**Participants' Demographic and Medical Characteristics.** The first self-report questionnaire contained questions about sociodemographic details. Information with regard to type of surgery, comorbid conditions, and geriatric health conditions (ie, inability to carry out daily activities, incontinence, severe sensory impairment, depression, polypharmacy, difficulty with walking<sup>21</sup>) were extracted from medical records. Comorbid conditions at the time of diagnosis were registered according to the 10th revision of the International Classification of Diseases.<sup>22</sup>

**Decisional Role Preference.** We assessed participants' preferred involvement in decision-making about aCT and aHT using an adapted version of the Control Preferences Scale.<sup>23</sup> Participants were asked to choose 1 of 5 decisional roles, ranging from (1) the patient making the decision, (2) the patient making the decision after considering the clinician's opinion, (3) the patient making the decision jointly with the clinician, (4) the clinician making the decision after considering the patient's opinion, to (5) the clinician making the decision.

### Statistical Analyses

Participants were categorized into 'younger' (40-64 years) and 'older' ( $\geq 65$  years) based on their age at diagnosis. The response options for decisional role preference were merged into 3 categories: active (1-2), shared (3), and passive (4-5). Comorbidity was defined as the sum of any comorbid disease (0, 1, or 2 or more diseases). Differences in patient characteristics and decisional role preferences between the groups were examined using the  $\chi^2$  test or the Fisher exact test, as appropriate.

Participants' minimally-required benefits to accept aCT and aHT were categorized into 0%, 1% to 5%, 6% to 10%, 11% to 15%, 16% to 20%, and 21% to 25%. Participants who were undecided about the minimally-required benefit were excluded from further analyses. Younger versus older participants' minimally-required benefits and acceptance versus refusal of therapy were compared using the Fisher exact test.

Univariable logistic regression analyses were conducted to examine the association between minimally-required benefit and patient characteristics and decisional role preference. The minimally-required benefit of both aCT and aHT was

dichotomized into 0% to 10% required benefit ('1') and 11% to 25% required benefit or refusal of therapy ('0'). A multivariable model was built with all significant factors ( $P < .05$ ) in univariable analysis.

Two researchers independently coded participants' motivations. Dissimilarities in coding were resolved through consensus. As this section was conducted for exploratory purposes, statistical differences in motivations between the age groups were not tested.

Analyses were conducted using SPSS version 20. A  $P$ -value below .05 was considered statistically significant.

## Results

### Participants

Overall, 100 women with invasive BC were eligible for this study. Of them, 13 were not interviewed before the postsurgical consultation, and 6 withdrew before the interview. The reasons for withdrawal were no interest ( $n = 3$ ), being nervous about getting the pathology results within the next few days ( $n = 2$ ), and not being fully recovered from surgery ( $n = 1$ ). Eighty-one participants were included in the analyses. The median time between surgery and the interview was 6 days (range, 3-12 days), and the telephone interview lasted on average 30 minutes (range, 10-50 minutes).

The participants' median age was 61 years (range, 42-86 years). Fifty-two (64%) participants were aged 40 to 64 years, and 29 (36%) were aged  $\geq 65$  years (Table 1). Overall, most women were married/lived together (51 of 81; 63%), had completed an intermediate-level education (35 of 81; 43%), were employed (38 of 81; 47%), and had children living at home (49 of 81; 61%). Seventy-two percent (58 of 81) had  $\geq 1$  comorbid condition, and 38% (31 of 81) suffered from  $\geq 1$  geriatric health condition at diagnosis. Eighty percent (65 of 81) were treated with breast-conserving surgery. Most participants preferred to share the decision about aCT (42 of 73; 58%) and aHT (39 of 73; 53%) with the clinician.

### Minimally-Required Benefit in 10-Year Disease-Free Survival From aCT

Some younger (2 of 52; 4%) and older (4 of 29; 14%) participants could not decide which benefit they would minimally require to consider the therapy worthwhile. In the remaining participants, 92% (48 of 52) of the younger and 62% (18 of 29) of the older participants, respectively, would accept aCT, and 4% (2 of 52) of the younger and 24% (7 of 29) of the older participants would refuse aCT at the maximum absolute benefit of 25% (Figure 1A). Older participants refused aCT significantly more often than younger participants ( $P = .005$ ). Of those who would accept therapy, the younger participants considered aCT worthwhile at an absolute median benefit of 5% (range, 1%-25%) and the older participants at an absolute median benefit of 4% (range, 0%-25%). These minimally-required benefits did not significantly differ ( $P = .13$ ).

### Minimally-Required Benefit in 10-Year Disease-Free Survival From aHT

None of the younger and 24% (7 of 29) of the older participants were undecided about their minimally-required benefit. In the remaining group, the majority of younger (48 of 52; 92%) and older (17 of 29; 59%) participants would accept aHT (Figure 1B).

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**Table 1** Characteristics of the Study Population Overall (n = 81) and by Age Category

Variables	Total (n = 81)		40-64 Years (n = 52; 64%)		≥65 Years (n = 29; 36%)		P
	n	%	n	%	n	%	
<b>Patient characteristics</b>							
Marital status							
Married/living together	51	63	33	63	18	62	.90
Single/divorced/widowed	30	37	19	37	11	38	
Educational level <sup>a</sup>							
Low	20	25	13	25	7	24	.19
Intermediate	35	43	19	37	16	55	
High	26	32	20	39	6	21	
Employment status							
Full/part-time	38	47	36	69	2	7	<b>&lt;.001</b>
Housekeeper	9	11	3	6	6	21	
Unemployed/long-term sick leave	8	10	8	15	0	0	
Retired	26	32	5	10	21	72	
Having children							
No children	18	22	11	21	7	24	<b>.044</b>
Yes, children not living at home	49	61	28	54	21	72	
Yes, children living at home	14	17	13	25	1	3	
Number of comorbid conditions							
0	23	28	19	37	4	14	.08
1	21	26	13	25	8	28	
2 or more	37	46	20	39	17	59	
Geriatric health condition <sup>b</sup>							
No	50	62	35	67	15	52	.17
Yes	31	38	17	33	14	48	
<b>Treatment characteristics</b>							
Type of surgery							
BCS	65	80	43	83	22	76	.46
MAST	16	20	9	17	7	24	
<b>Decisional role preference<sup>c</sup></b>							
Adjuvant chemotherapy <sup>d</sup>							
Active	19	26	12	26	7	26	.71
Shared	42	58	25	54	17	63	
Passive	12	16	9	20	3	11	
Adjuvant hormonal therapy <sup>d</sup>							
Active	21	29	14	30	7	26	.42
Shared	39	53	22	48	17	63	
Passive	13	18	10	22	3	11	

A P-value in bold means a significant difference between younger and older participants with respect to that variable.

Abbreviations: BCS = breast-conserving surgery; MAST = mastectomy.

<sup>a</sup>Levels of education were categorized as low = completed no/primary school; intermediate = completed lower general secondary education/vocational training; or high = completed pre-university education/high vocational training/university.

<sup>b</sup>Presence of a geriatric health condition was defined as having one or more of the following characteristics: not able to carry out daily activities, incontinence, severe sensory impairment, depression, polypharmacy, difficulties with walking.

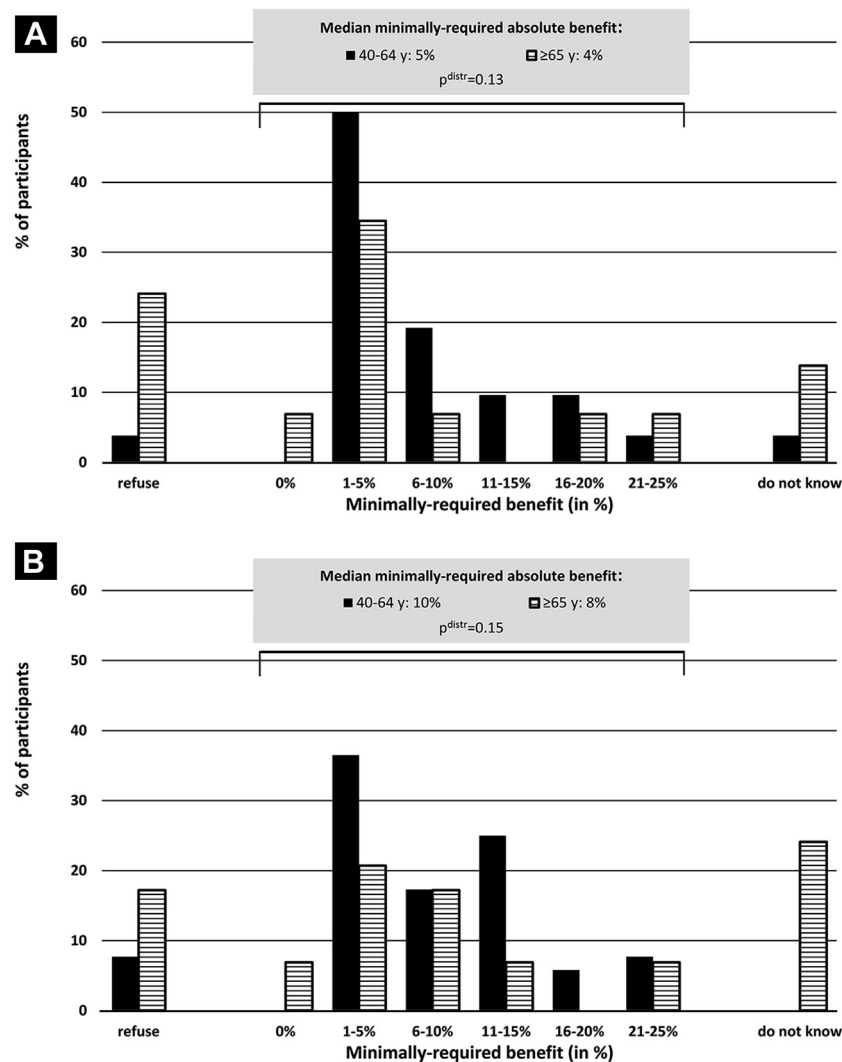
<sup>c</sup>Decisional role preferences were merged into 3 categories: active (the patient makes the decision alone, the patient makes the decision after considering the clinician's opinion); shared (the patient makes the decision together with the clinician); and passive (the clinician makes the decision after considering the patient's opinion, the clinician makes the decision alone).

<sup>d</sup>Eight participants did not fill out this question before the postoperative consultation.

Eight percent (4 of 52) of the younger and 17% (5 of 29) of the older participants would refuse aHT at an absolute benefit of 25%. Overall, acceptance versus refusal rates did not significantly differ between younger and older participants ( $P = .12$ ). Of the group

accepting therapy, younger and older participants considered it worthwhile at a median of 10% (range, 1%-25%) and 8% (range, 0%-25%) absolute benefit, respectively. These minimally-required benefits did not significantly differ ( $P = .15$ ).

**Figure 1** The Minimum Absolute Increase in 10-Year Disease-Free Survival that Younger ( $n = 52$ ) and Older ( $n = 29$ ) Participants Would Require to Consider Adjuvant Chemotherapy (A) or Hormonal Therapy (B) Worthwhile. In Both Scenarios, the 10-Year Disease-Free Survival Without Adjuvant Systemic Therapy Was 75%, and the Minimally-Required Benefit to Accept Therapy Could Range From 0% (No Benefit) to 25% (Maximum Benefit)



Abbreviations: refuse = women who would not accept therapy at any benefit; do not know = women who were undecided about the minimal benefit they would require to consider the therapy worthwhile;  $p^{\text{distr}}$  =  $P$ -value for distribution.

### Factors Related to Minimally-Required Benefit

Univariable logistic regression analyses showed that participants who were single/divorced/widowed were significantly less likely to accept aCT (odds ratio [OR], 0.21; 95% confidence interval [CI], 0.08-0.59;  $P = .003$ ) or aHT (OR, 0.34; 95% CI, 0.13-0.92;  $P = .033$ ) for 10% benefit or less, compared with participants who were married/lived together (Table 2). For aHT, there were no other significant factors besides marital status. For aCT, participants with a geriatric health condition had lower odds of accepting therapy at a 0% to 10% benefit (OR, 0.18; 95% CI, 0.06-0.50;  $P = .001$ ). Furthermore, participants who preferred an active decisional role were less likely to accept aCT at a 0% to 10% benefit than

participants who preferred a shared decisional role (OR, 0.25; 95% CI, 0.08-0.81;  $P = .021$ ).

Factors included in the multivariable model for aCT were marital status, geriatric health condition, and decisional role preference. The participants who were single/divorced/widowed had an OR of 0.16 (95% CI, 0.04-0.57;  $P = .005$ ) for accepting aCT at a 0% to 10% benefit, compared with participants who were married/living together. Having a geriatric condition was related to requiring larger benefits to accept aCT (OR, 0.27; 95% CI, 0.07-0.98;  $P = .047$ ). Having an active decisional role preference was related to requiring larger benefits compared with having a shared decisional role preference (OR, 0.15; 95% CI, 0.04-0.67;  $P = .012$ ).

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**Table 2** Univariable Logistic Regression Analysis Between Patient Characteristics, Type of Surgery, and Decisional Role Preferences and Accepting aCT (n = 75)<sup>a</sup> and aHT (n = 74)<sup>a</sup> at a 0% to 10% Benefit

	Participants who Would Accept aCT at a 0%-10% Benefit (%)	OR <sup>b</sup>	95% CI	P	Participants who Would Accept aHT at a 0%-10% Benefit (%)	OR <sup>b</sup>	95% CI	P
<b>Patient characteristics</b>								
Age in years								
40-49	78	1 (ref)			78	1 (ref)		
50-59	88	2.00	(0.28-14.53)	.49	44	0.22	(0.04-1.30)	.10
60-69	59	0.42	(0.07-2.39)	.33	63	0.49	(0.08-2.81)	.42
≥70	40	0.19	(0.03-1.25)	.08	46	0.25	(0.04-1.66)	.15
Marital status								
Married/living together	79	1 (ref)			65	1 (ref)		
Single/divorced/widowed	44	0.21	(0.08-0.59)	<b>.003</b>	39	0.34	(0.13-0.92)	<b>.033</b>
Educational level <sup>c</sup>								
Low	79	1 (ref)			50	1 (ref)		
Intermediate	64	0.47	(0.13-1.73)	.26	59	1.46	(0.46-4.67)	.52
High	61	0.42	(0.10-1.66)	.21	54	1.18	(0.35-4.02)	.79
Employment status								
Full/part-time	75	1 (ref)			55	1 (ref)		
Housekeeper	75	1.00	(0.17-5.87)	1.00	50	0.81	(0.18-3.73)	.79
Unemployed/long-term sick leave	50	0.33	(0.07-1.62)	.17	50	0.81	(0.18-3.73)	.79
Retired	57	0.43	(0.14-1.33)	.14	60	1.21	(0.40-3.65)	.73
Having children								
No	63	1 (ref)			43	1 (ref)		
Yes, children not living at home	65	1.13	(0.35-3.66)	.85	57	1.73	(0.52-5.80)	.37
Yes, children living at home	77	2.00	(0.39-10.31)	.41	64	2.40	(0.52-10.99)	.26
Number of comorbid conditions								
0	81	1 (ref)			64	1 (ref)		
1	65	0.44	(0.11-1.82)	.26	58	0.79	(0.22-2.77)	.71
2 or more	59	0.34	(0.09-1.22)	.10	49	0.54	(0.18-1.62)	.27
Geriatric health condition <sup>d</sup>								
No	81	1 (ref)			64	1 (ref)		
Yes	43	0.18	(0.06-0.50)	<b>.001</b>	41	0.39	(0.15-1.03)	.06
<b>Treatment characteristics</b>								
Type of surgery								
BCS	68	1 (ref)			51	1 (ref)		
MAST	60	0.70	(0.22-2.23)	.54	73	2.66	(0.76-9.31)	.13
<b>Decisional role preference<sup>e,f</sup></b>								
Shared	72	1 (ref)			56	1 (ref)		
Active	39	0.25	(0.08-0.81)	<b>.021</b>	40	0.53	(0.18-1.62)	.27
Passive	80	1.57	(0.29-8.60)	.60	67	1.60	(0.41-6.29)	.50

A P-value in bold means a significant difference between that group and the reference group.

Abbreviations: aCT = adjuvant chemotherapy; aHT = adjuvant hormonal therapy; BCS = breast-conserving surgery; CI = confidence interval; MAST = mastectomy; OR = odds ratio; ref = reference.

<sup>a</sup>Participants who could not decide upon their minimally-required benefit were excluded (aCT, n = 6; aHT, n = 7).

<sup>b</sup>An OR over 1 indicates a greater likelihood to accept therapy at a 0% to 10% benefit, an OR below 1 indicates a lower likelihood to accept therapy at a 0% to 10% benefit (and a greater likelihood to require a > 10% benefit).

<sup>c</sup>Levels of education were categorized as low = completed no/primary school; intermediate = completed lower general secondary education/vocational training; or high = completed pre-university education/high vocational training/university.

<sup>d</sup>Presence of a geriatric health condition was defined as having one or more of the following characteristics: not able to carry out daily activities, incontinence, severe sensory impairment, depression, polypharmacy, difficulties with walking.

<sup>e</sup>Decisional role preferences were merged into 3 categories: active (the patient makes the decision alone, the patient makes the decision after considering the clinician's opinion); shared (the patient makes the decision together with the clinician); and passive (the clinician makes the decision after considering the patient's opinion, the clinician makes the decision alone).

<sup>f</sup>Eight respondents did not fill out the questions about aCT and aHT before the postoperative consultation and were excluded from this analysis.

### Motivations in Favor of or Against Adjuvant Systemic Therapy

Both younger and older participants frequently reported that the wish to survive/avoid recurrence and the treatment recommendation of their clinician were motivations in favor of aCT (Table 3). In the case of aHT, younger participants frequently cited the clinician's recommendation and wanting to survive/avoid recurrence as arguments for the therapy. For older participants, the clinician's recommendation was the predominant argument.

For both younger and older participants, the most often reported argument against aCT was concern about potential side effects. Older participants also commonly reported that the wish to maintain their current quality of life and independence, the negative treatment experience of others, the benefits not outweighing side effects, and their old age were arguments against aCT. Regarding aHT, both age groups frequently noted that side effects and the long duration of treatment were arguments against the therapy.

### Discussion

This prospective study compared the minimal benefit in 10-year disease-free survival that younger and older patients with early BC would require to consider aCT and aHT worthwhile. Additionally, we assessed which factors were related to the minimally-required benefit, and explored younger and older patients' motivations for and against these therapies. To our knowledge, this is the first study that examined preferences for aCT and aHT in older patients<sup>24</sup> and before patients received a recommendation for or against adjuvant systemic therapy, thereby minimizing the biasing influence of cognitive dissonance reduction. This cognitive mechanism of adaptation leads individuals to reduce inconsistencies between previous decisions (such as treatment decisions) and current beliefs. Thus, patients will tend to justify earlier decisions about how they will be treated in such ways that their current preferences are in accordance with that decision.<sup>7</sup> In the present sample, participants did not know which treatment was indicated, and no treatment decision was yet made. We are aware that participants may already have had a treatment preference, based on clinical information they received after diagnosis (eg, having a very large tumor), experiences from significant others, or from information found on the Internet or elsewhere. This is true also in daily practice.

Our results reveal that older participants would more often refuse aCT than younger participants, but no significant difference was found regarding aHT. However, the proportion of older participants willing to accept systemic therapy was large (3 out of 5 women, for both aCT and aHT), and for these older women, the minimally-required benefit did not differ from that of younger women. The latter finding is in line with other studies on aCT that found no association between age and minimally-required benefit, in terms of overall<sup>9-11</sup> or disease-free survival,<sup>7</sup> but not with other studies demonstrating in contrast that higher age was related to higher minimally-required benefit from aCT<sup>25,26</sup> or aHT.<sup>26</sup> However, our study as well as earlier studies<sup>7,9-11</sup> showing no such association differ from the latter two<sup>25,26</sup> regarding design and population in the following way. First, in the 2 latter studies, it was unclear whether participants could refuse therapy. Second, the latter studies also involved more advanced BC stages, which could lead to

different treatment preferences. Based on our results, it appears that, for early-stage BC, age is not a factor in determining the minimally-required benefit, and that the majority of patients are willing to consider adjuvant systemic therapy. It is important for clinicians to be aware of these preferences.

Another finding was that some participants, predominantly older participants, were undecided about the minimal benefit they would require to consider adjuvant systemic therapy worthwhile. Participants primarily reported they would rely on the treatment advice of their clinician. It is important that clinicians themselves are aware of this finding, and they should try to ensure that information provision is clear and tailored to the needs of the patient. Additionally, patients should be made aware that they should voice their preferences and concerns.

Another finding was that being single, divorced, or widowed, having a geriatric health condition, and having a preference for an active decisional role predicted patients' preference for aCT. Women who were single/divorced/widowed had a 5 times higher odds of requiring a large benefit than women who were married/living together. This may be explained by either not having a partner for whom to consider a treatment worthwhile ("to live for"), or by lack of support from a partner during treatment. If a patient has 1 or more geriatric health conditions, she might be more likely to think that she might not cope with the side effects of adjuvant systemic therapy, and thus her minimally-required benefit should be higher to make it worthwhile. The association with role preference may be explained by 2 mechanisms with a different causal direction. On the one hand, patients who do not want aCT may want to be actively involved to ensure that no overtreatment occurs. That is, patients' existing treatment preference may determine their role preference. On the other hand, it has been found that patients who are more active, following the use of a decision aid, tend to choose more conservative treatment,<sup>27</sup> implying that decisional role may explain treatment preference.

As expected, the predominant motivation in favor of aCT was to survive/avoid recurrence, irrespective of age. Nevertheless, older participants seemed to value the clinician's recommendation more compared with younger participants. These 2 factors have often been noted in previous studies concerning older patients' decision-making about aCT<sup>13,14</sup> and about treatment for BC in general.<sup>15,28</sup> Further, our study indicated that motivations against aCT largely differed between younger and older participants. Both groups frequently reported concern about side effects as a motivation. Additionally, older participants reported the wish to maintain their current quality of life and independence and the belief that benefits do not outweigh side effects as concerns about aCT. As these concerns are specific to older patients, more focus should be placed on quality of life and independence when discussing treatment consequences, and sufficient information should be provided to help develop realistic expectations on side effects of aCT. This will better support older patients in developing an informed treatment preference. Interestingly, although age was not a factor in determining the minimally-required benefit to accept therapy, it was an important argument for women in deciding for or against adjuvant systemic therapy. The most striking observation was that older participants more frequently stated that their old age was an argument against aCT.

# Younger and Older Patients' Preferences for Adjuvant Systemic Treatment

**Table 3** Arguments in Favor of and Against aCT (n = 75)<sup>a</sup> and aHT (n = 74)<sup>b</sup> According to Age Category<sup>b</sup>

	aCT		aHT	
	40-64 Years (n = 50) %	≥65 Years (n = 25) %	40-64 Years (n = 52) %	≥65 Years (n = 22) %
<b>Arguments in favor of systemic therapy</b>				
Wish to survive/avoid recurrence/do everything possible to fight the cancer	40	28	25	14
Clinician's recommendation for treatment	24	36	25	36
Downplays side effects/not everybody will have side effects	14	16	13	18
Positive treatment experience of others	12	4	6	0
Age ("I am too young")	12	4	6	0
Potential benefits outweigh potential side effects	12	8	8	18
Someone (eg, partner, [grand] children) to live for	6	4	6	5
Reduce possible (future) regret	6	4	4	5
Trust in (effectiveness) of treatment	2	4	2	5
Preference based on feeling (not further specified)	2	0	4	0
Trust in the capability of my body to deal with the drug	0	4	0	0
<b>Specific for aCT</b>				
Short duration of treatment	2	0	—	—
<b>Specific for aHT</b>				
Able to discontinue therapy in case of many/severe side effects	—	—	8	5
Is experiencing/has experienced little/no menopausal complaints	—	—	6	18
Not having to go to hospital to undergo treatment	—	—	2	0
Medication/life style changes possible to lessen the severity of side effects	—	—	2	0
Taking a daily pill is not a burden	—	—	2	9
<b>Arguments against systemic therapy</b>				
Concerns about short- and/or long-term side effects	50	40	42	36
Maintain quality of life/independence/continue work	12	24	10	18
Negative treatment experience of others	12	20	8	0
Health status/condition	12	12	8	14
Potential benefits do not outweigh potential side effects	8	24	0	5
Undergoing adjuvant systemic therapy does not guarantee no recurrence	6	8	0	5
Relies on regular check-ups/option of new therapy in case of recurrence	4	0	2	0
Hopes to be cured without adjuvant systemic therapy	2	0	2	0
Age ("I am too old")	2	24	2	9
Lack of social support	2	8	2	5
Long duration of treatment	2	0	40	23
No or little trust in (effectiveness) of treatment	0	0	0	5
<b>Specific for aCT</b>				
Frequent hospital visits for chemotherapy are a burden	2	4	—	—
Fear of needles	2	0	—	—
<b>Specific for aHT</b>				
Is experiencing/has experienced many/severe menopausal complaints	—	—	6	0
Taking a daily pill is a burden	—	—	2	0
Negative experience with hormones	—	—	2	0

"—" Indicates that the argument is not applicable to the therapy.

Abbreviations: aCT = adjuvant chemotherapy; aHT = adjuvant hormonal therapy.

<sup>a</sup>Participants who could not decide upon their minimally-required benefit were excluded (aCT, n = 6; aHT, n = 7).

<sup>b</sup>Participants could indicate more than 1 argument.

The motivations for aHT were similar to those found for aCT, except that the wish to survive/avoid recurrence was less frequently reported. An explanation may be that participants generally know less

about this treatment compared with aCT, and thus possibly doubt or underestimate the effectiveness of aHT. The wish to survive/avoid recurrence and the clinician's recommendation were valued equally in



younger participants. This was not found for older participants who considered the clinician's recommendation most important. With regard to arguments against aHT, no overt differences were found in the predominant motivations between the age groups.

Some limitations of this study need to be noted. Participants were approached before they actually faced a decision. Although they probably would be confronted with this decision, the preference they reported here might still differ from their preference once they had received a recommendation. Further, fewer older participants than anticipated could be included in the study. This was owing to the fact that primarily older participants were excluded based on the exclusion criterion of having a previous malignancy (11 older compared with 2 younger women). Nevertheless, comparison of our older participants with older patients with early-stage invasive BC enrolled in a population-based cohort study in the Netherlands<sup>29</sup> showed that our sample compared favorably with the average older woman with BC with regard to median age and presence of comorbid and geriatric conditions. Finally, because our sample was small, further investigation about younger and older participants' preferences for aHT in a larger sample is required.

## Conclusion

This prospective study revealed that, whereas older participants were less willing to undergo aCT than younger participants, no significant difference was found for aHT. Still, a majority of older participants would accept both therapies, and these women required similar benefits in 10-year disease-free survival as younger women. The option of adjuvant systemic therapy should therefore be discussed with eligible patients regardless of age. Younger and older participants' motivations for and against therapy generally did not differ, except that, contrary to younger participants, older participants reported multiple motivations against aCT, which included fear of treatment-related toxicity, the wish to maintain current quality of life and independence, the negative treatment experience of others, benefits not outweighing side effects, and old age. Clinicians should explore what matters most to the patient, elicit their preference, and incorporate these evaluations in their treatment recommendation.

## Clinical Practice Points

- To date, little is known about older patients' preferences for aCT and aHT. Previous studies have mainly focused on young or middle-aged patients. The scarcity of evidence on older patients' treatment preferences indicates that clinicians have no clear guidance about what older patients generally desire. Several studies demonstrated that patient age often influences clinicians' advice about adjuvant systemic therapy.<sup>30,31</sup> This ageism may partially explain why older patients more often receive suboptimal therapy than younger patients, which might then be associated with lower survival rates.<sup>32</sup>
- Our prospective study has generated new knowledge that can be of help when making adjuvant treatment decisions with older patients. We found that the proportion of older women that would accept adjuvant systemic therapy was large, and for these women the minimally-required benefit for aCT and aHT did not differ from that of younger women. Also, we found a large

variation in preferences within the older group, suggesting that each individual older patient may value the benefits and side effects of treatment strategies differently.

- It is necessary to involve older patients in the decision-making process. This requires patients to be made aware that adjuvant systemic therapy is an option. Next, the benefits and side effects involved, including the associated uncertainty given the individual's biological age, should be discussed. It is essential to explicitly explore the patient's consideration as to whether the expected benefit is worth the side effects.<sup>33</sup>

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## Disclosure

The authors declare that they have no conflict of interest.

## Supplemental Data

Supplemental figure accompanying this article can be found in the online version at <http://dx.doi.org/10.1016/j.clbc.2016.04.001>.

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