



## What influences healthcare professionals' treatment preferences for older women with operable breast cancer? An application of the discrete choice experiment

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### Abstract

**Introduction:** Primary endocrine therapy (PET) is used variably in the UK as an alternative to surgery for older women with operable breast cancer. Guidelines state that only patients with “significant comorbidity” or “reduced life expectancy” should be treated this way and age should not be a factor.

**Methods:** A Discrete Choice Experiment (DCE) was used to determine the impact of key variables (patient age, comorbidity, cognition, functional status, cancer stage, cancer biology) on healthcare professionals' (HCP) treatment preferences for operable breast cancer among older women. Multinomial logistic regression was used to identify associations.

**Results:** 40% (258/641) of questionnaires were returned. Five variables (age, co-morbidity, cognition, functional status and cancer size) independently demonstrated a significant association with treatment preference ( $p < 0.05$ ). Functional status was omitted from the multi-variable model due to collinearity, with all other variables correlating with a preference for operative treatment over no preference ( $p < 0.05$ ). Only co-morbidity, cognition and cancer size correlated with a preference for PET over no preference ( $p < 0.05$ ).

**Conclusion:** The majority of respondents selected treatment in accordance with current guidelines, however in some scenarios, opinion was divided, and age did appear to be an independent factor that HCPs considered when making a treatment decision in this population.

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**Keywords:** Breast cancer; Primary endocrine therapy; Surgery; Discrete choice experiment; Older

### Introduction

A third of new breast cancer diagnoses occur in women aged over 70 years in the UK.<sup>1</sup> This proportion will continue to increase as the population ages.<sup>2</sup> Older patients have higher rates of comorbidity and frailty so that the risk

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of death from breast cancer is relatively reduced, with only 23% deaths due to breast cancer for patients diagnosed in their mid-80s compared to 73% for patients diagnosed in their 50s.<sup>3</sup> Older patients with operable breast cancer may be offered alternative treatment modalities, such as primary endocrine therapy (PET),<sup>4,5</sup> wherein oestrogen receptor (ER) positive disease may be treated with endocrine therapy alone.

A Cochrane review comparing PET with surgery based on trials conducted over 20 years ago demonstrated no difference in overall survival between the two treatments, however there were superior rates of local disease control in the surgical group.<sup>6</sup> None of these studies assessed the impact of comorbidity or frailty, and a recent review of case series indicated that older frailer women tend to be treated with PET and have inferior overall survival rates as would be expected due to higher other-cause mortality.<sup>7</sup>

National audits have demonstrated significant variation in the use of PET to treat older women across the UK<sup>8</sup> which is not fully explained by case mix variation (stage, deprivation, etc.).<sup>9</sup> Healthcare professional (HCP) preference may be a source of some of this variation<sup>10</sup> and this factor may exert a potent influence on patient choice.<sup>11</sup> A recent study demonstrated considerable variation in HCP opinion regarding the factors important in breast cancer treatment decision making in this population.<sup>12</sup>

The aim of this study was to use Discrete Choice Experiment (DCE) methodology to determine the impact of key variables on HCP treatment preferences for the management of operable breast cancer in older women. DCE is a rigorous survey methodology capable of eliciting individuals' preferences in controlled experimental conditions, through responses to hypothetical scenarios,<sup>13</sup> based on the assumption that the patients in the scenarios can be described by certain characteristics and that an individual's treatment preference depends upon these characteristics.<sup>14</sup>

## Materials and methods

The DCE method was chosen to establish HCP preferences in controlled experimental conditions using hypothetical scenarios. Key variables were identified and selected using the relevant literature and subdivided into levels of clinical severity based on clinical expert peer review. Table 1 shows the variables and levels. Twenty-five

scenarios were randomly generated using IBM SPSS version 21 Orthoplan software out of 3072 potential scenarios. For each scenario the participants were asked to indicate a preference for PET or operative treatment for a hypothetical older woman with operable breast cancer. In order to optimise reality in clinical practice, an "opt out" option was included, whereby respondents could indicate no preference for either treatment choice.<sup>15</sup> It was felt that this would more closely reflect HCP decision-making and therefore enhance response rates compared to the more conventional pair-wise choice design.<sup>16</sup>

We calculated that in order to estimate the preference for a given scenario with a reasonable degree of precision of say  $\pm 6\%$  (assuming a 50% preference) i.e. 95% confidence interval 44–56% would require 250 responders to the survey.

To be effective, scenarios must be plausible and so the questionnaire was piloted with a selection of experienced HCPs who identified eight of the 25 scenarios as being unrealistic. These were excluded from the final instrument. An experienced geriatrician, together with a panel of clinical breast specialists, examined the plausible scenarios and estimated the predicted life-expectancy for each hypothetical patient based on their age, levels of co-morbidity, cognition and functional status, which were categorised as <2 years, 2–5 years and >5 years. Life expectancy of less than 2 years would be an indicator that primary endocrine therapy would be a good choice with minimal morbidity in a woman in whom the breast cancer is unlikely to contribute to the cause of death. Conversely as literature suggests that the median duration of disease control with PET is 2 years, use of this treatment option for a woman with an estimated life expectancy of more than 5 years would be unlikely to result in long term disease control without change of management. The predicted life expectancy of each patient scenario was NOT shown to the questionnaire respondents as this information would not be routinely available in normal clinical practice. Fig. 1 illustrates a scenario example. The final 17 discrete choice scenarios were incorporated into a postal questionnaire that was mailed to all clinician and nurse members of the UK Association of Breast Surgery (ABS). An electronic reminder was sent via email to all members after four months. University of Sheffield Research Ethics Committee approvals were obtained (SMBRER243).

Table 1  
Discrete choice variables and levels.

Variable	Levels			
Patient age	70–74	75–79	80–84	85+
Co-morbidity	None	Mild	Moderate	Severe
Cognition	Normal	Mild impairment	Moderate impairment	Severe impairment
Functional status <sup>a</sup>	Independent	Mild dependence	Moderate dependence	Severe dependence
Cancer size	Small tumour, node negative	Small tumour, node positive	Large tumour, node negative	Large tumour, node positive
Cancer biology	ER positive, HER2 positive		ER positive, HER2 negative	
			ER strongly positive, HER2 negative	

<sup>a</sup> Denotes not included in final model.

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