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## Reply: Breast Cancer and Reconstruction: Normative Data for Interpreting the BREAST-Q

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**Sir**

We would like to thank Ms. Payne et al. for their comments on our recent articles (1-3). We agree that the normative values our studies generated for the BREAST-Q will serve as a valuable tool for on-going and future research. We would also like to thank the authors for comparing all three recent studies, and looking for similarities and differences between the data. A notable difference that they commented on is the difference in scores for the Physical Well-being domain across the three different pre-operative BREAST-Q modules.

Each BREAST-Q module, Reconstruction, Augmentation, and Reduction, is an independent patient-reported outcome instrument. As such, each were developed using qualitative interview data from separate disease-specific patient populations (4, 5). While there are similarities in structure, such as the concepts of interest (e.g. Satisfaction with Breasts, Psychosocial Well-being, etc.), the specific questions comprising each scale in the various modules are different, see Table 1 (6). The questions in the Physical Well-being module of the Reconstruction module are specific to physical symptoms experienced pre- and post-operatively by breast cancer patients undergoing reconstruction. Similarly, the questions in the Physical Well-being module of the Reduction module are specific to physical symptoms

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experienced pre- and post-operatively by patients undergoing breast reduction. Therefore, the individuals in the different studies were answering different questions to generate the respective BREAST-Q scores, limiting the ability to compare data across studies.

The exception to this is that the Mastectomy, Breast Conserving Therapy, and Reconstruction pre-operative scales are identical, as pre-operatively this is one patient population. These modules differ only post-operatively to reflect the different unique post-operative concepts of interest to each surgical sub-group. Therefore, the Reconstruction normative data generated with the common pre-operative breast cancer scales is applicable to all of the BREAST-Q breast cancer surgical sub-groups.

We would also like to thank the authors for bringing up the primary limitation of these studies: the demographics of the normative data cohorts. We agree that additional normative data generated from a more diverse population would further enrich our understanding of the BREAST-Q, and improve the use of normative data in future analyses.

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**Table 1**  
**Questions from Pre-operative BREAST-Q Modules: Physical Well-being – Chest**

Reduction	Augmentation	Reconstruction
a. Headaches?	a. Pain in your breast area?	a. Pain in the muscles of your chest?
b. Pain in your breast area?	b. Tightness in your breast area?	b. Difficulty sleeping because of discomfort in your breast area?
c. Lack of energy?	c. Difficulty lifting heavy objects?	c. Tightness in your breast area?
d. Difficulty doing vigorous physical activities (e.g. running or exercising)?	d. Difficulty doing vigorous physical activities (e.g. running or exercising)?	d. Pulling in your breast area?
e. Feeling physically unbalanced?	e. Difficulty lifting or moving your arms?	e. Naggng feeling in your breast area?
f. Shoulder pain?		f. Tenderness in your breast area?
g. Difficulty sleeping because of discomfort in your breast area?		g. Sharp pains in your breast area?
h. Neck pain?		h. Aching feeling in your breast area?
i. Painful gouges or grooves in your shoulders from your bra straps?		i. Throbbing feeling in your breast area?
j. Feeling physically uncomfortable?		j. Difficulty lifting or moving your arms?
k. Rashes under your breasts?		
l. Back pain?		
m. Arm pain?		
n. Pain, numbness or tingling in your hands because of your breast size?		