

## Supplement

**Supplementary Table 1.** Results from the subgroup analysis for small cystic lesions  $\leq 1$  cm. Data revealed no significant difference for the evaluated features compared to the entire dataset (see Table 4). As only 3 breast cancers had a diameter  $\leq 1$  cm, data on breast cancers is not provided due to insufficient data for the statistical analysis

	<b>T2<sub>DL</sub></b>			<b>T2<sub>STD</sub></b>			<b>p-value</b>	
	<b>R1 Median (IQR)</b>	<b>R2 Median (IQR)</b>	<b>Cohen's kappa (R1, R2)</b>	<b>R1 Median (IQR)</b>	<b>R2 Median (IQR)</b>	<b>Cohen's kappa (R1, R2)</b>	<b>R1 p-value (T2<sub>DL</sub> vs. T2<sub>STD</sub>)</b>	<b>R2 p-value (T2<sub>DL</sub> vs. T2<sub>STD</sub>)</b>
<b>Cysts (n = 56)</b>								
Conspicuity	5 (5-5)	5 (5-5)	0.965	5 (4-5)	5 (4-5)	0.559	<0.001	<0.001
Sharpness	5 (5-5)	5 (5-5)	0.397	4 (4-4)	4 (4-4)	0.650	<0.001	<0.001
Microstructure	5 (5-5)	5 (5-5)	0.561	4 (4-4)	4 (4-4)	0.576	<0.001	<0.001
Diagnostic confidence	5 (5-5)	5 (5-5)	0.791	5 (4-5)	5 (4-5)	0.491	<0.001	<0.001

T2<sub>DL</sub> = deep learning reconstructed T2-weighted Dixon with super-resolution, T2<sub>STD</sub> = standard T2-weighted fast spin-echo Dixon sequence, R1 = reader 1, R2 = reader 2, IQR = interquartile range

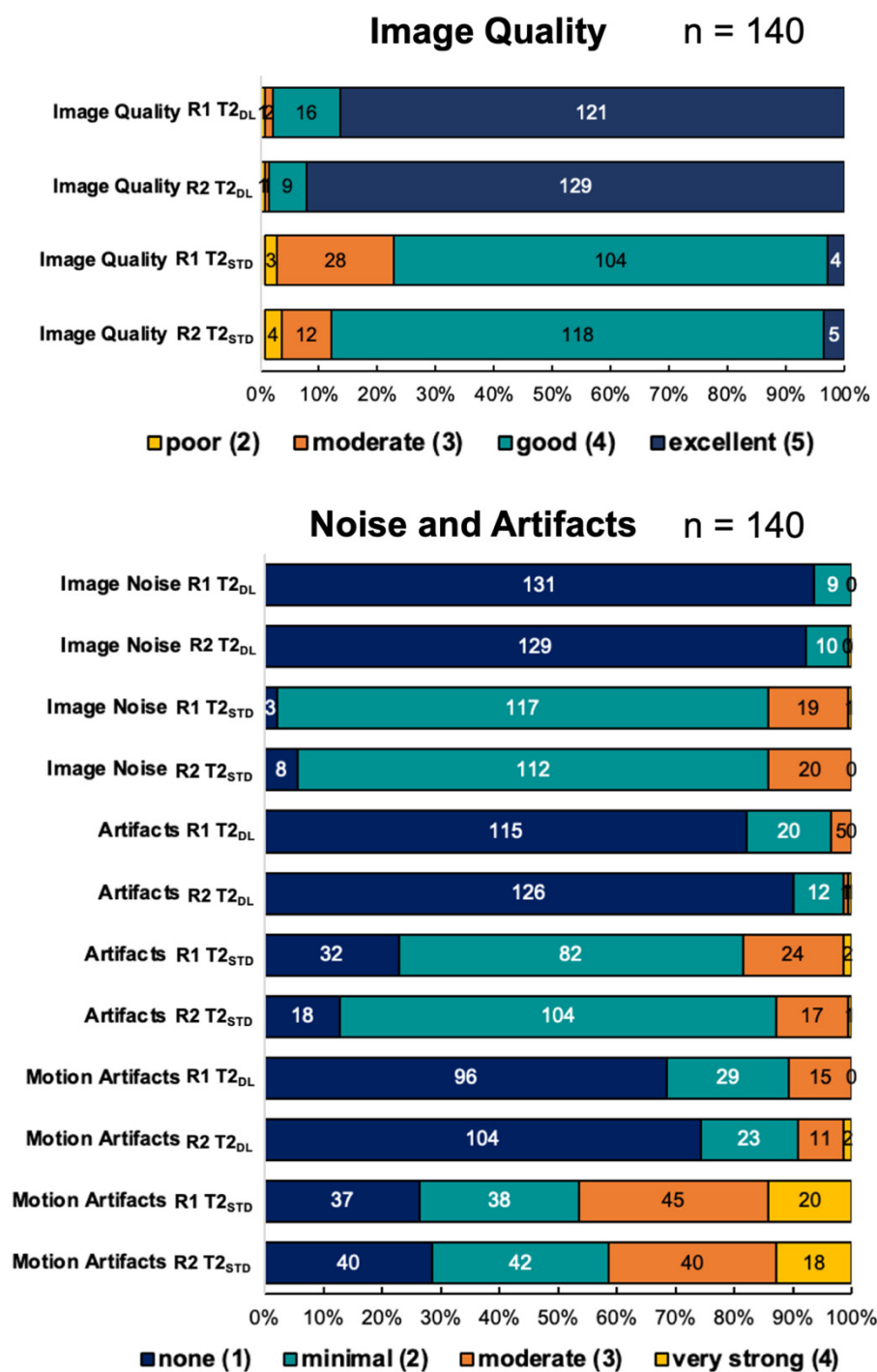
**Supplementary Table 2.** Comparisons between small ( $\leq 1.0$  cm) and larger ( $> 1.0$  cm) cysts and breast cancers. Tests were performed with Mann-Whitney-U tests

	<b>Reader 1</b>		<b>Reader 2</b>	
	<b>p-value</b> ( $\leq 1.0$ cm vs. $> 1.0$ cm)		<b>p-value</b> ( $\leq 1.0$ cm vs. $> 1.0$ cm)	
	<b>T2<sub>DL</sub></b>	<b>T2<sub>STD</sub></b>	<b>T2<sub>DL</sub></b>	<b>T2<sub>STD</sub></b>
<b>Cysts</b>				
Conspicuity	0.300	0.569	0.555	0.384
Diagnostic confidence	0.229	0.447	0.300	0.472
Microstructure	0.136	0.570	0.136	0.905
Sharpness	0.176	0.817	0.229	0.993
<b>Breast cancers</b>				
Conspicuity	1.000	0.590	0.925	0.545
Diagnostic confidence	0.462	0.635	0.875	0.503
Margins	0.925	0.503	0.925	0.777
Microstructure	0.875	0.462	1.000	0.826
Malignancy suspected	0.349	0.462	0.385	0.349

T2<sub>DL</sub> = deep learning reconstructed T2-weighted reconstructed Dixon with super-resolution,

T2<sub>STD</sub> = standard T2-weighted fast spin-echo Dixon sequence

**Supplementary Fig. 1.** Image quality, artifacts, image noise and motion artifacts.

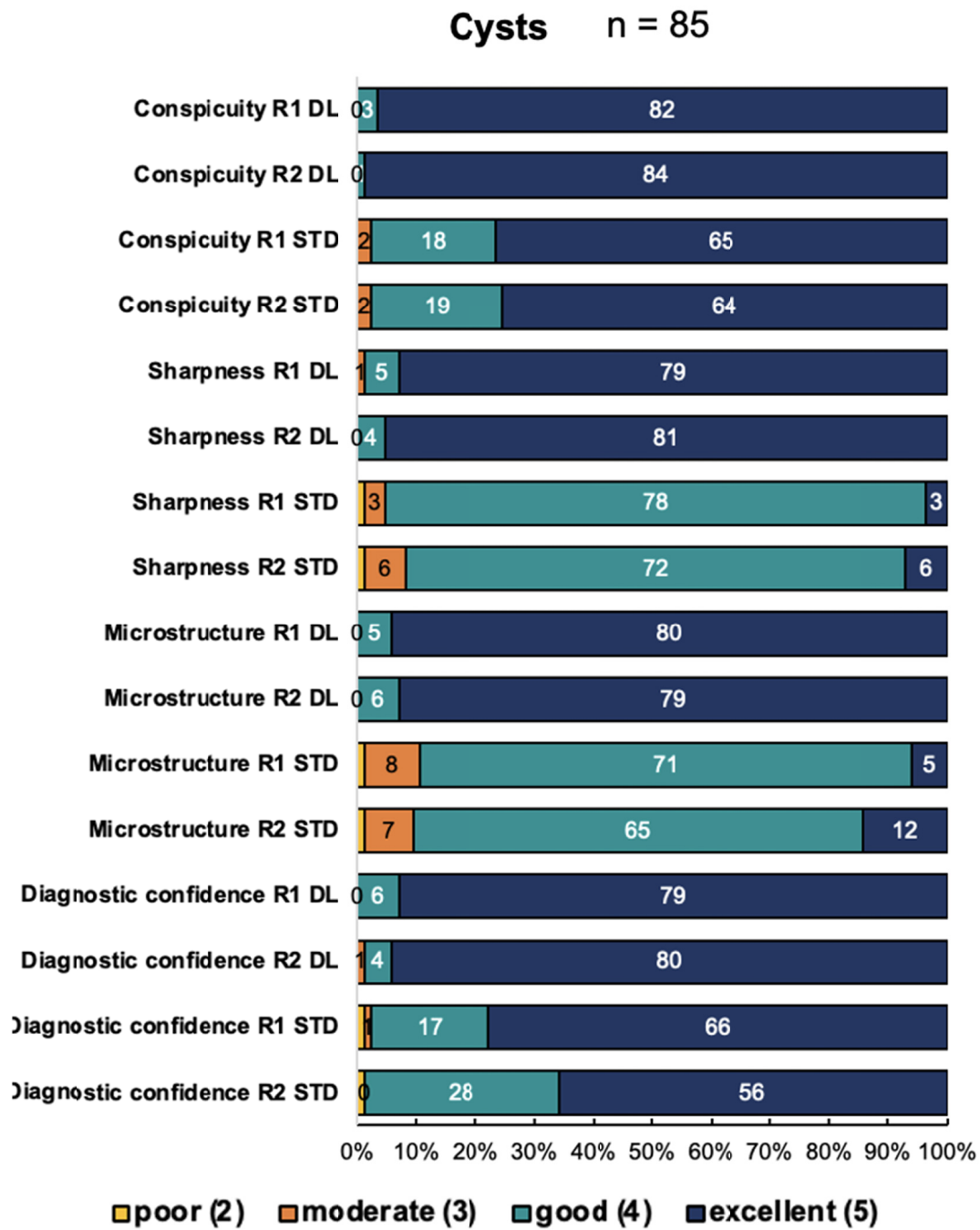


Artifacts, image noise and motion artifacts. The figure shows the results from the qualitative analysis (number of ratings) from R1 and R2 for T2<sub>DL</sub> and T2<sub>STD</sub>. Note that image quality was significantly improved for T2<sub>DL</sub>. Additionally image noise, artifacts and motion artifacts were significantly lower for T2<sub>DL</sub>.

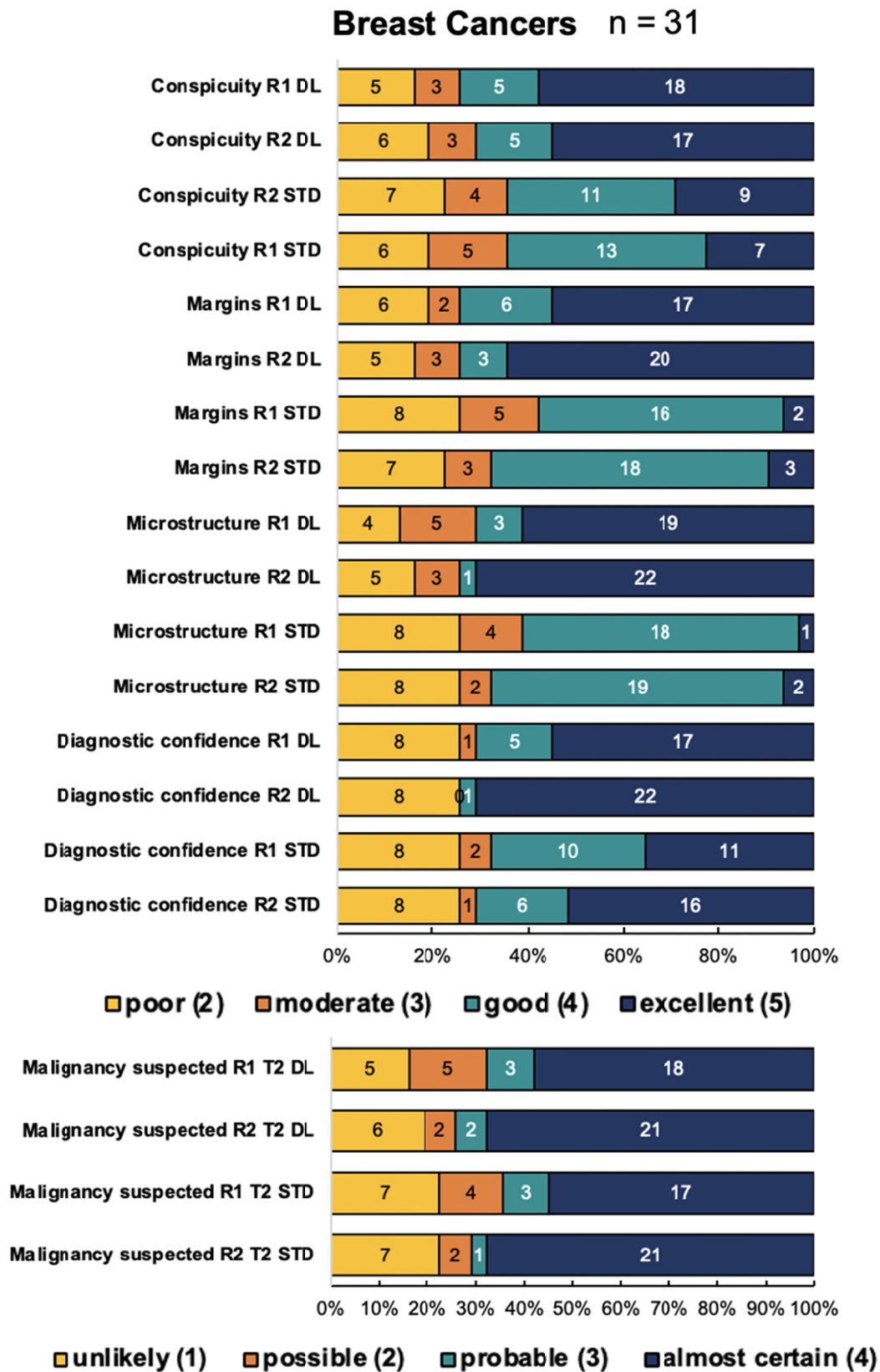
R1 = reader 1, R2 = reader 2, T2<sub>DL</sub> = deep learning reconstructed T2-weighted reconstructed Dixon with super-resolution, T2<sub>STD</sub> = standard T2-weighted fast spin-echo Dixon sequence

**Supplementary Fig. 2.**

A: Qualitative analysis for cysts.



## B. Qualitative analysis for breast cancers.



Results of the qualitative analysis for cysts (2A) and breast cancers (2B) for the DL ( $T2_{DL}$ ) sequence and the standard sequence ( $T2_{STD}$ ) for both readers (R1, R2) given in number of ratings for each item.

Note that lesion conspicuity, lesion margins and microstructure and diagnostic confidence were rated significantly more often towards the highest image quality score. The rate of which malignancy was suspected did not differ significantly between both sequence types. The dispersion of scores did vary more in breast cancers, which can be attributed to the wider range of signal intensities found in cancers compared to the very high signal intensity of breast cancers.

DL = deep learning, R1 = reader 1, R2 = reader 2,  $T2_{DL}$  = deep learning reconstructed T2-weighted Dixon with super-resolution,  $T2_{STD}$  = standard T2-weighted fast spin-echo Dixon sequence