



BreastScreen SA

VolparaEnterprise image assessment in screening mammography

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**Government
of South Australia**

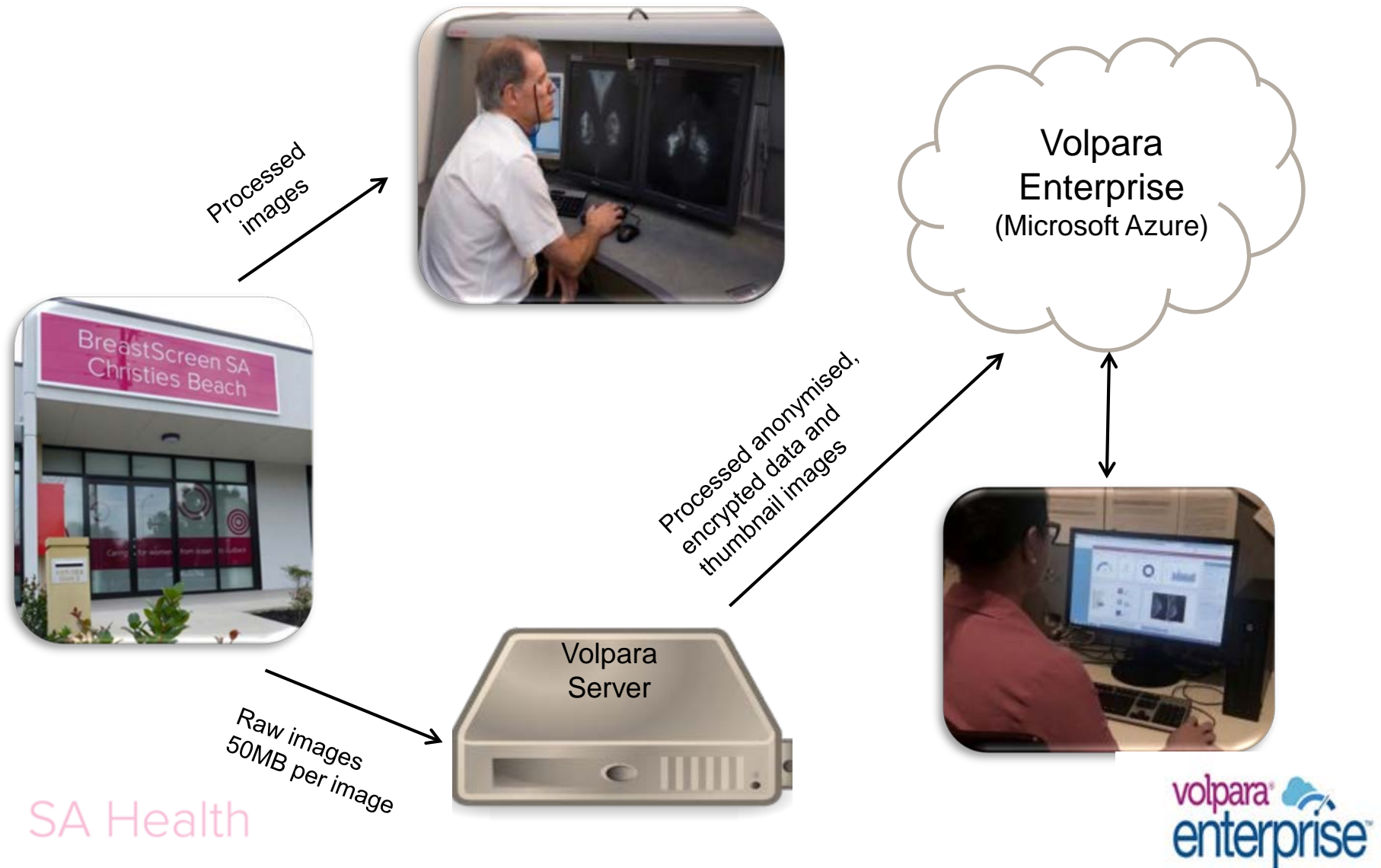
SA Health



Mammography image quality

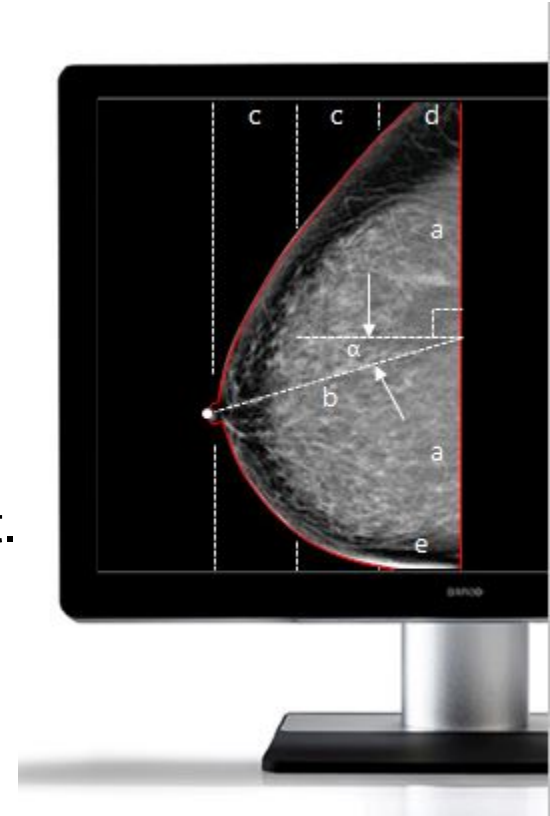
- > BreastScreen Australia uses PGMI criteria to assess mammographic image quality.
- > Currently, PGMI assessment is undertaken by a radiographer visually assessing and using the prescribed criteria to grade a mammogram.
- > Current system is subjective – criteria interpreted differently across states/services/radiographers.
- > BSSA VolparaEnterprise trial commenced in November, 2017 until February 2018.
- > VolparaEnterprise is an imaging quality and analytics software package.

How does VolparaEnterprise work?



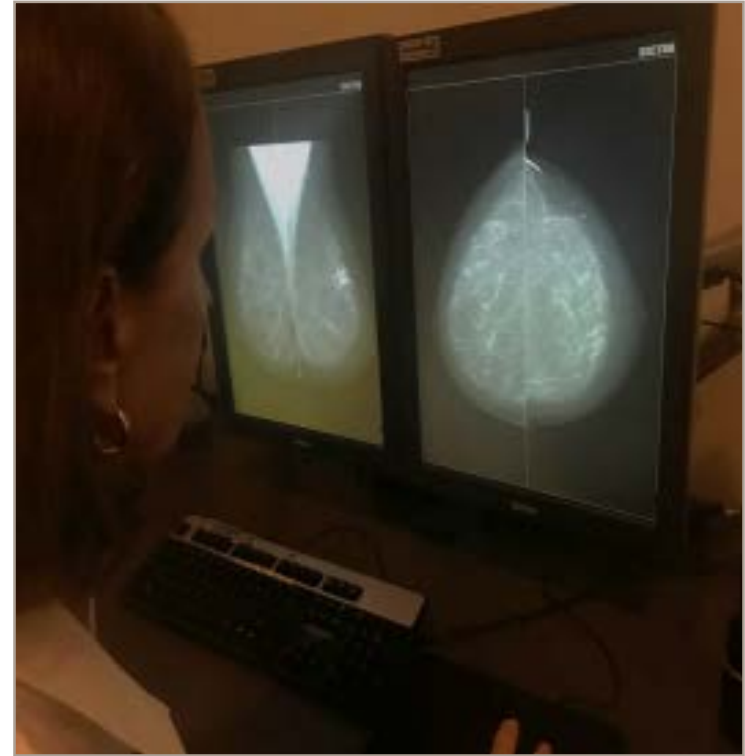
How does VolparaEnterprise do PGMI?

- > Uses an algorithm to segment the anatomic features on the image (eg skin, nipple).
- > Makes a series of measurements eg PNL, pectoral muscle length.
- > These combine to give a PGMI score for the image and image set.
- > Enterprise does not assess all PGMI criteria.



BSSA VolparaEnterprise study

- > All screening clinics and mobile units were included in the trial.
- > 55 radiographers had access to individual performance data on VolparaEnterprise.
- > Random selection of 491 clients.
- > Mammograms graded by senior radiographer using standard PGMI criteria.
- > Scoring repeated using modified PGMI.
- > Comparison with VolparaEnterprise image set score.
- > Absolute agreement and Cohen's kappa coefficient (k) statistics.



Standard PGMI results

BSSA PGMI

		Perfect	Good	Moderate	Inadequate	Total
Enterprise PGMI	Perfect	0	0	0	0	0
	Good	1 (0.2)	95 (19.3)	39 (7.9)	0	135 (27.4)
	Moderate	0	189 (38.4)	141 (28.7)	6 (1.2)	336 (68.3)
	Inadequate	0	4 (0.8)	15 (3.0)	2 (0.4)	21 (4.3)
	Total	1 (0.2)	288 (58.5)	195 (39.6)	8 (1.6)	492 (100.0)

Overall absolute agreement – 48.4% (pink cells)

Weighted k – 0.125 Slight agreement

Biggest disagreement: Volpara moderate – BSSA good

PGMI modified NAS criteria

BSSA PGMI modified

	Perfect	Good	Moderate	Inadequate	Total
Enterprise PGMI	0	0	0	0	0
Perfect	0	0	0	0	0
Good	3 (0.6)	59 (12.0)	73 (14.9)	0	135 (27.5)
Moderate	0	50 (10.2)	280 (57.0)	5 (0.1)	335 (68.2)
Inadequate	0	2 (0.4)	18 (3.7)	1 (0.2)	21 (4.2)
Total	3 (0.6)	111 (22.6)	371 (75.6)	6 (1.2)	491 (100.0)

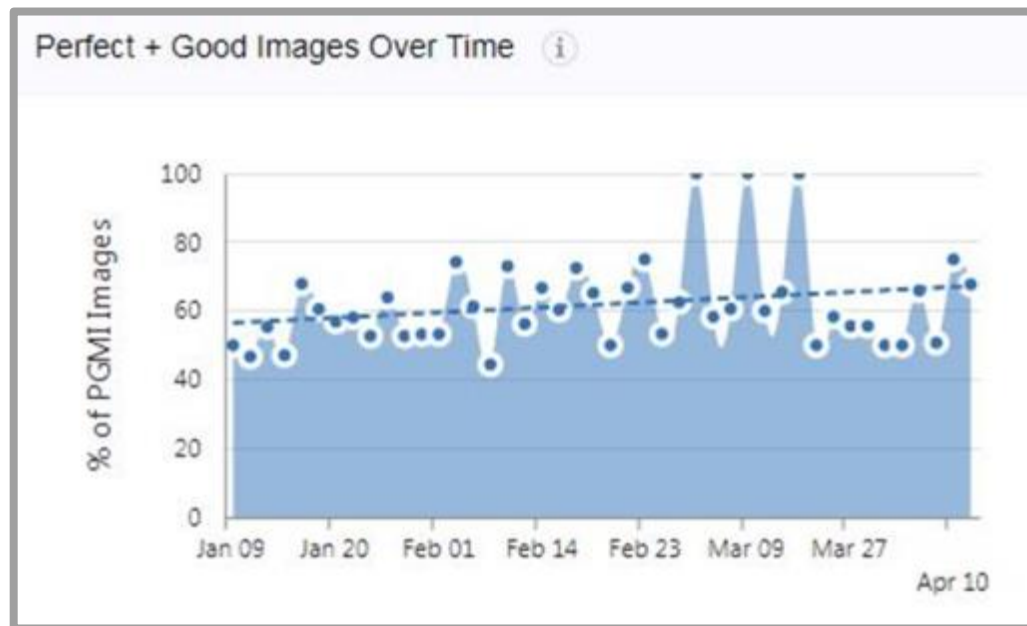
Overall absolute agreement – 69.2% (pink cells)

Weighted k – 0.291 fair agreement

Is the agreement strong enough to replace NAS designated radiographer's PGMI assessment?

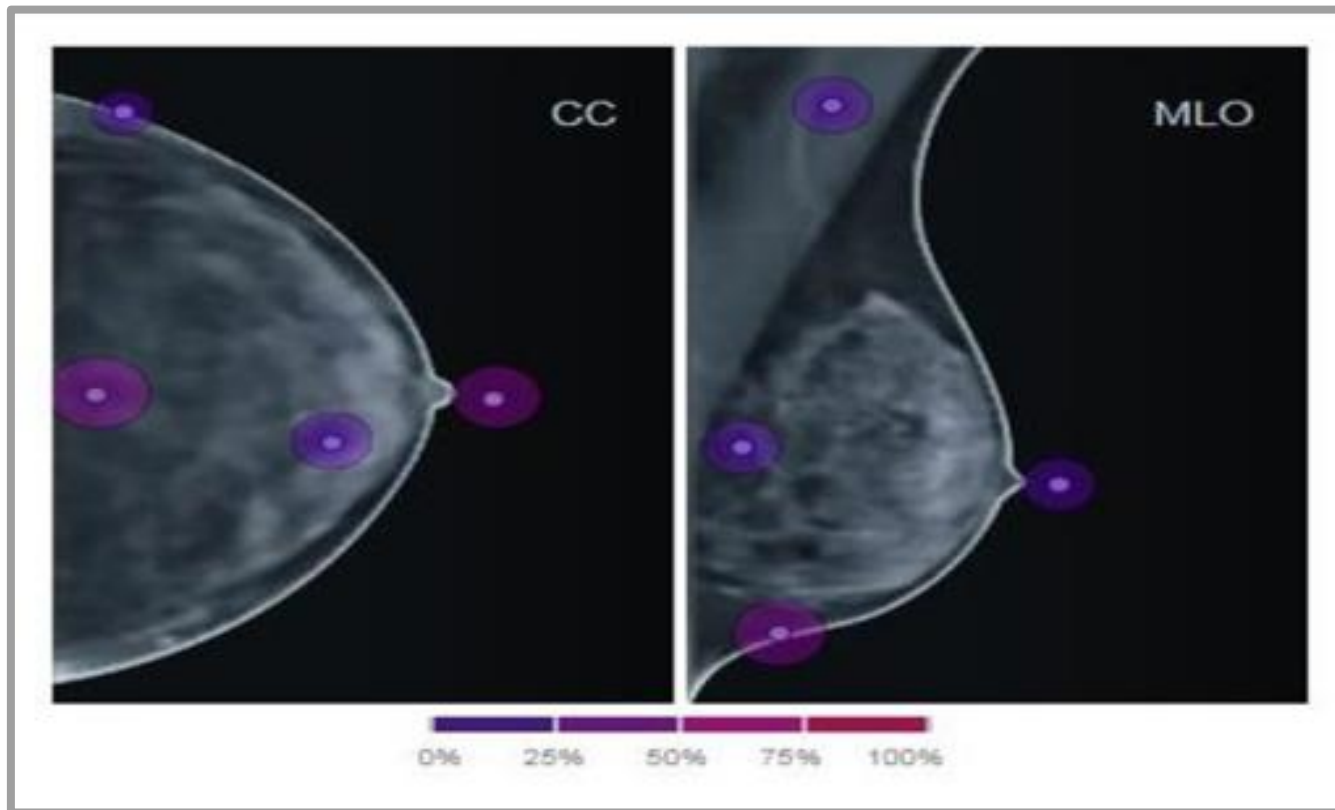
Not yet! However, VolparaEnterprise is a great supplement to radiographer image assessment as:

- > image quality feedback is immediate and on every image
- > observe trends



VolparaEnterprise

- > Radiographers are alerted to positioning hot spots.





**Does using VolparaEnterprise
impact radiographer performance?**

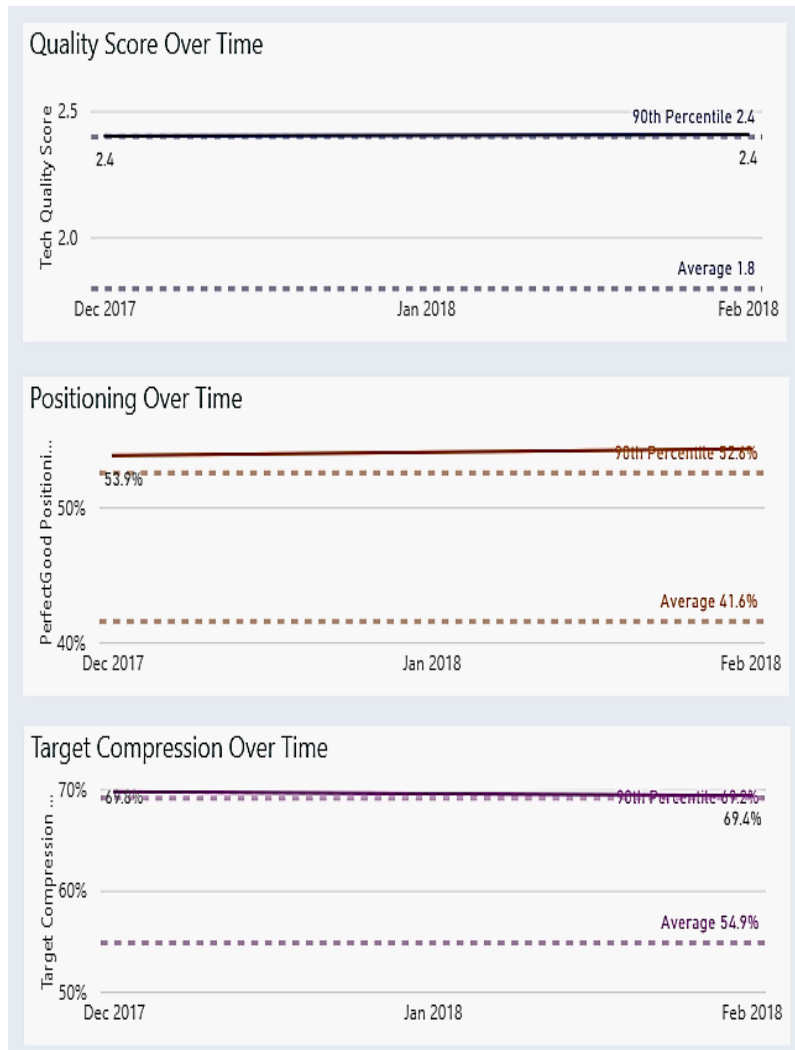
BSSA team performance

The Lead Technologist has a different level of access and can see all staff performance data.

From December to February, there was an:

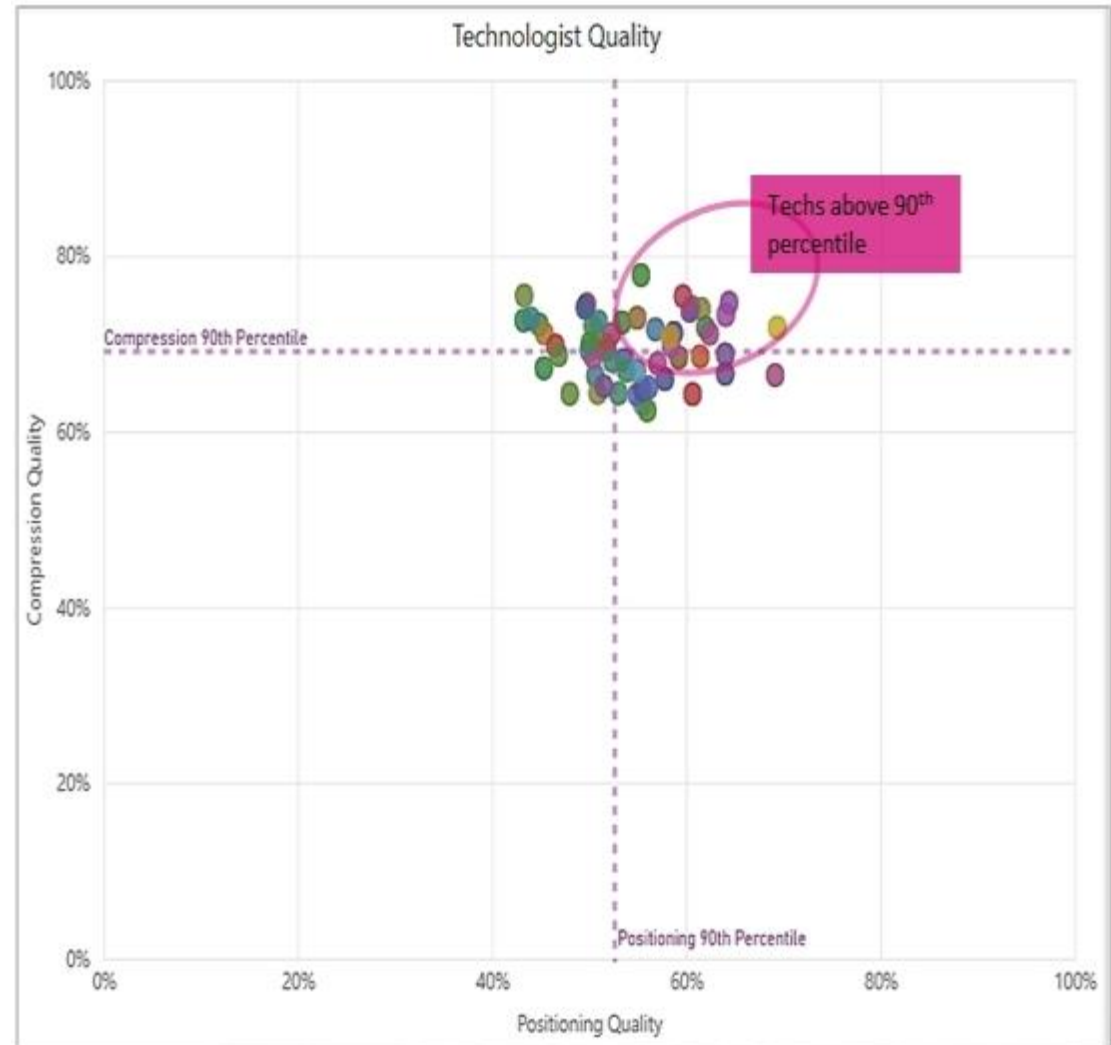
- > increase of 1.73% in images with 'Perfect' or 'Good' scores
- > increase of 0.63% in images with target compression.

(NB - BSSA staff were already performing at a high imaging standard prior to the trial).



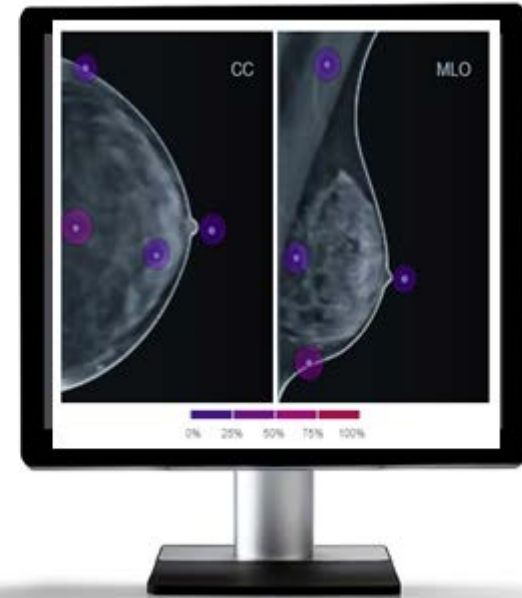
Overall BSSA image quality

- > All BSSA radiographers are above the average for positioning and compression when compared to other Enterprise users.
- > 32 radiographers have positioning scores in the top 10% of all Enterprise users.



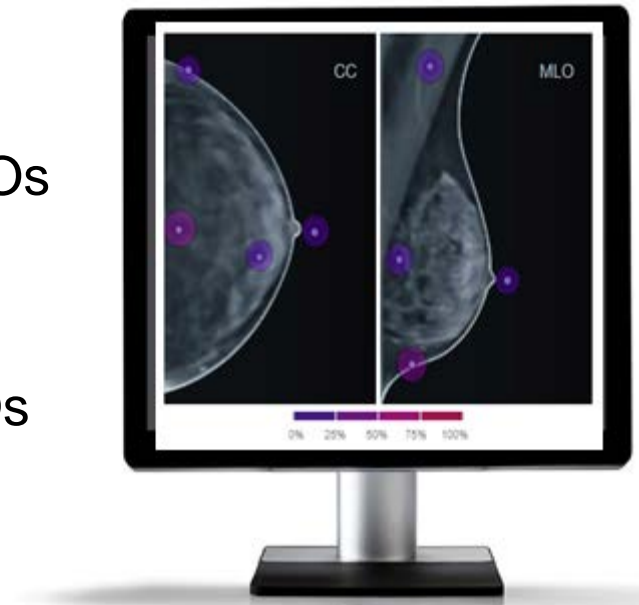
Radiographer 1

- > Radiographer logged in 37 times between December and February.
- > Overall, **7% increase** in positioning scores and **8% increase** in target compression.
- > The increase in positioning scores was due to:
 - **19% improvement** in pectoral length on MLOs
 - **6% improvement** in IMF demonstration on MLOs
 - **4% improvement** in nipple in profile on MLOs



Radiographer 2

- > Radiographer logged in 16 times between December and February.
- > Demonstrated a **4% increase in target compression** and **7% increase in positioning**.
- > The increase in positioning scores was largely due to:
 - **41% improvement** in pectoral length on MLOs
 - **17% improvement** in nipple angle on CCs
 - **14% improvement** in PNL on CCs
 - **7% improvement** in nipple in profile on MLOs





**What do the radiographer's think of
VolparaEnterprise?**

User feedback

- > 'I feel like my images are getting better and its keeping me on my toes with compression and positioning'.
- > 'Enterprise allows me to take note of any positioning trends as early as possible so I can correct them before any bad habits form. I love it!'
- > 'Using positioning hot spots has helped me to improve my positioning. It's a very effective tool'.
- > 'System is user friendly which has been good for me as I have average IT skills'.
- > 'It is a quick and efficient way to check your overall performance on a regular basis'.

Over 90% survey respondents said they would definitely or probably continue to review their performance on the VolparaEnterprise system



Acknowledgements

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