

Philips in partnership with Cobalt:

Compressed SENSE pilot reaps rewards for Cobalt with accelerated MRI examinations and increased productivity, enabling up to 20 additional patients to be scanned each week.

Growing pressure on imaging services

- Over a four-year period, the number of Magnetic Resonance Imaging (MRI) scans being performed annually in England has grown by 8.9% (2012/13: 2.35 million; 2016/17: 3.36 million)^I which is compounding pressures on radiologists – figures suggest their workload has increased by 30% during a similar period (2012–2017).^{II}
- There is also an ongoing nationally recognised shortage of diagnostic radiographers, particularly those specialising in MRI and CT ^{III,IV}
- This increased workload is having detrimental impacts on the radiology workforce; with radiologists and radiographers showing signs of stress and burnout in part due to longer working hours – a factor in taking an early retirement or a change in career.^V
- The use of MRI is predicted to increase further, owing to an increase in chronic conditions and continuous pressures on healthcare systems.^{VI}
- These findings underline a need for increased efficiencies in imaging services in the UK.

Cobalt^{VII}: Innovation in imaging

- Cobalt is a charity that invests in equipment, research and education to enable patient access to the best technology and medical imaging services.
- Cobalt and Philips have enjoyed a strong partnership since 1993 when the first 0.5T MRI scanner in a mobile unit was provided to support patients in Gloucestershire, Herefordshire and Worcestershire. Since then Cobalt and Philips have collaborated on a number of memorable firsts, including the UK's first 1.5T MRI in a mobile unit, first 1.5T Ingenia mobile, and first 3.0T Achieva TX and Ingenia MRI mobiles.
- The team is primarily focused on medical diagnostic imaging and believes that all patients should have access to the very best equipment while helping doctors to make a clear diagnosis, and an appropriately personalised treatment plan.
- The Imaging Centre in Cheltenham remains at the forefront of diagnostic imaging technology.

- Over 75,000 patients are seen each year, both at the Imaging Centre in Cheltenham, at the Institute of Translational Medicine (ITM) Imaging Centre in Birmingham and with the mobile MRI and CT scanners that travel nationally.
- To meet the increasing demand for MRI capacity within the clinic, Cobalt introduced Philips' Compressed SENSE technology on their Ingenia 3.0T during September 2018. This made Cobalt the first imaging facility in the UK to trial Compressed SENSE in a clinical setting, over a three month period.

“Cobalt saw its diagnostic imaging services reduce their MRI examination times by up to 30–50%, accommodating up to 20 additional patients per week as a result.”



Left to right: Ruth Pearson, Training Facilitator MRI radiographer, Zoe Wray, MRI Senior Radiographer, and Karen Hackling-Searle, Head of MRI at the front of Cobalt Imaging Centre, Cheltenham, UK.

Adapting to the new software and steps taken to maximise impact

- News regarding the Compressed SENSE pilot generated excitement amongst the team.

Karen Hackling-Searle,
Head of MRI, says:

‘We discussed Compressed SENSE with the radiographers and highlighted this was something new with the potential for measurable benefits for the patients.

A core group of radiographers really embraced the trial, in the hope that we’d see some tangible benefits.’

- Rather than changing all the scanning protocols immediately, several routine body areas were chosen for dedicated Compressed SENSE scanning sessions. Where possible, body areas were block-booked to reduce set-up time and maximise the throughput.
- Dedicated sessions also gave the team time to review the patient pathway from reception arrival, through preparation to scanning and patient release. This was to ensure the most efficient workflows to turn patients around in shorter appointment slots, whilst continuing to maintain the same level of care and support.
- Patients were asked to arrive earlier at the clinic and measures were taken to accommodate additional car parking requirements, owing to the increase in patients arriving during the Compressed SENSE sessions. The team recognised a need for additional staffing resource to move the patients through the pathway and rostered a dedicated Imaging Assistant to the 3.0T Ingenia scanner.
- A core team was established to set up and optimise scanning protocols. This gave them ownership of the task, and authority to develop the protocol as was necessary, whilst maintaining high image quality.



Left to right: Zoe Wray and Ruth Pearson

- When developing protocols, the team had to ensure that there was no compromise on image quality and that the transition to new protocols was seamless. In fact, the transition was indeed seamless, as the radiologists did not notice the changes made, and continued to report as if nothing has changed.

“Cobalt strive for innovation and improving the patient pathway. With that in mind, we always have our eye open for anything new to achieve this. With Compressed SENSE there will be a lot of discussions across the whole MR world about this technological advance in MRI acceleration technique.”

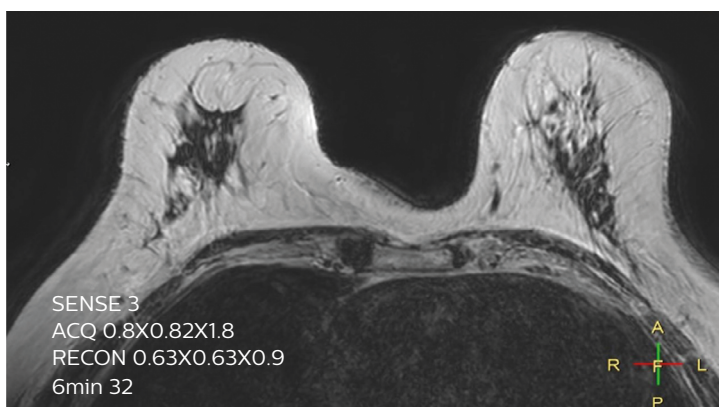
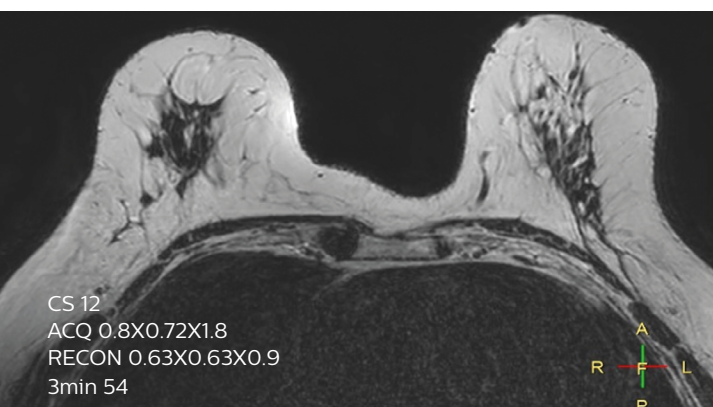
Karen Hackling-Searle, Head of MRI

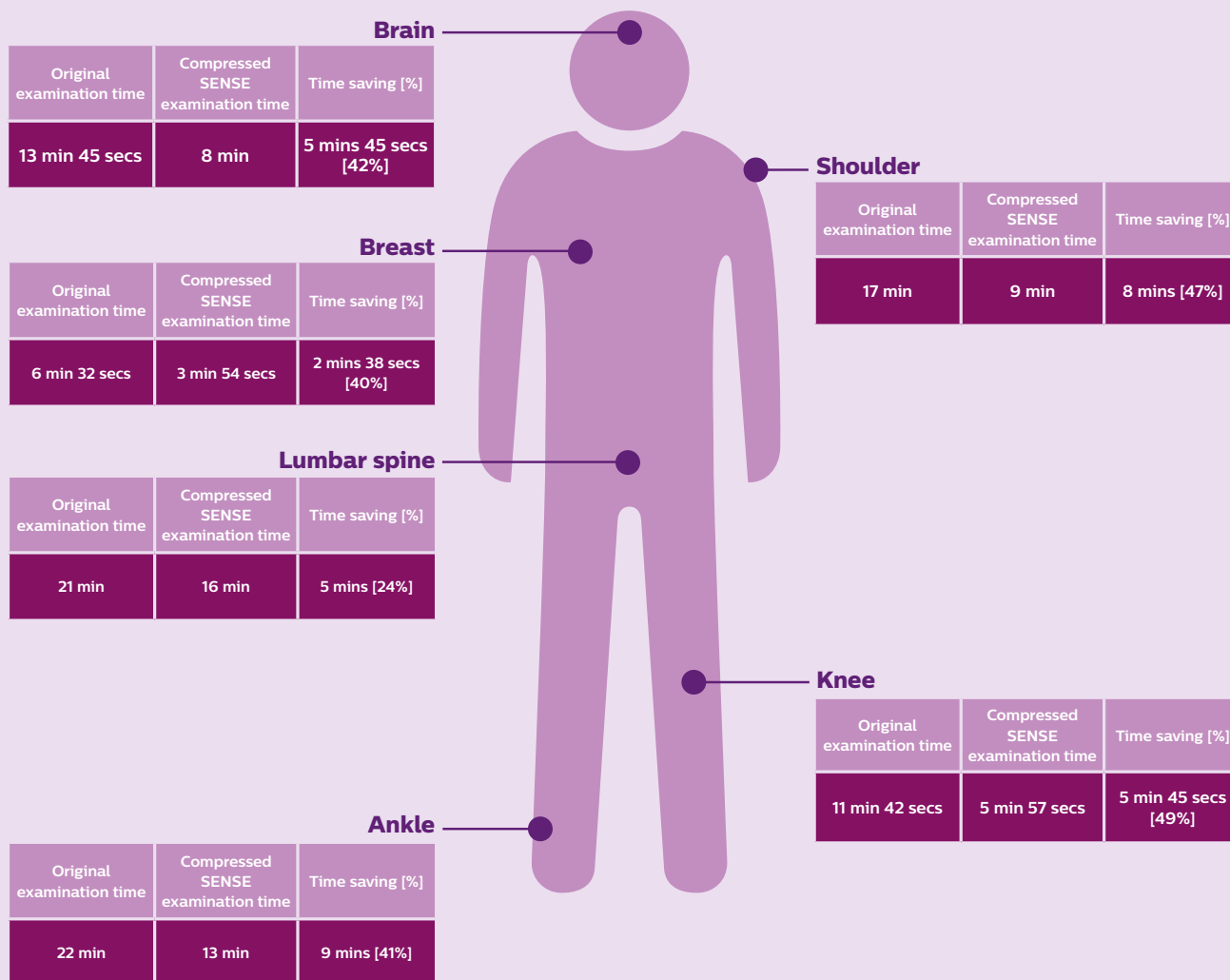
Appraising the benefits for the team and for patients

Increased productivity

The team were able to scan an additional 17–20 patients per week, compared with the same period in the previous year.

The increased throughput meant that the staff had to be more prepared in terms of moving the patients through the system efficiently.





Increased precision

The time gain with Compressed SENSE was also used to increase resolution in order to identify the tumour type and enable a more personalised treatment. For example, in breast imaging, resolution is crucial to permit visualisation of very small lesions and Compressed SENSE enables a thinner slice, 3D isotropic sequence which has increased diagnostic confidence for the radiologists.

‘The 3D-Thrive sequence has proven to be important in providing accurate post-processing data to inform on diagnosis and how we care for the patient,’ says Ruth Pearson, Training Facilitator MRI Radiographer.

“I would definitely say that throughput has been helpful to the breast list. Prior to Compressed SENSE we were scanning up to seven patients, we’re now able to scan up to nine patients within the same time period.”

Zoe Wray, Senior MRI radiographer

“Normally, if you want more detail on the MRI scan the scan takes longer. Previously we’ve had to balance between getting the detail required and how long the patient can lie still. Now with the new technology we can get more detail and scan faster.”

Ruth Pearson, Training Facilitator MRI Radiographer

Enhanced patient experience

Compressed SENSE in combination with in-bore experience and the ambient lighting is a combined approach to reduce patient anxiety, supporting the best possible levels of compliance and a successful scanning outcome for diagnosis. The radiographers found they did not need to spend so much time encouraging anxious patients on and into the scanner during set up, which enabled a quicker examination with less movement issues, which helped ensure the day list schedule remained on-track. Zoe Wray, also adds: ***‘It’s better for the patient in that they’re not having to stay still as long and they’re not having to stay in the scanner longer than required either, which can help improve the experience.’*** Other groups who are likely to benefit include those suffering with pain, and children where keeping still for an examination is challenging.



The Ingenia 3.0T provides an immersive in-bore visual experience



The Ingenia 3.0T with Ambient Experience lighting

To learn more, visit

Compressed Sense website: <https://www.philips.co.uk/Cobalt>

Compressed Sense documents: <https://www.philips.co.uk/CSdocs>

For further information please contact

For further information please contact **Jon Brigly**

Marketing Manager, MR and CT, Philips Health Systems UKI

Email: Jon.Brigly@philips.com

ⁱ NHS England, 23 November 2017. Diagnostic Imaging Dataset Annual Statistical Release 2016/17. Available at: <https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2017/11/Annual-Statistical-Release-2016-17-DID-PDF-1.5MB.pdf> (accessed 2 July 2019)

ⁱⁱ BBC, 22 August 2018. Radiologist shortage 'affecting cancer care' in the UK. Available at: <https://www.bbc.co.uk/news/health-45275071> (accessed 2 July 2019)

ⁱⁱⁱ The Society and College of Radiographers, May 2019. UK Workforce Census 2018 report. Available at: https://www.sor.org/sites/default/files/document-versions/diagnostic_workforce_census_2018.pdf (accessed 2 July 2019)

^{iv} The Society and College of Radiographers, 6th November 2018. BBC interview with Society CEO highlights radiographer workforce shortage. Available at: <https://www.sor.org/news/bbc-interview-society-ceo-highlights-radiographer-workforce-shortage> (accessed 2 July 2019)

^v Royal College of Radiologists, April 2019. UK Workforce Census 2018 report. https://www.rcr.ac.uk/system/files/publication/field_publication_files/clinical-radiology-uk-workforce-census-report-2018.pdf

^{vi} <https://www.businesswire.com/news/home/20190801005481/en/Global-Magnetic-Resonance-Imaging-Market-Drivers-Restraints>

^{vii} Cobalt. Available at: <https://www.cobalthhealth.co.uk/> (accessed 2 July 2019)

