



Imagine Now & Next

Redefining ultrasound imaging with DeepInsight™

Diagnostic ultrasound systems are essential in clinical practice, allowing real-time visualisation of organs, tissues and anatomical structures to provide valuable information and help guide patient care. Equally importantly, the technology is painless and non-invasive – and does not expose individuals to radiation – making it particularly patient-friendly. However, the images produced can exhibit inter-patient variability, plus there are limitations on scanning body parts that do not transmit sound waves as well as others. FUJIFILM Healthcare has developed a powerful cognitive technology called DeepInsight™, that significantly improves the quality of ultrasound images to overcome some of the pitfalls. So what can DeepInsight™ do?

The challenges of ultrasound imaging

Ultrasound systems work by transmitting a focused beam of sound waves into the body, which are reflected by boundaries between tissues in the path of the beam. The reflected echo signals are detected and used to reconstruct an image of the internal structures. However, every patient is different, and many aspects can limit the ultrasound scanning in terms of clarity of the image and sharpness of the tissue structures. Moreover, noise and artefacts generated by the system's electrical components can easily be confused with speckle signals – small scatterers of tissue that appear as a granular pattern on ultrasounds. These speckle signals are used by sonographers to monitor small differences in tissue condition and function, making them a useful diagnostic feature of the image. Depicting the pure, useful signal is therefore an important step to improve the quality of ultrasound images, simplifying interpretation and aiding diagnosis.

Developing DeepInsight™

The need for clearer ultrasound imaging drove the development of DeepInsight™, an innovative ultrasound platform that guarantees the purest image quality. DeepInsight™ technology provides fast, efficient image processing based on artificial intelligence for an augmented view of the tissue structures. It significantly increases clarity levels and allows confident scanning, even for the most challenging patients. The borders of organs and blood vessels can be clearly identified, and both image contrast and the visibility of deep structures are improved. Furthermore, unnecessary image noise inside blood vessels and in deep regions is effectively reduced, resulting in an improved image overall.

Diving in to DeepInsight™

DeepInsight™ uses artificial intelligence to distinguish between echo signals and electrical noise – while still retaining important speckle signals – to selectively extract the signals that are necessary for diagnosis. This results in high quality images, even from deep regions of the body, to support more accurate ultrasound examinations. Crucially, DeepInsight™'s capabilities are designed to work in real time, allowing the sonographer to benefit from this powerful image enhancement while adjusting the transducer to identify areas of interest and ensure the best possible image quality.

Benefits of DeepInsight™

FUJIFILM Healthcare Europe believes that ultrasound imaging must cover five essential elements to meet the ever-increasing demands of diagnostic imaging, both now and in the future. DeepInsight™ has been developed to satisfy these elements, streamlining ultrasound examinations to enhance diagnostics and patient care.

5 essential elements for ideal ultrasound imaging

Fujifilm Healthcare believes that ultrasound imaging must cover 5 elements in future.

"DeepInsight" is the ideal form of ultrasound imaging that meets all of these elements, or the technology and innovation to achieve it.

Reproducibility

Keep stable image quality without inter-examiner and inter-patient variation

Accuracy

Improve signal to noise ratio (S/N) without compromising resolution

Visibility

Provide images that enable to recognize abnormalities even in difficult cases

Utilization of AI

Provide a new level of image quality with DeepInsight technology, which utilizes AI technology*

Efficiency

Reduce the burden of image adjustment and provide high quality images in a short time

*The technology was developed and designed using machine learning, one of the AI technologies. The performance and accuracy of the system does not automatically change after implementation.

DeepInsight™'s artificial intelligence uses advanced algorithms to improve the quality in real time during an examination, making evaluation and diagnosis simpler and more accurate. This speeds up assessment, helping to shorten examination times and improve the overall efficiency of the radiology suite. Clinical staff benefit from more reproducible results, with reduced inter-operator and inter-patient variation, and even complex cases should be easier to interpret due to clearer images.

What's next for the technology?

DeepInsight™ has initially been launched as part of a new ultrasound series – ARIETTA™ 850 DeepInsight™ and ARIETTA™ 650 DeepInsight™ – providing these instruments with exceptional high- definition image quality. These new systems will redefine ultrasound imaging, benefitting patients and improving the capabilities of radiology suites. With the ever-growing demand for improved visualisation, we will be exploring further opportunities to use this technology, so watch this space for future developments using DeepInsight™ !

DeepInsight™ was developed and designed by using artificial intelligence. The performance and accuracy does not automatically change after implementation and may vary depending on the system and transducer.