Precision Imaging

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Ultrasound imaging, particularly in the field of veterinary medicine, is a fundamental component of the diagnostic process across a large number of disease processes. B-mode imaging remains the mainstay in diagnostic ultrasound and currently has widespread availability to both the referring and specialty veterinary communities. Grey-scale imaging quality is therefore of paramount importance in the identification of pathology; particularly subtle lesions. Toshiba has developed Precision Imaging™ specifically for this reason.

Image quality in B-mode ultrasound is directly dependent upon both spatial and contrast resolution. Spatial resolution describes the ability to differentiate between two reflectors in space; this is further subdivided into axial and lateral resolution. Contrast resolution describes the ability to differentiate between varying signal intensities. Precision Imaging™ maximizes both of these features by using a new method of signal processing that is powered by Intelligent Component Architecture. Images are not only evaluated line-by-line, but also by including information from adjacent lines. Data acquired from adjacent lines permits for both noise reduction and enhanced structural boundary definition. The result is a more homogeneous image that enhances subtle tissue differences.

In the clinical setting, increasing levels of Precision Imaging™ has been particularly beneficial in delineating intestinal wall serosal margins and internal layering (Figure 1) in addition to defining vascular margins for more precise evaluation of adjacent lymph node borders (Figure 2).
Figure 1
A small intestinal segment (near field) is evaluated at 3 different levels of Precision Imaging™. Note that with increasing level, there is improved delineation of the serosal border and therefore differentiation from surrounding mesentery. Furthermore, internal layering is more clearly defined. *Slight variation in small intestinal appearance is due to normal bowel peristalsis at the time of ultrasound examination.

Figure 2
The distal aorta and adjacent medial iliac lymph nodes are evaluated at 3 different levels of Precision Imaging™. Note that with increasing level, the aortic and lymph node margins are more clearly delineated.

Ultimately, Precision Imaging™ is responsible for an improvement in image quality that correlates directly with operator confidence and therefore efficiency in the clinical setting. Most importantly, patient safety is also greatly improved, particularly in the case of intervention where sampling of very small or subtle lesions may be indicated.