

# PENTAX Medical – State-of-the-art Endoscopic Ultrasound

*The optimal solution from diagnosis to therapy*

**PENTAX**  
MEDICAL





# Superior image quality for a more accurate diagnosis and therapy

The outstanding image quality of PENTAX Medical ultrasound endoscopes offers an optimal foundation for the detection and staging of lymph nodes and tumours in the gastrointestinal and respiratory system.

## Diagnostic

**EG-3670URK**  
360° radial ultrasound endoscope for diagnostic EUS.



## EUS-FNA



**EG-3270UK**  
Linear ultrasound endoscope for day-to-day diagnostic EUS and EUS-FNA.



**EB-1970UK**  
Linear ultrasound bronchoscope for diagnostic EBUS and EBUS-TBNA.

## Therapeutic

**EG-3870UTK**  
Linear ultrasound endoscope for therapeutic EUS.



## Diagnostic

## EBUS-TBNA

## Therapeutic

**> State-of-the-art image quality**  
High-class ultrasound imaging and excellent visualisation capabilities. The combination of Hitachi's and PENTAX Medical's superb technologies results in optimised detection, staging and therapy.

**> Maximum comfort**  
Flexibility and advanced maneuverability allow greater comfort for both patient and examiner. EBUS is a minimal invasive technique that reduces the risk of complications and which can replace surgical invasive procedures (eg. Mediastinoscopy).

**> Broad field of applications**  
Diagnostic and interventional procedures in the gastrointestinal tract as well as staging of lung cancer patients.

**> Superior imaging modalities**  
Superior quality and innovative imaging modalities such as Real-Time Tissue Elastography, Dynamic Contrast Harmonic Imaging and Colour and Power Doppler for vessel distinction and higher procedure safety.

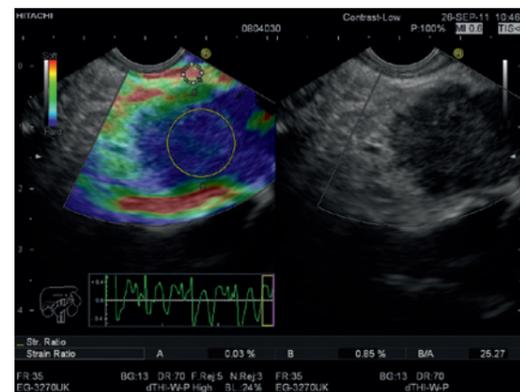
**> Transducer visibility**  
Unrivalled orientation and navigation provides the user with more confidence.

## Innovative imaging modalities for a more accurate diagnosis and therapy

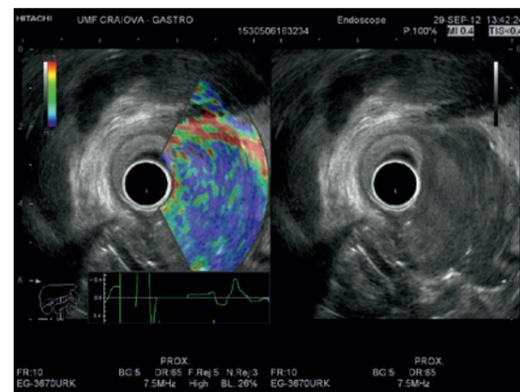
The market-leading partnership of PENTAX Medical and Hitachi in endoscopic ultrasound has created unparalleled image quality and state-of-the-art technologies. By offering radial and linear ultrasound endoscopes, Real-Time Tissue Elastography and EBUS-guided TBNA, the partnership is developing a unique product range for optimal patient care.

### Elastography

Elastography is an imaging modality that evaluates the relative stiffness of tissue within the body, by its response to compression. It complements the existing grayscale ultrasound image by overlaying colours. Additionally, strain ratio elastography provides a quantitative measurement to the qualitative pattern and colour recognition by measuring the strain ratio between a lesion and adjacent softer tissue. "Elastography emerges as a useful tool to differentiate benign from malignant lesions, mainly in pancreatic diseases and lymph nodes".<sup>1)</sup> "It is useful for identifying cases in which biopsies are unnecessary and for directing biopsies to optimal areas in cases where histologic diagnosis is required."<sup>2)</sup>



Pancreatic adenocarcinoma, EG-3270UK<sup>3)</sup>



Esophageal tumor, EG-3670URK<sup>4)</sup>

### Guidelines for elastography by EFSUMB

"Complementing established B-mode criteria EUS strain ratio Elastography is useful as an additional tool for discrimination of benign and malignant lymph nodes and to better target FNA. [...]"

EUS Elastography is useful as a complementary tool for the characterization of focal pancreatic lesions."<sup>5)</sup>

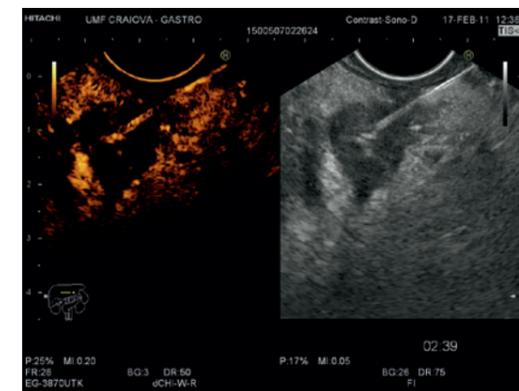
### High diagnostic accuracy

Diagnostic accuracy of elastography for lymph nodes is presented by a sensitivity of 88% and a specificity of 85%.<sup>6)</sup>

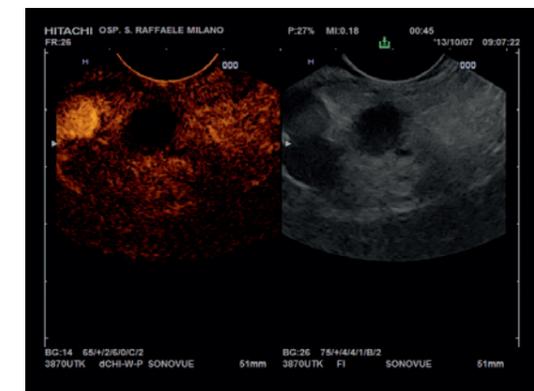
Diagnostic accuracy of elastography for pancreatic mass is presented by a sensitivity of 96% and a specificity of 69%.<sup>7)</sup>

### Contrast-enhancement

Contrast-enhanced ultrasound combines the advantage of high-resolution ultrasound with the administration of microbubble-based contrast agents using a contrast-specific mode of the Hitachi ultrasound scanner. "CE-EUS can be used for characterization of microvascularization, to differentiate benign from malignant lesions and to improve staging and real-time guidance of diagnostic and therapeutic procedures with a high sensitivity."<sup>8)</sup>



ADK CE-EUS guided FNA, EG-3870UTK<sup>4)</sup>



CE EUS in pancreatic cancer, EG-3870UTK<sup>9)</sup>

### Guidelines for CE-EUS by EFSUMB

"Discrimination of hypoenhancing ductal adenocarcinoma of the pancreas from other iso- or hyperenhancing lesions, discrimination of mass-forming chronic pancreatitis from ductal adenocarcinoma in patients with chronic pancreatitis and improved discrimination of cystic tumors from pancreatic pseudocysts".<sup>10)</sup>

### High diagnostic accuracy

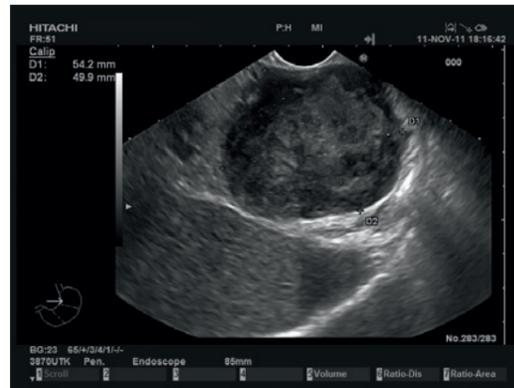
Diagnostic accuracy of CE-US for pancreatic mass is presented by a sensitivity of 94% and a specificity of 89%.<sup>11)</sup>

1) Iglesias-Garcia et al.: Contrast-enhanced harmonic endoscopic ultrasound. *Gastrointest Endosc Clin N A*, 2012.  
 2) Iglesias-Garcia: Review Endoscopic Ultrasound Elastography. *Endoscopic Ultrasound*, 2012.  
 3) Courtesy of Dr. Marc Giovannini, Paoli Calmettes Institut Marseille, France  
 4) Courtesy of Prof. Adrian Săftoiu, University of Medicine and Pharmacy Craiova, Romania  
 5) Bamber et al.: EFSUMB Guidelines and Recommendations on the Clinical Use of Ultrasound Elastography. *Ultraschall in Med*, 2013.  
 6) Xu W et al. EUS elastography for the differentiation of benign and malignant lymph nodes: a meta-analysis. *Gastrointest Endosc*, 2011; 74(5): 1001-9.  
 7) Pei Q et al. Diagnostic value of EUS elastography in differentiation of benign and malignant solid pancreatic masses: a meta-analysis. *Pancreatol*, 2012; 12: 402-8.  
 8) Săftoiu et al.: Contrast-enhanced harmonic endoscopic ultrasound. *Endoscopy*, 2012  
 9) Courtesy of Dr. Maria Chiara Petrone, Vita Salute San Raffaele University, Italy  
 10) Piscaglia, et al. The EFSUMB Guidelines and Recommendations on the Clinical Practice of Contrast Enhanced Ultrasound (CEUS): Update 2011 on non-hepatic applications. *Ultraschall in Med* 2012; 33: 33-59.  
 11) Gong TT et al.: Contrast-enhanced EUS for differential diagnosis of pancreatic mass lesions: a meta-analysis. *Gastrointest Endosc*, 2012; 76: 301-9

## B mode & Doppler imaging

The B mode (brightness mode) is a two-dimensional ultrasound imaging of the tissue and underlying structures and represents the standard grayscale ultrasound image. Doppler imaging mode is used to provide a visualisation of blood vessels and surrounding structures, adding information about blood flow direction and velocity.

Hitachi HI Com combines frequency and spatial compounding resulting in an exceptional contrast and detailed resolution. Hitachi HI Rez+ is a high-resolution, real-time tissue adaptive filter technique which enhances real tissue echoes and provides a more uniform appearance.



GIST, B mode, EG-3870UTK <sup>1)</sup>



LN 7, Sarcoidosis, Doppler, EB-1970UK<sup>2)</sup>

### Clinical benefits

The PENTAX Medical ultrasound endoscopes' excellent B mode image quality allows highly accurate EUS-guided diagnosis and therapy.

Colour and Power Doppler imaging help to clearly identify vessels before targeting the needle for EUS-FNA and EBUS-TBNA.

High-resolution B mode combined with Hitachi HI Com and HI Rez+ provides the clinician with multiple options and the flexibility to improve resolution, delineation and depth of imaging, whilst reducing noise, to improve diagnosis.

1) Courtesy of Dr. Marc Giovannini, Paoli Calmettes Institut Marseille, France  
2) Courtesy of Prof. Jouke Annema, Academic Medical Centre, University of Amsterdam, Netherlands

## A product range which meets your expert needs.



### EG-3670URK

State-of-the-art ultrasound technology in a radial endoscope designed for diagnosis.

The outstanding image quality of the EG-3670URK, combining a forward viewing endoscope and ultrasound, offers an optimal foundation for the detection and staging of lymph nodes and tumours in the gastrointestinal system.



### EG-3270UK

State-of-the-art ultrasound technology in a slim linear endoscope designed for the daily diagnostic EUS and EUS-FNA.

The EG-3270UK combines the feasibility of Fine Needle Aspiration (FNA) with excellent ultrasound image quality in a very comfortable endoscope. This unique combination sets a new standard in endoscopic ultrasound for everyday practice; easy to use and applicable to a wide range of procedures.



### EG-3870UTK

State-of-the-art ultrasound technology in a linear endoscope designed for therapy.

The EG-3870UTK ultrasound endoscope with its outstanding image quality offers an optimal foundation for the detection and staging of lymph nodes and tumors in the gastrointestinal system.

The combination of excellent image quality and a large working channel offers a variety of therapeutic options.



### EB-1970UK

State-of-the-art ultrasound technology, new level of precision and visual accuracy

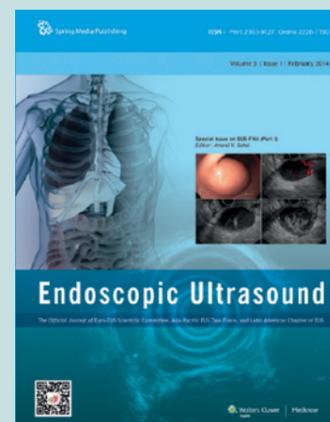
The outstanding image quality of the EB-1970UK offers an uncompromising foundation for the detection and staging of lymph nodes and tumours in the lung. Endobronchial ultrasound and real-time EBUS-TBNA contribute to a more reliable diagnosis and precise staging - becoming a standard for optimal patient care.

## The Endoscopic Ultrasound Journal

Endoscopic Ultrasound, a publication of the Euro EUS Scientific Committee, Asia-Pacific EUS Task Force, is a peer-reviewed on-line journal with a quarterly print on demand version. The journal's full text is free and available online at

<http://www.eusjournal.com>.

The journal covers technical and clinical studies related to health, ethical and social issues in the fields of EUS, ERCP and EBUS.



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