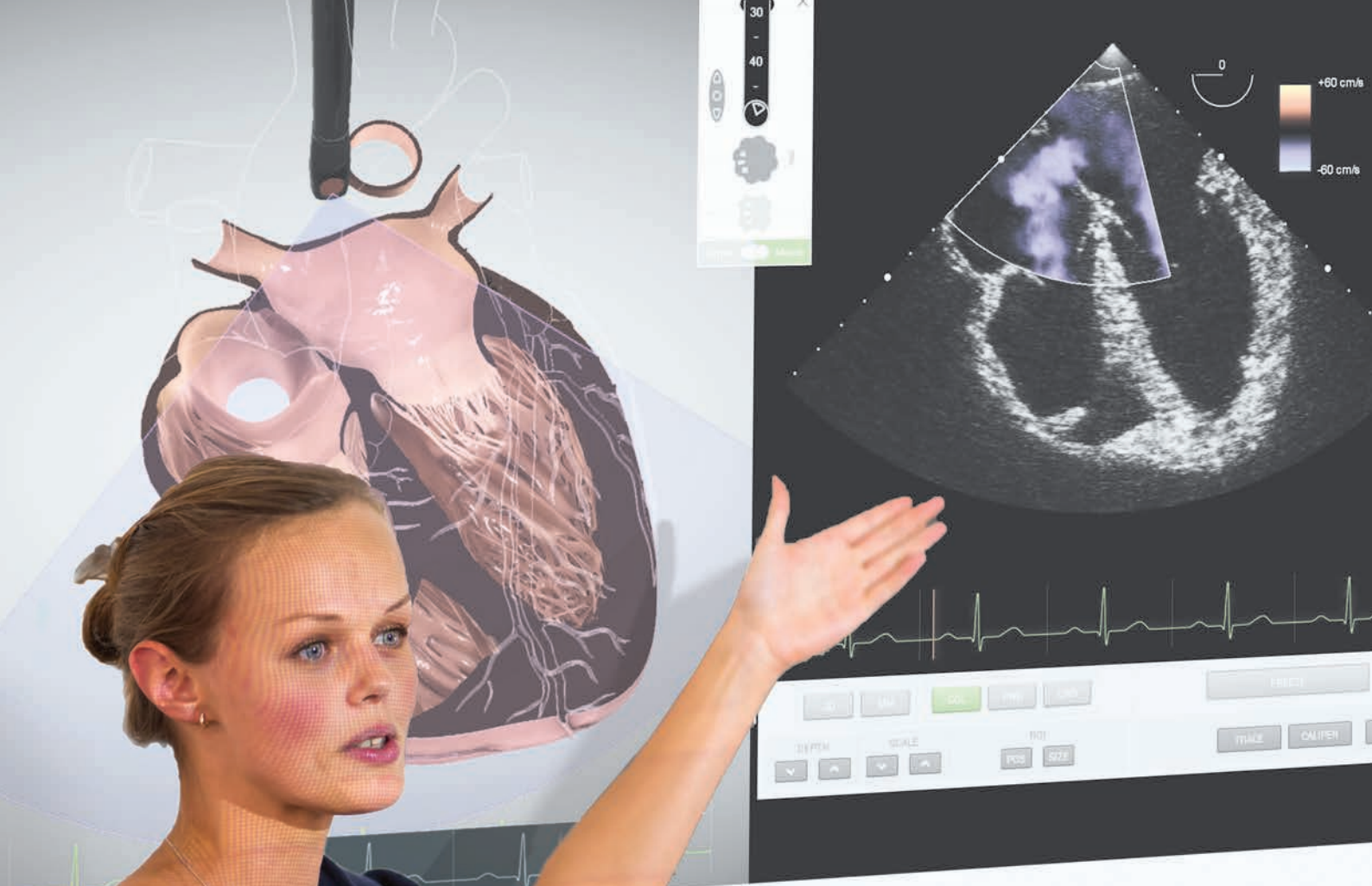INTELLIGENT
ULTRASOUND®

HEARTWORKS®

Simulation in Cardiac Anatomy, Transesophageal
& Transthoracic Echocardiography and Lung Ultrasound

"The animation of the heart is truly amazing. It's like working with the real thing."

Professor Robert Anderson
Emeritus Professor of Cardiac Morphology, Institute of Child Health

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HeartWorks® is the creation of leading cardiac anesthesiologists from University College London Hospitals, providing healthcare educators with realistic simulation tools for the effective teaching of cardiac anatomy, transthoracic and transesophageal (TTE/TEE) echocardiography as well as lung ultrasound.

From the development of the most anatomically correct and realistic 3D heart to a range of fully interactive mannequin based simulators, students can now learn:

- to understand cardiac anatomy through a virtual and interactive 3D heart including an integrated text book with intra-cardiac structures labeled and described.

- to practice realistic TEE and TTE probe handling skills for real-time image acquisition.

- to interpret image relationships between the 3D heart and corresponding ultrasound views.

- to recognize pathology.

- to make accurate quantitative assessments of cardiac function with Doppler and M-mode functions.

HEARTWORKS | Cardiac Anatomy Module

Users will acquire a detailed knowledge of the heart anatomy and cardiac structures through this freely interactive computer generated model of a beating, human heart, which includes a comprehensive anatomy text book with over 160 separate intra-cardiac structures labeled and described.

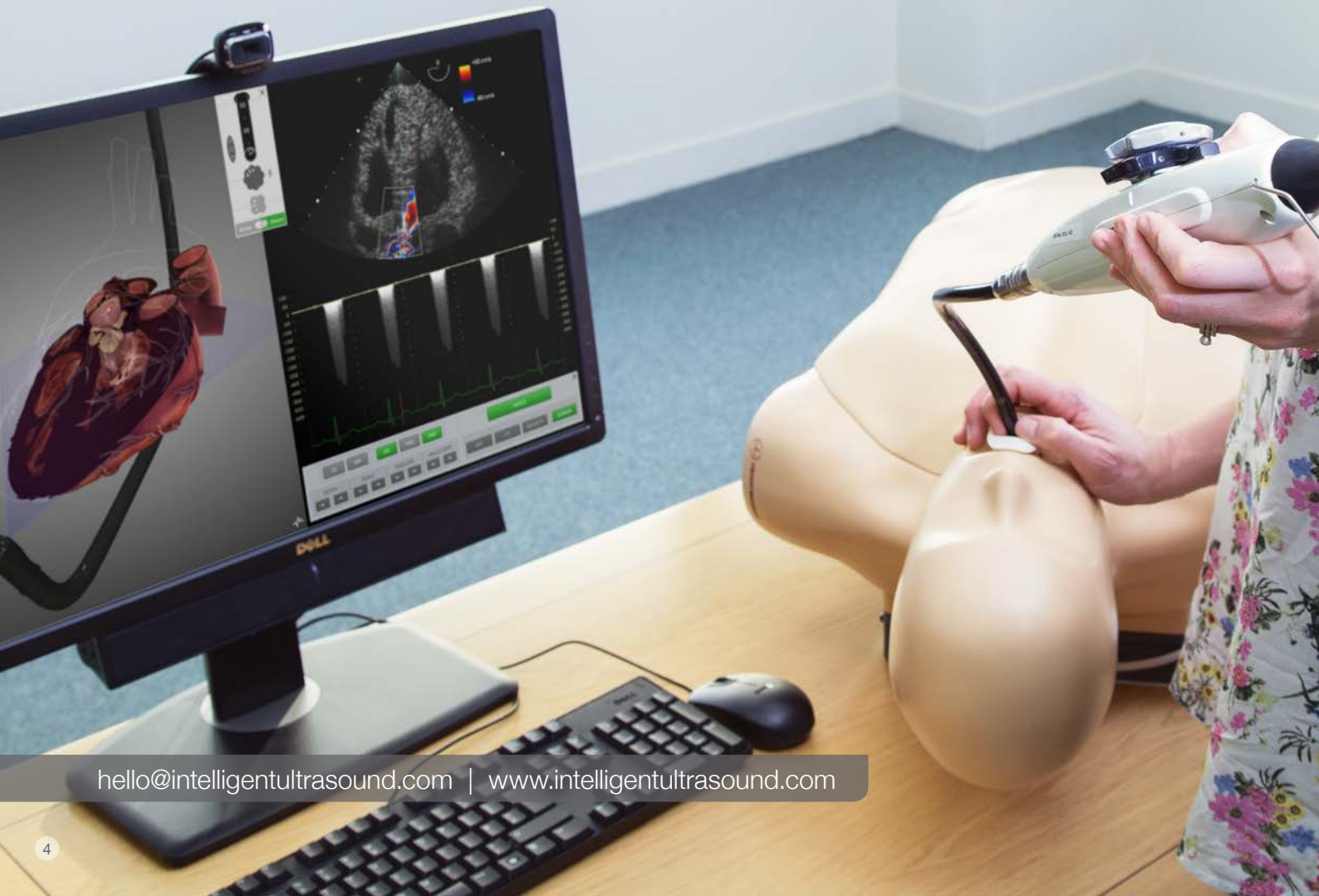## HEARTWORKS | eLearn
A Complete Education in TEE

Web based and interactive, HeartWorks e-learn is a dynamic, self-directed learning tool for clinicians wishing to consolidate their knowledge of TEE. Learners will receive **11 AMA PRA Category 1 Credits™** upon passing the end-of-course assessment.

Accredited by the American Society of Echocardiography (ASE)

"HeartWorks provides high quality images and a virtual reality environment that is leading to a more rapid development of psychomotor skills, especially in novices."

Priya A Kumar, M.D.

Professor of Perioperative Echocardiography
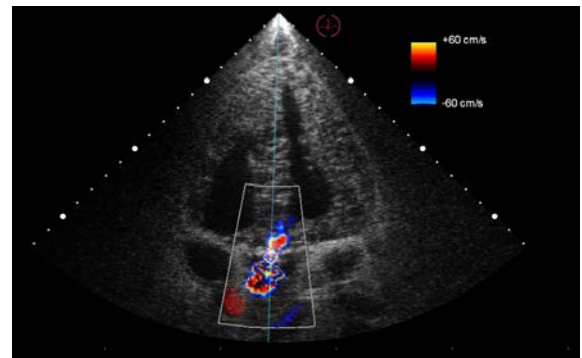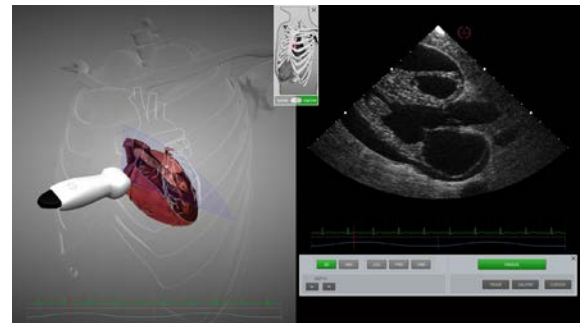*The University of North Carolina at Chapel Hill, USA*

HEARTWORKS®| Dual Simulator
A Complete Education in TEE and TTE

A 'plug and play' solution, tutors can easily switch between **TEE** and **TTE** in their training schedules. Retaining all the features of the acclaimed HeartWorks imaging software, educational programs can be both cost and time efficient without compromising on quality.

- The mannequin has soft skin with accurate, palpable anatomical landmarks to aid TTE probe positioning.

- Anatomy display includes representation of chest wall, ribs, sternum and spine.

- TEE probe with authentic controls enables users to practice and visualize multiplane probe positioning.

- The mannequin can be positioned supine or at a 45° left lateral tilt to represent common scanning positions.

- Sections of the 3D heart model can be sliced and removed to reveal underlying structures for better understanding of anatomy and effects on cardiac imaging.

HEARTWORKS | Pathology

HeartWorks pathology models for both TTE and TEE imaging have been created to facilitate the echocardiographic evaluation of patients with structural and hemodynamic disturbances. **Color** and **spectral Doppler** modalities are available along with the tools with which to make accurate quantitative assessments of cardiac function.

Available in single modality options for TEE or TTE.

"The HeartWorks TTE Mobile simulator allows us to incorporate ultrasound realistically and seamlessly within the overall scenario."

Dr. Lisa Wee, Simulation Fellow
University Hospital of South Manchester, UK

HEARTWORKS | TTE Mobile

*A cost-effective solution designed to help students transfer their ultrasound knowledge and skills into clinical practice through simulated **scenario training.***

Transferring skills to clinical practice

A light-weight, removable chest overlay that can be positioned over most full body adult patient simulators*, HeartWorks TTE Mobile facilitates transthoracic echocardiography learning objectives within clinical scenario training, ensuring students gain a practical knowledge and experience in:

- Recognizing when to utilize TTE in the care of patients.
- Acquiring quality images with correct probe placement.
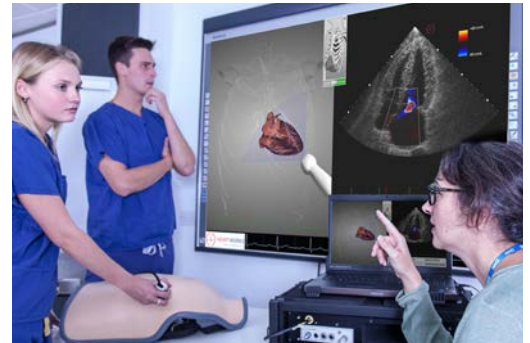- Interpreting ultrasound images to determine correct diagnoses and treatments.

Real-time imaging creates realistic scenarios

The real-time imaging on the computer screen allows users to identify probe placement in relation to the captured ultrasound plane and corresponding cardiac structures and surrounding organs. Split screen views show the ultrasound image in relation to the 3D heart anatomy.

Increasing access to echo education

Easy to set up and use, HeartWorks TTE Mobile is a portable simulator that will allow for training to take place in a variety of settings giving professionals of multiple healthcare disciplines greater access to echocardiography and lung ultrasound education.

SimMan™, iStan™, Caesar™, HAL 3201™, Simulaids™, STAT™, HPS™, ALS Simulator™ and MetiMan™.

Workshops and Tutorials

Self-Directed Learning

> *"A stress free and certainly risk free ultrasound training solution, HeartWorks is an essential addition to any unit offering an ultrasound and echocardiography service, or trying to teach such skills."*
>
> *Dr Craig Morris*
> *Consultant Intensivist and Anaesthetist, Royal Derby Hospital, UK*
> *Emeritus Professor of Cardiac Morphology, Institute of Child Health*

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HEARTWORKS | START
Student Assessment and Review Tool

*An **effective assessment** tool to test students' performance and understanding of TEE and TTE procedures.*

Setting and Marking Tests

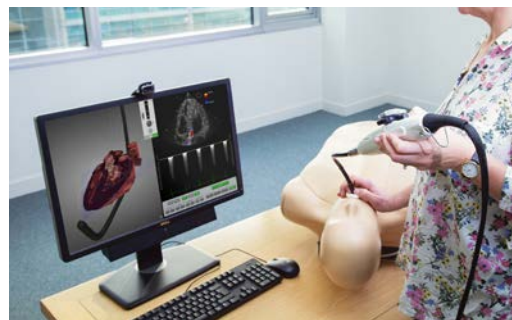Tutors can create standardized or customized tests setting tasks for students such as:

- Capture specified images with or without Doppler or M-mode.
- Set interpretative questions and quantitative tasks relating to the acquired images.
- Tests can be saved, annotated and archived to allow for a quality debrief.
- Intuitive START software makes setting and marking tests quick and easy.
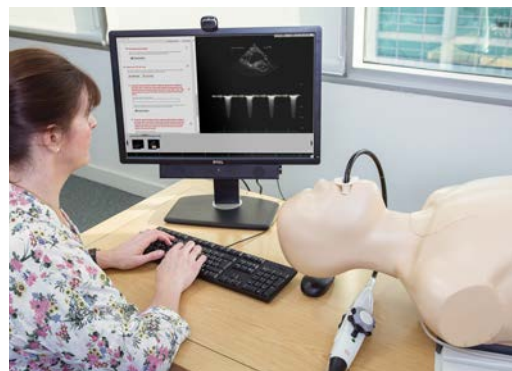
Quality Debriefing

- Both students and tutors can retrieve test data anywhere through their secure log in and review all aspects of the test for a comprehensive debrief.
- The full HeartWorks system functionality is retained allowing the tutor to interject at any point of the student's recorded image captures to demonstrate specific teaching points and corrections.

Student Management Database

- Tutors can access the administration database to measure students' progress by referencing past tests that have been stored in the system.
- New students can be easily enrolled and assigned a range of tests that have been created.

Assessing quality and accuracy of images captured

Assessing knowledge and correct interpretation of images

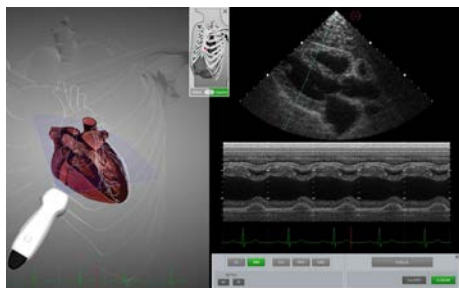*Comprehensive data retrieval for a quality debrief*

3D model of atrial septal defect

3D model & ultrasound view of Mitral Regurgitation

Color & Pulsed Wave Doppler

M-mode

Heart and Lung Pathology Models

HeartWorks pathology models for both TEE and TTE have been created to facilitate the ultrasound evaluation of patients with structural and functional disturbances of the heart and lungs.

Meticulous in detail, the animated heart simulates the normal human cardiac cycle and a range of disease states to illustrate presentations of patients with structural and hemodynamic disturbances. HeartWorks lung pathology models increase the educational scope in multiple healthcare settings.

Realistic Doppler Functions for Quantitative Assessment

Color and **spectral Doppler** modalities are available along with the tools with which to make accurate quantitative assessment of cardiac function. Color flow mapping can be enabled at a simple touch of a button. **Pulsed and continuous wave Doppler** information can be obtained from any intra-cardiac region.

Understanding the Anatomy and Image Relationships

Slicing and removing sections of the animated heart to visualize structures and the anatomy is a unique feature of the HeartWorks system providing students with a valuable aid to understand and interpret corresponding ultrasound views. Accompanying notes on the pathology models highlight the ultrasound features displayed.

Visit the HeartWorks YouTube channel to view our range of pathology models or go to the App store and download the HeartWorks App.

SIMULATOR | Support Plans

Our Support Plans are a 12 or 24 month software support and subscription service. It ensures that you have access to our software support services as well as ensuring that your HeartWorks system or systems remain up to date with new Heartworks Module releases during the subscription period.

Benefits of our support service include:

- Software support service and Help Desk
- New pathology releases
- Doppler and measurement tool enhancements
- Anatomical updates and revisions
- Software version releases
- System updates and bug fixes
- A substantial price advantage over separate purchases

Global Sales Coverage

Intelligent Ultrasound Limited is present in most countries throughout the world, either through its direct sales teams or via our Distribution Partners.

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HeartWorks is recognized globally as the leading simulation system for education in cardiac anatomy, echocardiography and lung ultrasound. Initiated and developed by leading clinicians in cardiac anesthesiology at University College London Hospitals, it is unrivalled for quality, accuracy and realism in the teaching of transthoracic and transesophageal echocardiography.

Intelligent Ultrasound is proud to work closely with healthcare educators from around the world to develop market leading simulators and learning systems that will help better prepare and support clinicians in the care of their patients.

INTELLIGENT ULTRASOUND®

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