Fast assessment of haemodynamic status and the circulation's capacity to deliver oxygen and nutrients to the vital organs has always been of central importance in emergency medicine. Reliable information is often critical to both diagnosis and guiding treatment. Traditionally, the choice has been between intermittent measurements, such as thermodilution or Doppler echocardiography, or piecing together the clues given by blood pressure, heart rate, respiratory rate and pulse oximetry.

However, using Thoracic Electrical Bioimpedance (TEB), the emergency doctor can determine cardiac output continuously, along with a host of other haemodynamic parameters. And best of all, the measurement is both inexpensive and non-invasive.

NASA first developed TEB in the 1960s to monitor haemodynamic changes in astronauts. Four small sensors send and receive a low-amplitude, high frequency current through the patient's thorax. The timing of the changes can be directly related to the systolic time intervals. This makes it possible to measure such factors as the ventricular ejection time (VET) and the pre-ejection period (PEP).

The thoracic cavity, the aorta and vena cava act as the path for most of the current. Therefore the biggest changes in current tell us about the variations in the volume and speed of aortic blood produced by the pumping action of the heart.

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The Uncomplicated measurement of lung mechanics monitoring

The newest version of the HD11 ultrasound system, Philips HD11 XE, is a compact and elegantly designed "all-in-one" system that puts a wide range of necessary tools – diagnosis, assessment, procedure guidance, and monitoring – all at clinicians' fingertips. It is designed to work with a broad range of transducers – more than 20 – allowing clinicians to select the transducer that best fits their patient without having to change systems.

The new HD11 XE (extreme edition) adds a variety of features to help physicians more accurately measure heart chambers, wall motion and ejection fraction. Features like a flat panel monitor, improved ergonomics and more powerful cardiac capabilities help physicians streamline workflow. Whether used on-cart or off-line, the system's QLAB quantification software helps physicians improve their diagnostic capability by providing an extensive, non-invasive assessment of cardiac anatomy and function.

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