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• Facilita o acesso a locais anatomicamente exíguos.

• Aconselhável para doenças cardíacas, pulmonares e exames abdominais.

• IA disponível.

• CW e PW.

• Cálculos cardíacos.

Lexsa

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• Ideal para diagnósticos pulmonares, estruturas vasculares, nervos e MSK.

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Vantagens específicas do Kosmos

Inteligência artificial que permite rapidez e fiabilidade de diagnóstico, oferecendo um suporte didático valorizado.

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Vantagens específicas do Kosmos

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Vantagens específicas do Kosmos

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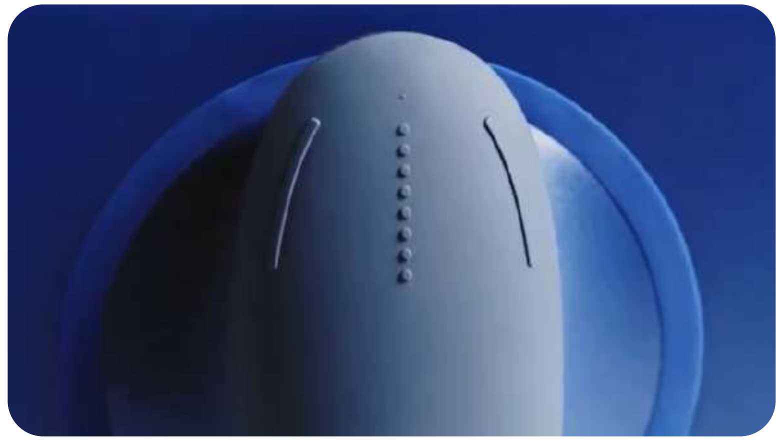
Vantagens do Kosmos Bridge

Suporte que se ajusta ao ângulo de visão do utilizador;



CapSense buttons and slider para controlo e ajuste de imagem sem necessidade de largar a sonda;

Fácil de segurar.

MAIOR RAPIDEZ E CONFORTO NA REALIZAÇÃO DOS EXAMES

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KOSMOS Specifications

Weight	• Torso: 8 ounces • Bridge: 23 ounces
Dimensions	• Torso: 150 (L) x 56 (W) x 35 (D) mm • Bridge: 216 (W) x 146 (H) x 59 (D) mm
Display	• 8-inch, gorilla glass, touch screen display • Resolution: 1920 x 1200 pixels
Transducer	• High performance, high durability PZT-based phased array
Probe Cleanability	• Validated to cleaning, intermediate and high-level disinfection per FDA guidelines, when using approved cleaning and disinfection chemicals and the process described in the User Guide
Durability	• Both Torso and Bridge tested to withstand a one-meter drop • Premium materials selected for compatibility with harsh cleaning chemicals • Bridge: IP22 rated • Torso: IPX7 rated
System Storage	• 128 GB
Connectivity	• 802.11 a/b/g/n/ac Wi-fi connectivity • DICOM connectivity • On-device processing - no cloud connectivity required
Battery	• Supports 2 hours of continuous scanning
Ultrasound	• B-mode, M-mode, Color Doppler Imaging • Optimized for high-resolution and high-penetration cardiac, lung and abdominal imaging • Proprietary custom ASIC Technology • Advanced signal processing techniques found in large radiologic systems
Visual Auscultation	• Auscultation microphones integrated directly into probe face to enable simultaneous imaging and auscultation • High-fidelity analog signal conditioning, digitization and processing to produce high-quality sound + visual auscultation waveform display
ECG	• Integrated 3-lead, single-channel ECG • High-fidelity analog signal conditioning, digitization and processing to produce high-quality ECG waveforms
Synchronization	• 3 diagnostic signals (Ultrasound, Auscultation and ECG) time-synchronized via proprietary EchoNous ASIC
IT Security	• WIFI Security: WPA, WPA2, WPA2-PSK • Device Security: System & Admin Password • Software Security: Qualcomm Secure Boot
Warranty	• 5-year warranty

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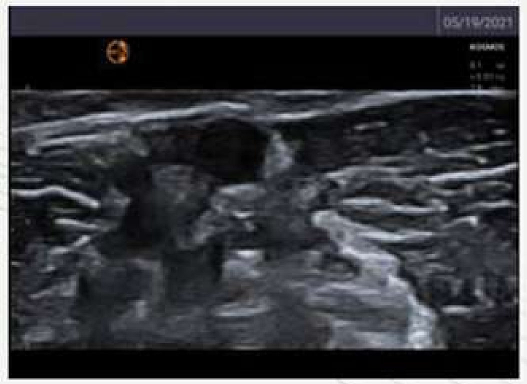
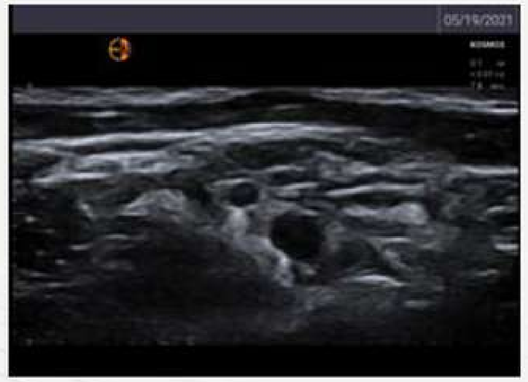


Basilic Vein



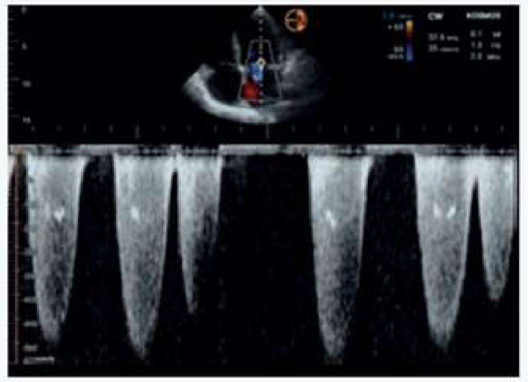
Brachial Plexus

Internal Jugular with Carotid

Patellar Tendon

Abdominal

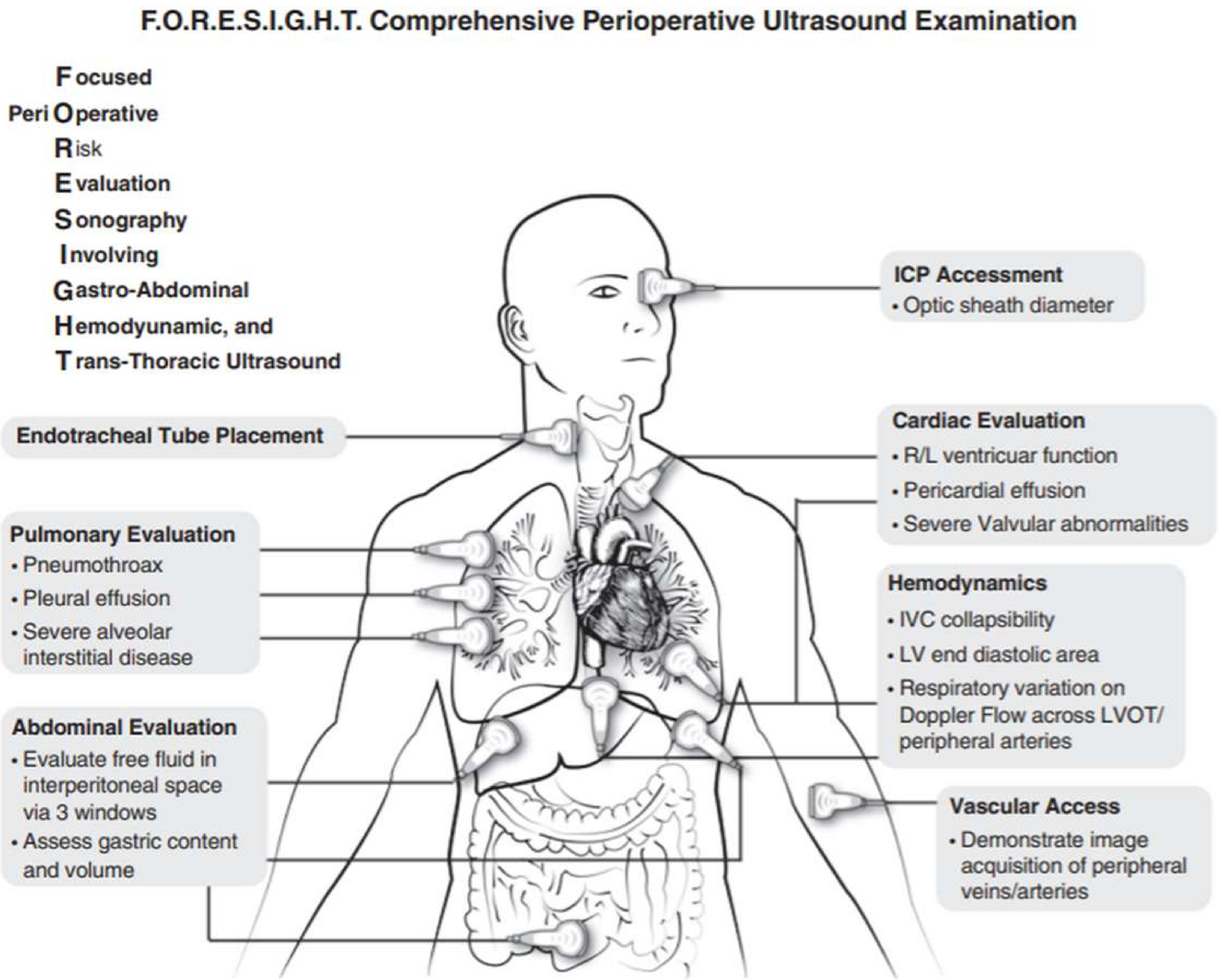
Cardiac



CW

Trio

Fundamentação Cientifica



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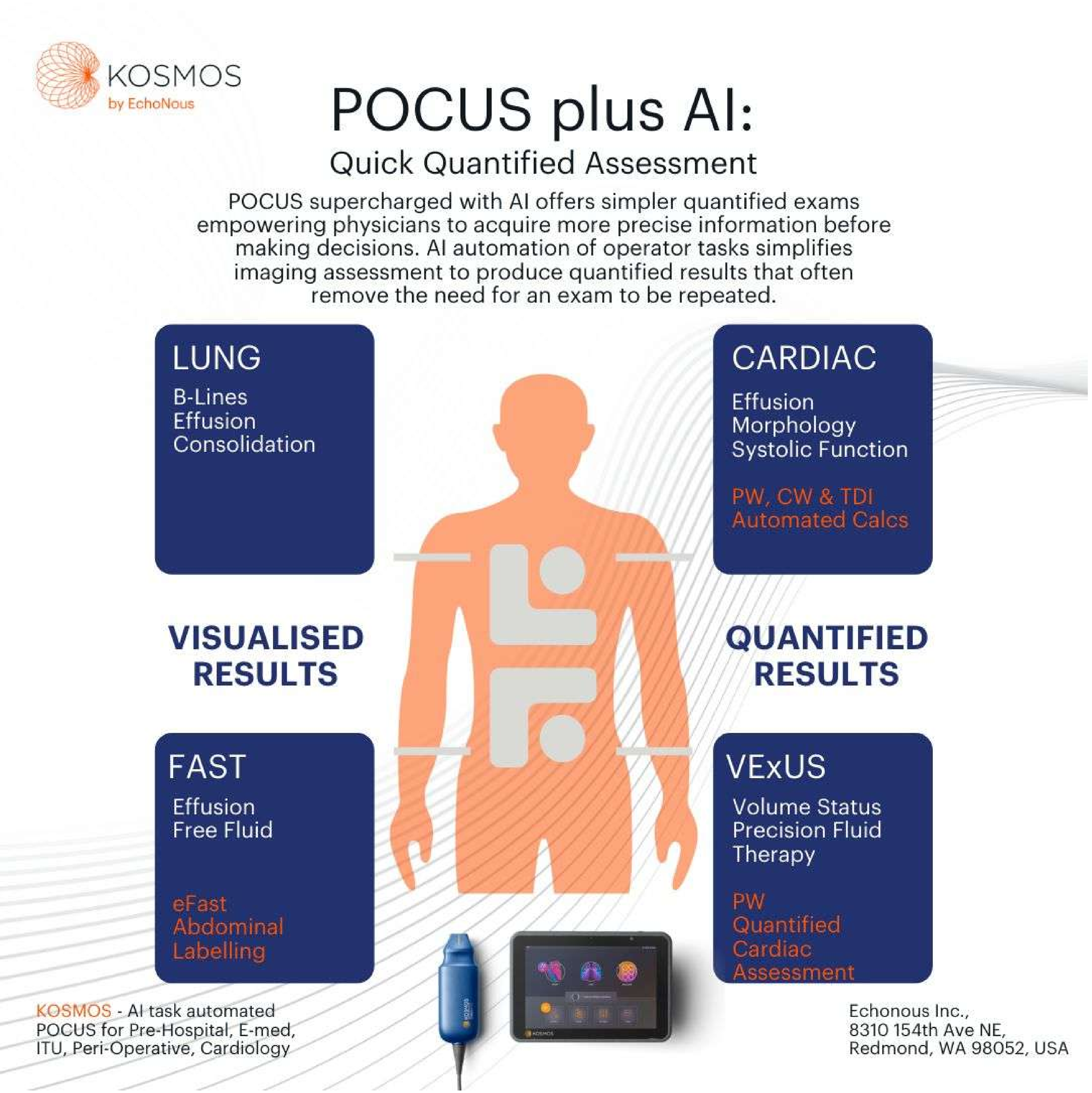
Fundamentação Cientifica



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Fundamentação Científica

Anestesia

Perioperative Point-of-Care Ultrasound

From Concept to Application

Davinder Ramsingh, M.D., Yuriy S. Bronshteyn, M.D., F.A.S.E., Stephen Haskins, M.D., Joshua Zimmerman M.D., F.A.S.E.

Perhaps the most essential aspect of a physician's role is our diagnostic capabilities. If we cannot accurately diagnose pathology, we cannot effectively treat and may cause patient harm. Point-of-care ultrasound has emerged as a modality to improve bedside assessment. Point-of-care ultrasound refers to the use of ultrasonography at the patient's bedside for diagnostic and therapeutic purposes.[1] The physician acquires and interprets all images in real time and then uses that information to diagnose and direct therapies. While comprehensive imaging can be performed and interpreted at the point-of-care, the term point-of-care ultrasound typically refers to an ultrasound exam that is simple, rapid, and goal-oriented. It is a tool used most often to provide answers to acute "yes or no" clinical questions but can be more sophisticated based on the provider's qualifications. In the acute care setting, this modality has demonstrated utility for nearly every component of bedside assessment, including cardiovascular, pulmonary, airway, and abdominal evaluation.[2–5]

Point-of-care ultrasound has been identified as the most rapidly growing sector in medical ultrasound imaging.[6] Recent advances in this technology include improved image quality as well a significant reduction in price, with handheld devices costing approximately one twentieth the price of 10 yr ago (from $40,000+ to $2,000). These devices are now extremely portable, have intuitive interfaces, and are rapidly integrating methods of automation or semiautomation. Additionally, the integration of artificial intelligence is facilitating pathology identification.[7] With these innovations, the number of specialties utilizing point-of-care ultrasound and the frequency with which point-of-care ultrasound exams are being performed are dramatically increasing.

Thus far, point-of-care ultrasound has gained widespread acceptance in certain acute care specialties, such as emergency medicine and critical care. However, the adoption of many aspects of point-of-care ultrasound has been slower within anesthesiology, even though patients have similar comorbidities and acute care events in the perioperative setting as they do in the emergency and critical care settings.[3] Indeed, events such as pneumothorax, hypovolemia, cardiac dysfunction, pericardial and pleural effusions, gastric fullness, abdominal bleeding, and pulmonary edema are just a few of the scenarios that are omnipresent. Truly, from a patient care standpoint, why should the skill set for bedside evaluation change simply because the patient entered the perioperative environment? To this point, there has been a significant increase in interest in *perioperative* point-of-care ultrasound.

This clinical focus review seeks to highlight the recent evidence on perioperative point-of-care ultrasound, with a focus on its application for the general anesthesiologist. In addition, we will discuss the topics of training and certification. Finally, we will review the topic of reporting and billing. This article will focus on anesthesiologists in the United States as a review to support the consideration of national society guidelines on the topic.

Utility of Perioperative Point-of-Care Ultrasound

We summarize the current point-of-care ultrasound topics that have demonstrated utility for the perioperative setting under the following categories: Cardiovascular, Pulmonary and Airway, Abdominal and Pelvic, and Additional Topics. A summary of these topics is highlighted in table 1 and figure 1.

Cardiovascular Status and Mechanism of Shock

Point-of-care ultrasound has proven to be highly useful for the acute assessment of gross cardiovascular function as well as for the assessment of causes of hemodynamic instability and shock. Point-of-care ultrasound provides several modalities to evaluate both static and dynamic markers of fluid status. For example, ultrasound of the inferior vena cava diameter and left ventricular end-diastolic diameter have shown a strong correlation to central venous pressure and stroke volume, respectively.[8–10] These parameters may be useful for the detection of hypovolemic states. Additionally, the use of Doppler ultrasound to assess the variability of pulsatile flow across cardiac and arterial structures can be used to predict fluid responsiveness.[11,12] This modality provides a dynamic marker that can be used to optimize one's

FONTES: https://watermark.silverchair.com
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Fundamentação Cientifica

Anestesia

Current concepts of perioperative monitoring in high-risk surgical patients: a review

Check for updates

Paolo Aseni[1*], Stefano Orsenigo[2], Enrico Storti[3], Marco Pulici[2] and Sergio Arlati[2]

Abstract

A substantial number of patients are at high-risk of intra- or post-operative complications or both. Most perioperative deaths are represented by patients who present insufficient physiological reserve to meet the demands of major surgery. Recognition and management of critical high-risk surgical patients require dedicated and effective teams, capable of preventing, recognize, start treatment with adequate support in time to refer patients to the satisfactory ICU level provision. The main task for health-care planners and managers is to identify and reduce this severe risk and to encourage patient's safety practices. Inadequate tissue perfusion and decreased cellular oxygenation due to hypovolemia, heart dysfunction, reduced cardiovascular reserve, and concomitant diseases are the most common causes of perioperative complications. Hemodynamic, respiratory and careful sequential monitoring have become essential aspects of the clinical practice both for surgeons and intensivists. New monitoring techniques have changed significantly over the past few years and are now able to rapidly identify shock states earlier, define the etiology, and monitor the response to different therapies. Many of these techniques are now minimally invasive or non-invasive. Advanced hemodynamic and respiratory monitoring combines invasive, non-invasive monitoring skills. Non-invasive ultrasound has emerged during the last years as an essential operative and perioperative evaluation tool, and its use is now rapidly growing. Perioperative management guided by appropriate sequential clinical evaluation combined with respiratory and hemodynamic monitoring is an established tool to help clinicians to identify those patients at higher risk in the attempt to reduce the complications rate and potentially improve patient outcomes. This review aims to provide an update of currently available standard concepts and evolving technologies of the various respiratory and hemodynamic monitoring systems for the high-risk surgical patients, highlighting their potential usefulness when integrated with careful clinical evaluation.

Perioperative and postoperative UltraSonographic evaluation

Bedside or Point of Care UltraSonography (PoCUS) is rapidly becoming the new standard monitoring device for real-time diagnostic assessment in addition to clinical and standard physical examination in the emergency department, intensive care unit, and now in the peri-operative and postoperative period [49].

PoCUS is a diagnostic modality that provides clinically significant data usually not obtainable by inspection, palpation, auscultation, or other components of the physical examination, and should be considered complementary to the physical examination. Bedside imaging may provide to the anesthesiologists the additional information about the volume status, basic cardiac function, lung status, and respiratory function, and It is fundamental for early detection of intrabdominal and intrathoracic bleeding or fluid collection. PoCUS, when used for airway and lungs assessment, allows careful clinical evaluation of airway patency and effective breathing also in emergency conditions. In the daily practice, it can help in the evaluation of patients in spontaneous and artificial ventilation guiding the intubation maneuvers and granting dynamic lung assessment.

Using a combined ultrasonographic evaluation of multiple districts (inferior vena cava, heart chambers, and lung parenchyma), it is possible to determine the hemodynamic status of the patient and to assess its changes in relation to the treatment performed. PoCUS, for its intrinsic characteristic of being fast, reliable and easily replicable, it is particularly useful for the periodic assessment of relevant clinical variables; it can be used as a valid instrument to constantly monitor the patient's status, anticipating potential detrimental evolutions thereby configuring itself as a precious tool guiding in the correct management of critical patients (Figs. 1, 2 and 3).

FONTE: https://pssjournal.biomedcentral.com/articles/10.1186/s13037-019-0213-5

Fundamentação Cientifica

FORESIGHT

How point-of-care ultrasound devices speed diagnostics and support health equity

The handheld technology is gaining in popularity and offers many benefits to providers, including improved outcomes, a physician imaging expert says.

By Bill Siwicki | August 18, 2022 | 08:40 AM

Q. AI is growing in use to help bridge the gap created by the staffing shortages in healthcare. In your experience, how is AI enabling staff with less training to do more?

A. Cross-setting and cross-specialty use of ultrasound information not only improves and speeds diagnostic decision-making at the point of care, but also addresses growing burdens on the radiology field. The reality is that the demand for imaging has risen at much faster rates relative to other health services in recent years, all while the pool of radiologists has steadily dwindled.

AI-powered imaging that draws from a deep repository of data and provides robust guidance delivers the framework needed to expand healthcare's view of where, how and who can use diagnostic imaging. For example, paramedics have effectively introduced handheld ultrasound into cardiac assessment without disrupting resuscitation protocol.

Other care teams are using handheld ultrasound to determine heart failure without the need to order and await the results of a chest X-ray. And notably, a recent study conducted by UNC Health found that nurse midwives using handheld ultrasound probes could perform at the level of trained sonographers when trying to obtain measures such as fetal age.

FONTES: https://www.healthcareitnews.com/news/how-point-care-ultrasound-devices-speed-diagnostics-and-support-health-equity

Fundamentação Cientifica

FORESIGHT

POCUS as An Extension of the Physical Examination

Cardiac POCUS has been increasingly adopted by a wide variety of users as an extension of the physical exam and clinical assessment. This means that anywhere in which an examination takes place, cardiac POCUS might also take place. This can occur once during an outpatient encounter or serially during an inpatient admission.

POCUS has been shown to aid medical students, internal medicine (IM) residents, and cardiologists in diagnoses that are often inadequately assessed on physical examination. For instance, chamber size such as ventricular hypertrophy and atrial enlargement have been easily identified by POCUS users after brief training [10, 14]. Left ventricular dysfunction can also be identified even with limited training [15]. In the hands of IM residents who had brief training, a POCUS exam using a pocket-sized machine in patients admitted with acute decompensated heart failure best predicted a left ventricular ejection fraction < 40%, even after considering the physical exam, EKG, chest radiography, and brain natriuretic peptide levels. Moreover, the diagnosis by POCUS was made on average 22 h prior to standard echocardiography [16].

FONTE: https://link.springer.com/article/10.1007/s11886-020-01394-y

Fundamentação Cientifica

Cardiologia

[Pulmonary and Cardiovascular CHEST Reviews]

CHEST

A Shifting Paradigm

The Role of Focused Cardiac Ultrasound in Bedside Patient Assessment

Check for updates

Jeffrey A. Marbach, MBBS; Aws Almufleh, MBBS, MPH; Pietro Di Santo, MD; Trevor Simard, MD; Richard Jung, BSc; Gretchen Diemer, MD; Frances Mae West, MD; Scott J. Millington, MD; Rebecca Mathew, MD; Michel R. Le May, MD; and Benjamin Hibbert, MD, PhD

Transthoracic echocardiography is the standard of care in anatomic and functional cardiovascular assessment; however, focused cardiac ultrasound (FoCUS) performed with portable ultrasound equipment is increasingly being used as an adjunct to comprehensive history and physical examination. FoCUS assessments, unlike formal echocardiography, are intended to assist physicians in answering explicit clinical questions with a narrow differential diagnosis in real time. Over the past decade, a growing body of literature has repeatedly shown the value that FoCUS adds to clinical evaluation. Specifically, FoCUS improves point-of-care diagnostic accuracy, which in turn modifies treatment plans, decreases time to diagnosis, and reduces resource utilization. Although less robust, there is also evidence showing improvement in clinical outcomes. Based on this evidence, clinicians, training programs, and clinical societies have embraced FoCUS as a tool to complement bedside patient evaluation. Herein, we review the evidence for FoCUS in clinical practice, specifically evaluating the diagnostic accuracy, the impact on clinical decision-making, and the effect on clinical outcomes.

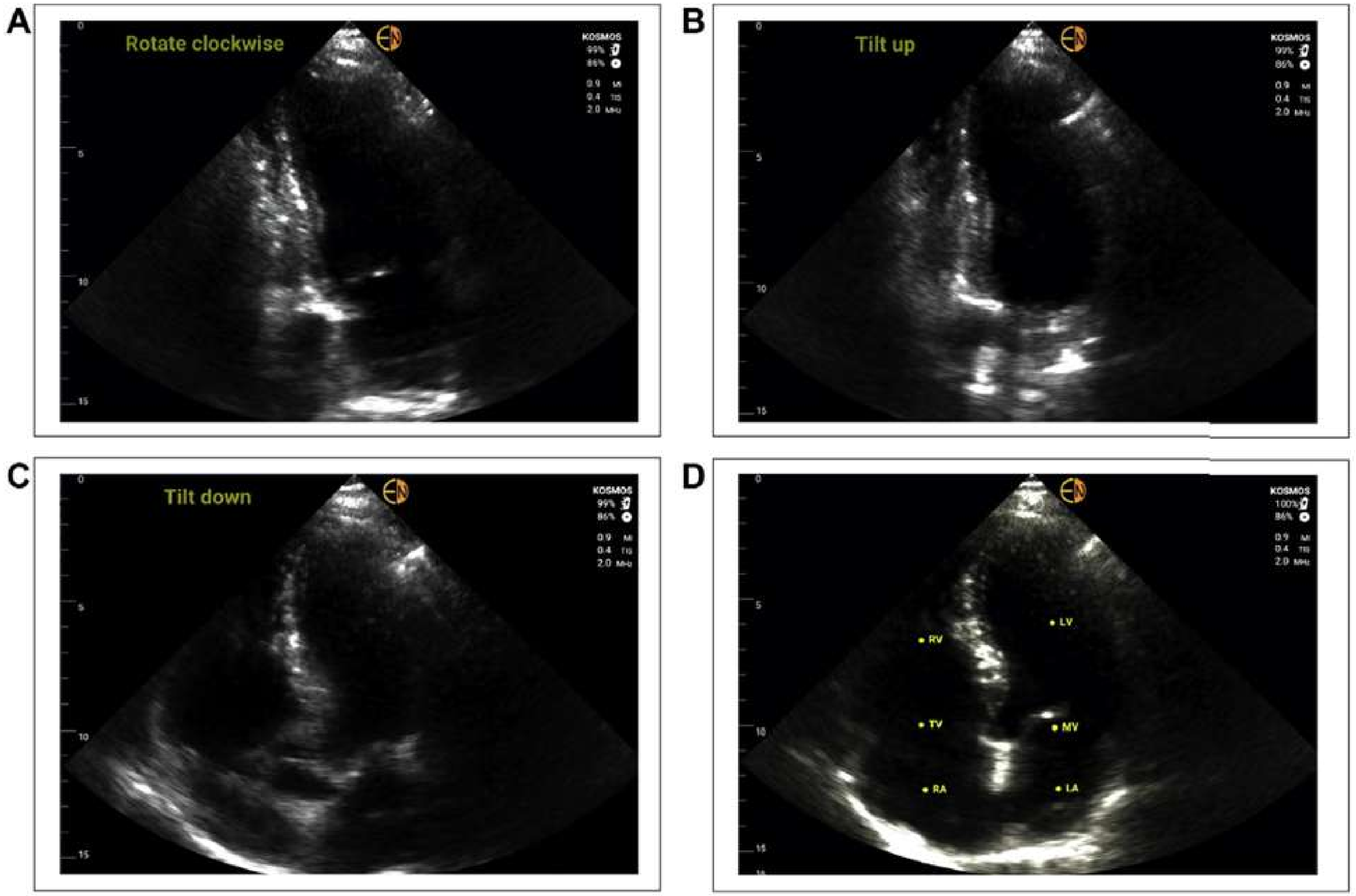
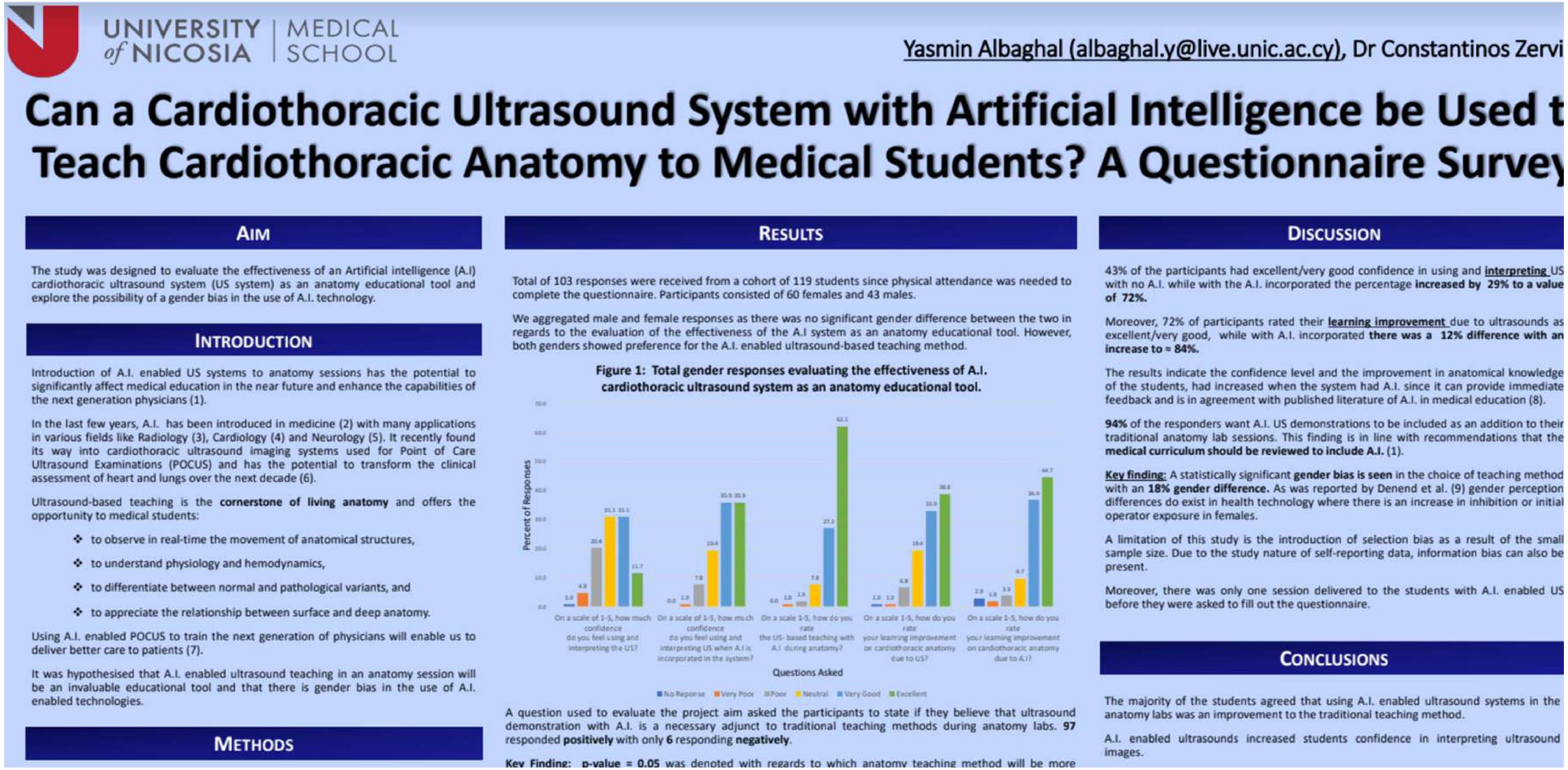


Figure 2 – A-D, Acquisition of an apical four-chamber view using the artificial intelligence guidance and anatomic recognition systems on KOSMOS (EchoNous). A, Counterclockwise rotation of the probe demonstrating a two-chamber view. Guidance instructs operator to rotate the probe clockwise. B, Posteriorly directed viewing cutting out the RV. Guidance instructs operator to tilt the probe upward. C, Anteriorly directed view showing the aortic valve and the aortic root. Guidance instructs operator to tilt the probe downward. D, Automatic anatomic recognition in apical four-chamber view. LA = left atrium; MV = mitral valve; RA = right atrium; TV = tricuspid valve. See Figure 1 legend for expansion of other abbreviations. (Images provided courtesy of EchoNous.)

FONTE: https://pubmed.ncbi.nlm.nih.gov/32707179/

Fundamentação Cientifica

Cardiologia



UNIVERSITY of NICOSIA | MEDICAL SCHOOL

Yasmin Albaghal (albaghal.y@live.unic.ac.cy), Dr Constantinos Zervi

Can a Cardiothoracic Ultrasound System with Artificial Intelligence be Used t Teach Cardiothoracic Anatomy to Medical Students? A Questionnaire Survey

Aim

The study was designed to evaluate the effectiveness of an Artificial intelligence (A.I) cardiothoracic ultrasound system (US system) as an anatomy educational tool and explore the possibility of a gender bias in the use of A.I. technology.

Introduction

Introduction of A.I. enabled US systems to anatomy sessions has the potential to significantly affect medical education in the near future and enhance the capabilities of the next generation physicians (1).

In the last few years, A.I. has been introduced in medicine (2) with many applications in various fields like Radiology (3), Cardiology (4) and Neurology (5). It recently found its way into cardiothoracic ultrasound imaging systems used for Point of Care Ultrasound Examinations (POCUS) and has the potential to transform the clinical assessment of heart and lungs over the next decade (6).

Ultrasound-based teaching is the **cornerstone of living anatomy** and offers the opportunity to medical students:

- to observe in real-time the movement of anatomical structures,
- to understand physiology and hemodynamics,
- to differentiate between normal and pathological variants, and
- to appreciate the relationship between surface and deep anatomy.

Using A.I. enabled POCUS to train the next generation of physicians will enable us to deliver better care to patients (7).

It was hypothesised that A.I. enabled ultrasound teaching in an anatomy session will be an invaluable educational tool and that there is gender bias in the use of A.I. enabled technologies.

Methods

Results

Total of 103 responses were received from a cohort of 119 students since physical attendance was needed to complete the questionnaire. Participants consisted of 60 females and 43 males.

We aggregated male and female responses as there was no significant gender difference between the two in regards to the evaluation of the effectiveness of the A.I system as an anatomy educational tool. However, both genders showed preference for the A.I. enabled ultrasound-based teaching method.

Figure 1: Total gender responses evaluating the effectiveness of A.I. cardiothoracic ultrasound system as an anatomy educational tool.

A question used to evaluate the project aim asked the participants to state if they believe that ultrasound demonstration with A.I. is a necessary adjunct to traditional teaching methods during anatomy labs. **97** responded **positively** with only **6** responding **negatively**.

Key Finding: p-value = 0.05 was denoted with regards to which anatomy teaching method will be more

Discussion

43% of the participants had excellent/very good confidence in using and **interpreting** US with no A.I. while with the A.I. incorporated the percentage **increased by 29% to a value of 72%.**

Moreover, 72% of participants rated their **learning improvement** due to ultrasounds as excellent/very good, while with A.I. incorporated **there was a 12% difference with an increase to ≈ 84%.**

The results indicate the confidence level and the improvement in anatomical knowledge of the students, had increased when the system had A.I. since it can provide immediate feedback and is in agreement with published literature of A.I. in medical education (8).

94% of the responders want A.I. US demonstrations to be included as an addition to their traditional anatomy lab sessions. This finding is in line with recommendations that the **medical curriculum should be reviewed to include A.I.** (1).

Key finding: A statistically significant **gender bias is seen** in the choice of teaching method with an **18% gender difference.** As was reported by Denend et al. (9) gender perception differences do exist in health technology where there is an increase in inhibition or initial operator exposure in females.

A limitation of this study is the introduction of selection bias as a result of the small sample size. Due to the study nature of self-reporting data, information bias can also be present.

Moreover, there was only one session delivered to the students with A.I. enabled US before they were asked to fill out the questionnaire.

Conclusions

The majority of the students agreed that using A.I. enabled ultrasound systems in the anatomy labs was an improvement to the traditional teaching method.

A.I. enabled ultrasounds increased students confidence in interpreting ultrasound images.

KOSMOS

FONTE: https://kosmosplatform.com/insights/can-a-cardiothoracic-ultrasound-system-with-artificial-intelligence-be-used-to-teach-cardiothoracic-anatomy-to-medical-students

Fundamentação Cientifica

Cardiologia

Background

The aim of this study was to evaluate the ability of a novel handheld echocardiography (HHE) device with continuous-wave Doppler (CWD) capability to measure peak aortic valve jet velocity (Vmax) and facilitate aortic stenosis (AS) severity grading.

Methods

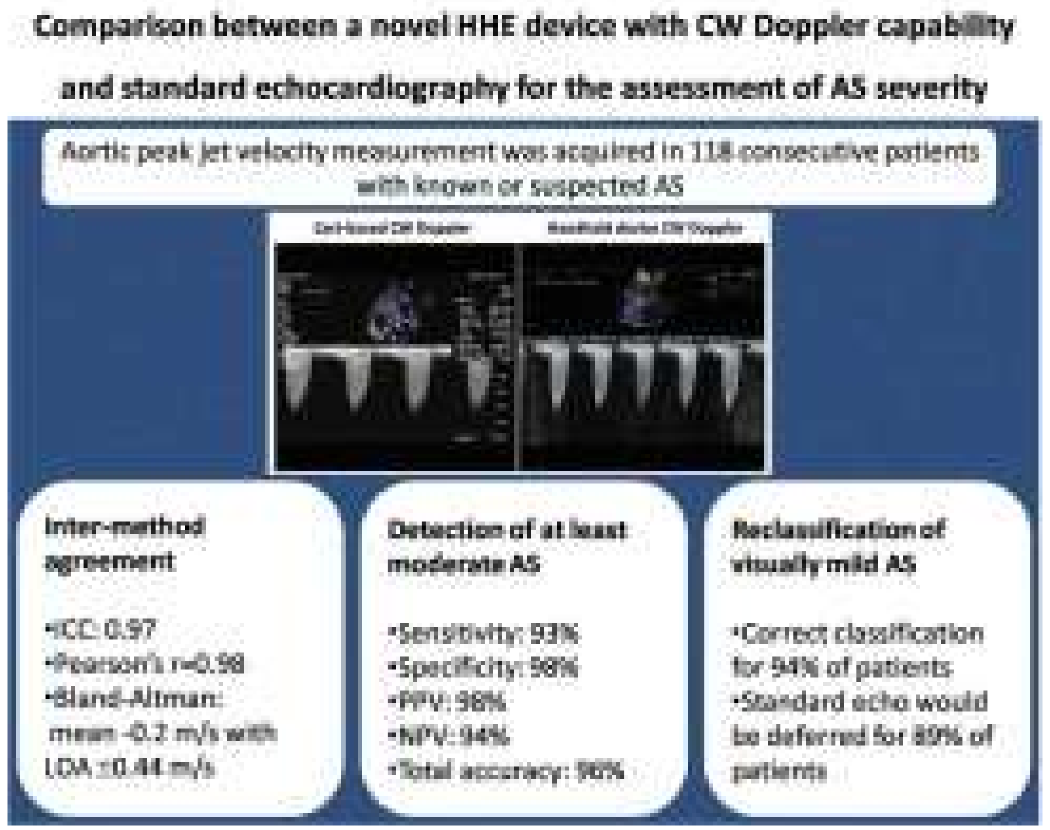
We prospectively included 121 consecutive patients with known or suspected AS. All patients were scanned with the HHE and the high-end echocardiography system (reference standard) in order to obtain CWD signal across the aortic valve. The aortic Vmax measurements were acquired from the apical 5-chamber view by both methods and were compared to assess method agreement using intra-class correlation coefficient (ICC), linear regression analysis and Bland-Altman analysis. The diagnostic accuracy for the detection of at least moderate AS (Vmax≥3 m/s) was calculated. Also, the utility of HHE with CWD to reclassify patients compared to the visual estimation of AS severity was assessed.

Results

The acquisition of CWD signal using HHE was feasible in 118 out of 121 patients (mean age 68±17years old, 57% male). There was excellent agreement between the HHE CWD and the cart-based measurements (ICC=0.97; 95%CI 0.83-0.99 and r=0.98; 95%CI 0.91-0.99, p<0.001 for both). The Bland-Altman plot showed a small underestimation bias of -0.2 m/s (p<0.001), with limits of agreement ±0.44 m/s for the Vmax. Detection of at least moderate AS using the HHE with CWD was feasible with sensitivity 93% (95%CI 83%-98%), specificity 98% (95%CI 91%-100%), PPV 98% (95%CI 88%-100%), NPV 94% (95%CI 85%-97%) and a total diagnostic accuracy of 96%.The patients visually assessed as mild AS cases were reclassified as no stenosis (17%), mild (72%) and moderate (11%) AS with the addition of CWD imaging.

Conclusion

Use of a novel HHE device with CWD spectral analysis by experienced operators can reliably detect clinically significant AS and facilitate AS grading. This technology may improve screening and diagnostic workup of AS compared to current practice.



FONTE: https://www.onlinejase.com/article/S0894-7317(22)00449-7/fulltext

Fundamentação Cientifica

Emergência e Medicina interna

Point of care ultrasonography from the emergency department to the internal medicine ward: current trends and perspectives

Antonio Leidi[1] · Frédéric Rouyer[2] · Christophe Marti[1] · Jean-Luc Reny[1] · Olivier Grosgurin[1,2]

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Abstract

The advent of portable devices in the early 80s has brought ultrasonography to the patient's bedside. Currently referred to as 'point of care ultrasonography' (POCUS), it has become an essential tool for clinicians. Initially developed in the emergency and critical care settings, POCUS has gained increasing importance in internal medicine wards in the last decade, with both its growing diagnostic accuracy and portability making POCUS an optimal instrument for everyday clinical assessment and procedures. There is large body of evidence to confirm POCUS' superiority when compared to clinical examination and standard X-ray imaging in a variety of clinical situations. On the contrary, only few indications, such as procedural guidance, have a proven additional benefit for patients. Since POCUS is highly user-dependent, pre- and post-graduate curricula are needed and the range of use should be clearly defined. This review focuses on trends and perspectives of POCUS in the management of diseases frequently encountered in emergency and internal medicine. In addition, questions are raised regarding the teaching and supervision of POCUS needing to be addressed in the near future.

Keywords Point of care · Ultrasonography · Ultrasound · Internal medicine · Emergency medicine

FONTE: https://archive-ouverte.unige.ch/files/downloads/0/0/1/5/2/3/2/6/unige_152326_attachment01.pdf

Fundamentação Cientifica

Emergência

The Use of Handheld Ultrasound Devices in Emergency Medicine

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Abstract

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Purpose of Review

Ultraportable handheld ultrasound (HHU) devices are being rapidly adopted by emergency medicine (EM) physicians. Though knowledge of the breadth of their utility and functionality is still limited compared to cart-based systems, these machines are becoming more common due to ease-of-use, extreme affordability, and improving technology.

FONTE: https://pubmed.ncbi.nlm.nih.gov/33996272/

Fundamentação Cientifica

Kosmos

How AI can increase the effectiveness of point-of-care ultrasounds

Dr. Mark Favot says learning to use point-of-care ultrasound devices can be "very humbling" for physicians – but artificial intelligence can make it easier for them to acquire new skills.

By **Kat Jercich** | April 29, 2022 | 11:54 AM

Q. How can having artificial intelligence guidance make a difference with these devices?

A. Artificial intelligence has the potential to dramatically increase the effectiveness of POCUS, primarily by reducing the impact of poor confidence in image interpretation, which is one of the most common barriers to POCUS implementation.

Many physicians learned POCUS by attending one- or two-day Continuing Medical Education courses that are hosted by a large group of POCUS experts. These courses offer many advantages to the attendees, including favorable faculty-to-learner ratios, a wide variety of high-end state-of-the-art POCUS equipment, simulated patient models with excellent "windows" for ultrasound imaging, and access to lectures with a large array of pathology.

The "problem" for people that attend these courses begins when they return to their own institution and now have to scan with their older, often outdated equipment, on patients that may have issues that make ultrasound imaging challenging and without the expert right there next to them coaching them on probe movements to improve the images or assisting with interpretation when things don't look exactly like the textbook or lectures they recently attended.

FONTES: https://www.healthcareitnews.com/news/how-ai-can-increase-effectiveness-point-care-ultrasounds

Aplicações

P-POCUS Technique	Preoperative	Intraoperative	Postoperative	Related Evidence-based Protocols
Cardiovascular	(1) Pericardial disease (2) Ventricular failure (3) Regional wall motion abnormalities (4) Significant valvular disease (5) Massive pulmonary embolus/deep venous thrombosis	(1) Change in ventricular function (2) New regional wall motion abnormalities (3) Undiagnosed valvular disease (4) New pericardial effusion (5) Evaluation of procedural complications (air, foreign object, *etc.*) (6) Procedural guidance (7) Assessment during PEA and asystolic arrest	(1) Change in ventricular function (2) New regional wall motion abnormalities (3) New pericardial effusion (4) Pulmonary embolus/deep venous thrombosis (5) Assessment during PEA and asystolic arrest	BEAT, FATE, FEEL, FoCUS, FORESIGHT, RUSH
Volume status	(1) Assess pre-induction volume status (2) Evaluation of central venous pressure	(1) Assess static changes in volume status (2) Detect fluid responsive events	(3) Serial assessment of volume status	FATE, FORESIGHT, RUSH
Pulmonary and Airway	Assessment for cause(s) of respiratory distress: (1) Pneumothorax (2) Pleural effusions (3) Interstitial syndromes (4) Pulmonary edema (5) COPD/Asthma (6) Pneumonia (7) Pulmonary embolism/deep venous thrombosis Identification/ Management of difficult airway: (1) Evaluate markers for difficult airway (2) Visualization of trachea and cricothyroid membrane	Assessment for procedural complications and worsening of patient pathologies: (1) Pneumothorax (2) Diaphragmatic function (3) Hemothorax Assessment for cause(s) of respiratory distress (1) Pneumothorax (2) Pleural effusions (3) Interstitial syndromes (4) Pulmonary edema (5) COPD/Asthma (6) Pneumonia (7) Pulmonary embolus/deep venous thrombosis Management of airway: (1) Endotracheal tube localization (tracheal *vs.* bronchial) (2) Visualization of trachea and cricothyroid membrane (3) Localization of esophagus	Assessment for procedural complications and worsening of patient pathologies: (1) Pneumothorax (2) Diaphragmatic function (3) Hemothorax Assessment for cause(s) of respiratory distress (1) Pneumothorax (2) Pleural effusions (3) Interstitial syndromes (4) Pulmonary edema (5) COPD/Asthma (6) Pneumonia (7) Pulmonary Embolus/deep venous thrombosis Management of airway: (1) Endotracheal tube localization (2) Visualization of trachea and cricothyroid membrane	BLUE, FALLS, FATE, FORESIGHT, PLUS, RADiUS, RUSH
Abdominal and Pelvic	(1) Assessment of gastric contents/NPO status (2) Trauma assessment for free fluid in the peritoneum (3) Bladder volume assessment	(1) Evaluation of gastric volume collection during surgery (2) Evaluation of abdominal free fluid from surgical complications (3) Bladder volume assessment/urinary catheter assessment	(1) Evaluation of gastric volume collection during surgery (2) Evaluation of abdominal free fluid from surgical complications (3) Bladder volume assessment/ urinary catheter assessment (4) Assessment of abdominal distension and/or ileus	FAST, FORESIGHT, GUS

SPECULUM S.A.
Acompanhamos o pulsar da vida

KOSMOS

Aplicações
Anestesia

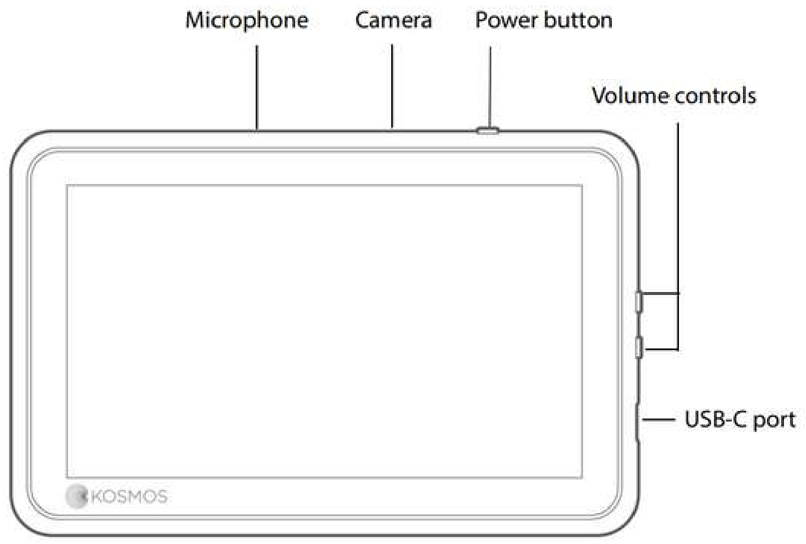
Table 2. Common Applications of POCUS in the Perioperative Setting[27,40]

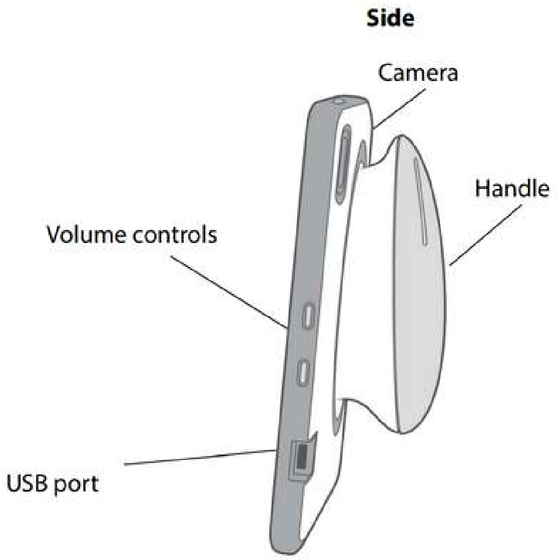
Examples of POCUS Applications in Phases of Anesthesia Care			
Technique	**Preoperative**	**Intraoperative**	**Postoperative**
Airway	• Identification of patients at risk for difficult airway • Locating the cricothyroid membrane to facilitate easy identification should invasive airway access be needed. • Identification of vocal cord palsy and other pathology	• Verification of endotracheal tube (ETT) positioning • Assessment of ETT depth • Localization of the cricoid membrane	• Emergency airway interventions (by visualization of trachea and cricothyroid membrane)
Lung	• Identification of patients at risk for respiratory distress (e.g., pleural effusions, pulmonary edema, pneumothorax)	• Assessment for the specific causes of respiratory distress (e.g., pleural effusions, pulmonary edema, pneumothorax)	• Assessment for post-procedural complications (e.g., pleural effusions, pulmonary edema, pneumothorax)
Cardiac	• Identification of patients at risk for cardiopulmonary disease	• Assessment for acute cardiac changes	• Assessment for acute cardiac changes
Gastric	• Assessment of gastric contents (e.g., empty, clear fluid, or solid) and volume	Not applicable	• Assessment of patients with abdominal distension and/or ileus
Abdominal	• Initial evaluation of hypotensive trauma patients	Not applicable	• Identification of intra-abdominal fluid extravasation following hip arthroscopy • Identification of urinary retention

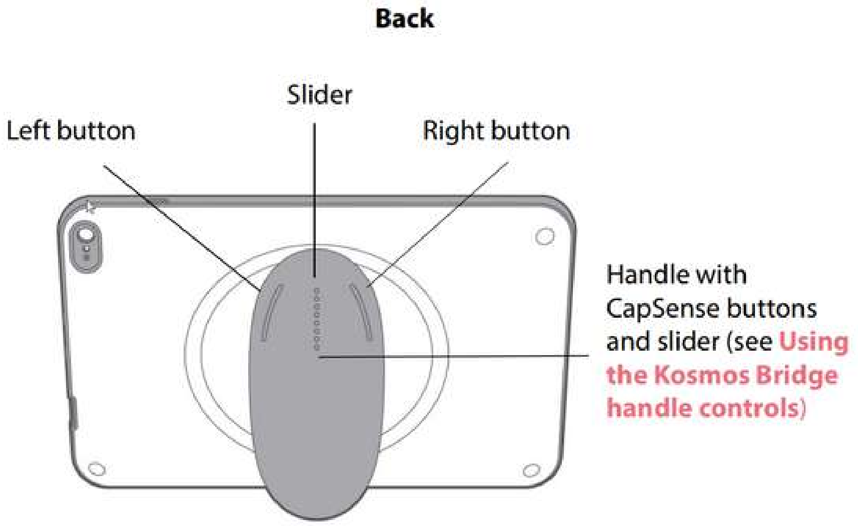
FONTES: https://www.aana.com/docs/default-source/practice-aana-com-web-documents-%28all%29/professional-practice-manual/pocus-in-anesthesia-care-practice-considerations.pdf?sfvrsn=a3259e3e_4

Tutorial

Kosmos Bridge

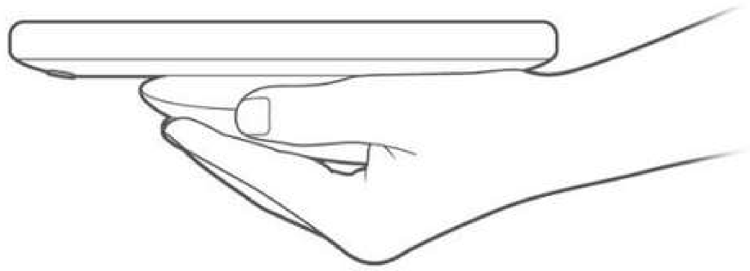




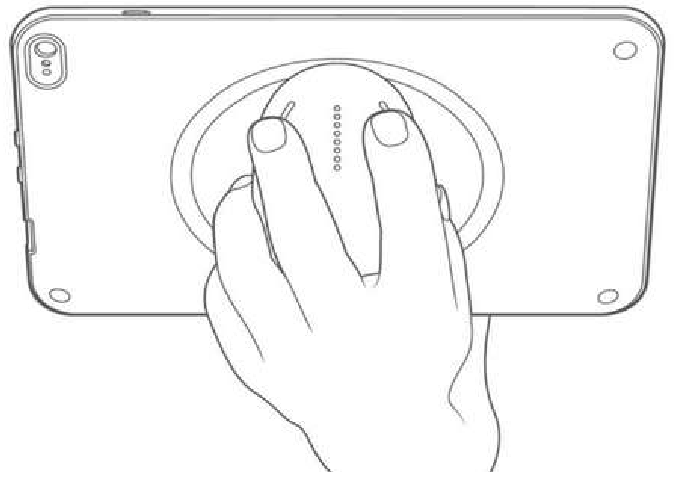


Utilização

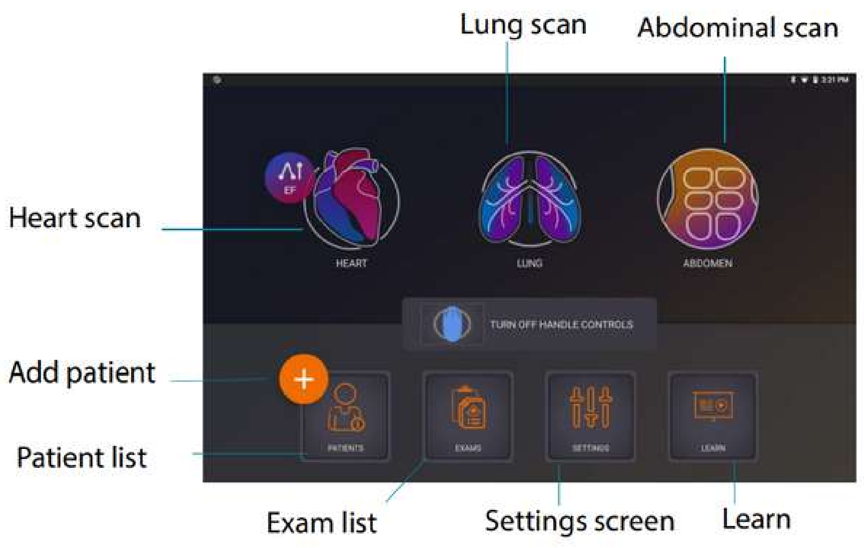
- Hold Kosmos Bridge in a relaxed position, so that you do not bend your wrist.



- Place your index and middle fingers on all three controls so they are easily accessible.

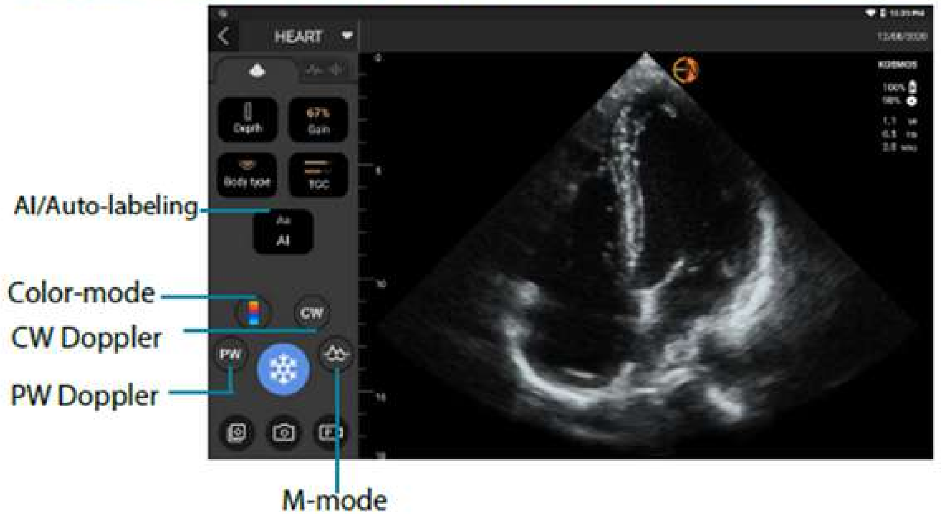


Ecrã Principal: Kosmos Torso e Kosmos Torso-One



Ecrã Principal: Lexsa

Torso and Torso-One Imaging screen: Ultrasound tab (B-mode)



Lexsa Imaging screen: Ultrasound tab (B-mode)

*Center line is available in MSK, Nerve and Vascular presets

CW Mode

Similarly you can acquire CW signal by tapping on the CW mode button.

- Do not forget to adjust the focal point to get the optimal waveform.

PW/CW Cine Review

When you freeze, in addition to the text and marker annotations, you can also measure:

1 Slope

2 Velocity

KOSMOS

MISSÃO POKUS

BOM TRABALHO!