POCUS JOURNAL

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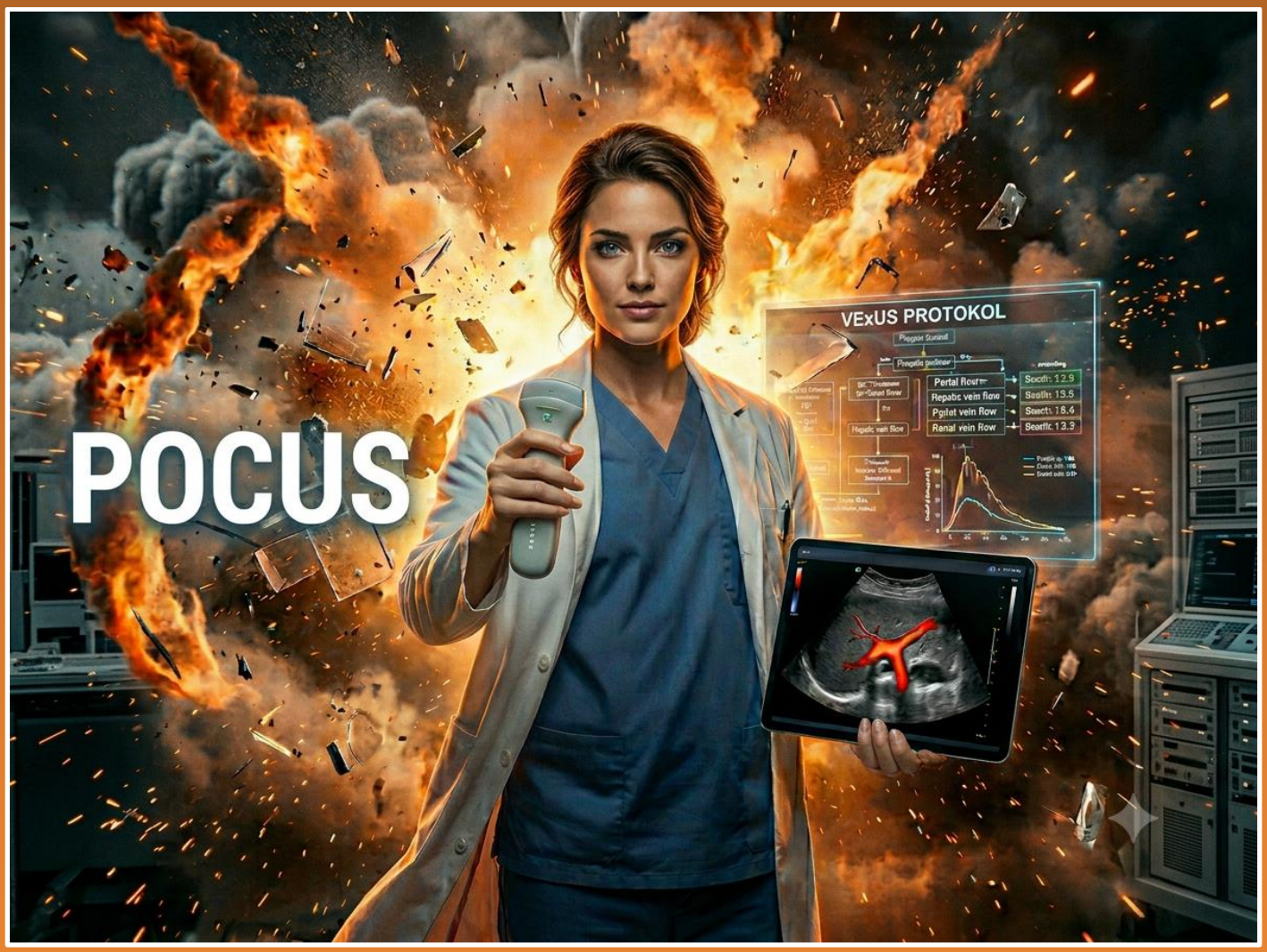
Non-profit association of national Point-Of-Care-UltraSound schools



Dear Colleagues and Friends,

Let this image serve as a stark reminder of the turbulent times we live in - an era increasingly defined by conflict, unrest, natural disasters, and profound human suffering across the globe. If there was ever a moment for healthcare professionals to decisively adapt and confront acute emergencies alongside the escalating health challenges of a growing population, that moment is now. In this critical mission, POCUS diagnostics is an indispensable asset.

My sincere thanks to everyone whose contributions helped publish this latest issue of our journal. I wish you profound success in your practice - and may your clinical burden be minimal, save for your efforts in disease prevention and health promotion.

Warm regards,

Dr. Ivica Zdravković
General Secretary of IPA
Editor-in-Chief

POCUS Academy of Serbia

POCUS WORKSHOP, Sremska Mitrovica Emergency Department

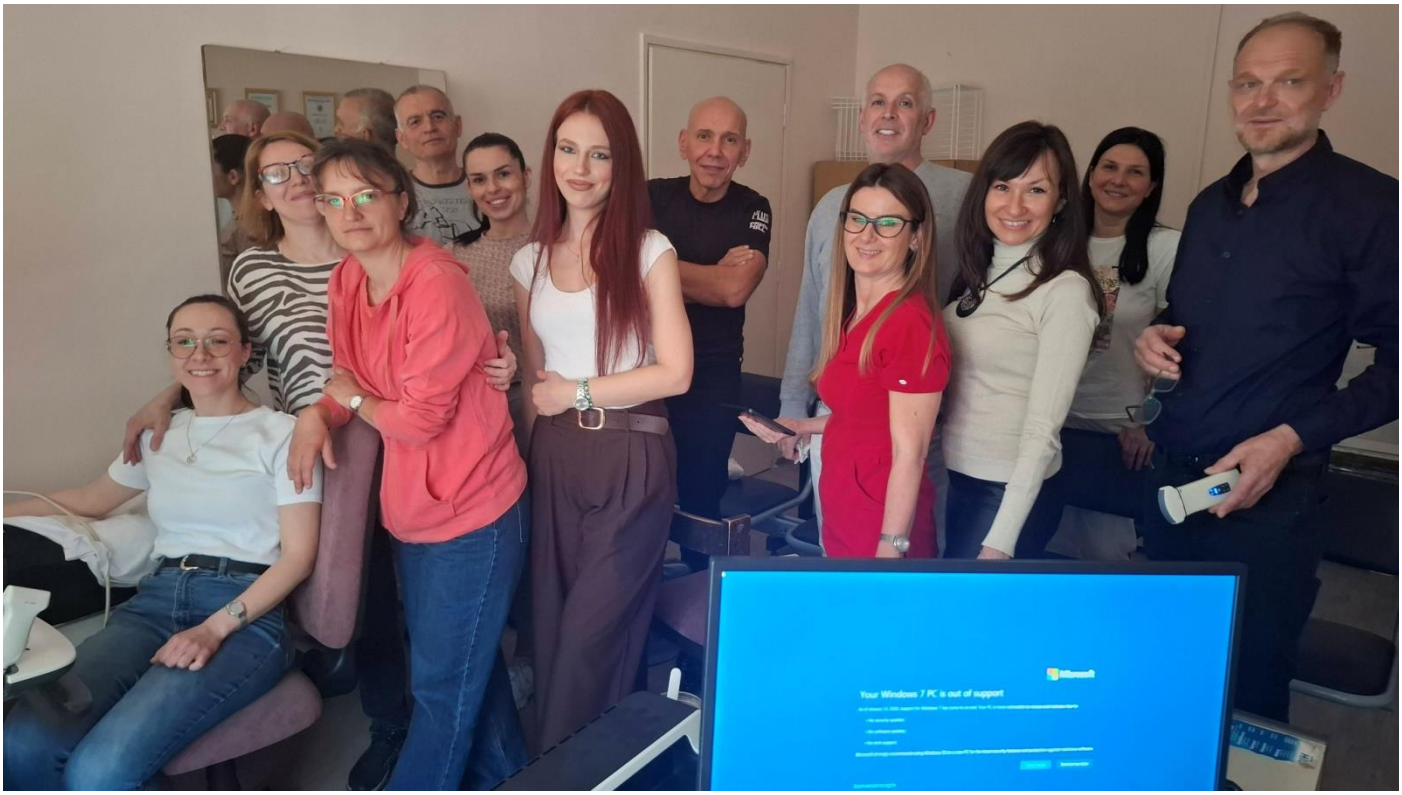
April 2026

On Saturday, April 25, 2026, we held a hands-on workshop on the eFAST and RUSH ultrasound protocols at the Emergency Medical Service of the Health Center in Sremska Mitrovica. The initiative for this educational event was launched by Dr. Spomenko Drinić, Head of the Emergency Department, Dr. Svetlana Cvijanović Krstić, and our colleague Dr. Adil Elhag, the former Director of the Sremska Mitrovica Health Center and soon to become an instructor at our Academy.

In a relaxed yet highly productive atmosphere, four hours of combined theoretical and practical training flew by. As part of the eFAST and RUSH protocols, participants were also introduced to Lung Ultrasound (LUS) and the Focused Assessed Transthoracic Echocardiography (FATE) protocol for cardiac ultrasound.

A big thank you to all participants for their enthusiasm and engagement. We wish you every success in applying these skills in your daily clinical practice!

See you soon at one of our upcoming POCUS workshops!




DIPLOMA
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Case Report: Breast Ultrasound Examination

Dr. Adil Elhag, GP specialist, POCUS instructor
Health Center Sremska Mitrovica

In Serbia, the organized breast cancer screening program is offered to women between 50 and 69 years of age. The program consists of screening mammography every two years.

Women over the age of 69 should not discontinue mammographic surveillance. Instead, the procedure changes: mammography is performed as a diagnostic examination upon referral by a gynecologist or primary care physician. In the absence of suspicious findings, this examination is generally recommended every two years.

Breast ultrasound is primarily recommended for younger women with glandular or mixed breast parenchyma, as ultrasound is more effective in detecting lesions in these breast types. In contrast, in predominantly fatty (lipomatous) breasts, which are more common in older women, ultrasound is not considered the first-line imaging modality for detecting suspicious lesions.

However, medicine is full of exceptions. Women over the age of 70 may still have mixed breast parenchyma, in which ultrasound can effectively detect both benign and malignant lesions. Likewise, some women younger than 50 may have predominantly fatty breasts, making mammography the more appropriate imaging modality.

The following case illustrates this point.

Case Presentation

A 70-year-old woman presented for a preventive breast ultrasound examination. She reported bilateral nipple retraction. Her family history was significant for breast cancer in her older sister, who had undergone surgery three months earlier. The patient also reported that her last screening mammogram had been performed four years earlier and had been interpreted as normal.

Breast Ultrasound Examination

Indication: Preventive examination; bilateral nipple retraction.

Family history: Sister with breast cancer.

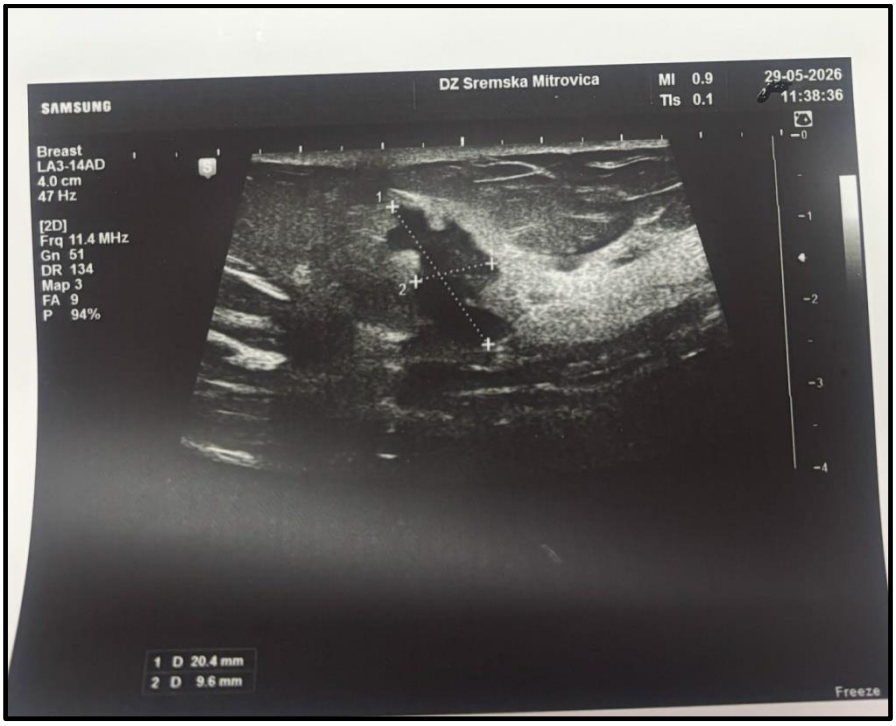
Obstetric history:

- **Pregnancies: 3**
- **Deliveries: 2**

Ultrasound Findings:

Both breasts are symmetrical with predominantly heterogeneous fibroglandular parenchyma. The skin, subcutaneous tissue, and pectoral fascia appear unremarkable. In the left breast, approximately 5 cm from the nipple in the upper outer quadrant, there is a hypoechoic, lobulated lesion measuring 20×10mm, associated with posterior acoustic attenuation. Within the same quadrant, there is an additional poorly defined hypoechoic lesion measuring 10×10 mm.

No significant axillary and lymphadenopathy is identified bilaterally.



BI-RADS Assessment:
Right breast: BI-RADS 2
Left breast: BI-RADS 4C

Recommendation: Urgent diagnostic mammography is strongly indicated.

Mammography Findings:

The mammographic examination confirmed the ultrasound findings, identifying a suspicious lesion measuring 28×12 mm, which was classified as BI-RADS 5. The patient was referred for an ultrasound-guided core needle biopsy.

All of these diagnostic procedures took place within the past three weeks, highlighting the importance of prompt evaluation and timely diagnostic work-up.

The patient is currently admitted to the Department of General Surgery at the Sremska Mitrovica Health Center, where she is awaiting definitive surgical treatment.

Thyroid POCUS Education at the Banja Luka Health Center Symposium: Empowering Physicians to Implement Ultrasound Diagnostics in Primary and Secondary Practice

Prim. Dr. Željka Popović,
Associate proffesor of echosonography (IPA)
Public Health Center Doboj

Point-of-Care Ultrasound (POCUS) represents a revolutionary method for rapid clinical assessment at the patient's bedside, significantly reducing the time to diagnosis. As part of the recently held Symposium organized by the Banja Luka Health Center, a targeted educational session on thyroid POCUS was conducted, intended for physicians of various specialties. The primary objective of this training was to introduce participants to the basic principles of ultrasound physics, standard thyroid examination protocols, and the recognition of fundamental pathological entities. Through theoretical lectures and intensive hands-on practical exercises, the participants acquired basic competencies, with the ultimate goal of empowering and encouraging them to pursue further educational processes and independently apply this technique in their daily practice.

Point-of-Care Ultrasound (POCUS) redefines the modern approach to diagnostics, allowing clinicians immediate insight into organ anatomy and pathology directly at the patient's bedside or in a primary health care clinic. While traditional ultrasound relies on centralized radiology departments, POCUS serves as an extension of the physical examination.

Due to its superficial location and the high incidence of nodular changes in the general population, the thyroid gland represents an ideal organ for POCUS evaluation. At the Banja Luka Health Center Symposium, the need for standardized

education of physicians from various profiles on the basics of neck ultrasonography was recognized.

The main objective of the structured course was the demystification of ultrasound technology and bridging the gap between theoretical knowledge and practical application.

The educators, Prim. Dr. Željka Popović and Prim. Dr. Danijel Arijas, designed a curriculum focused on empowering and encouraging physicians who had no prior formal contact with ultrasound, in order to eliminate the initial "fear of the machine" and establish a solid foundation for further training.

"Our goal was not only to convey theoretical knowledge, but to instill confidence and motivation in physicians to accept ultrasonography as an essential component of the modern physical examination."

One of the key specificities of this education was the heterogeneity of the group. The lectures and practical sessions were attended by physicians of various specialties – from family medicine physicians, pediatricians, and internists, all the way to residents and general practitioners. This multidisciplinary approach

confirmed that POCUS is a universal tool that transcends traditional barriers among medical branches.

The educational program consisted of two complementary parts: theoretical and practical (hands-on) training.

In the theoretical part, Prim. Dr. Željka Popović and Prim. Dr. Danijel Arijas introduced the participants to the basics of ultrasound physics, proper machine optimization (gain, depth, focus), and the normal anatomy of the thyroid gland and surrounding neck structures. Special emphasis was placed on the morphological characteristics of healthy parenchyma.

The practical part enabled the participants to work on modern ultrasound machines equipped with high-frequency linear probes. Under the constant supervision of mentors, the participants had the opportunity to practice proper probe orientation, the identification of the thyroid lobes and isthmus, as well as the detection of vascular structures (*a. carotis* and *v. jugularis*) using color Doppler.

The thyroid POCUS training at the Banja Luka Symposium demonstrated exceptional success and a high level of motivation among the participants. The attendees successfully mastered the basic skills of probe handling and the recognition of anatomical landmarks.

This course represents a crucial step toward the decentralization of ultrasound diagnostics and its integration into daily practice. Continuous support and advanced training will be essential for these physicians to fully implement the acquired knowledge for the benefit of their patients.

Erector Spinae Plane Block as the Main Component of Multimodal Analgesia for Orthopedic Surgery in a 13-Year-Old Child: A Case Report.

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ABSTRACT

Background

Modern pediatric anesthesiology is guided by the concept of perioperative multimodal analgesia, which combines reliable pain control with a reduction in perioperative opioid exposure to minimize opioid-related adverse effects and facilitate rapid postoperative recovery. For orthopedic procedures involving the proximal femur in children, standard approaches include general anesthesia with systemic opioids or epidural anesthesia; however, these techniques may be associated with numerous adverse effects such as respiratory depression, hemodynamic instability, nausea and vomiting, and urinary retention. Literature data have demonstrated the effectiveness of combined anesthesia with erector spinae plane (ESP) block as the main component of analgesic management for surgery on the thoracic cage, abdominal wall, spine, and hip region. Therefore, the aim of this report was to present a clinical example of a combined anesthetic technique designed to minimize the impact of opioids and epidural anesthesia during the perioperative and postoperative periods.

Case report

We present a case of combined anesthesia in a 13-year-old child with bilateral slipped capital femoral epiphysis. The patient underwent bilateral proximal femoral epiphysiodesis under general anesthesia supplemented with an ESP block. We describe the anesthetic technique with bilateral ultrasound-guided erector spinae plane block at the L1 level using 0.375% ropivacaine. The effectiveness of the

opioid-free postoperative period was assessed using the visual analogue scale (VAS): an increase in pain from 0 to 2–3 points on the VAS was observed 2 hours after surgery, confirming the feasibility of ESP block as the principal component of multimodal analgesia.

Conclusions

This report demonstrates the possibility of effective use of ESP block as the main component of multimodal analgesia during orthopedic surgery in children. The observation supports the clinical feasibility of an opioid-sparing strategy using ESP block for procedures on the proximal femur.

Keywords

ESP block, erector spinae plane block, regional anesthesia, pediatric anesthesiology, multimodal analgesia, hip surgery, slipped capital femoral epiphysis, ropivacaine.

Ethical considerations

Informed consent for anesthesia and for the use of anonymized clinical data in a scientific publication was obtained from the child's legal representative prior to anesthesia.

Introduction

Orthopedic surgery in children requires a comprehensive approach that takes into account the severity of the underlying pathology, the invasiveness of the surgical procedure (osteotomy, osteosynthesis, blood loss, etc.), the child's psycho-emotional status depending on age, the expected intensity of postoperative pain, and the need for early mobilization. These factors directly influence the choice of an individualized (personalized) anesthetic strategy.

Traditionally, orthopedic surgery of varying complexity in children is performed under general anesthesia combined with systemic opioids or neuraxial techniques, in particular epidural anesthesia. These approaches provide effective control of intra- and postoperative pain but may be associated with adverse effects such as nausea, vomiting, sedation, respiratory depression, hemodynamic instability, motor block, and technical limitations. [9]

A differentiated approach to anesthetic management is required depending on the surgical site and the patient's age group. According to published data, in pediatric orthopedic procedures on the lower limb, a common strategy in younger children is a combination of a laryngeal mask airway with peripheral nerve blocks, whereas in adolescents spinal anesthesia with preserved consciousness may be acceptable. Peripheral nerve blocks are particularly suitable for orthopedic procedures on the distal lower extremity (thigh, knee, leg, foot) because they can provide adequate analgesia in these regions. However, analysis of the literature indicates limited

effectiveness of peripheral nerve blocks in younger and middle-childhood age groups for hip surgery, which has prompted the search for optimal anesthetic strategies for these patients.

Modern pediatric anesthesiology focuses on reducing perioperative opioid consumption while maintaining reliable pain control. In this context, interfascial plane blocks are gaining increasing importance as components of multimodal analgesia. Among them, the erector spinae plane block is considered a technically simple ultrasound-guided technique that can provide effective analgesia for a range of procedures on the thoracic cage, abdominal wall, spine, and hip region. For pediatric hip surgery, published reports indicate the clinical efficacy of lumbar ESP block, although the duration of postoperative analgesia is variable and requires further investigation. [10]

Here we present a case illustrating the successful use of bilateral lumbar ESP block as part of a combined anesthetic technique for bilateral femoral neck fixation in a 13-year-old patient.

Functional anatomy and ESP block technique

The erector spinae muscle group (m. erector spinae) consists of the iliocostalis muscle (m. iliocostalis), longissimus muscle (m. longissimus), and spinalis muscle (m. spinalis). These muscles extend bilaterally from the base of the skull to the pelvis and sacral region, lying between the spinous and transverse processes of the vertebrae and continuing toward the ribs. Sensory innervation of the posterior thoracic wall is provided by the dorsal rami of the spinal nerves from C1 to L5, whereas the ventral rami of the thoracic spinal nerves continue as intercostal nerves to innervate the anterolateral thoracic wall and abdominal wall.

The presumed mechanism of ESP block involves cranio-caudal and interfascial spread of local anesthetic within the fascial plane of the erector spinae muscle, with predominant involvement of the dorsal rami of the spinal nerves. Anterior spread of the injectate into the paravertebral space is possible but less predictable and remains a subject of ongoing discussion in the literature. Consequently, the extent and intensity of the sensory block may vary depending on the level of injection, volume of local anesthetic, and individual patterns of fascial spread. [2]

For ultrasound guidance, the probe is placed in a paramedian sagittal plane approximately 2 cm lateral to the midline. At thoracic levels, the trapezius, rhomboid, and erector spinae muscles can be visualized overlying the transverse processes, whereas at more caudal levels the primary structure seen is the erector spinae muscle itself over the hyperechoic contour of the transverse process with an acoustic shadow posterior to it. The needle is advanced in-plane in a cranio-caudal direction until it contacts the transverse process, after which a test injection of 1–3 ml of local anesthetic confirms correct spread deep to the erector spinae muscle and superficial to the transverse process. To complete the block, 20–30 ml of local anesthetic is typically injected on each side, as ESP block is a fascial plane block whose effectiveness is largely volume dependent.

The choice of injection level is determined by the anticipated surgical field. Because local anesthetic spreads predominantly in the cranio-caudal direction, the needle entry point should be positioned approximately in the center of the desired sensory coverage. The block can be performed with the patient in the sitting, lateral, or prone position; in clinical practice, bony landmarks such as C7, the scapular spine at T3, and the inferior angle of the scapula at T7 are commonly used.

Figure 1. Convex transducer and probe position: the transducer is placed in a paramedian sagittal orientation, approximately 2 cm lateral to the midline.

Figure 2. Linear transducer

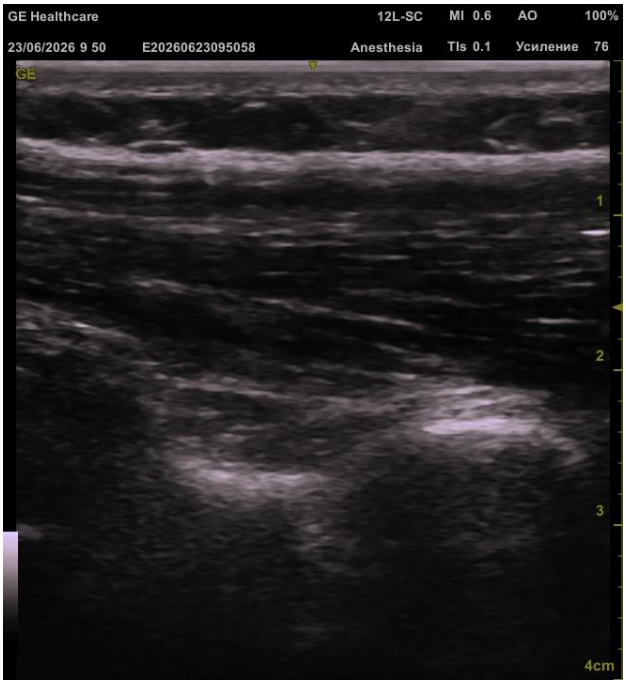

Figure 5. Ultrasound scan at the Th12–L1 level demonstrating the hyperechoic transverse processes and the erector spinae muscle.

Figure 4. Ultrasound scan at the L1 level showing the hyperechoic transverse process of L1 with acoustic shadow deep to it.

Case report

A 13-year-old patient weighing 73 kg was admitted to Morozov Children's City Clinical Hospital with complaints of hip pain. According to the patient and parents, the child had experienced pain in the hip joints while walking, more pronounced on the right side, for 6 months; trauma was denied, and the patient ambulated with crutches, limping on the left leg.

The planned surgery was in situ epiphysiodesis of the proximal femora on both sides using 7.5-mm partially threaded cannulated screws. The surgical plan included supine positioning, fluoroscopic marking of the hip joint, a 4-cm mini-incision, placement of a guide, insertion of guide wires, preparation of channels for screws, screw insertion, verification of screw position, and wound closure.

Informed consent for anesthesia was obtained. In the operating room, after preoxygenation, anesthesia was induced with propofol 180 mg (approximately 2.5 mg/kg), followed by insertion of a size 4 laryngeal mask airway; the patient was maintained on spontaneous respiration. Sedation was continued with sevoflurane at 1 MAC in an oxygen–air mixture (O_2 0.6 L/min + air 1.4 L/min), with a respiratory rate of 14–16 breaths per minute throughout anesthesia.

Under ultrasound guidance, bilateral erector spinae plane block was performed at the L1 level using a convex probe. A total of 40 ml of 0.375% ropivacaine was injected, 20 ml on each side. No opioids were administered. Skin incision was made 15 minutes after completion of the block.

The duration of surgery was 2 hours 38 minutes. Hemodynamic parameters remained stable: heart rate around 80 beats per minute (within 10–15% of baseline), arterial pressure 98/54 mmHg (within 10% of baseline), and oxygen saturation 99%. No additional analgesics were required intraoperatively. Thirty minutes before the end of surgery, 1 g of intravenous paracetamol was administered as part of preventive multimodal analgesia. In the postoperative period, high-quality multimodal analgesia without opioids was achieved; pain intensity increased from 0 to 2–3 points on the VAS 2 hours after surgery. No complications related to the regional technique, local anesthetic systemic toxicity, or respiratory disturbances were observed.

A second description of the case is presented in the main text: prior to induction, peripheral venous access was secured, anesthesia was induced with propofol 180 mg, and a size 4 laryngeal mask airway was inserted. Bilateral ESP block at L1 was then performed under ultrasound guidance using a convex probe, with 20 ml of 0.375% ropivacaine injected on each side. No opioids were used intraoperatively; skin incision was made 15 minutes after the block, and intraoperative fluid therapy consisted of 1460 ml of Sterofundin (approximately 9–10 ml/kg/h). The duration of surgery was 2 hours 38 minutes, with stable hemodynamics (heart rate about 80 beats per minute, arterial pressure 98/54 mmHg, oxygen saturation 99%) and no need for additional analgesics. In the postoperative period, good multimodal analgesia without opioids was maintained, with pain increasing from 0 to 2–3 points on the VAS during the first 2 hours; no complications were noted.

Discussion

This case demonstrates the effective use of ESP block as the main component of multimodal analgesia during orthopedic surgery in a child. The absence of hemodynamic responses to surgical stimulation and the lack of need for additional intraoperative analgesics indicate sufficient intraoperative analgesic efficacy of the chosen strategy. Similar case reports and case series suggest that lumbar ESP block may be useful for pediatric hip surgery and can reduce perioperative opioid requirements. [4]

From an anatomical and technical standpoint, a key advantage of ESP block is the injection of local anesthetic into a relatively superficial fascial plane above the transverse process under direct ultrasound visualization. The resulting extensive cranio-caudal spread allows for a broad area of analgesia, although the sensory profile of the block and the involvement of ventral rami remain variable. This variability may explain differences in the duration and intensity of postoperative analgesia among patients. [5]

An important practical advantage of ESP block is the potential to avoid the drawbacks of both systemic opioid analgesia and neuraxial techniques. In pediatric orthopedics, this is particularly relevant when an opioid-sparing approach, early mobilization, and minimization of adverse reactions associated with traditional analgesic methods are required. [6] At the same time, the present observation shows that the duration of pronounced postoperative analgesia may be limited: within the first 2 hours after surgery, pain intensity increased to 2–3 points on the VAS. This is consistent with published data indicating that ESP block can provide adequate early analgesia but does not always surpass neuraxial techniques in terms of duration of pain relief picareonline. [5]

Limitations of this report include its single-case nature, the absence of a control group, and the limited scope of postoperative pain assessment. Nevertheless, this case illustrates the clinical feasibility of bilateral L1 ESP block for surgery on the proximal femur in an adolescent patient.

Conclusions

Bilateral ESP block at the L1 level under ultrasound guidance with 20 ml of 0.375% ropivacaine on each side provided effective intraoperative analgesia in a 13-year-old patient undergoing bilateral femoral neck screw fixation for chronic slipped capital femoral epiphysis. No opioids were used, hemodynamic parameters remained stable throughout the approximately 2-hour procedure, and high-quality opioid-free multimodal analgesia was achieved in the postoperative period. The increase in pain intensity to 2–3 points on the VAS within 2 hours after surgery indicates good intraoperative efficacy of the technique with a limited duration of postoperative effect.

ESP block may be considered a promising component of combined anesthesia and multimodal analgesia for pediatric orthopedic hip surgery. It may be applicable in children with hip pathology such as slipped capital femoral epiphysis and deformities of the proximal femur, including patients with comorbid conditions.

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Will buying an ultrasound probe become as common as buying a mobile phone or a smart TV?

Ivica Zdravković, MD/PhD, Associate Professor (IPA)

Traditional ultrasound probes are gradually becoming part of history. A new MEMS technology is replacing fragile piezoelectric crystals with millions of microscopic silicon membranes integrated on a single chip. MEMS is an acronym for Micro-Electro-Mechanical Systems, referring to miniature machines and sensors integrated directly onto a computer chip.

Instead of crystals "locked" to a single frequency, software now controls the vibration of millions of micro-membranes on the chip. The computer dictates how they operate and at which frequencies they vibrate. These frequencies determine the wavelength and penetration depth of ultrasound: in one second we can achieve the deep penetration of a convex probe, and in the next the high resolution of a shallow linear probe.

What do we gain from this?

1. All-in-one probes

A single pocket-sized probe for all applications: full-body examinations (neck, heart, abdomen, extremities) without thinking whether we need a linear, convex, or sector probe.

2. Pocket format and lower cost

Chip-based production enables mass manufacturing at lower cost. The device fits in a pocket, and images are viewed on a smartphone, tablet, or laptop.

3. Drop resistance

There are no fragile crystals that can break if the probe is dropped. The chip is significantly more durable for field use.

4. Pure digital signal

The signal is digitized directly on the chip, reducing noise and enabling powerful AI-based image processing.

Of course, there are (for now) certain limitations compared to traditional technology:

1. **Reduced deep penetration: in extremely obese patients, at depths greater than 15–20 cm, image quality is inferior compared to high-end crystal-based probes.**
2. **Probe heating: the operation of millions of micro-elements in a small space generates heat, requiring software-based cooling or performance limitation.**

3. **Near-field noise: minor noise may appear close to the skin surface, although modern AI algorithms successfully reduce it.**
4. **Limitations in advanced Doppler: for high-end cardiology hemodynamics and spectral Doppler analysis, traditional crystal-based probes still offer superior precision.**

There is a degree of skepticism within the ultrasound industry toward "cheaper solutions," as in many other fields. For equipment distributors, it is less profitable to promote technologies that generate lower margins. As a result, the advantages of MEMS technology are often downplayed, while its limitations are emphasized. However, such thinking is short-sighted.

In the past, the television industry relied on extremely expensive devices that were typically purchased once in a lifetime and often represented a single unit per household. Today, televisions are extremely affordable, which is precisely why we own more of them than ever - often one in every room.

In a few years, it will be completely normal for every physician to have their own probe - just as affordable and durable as modern TVs or mobile phones. Not a single, extremely expensive device expected to last decades, but a tool that is easily replaced and always backed up.

Before investing tens of thousands of euros in a system you plan to use for the next several decades, it is worth considering this perspective.

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POCUS – Real-Time Diagnosis: From Physical Examination to Modern Emergency Medicine

Vekoslav Zajić, MD, Specialist in Emergency Medicine, POCUS Educator

(Lecture delivered at the POCUS School of Ultrasound Diagnostics, Kragujevac, Serbia, May 23–24, 2026)

Abstract

Point-of-Care Ultrasound (POCUS) represents one of the most significant innovations in modern emergency medicine. By enabling physicians to obtain essential diagnostic information directly at the patient's bedside, POCUS significantly reduces the time to diagnosis, accelerates therapeutic decision-making, and improves patient safety. Today, leading international professional organizations recognize POCUS as an integral component of the physical examination and a core competency for emergency physicians. The development of portable ultrasound devices has further expanded its application in both hospital and prehospital settings. However, successful implementation of this technique requires continuous education of healthcare professionals, standardized examination protocols, and strong institutional support.

Keywords: POCUS, emergency medicine, ultrasound, bedside diagnostics, emergency medical services, clinical decision-making

Introduction

Advances in medicine over the past several decades have profoundly transformed the diagnosis and treatment of patients. In emergency medicine, where rapid and accurate clinical decision-making is critical, the need for diagnostic tools capable of providing immediate patient assessment has become more important than ever.

Point-of-Care Ultrasound (POCUS) is the answer to this need. Unlike conventional ultrasound examinations, which are typically performed in radiology departments and often involve delays, POCUS allows ultrasound assessment to be performed immediately at the patient's bedside, precisely when critical clinical decisions must be made.

Modern ultrasound systems have become sufficiently compact, portable, and technologically advanced to serve as standard equipment for emergency physicians. Consequently, ultrasound has evolved into an extension of the physical examination, enabling clinicians to visualize anatomical structures and pathological processes underlying the patient's clinical presentation in real time.

From the Stethoscope to Ultrasound – The Evolution of Physical Examination

When René Laennec introduced the stethoscope in the early nineteenth century, medicine gained a revolutionary tool that allowed physicians to "look inside" the human body without invasive procedures. More than two centuries later, ultrasound has assumed a comparable role.

Traditional physical examination relies on inspection, palpation, percussion, and auscultation. Although these methods remain fundamental to everyday clinical practice, their diagnostic accuracy may be limited in certain situations. POCUS does not replace the physical examination—it complements and enhances it.

Today, within only a few minutes, physicians can confirm pleural effusion, evaluate left ventricular systolic function, identify pneumothorax, or detect free intraperitoneal fluid. This capability represents a significant advancement over the traditional approach based solely on physical examination.

The Role of POCUS in Emergency Medicine

According to recommendations issued by the American College of Emergency Physicians (ACEP), the World Interactive Network Focused on Critical Ultrasound (WINFOCUS), and the European Society for Emergency Medicine (EuSEM), POCUS is considered a core competency of emergency physicians.

Its applications include a broad spectrum of clinical scenarios:

- **Assessment of trauma patients using the FAST and eFAST protocols**
- **Evaluation of undifferentiated shock using the RUSH protocol**
- **Assessment of acute dyspnea**
- **Identification of pericardial effusion and cardiac tamponade**
- **Diagnosis of deep vein thrombosis**
- **Evaluation of abdominal emergencies**
- **Ultrasound guidance for invasive procedures**

One of the greatest strengths of POCUS lies in its ability to provide rapid answers to focused clinical questions. Does the patient have a pneumothorax? Is there free fluid in the abdomen? Is hypotension caused by cardiogenic shock or hypovolemia? The answers to these questions often determine whether treatment is initiated promptly or delayed.

Clinical Importance in Life-Threatening Conditions

In emergency medicine, time is one of the most important prognostic factors. Any reduction in the time required to establish a diagnosis may significantly improve patient outcomes.

In patients presenting with acute dyspnea, lung ultrasound rapidly differentiates pulmonary edema, pleural effusion, pneumothorax, and interstitial syndrome. Bilateral B-lines may indicate acute heart failure, whereas the absence of lung sliding combined with the presence of the lung point sign has high diagnostic accuracy for pneumothorax.

In hemodynamically unstable patients, focused echocardiography can identify pericardial effusion with signs of cardiac tamponade, severe left ventricular dysfunction, or right ventricular dilatation suggestive of massive pulmonary embolism.

The FAST examination is one of the most important examples of ultrasound application in emergency medicine. Rapid detection of free fluid within the peritoneal or pericardial cavity enables timely recognition of internal hemorrhage in trauma patients.

POCUS also plays an important role in diagnosing abdominal aortic aneurysm, acute cholecystitis, hydronephrosis, ectopic pregnancy, and numerous other conditions in which early recognition directly influences survival and clinical outcomes.

Importance in Prehospital Emergency Care

POCUS demonstrates exceptional value in prehospital emergency medical services. The development of portable and wireless ultrasound devices has made it possible to perform ultrasound examinations at the scene of an emergency, during patient transport, or in outpatient settings.

Physicians can now assess patients before hospital arrival, notify the receiving emergency department of the suspected pathology, and direct patients to facilities equipped with the most appropriate resources for definitive treatment.

This approach contributes to more efficient utilization of healthcare resources while reducing the time to definitive care.

Education as the Key to Successful Implementation

Although technological advances have made ultrasound devices widely available, the greatest challenge remains user education.

Ultrasound is an operator-dependent imaging modality requiring theoretical knowledge, practical skills, and continuous professional development. Diagnostic accuracy depends directly on the physician's experience and competence.

For this reason, international guidelines strongly advocate structured training programs, standardized examination protocols, proper documentation of findings, and continuous quality assurance.

Purchasing an ultrasound machine is only the first step. Real progress occurs when healthcare systems develop a sufficient number of well-trained physicians capable of using ultrasound safely, effectively, and according to contemporary standards.

Looking Ahead

Based on current trends, ultrasound is expected to become as routine a component of the physical examination as the stethoscope or electrocardiograph.

Advances in artificial intelligence, sophisticated software algorithms, and increasingly affordable ultrasound equipment will further expand the capabilities of bedside diagnostics. Nevertheless, regardless of technological progress, the physician will remain central to the diagnostic process by integrating ultrasound findings with the patient's history, physical examination, and clinical judgment.

POCUS does not replace clinical reasoning. On the contrary, it makes clinical reasoning more accurate, faster, and safer.

Conclusion

Point-of-Care Ultrasound represents one of the most significant developments in modern emergency medicine. Its ability to provide real-time diagnostic information facilitates faster clinical decision-making, earlier initiation of treatment, and improved patient safety.

Ultrasound is no longer a diagnostic modality reserved exclusively for radiology departments. It has become an integral part of the physical examination and the daily practice of emergency physicians. The future belongs to healthcare systems that recognize the importance of this technology and invest not only in equipment but, above all, in the education of the professionals who use it.

An ultrasound machine alone does not make a diagnosis. A diagnosis is made by a well-trained physician who, with the aid of ultrasound, can visualize what was previously hidden.

POCUS Journal

International POCUS Academy

Clinical Cases of POCUS Use at the Prehospital Stage in Emergency Situations in Moscow.

Authors:

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Moscow's healthcare system has two main branches for delivering urgent and emergency medical care: the prehospital stage (ambulance teams and disaster medicine teams) and the hospital stage, with patient triage (green, yellow, red streams) in modern emergency hospitals operating under new care standards.

At the prehospital level, ambulance teams are classified as:

· paramedic teams (one or two healthcare workers when possible);
· paramedic intensive care teams (for urgent patients);
· physician-staffed teams (paediatric and adult);
· physician resuscitation teams;
· Territorial Centre for Disaster Medicine (TsEMP) teams – physician and resuscitation units;
· air ambulance teams (5 medical helicopters).

In total, about 1,100 ambulance teams and 30 disaster medicine crews operate in Moscow.

Since the beginning of 2026, all teams have been equipped with certified medical devices that enable a broad range of diagnostic and therapeutic procedures for children of all ages, adults, and pregnant women – including advanced resuscitation during transport. These include automated chest compression devices (LUCAS 2 and the Russian-made "ARKA" system), continuous vital-sign monitoring, and visual control via portable ultrasound systems with Wi-Fi probes (SONON 300C/300L, Mindray MX7, GE Logiq E).

[Photos from personal archive, 2022]

[Photo of the ARKA device]

In mass casualty incidents, TsEMP teams assume the lead role in organising care: they conduct triage, manage life-threatening conditions, distribute patients among ambulance teams according to their capabilities, mobilise additional resources, and route casualties to hospitals, including via air ambulance.

[Photo of Eurocopter EC145 and a TsEMP vehicle]

[Photo of the crew based at Kommunarka Hospital]

Clinical Case No. 1

Call for a mass traffic accident. Three people were injured, the most severe being a 35-year-old woman.

Physical examination: BP 110/60 mmHg, HR 105 bpm, RR 19/min, SpO_2 95%, temperature 36.3°C. Palpation revealed epigastric tenderness and bilateral chest crepitus.

Screening ultrasound using the EFAST protocol showed free fluid in the abdominal cavity (Morrison's pouch). No fluid was detected in the pleural cavities or pericardium, and no pneumothorax was found.

[Ultrasound image in the helicopter]

The patient was urgently transported to a Moscow hospital, where CT confirmed traumatic free fluid in the abdomen; she underwent surgery.

[Photo of patient handover to the ICU]

Clinical Case No. 2

Call for a 5-year-old child who fell from the 4th floor.

On examination: coma, medically sedated, mechanically ventilated. BP 90/40 mmHg, HR 155 bpm, SpO_2 98%. Breath sounds were diminished bilaterally.

[Photo of the young patient]

[Photo of transfer from the helipad]

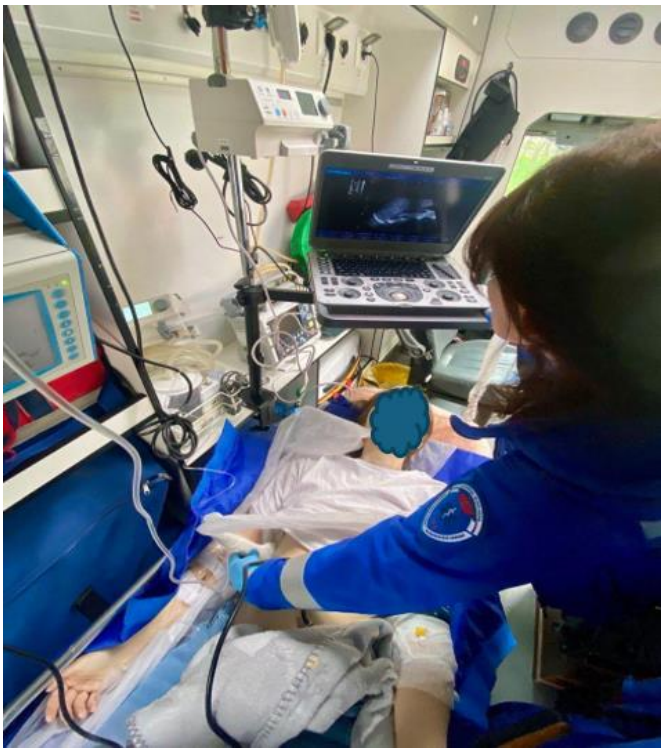
The RUSH protocol (ultrasound assessment of shock) was performed. Findings: compression atelectasis of the right lung with massive pleural effusion (>500 ml) and bilateral pneumothorax. On-site ultrasound-guided decompression of the left tension pneumothorax was performed. The child was stabilised and urgently transported to a paediatric hospital.

At the hospital, contrast-enhanced CT was performed, and the child was operated on by the surgical team. Subsequently, the child was transferred to a ward and discharged for outpatient rehabilitation.

Additional Activities of the POCUS MOSKOW Team

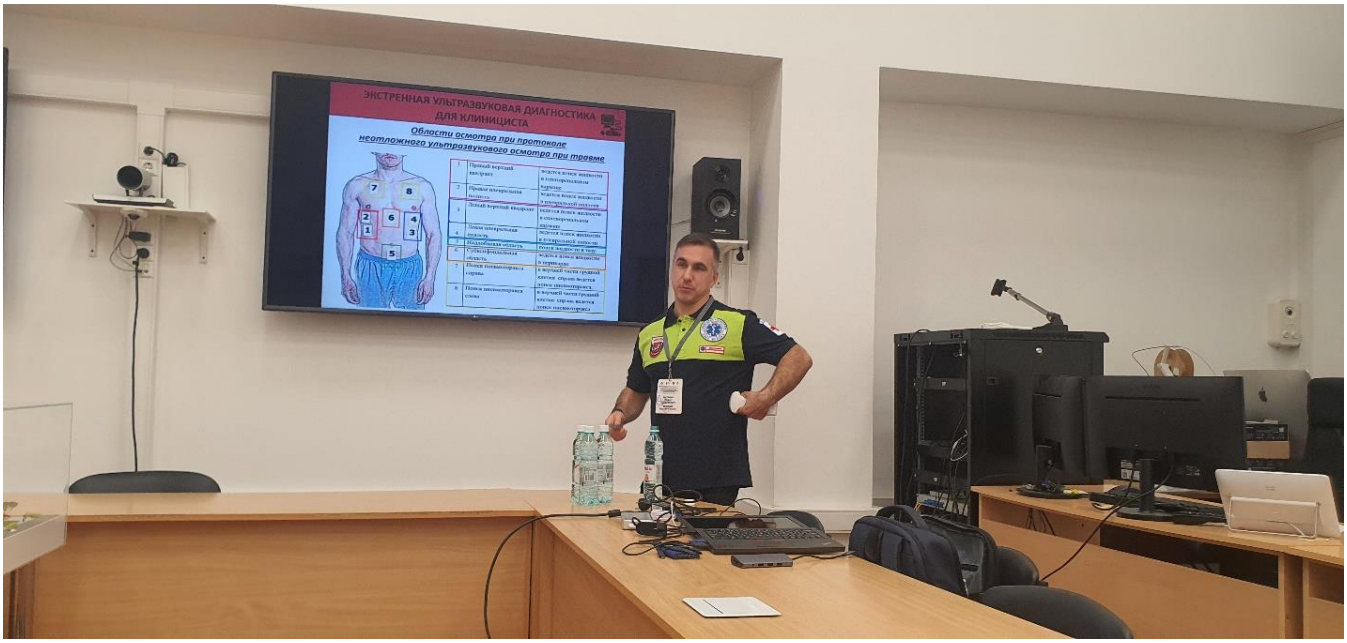
Considerable attention is given to training prehospital personnel (paramedics and physicians of ambulance teams, TsEMP crews) in the use of portable ultrasound devices and in mastering EFAST, BLUE, RUSH protocols.

[Example of a paramedic performing ultrasound after training]

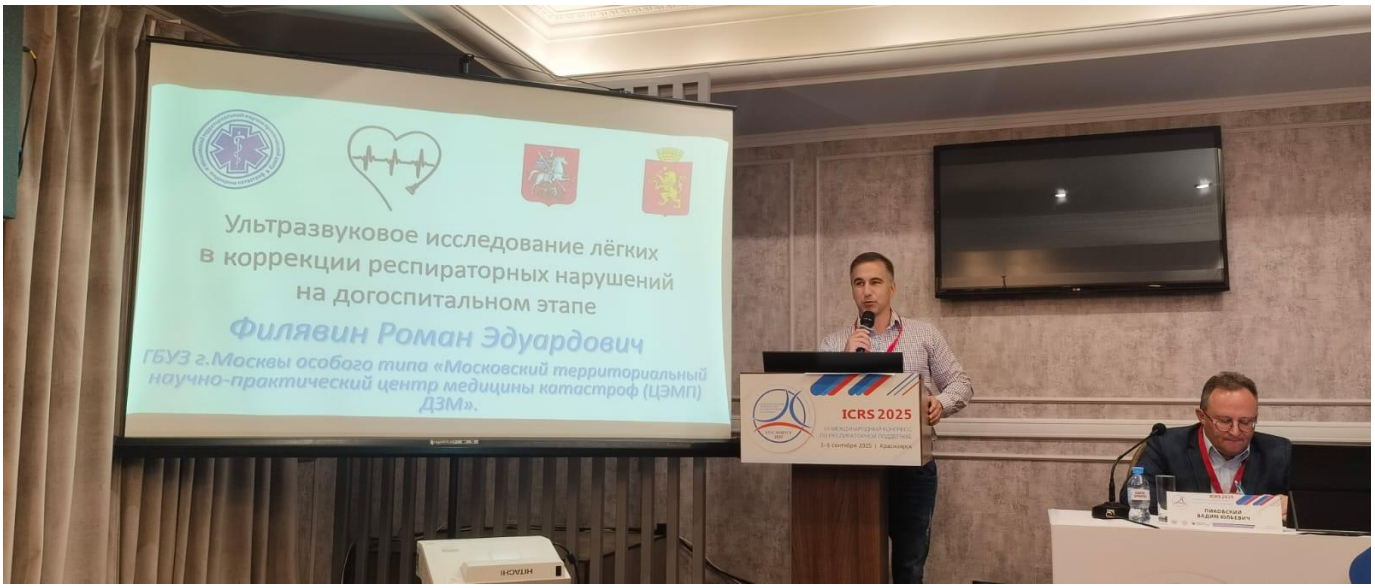


(An example of performing ultrasound at the prehospital stage after training with a patient after an injury by an NSR paramedic).

The team actively participates in off-site workshops and conferences throughout the year, promoting screening ultrasound protocols and ultrasound-guided invasive techniques, while ensuring continuity of care in a megacity setting.



[Photo of the conference in St. Petersburg]



[Photo of the presentation in Krasnoyarsk]

[Photo of the workshop on difficult airways (Prof. V.Yu. Pikovsky) and lung ultrasound (V.N. Lykhin)]

POCUS Echocardiography: What is It?

Dr. Ivica Zdravković, IPA Secretary General

In modern medicine, three main types of echocardiography can be distinguished, as well as three corresponding categories of ultrasound systems used for cardiac imaging, depending on clinical needs and available resources:

1. Basic FATE / FoCUS

Basic Focus Assessed Transthoracic Echocardiography (FATE), also referred to as Focused Cardiac Ultrasound (FoCUS).

Purpose: Rapid, orientational assessment of cardiac status, including morphology and basic functional dynamics, predominantly qualitative rather than quantitative evaluation. It is used in primary care, emergency medicine, rural medicine, intensive care units, and similar settings.

Equipment: Typically portable, black-and-white devices. In most cases, a convex probe is sufficient. No dedicated cardiology software is required for this level of assessment.

What Basic FATE / FoCUS enables:

- **Estimation of cardiac chamber volumes and left ventricular wall thickness**
- **Assessment of aortic diameter**
- **Evaluation of left ventricular wall motion**
- **Detection of pericardial effusion**
- **Identification of pulmonary embolism signs (e.g., D-shaped left ventricle)**
- **M-mode assessment of E/A ratio (diastolic function: A > E may suggest HFpEF)**

2. Advanced FATE / Basic Echocardiography

This level represents a more detailed functional and hemodynamic assessment of the heart, typically performed in secondary healthcare settings, primarily by internists or cardiologists.

Equipment: Ultrasound systems must include Doppler capability, specifically:

- **Pulsed Wave (PW) Doppler**
- **Continuous Wave (CW) Doppler**

These features enable:

- **Detailed flow assessment in valvular heart disease**
- **Hemodynamic measurements (e.g., Velocity-Time Integral – VTI)**
- **Semi-quantitative evaluation of diastolic function**
- **Additional functional cardiac assessment parameters**

3. Expert / Full Echocardiography

Purpose: Comprehensive cardiological diagnostics.
Equipment: High-end ultrasound systems featuring:

- **Tissue Doppler Imaging (TDI)**
- **3D/4D imaging**
- **Speckle Tracking Echocardiography (STE)**
- **Advanced CW and PW Doppler capabilities**

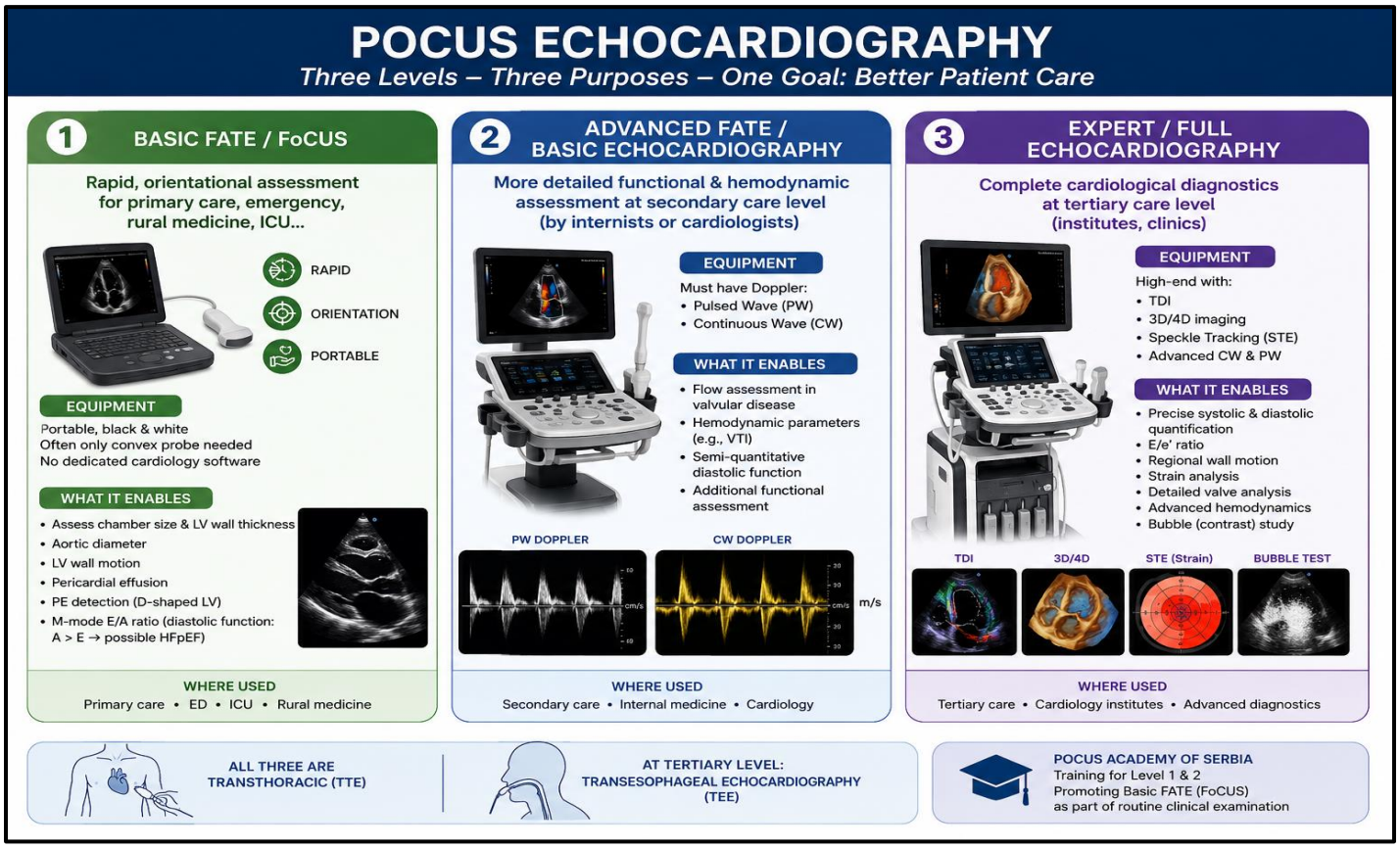
Clinical use: Tertiary care cardiology (institutes, university hospitals, specialized clinics).

This level allows:

- **Precise quantification of systolic and diastolic function**
- **E/e′ ratio analysis**
- **Assessment of regional wall motion abnormalities**
- **Strain imaging analysis**
- **Detailed valvular pathology evaluation**
- **Advanced hemodynamic assessment**
- **Performance of contrast (“bubble”) studies**

All three forms of echocardiography are performed as transthoracic echocardiography (TTE). At the tertiary level of care, transesophageal echocardiography (TEE) is also utilized for more advanced diagnostic evaluation.

At the POCUS Academy of Serbia, training is conducted for the first two levels of echocardiography, with a strong focus on promoting Basic FATE (FoCUS) as an integral part of routine clinical examination and physical diagnostics.

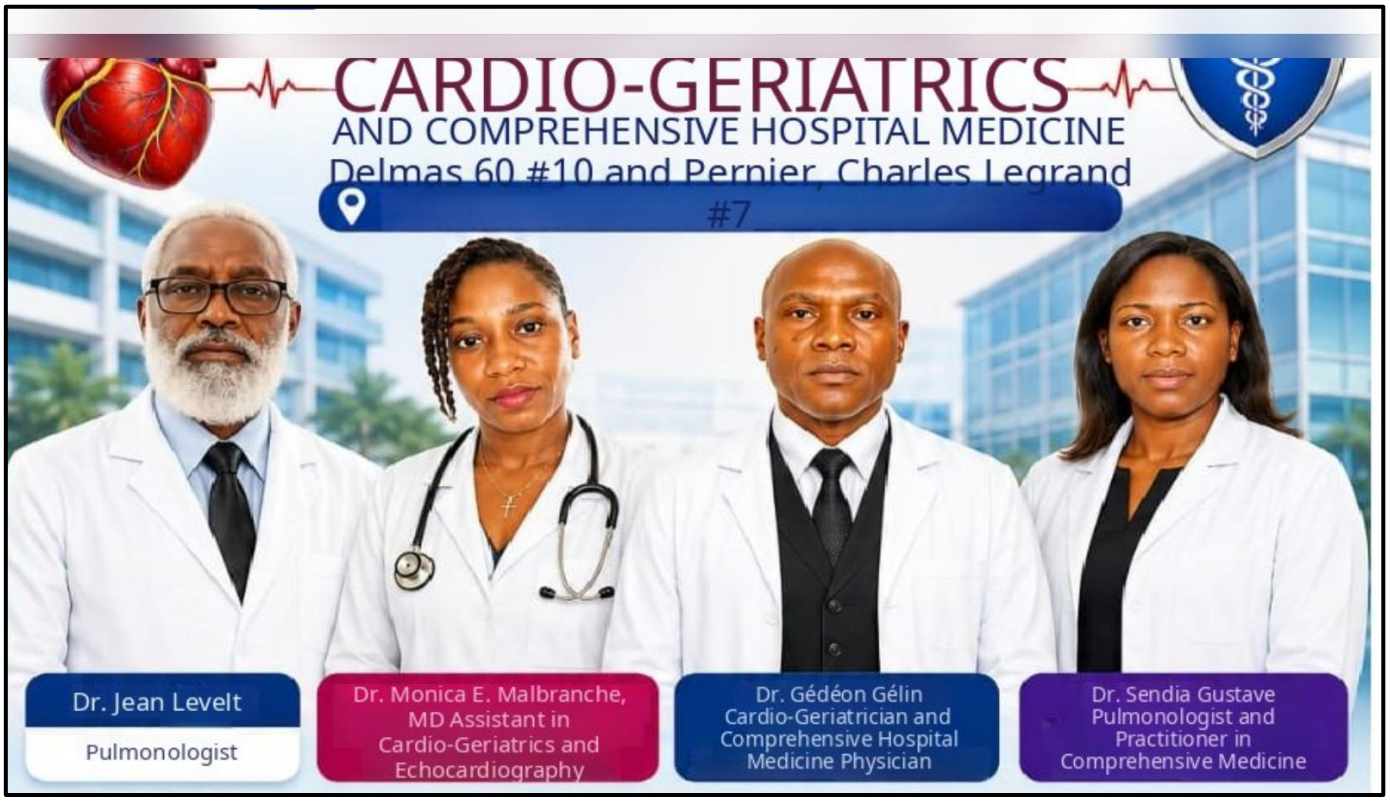


Advancing Diagnostic Excellence: The Resilience of Dr Gedeon GELIN', lead of Haiti's Team for Pocus International Academy

Dr. Gedeon GELIN, IPA President

The core of Dr. Gelin's mission is to democratize access to diagnostic ultrasound imaging, particularly for underserved populations in rural Haiti. By serving as the primary instructor, he has personally taken on the burden of capacity building in a region where such specialized medical training is scarce. His work represents a form of "diagnostic resilience," where a single practitioner leverages limited resources to create a sustainable educational framework that aims to improve patient outcomes across the nation.

Pocus International Academy is located at Haiti Cardio-Geriatrics and Comprehensive Hospital Medicine at Delmas 60.



Despite the profound security challenges currently facing Haiti, the mission to democratize diagnostic imaging remains steadfast. Under the leadership of Dr. Gédéon Gelin, a Sorbonne-trained cardio-geriatric specialist and expert in general sonography, the International POCUS Academy - through its local affiliate, the Haiti School of Heart and General Ultrasound - continues to expand its reach. Dr. Gelin's commitment to excellence has been widely recognized by medical professionals, who note that his training programs provide a level of instruction that rivals international standards in France and the Dominican Republic.

To facilitate hands-on learning across the country, the school has established three dedicated training centers located in the North, the Central Plateau, and the South. These sites serve as hubs for clinical education, allowing trainees to bridge the gap between theoretical knowledge and bedside practice. Beyond clinical training, these participants are active contributors to a broader social movement aimed at making sonography accessible to underserved rural populations. A recent testament to this impact occurred in Jérémie, a city in southwestern Haiti, where trainees successfully performed over 100 sonographic examinations for pregnant women in a rural locality, providing critical diagnostic data in an area where such services are often scarce.

From Left to right:Training Center of Limbe, North of Haiti (Dr Pierre-Left and Dr Saint-Fleur-Right); Training Center of Duchity, South of Haiti (Dr Theodore with a blue suit) and Training Center of Baptist (Center of the Country) -Dr Guerrier and Dr Monace (with glasses).

Looking toward the future, the International POCUS Academy and its Haitian affiliate are preparing for a significant milestone. In anticipation of the tenth anniversary of the Haiti Heart and General Ultrasound School in 2027, the institution will launch a high-level, specialized course in echocardiography beginning in September 2026. This program is designed to further elevate the diagnostic capabilities of local physicians and nurses, ensuring that even amidst national instability, the standard of care for cardiovascular health continues to make inroads in the country.

From a Single Ultrasound Probe to 46%: The Grassroots Revolution of Regional Anesthesia in Omsk, Russia

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Abstract

In 2018, Omsk – a city of 1.18 million people – had only 10% of its anaesthesiology-intensive care units equipped with a dedicated ultrasound machine. The local professional leadership actively resisted ultrasound-guided regional anesthesia. In response, a group of 11 young anaesthesiologists created a free, informal "Discussion Club", meeting on a single 2012 SonoScape A6 with *one linear probe*. Over the years, the club expanded, merged with the Omsk Society of Young Anaesthesiologists-Intensivists (OMAR), addressed legal and procurement barriers, partnered with ultrasound vendors, and organised regional conferences. By the end of 2025, an internal survey showed that ultrasound availability in anaesthesia departments had reached 46% – a 4.6-fold increase. This paper describes how a bottom-up initiative in a remote Russian region overcame institutional inertia and transformed regional anaesthesia practice.

Introduction: The 2018 reality in Omsk

At the beginning of 2018, Omsk Oblast had 105 public medical institutions, including 58 hospitals with a total of 15,689 inpatient beds (79.8 beds per 10,000 population – slightly above the Siberian average). Physicians performed 238,000 surgical operations that year, 136,000 of them in hospitals. The region employed 166 anaesthesiologists-intensivists, who faced a chronic shortage of modern equipment.

Most critically, only 10% of anaesthesiology and intensive care units owned an ultrasound machine dedicated to regional anaesthesia. The majority relied on blind, landmark-based techniques or borrowed radiology devices. The administrative wing of the local Federation of Anaesthesiologists-Intensivists (FAR RF) openly dismissed ultrasound guidance as "expensive, complicated, and unnecessary". In this environment, young specialists had almost no opportunity to learn evidence-based regional anaesthesia.

The birth of the Discussion Club (2018)

In late 2018, a group of 11 anaesthesiologists (most under 35 years of age) working at the Clinical Medical and Surgical Centre (CMSC) decided to bypass the official system. They formed a free, non-profit Regional Anaesthesia Discussion Club. Their only equipment: a portable SonoScape A5 (2008 model) with one linear probe. The first meeting combined a lecture with hands-on scanning on this single machine.

Meetings took place once every several months, each dedicated to one new technique or an under-represented POCUS topic (cardiac, lung, FAST, etc.). There was no budget, no administrative support, only enthusiasm. This was the seed of change.

Growth and expansion (2019–2023)

By 2019, the club had proven that regular practice improved block success rates. Yet the systemic equipment shortage remained at ~10%. The club continued meeting, slowly growing its informal network.

The breakthrough came in 2023, when the club merged with the Omsk Society of Young Anaesthesiologists-Intensivists (OMAR) – another non-profit educational platform. Together, they expanded the agenda beyond regional anaesthesia to include:

- **Advanced POCUS in critical care (FAST, lung ultrasound, basic echocardiography)**
- **Enhanced Recovery After Surgery (ERAS) protocols**
- **Difficult airway management (videolaryngoscopy, DAS-guidline)**

This merger transformed the club from a small circle into a regional interdisciplinary educational platform.

Addressing legal, procurement, and vendor barriers

Recognising that education alone would not buy ultrasound machines, the club took three additional actions:

1. **Legal justification. The club prepared analytical memos citing FAR RF guidelines and international PROSPECT/ERAS recommendations, arguing that performing regional blocks without ultrasound navigation carries an unjustifiable medicolegal risk. These memos were used by members to demand the inclusion of portable ultrasound machines in hospital equipment lists and procurement plans.**
2. **Vendor collaboration. The club invited companies selling ultrasound systems (Mindray, GE, Philips, SonoScape, domestic brands) to present both budget and expert models at club meetings. Members could compare specifications, test ergonomics, and learn about total cost of ownership. The club remained neutral but facilitated transparent access to information.**
3. **Conferences. In 2024, the club co-organised the first Omsk regional POCUS conference. The Omsk Anaesthesiology Forum 2026 (29 August 2026) was announced as the next major event. These conferences served as platforms for clinical updates, legal discussions, and direct networking between end-users and hospital decision-makers.**

Results: Ultrasound availability reaches 46% by end of 2025

In December 2025, the club conducted an internal survey of all anaesthesiology-intensive care units in Omsk. The key finding: 46% of departments now had a dedicated ultrasound machine for perioperative use – a dramatic increase

from 10% in 2019. Among younger anaesthesiologists (under 40 years), the actual utilisation of ultrasound for regional blocks exceeded 70%, indicating a lasting generational shift.

While 46% is still below the ideal, it represents a 4.6-fold improvement achieved through grassroots effort, legal advocacy, vendor engagement, and persistent education – all without significant external funding.

Discussion

The Omsk experience challenges the assumption that systemic change requires top-down directives. With minimal resources – one old machine, a dozen young doctors – the club succeeded where official structures had failed. Key lessons:

- **Institutional resistance can be bypassed by creating parallel, informal educational networks.**
- **Legal arguments (medicolegal risk of blind techniques) are powerful tools for procurement justification.**
- **Vendor partnerships provide free access to equipment demonstrations and comparative data.**
- **Conferences legitimise the movement and connect practitioners with administrators.**

The club's evolution from a single-probe hobby group to a driver of regional policy offers a replicable model for other remote Russian regions and beyond.

Conclusion

In 2018, Omsk had 10% ultrasound coverage in anaesthesia, a sceptical administration, and a handful of young enthusiasts with one vintage machine. By the end of 2025, coverage reached 46%, routine ultrasound-guided blocks became standard in several hospitals, and the Omsk Anaesthesiology Forum was announced as a recurring international event. The Omsk Regional Anaesthesia Discussion Club proves that grassroots initiatives, when combined with legal strategy, vendor collaboration, and persistent education, can overcome institutional inertia and transform clinical practice – even in the most resource-limited settings.

Acknowledgements

The authors thank all members of the Omsk Regional Anaesthesia Discussion Club, the Omsk Society of Young Anaesthesiologists-Intensivists (OMAR), and the ultrasound vendors who supported the club's educational mission.

Conflict of Interest

None declared.

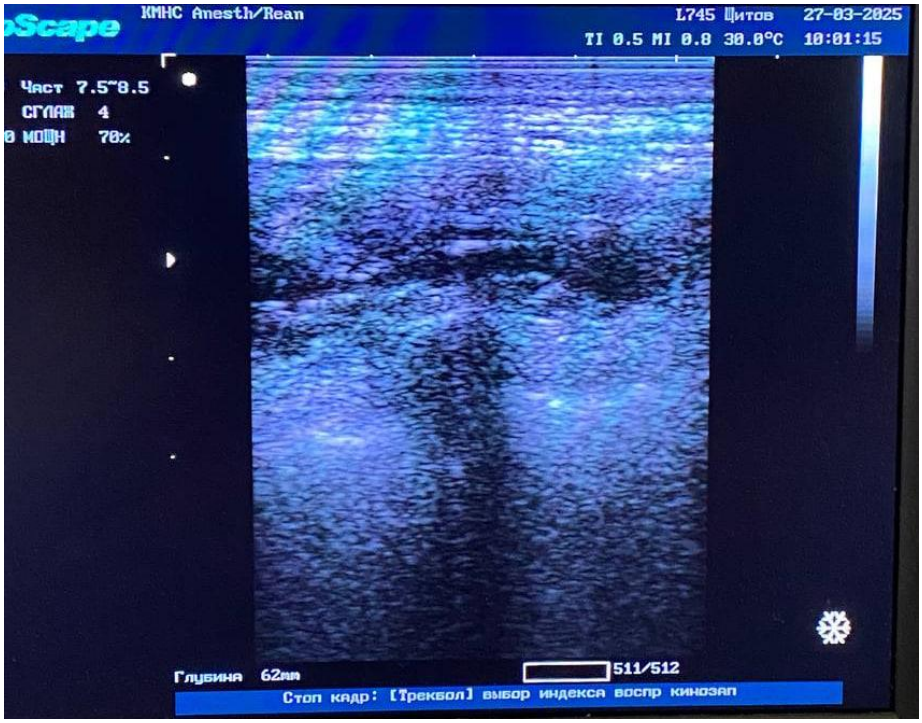

Figure 1. Ultrasound-guided PECS I-II block performed using a linear probe (SonoScape A6). The image shows the fascial plane between the pectoralis major (Pm) and pectoralis minor (Pmı) muscles (PECS I) and the plane between the pectoralis minor and serratus anterior muscle (PECS II).

Joint meeting of the Regional Anesthesia Discussion Club and the Omsk Society of Young Anesthesiologists-Intensivists (OMAR). The session focused on ERAS protocols for cesarean section, including ultrasound-guided interfascial blocks of the anterior abdominal wall: quadratus lumborum block (QLB types 1, 2, 3), transversus abdominis plane (TAP) block, rectus sheath block, and other techniques. The photograph shows hands-on training and case discussion among club members.

POCUS Academy of Serbia

POCUS Diagnostics Days 2026

The Second "POCUS Diagnostics Days", organized by the POCUS Academy of Serbia, were held on May 23–24, 2026, at the Institute for Emergency Medicine in Kragujevac. The event was jointly organized by the Institute - led by its welcoming Director, Prim. Dr. Ljiljana Mirkov, the POCUS Academy of Serbia, and Medisal company, whose generous support included providing state-of-the-art Mindray ultrasound systems for both the lectures and hands-on workshops.

Nearly 100 physicians from across Serbia, as well as Bosnia and Herzegovina and Montenegro, attended the meeting. The opening session featured lectures by Prim. Dr. Ivica Zdravković, Dr. Vekoslav Zajić, Dr. Dejan Živanović, Dr. Sava Vojnović, and Dr. Kristina Stević.

In addition to the keynote speakers, the Academy's instructors who contributed to the two-day educational program included Dr. Suzana Zdravković, Dr. Branka Popović, Dr. Milena Tošić Milosavljević, Dr. Adil Elhag, Dr. Nikola Milojević, and Dr. Nada Pejčić.

The meeting took place in an outstanding atmosphere, with participants receiving practical training at nine ultrasound stations, allowing physicians to gain hands-on experience across a broad spectrum of Point-of-Care Ultrasound (POCUS) applications.

The event was further enhanced by the exceptional support of the dedicated Medisal team: Luka Ćirić, David Ćojbašić, Teodora Uzelac, Aleksandra Vinter, and Metodija Atanasoski, whose professionalism and enthusiasm contributed greatly to the success of the workshop.

We would like to thank all participants, instructors, organizers, and partners for making this event such a success.


DOBRODOŠLI
POCUS


Point-Of-Care-UltraSound
POCUS
POCUS AKADEMIJA SRBIJE
POCUS
AKADEMIJA SRB
Udruženje lekara za edukaciju
kliničke ultrazvučne dijag
УЛТРАЗВУК ПЛУЋА
ОД НЕПОВЕРЕЊА ДО НЕЗАОБИЛАЗНОГ ДЕЛА
ПРЕГЛЕДА


Top 10 grešaka
početnika u POCUS-u
dr Sava Vojnović


Point-Of-Care-UltraSound
POCUS
FATE / FoCUS
(Focus Assessed Transthoracic
Echocardography)
Iz ugla lekara u primarnoj zdravstvenoj zaštiti
Dr med. Dejan Živanović
specijalista opšte medicine
i POCUS ultrasonografije


Edukacija
Point-Of-Care-UltraSound
POCUS
POCUS AKADEMIJA SRBIJE
Udruženje lekara za edukaciju u obl
kliničke ultrazvučne dijagnostik


DOBRODOŠLI
Prim. dr Ivica Zdravković


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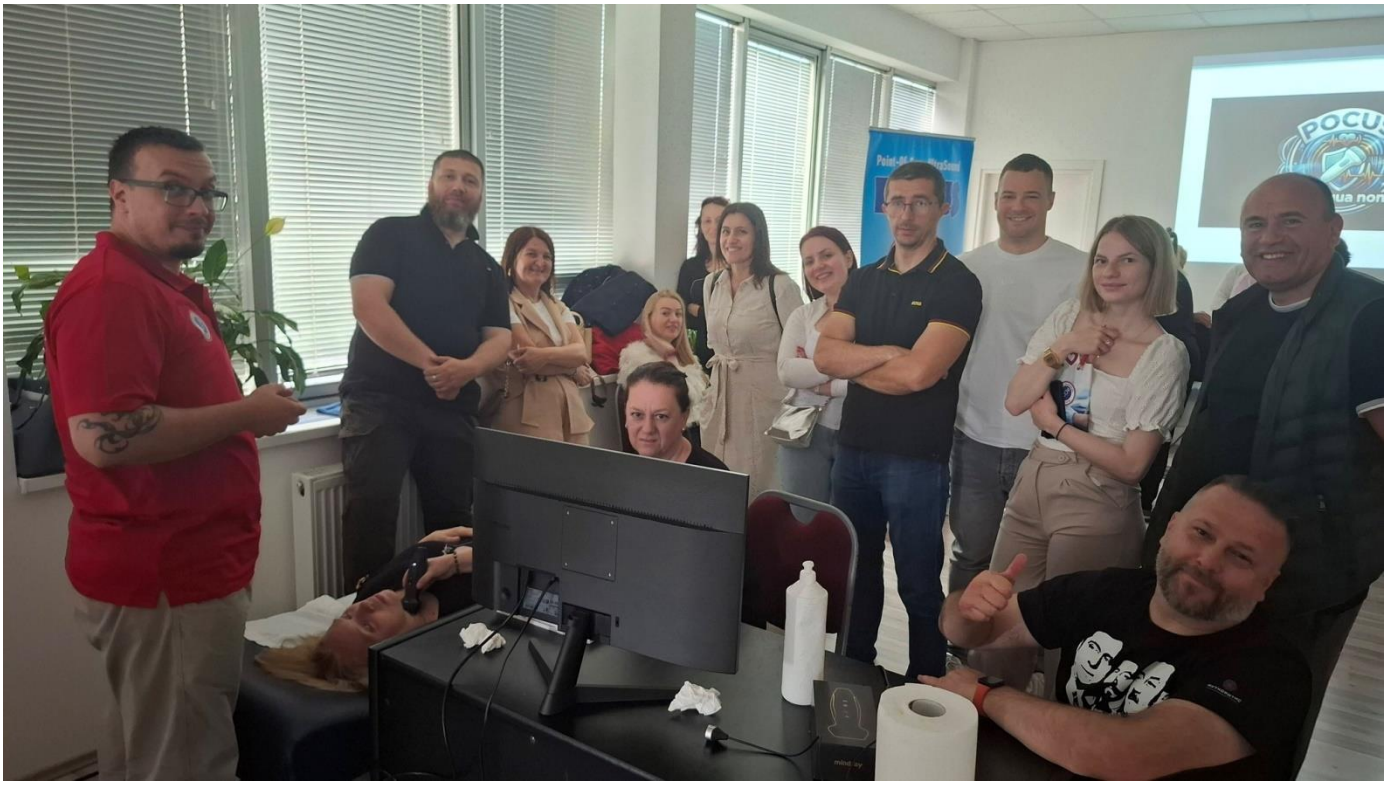


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We look forward to welcoming you again next year!

POCUS MOSCOW:

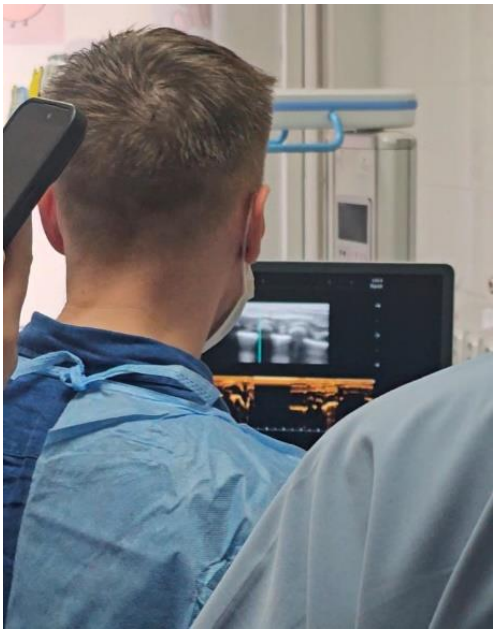
Vsevolod Lykhin MD/PhD, CEO of POCUS MOSCOW

POCUS IPA / INTERNATIONAL POCUS ACADEMY
Report for the First Half of 2026

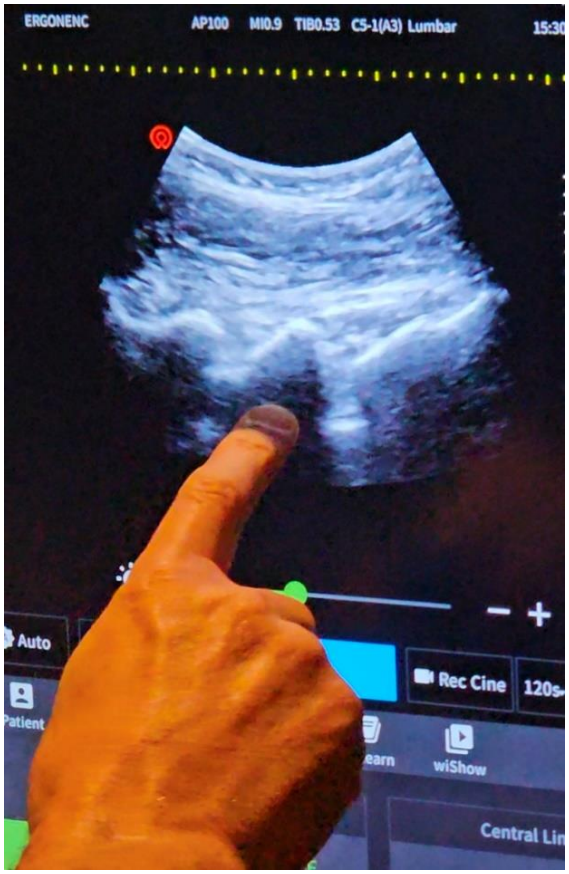
The POCUS MOSCOW team entered 2026 with strong momentum, new educational projects, international collaborations, and an expanding vision for practical ultrasonography.

The year began with an intensive January course in Turkestan, Republic of Kazakhstan: five days filled with knowledge, hands-on practice, and clinical discussion. POCUS continues to bring together physicians from different specialties around one shared idea — fast, accurate, and clinically meaningful decision-making at the bedside.



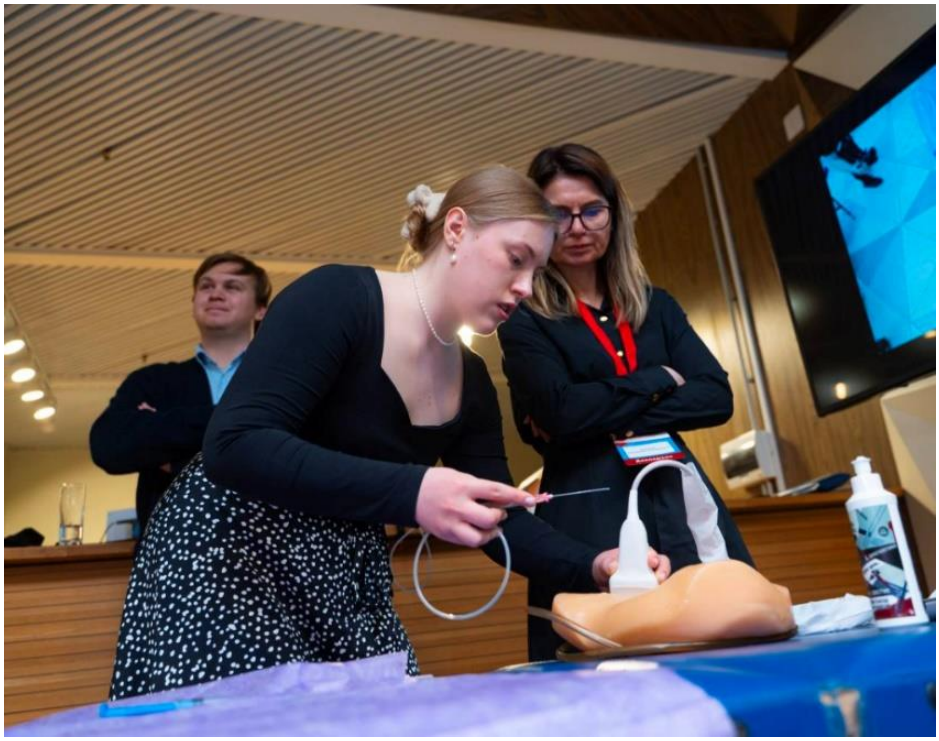
In February, our team took part in a master class in Istanbul, Turkey. Special attention was given to musculoskeletal ultrasound and facial ultrasound - two rapidly growing areas that are becoming increasingly relevant for physicians across different fields of practice.



We continue to develop our visiting educational programs across Russia. In March, an advanced ultrasound-guided regional anesthesia course was held in Kazan. This remains one of the key directions for POCUS MOSCOW: anatomy, navigation, safety, and confident technique form the foundation of modern regional anesthesia.

April was traditionally a month of olympiads, conferences, and student education. We actively support the development of POCUS from the very beginning of medical training and took part in the International Medical Olympiad at Sechenov University. POCUS should begin at the student's desk — not only at the bedside.

For more than five years, the Moscow Congress of Anesthesiologists and Intensivists has included POCUS MOSCOW competitions. This year, teams competed in ultrasound-guided vascular access, the eFAST protocol, and videolaryngoscopy. These formats demonstrate that medical education can be serious, practical, competitive, team-based, and inspiring at the same time.

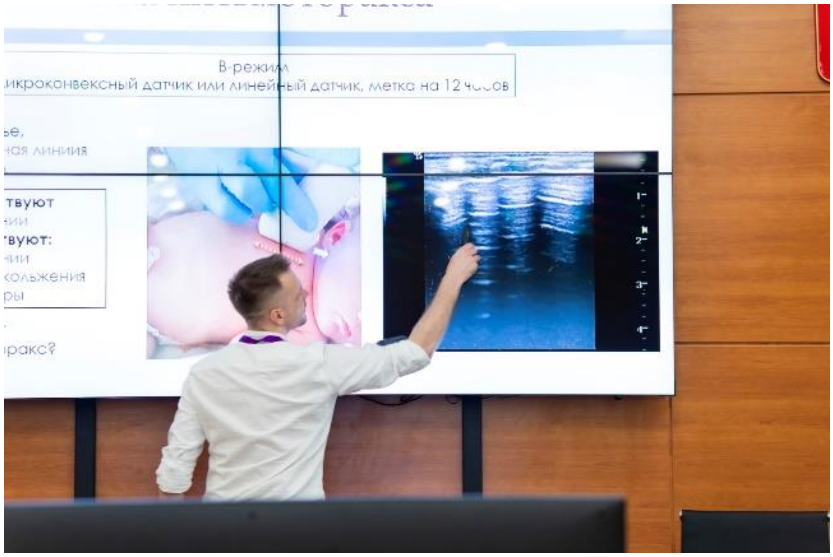


In May, the 2nd International POCUS PAIN AIRWAYS Congress took place, bringing together experts from different countries. A unique lecture program and a full day of intensive master classes made the congress a true platform for professional exchange. This year, a colleague from the United Kingdom joined the event - another reminder that POCUS connects countries and professional communities.

We would like to express our sincere gratitude to Andrey Nikolaevich Proshunin and the Society of Regional Anesthesia and Pain Medicine for organizing this important event.

Another rapidly developing direction is the use of POCUS in obstetric anesthesia and perinatal medicine. In May, our team participated in a series of master classes and scientific sessions at the Government House of the Moscow Region, where modern applications of ultrasound guidance in clinical practice were discussed.

One of the new and promising areas is the use of ultrasound guidance in regional anesthesia for hair transplantation. The nerve blocks that are commonly used in the treatment of chronic cervicogenic headache are also highly relevant for scalp anesthesia. Once again, POCUS shows that it can expand the boundaries of clinical reality.



Ahead of us is a trip to Almaty for a course on musculoskeletal and facial ultrasound for cosmetologists and plastic surgeons. We continue to build an international educational space that brings together anesthesiology, intensive care, pain medicine, aesthetics, perinatal medicine, and applied ultrasound anatomy.

See you at POCUS WORLD!

POCUS IPA / INTERNATIONAL POCUS ACADEMY

Practical ultrasonography that connects physicians, countries, and clinical disciplines.

The Advantage and Necessity of the FATE Protocol in Diagnosing Secondary Left Ventricular Hypertrophy (HCM) in a General Practice Setting: A Case Report

Dejan Živanović, MD, Specialist in General Medicine, POCUS instrucotr

Patient Presentation

A 58-year-old female patient, a long-standing hypertensive with no prominent subjective complaints, undergoes regular follow-ups and treatment at a general medicine clinic. She strictly adheres to her prescribed therapy (an ACE inhibitor), routinely monitors her lab work, and attends consultative examinations with an internist and an ophthalmologist.

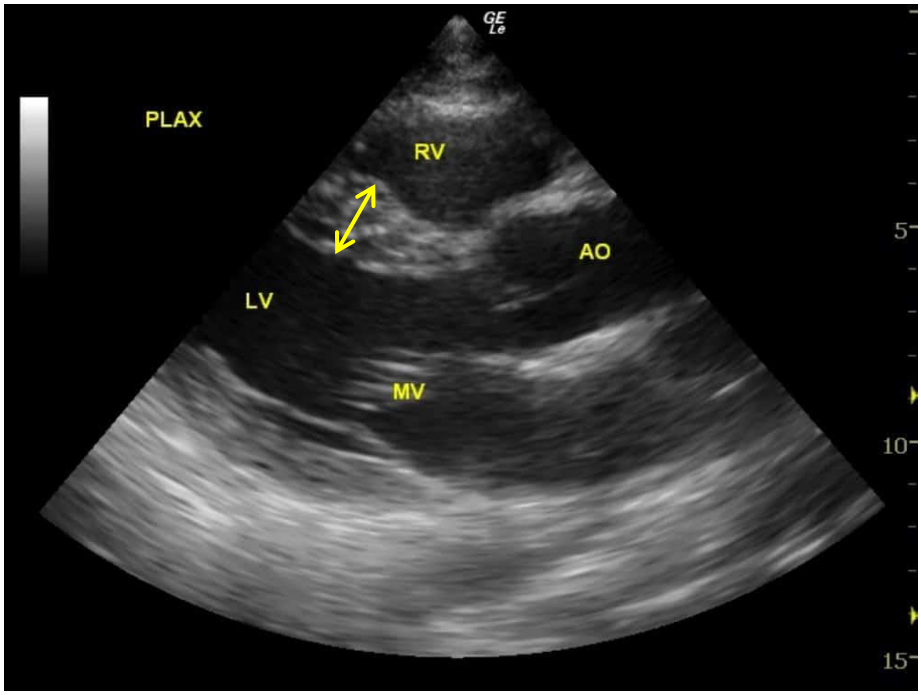
- **Blood Pressure (BP): 130/80 mmHg**
- **Cardiovascular Examination: Rhythmic cardiac action, clear heart sounds, no audible murmurs.**
- **Respiratory Examination: Normal vesicular breathing.**
- **Electrocardiogram (ECG): Sinus rhythm, heart rate approximately 75 bpm, with no acute or chronic changes across leads.**
- **Laboratory Findings: Complete blood count and biochemistry within reference ranges.**

The patient presented a recent report from an internist confirming an unchanged status (following an ECG and physical examination), with recommendations to continue the current therapy and return for a regular follow-up in six months.

Systematic Examination & POCUS/FATE Findings

During a routine systematic screening at a private general practice clinic, the aforementioned physical findings were confirmed. However, an additional Focus Assessed Transthoracic Echocardiography (FATE) protocol was performed using a convex probe, yielding the following objective findings:

- **MAPSE and TAPSE: Within normal limits.**
- **Left Ventricle (LV): Normal dimensions, but the *interventricular septum and posterior wall thickness are 18 mm (severe hypertrophy)*.**
- **Ejection Fraction (EF): Preserved, >60%.**
- **Other Cardiac Chambers: Normal dimensions; aortic root is not dilated.**
- **Valvular Assessment: No prominent valvular pathology, with discretely thickened cusps.**
- **Diastolic Function: Normal E/A ratio.**
- **EPSS (E-Point Septal Separation): Normal at 5 mm.**
- **Wall Motion: No regional wall motion abnormalities of the LV during systole.**
- **Right Heart Parameters: Normal RVSP (Right Ventricle Systolic Pressure); Inferior Vena Cava (IVC) collapses normally.**
- **Pericardium: No pericardial effusion.**



Septal wall thickness

This crucial structural finding indicated the absolute necessity for further specialized diagnostic workup and management. The patient's therapy was optimized, and an urgent referral to a cardiologist was scheduled.

Conclusion

Standard internal medicine examinations dictated by traditional clinical propedeutics are no longer sufficient for the timely diagnosis of structural heart diseases. This case serves as a prime example of secondary hypertrophic cardiomyopathy caused by chronic hypertension - which, although currently well-regulated, was likely addressed too late to prevent structural remodeling.

It is becoming essential to integrate advanced, point-of-care diagnostics directly into general medicine clinics. A straightforward implementation of the FATE protocol has become an indispensable asset in a physician's daily workflow. For patients, this proactive approach extends life expectancy and, perhaps even more importantly, significantly improves the quality of life for both the patients and their families.

The Significance of POCUS Diagnostics in Detecting Heart Failure in Patients with Minimal or Absent Symptoms

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Patient Presentation

A 54-year-old male presented to the clinic with mild, non-specific complaints of a discrete sensation of breathlessness and chest tightness over the past few weeks. The symptoms slightly intensify during physical exertion but lack a clear, direct correlation with workload. The patient denies chest pain, paroxysmal nocturnal dyspnea (PND), or orthopnea, noting that he sleeps flat without discomfort. He also denies noticeable peripheral edema. Home blood pressure monitoring records were reported as normal.

The patient is a chronic smoker (>35 years) and leads a sedentary lifestyle. His Body Mass Index (BMI) is within the normal range. He takes no regular medication for hypertension or other chronic conditions, except for occasional self-administered Aspirin "for circulation," as casually advised by a previous physician. His last routine laboratory analyses, performed a few months ago, were within normal reference ranges. He has not undergone a recent chest X-ray or regular comprehensive medical check-ups. The patient denies any significant past or current medical conditions, prior surgeries, or hospitalizations.

Physical and Objective Examination

Upon examination, the patient is eupneic, afebrille, with normal skin, visible mucous membranes, and sclera color. Oxygen saturation (SpO2) is 96% on room air. Cardiac action is rhythmic with a heart rate of approximately 85 bpm. The electrocardiogram (ECG) confirms sinus rhythm at 85 bpm, with no significant ST-segment or T-wave abnormalities. Auscultation of the heart and lungs yields normal findings. The abdomen is flat, non-tender upon palpation, and presents no palpable organomegaly. On the lower extremities, very discrete, pitting perimalleolar edema is palpable.

Based solely on this physical examination and history, what could be concluded? One might suspect somatization, attribute the dyspnea and fatigue to neurasthenia, or classify it as a common decline in physical capacity due to being simply "out of shape" (deconditioning). In standard clinical practice, this is frequently labeled as "deconditioning fatigue," leading to advice on smoking cessation and lifestyle modification without further cardiac workup. However, point-of-care ultrasound (POCUS) completely redefines the diagnostic path.

Point-of-Care Ultrasound (POCUS) Findings

Using a convex ultrasound probe over the lung fields, a standard, physiological A-profile is observed bilaterally. The same probe reveals no free fluid (ascites)

subdiaphragmatically or within Morrison's and Koller's pouches. Additionally, no pleural effusion is detected in the right upper quadrant (RUQ) or left upper quadrant (LUQ) recesses. However, transitioning the same convex probe to the subxiphoid window immediately reveals the underlying pathology.

The subxiphoid view demonstrates a severely reduced Mitral Annular Plane Systolic Excursion (MAPSE) and poor, practically filiform contractility of the left ventricular walls, alongside left ventricular dilatation. In the apical four-chamber (A4C) view, the image remains consistent, further highlighting global hypokinesia of the left ventricle.

Positioning the patient in the left lateral decubitus position allows for a Parasternal Long Axis (PLAX) view. Objective measurements reveal:

- **Left Ventricular End-Diastolic Diameter (LVEDD): 65 mm (severely dilated)**
- **Interventricular Septum (IVS) & Posterior Wall Thickness (PW): ~13 mm each (mild hypertrophy)**
- **E-Point Septal Separation (EPSS): 22 mm (indicative of severe dysfunction)**

Utilizing fractional shortening (Teichholz formula), the pronounced EPSS, and the restricted MAPSE, a definitive conclusion is reached: the patient's Left Ventricular Ejection Fraction (LVEF) is severely reduced, estimated at approximately 25%. No gross valvulopathy is noted on the mitral, aortic, tricuspid, or pulmonary valves. The Parasternal Short Axis (PSAX) view confirms global hypocontractility of virtually all left ventricular walls during systole, accompanied by a moderate separation between the epicardium and pericardium, revealing a pericardial effusion measuring up to 8 mm.

Discussion and Clinical Course

The patient presents with severe, chronic heart failure that developed slowly and progressively, allowing for physiological adaptation. This adaptation explains the minimal, almost absent subjective symptoms. Given his sedentary lifestyle and a profession requiring no significant physical exertion, this condition could have remained undetected, progressing quietly toward total cardiac collapse or sudden complications of dilated and hypertrophic cardiomyopathy, such as fatal arrhythmias or symptomatic ischemia.

Without the utilization of POCUS - an immediate, bedside examination - the critical severity of this patient's underlying disease would have been missed entirely. Following the POCUS evaluation, the patient was immediately referred to the internal medicine department of a nearby hospital for comprehensive diagnostic verification and optimized medical therapy. Within one month of initiating guideline-directed medical therapy (GDMT), the patient reported complete resolution of subjective complaints, and his ejection fraction had already surpassed 40%.

It is clinically vital to recognize that many patients experiencing slowly progressive cardiac deterioration habituate to their symptoms. This phenomenon has gained particular relevance recently, following documented cardiomyopathic complications associated with COVID-19. It reinforces our understanding that various viral infections can cause myocardial damage; the resulting myocarditis induces global

systolic weakness, driving patients into latent or rapidly progressing heart failure syndromes.

Literature and Research Context: The Dissociation Between Symptoms and Function

The absence of a clear correlation between the severity of clinical symptoms and the objective state of the myocardium or heart failure status is well-documented. Key landmark studies validating this discordance include:

1. **The SOLVD Prevention Trial (Studies of Left Ventricular Dysfunction, 1992)**

   Historically the most significant trial addressing this phenomenon. Investigators analyzed patients with an LVEF ≤ 35% who presented with no clinical symptoms of heart failure (NYHA Class I). *More than half* of these patients with severely impaired pump function felt perfectly well. The trial demonstrated that such patients can remain clinically stable for years (the latent period), but that initiating early pharmacological intervention (such as ACE inhibitors) during this asymptomatic phase dramatically prevents progressive cardiac remodeling and ventricular dilatation.

2. **The SAVE Study (Survival and Ventricular Enlargement, 1992)**

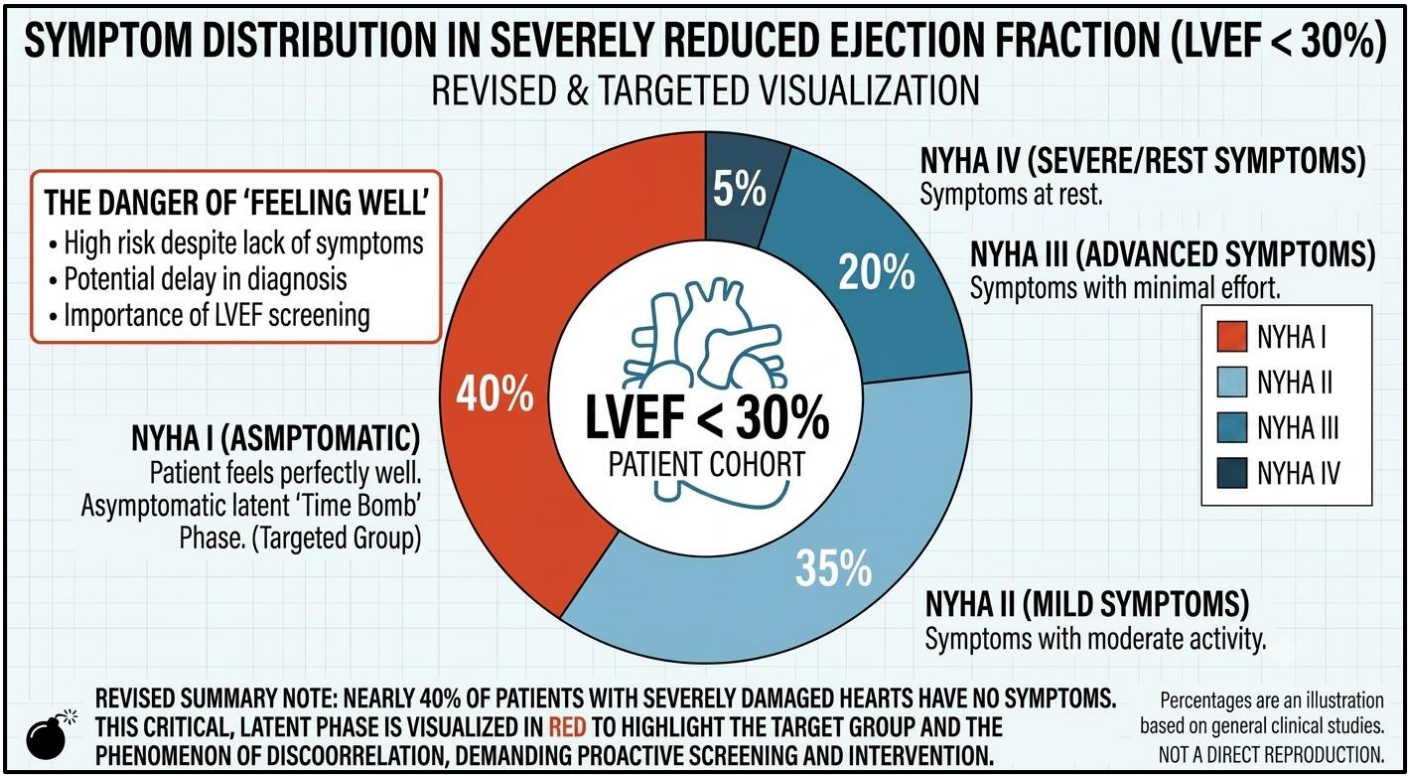
   This study monitored post-myocardial infarction patients with an LVEF ≤ 40% who had not yet developed overt clinical symptoms of heart failure. It proved that asymptomatic patients maintain excellent short-term subjective quality of life due to early neurohumoral and structural compensatory mechanisms, despite objective, severe myocardial weakness.

3. **The Glasgow Heart Failure Study (McDonagh et al., 1997)**

   A large-scale epidemiological study designed to screen the general population for unrecognized cardiac dysfunction. Among individuals found to have a severely reduced ejection fraction (around 30%), *approximately 50%* reported absolutely no subjective symptoms and were entirely unaware of their underlying cardiac disease.

4. **The TransitionCHF Trial (Ongoing)**

   A contemporary, large-scale multicenter study in Germany specifically recruiting 1,000 asymptomatic patients (NYHA Class I) with an LVEF ≤ 40%. Its objective is to map the precise genetic, metabolic, and pathophysiological mechanisms that allow these individuals to remain asymptomatic, while identifying specific triggers that prompt the transition from asymptomatic to symptomatic heart failure.



Conclusion

This case serves as a powerful reminder that POCUS plays an indispensable, irreplaceable role in establishing an accurate, timely diagnosis at the primary healthcare level. Avoiding the integration of bedside ultrasound into basic physical propedeutics introduces a critical risk of diagnostic failure. Without POCUS, severely ill patients run the risk of being discharged as "healthy" or, worse, mismanaged and treated for generalized anxiety, stress, or somatoform depression.

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CONTENTS:

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