

P2SK Journal Scanning Sept 15 2021

A Case Report Utilizing Ultrasound for the Identification of Traumatic Pulmonary Contusion
[focused assessment sonography trauma](#) by Daniel Merrill / 2mo

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Med J (Ft Sam Houst Tex). 2021 Apr-Jun;(PB 8-21-04/05/06):98-99.

ABSTRACT

Pulmonary contusions are a common injury in both military and civilian trauma patients. In austere and resource-limited settings common to deployment, military physicians may be limited on their ability to diagnose or differentiate this entity from other traumatic injuries. We describe the use of ultrasound for the identification of pulmonary contusion in a patient with a gunshot wound while performing an extended Focused Assessment with Sonography (eFAST). The utility of ultrasound in polytraumatic patients stretches far beyond the initial FAST exam and can drastically inform clinical decision making and treatment.

The utility of handheld ultrasound as a point-of-care screening tool to assess vocal fold impairment following congenital heart surgery

[pubmed: point of care ultras...](#) by Anita Deshpande / 2mo

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Int J Pediatr Otorhinolaryngol. 2021 Jul 6;148:110825. doi: 10.1016/j.ijporl.2021.110825. Online ahead of print.

ABSTRACT

INTRODUCTION: Vocal fold motion impairment (VFMI) is a known potential complication of congenital heart surgery (CHS). Flexible nasolaryngoscopy (FNL) is the gold standard for evaluation of vocal fold movement but has risks, including epistaxis, desaturation, and changes in heart rate. Laryngeal ultrasound (LUS) has begun to emerge as a diagnostic tool and has been shown to have high accuracy in the evaluation of VFMI. We sought to assess the utility of hand-held LUS as a point-of-care screening tool to assess VFMI in pediatric patients following congenital heart surgery.

METHODS: Using a prospective cohort design, children under 18 years who were undergoing congenital heart surgery at a tertiary care pediatric hospital were enrolled. All patients underwent postoperative LUS and FNL. All studies were reviewed by two otolaryngology reviewers blinded to the clinical diagnosis. Higher quality studies were reviewed by two cardiology reviewers also blinded to the clinical diagnosis. Accuracy and inter-rater reliability were calculated.

RESULTS: Sixty-two children were screened. Fourteen children with VFMI were identified via FNL. When comparing LUS and FNL, both individual accuracy (90.3% and 75.8%) and interrater agreement (79% overall, 96% for high quality videos) were high for the otolaryngology reviewers. The cardiology reviewers were able to obtain 100% accuracy for high quality videos.

CONCLUSION: Handheld LUS has utility as a point-of-care screening tool to assess VFMI. This may have benefit in low-resource settings, for universal screening in cardiac intensive care units, or in settings where otolaryngology consultation may be difficult to obtain.

Ultrasound in Emergency MedicinePoint-of-Care Ultrasound (POCUS) for Isolated Pediatric Dysuria: An Unusual Presentation of Acute Appendicitis

[pubmed: point of care ultras...](#) by Benjamin R Gammon / 2mo

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J Emerg Med. 2021 Jul 9:S0736-4679(21)00466-2. doi: 10.1016/j.jemermed.2021.05.009. Online ahead of print.

ABSTRACT

BACKGROUND: Isolated complaint of dysuria in an adolescent is a rare presentation for acute perforated appendicitis. Acute appendicitis typically involves vague periumbilical pain that migrates to the right lower quadrant, associated with pain, nausea, and loss of appetite. There have been case reports of associated pyuria and dysuria in addition to classical symptoms, but to our knowledge, this is the first case with isolated dysuria presenting to an emergency department (ED).

CASE REPORT: A 14-year-old boy presented to the ED with 3 days of dysuria and subsequent sensation of urinary retention. Urine dip showed occult blood without white cells or nitrites. A bedside renal/bladder point-of-care ultrasound (POCUS) did not show evidence of obstruction. However, it did reveal a retrovesicular fluid collection with an echogenic foci inside suspicious for abscess, likely secondary to ruptured appendicitis. This diagnosis was confirmed with a dedicated right lower quadrant ultrasound, with resultant treatment with i.v. antibiotics and eventual surgical resection of the appendix. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** Pediatric and adolescent patients may present with extremely atypical symptoms of a common disease process. In this case, early use of POCUS in the ED helped to quickly identify an acute surgical process and focus diagnostic and therapeutic interventions.

B-lines beyond the thoracic cavity - ultrasound identification of intercostal pulmonary hernia

["lung ultrasound" or "lung ultrasonograp...](#) by Richard Gordon / 2mo

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J Clin Ultrasound. 2021 Jul 12. doi: 10.1002/jcu.23035. Online ahead of print.

ABSTRACT

Intercostal pulmonary hernia is a rare condition that may present to the emergency department spontaneously, following blunt trauma or as a complication of thoracic surgery. With the evolution of minimally invasive thoracic surgery pulmonary hernia may become more common. In this case of postoperative chest pain, incisional swelling, and shortness of breath, we present the ultrasound characteristics of a postoperative intercostal pulmonary hernia and its resemblance to subcutaneous emphysema.

Lung Ultrasound on Admission to a Covid Decision Unit - Helpful in Differential Diagnosis or a Waste of Time?

["lung ultrasound" or "lung ultrasonograp...](#)by Christian Salzmann / 2mo

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Pneumologie. 2021 Jul 12. doi: 10.1055/a-1502-8844. Online ahead of print.

ABSTRACT

BACKGROUND: In patients with Covid-19, typical and often severe lung lesions have been reported. In addition to the use of chest CT, the diagnostic benefit of lung ultrasound has been advocated. This trial investigates if in patients presenting with symptoms compatible with Covid-19, lung ultrasound is of use in the early differential diagnosis.

METHODS: This study includes 46 patients of the first wave of the Covid-19 pandemic (23 with confirmed infection, 23 controls with later on excluded infection), who were initially admitted to the Covid Decision Unit of an academic teaching hospital under the clinical suspicion of SARS-CoV-2 infection. All patients were examined by pulmonary ultrasound shortly after admission. The final diagnosis of infection was made or ruled out by means of - sometimes repeated - PCR of nasal/pharyngeal swabs. Findings of SARS-CoV-2 patients and controls were compared and analyzed for significant differences in chest sonographic parameters.

RESULTS: There were significant differences in the lung ultrasound findings of both groups. In the Covid group there were significantly fewer A-lines, more pathological B-lines (increased or confluent) and more consolidations. Pleural effusions were significantly more frequent in the control group. The calculated lung ultrasound score (LUS) was higher in the Covid group than in the control group. However, a reliable differentiation between the two groups was not possible due to the wide range and overlap.

CONCLUSION: In a clinical setting, lung ultrasound reveals more frequent and different lesions in SARS-CoV-2 infected patients than in patients in whom the initial clinical suspicion was not confirmed. However, due to the overlap of findings between the two groups, lung ultrasound was not suitable to differentiate with sufficient certainty between SARS-CoV-2 infected and non-infected patients.

Procedural Applications of Point-of-Care Ultrasound in Pediatric Emergency Medicine

[pubmed: pediatric intubation](#)by Ashkon Shaahinfar / 2mo

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Emerg Med Clin North Am. 2021 Aug;39(3):529-554. doi: 10.1016/j.emc.2021.04.006. Epub 2021 Jun 11.

ABSTRACT

Point-of-care ultrasound can improve efficacy and safety of pediatric procedures performed in the emergency department. This article reviews ultrasound guidance for the following pediatric emergency medicine procedures: soft tissue (abscess incision and drainage, foreign body identification and removal, and peritonsillar abscess drainage), musculoskeletal and neurologic (hip arthrocentesis, peripheral nerve blocks, and lumbar puncture), vascular access (peripheral intravenous access and central line placement), and critical care (endotracheal tube placement, pericardiocentesis, thoracentesis, and paracentesis). By incorporating ultrasound, emergency physicians caring for pediatric patients have the potential to enhance their procedural scope, confidence, safety, and success.

Diagnostic Applications of Point-of-Care Ultrasound in Pediatric Emergency Medicine

[acute scrotum or testicular torsion](#) by Margaret Lin-Martore / 2mo

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Emerg Med Clin North Am. 2021 Aug;39(3):509-527. doi: 10.1016/j.emc.2021.04.005.

ABSTRACT

Point-of-care ultrasound has become an essential part of pediatric emergency medicine training and practice. It can have significant clinical benefits, including improving diagnostic accuracy and decreasing length of stay, and does not require radiation exposure for patients. In this review, we summarize the current diagnostic point-of-care ultrasound applications in pediatric emergency medicine, their evidence, and techniques.

ECHOTIP-Ped: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in pediatric patients

[pubmed: bUS](#) by Geremia Zito Marinosci / 2mo

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J Vasc Access. 2021 Jul 13;11297298211031391. doi: 10.1177/11297298211031391. Online ahead of print.

ABSTRACT

Central venous access devices are routinely used in pediatric care for administration of fluids and medications and for drawing blood samples. The adoption of ultrasound guided venipuncture, the availability of bedside ultrasound devices and the use of intraprocedural methods for tip location have been shown to reduce procedure-related complications, as documented by the recommendations of most recent guidelines. In pediatric patients, bedside ultrasound is a promising tool not only for optimizing the choice of the vein and guiding the venipuncture, but also for ensuring an accurate and intraprocedural method of tip navigation and tip location. The aim of this paper is to review all the evidence about the accuracy of ultrasound methods for tip navigation and tip location in pediatric patients, and to suggest a structured protocol for clinical practice.

Effect of acupuncture on diaphragmatic function in patients with AECOPD type respiratory failure evaluated by ultrasound detection

pubmed: bUS by Si-Cheng Yuan / 2mo

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Zhongguo Zhen Jiu. 2021 Jul 12;41(7):703-10. doi: 10.13703/j.0255-2930.20200606-k0007.

ABSTRACT

OBJECTIVE: To observe the therapeutic effect of acupuncture combined with western conventional therapy on type II respiratory failure of acute exacerbation of chronic obstructive pulmonary disease (AECOPD) and evaluate the effect of acupuncture on diaphragmatic function and prognosis by bedside ultrasound.

METHODS: A total of 111 patients with AECOPD type II respiratory failure were randomized into an acupuncture group, a conventional treatment group and a non-acupoint acupuncture group, 37 cases in each one. The routine AECOPD nursing care and treatment with western medicine were provided in the 3 groups. Additionally, in the acupuncture group, acupuncture was applied at Dingchuan (EX-B 1), Feishu (BL 13), Taiyuan (LU 9), Danzhong (CV 17) and Zhongwan (CV 12), etc. In the non-acupoint acupuncture group, acupuncture was given at the points 5 to 10 mm lateral to each of the acupoints selected in the acupuncture group. Acupuncture was given once every day, 30 min each time, consecutively for 10 days in the above two groups. Separately, before treatment, on day 3, 7 and 10 of treatment, arterial partial pressure of oxygen (PaO₂), partial pressure of carbon dioxide (PaCO₂) and diaphragm thickening fraction (TFdi) were observed in each group. Before and after treatment, the inflammatory and immune indexes (levels of white blood cell [WBC], procalcitonin [PCT], hypersensitive C-reactive protein [hs-CRP] and T lymphocyte percentage [%]), auxiliary respiratory muscle movement score, the score of chronic obstructive pulmonary disease (COPD) assessment test (CAT), the score of the modified British Medical Research Council dyspnea scale (mMRC) and the TCM syndrome score were compared in each group. The duration of mechanical ventilation, relative complications, 14-day clinical controlled discharge rate and the therapeutic effect were observed in each group.

RESULTS: On day 3, 7 and 10 of treatment, PaO₂ and TFdi were all increased as compared with those before treatment ($P<0.01$) and PaCO₂ was reduced as compared with that before treatment in each group ($P<0.01$). After treatment, % was increased as compared with that before treatment in each group ($P<0.01$), WBC, PCT, hs-CRP, auxiliary respiratory muscle movement score, CAT score, mMRC score and TCM syndrome score were all reduced as compared with those before treatment in each group ($P<0.01$). After treatment, PaCO₂, WBC, PCT, hs-CRP, auxiliary respiratory muscle movement score, CAT score and mMRC score in the acupuncture group were all lower than the other two groups ($P<0.01$), PaO₂ and TFdi were higher than the other two groups ($P<0.01$); % was higher and TCM syndrome score was lower in the acupuncture group compared with those in the non-acupoint acupuncture group ($P<0.01$). The duration of mechanical ventilation and the total incidence of complications in the acupuncture group were all lower than the other two groups ($P<0.01$), and the 14-day clinical controlled discharge rate and total clinical effective rate were higher than the other two groups ($P<0.01$).

CONCLUSION: Acupuncture as adjunctive therapy achieves significant therapeutic effect on AECOPD type II respiratory failure. It improves diaphragmatic function, promotes oxygenation and relieves carbon dioxide retention of artery, alleviates clinical symptoms and reduces the time of mechanic ventilation and hospitalization. Besides, the bedside ultrasound detection can objectively reflect the effect of acupuncture on diaphragmatic function in the patients with AECOPD complicated with type II respiratory failure.

Simultaneous pneumothorax and pneumoperitoneum as a late consequence of traumatic injury of the diaphragm: Multimodality imaging approach with surgical correlation and treatment

[diaphragm and \(ultrasound or ultrasonogr...](#) by Antonio Solazzo / 2mo

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Radiol Case Rep. 2021 Jul 1;16(9):2421-2425. doi: 10.1016/j.radcr.2021.05.079. eCollection 2021 Sep.

ABSTRACT

Simultaneous occurrence of pneumothorax and pneumoperitoneum is a rare event, usually related to traumas or surgical procedures involving the diaphragm. However, clinicians should be aware of the possible onset of these two clinical conditions even in patients without a recent clinical history that can clearly explain them. Cross-sectional imaging techniques are of great importance, providing crucial information about the patient's clinical status and guiding the following patient management. This work describes a unique case of a sudden occurrence of simultaneous pneumothorax and pneumoperitoneum in a previous asymptomatic man with a solely clinical history of minor trauma during childhood, evaluated through a multimodality imaging approach and treated with video-assisted thoracoscopy surgery.

Albumin Infusion in Patients with Cirrhosis: Time for POCUS-Enhanced Physical Examination

[pubmed: point of care ultrasonography](#) by Abhilash Koratala / 2mo

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Cardiorenal Med. 2021 Jul 14:1-5. doi: 10.1159/000517363. Online ahead of print.

ABSTRACT

Objective assessment of fluid status is of utmost significance in the management of patients with complex disorders involving hemodynamics and multi-organ crosstalk such as cardiorenal or hepatorenal syndrome. The role of volume expansion using intravenous albumin in the setting of hepatorenal syndrome has been an everlasting debate among clinicians. With the accumulating evidence on the deleterious consequences of iatrogenic fluid overload, empiric albumin administration in these patients has been the focus of much attention, and the findings of recent studies suggest a higher incidence of pulmonary complications with albumin. Poor sensitivity of conventional physical examination has led to an interest in the utility of novel noninvasive bedside tools such as point-of-care ultrasonography (POCUS) to evaluate hemodynamics more precisely. Once confined to specialties such as obstetrics and emergency medicine, the scope of diagnostic POCUS is rapidly expanding in other fields including internal medicine and nephrology. Herein, we offer our perspective on the emerging role of POCUS for objective evaluation of patients with suspected hepatorenal physiology based on our experience. We propose that future clinical trials consider incorporating this strategy and explore the impact of POCUS-guided therapy on the outcomes.

Lung ultrasound predicts non-invasive ventilation outcome in COVID-19 acute respiratory failure: a pilot study

["lung ultrasound" or "lung ultrasonograp...](#)by Daniele G Biasucci / 2mo

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Minerva Anesthesiol. 2021 Jul 14. doi: 10.23736/S0375-9393.21.15188-0. Online ahead of print.

ABSTRACT

BACKGROUND: To determine relationships between lung aeration assessed by lung ultrasound (LUS) with Non-Invasive Ventilation (NIMV) outcome, intensive care unit (ICU) admission and mechanical ventilation (MV) needs in COVID-19 respiratory failure.

METHODS: A cohort of adult patients with COVID-19 respiratory failure underwent LUS during initial assessment. A simplified LUS protocol consisting in scanning six areas, three for each side, was adopted. A score from 0 to 3 was assigned to each area. Comprehensive LUS score (LUSsc) was calculated as the sum of the score in all areas. LUSsc, the amount of involved sonographic lung areas (LUSq), the number of lung quadrants radiographically infiltrated and the degree of oxygenation impairment at admission (SpO₂/FiO₂ ratio) were compared to NIMV Outcome, MV needs and ICU admission.

RESULTS: Among 85 patients prospectively included in the analysis, 49 of 61 needed MV. LUSsc and LUSq were higher in patients who required MV (median 12 [IQR 8-14] and median 6 [IQR 4-6], respectively) than in those who did not (6 [IQR 2-9] and 3 [IQR 1-5], respectively), both $p < 0.001$. NIMV trial failed in 26 patients out 36. LUSsc and LUSq were significantly higher in patients who failed NIMV than in those who did not. From ROC analysis, LUSsc ≥ 12 and LUSq ≥ 5 gave the best cut-off values for NIMV failure prediction (AUC=0.95, 95%CI 0.83-0.99 and AUC=0.81, 95%CI 0.65-0.91, respectively).

CONCLUSIONS: Our data suggest LUS as a possible tool for identifying patients who are likely to require MV and ICU admission or to fail a NIMV trial.

Strengthening the success rate of suprapubic aspiration in infants by integrating point-of-care ultrasonography guidance: A parallel-randomized clinical trial

pubmed: [bUS](#) by Sadroddin Mahdipour / 2mo

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PLoS One. 2021 Jul 15;16(7):e0254703. doi: 10.1371/journal.pone.0254703. eCollection 2021.

ABSTRACT

BACKGROUND: Urinary tract infection (UTI) is a common disease in childhood. A sterile collection of urine samples using suprapubic aspiration (SPA) and bladder catheterization (BC) is helpful for rapid and accurate diagnosis of UTI in infants. With the advent of point-of-care ultrasound (POCUS), the use of ultrasound by non-radiologists at the patient's bedside, great advancement has been noticed in various medical fields. Considering the importance and advantages of using POCUS in the physical examination and guiding procedures, the authors aimed to compare urine sampling's success rate by SPA, BC, and POCUS guided SPA (POCUS-SPA) in infants performed by three pediatricians.

MATERIALS AND METHODS: This study is a randomized clinical trial conducted on 114 neonates and infants with suspected UTI admitted to 17-Shahrivar children's hospital from April 2017 to September 2019. Neonates and infants were randomly assigned to three groups of BC, SPA, and POCUS-SPA. The primary outcome was the success of sampling defined by obtaining 1cc of urine in each method. The secondary outcome was assessing the pain level.

RESULTS: Results showed that the POCUS-SPA had the highest success rate in urine sampling, and a statistically significant relation was noted among the three groups ($P = 0.0001$). From 38 patients in each group, 37 patients of POCUS-SPA (97.4%), 34 patients of BC (89.5%), and 23 patients of SPA (60.5%) had a successful sampling. Most of the patients in all three groups experienced severe pain.

CONCLUSIONS: In the current study, results showed that the POCUS-SPA significantly increased the success rate of urine sampling and most of the patients in all three groups had severe pain. Based on the shortage of access to radiologists in emergency setups, it seems that the POCUS-SPA by the pediatricians can be one of the most appropriate and applicable diagnostic methods in infants with UTI.

Optimization of Hypoglossal Nerve Stimulation for Obstructive Sleep Apnea With Ultrasound Assessment of Tongue Movement

pubmed: [Neck Mass & Ultrasound \(ultrasou...](#) by Maksim Korotun / 2mo

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ABSTRACT

BACKGROUND: Hypoglossal nerve stimulation (HGNS) is an Food and Drug Administration-approved therapy for obstructive sleep apnea. Initial programming of HGNS is based on the observation of anterior tongue movement, which may not reflect opening at the retroglossal airway. We developed an ultrasonographic technique to assess the base of tongue movement with HGNS to be used to optimize the initial voltage settings.

STUDY QUESTION: This study aimed to investigate the use of ultrasound to assess tongue movement with HGNS and related this measure to the apnea hypopnea index (AHI) on subsequent home sleep apnea testing or in-laboratory polysomnography with therapy.

STUDY DESIGN: Seventeen subjects ($n = 17$) implanted with HGNS were enrolled at least 1 month postimplantation. Ultrasonographic measures were then used to optimize HGNS voltage to produce observable base of tongue protrusion without producing discomfort. Responders were defined as a reduction in AHI $> 50\%$ and an AHI of <20 events/h.

RESULTS: There were 17 subjects, 11 men and 6 women, with age = 64.6 ± 9.8 years, body mass index = 27.9 ± 2.7 kg/m², and pretreatment AHI = 36.5 ± 14.4 /h, T-90% = $10.7 \pm 14.8\%$. The mean hyoid bone excursion (HBE) in responders = 1.0 ± 0.13 cm versus 0.82 ± 0.12 cm in nonresponders ($P = 0.017$). HBE was correlated with AHI during HGNS treatment (coef. -0.54 , $P = 0.03$). Best subsets regression analysis using treatment-based AHI as the dependent variable and age, body mass index, baseline AHI, HBE, and HGNS voltage as independent variables showed that HBE (coef. -44.6 , $P = 0.044$) was the only independent predictor of response. Receiver operator curve analysis showed that HBE > 0.85 cm had a sensitivity of 83.3% and specificity of 80.0% with a positive likelihood ratio of 4.17 to predict responder status.

CONCLUSION: We demonstrated that ultrasound assessment of HBE during HGNS programming is a useful tool to optimize therapy.

Risk assessment in interstitial lung disease: the incremental prognostic value of cardiopulmonary ultrasound "lung ultrasound" or "lung ultrasonograp...by Wei-Wei Zhu / 2mo

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BMC Pulm Med. 2021 Jul 15;21(1):237. doi: 10.1186/s12890-021-01606-3.

ABSTRACT

BACKGROUND: The mortality risk of chronic interstitial lung disease (ILD) is currently assessed using the ILD-GAP score. The present study evaluates whether the addition of cardiopulmonary ultrasound parameters to the ILD-GAP score can further improve the predictive value of ILD-GAP.

METHODS: Medical records from 91 patients with ILD hospitalized from June 2015 to March 2016 were retrospectively examined. The Lung ultrasound (LUS) score, right ventricular (RV) function, and mechanics were obtained from the cardiopulmonary ultrasound. The ILD-GAP score was calculated from

demographic characteristics and pulmonary function parameters. Patients were followed up with until May 2020. The primary endpoint was all-cause death.

RESULTS: After exclusions, 74 patients with ILD were included in the analysis. During the follow-up period, 36 patients with ILD survived (ILD_s), and 38 patients died (ILD_d). Compared to ILD_s, the ILD_d cases exhibited a higher number of B-lines, LUS score, and RV end-diastolic base dimension (RVD), but lower RV function. In multivariate analysis, the ILD-GAP score (hazard ratio, 2.88; 95% CI 1.38-5.99, P = 0.005), LUS score (hazard ratio 1.13; 95% CI 1.04-1.24, P = 0.006), and RVD (hazard ratio 1.09, 95% CI 1.03-1.16, P = 0.004) were significantly related to the risk of death. Adding the LUS score and RVD to the ILD-GAP score significantly improved the predictive value compared to the ILD-GAP score alone (C statistics 0.90 vs 0.76, P = 0.018).

CONCLUSION: We investigated the utility of a new prognostic model for ILD that includes both cardiopulmonary ultrasound parameters (LUS score and RVD) and the ILD-GAP score. This model better reflects the severity of pulmonary fibrosis and cardiac involvement, and has incremental predictive value over the ILD-GAP score alone.

Risk assessment in interstitial lung disease: the incremental prognostic value of cardiopulmonary ultrasound "lung ultrasound" or "lung ultrasonograp... by Wei-Wei Zhu / 2mo

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reflects the severity of pulmonary fibrosis and cardiac involvement, and has incremental predictive value over the ILD-GAP score alone.

Perception of an Introductory Point-of-Care Ultrasound Course for Thai Medical Students on Emergency Medicine Rotation

[pubmed: point of care ultrasonography](#) by Alissara Vanichkulbodee / 59d

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Open Access Emerg Med. 2021 Jul 5;13:291-298. doi: 10.2147/OAEM.S316730. eCollection 2021.

ABSTRACT

INTRODUCTION: Point-of-care ultrasonography (POCUS) is increasingly utilized in emergency departments (EDs) throughout Thailand. Although emergency medicine (EM) residents are trained in POCUS, Thai medical students receive limited training. An introductory POCUS course was implemented for medical students to prepare them for internships.

OBJECTIVE: This study described the perception and use of POCUS by graduates of an introductory POCUS course.

MATERIALS AND METHODS: Medical students who completed the POCUS course were surveyed during their intern year from 2012 to 2015. The survey collected demographic characteristics. The Likert Scale was used to assess POCUS practice patterns and perceptions of the course.

RESULTS: There were 230 respondents (98% response rate). All thought that POCUS was important. Furthermore, 96% of respondents felt that the POCUS course meaningfully impacted their ability to deliver care. POCUS use was greatest for obstetrics/gynecology and trauma cases. Over half of respondents (55.2%) felt very confident with using extended-Focused Assessment with Sonography in Trauma. Most respondents (81.8%) were positively impacted by the course, and 61.7% were satisfied with the scope of the course. Recommendations for improvement included increasing the course length, the content, and the hands-on time for POCUS practice.

CONCLUSION: Graduates positively perceived the course and felt it dramatically impacted their clinical practice as novice physicians. An introductory POCUS course should be incorporated into the medical school curriculum to prepare graduates for practice. Future goals include increasing the scope of POCUS practice to help guide interns and residents in emergency patient care such as lung ultrasound in COVID-19 or pneumonia patients and studying the impact this course has on patient outcomes.

Musculoskeletal ultrasound in hemophilia: Results and recommendations from a global survey and consensus meeting

[pubmed: point of care ultras...](#) by Nihal Bakeer / 59d

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ABSTRACT

INTRODUCTION: For persons with hemophilia, optimization of joint outcomes is an important unmet need. The aim of this initiative was to determine use of ultrasound in evaluating arthropathy in persons with hemophilia, and to move toward consensus among hemophilia care providers regarding the preferred ultrasound protocols for global adaptation.

METHODS: A global survey of hemophilia treatment centers was conducted that focused on understanding how and why ultrasound was being used and endeavored to move toward consensus definitions of both point-of-care musculoskeletal ultrasound (POC-MSKUS) and full diagnostic ultrasound, terminology to describe structures being assessed by ultrasound, and how these assessments should be interpreted. Next, an in-person meeting of an international group of hemophilia health care professionals and patient representatives was held, with the objective of achieving consensus regarding the acquisition and interpretation of POC-MSKUS and full diagnostic ultrasound for use in the assessment of musculoskeletal (MSK) pathologies in persons with hemophilia.

RESULTS: The recommendations were that clear definitions of the types of ultrasound examinations should be adopted and that a standardized ultrasound scoring/measurement system should be developed, tested, and implemented. The scoring/measurement system should be tiered to allow for a range of complexity yet maintain the ability for comparison across levels.

CONCLUSION: Ultrasound is an evolving technology increasingly used for the assessment of MSK outcomes in persons with hemophilia. As adoption increases globally for clinical care and research, it will become increasingly important to establish clear guidelines for image acquisition, interpretation, and reporting to ensure accuracy, consistency, and comparability across groups.

Diagnosis of bone cement implantation syndrome using point of care ultrasound examination

[pubmed: point of care ultras...](#) by Walter Chunhong Huang / 59d

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ABSTRACT

Once regarded as a rare complication, the potentially fatal bone cement implantation syndrome (BCIS) has been increasingly reported. BCIS can present as transient desaturation, hypotension, cardiac dysrhythmias, and cardiovascular collapse. Diagnosis of BCIS is often clinical and confirmed with computed tomography (CT) imaging postoperatively. However, point of care ultrasound (POCUS) examination could be a helpful and timely tool to clinch the diagnosis in a sudden cardiovascular collapse. We present a case of Grade 3 BCIS where POCUS examination revealed a massive clot in the right atrium, which supports the diagnosis.

Optic nerve sheath diameter assessment by neurosonology: A review of methodologic discrepancies

pubmed: [bUS](#) by Raoul R F Stevens / 59d

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J Neuroimaging. 2021 Jul 16. doi: 10.1111/jon.12906. Online ahead of print.

ABSTRACT

BACKGROUND AND PURPOSE: Reported cutoff values of the optic nerve sheath diameter (ONSD) for the diagnosis of elevated intracranial pressure (ICP) are inconsistent. This hampers ONSD as a possible noninvasive bedside monitoring tool for ICP. Because the influence of methodological differences on variations in cutoff values is unknown, we performed a narrative review to identify discrepancies in ONSD assessment methodologies and to investigate their effect on reported ONSD values.

METHODS: We used a structured and quantitative approach in which each ONSD methodology found in the reviewed articles was categorized based on the characteristic appearance of the ultrasound images and ultrasound marker placement. Subsequently, we investigated the influence of the different methodologies on ONSD values by organizing the ONSDs with respect to these categories.

RESULTS: In a total of 63 eligible articles, we could determine the applied ONSD assessment methodology. Reported ultrasound images either showed the optic nerve and its sheath as a dark region with hyperechoic striped band at its edges or as a single dark region surrounded by lighter retrobulbar fat. Four different ultrasound marker positions were used to delineate the optic nerve sheath, which resulted in different ONSD values and more importantly, different sensitivities to changes in ICP.

CONCLUSIONS: Based on our observations, we recommend to place ultrasound markers at the outer edges of the hyperechoic striped bands or at the transitions from the single dark region to the hyperechoic retrobulbar fat because these locations yielded the highest sensitivity of ONSD measurements for increased ICP.

The clinical and prognostic values of optic nerve sheath diameter and optic nerve sheath diameter/eyeball transverse diameter ratio in comatose patients with supratentorial lesions

optic nerve ultrasound by Sha Zhu / 59d

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INSIGHTS

Add note

BMC Neurol. 2021 Jul 2;21(1):259. doi: 10.1186/s12883-021-02285-7.

ABSTRACT

BACKGROUND: The optic nerve sheath diameter (ONSD) and ONSD/eyeball transverse diameter (ETD) ratio have been proven to be correlated with intracranial pressure. This study aimed to evaluate the prognostic roles of ONSD and the ONSD/ETD ratio in comatose patients with supratentorial lesions and to determine the relationship of these two indices with the prognosis of such patients.

METHODS: A total of 54 comatose patients with supratentorial lesions and 50 healthy controls were retrospectively included in this study. ONSD and ETD were measured by unenhanced computed tomography (CT). The differences in ONSD and the ONSD/ETD ratio between the two groups were compared. The prognosis of comatose patients was scored using the Glasgow Outcome Scale (GOS) at the 3-month follow-up, and these patients were classified into good (GOS score ≥ 3) and poor (GOS score < 3) prognosis groups. The differences in ONSD and the ONSD/ETD ratio were compared between comatose patients with good prognoses and those with poor prognoses.

RESULTS: The ONSD and ONSD/ETD ratios in the comatose patients were 6.30 ± 0.60 mm and 0.27 ± 0.03 , respectively, and both were significantly greater than those in the healthy controls (5.10 ± 0.47 mm, $t = 11.426$, $P < 0.0001$; 0.22 ± 0.02 , $t = 11.468$, $P < 0.0001$; respectively). ONSD in patients with poor prognosis was significantly greater than that in patients with good prognosis (6.40 ± 0.56 vs. 6.03 ± 0.61 mm, $t = 2.197$, $P = 0.032$). The ONSD/ETD ratio in patients with poor prognosis was significantly greater than that in patients with good prognosis (0.28 ± 0.02 vs. 0.26 ± 0.03 , $t = 2.622$, $P = 0.011$). The area under the receiver operating characteristic (ROC) curve, used to predict the prognosis of comatose patients, was 0.650 (95% confidence interval (CI): 0.486-0.815, $P = 0.078$) for ONSD and 0.711 (95% CI: 0.548-0.874, $P = 0.014$) for the ONSD/ETD ratio.

CONCLUSIONS: The ONSD and ONSD/ETD ratios were elevated in comatose patients. The ONSD/ETD ratio might be more valuable than ONSD in predicting the prognoses of comatose patients with supratentorial lesions.

How I Do It: Point-of-Care Ultrasound for Bedside Diagnosis of Lower Extremity Deep Venous Thrombosis

[pubmed: point of care ultras...](#) by Mary E Barrosse-Antle / 59d

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INSIGHTS

Add note

Chest. 2021 Jul 13:S0012-3692(21)01330-1. doi: 10.1016/j.chest.2021.07.010. Online ahead of print.

ABSTRACT

The point-of-care ultrasound deep venous thrombosis exam (POCUS DVT exam) can facilitate rapid bedside diagnosis and treatment of lower extremity DVT. Awaiting radiology-performed Doppler ultrasonography and interpretation by radiologists can lead to delays in lifesaving anticoagulation, and the POCUS DVT exam can provide timely diagnostic information in the patient with lower extremity symptoms. This article outlines accepted techniques for the POCUS DVT exam, discusses the historical context from which the current recommendations have evolved, and provides illustrations alongside ultrasound images of relevant venous anatomy to orient the clinician. Finally, common pitfalls and methods to avoid them are described.

Real-time ultrasound-guided lumbar puncture in the neonatal intensive care unit

[pubmed: point of care ultras...](#) by Jason Z Stoller / 57d

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INSIGHTS

Add note

J Perinatol. 2021 Jul 17. doi: 10.1038/s41372-021-01152-0. Online ahead of print.

ABSTRACT

OBJECTIVE: To determine the rates of traumatic lumbar puncture (LP) and overall success rates using the real-time ultrasound-guided technique when performed by a neonatal point-of-care ultrasound provider.

STUDY DESIGN: Retrospective observational study of 17 infants in the neonatal intensive care unit who underwent a real-time ultrasound-guided LP between March 2015 and November 2016. Spearman's correlation was calculated.

RESULTS: The first attempt and overall success rates were 65% and 100%, respectively. The rate of nontraumatic LP was 69%. CSF RBC count was inversely correlated with both PMA (Spearman's correlation coefficient (r_s) = -0.74, p = 0.0017) and weight (r_s = -0.74, p = 0.0015) at the time of LP.

CONCLUSIONS: This study is the first to provide evidence of high success rates with real-time ultrasound-guided LP when performed by a neonatologist. Our data demonstrate feasibility in neonates over a broad range of weights, including premature infants as small as 750 g.

Point-of-Care Thoracic Ultrasonography in Patients With Cirrhosis and Liver Failure

[pubmed: point of care ultrasonography](#) by Kamal Kajal / 57d

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INSIGHTS

Add note

Cureus. 2021 Jun 10;13(6):e15559. doi: 10.7759/cureus.15559. eCollection 2021 Jun.

ABSTRACT

Point-of-care ultrasonography (POCUS) helps determine liver-related pathologies like an abscess, portal vein or hepatic vein thromboses, presence of ascites, site for pleural or ascitic paracentesis, and guiding biopsies. POCUS is revolutionizing the management of critically ill patients presenting with pneumonia, acute respiratory distress syndrome, acute-on-chronic liver failure, and in the emergency. The objectives of thoracic ultrasonography (TUS) are to aid the clinician in differentiating between pneumonia, effusions, interstitial edema and collections, and in estimating the volume status of patients with liver disease using inferior vena cava dynamic indices. The use of POCUS in patients with cirrhosis has since evolved. It is now widely used to help diagnose volume status, left ventricular diastolic dysfunction, myocardial infarction, and right ventricular dilation due to pulmonary embolism and to determine the causes for weaning failures such as effusions, lung collapse, and pneumothorax. During the Coronavirus Disease 2019 (COVID-19) pandemic, moving patients for computed tomography can be difficult. Therefore, TUS is now essential in liver transplantation and intensive care practice to assess ventilatory pressures, cardiac function, and fluid management. This review indicates the current and optimized use of TUS, offers a

practical guide on TUS in the liver intensive care unit (ICU), and presents a diagnostic pathway for determining lung and pleural pathology, resolution of respiratory failure, and aid weaning from mechanical ventilation.

Lateral-Apical Approach to Pericardiocentesis for Treatment of Cardiac Tamponade Immediately Post-orthotopic Liver Transplantation

[pubmed: point of care ultras...](#)by Christan D Santos / 57d

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INSIGHTS

Add note

Cureus. 2021 Jun 16;13(6):e15684. doi: 10.7759/cureus.15684. eCollection 2021 Jun.

ABSTRACT

Cardiac tamponade is a rare complication following orthotopic liver transplantation (OLT). The incidence and treatment specific to the immediate postoperative OLT patient have never been reported. Here, we describe a case of OLT complicated by coagulopathy and difficult intraoperative pulmonary artery catheter placement with subsequent postoperative hemopericardium resulting in tamponade. An emergent, ultrasound-guided, lateral-apical pericardiocentesis was successfully performed, suggesting a possible procedural technique for pericardiocentesis in the immediate postoperative period for liver transplant patients.

A rare survival case of blunt left ventricular rupture caused by a low-energy pedestrian collision with a stationary forklift: a case report

[pubmed: intubation ultrasoun...](#)by Huangkai Zhu / 57d

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INSIGHTS

Add note

Ann Transl Med. 2021 Jun;9(12):1028. doi: 10.21037/atm-21-3031.

ABSTRACT

Blunt cardiac rupture (BCR) is a rare injury with a high mortality rate. It is usually caused by high-energy traumatic accidents, such as motor vehicle collisions. For the first time, we report a rare case of BCR caused by a pedestrian collision with a stationary motor vehicle, which is a low-energy traumatic accident. This is also the first surgical survival BCR case to be reported of a contralateral ventricular rupture at the direct stress site. A 45-year-old formerly healthy Chinese woman, with no family history of heart disease, was walking in a hurry when she accidentally hit a forklift that was parked on the side of the road. The patient gradually lost consciousness, and was admitted to Hwa Mei Hospital Emergency Center 1 hour later. An ultrasound revealed a pericardial effusion about 1 cm deep and a small amount of peritoneal -35 effusion. Emergency computed tomography (CT) scans revealed a small amount of fluid accumulation in the right thoracic cavity, fractures of the 5th and 6th ribs on the right side, and pericardial effusion. The patient's blood pressure remained unstable after 1 hour of endotracheal intubation, B-ultrasound-guided

pericardiocentesis, and antishock therapy; thus, open-heart surgery was deemed necessary. A large amount of blood accumulation was found in the intact pericardium. There was a small blood clot at the apex of the left ventricle near the interventricular septum. The removal of the clot revealed a tear about 1 cm in diameter. The patient's BCR was successfully repaired in the surgery. By the end of the 18-month follow-up period, the patient was found to have recovered well without significant complications. The internal mechanism of the case report was deceleration. Prompt diagnosis and emergency thoracotomy when BCR is suspected are key to rescuing patients, regardless of whether the accident is high energy or low energy, or if there is evidence of a direct force acting on the precordium, or the presence of pericardial rupture.

Pleural Effusion: A Rare Presentation of Mature Teratoma in a Young Patient

[pubmed: bUS](#) by Mubashar Iqbal / 57d

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INSIGHTS

Add note

Cureus. 2021 Jun 9;13(6):e15550. doi: 10.7759/cureus.15550. eCollection 2021 Jun.

ABSTRACT

Mediastinal masses always present a diagnostic challenge to clinicians and radiologists. There are wide varieties of pathologies ranging from benign to malignant conditions. Teratomas are one of the rare causes of mediastinal tumors. In this case, we report a young male who presented to the emergency room with acute pleuritic chest pain. The chest X-ray showed massive right-sided pleural effusion. Subsequently, bedside chest ultrasound ruled out septations and helped drain the fluid. The pleural fluid analysis demonstrated transudate chemistry. A computerized tomography (CT) of the chest was performed, revealing a complex anterior mediastinal mass suspected of Mature Teratoma. The tumor was surgically removed in its entirety, and pathology confirmed it a mature teratoma. The patient remained asymptomatic on postoperative follow-up.

Transcranial Doppler Use in Non-traumatic Critically Ill Children: A Multicentre Descriptive Study

[pubmed: bUS](#) by Virginie Rollet-Cohen / 57d

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INSIGHTS

Add note

Front Pediatr. 2021 Jul 2;9:609175. doi: 10.3389/fped.2021.609175. eCollection 2021.

ABSTRACT

Background: The use and perceived value of transcranial Doppler (TCD) scope in paediatric critical care medicine has not been extensively documented. **Objective:** To describe the use of TCD to assess non-traumatic brain injury in patients admitted to four paediatric intensive care units (PICUs) in France. **Methods:** We prospectively included all children (aged under 18) assessed with inpatient TCD between November 2014 and October 2015 at one of the four PICUs. The physicians completed a

questionnaire within 4 h of performing TCD. **Results:** 152 children were included. The primary diagnosis was neurological disease in 106 patients (70%), including post ischemic-anoxic brain insult ($n = 42$, 28%), status epilepticus ($n = 19$, 13%), and central nervous system infection/inflammation ($n = 15$, 10%). TCD was the first-line neuromonitoring assessment in 110 patients (72%) and was performed within 24 h of admission in 112 patients (74%). The most common indications for TCD were the routine monitoring of neurological disorders ($n = 85$, 56%) and the detection of asymptomatic neurological disorders ($n = 37$, 24). Concordance between the operator's interpretation of TCD and the published normative values was observed for 21 of the 75 (28%) TCD abnormal findings according to the published normative values. The physicians considered that TCD was of value for the ongoing clinical management of 131 (86%) of the 152 patients. **Conclusion:** TCD is commonly used in French PICUs and tends to be performed early after admission on patients with a broad range of diseases. The physicians reported that the TCD findings often helped their clinical decision making. In view of the subjectivity of bedside interpretation, true TCD contribution to clinical care remains to be determined. Objective studies of the impact of TCD on patient management and clinical outcomes are therefore warranted.

Ambulance deceleration causes increased intra cranial pressure in supine position: a prospective observational prove of principle study

[optic nerve ultrasound](#) by Iscander M Maissan / 56d

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INSIGHTS

Add note

Scand J Trauma Resusc Emerg Med. 2021 Jun 30;29(1):87. doi: 10.1186/s13049-021-00904-3.

ABSTRACT

BACKGROUND: Ambulance drivers in the Netherlands are trained to drive as fluent as possible when transporting a head injured patient to the hospital. Acceleration and deceleration have the potential to create pressure changes in the head that may worsen outcome. Although the idea of fluid shift during braking causing intra cranial pressure (ICP) to rise is widely accepted, it lacks any scientific evidence. In this study we evaluated the effects of driving and deceleration during ambulance transportation on the intra cranial pressure in supine position and 30° upright position.

METHODS: Participants were placed on the ambulance gurney in supine position. During driving and braking the optical nerve sheath diameter (ONSD) was measured with ultrasound. Because cerebro spinal fluid percolates in the optical nerve sheath when ICP rises, the diameter of this sheath will distend if ICP rises during braking of the ambulance. The same measurements were taken with the headrest in 30° upright position.

RESULTS: Mean ONSD in 20 subjects in supine position increased from 4.80 (IQR 4.80-5.00) mm during normal transportation to 6.00 (IQR 5.75-6.40) mm ($p < 0.001$) during braking. ONSD's increased in all subjects in supine position. After raising the headrest of the gurney 30° mean ONSD increased from 4.80 (IQR 4.67-5.02) mm during normal transportation to 4.90 (IQR 4.80-5.02) mm ($p = 0.022$) during braking. In 15 subjects (75%) there was no change in ONSD at all.

CONCLUSIONS: ONSD and thereby ICP increases during deceleration of a transporting vehicle in participants in supine position. Raising the headrest of the gurney to 30 degrees reduces the effect of braking on ICP.

Is Increased Intracranial Pressure a Factor in Persistent Headache After Coronavirus Disease 2019?

[optic nerve ultrasound](#) by Erman Altunisik / 56d

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INSIGHTS

Add note

J Nerv Ment Dis. 2021 Jul 16. doi: 10.1097/NMD.0000000000001393. Online ahead of print.

ABSTRACT

This study aimed to determine pain characteristics in patients with persistent headache after COVID-19 and to investigate the role of increased intracranial pressure (ICP) in the pathogenesis of this headache. This is a case-control study comparing the parameters and measurements indicating increased ICP based on magnetic resonance imaging between COVID-19-diagnosed patients with persistent headache and a control group. Optic nerve sheath diameter (ONSD) and eyeball transverse diameter (ETD) were performed on the left eye of each participant. Seventeen of the patients (53.12%) met the diagnostic criteria for new daily persistent headache. Seven patients (21.87%) had migraine, and eight (25%) had tension headache characteristics. No significant difference was observed between the patient and control groups in terms of the ONSD and ETD values. It is possible that the etiopathogenesis is multifactorial. We consider that future studies that will evaluate ICP measurements in large patient groups can present a different perspective for this subject.

Lung Ultrasound Findings of Patients with Dengue Infection: A Prospective Observational Study

["lung ultrasound" or "lung ultrasonograp..."](#) by Hiroshi Koyama / 56d

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INSIGHTS

Add note

Am J Trop Med Hyg. 2021 Jul 19:tpmd201274. doi: 10.4269/ajtmh.20-1274. Online ahead of print.

ABSTRACT

Lung ultrasound (LUS) is performed for several conditions and is a more sensitive method of detecting pathological pulmonary changes than chest X-ray. Therefore, LUS for individuals with dengue could be an important tool for the early detection of pleural effusions and pulmonary edema signifying capillary plasma leakage, which is the hallmark of severe dengue pathophysiology. We conducted a prospective observational study of pulmonary changes identifiable with LUS in dengue patients admitted to the Hospital for Tropical Diseases in Mahidol University, Bangkok, and the Bamrasnaradura Infectious Diseases Institute, Nonthaburi, Thailand. The LUS findings were described according to standard criteria, including the presence of A, B1, B2, and C patterns in eight chest regions and the presence of pleural effusions. From November 2017 to April 2018, 50 patients with dengue were included in the study. LUS was performed during the Shonna febrile phase for nine patients (18%) and during the critical-convalescence phase for 41 patients (82%). A total of 33 patients (66%) had at least one abnormality discovered using LUS. Abnormal LUS findings were observed more frequently during the critical-convalescence phase (N = 30/41; 73%) than during the febrile phase (N = 3/9; 33%) (P = 0.047).

Abnormal aeration patterns were observed in 31 patients (62%). Only B patterns with only multiple B lines were observed in 21 patients (42%); of these patients, three had already exhibited these during the febrile phase (N = 3). C patterns (N = 10; 24%), pleural effusion (N = 10; 24%), and subpleural abnormalities (N = 11; 27%) were observed only during the critical-convalescence phase. LUS can detect signs of capillary leakage, including interstitial edema and pleural effusions, early during the course of dengue.

Accuracy of cricothyroid membrane identification using ultrasound and palpation techniques in obese obstetric patients: an observational study

[pubmed: intubation ultrasoun...by A Lavelle / 56d](#)

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INSIGHTS

Add note

Int J Obstet Anesth. 2021 Jun 30;48:103205. doi: 10.1016/j.ijoa.2021.103205. Online ahead of print.

ABSTRACT

BACKGROUND: During performance of emergency front of neck access, the final step in management algorithms for the 'can't intubate, can't oxygenate' scenario, accurate identification of the cricothyroid membrane, is crucial. Accurate identification using palpation techniques is low, with highest failure rates occurring in obese females.

METHODS: This prospective observational study recruited 28 obese obstetric patients. The cricothyroid membrane was identified using ultrasound, marked with an ultraviolet pen and covered with a dressing. The candidate was asked to perform cricothyroid membrane identification using landmark technique (group L) followed by ultrasound (group U). The primary outcome was the distance between the actual and estimated cricothyroid membrane midpoint. Secondary outcomes were the proportion of accurate assessments, time taken, and subjective ease of identification using a visual analogue score.

RESULTS: Distance from the cricothyroid membrane midpoint was shorter in group U than Group L (2.5 mm vs 5.5 mm, $P=0.002$). The proportion of correctly identified cricothyroid membranes was greater in group U than group L (71% vs 39%, $P=0.015$). Time required for identification was shorter in group L than group U (16.9 s vs 23.5 s, $P=0.001$). Visual analogue scores for ease of identification were lower in group U than group L (2.4 cm vs 4.2 cm, $P=0.013$).

CONCLUSIONS: Ultrasound-guided cricothyroid membrane localisation was significantly more accurate but slower than the landmark technique in obese obstetric patients. As such, we recommend the use of pre-procedural identification of the cricothyroid membrane in this patient population and formal training of anaesthetists in airway ultrasound.

Non-Fellowship regional anesthesia training and assessment: an international Delphi study on a consensus curriculum

[pubmed: point of care ultras...by Alwin Chuan / 55d](#)

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INSIGHTS

Add note

Reg Anesth Pain Med. 2021 Jul 20:rapm-2021-102934. doi: 10.1136/rapm-2021-102934. Online ahead of print.

ABSTRACT

BACKGROUND AND OBJECTIVES: While there are several published recommendations and guidelines for trainees undertaking subspecialty Fellowships in regional anesthesia, a similar document describing a core regional anesthesia curriculum for non-fellowship trainees is less well defined. We aimed to produce an international consensus for the training and teaching of regional anesthesia that is applicable for the majority of worldwide anesthesiologists.

METHODS: This anonymous, electronic Delphi study was conducted over two rounds and distributed to current and immediate past (within 5 years) directors of regional anesthesia training worldwide. The steering committee formulated an initial list of items covering nerve block techniques, learning objectives and skills assessment and volume of practice, relevant to a non-fellowship regional anesthesia curriculum. Participants scored these items in order of importance using a 10-point Likert scale, with free-text feedback. Strong consensus items were defined as highest importance (score ≥ 8) by $\geq 70\%$ of all participants.

RESULTS: 469 participants/586 invitations (80.0% response) scored in round 1, and 402/469 participants (85.7% response) scored in round 2. Participants represented 66 countries. Strong consensus was reached for 8 core peripheral and neuraxial blocks and 17 items describing learning objectives and skills assessment. Volume of practice for peripheral blocks was uniformly 16-20 blocks per anatomical region, while ≥ 50 neuraxial blocks were considered minimum.

CONCLUSIONS: This international consensus study provides specific information for designing a non-fellowship regional anesthesia curriculum. Implementation of a standardized curriculum has benefits for patient care through improving quality of training and quality of nerve blocks.

Right ventricular dysfunction and right ventricular-arterial uncoupling at admission increase the in-hospital mortality in patients with COVID-19 disease

["lung ultrasound" or "lung ultrasonograp..."](#) by Daniel Manzur-Sandoval / 54d

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INSIGHTS

Add note

Echocardiography. 2021 Jul 19. doi: 10.1111/echo.15164. Online ahead of print.

ABSTRACT

BACKGROUND: Coronavirus disease 2019 (COVID-19) frequently involves cardiovascular manifestations such as right ventricular (RV) dysfunction and alterations in pulmonary hemodynamics. We evaluated the application of the critical care ultrasonography ORACLE protocol to identify the most frequent alterations and their influence on adverse outcomes, especially those involving the RV (dilatation and dysfunction).

METHODS: This cross-sectional study included 204 adult patients with confirmed COVID-19 admitted at three centers. Echocardiography and lung ultrasound images were acquired on admission using the ORACLE ultrasonography algorithm.

RESULTS: Two-hundred and four consecutive patients were evaluated: 22 (11.9%) demonstrated a fractional shortening of < 35%; 33 (17.1%) a tricuspid annular plane systolic excursion (TAPSE) of < 17 mm; 26 (13.5%) a tricuspid peak systolic S wave tissue Doppler velocity of < 9.5 cm/sec; 69 (37.5%) a RV basal diameter of > 41 mm; 119 (58.3%) a pulmonary artery systolic pressure (PASP) of > 35 mm Hg; and 14 (11%) a TAPSE/PASP ratio of < .31. The in-hospital mortality rate was 37.6% (n = 71). Multiple logistic regression modeling showed that PASP > 35 mm Hg, RV FS of < 35%, TAPSE < 17 mm, RV S wave < 9.5, and TAPSE/PASP ratio < .31 mm/mm Hg were associated with this outcome. PASP and the TAPSE/PASP ratio had the lowest feasibility of being obtained among the investigators (62.2%).

CONCLUSION: The presence of RV dysfunction, pulmonary hypertension, and alteration of the RV-arterial coupling conveys an increased risk of in-hospital mortality in patients presenting with COVID-19 upon admission; therefore, searching for these alterations should be routine. These parameters can be obtained quickly and safely with the ORACLE protocol.

Feasibility of patient-performed lung ultrasound self-exams (Patient-PLUS) as a potential approach to telemedicine in heart failure

["lung ultrasound" or "lung ultrasonograp...](#) by Alan T Chiem / 54d

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INSIGHTS

Add note

ESC Heart Fail. 2021 Jul 20. doi: 10.1002/ehf2.13493. Online ahead of print.

ABSTRACT

AIMS: Patient-performed lung ultrasound (LUS) in a heart failure (HF) telemedicine model may be used to monitor worsening pulmonary oedema and to titrate therapy, potentially reducing HF admission. The aim of the study was to assess the feasibility of training HF patients to perform a LUS self-exam in a telemedicine model.

METHODS AND RESULTS: A pilot study was conducted at a public hospital involving subjects with a history of HF. After a 15 min training session involving a tutorial video, subjects performed a four-zone LUS using a handheld ultrasound. Exams were saved on a remote server and independently reviewed by two LUS experts. Studies were determined interpretable according to a strict definition: the presence of an intercostal space, and the presence of A-lines, B-lines, or both. Subjects also answered a questionnaire to gather feedback and assess self-efficacy. The median age of 44 subjects was 53 years (range, 36-64). Thirty (68%) were male. Last educational level attained was high school or below for 31 subjects (70%), and one-third used Spanish as their preferred language. One hundred fifty of 175 lung zones (85%) were interpretable, with expert agreement of 87% and a kappa of 0.49. 98% of subjects reported that they could perform this LUS self-exam at home.

CONCLUSIONS: This pilot study reports that training HF patients to perform a LUS self-exam is feasible, with reported high self-efficacy. This supports further investigation into a telemedicine model using LUS to reduce emergency department visits and hospitalizations associated with HF.

Bedside echocardiography for diagnosis of intracardiac cement embolism after percutaneous vertebroplasty: A case report

pubmed: [bUS](#) by Panpan Yin / 54d

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INSIGHTS

Add note

J Card Surg. 2021 Jul 19. doi: 10.1111/jocs.15830. Online ahead of print.

ABSTRACT

This case report is to demonstrate that a female patient had suddenly become unconscious 14 hours after percutaneous vertebroplasty. Bedside echocardiogram showed that the patient had a strong echo in the right heart with a small amount of pericardial effusion. CT showed high density in the distal branches of both pulmonary arteries and a high density in the right heart. With the help of that, the doctor made the diagnosis of intracardiac cement embolism in a very short time. The bone cement in the heart was removed under emergency cardiopulmonary bypass, then the patient was discharged smoothly.

Predictive Utility of Changes in Optic Nerve Sheath Diameter after Cardiac Arrest for Neurologic Outcomes

[optic nerve ultrasound](#) by Heekyung Lee / 54d

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INSIGHTS

Add note

Int J Environ Res Public Health. 2021 Jun 18;18(12):6567. doi: 10.3390/ijerph18126567.

ABSTRACT

The optic nerve sheath diameter (ONSD) can help predict the neurologic outcomes of patients with post-cardiac arrest (CA) return of spontaneous circulation (ROSC). We aimed to investigate the effect of ONSD changes before and after CA on neurologic outcomes in patients with ROSC after CA using brain computed tomography (CT). The study included patients hospitalized after CA, who had undergone pre- and post-CA brain CT between January 2001 and September 2020. The patients were divided into good and poor neurologic outcome (GNO and PNO, respectively) groups based on their neurologic outcome at hospital discharge. We performed between-group comparisons of the amount and rate of ONSD changes in brain CT and calculated the area under the curve (AUC) to determine their predictive value for neurologic outcomes. Among the 96 enrolled patients, 25 had GNO. Compared with the GNO group, the PNO group showed a significantly higher amount (0.30 vs. 0.63 mm; $p = 0.030$) and rate (5.26 vs. 12.29%; $p = 0.041$) of change. The AUC for predicting PNO was 0.64 (95% confidence interval = 0.53-0.73; $p = 0.04$), and patients with a rate of ONSD change $>27.2\%$ had PNO with 100% specificity and positive predictive value. Hence, ONSD changes may predict neurologic outcomes in patients with post-CA ROSC.

Current role of ultrasound in hemodialysis access evaluation

[pubmed: point of care ultras...by Meola Mario / 54d](#)
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INSIGHTS

Add note

J Vasc Access. 2021 Jul 21:11297298211034638. doi: 10.1177/11297298211034638. Online ahead of print.

ABSTRACT

Physical examination (PE) is considered the backbone before vascular access (VA) placement, during maturation period and for follow-up. However, it may be inadequate in identifying suitable vasculature, mainly in comorbid patients, or in detecting complications. This review highlights the advantages of ultrasound imaging to manage VA before placement, during maturation and follow-up. Furthermore, it analyses the future perspectives in evaluating early and late VA complications thank to the availability of multiparametric platforms, point of care of ultrasound, and portable/wireless systems. Technical improvements and low-cost systems should favor the widespread ultrasound-based VA surveillance programs. This significant turning point needs an adequate training of nephrologists and dialysis nurses and the standardization of exams, parameters, and procedures.

Performance of Lung Ultrasound for Monitoring Interstitial Lung Disease

["lung ultrasound" or "lung ultrasonograp...by Georgios Pitsidianakis / 53d](#)
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INSIGHTS

Add note

J Ultrasound Med. 2021 Jul 22. doi: 10.1002/jum.15790. Online ahead of print.

ABSTRACT

OBJECTIVES: In this study, we sought to assess the validity of lung ultrasound (LUS) during the follow-up of patients with a wide spectrum of interstitial lung diseases (ILDs).

METHODS: Twenty-four patients (13 males, 11 females; mean age \pm SD, 65.4 \pm 14.3 years; age range, 40-84 years) with a diagnosis of ILDs who were admitted to the Interstitial Lung Disease Unit were prospectively enrolled. Patients were examined with a 56-lung intercostal space LUS protocol in lateral decubitus position, at baseline, 6-months, and 1-year. The LUS score was defined as the sum of B-lines counted in each intercostal space. All patients underwent complete pulmonary function tests at baseline and follow-up time-points. High-resolution computed tomography (HRCT) was performed at baseline and during follow-up, according to personalized patients' needs. All HRCT studies were graded according to the Warrick scoring system (WS).

RESULTS: Pooled data analysis showed a significant correlation between WS and LUS scores ($P < .001$). For separate time-point analysis, a significant correlation between LUS scores and WS was found at baseline ($P < .001$) and 1 year ($P = .005$). LUS scores negatively correlated with alveolar volume (VA)

($P < .046$) and diffusing capacity for carbon monoxide (DLCO) ($P < .001$) at 6 months and with transfer coefficient of the lung for carbon monoxide (KCO) ($P < .031$) and DLCO ($P = .002$) at 12-months. A multivariate regression model showed DLCO to be an independent predictor of LUS score at 1 year ($P = .026$).

CONCLUSIONS: Our results highlight the validity and potential applicability of LUS for disease monitoring in a wide spectrum of ILDs.

Lung ultrasound for the assessment of lung recruitment in neonates with massive pneumothorax during extracorporeal membrane oxygenation: a case report

[pubmed: neonate lung ultrasound](#) by Xiaolong Zhang / 53d

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INSIGHTS

Add note

J Artif Organs. 2021 Jul 22. doi: 10.1007/s10047-021-01287-z. Online ahead of print.

ABSTRACT

Bedside lung ultrasound may be an effective method for the assessment of lung recruitment in newborns with extracorporeal membrane oxygenation (ECMO). We report a case of a neonate who had severe hypoxemia with persistent pulmonary hypertension and massive pneumothorax due to meconium aspiration syndrome and was treated with ECMO. Positive pressure mechanical ventilation resulted in persistent massive air leakage from the disrupted pulmonary tissue. When ECMO was initiated, a "total lung rest" ventilation strategy was used to facilitate healing of the lung rupture and absorption of the pneumothorax. After complete absorption of the pneumothorax, lung recruitment was performed by progressively increasing the positive end-expiratory pressure under the guidance of lung ultrasound. Bedside lung ultrasound was successfully used to assess pneumothorax absorption and improvement of pulmonary inflammation and successfully guided the recruitment of collapsed alveoli and the withdrawal of ECMO.

Lung ultrasound features and relationships with respiratory mechanics of evolving BPD in preterm rabbits and human neonates

[pubmed: neonate lung ultrasound](#) by Barbara Loi / 53d

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INSIGHTS

Add note

J Appl Physiol (1985). 2021 Jul 22. doi: 10.1152/jappphysiol.00300.2021. Online ahead of print.

ABSTRACT

Evolving broncho-pulmonary dysplasia (BPD) is a regionally heterogeneous disorder characterized by impaired alveolarization leading to lung aeration inhomogeneities. Hyperoxia-exposed preterm rabbits

have been proposed to mimic evolving BPD and we aim to verify if this model has the same lung ultrasound and mechanical features of evolving BPD in human neonates. Twenty-five preterm rabbits and twenty-five neonates with evolving BPD were enrolled and subjected to semi-quantitative lung ultrasound and lung mechanics measurement. A modified rabbit lung ultrasound score (rLUS), the previously validated neonatal lung ultrasound score (LUS) and classical mechanics measurements were obtained. Lung ultrasound images were also recorded and evaluated by two independent observers with different expertise blinded to each other's evaluation. Lung ultrasound findings were equally heterogeneous both in rabbits as in human neonates: images were very similar and encompassed all the classical lung ultrasound semiology. The inter-rater absolute agreement for the evaluation of lung ultrasound images in rabbits was very high (ICC: 0.989 (95%CI: 0.975-0.995); $p < 0.0001$) and there was no difference between the two observers. Lung mechanics parameters were similarly altered both in rabbits and human neonates. There were significant correlations between airway resistances and lung ultrasound scores both in rabbits ($r = 0.519$; $p = 0.008$) and in neonates ($r = 0.409$; $p = 0.042$). No significant correlation between rLUS, LUS and any other mechanics parameter. Lung ultrasound was easy to be performed and accurate even in these small animals and with a short training. In conclusion, the preterm rabbit model fairly reproduces the lung ultrasound and mechanical characteristics of preterm neonates with evolving BPD.

Neonatal lung ultrasound and surfactant administration: a pragmatic, multicenter study

"lung ultrasound" or "lung ultrasonograp...by Francesco Raimondi / 53d

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INSIGHTS

Add note

Chest. 2021 Jul 19:S0012-3692(21)01354-4. doi: 10.1016/j.chest.2021.06.076. Online ahead of print.

ABSTRACT

BACKGROUND: Previous research shows that a lung ultrasound score (LUS) can anticipate CPAP failure in neonatal respiratory distress syndrome.

RESEARCH QUESTION: Can LUS also predict the need for surfactant replacement?

STUDY DESIGN AND METHODS: Multicenter, pragmatic study on preterm neonates who underwent lung ultrasound at birth and those given surfactant by masked physicians were also scanned within 24 hours from administration. Clinical data and respiratory support variables were recorded. Accuracy of LUS, $\text{SatO}_2/\text{FiO}_2$, FiO_2 and Silverman score for surfactant administration were evaluated using receiver operating curves. The simultaneous prognostic value of LUS and $\text{SatO}_2/\text{FiO}_2$ for surfactant administration, adjusting for gestational age, were analyzed through logistic regression model.

RESULTS: Two hundred forty infants were enrolled. One-hundred eight received at least one dose of surfactant. LUS predicted the first surfactant administration with an area under the curve (AUC) = 0.86 (95%CI 0.81-0.91) cut-off=9 Sensitivity=0.79 (95% CI, 0.70; 0.86), Specificity=0.83 (95% CI, 0.76; 0.89), Positive Predictive Value =0.79 (95% CI, 0.71; 0.87), Negative Predictive Value=0.82 (95% CI, 0.75; 0.89), Likelihood Ratio +=4.65 (95% CI, 3.14; 6.89), and Likelihood Ratio -= 0.26 (95% CI, 0.18; 0.37). No significant difference was shown among different gestational age (GA) groups: 25-27 (AUC =0.91; 95% CI 0.84-0.99), 28-30 (AUC=0.81; 95% CI 0.72-0.91), 31-33 (AUC = 0.88; 95% CI 0.79-0.95) weeks GA, respectively. LUS declined significantly within 24 hours in babies receiving one surfactant dose. When comparing FiO_2 , $\text{SatO}_2/\text{FiO}_2$, LUS and Silverman scores as criteria for surfactant administration, only the latter had a significantly poorer performance. The combination of $\text{SatO}_2/\text{FiO}_2$ and LUS had the highest predictive power with AUC = 0.93 (95%CI 0.89-0.97) regardless of the GA interval.

INTERPRETATION: LUS is a reliable criterion to administer the first surfactant dose irrespective of GA. Its association with SatO₂/FiO₂ significantly improves the prediction power for surfactant need.

Fascia Iliaca Blocks Performed in the Emergency Department Decrease Opioid Consumption and Length of Stay in Hip Fracture Patients

[pubmed: fascia iliaca](#) by Nicholas Kolodychuk / 53d

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INSIGHTS

Add note

J Orthop Trauma. 2021 Jul 17. doi: 10.1097/BOT.0000000000002220. Online ahead of print.

ABSTRACT

OBJECTIVES: To examine the impact of fascia iliaca blocks performed in the emergency department on hip fracture patients on opioid consumption, length of stay, and readmission rate.

DESIGN: Prospective cohort study.

SETTING: Community-based level 1 trauma center
Patients/Participants: Ninety-eight patients with isolated femoral neck, intertrochanteric, and subtrochanteric femur fractures (OTA/AO 31-A and 31-B) presenting from January 1, 2020 to June 30, 2020.

INTERVENTION: Ultrasound-guided fascia iliaca compartment block using 40mL of 0.25% bupivacaine.

MAIN OUTCOME MEASUREMENTS: Opioid consumption, length of stay, discharge disposition, and 30-day readmission rate.

RESULTS: Thirty-three patients had contraindication to FIB. Thirty-nine of 65 patients (60%) without contraindications to undergoing FIB received fascia iliaca block. Mean age, BMI, fracture type, and surgical procedure were similar between patients undergoing FIB and not receiving FIB. The FIB group had significantly lower opioid consumption pre-operatively (17.4 vs 32.0 MMEs), post-operatively (37.1 vs 85.5 MMEs), over total hospital stay (54.5 vs 117.5 MMEs), and mean opioid consumption per day of hospital stay (13.3 vs 24.0 MMEs). Patients in FIB group had shorter length of stay compared to control group (4.3 vs 5.2 days). There was no significant difference in discharge disposition destination between groups. No patients reported complications of FI block.

CONCLUSIONS: Undergoing fascia iliaca block in the emergency department was associated with decreased opioid consumption, decreased length of stay, and decreased hospital readmission within 30 days of hip fracture.

LEVEL OF EVIDENCE: Therapeutic Level II. See Instructions for Authors for a complete description of levels of evidence.

Application value of lung ultrasound in the diagnosis and severity assessment of ventilator-associated pneumonia

[pubmed: BUS](#) by Jie Li / 52d

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INSIGHTS

Add note

Zhonghua Wei Zhong Bing Ji Jiu Yi Xue. 2021 Jun;33(6):702-707. doi: 10.3760/cma.j.cn121430-20200824-00589.

ABSTRACT

OBJECTIVE: To explore the value of bedside lung ultrasound in the early diagnosis and severity assessment of ventilator-associated pneumonia (VAP).

METHODS: A prospective observational study was conducted in 60 patients with VAP (VAP group) and 62 patients without VAP (control group) who were admitted to department of intensive care unit of General Hospital of Ningxia Medical University from September 2018 to July 2020. The gender, age and underlying diseases of non-VAP group were matched with VAP group. The general clinical data such as gender, age, underlying diseases, department source of the patient, acute physiology and chronic health evaluation II (APACHE II) score, sequential organ failure assessment (SOFA) score were recorded. The body temperature, white blood cell count (WBC), procalcitonin (PCT), oxygenation index ($\text{PaO}_2/\text{FiO}_2$), alveolar artery oxygen differential pressure ($\text{P}_{\text{A-aDO}_2}$) were recorded. During mechanical ventilation, the patient's body temperature, WBC, sputum characteristics, and the change of the lung ultrasound were dynamically observed. With or without dynamic air bronchogram, lung ultrasound was considered to be positive as long as there were small subpleural consolidation or tissue-like sign. Ventilator-associated pneumonia lung ultrasound score (VPLUS) and lung ultrasound score (LUSS) were performed, and chest CT scan was completed on the same day. Use positive chest CT scan as the standard to evaluate the diagnostic efficacy of lung ultrasound, VPLUS score, and the combination of the two with PCT for VAP. LUSS was used to assess the severity of disease in patients with VAP. The correlation between LUSS and $\text{PaO}_2/\text{FiO}_2$, $\text{P}_{\text{A-aDO}_2}$, APACHE II score and SOFA score were analyzed.

RESULTS: (1) General information: compared with non-VAP group, VAP group had more emergency surgery patients [51.7% (31/60) vs. 33.9% (21/62), $P = 0.047$], APACHE II score and SOFA score were significantly higher (APACHE II score: 15.4 ± 5.7 vs. 13.4 ± 3.4 , $P = 0.021$; SOFA score: 8.8 ± 4.2 vs. 6.3 ± 3.3 , $P < 0.001$), body temperature tended to rise (centigrade: 38.3 ± 0.8 vs. 38.0 ± 0.9 , $P = 0.054$), more patients had airway purulent secretions [65.0% (39/60) vs. 41.9% (26/62), $P = 0.011$], and mechanical ventilation time and length of ICU stay were longer [mechanical ventilation time (days): 10.5 (6.6, 15.0) vs. 4.3 (3.0, 6.0), $P < 0.001$; length of ICU stay (days): 14.8 (9.0, 18.0) vs. 6.0 (4.0, 9.1), $P < 0.001$], 28-day mortality rate was higher [31.7% (19/60) vs. 9.7% (6/62), $P = 0.003$]. (2) Diagnostic efficacy evaluation: when lung ultrasound was positive, $\text{VPLUS} \geq 3$ and $\text{PCT} > 0.5 \mu\text{g/L}$ were used separately for the diagnosis of VAP, the sensitivity was 73.3%, 75.0%, 61.7%, respectively; the specificity was 80.6%, 58.1% and 59.7%, respectively; the 95% confidence interval (95%CI) was 0.685-0.842, 0.574-0.748, 0.514-0.694, respectively, all $P < 0.05$, positive lung ultrasound had good sensitivity and specificity. When positive lung ultrasound or $\text{VPLUS} \geq 3$ were combined with $\text{PCT} > 0.5 \mu\text{g/L}$ for tandem test, the specificity of VAP diagnosis was increased to 95.2% and 83.9%, respectively; but the specificity of VAP diagnosis of positive lung ultrasound combined with $\text{PCT} > 0.5 \mu\text{g/L}$ was higher than $\text{VPLUS} \geq 3$ combined with $\text{PCT} > 0.5 \mu\text{g/L}$ (95.2% vs. 83.9%, $P < 0.05$). (3) Correlation analysis: LUSS showed a significant positive correlation with APACHE II and SOFA score (r values were 0.407, 0.399, P values were 0.001, 0.002, respectively), LUSS had no relation with $\text{PaO}_2/\text{FiO}_2$ and $\text{P}_{\text{A-aDO}_2}$ (r values were 0.189, -0.064, P values were 0.629, 0.149, respectively).

CONCLUSIONS: Lung ultrasound can early detect VAP , and its diagnostic specificity is significantly improved when combined with PCT > 0.5 µg/L. LUSS is closely related to the severity of disease in VAP patients, therefore, lung ultrasound may be an effective method for early diagnosis and efficacy evaluation of VAP patients.

Comparison of transorbital ultrasound measurements to predict intracranial pressure in brain-injured patients requiring external ventricular drainage

[optic nerve diameter](#) by Jin Young Youm / 52d

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INSIGHTS

Add note

J Neurosurg. 2021 Jul 23:1-7. doi: 10.3171/2021.1.JNS204218. Online ahead of print.

ABSTRACT

OBJECTIVE: The optic nerve sheath diameter (ONSD) excluding the dura mater (ONSDE; i.e., the subarachnoid diameter) and the ONSD including the dura mater (ONSDI) have been used differently in studies, but the predictive ability of these two different measurements of the ONSD as measured by invasive intracranial pressure (ICP) monitoring has never been compared. Additionally, studies on the prediction of ICP using central retinal artery (CRA) Doppler ultrasonography are scarce. The authors aimed to determine how the two different ONSD measurements, the ONSD/eyeball transverse diameter (ETD) ratio, and transorbital Doppler ultrasonography parameters are associated with ICP via external ventricular drainage (EVD).

METHODS: This prospective observational study included 50 patients with brain injury who underwent EVD between August 2019 and September 2020. The mean of three repeated measurements of the ONSDI and ONSDE was calculated to reduce artifact and off-axis measurements. ETD, an immutable value, was measured from the initial brain CT with a clear outline of the eyeball. Simultaneously, flow velocities in the CRA and posterior ciliary artery (PCA) were compared with the ICP.

RESULTS: The ONSDE, ONSDI, and ONSD/ETD ratio were significantly associated with ICP ($p = 0.005$, $p < 0.001$, and $p < 0.001$, respectively). The ONSD/ETD ratio showed the highest predictive power of increased ICP (area under the curve [AUC] 0.897). The ONSDI was correlated more with the ICP than was the ONSDE (AUC 0.855 vs 0.783). None of the Doppler ultrasonography parameters in the CRA and PCA were associated with ICP.

CONCLUSIONS: The ONSD/ETD ratio is a better predictor of increased ICP compared with the ONSDI or ONSDE in brain-injured patients with nonsevere ICP. The ONSDI may be more available for predicting the ICP than the ONSDE.

Importance of Lung Ultrasound Follow-Up in Patients Who Had Recovered from Coronavirus Disease 2019: Results from a Prospective Study

["lung ultrasound" or "lung ultrasonograp...](#) by Alba Hernández-Piriz / 52d

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INSIGHTS

Add note

J Clin Med. 2021 Jul 20;10(14):3196. doi: 10.3390/jcm10143196.

ABSTRACT

There is growing evidence regarding the imaging findings of coronavirus disease 2019 (COVID-19) in lung ultrasounds, however, their role in predicting the prognosis has yet to be explored. Our objective was to assess the usefulness of lung ultrasound in the short-term follow-up (1 and 3 months) of patients with SARS-CoV-2 pneumonia, and to describe the progression of the most relevant lung ultrasound findings. We conducted a prospective, longitudinal and observational study performed in patients with confirmed COVID-19 who underwent a lung ultrasound examination during hospitalization and repeated it 1 and 3 months after hospital discharge. A total of 96 patients were enrolled. In the initial ultrasound, bilateral involvement was present in 100% of the patients with mild, moderate or severe ARDS. The most affected lung area was the posteroinferior (93.8%) followed by the lateral (88.7%). Subpleural consolidations were present in 68% of the patients and consolidations larger than 1 cm in 24%. One month after the initial study, only 20.8% had complete resolution on lung ultrasound. This percentage rose to 68.7% at 3 months. Residual lesions were observed in a significant percentage of patients who recovered from moderate or severe ARDS (32.4% and 61.5%, respectively). In conclusion, lung injury associated with COVID-19 might take time to resolve. The findings in this report support the use of lung ultrasound in the short-term follow-up of patients recovered from COVID-19, as a radiation-sparing, easy to use, novel care path worth exploring.

Stay Still's for POCUS: using bedside ultrasound to screen for cardiac complications

[pubmed: point of care ultras...](#) by Justin Choi / 49d

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INSIGHTS

Add note

Oxf Med Case Reports. 2021 Jul 21;2021(7):omab055. doi: 10.1093/omcr/omab055. eCollection 2021 Jul.

ABSTRACT

Adult Still's disease (ASD) is a rare systemic inflammatory disorder of unknown etiology most commonly characterized by daily spiking fevers, an evanescent, 'salmon-colored' rash, and arthralgia. Cardiac complications such as pericarditis, myocarditis, heart failure, and pericardial effusion progressing to tamponade have been reported. Because of the severe and potentially lethal complications associated with these processes, the clinician's index of suspicion must remain high and the threshold for cardiac imaging low. Here, we present a case of ASD-associated myocarditis identified quickly by point-of-care ultrasound, allowing for prompt workup and treatment.

Identifying Conditions With High Prevalence, Cost, and Variation in Cost in US Children's Hospitals

[pubmed: pediatric appendicit...](#) by Peter J Gill / 49d

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INSIGHTS

Add note

JAMA Netw Open. 2021 Jul 1;4(7):e2117816. doi: 10.1001/jamanetworkopen.2021.17816.

ABSTRACT

IMPORTANCE: Identifying high priority pediatric conditions is important for setting a research agenda in hospital pediatrics that will benefit families, clinicians, and the health care system. However, the last such prioritization study was conducted more than a decade ago and used International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes.

OBJECTIVES: To identify conditions that should be prioritized for comparative effectiveness research based on prevalence, cost, and variation in cost of hospitalizations using contemporary data at US children's hospitals.

DESIGN, SETTING, AND PARTICIPANTS: This retrospective cohort study of children with hospital encounters used data from the Pediatric Health Information System database. Children younger than 18 years with inpatient hospital encounters at 45 tertiary care US children's hospitals between January 1, 2016, and December 31, 2019, were included. Data were analyzed from March 2020 to April 2021.

MAIN OUTCOMES AND MEASURES: The condition-specific prevalence and total standardized cost, the corresponding prevalence and cost ranks, and the variation in standardized cost per encounter across hospitals were analyzed. The variation in cost was assessed using the number of outlier hospitals and intraclass correlation coefficient.

RESULTS: There were 2 882 490 inpatient hospital encounters (median [interquartile range] age, 4 [1-12] years; 1 554 024 [53.9%] boys) included. Among the 50 most prevalent and 50 most costly conditions (total, 74 conditions), 49 (66.2%) were medical, 15 (20.3%) were surgical, and 10 (13.5%) were medical/surgical. The top 10 conditions by cost accounted for \$12.4 billion of \$33.4 billion total costs (37.4%) and 592 815 encounters (33.8% of all encounters). Of 74 conditions, 4 conditions had an intraclass correlation coefficient (ICC) of 0.30 or higher (ie, major depressive disorder: ICC, 0.49; type 1 diabetes with complications: ICC, 0.36; diabetic ketoacidosis: ICC, 0.33; acute appendicitis without peritonitis: ICC, 0.30), and 9 conditions had an ICC higher than 0.20 (scoliosis: ICC, 0.27; hypertrophy of tonsils and adenoids: ICC, 0.26; supracondylar fracture of humerus: ICC, 0.25; cleft lip and palate: ICC, 0.24; acute appendicitis with peritonitis: ICC, 0.21). Examples of conditions high in prevalence, cost, and variation in cost included major depressive disorder (cost rank, 19; prevalence rank, 10; ICC, 0.49), scoliosis (cost rank, 6; prevalence rank, 38; ICC, 0.27), acute appendicitis with peritonitis (cost rank, 13; prevalence rank, 11; ICC, 0.21), asthma (cost rank, 10; prevalence rank, 2; ICC, 0.17), and dehydration (cost rank, 24; prevalence rank, 8; ICC, 0.18).

Training strategies for point of care ultrasound in the ICU

pubmed: bUS by Jason Cheng / 49d

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INSIGHTS

Add note

Curr Opin Anaesthesiol. 2021 Jul 26. doi: 10.1097/ACO.0000000000001042. Online ahead of print.

ABSTRACT

PURPOSE OF THE REVIEW: Ultrasound in critical care medicine (CCUS) is a relatively young tool that has been evolving rapidly as skillsets, applications and technology continue to progress. Although ultrasound is identified as a core competency in intensive care unit (ICU) training, there remains significant variability and inconsistencies in the delivery of ultrasound training. The goal of this narrative review is to explore areas of consensus and highlight areas where consensus is lacking to bring attention to future directions of ultrasound training in critical care medicine.

RECENT FINDINGS: There exists considerable variation in competencies identified as basic for CCUS. Recent efforts by the European Society of Intensive Care Medicine serve as the most up to date iteration however implementation is still limited by regional expertise and practice patterns. Major barriers to ultrasound training in the ICU include a lack of available experts for bedside teaching and a lack of familiarity with new technology.

SUMMARY: Though international uptake of CCUS has made many gains in the past 20 years, further adoption of technology will be required to overcome the traditional barriers of CCUS training. Although the availability and time constraints of experts will remain a limitation even with wireless capabilities, the ability to expand beyond the physical constraints of an ultrasound machine will vastly benefit efforts to standardize training and improve access to knowledge.

Lung ultrasonography: what the cardiologist should know

["lung ultrasound" or "lung ultrasonograp..."](#) by Antonello D'Andrea / 49d

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INSIGHTS

Add note

G Ital Cardiol (Rome). 2021 Aug;22(8):638-647. doi: 10.1714/3641.36220.

ABSTRACT

In recent years, lung ultrasonography has acquired an important role as a valuable diagnostic tool in clinical practice. The lung is usually poorly explorable, but it provides more acoustic information in pathological conditions that modify the relationship between air, water and tissues. The different acoustic impedance of all these components makes the chest wall a powerful ultrasound reflector: this is responsible for the creation of several artifacts providing valuable information about lung pathophysiology. Lung ultrasonography helps in the diagnostic process of parenchymal and pleural pathologies, in the differential diagnosis of dyspnea and in the clinical and prognostic evaluation of the SARS-CoV-2 infection.

The Effect of Biomarkers and Optic Nerve Sheath Diameter in Determining Mortality in non-Traumatic Subarachnoid Hemorrhage

[optic nerve diameter](#) by Yavuz Cenik / 49d

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INSIGHTS

Add note

Clin Neurol Neurosurg. 2021 Jul 10;207:106813. doi: 10.1016/j.clineuro.2021.106813. Online ahead of print.

ABSTRACT

AIM: Although radiological methods are sufficient for the diagnosis of spontaneous subarachnoid hemorrhage (SAH), additional biomarkers are needed to predict prognosis. The aim of this study was to investigate the effects of serum S100B protein, Glial Fibrillary Acidic Protein (GFAP) levels and, Optic Nerve Sheath Diameter (ONSD) on mortality and clinical severity in patients with spontaneous SAH.

MATERIALS AND METHODS: Fifty-six patients who were diagnosed with SAH after first evaluation in the emergency department (ED) were included in the study group; Forty-six patients who were admitted to the ED with headache of non-intracranial etiology, were included as the control group. Cerebral computed tomography (CT) images and peripheral blood samples were obtained from all patients; at the time of diagnosis and 24 h after diagnosis. Serum S100B protein and GFAP levels were measured from the blood samples and ONSD was measured on CT.

RESULTS: Serum S100B protein and GFAP levels and, ONSDs at the time of diagnosis and 24 h after diagnosis were significantly higher in the study group ($p < 0.05$). Both GFAP levels and ONSD at the time of diagnosis and 24 h after the diagnosis were found to be related with increased mortality ($p < 0.05$). A similar association was found for serum S100B protein levels 24 h after the diagnosis, but not at the time of diagnosis ($p = 0.540$).

CONCLUSION: Serum S100B protein and GFAP levels and, ONSD were increased in patients with spontaneous SAH. All parameters were found to be associated with increased mortality.

Feasibility study of abdominal ultrasound using hand-held devices in homecare services

[pubmed: point of care ultras...](#)by Sergi Vilanova-Rotllan / 49d

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INSIGHTS

Add note

Med Clin (Barc). 2021 Jul 23;S0025-7753(21)00328-6. doi: 10.1016/j.medcli.2021.03.038. Online ahead of print.

ABSTRACT

BACKGROUND AND OBJECTIVES: The miniaturisation and portability of ultrasound devices allow the family doctor to apply them in areas such as the patient's home. The present study aims to prove that performing an abdominal ultrasound in the home of frail patients is feasible, decreases the delay in care, and reduces diagnostic uncertainty.

PATIENTS AND METHODS: Case-control study. A sample of 59 patients was studied: 30 cases and 29 controls. A descriptive analysis of the case group was carried out and the delay variable was compared between both groups.

RESULTS: A relevant and significant reduction, up to 10 times lower, was observed in the delay between the ultrasound performed in homecare compared those performed in the hospital. Of the patients, 73.4% only required clinical follow-up by their physician. In those patients who required other complementary tests or referrals, the definitive diagnosis was in complete agreement with the results of the ultrasound performed in homecare.

CONCLUSIONS: The implementation of ultrasound in homecare services is feasible and provides relevant clinical benefits for the patient and increases the resolution capacity of the professional.

"Asymptomatic" Flash Pulmonary Edema by Point-of-Care Ultrasound: A Novel Bedside Finding of Transient Global Ischemia

["lung ultrasound" or "lung ultrasonograp...](#) by Bruce J Kimura / 47d

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INSIGHTS

Add note

JACC Case Rep. 2020 Aug 19;2(10):1545-1549. doi: 10.1016/j.jaccas.2020.06.029. eCollection 2020 Aug.

ABSTRACT

A 65-year-old man with remitted chest pain and no tachypnea was taken urgently to catheterization because of diffuse lung ultrasound B-lines on bedside examination. He was found to have severe left-main disease. This case emphasizes the value of ultrasound to recognize acute cardiogenic interstitial pulmonary edema despite minimal symptoms. (**Level of Difficulty: Advanced.**)

Point-of-Care Ultrasound-Guided Drainage of Joint Effusions in the Pediatric Emergency Setting: A Case Series

[pubmed: point of care ultras...](#) by Eric Scheier / 47d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Jul 28. doi: 10.1002/jum.15795. Online ahead of print.

ABSTRACT

Literature supporting the use of point-of-care ultrasound (POCUS) for both identification and aspiration of effusions in large joints in the pediatric emergency department (PED) is sparse. We collected a case series of five patients who presented to the PED from August 2020 to December 2020 with an effusion in the hip, shoulder, knee, or elbow identified and aspirated under POCUS performed by pediatric emergency medicine (PEM) physicians. POCUS confirms effusion location and size and visualization of a completely evacuated effusion. POCUS can also guide the decision to start antibiotics earlier in the course of illness, can prevent unnecessary transfers for formal sonographic imaging or for potentially

unnecessary radiographic imaging. This series supports the role of a PEM physician and POCUS guidance in the identification and aspiration of large-joint effusions.

Can lung ultrasound score accurately predict the need for surfactant replacement in preterm neonates? A systematic review and meta-analysis protocol

[pubmed: neonate lung ultrasound](#) by Letizia Capasso / 47d

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INSIGHTS

Add note

PLoS One. 2021 Jul 28;16(7):e0255332. doi: 10.1371/journal.pone.0255332. eCollection 2021.

ABSTRACT

Respiratory distress syndrome (RDS) is a leading cause of morbidity and mortality in preterm infants due to primary surfactant deficiency. Surfactant replacement has greatly improved the short and long term prognosis of RDS but its administration criteria remain uncertain. Lung ultrasound has been recently shown as a non-invasive, repeatable, bedside tool to estimate parenchymal aeration using a semiquantitative score (LUS). The objective of this systematic review and meta-analysis is to evaluate the accuracy of LUS, assessed on the first day of life, to predict surfactant replacement. Methods will follow the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines and the protocol has been registered in PROSPERO database (registration number: CRD42021247888). Primary outcome: in a population of preterm infants, LUS will be compared in neonates who received surfactant replacement versus those who did not. Secondary outcome will be the accuracy of lung ultrasound score to predict the need for ≥ 2 doses of surfactant.

Ultrasound-guided internal jugular venipuncture using pocket-sized versus standard ultrasound devices: a prospective non-inferiority trial

[pubmed: bUS](#) by Kenji Yamamoto / 47d

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INSIGHTS

Add note

J Med Ultrason (2001). 2021 Jul 28. doi: 10.1007/s10396-021-01118-x. Online ahead of print.

ABSTRACT

PURPOSE: Pocket-sized ultrasound devices (PUDs) are commonly adopted for bedside use despite their inferior performance compared with standard ultrasound devices (SUDs). We investigated the non-inferiority of PUDs versus SUDs for ultrasound-guided internal jugular venipuncture.

METHODS: All patients undergoing scheduled surgery with general anesthesia and internal jugular vein catheter placement were prospectively included in this randomized non-inferiority trial to compare the qualities of the internal jugular venipuncture between the PUD group (Group P) and SUD group (Group

S). The primary endpoint was puncture time, and the secondary endpoints included number of punctures, needle and guidewire visibility, and anatomic visibility.

RESULTS: Fifty-two patients were randomized to one of the two groups (26 per group). The mean (SEM) puncture time was 56.4 (10.9) s in Group P and 45.5 (4.0) s in Group S. The mean difference of 10.9 s was within the prespecified non-inferiority margin of 100% (two-sided 95% CI: - 12.9-34.6, upper limit of the 95% CI: 45.5) for puncture time. The mean (SEM) number of punctures was 1.15 (0.12) times in Group P and 1.12 (0.06) times in Group S. The difference of 0.04 punctures was within the prespecified non-inferiority margin of 100% (two-sided 95% CI: - 0.24-0.31, upper limit of the 95% CI: 1.12) for number of punctures. Non-inferiority was not shown for needle and guidewire visibility and anatomic visibility.

CONCLUSION: PUDs for internal jugular venipuncture are not inferior to SUDs with regard to puncture time and number of punctures, despite differences in visibility and device performance.

Cardiopulmonary alterations by ultrasound in a patient with uncomplicated mixed malaria infection: a case report from the Amazon Basin

["lung ultrasound" or "lung ultrasonograp...](#)by Alma Wegener / 47d

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INSIGHTS

Add note

Malar J. 2021 Jul 28;20(1):330. doi: 10.1186/s12936-021-03861-5.

ABSTRACT

BACKGROUND: Information on cardiopulmonary complications in clinical malaria is sparse and diagnosis may be difficult in resource-limited areas due to lack of proper diagnostic tools and access to medical care. A case of pericardial effusion and pulmonary alterations assessed by ultrasound in a patient with uncomplicated mixed malaria infection is described.

CASE PRESENTATION: A previously healthy 23-year-old male from the Amazon Basin was diagnosed with mixed infection of *Plasmodium vivax* and *Plasmodium falciparum* by peripheral blood smear. The patient presented with mild malaria symptoms without signs of severe malaria, but reported moderate chest pain and shortness of breath. Laboratory analyses revealed thrombocytopenia and anemia. The electrocardiogram had PR depressions and bedside ultrasound of the cardiopulmonary system showed pericardial effusion (18 mm) accompanied by multiple B-lines in the lungs, identified as vertical artifacts extending from the pleural line. Cardiac biomarkers were normal. The patient was treated according to national guidelines for malaria and suspected pericarditis, respectively. At follow-up on day 5, the pericardial effusion (9mm) and B-lines had markedly decreased. By day 21 the patient was asymptomatic, had completed the treatment, and the electrocardiogram and ultrasound findings had normalized.

CONCLUSIONS: This case report highlight the usefulness of bedside ultrasound to identify cardiopulmonary involvement in patients with uncomplicated malaria and relevant symptoms.

Evaluation of Increased Intracranial Pressure with the Optic Nerve Sheath Diameter by Ultrasound in Epiduroscopic Neural Laser Discectomy Procedures

[optic nerve ultrasound](#)by Serbulent Gokhan Beyaz / 46d

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INSIGHTS

Add note

Pain Physician. 2021 Aug;24(5):E595-E600.

ABSTRACT

BACKGROUND: In order to clarify the camera image and open the adhesions mechanically during epiduroscopy, saline is injected continuously in the epidural area. As a result, an increase in intracranial pressure is to be expected in theory. Increased intracranial pressure can be evaluated by measuring by optic nerve sheath diameter.

OBJECTIVES: This study was designed to evaluate the relationship between optic nerve sheath diameter measurements and intracranial pressure, after injecting fluid to the epidural area during epiduroscopy procedures performed in our clinic.

STUDY DESIGN: Retrospective study.

SETTING: Sakarya University Training and Research Hospital.

METHODS: During the epiduroscopy procedure, pre and postoperative bilateral optic nerve sheath diameters were measured with an ultrasonography probe. With the patients' eyelids closed, the probe was placed on the orbita in the sagittal plane, measuring 3 mm posterior of the papilla.

RESULTS: While there was a statistically significant difference between pre- and post-operative optic nerve sheath diameter measurements, there was no significant correlation with processing time, amount of fluid delivered, or fluid delivery rates.

LIMITATIONS: One of the limitations of this study is the retrospective collection of data. A second limitation is that repetitive measurements were not performed, instead of a single postoperative measurement.

CONCLUSION: We think more prospective randomized controlled studies are required to examine the increase in the diameter of the optic nerve sheath, which is an indirect indicator of increased intracranial pressure after epiduroscopy applications, in order to determine whether the pressure increase is associated with the rate of fluid delivery, the total fluid amount, or the processing time.

Focal cardiac ultrasound learning with pocked ultrasound device: A bicentric prospective blinded randomized study

[pubmed: point of care ultras...](#) by Céline Occelli / 46d

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INSIGHTS

Add note

J Clin Ultrasound. 2021 Jul 28. doi: 10.1002/jcu.23047. Online ahead of print.

ABSTRACT

PURPOSE: Point-of-care ultrasound using a pocket-ultrasound-device (PUD) is increasing in clinical medicine but the optimal way to teach focused cardiac ultrasound is not clear. We evaluated whether teaching using a PUD or a conventional-ultrasound-device (CUD) is different when the final exam was conducted on a PUD. The primary aim was to compare the weighted total quality scale (WTQS, out of 100) obtained by participants in the two groups (CUD and PUD) on a live volunteer 2-4 weeks after their initial training. The secondary aims were to compare examination time and students' confidence levels (out of 50).

METHODS: This bicentric, prospective single-blind randomized trial included undergraduate medical students. After watching a 15 min video about echocardiography views, students had a 45 min hands-on training session with a live volunteer using a PUD or a CUD. The final examination was conducted with a PUD on a live volunteer.

RESULTS: Eighty-six comparable students were included, with 4 ± 1 years of medical training. In the PUD group, the mean WTQS was 65 ± 16 versus 60 ± 15 in the CUD group [$p = 0.22$; in multivariate analysis, OR 0.8 95% CI (0.1;1.6), $p = 0.34$]. The examination time was 10.0 [6.2-12.4] min in the PUD group versus 11.4 [7.3-13.2] in the CUD group ($p = 0.39$), while the confidence level was 27.9 ± 7.7 in the PUD group versus 27.4 ± 7.2 in the CUD group ($p = 0.76$).

CONCLUSION: There was no difference between teaching echocardiographic views using a PUD as compared to a CUD on the PUD image quality, exam time, or confidence level of students.

Evaluation of a Point-of-Care Ultrasound Educational Program for Nurse Educators

pubmed: [point of care ultras...](#)by Masaru Matsumoto / 46d

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INSIGHTS

Add note

J Contin Educ Nurs. 2021 Aug;52(8):375-381. doi: 10.3928/00220124-20210714-07. Epub 2021 Aug 1.

ABSTRACT

BACKGROUND: The effectiveness of point-of-care ultrasound (POCUS) for nurses has been demonstrated; however, only a limited number of nurses have been trained to perform POCUS. This article reports on a POCUS train-the-trainer program for nurse educators that targets lower urinary track dysfunction.

METHOD: Nurse educators ($n = 38$) were invited to participate in a POCUS train-the-trainer program, which comprised an e-learning module and a hands-on seminar. Acquisition of knowledge and skills were assessed after the module and seminar, respectively.

RESULTS: Questions from the "Basic Knowledge of Ultrasonography" test were answered correctly at a rate of 93.0% (SD , 8.5%). Measured values of bladder urinary volume using ultrasonography were in close agreement with actual values. All of the participants indicated that the program covered the content necessary to use in practice.

CONCLUSION: The POCUS train-the-trainer program equips nurse educators with the knowledge and skills needed for training nurses at their institutions.

Reinforcing the valuable role of gastric ultrasound for volume and content assessment: an observational study

[pubmed: point of care ultras...](#)by Elena Segura-Grau / 46d

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INSIGHTS

Add note

Braz J Anesthesiol. 2021 Jul 26;S0104-0014(21)00289-X. doi: 10.1016/j.bjane.2021.07.008. Online ahead of print.

ABSTRACT

BACKGROUND: Pulmonary aspiration is one of the most important complications in anesthesiology. Assessment of gastric content by ultrasound is a good method to quantify gastric volume and to determine the risk of intraoperative pulmonary aspiration. The aim of this study is to determine the accuracy of the gastric ultrasonography in the qualitative analysis of gastric content, mainly in the analysis of small amounts of liquid content.

METHODS: Gastric ultrasound was performed to 36 patients before upper gastrointestinal endoscopy (UGI), making two longitudinal scans at the epigastric level, one in supine position and the other in right lateral decubitus position, measuring two diameters and the area of the gastric antrum and assessing the content characteristics determining whether it was an empty stomach or contained fluid or solid content. Subsequently, the ultrasound findings were compared with UGI findings.

RESULTS: Gastric areas were analyzed by the trace and the lengths of the craniocaudal and anteroposterior axes concluding that there are no significant differences between the two methods. No statistically significant difference was found between UGI and US assessment technics. No statistically significant difference was found between the estimated volume by UGI and US.

CONCLUSIONS: Though our study has some limitations, qualitative analysis of gastric content using ultrasound followed by endoscopy enabled the conclusion that there are no differences in the qualitative assessment regarding these two techniques, supporting the important role of point-of-care gastric ultrasound (POCGUS) in the assessment of pulmonary aspiration risk by the anesthesiologist in the perioperative period.

The physical examination is unreliable in determining the location of the distal fibular physis

[pubmed: point of care ultras...](#)by Véronique Dion / 46d

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INSIGHTS

Add note

Am J Emerg Med. 2021 Jul 22;50:97-101. doi: 10.1016/j.ajem.2021.07.040. Online ahead of print.

ABSTRACT

OBJECTIVES: Salter-Harris type 1 (SH1) fractures of the distal fibula are acute orthopedic injuries with tenderness over the physis without radiographic evidence of fracture. Our primary objective was to establish the accuracy of the physical examination performed by pediatric emergency medicine (PEM) physicians in determining the location of the distal fibular physis compared to a criterion standard of ultrasound.

METHODS: This was a prospective, observational study at an urban academic pediatric emergency department of a convenience sample of children aged 4 to 10 years old between March 2019 and March 2020. A PEM physician or fellow examined the patient's distal fibula and marked the location of the physis with a marker. A study investigator scanned the distal fibula to establish the location of the physis on ultrasound and measured the distance between the clinician's estimated position and the actual sonographic position. We a priori defined a clinically accurate position as a distance of ≤ 5 mm. We compared the accuracy rate of physical examination to ultrasound landmarking using proportions with 95% confidence intervals (CI).

RESULTS: We enrolled 71 patients, of whom 52 (73%) were male. The mean age was 6.7 years and the mean weight was 25.5 kg. Participating PEM physicians included 18 attending physicians and 2 fellows. The distal fibular physis was correctly identified in 24 patients, yielding an accuracy rate of 34% (95% CI 23%-46%). The mean distance between the physician's estimated position and the sonographic position was 7.4 mm (95% CI 6.4-8.4 mm).

CONCLUSIONS: PEM physicians were unable to accurately identify the distal fibular physis on physical examination.

eFAST exam errors at a level 1 trauma center: A retrospective cohort study focused assessment sonography trauma

by Kiana Khosravian / 46d

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INSIGHTS

Add note

Am J Emerg Med. 2021 Jul 21;49:393-398. doi: 10.1016/j.ajem.2021.07.036. Online ahead of print.

ABSTRACT

OBJECTIVES: Extended Focused Assessment with Sonography for Trauma (eFAST) ultrasound exams are central to the care of the unstable trauma patient. We examined six years of eFAST quality assurance data to identify the most common reasons for false positive and false negative eFAST exams.

METHODS: This was an observational, retrospective cohort study of trauma activation patients evaluated in an urban, academic Level 1 trauma center. All eFAST exams that were identified as false positive or false negative exams compared with computed tomography (CT) imaging were included.

RESULTS: 4860 eFAST exams were performed on trauma patients. 1450 (29.8%) were undocumented, technically limited, or incomplete (missing images). Of the 3410 remaining exams, 180 (5.27%) were true positive and 3128 (91.7%) were true negative. 27 (0.79%) exams were identified as false positive and 75 (2.19%) were identified as false negative. Of the false positive scans, 7 had no CT scan and 8 had correct real-time trauma paper documentation of eFAST exam results when compared to CT and were excluded,

leaving 12 false positive scans. Of the false negative scans, 11 were excluded for concordant documentation in real-time trauma room paper documentation, 20 were excluded for no CT scan, and 2 were excluded as incomplete, leaving 42 false negative scans. Pelvic fluid, double-line sign, pericardial fat pad, and the thoracic portion of the eFAST exam were the most common source of errors.

CONCLUSION: The eFAST exams in trauma activation patients are highly accurate. Unfortunately poor documentation and technically limited/incomplete studies represent 29.8% of our eFAST exams. Pelvic fluid, double-line sign, pericardial fat pad, and the thoracic portion of the eFAST exam are the most common source of errors.

Ultrasound and Influenza: The Spectrum of Lung and Cardiac Ultrasound Findings in Patients with Suspected Influenza A and B

[pubmed: point of care ultras...](#) by Ahad A Al Saud / 46d

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INSIGHTS

Add note

Ultrasound Med Biol. 2021 Jul 26:S0301-5629(21)00294-5. doi: 10.1016/j.ultrasmedbio.2021.06.018. Online ahead of print.

ABSTRACT

In patients with influenza, cardiac and lung ultrasound may help determine the severity of illness and predict clinical outcomes. To determine the ultrasound characteristics of influenza and define the spectrum of lung and cardiac findings in patients with suspected influenza A or B, we conducted a prospective observational study in patients presenting to the emergency department at a tertiary care academic institution. An ultrasound protocol consisting of cardiac, lung and inferior vena cava scans was performed within 6 h of admission. We compared the ultrasound findings in cases with positive and negative influenza polymerase chain reaction, while controlling for comorbidities. We enrolled 117 patients, 41.9% of whom (49/117) tested positive for influenza. In those with influenza, ultrasound confirmed preserved left ventricular and right ventricular (RV) function in 81.3% of patients. The most common cardiac pathology was RV dilation (10.4%), followed by left ventricular systolic dysfunction (8.3%). Patients with negative influenza polymerase chain reaction with RV dysfunction demonstrated higher hospital admission than those those with normal RV function (45.1%, 23/51, vs. 17.9%, 5/28; $p = 0.016$). B-lines were prevalent in both influenza and non-influenza groups (40.8% and 69.1%, respectively; $p = 0.013$). Lung consolidation was identified in only 8.25% of patients with influenza. In conclusion, in patients with influenza we were unable to define distinct ultrasound features specific to influenza A or B, suggesting that ultrasound may not be beneficial in diagnosing influenza nor in evaluating its severity.

McConnell in Shock

[pubmed: bUS](#) by Joana Silva Marques / 45d

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INSIGHTS

Add note

Cureus. 2021 Jun 21;13(6):e15819. doi: 10.7759/cureus.15819. eCollection 2021 Jun.

ABSTRACT

The ideal approach to hemodynamically unstable patients requires the quick identification of the type of shock and its etiology. This can be a challenge in critically ill patients due to the limited information, the wide number of differential diagnosis and the need for fast intervention. Point-of-care ultrasound (POCUS) is a non-invasive, low-cost, real-time and reliable tool used to rapidly and accurately assess hemodynamically unstable patients at the bedside. It can support diagnosis, tailor therapy and guide further workup, especially in patients deemed too unstable to undergo other imaging studies. The authors describe the case of a patient in obstructive shock due to pulmonary embolism, in which McConnell sign was identified by bedside echocardiography, before lab tests and pulmonary computerized tomography angiogram results were obtained.

Ultrasonographic Evaluation of Physiologic Free Intraoperative Fluid in Healthy Children: A Prospective Observational Study

[pubmed: fast sonography trau...](#) by Anthony R Arredondo / 42d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Jul 19. doi: 10.1002/jum.15787. Online ahead of print.

ABSTRACT

OBJECTIVES: The detection of intraperitoneal free fluid (FF) is an important finding in the sonographic evaluation of the pediatric abdomen, especially in the context of blunt abdominal trauma. One specific challenge is differentiating physiologic from pathologic FF. The purpose of this study was to determine with ultrasound the prevalence, location, and volume of intraperitoneal FF in healthy pediatric patients and its relation to pubertal status and gender.

METHODS: Healthy children between the ages of 1 and 17 years who presented to the emergency department with non-abdominal complaints were evaluated for physiologic intra-abdominal fluid. Point-of-Care Ultrasound (POCUS) was performed, utilizing the Focused Assessment with Sonography in Trauma (FAST) examination.

RESULTS: A total of 325 pediatric patients were analyzed. Intraperitoneal FF was found in 52 children (16.0%, 95% CI: 12.0-20.0%). The pelvis was the only region where FF was located. The prevalence of FF was nearly equivalent between male and female children (15.4% vs 16.7%, $P = .76$). There was a higher prevalence of FF identified in the prepubertal subgroup compared to the pubertal group (20.0% vs 11.3%, $P = .03$). Seventy-seven percent of children with FF had a fluid volume of less than 1 mL.

CONCLUSIONS: Physiologic FF of less than 1 mL within the pelvis is a common finding in the pediatric population. There was no difference in the rate of FF identified by gender, but there was a higher prevalence of FF among prepubertal children.

Pulmonary Embolism and Cardiac Tamponade in Critical Care Patients with COVID-19; Telemedicine's Role in Developing Countries: Case Reports and Literature Review

[pubmed: bedside echo](#) by Islam Mohammed Sheata / 42d

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INSIGHTS

Add note

Anesth Pain Med. 2021 Apr 7;11(2):e113752. doi: 10.5812/aapm.113752. eCollection 2021 Apr.

ABSTRACT

INTRODUCTION: In this study, two cases that demonstrate the importance of bedside echocardiography and hands-off telemedicine technology for diagnosis and intervention in patients with coronavirus disease 2019 (COVID-19) are discussed.

CASE PRESENTATION: We report two cases of cardiac emergency associated with COVID-19. Case 1 is a 50-year-old female patient with chronic hypertension and chronic renal failure. Case 2 is a 64-year-old female with atrial fibrillation and recent stroke. Both were admitted to an isolation intensive care unit that was designated specifically to patients with COVID-19.

CONCLUSIONS: During admission, both patients had sudden deterioration characterized by oxygen desaturation and hypotension necessitating inotropic support. As a result, for both patients, bedside echocardiography was performed by the attending intensivist. Echocardiographic findings showed cardiac tamponade and acute pulmonary embolism, respectively, which were confirmed by a cardiologist through telemedicine technology. Proper emergency management was initiated, and both patients recovered well. Limited bedside transthoracic echocardiography had a front-line impact on the treatment and outcome of the two patients with COVID-19. By implementing telemedicine technology, the lives of two patients were saved, demonstrating the significance of telemedicine in isolation intensive care units in the developing countries during the COVID-19 pandemic.

Point-of-Care Ultrasonography Saves the Day in Dilated Cardiomyopathy: A Rare Presentation of Hyperhomocysteinemia

[pubmed: bUS](#) by Mack Sheraton / 42d

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INSIGHTS

Add note

Cureus. 2021 Jul 28;13(7):e16699. doi: 10.7759/cureus.16699. eCollection 2021 Jul.

ABSTRACT

Here, we report a case of hereditary hyperhomocysteinemia presenting as dilated cardiomyopathy which was successfully diagnosed using a combination of point-of-care ultrasonography (POCUS) and echocardiogram (ECHO). A 39-year-old Caucasian male with a family history of homocystinuria and early deaths in adult male members from cardiovascular disease presented with complaints of purplish

discoloration and 4/10 pain in bilateral feet along with severe nausea/vomiting for the last two days. Physical examination was significant for tachycardia, low normal mean arterial pressures, dry mucous membranes, right basilar crepitations, S3 gallop with holosystolic murmur along with peripheral cyanosis, and pitting edema. Laboratory examination revealed leucocytosis, elevated d-dimers, high anion gap metabolic acidosis secondary to worsening renal function, elevated liver enzymes, hyperhomocysteinemia, elevated B-type natriuretic peptide, and troponins along with low protein C and S. Electrocardiogram demonstrated left axis deviation with abnormal QRS-T angle and intraventricular conduction delay with a QRS duration of 133 ms. Bedside POCUS and ECHO revealed marked left ventricular dilatation with an ejection fraction of 10% and mitral regurgitation. Computed tomography angiography of the chest and abdomen was positive for partial left subclavian vein thrombus with extensive collateral formation and right-sided pleural effusion. The patient was started on anticoagulants and promptly transferred to a tertiary care center for left ventricular assist device placement. Hyperhomocysteinemia can present with atypical heart failure symptoms, and early usage of bedside POCUS and interpretation of findings in the context of family history are imperative for a successful diagnosis.

Does diaphragm ultrasound improve the rapid shallow breathing index accuracy for predicting the success of weaning from mechanical ventilation?

[pubmed: diaphragm AND ultrasound variant...](#)by Guillaume Fossat / 42d

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INSIGHTS

Add note

Aust Crit Care. 2021 Jul 30:S1036-7314(21)00086-2. doi: 10.1016/j.aucc.2021.05.008. Online ahead of print.

ABSTRACT

BACKGROUND: This prospective study investigated whether taking into account diaphragmatic excursion (DE) measured by ultrasonography would improve the performance of the rapid shallow breathing index (RSBI) to predict extubation success or failure.

OBJECTIVES: The aim of the study was to compare the new composite index named the rapid shallow diaphragmatic index (RSDI), and the RSBI measured during a spontaneous breathing trial regarding their ability to predict the need for re-intubation at 72 h.

METHODS: One hundred mechanically ventilated patients underwent daily 30-min spontaneous breathing trials (SBTs) under pressure support ventilation of 6 cm H₂O and end-expiratory pressure of 0 cm H₂O until the SBT was considered successful and followed by extubation. The performances of RSBI (respiratory rate/tidal volume) and of the ratio RSBI/DE measured at 5 and 25 min of the successful SBT were compared in terms of area under the receiver operating characteristics curve (AUC), for predicting extubation success at 72 h. As secondary analysis, extubation and weaning success at 7 d were also considered. As exploratory analyses, predictive indices incorporating both clinical characteristics, the DE, and ultrasound diaphragm thickening fraction (DTF) were investigated.

RESULTS: RSBI and RSBI/DE showed AUCs with 95% confidence intervals consistently extending below 0.50, either at the 5th (0.55 [0.36-0.74] and 0.55 [0.34-0.75], respectively) or at the 25th minute of SBT (0.49 [0.27-0.71] and 0.50 [0.29-0.68], respectively) for predicting weaning success at 72 h or at 7 d (5th min: 0.53 [0.37-0.70] and 0.54 [0.37-0.70], respectively; 25th min: 0.54 [0.37-0.71] and 0.55 [0.39-0.71], respectively). An exploratory index incorporating the accessory respiratory muscle activity, DE,

DTF, and respiratory rate at 5th min of SBT showed AUCs for predicting extubation success at 7 d in the 78 patients with DTF measurement (0.77 [0.64-0.90]) that were significantly higher than that of the RSBI ($P = 0.017$) and RSBI/DE ($P < 0.001$) in the same respective populations.

CONCLUSIONS: The RSBI and the ratio RSBI/DE failed to predict weaning success when measured during an SBT performed under minimal pressure support. Predictive indices incorporating ultrasound DE and DTF may merit further investigation.

Cardiovascular examination using hand-held cardiac ultrasound

[pubmed: bUS](#) by Sam Jenkins / 41d

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INSIGHTS

Add note

J Echocardiogr. 2021 Aug 2. doi: 10.1007/s12574-021-00540-x. Online ahead of print.

ABSTRACT

Echocardiography is the first-line imaging modality for assessing cardiac function and morphology. The miniaturisation of ultrasound technology has led to the development of hand-held cardiac ultrasound (HCU) devices. The increasing sophistication of available HCU devices enables clinicians to more comprehensively examine patients at the bedside. HCU can augment clinical exam findings by offering a rapid screening assessment of cardiac dysfunction in both the Emergency Department and in cardiology clinics. Possible implications of implementing HCU into clinical practice are discussed in this review paper.

Skills Classification in Cardiac Ultrasound with Temporal Convolution and Domain Knowledge Using a Low-Cost Probe Tracker

[pubmed: bUS](#) by Matthew S Holden / 41d

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INSIGHTS

Add note

Ultrasound Med Biol. 2021 Jul 31:S0301-5629(21)00287-8. doi: 10.1016/j.ultrasmedbio.2021.06.011. Online ahead of print.

ABSTRACT

As point-of-care ultrasound (POCUS) becomes more integrated into clinical practice, it is essential to address all aspects of ultrasound operator proficiency. Ultrasound proficiency requires the ability to acquire, interpret and integrate bedside ultrasound images. The difference in image acquisition psychomotor skills between novice (trainee) and expert (instructor) ultrasonographer has not been described. We created an inexpensive system, called Probe Watch, to record probe motion and assess image acquisition in cardiac POCUS using an inertial measurement device and software for data

recording based on open-source components. We designed a temporal convolutional network for skills classification from probe motion that integrates clinical domain knowledge. We further designed data augmentation methods to improve its generalization. Subsequently, we validated the setup and assessment method on a set of novice and expert sonographers performing cardiac ultrasound in a simulation-based training environment. The proposed methods classified participants as novice or expert with areas under the receiver operating characteristic curve of 0.931 and 0.761 for snippets and trials, respectively. Integrating domain knowledge into the neural network had added value. Furthermore, we identified the most discriminative features for assessment. Probe Watch quantifies motion during cardiac ultrasound and provides insight into probe motion behavior. It may be deployed during cardiac ultrasound training to monitor learning curves objectively and automatically.

Does Point-of-Care Ultrasound Change the Needle Insertion Location During Routine Bedside Paracentesis?

[pubmed: point of care ultras...](#) by David M Rodrigues / 40d

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INSIGHTS

Add note

J Gen Intern Med. 2021 Aug 3. doi: 10.1007/s11606-021-07042-7. Online ahead of print.

ABSTRACT

BACKGROUND: Paracentesis is a bedside procedure to obtain ascitic fluid from the peritoneum. Point-of-care ultrasound (POCUS) improves the safety of some medical procedures. However, the evidence supporting its utility in paracentesis is limited.

OBJECTIVE: We aimed to assess if POCUS would yield a user-preferred site for needle insertion compared to conventional landmarking, defined as a ≥ 5 cm change in location.

DESIGN: This was a prospective non-randomized trial comparing a POCUS-guided site to the conventional anatomic site in the same patient.

PARTICIPANTS: Adult patients at Kingston Health Sciences Centre undergoing paracentesis were included.

INTERVENTIONS: Physicians landmarked using conventional technique and compared this to a POCUS-guided site. The paracentesis was performed at whatever site was deemed optimal, if safe to do so.

MAIN MEASURES: Data collected included the distance from the two sites, depth of fluid pockets, and anatomic considerations.

KEY RESULTS: Forty-five procedures were performed among 30 patients and by 24 physicians, who were primarily in their PGY 1 and 2 years of training (33% and 31% respectively). Patients' ascites was mostly due to cirrhosis (84%) predominantly due to alcohol (47%) and NAFLD (34%). Users preferred the POCUS-guided site which resulted in a change in needle insertion ≥ 5 cm from the conventional anatomic site in 69% of cases. The average depth of fluid was greater at the POCUS site vs. the anatomic site (5.4 ± 2.8 cm vs. 3.0 ± 2.5 cm, $p < 0.005$). POCUS deflected the needle insertion site superiorly and laterally to the anatomic site. The POCUS site was chosen (1) to avoid adjacent organs, (2) to optimize the fluid pocket, and (3) due to abdominal wall considerations, such as pannus. Six cases landmarked anatomically were aborted when POCUS revealed inadequate ascites.

CONCLUSIONS: POCUS changes the needle insertion site from the conventional anatomic site for most procedures, due to optimizing the fluid pocket and safety concerns, and helped avoid cases where an unsafe volume of ascites was present.

A single-center comparative study of lung ultrasound versus chest computed tomography during the COVID-19 era

[pubmed: bUS](#) by Kobalava Zhanna Davidovna / 40d

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INSIGHTS

Add note

Multidiscip Respir Med. 2021 Jul 21;16(1):766. doi: 10.4081/mrm.2021.766. eCollection 2021 Jan 15.

ABSTRACT

BACKGROUND: Lung ultrasound (LUS) is a bedside imaging tool that has proven useful in identifying and assessing the severity of pulmonary pathology. The aim of this study was to determine LUS patterns, their clinical significance, and how they compare to CT findings in hospitalized patients with coronavirus infection.

METHODS: This observational study included 62 patients (33 men, age 59.3 ± 15.9 years), hospitalized with pneumonia due to COVID-19, who underwent chest CT and bedside LUS on the day of admission. The CT images were analyzed by chest radiographers who calculated a CT visual score based on the expansion and distribution of ground-glass opacities and consolidations. The LUS score was calculated according to the presence, distribution, and severity of anomalies.

RESULTS: All patients had CT findings suggestive of bilateral COVID-19 pneumonia, with an average visual scoring of $8.1 \pm 2.9\%$. LUS identified 4 different abnormalities, with bilateral distribution (mean LUS score: 26.4 ± 6.7), focal areas of non-confluent B lines, diffuse confluent B lines, small sub-pleural micro consolidations with pleural line irregularities, and large parenchymal consolidations with air bronchograms. LUS score was significantly correlated with CT visual scoring ($\rho = 0.70$; $p < 0.001$). Correlation analysis of the CT and LUS severity scores showed good interclass correlation (ICC) (ICC = 0.71; 95% confidence interval (CI): 0.52-0.83; $p < 0.001$). Logistic regression was used to determine the cut-off value of ≥ 27 (area under the curve: 0.97; 95% CI: 90-99; sensitivity 88.5% and specificity 97%) of the LUS severity score that represented severe and critical pulmonary involvement on chest CT (CT: 3-4).

CONCLUSION: When combined with clinical data, LUS can provide a potent diagnostic aid in patients with suspected COVID-19 pneumonia, reflecting CT findings.

'Look into Their Hearts' 7-Year-Old Boy with Sickle Cell Disease, Fever, Left Sixth and Seventh Cranial Nerve Palsy and Left Hemiplegia

[pubmed: bUS](#) by Sekou M Jabateh / 40d

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Add note

ABSTRACT

A 7-year-old Liberian boy presented with fever, severe headache, neck pain and 'not being able to walk'. In the emergency room, his sickle cell screen was positive, and his haemoglobin level was 7 g/dl. Initially, he was admitted to the ward with a diagnosis of sickle cell painful crisis and was treated with ceftriaxone iv, and oral morphine and paracetamol. In a more complete physical examination, he had left peripheral seventh nerve palsy, left sixth nerve palsy and ipsilateral hemiplegia, also neck rigidity. In a bedside ultrasound scan, he had a large, mobile vegetation on the aortic leaflet of the mitral valve. The final diagnosis was acute infective endocarditis with multiple embolic strokes in a child with sickle cell disease. Headache and neck rigidity was most likely due to SAH or meningitis.

Undifferentiated Dyspnea with Point-of-Care Ultrasound, Primary Emergency Physician Compared with a Dedicated Emergency Department Ultrasound Team

pubmed: [point of care ultras...](#)by Alexander Beyer / 40d

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INSIGHTS

Add note

J Emerg Med. 2021 Aug 1:S0736-4679(21)00188-8. doi: 10.1016/j.jemermed.2021.03.003. Online ahead of print.

ABSTRACT

BACKGROUND: Emergency physicians (EPs) perform critical actions while operating with diagnostic uncertainty. Point-of-care ultrasound (POCUS) is useful in evaluation of dyspneic patients. In prior studies, POCUS is often performed by ultrasound (US) teams without patient care responsibilities.

OBJECTIVES: This study evaluates the effectiveness of POCUS in narrowing diagnostic uncertainty in dyspneic patients when performed by treating EPs vs. separate US teams.

METHODS: This multicenter, prospective noninferiority cohort study investigated the effect of a POCUS performing team in patient encounters for dyspnea. Before-and-after surveys assessing medical decision-making were administered to attending physicians. Primary outcome was change in most likely diagnosis after POCUS. This was assessed for noninferiority between encounters where the primary or US team performed POCUS. Secondary outcomes included change in differential diagnosis, confidence in diagnosis, interventions considered, and image quality.

RESULTS: There were 156 patient encounters analyzed. In the primary team group, most likely diagnosis changed in 40% (95% confidence interval 28-52%) of encounters vs. 32% (95% confidence interval 22-41%) in the US team group. This was noninferior using an a priori specified margin of 20% ($p < .0001$). Post-POCUS differential decreased by a mean 1.8 diagnoses and was equivalent within a margin of 0.5 diagnoses between performing teams ($p = 0.034$). Other outcomes were similar between groups.

CONCLUSION: POCUS performed by primary teams was noninferior to POCUS performed by US teams for changing the most likely diagnosis, and equivalent when considering mean reduction in number of diagnoses. POCUS performed by treating EPs reduces cognitive burden in dyspneic patients.

Lung Ultrasound in the Diagnosis of COVID-19 Pneumonia: Not Always and Not Only What Is COVID-19 "Glitters"

["lung ultrasound" or "lung ultrasonograp...](#)by Carla Maria Irene Quarato / 39d

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Front Med (Lausanne). 2021 Jul 19;8:707602. doi: 10.3389/fmed.2021.707602. eCollection 2021.

ABSTRACT

Background: In the current coronavirus disease-2019 (COVID-19) pandemic, lung ultrasound (LUS) has been extensively employed to evaluate lung involvement and proposed as a useful screening tool for early diagnosis in the emergency department (ED), prehospitalization triage, and treatment monitoring of COVID-19 pneumonia. However, the actual effectiveness of LUS in characterizing lung involvement in COVID-19 is still unclear. Our aim was to evaluate LUS diagnostic performance in assessing or ruling out COVID-19 pneumonia when compared with chest CT (gold standard) in a population of SARS-CoV-2-infected patients. **Methods:** A total of 260 consecutive RT-PCR confirmed SARS-CoV-2-infected patients were included in the study. All the patients underwent both chest CT scan and concurrent LUS at admission, within the first 6-12 h of hospital stay. **Results:** Chest CT scan was considered positive when showing a "typical" or "indeterminate" pattern for COVID-19, according to the RSNA classification system. Disease prevalence for COVID-19 pneumonia was 90.77%. LUS demonstrated a sensitivity of 56.78% in detecting lung alteration. The concordance rate for the assessment of abnormalities by both methods increased in the case of peripheral distribution and middle-lower lung location of lesions and in cases of more severe lung involvement. A total of nine patients had a "false-positive" LUS examination. Alternative diagnosis included chronic heart disease (six cases), bronchiectasis (two cases), and subpleural emphysema (one case). LUS specificity was 62.50%. Collateral findings indicative of overlapping conditions at chest CT were recorded also in patients with COVID-19 pneumonia and appeared distributed with increasing frequency passing from the group with mild disease (17 cases) to that with severe disease (40 cases). **Conclusions:** LUS does not seem to be an adequate tool for screening purposes in the ED, due to the risk of missing some lesions and/or to underestimate the actual extent of the disease. Furthermore, the not specificity of LUS implies the possibility to erroneously classify pre-existing or overlapping conditions as COVID-19 pneumonia. It seems more safe to integrate a positive LUS examination with clinical, epidemiological, laboratory, and radiologic findings to suggest a "virosis." Viral testing confirmation is always required.

Transthoracic Ultrasound in Infectious Organizing Pneumonia: A Useful Guide for Percutaneous Needle Biopsy

["lung ultrasound" or "lung ultrasonograp...](#)by Donato Lacedonia / 39d

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Front Med (Lausanne). 2021 Jul 19;8:708937. doi: 10.3389/fmed.2021.708937. eCollection 2021.

ABSTRACT

In patients presenting with classical features of CAP (i.e., new peripheral pulmonary consolidations and symptoms including fever, cough, and dyspnea), a clinical response to the appropriate therapy occurs in few days. When clinical improvement has not occurred and chest imaging findings are unchanged or worse, a more aggressive approach is needed in order to exclude other non-infective lesions (including neoplasms). International guidelines do not currently recommend the use of transthoracic ultrasound (TUS) as an alternative to chest X-ray (CXR) or chest computed tomography (CT) scan for the diagnosis of CAP. However, a fundamental role for TUS has been established as a guide for percutaneous needle biopsy (US-PNB) in pleural and subpleural lesions. In this retrospective study, we included 36 consecutive patients whose final diagnosis, made by a US-guided percutaneous needle biopsy (US-PTNB), was infectious organizing pneumonia (OP). Infective etiology was confirmed by additional information from microbiological and cultural studies or with a clinical follow-up of 6-12 months after a second-line antibiotic therapy plus corticosteroids. All patients have been subjected to a chest CT and a systematic TUS examination before biopsy. This gave us the opportunity to explore TUS performance in assessing CT findings of infective OP. TUS sensitivity and specificity in detecting air bronchogram and necrotic areas were far lower than those of CT scan. Conversely, TUS showed superiority in the detection of pleural effusion. Although ultrasound findings did not allow the characterization of chronic subpleural lesions, TUS confirmed to be a valid diagnostic aid for guiding percutaneous needle biopsy of subpleural consolidations.

Is Ultrasonography a Better Method of Endotracheal Tube Size Estimation in Pediatric Age Group than the Conventional Physical Indices-Based Formulae?

pubmed: [pediatric endotrache...](#) by None Gunjan / 39d

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Anesth Essays Res. 2020 Oct-Dec;14(4):561-565. doi: 10.4103/aer.AER_115_20. Epub 2021 May 27.

ABSTRACT

BACKGROUND: Providing safe anaesthesia to paediatric patients is a challenging task. This requires a thorough knowledge of the soft and pliable paediatric airway. Owing to the vulnerability of the anatomical structures involved, choosing an appropriate sized endotracheal tube (ETT) is important in these cases. A larger sized ETT may lead to trauma and a smaller one would result in leakage and risk of aspiration. Both situations demand an immediate tube change, thereby complicating the condition. The physical indices- based formulae have often failed to justify the purpose leading to repeated laryngoscopy and tube change during intubation. The increase in availability of the modern ultrasound devices have shown promise in these cases.

AIMS AND OBJECTIVES: In this study we examine the accuracy of ultrasonography (USG) to assess the appropriate ETT size, comparing it with physical indices based formulae suggested ETT size so that repeated attempts on intubation can be minimized.

MATERIALS AND METHODS: The study group included 100 patients of 1-5 years, ASA I- II, requiring orotracheal intubation under general anaesthesia. The tracheal sub-glottic diameter was estimated by pre-anaesthetic USG to determine the ETT size, both cuffed and uncuffed. ETT data obtained by these methods were compared by Pearson's correlation coefficient and *t*-test.

RESULTS: USG predicted ETT size were significantly more consistent than the physical indices based formulae. Also the age based formulae were found to be more precise than the height based ones. Seven patients required change of tube once.

CONCLUSION: Ultrasonography is an effective tool in predicting paediatric ETT size.

Use of Point-of-Care Ultrasound for Evaluation of Extravascular and Intravascular Fluid Status in Pediatric Patients Maintained on Chronic Hemodialysis

[pubmed: bUS](#)by Orly Haskin / 39d

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INSIGHTS

Add note

Blood Purif. 2021 Jul 14:1-7. doi: 10.1159/000517365. Online ahead of print.

ABSTRACT

AIMS: Traditional methods that use clinical parameters to determine dry weight in hemodialysis patients are inaccurate. This study aimed to compare clinical assessment of fluid status to sonographic parameters of fluid status in pediatric patients undergoing chronic hemodialysis.

METHODS: In a prospective observational study, pediatric patients maintained on chronic hemodialysis (ages 2.3-20 years) were evaluated clinically and sonographically before and after dialysis at 6 consecutive sessions. Sonographic parameters examined were number of lung B-lines as a measure of extravascular volume and inferior vena cava (IVC)/aorta ratio as a measure of intravascular volume. Clinical assessment of fluid status was compared to sonographic assessment.

RESULTS: Twelve patients were evaluated during 72 dialysis sessions. Sonographic parameters were significantly lower post-dialysis than pre-dialysis (B-lines number 4.5 ± 5 vs. 7.69 ± 7.46 , $p < 0.0001$; IVC/aorta ratio 0.9 ± 0.2 vs. 1.1 ± 0.2 , $p < 0.0001$, respectively). Ultrafiltration volume correlated with change in B-lines number during dialysis ($r = 0.39$, $p < 0.01$). Percent of blood volume drop correlated with post-dialysis IVC/aorta ratio ($r = 0.48$, $p < 0.001$). A higher percent of symptomatic episodes occurred with post-dialysis IVC/aorta ratio < 0.8 versus ≥ 0.8 (39.1 vs. 15.2%, $p = 0.036$). Four patients were hypertensive, a clinical parameter implying fluid overload, in only one sonographic evaluation indicated fluid overload. Eight patients were clinically determined to be euvoletic, in three of them sonographic evaluation discovered covert fluids.

CONCLUSION: Bedside ultrasound is a single modality that can be used to assess both extravascular and intravascular fluid status. It may contribute to clinical decisions differentiating fluid-related versus fluid-unrelated hypertension and identifying patients with covert fluids.

Lung ultrasound correlates with radiographic severity and pattern in COVID-19 pneumonia: a preliminary study

[pubmed: bUS](#)by Guangzhou Du / 39d

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ABSTRACT

BACKGROUND: Coronavirus Disease 2019 (COVID-19) was outbreaking in late 2019 and a proportion of patients developed to pneumonia. Although chest CT is a pivotal diagnostic tool for COVID-19 pneumonia, CT is expensive and also radiological burden for patients. There is urgent to investigate the role of lung ultrasound (LUS) in diagnosing and monitoring COVID-19 pneumonia.

METHODS: A total of 8 patients with confirmed cases of COVID-19 pneumonia in Shantou Central Hospital from January 2020 to February 2020 were retrospectively studied. All participants underwent chest HRCT and LUS examination; both were independently performed within 1 day of the other. The radiological patterns were reviewed by 2 radiologists who were blind to the clinical information. A senior ultrasound physician, blind to HRCT results and clinical data, performed bedside LUS in the isolation ward. The CT score was used (a semi-quantitative scoring system) to assess radiographic severity and extent. A B-lines score denoting the extent and severity of sonographic lesion was calculated by summing the number of B-lines on 18 scanning sites.

RESULTS: B-lines (100%), pleural irregularities (25%), consolidation (25%), and pleural effusion (25%) were the main findings of LUS examination. Interstitial abnormalities, ground-glass opacities (GGO), consolidations and local or bilateral patchy shadowing were the main findings of HRCT examination. The findings of LUS and HRCT were compared point to point and high consistency was found between the 2 measurements. A significant correlation was also found between the B-lines score and CT score [$r=0.96$, 95% confidence interval (CI): 0.81 to 0.99, $P=0.0001$].

CONCLUSIONS: Both LUS patterns and B-lines score are significantly correlated with HRCT findings and score, respectively, supporting its role in assessing COVID-19 pneumonia severity, screening, and following up dynamic changes of pneumonia.

Eye-Neck Integrated Ultrasound in Idiopathic Intracranial Hypertension and Cerebral Venous Sinus Thrombosis

[optic nerve ultrasound](#) by Li Liu / 38d

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ABSTRACT

Background: The clinical presentation of cerebral venous sinus thrombosis (CVST) overlaps with that of idiopathic intracranial hypertension (IIH), but no screening tool exists. We investigated the role of eye-neck integrated ultrasound in the diagnosis and differentiation of IIH and CVST. **Methods:** Twenty IIH patients, 30 CVST patients, and 40 healthy controls were retrospectively analyzed. The ultrasonographic optic nerve sheath diameter (ONSD) and hemodynamic characteristics of the internal jugular veins (IJVs) were recorded. The cerebrospinal fluid opening pressure was measured after ultrasonic

examination. **Results:** The ONSD was significantly larger in IIH patients than in controls (4.71 ± 0.41 vs. 3.93 ± 0.24 mm, $p < 0.001$). The ONSD cut-off for IIH diagnosis was 4.25 mm (AUC = 0.978; 95% CI: 0.95-1.0, $p < 0.001$, sensitivity: 90%, specificity: 93%). In the CVST group, 22 (73.3%) patients had elevated intracranial pressure (ICP); the mean ONSD was significantly higher in patients with increased ICP than in those without (4.43 ± 0.33 vs. 3.95 ± 0.17 mm, $p < 0.001$). The mean blood flow volume (BFV) was significantly reduced in CVST patients (425.17 ± 349.83 mL/min) compared to that in controls (680.37 ± 233.03 mL/min, $p < 0.001$) and IIH patients (617.67 ± 282.96 mL/min, $p = 0.008$). The optimal BFV cut-off for predicting CVST was 527.28 mL/min (AUC = 0.804, 95% CI: 0.68-0.93, $p < 0.001$, sensitivity: 80%, specificity: 78%). The velocity of the unilateral IJVs-J3 segment decreased or remained constant during deep inspiration (abnormal respiratory modulate blood flow test, ARMT) in 32.5% of controls, with no bilateral ARMT. The prevalence of bilateral ARMT was 25% in IIH patients ($\chi^2 = 12.9$, $p = 0.005$) and 27% in CVST patients ($\chi^2 = 17.6$, $p = 0.001$). **Conclusion:** Eye-neck integrated ultrasound is an easily available bedside technique to assess ICP and hemodynamic characteristics of IJVs. ONSD measurement can identify patients with increased ICP, and reduced IJV BFV may aid the differentiation of CVST and IIH.

Sarcopenia in critically ill children: A bedside assessment using point-of-care ultrasound and anthropometry

pubmed: [point of care ultras...](#) by Ruane S de Figueiredo / 38d

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Clin Nutr. 2021 Jul 21;40(8):4871-4877. doi: 10.1016/j.clnu.2021.07.014. Online ahead of print.

ABSTRACT

BACKGROUND & AIMS: Due to the lack of validated methods of muscle assessment, sarcopenia is not well described in critically ill children. The main objectives of this study were to assess muscle wasting using point-of-care ultrasound (POCUS) and anthropometry, as well as its association with nutrition delivery in PICU.

METHODS: This was a single-center, prospective cohort study, including consecutive children admitted to the PICU. Quadriceps femoris muscle thickness (QFMT) and anthropometrics measurements were performed at admission and then weekly until the 14th day of the PICU stay. The three moments of assessment were defined as T0 (baseline), T1 (7th day) and T2 (14th day). For analysis purposes, participants assessed only in T0 and T1 were defined as Subgroup 1, while those assessed in T0, T1 and T2 were defined as Subgroup 2. Actual total daily intake was determined by patient intake records until discharge or during the first 14 full days of PICU admission.

RESULTS: In all, 119 patients were included with a median age of 12.0 months (IQR 4.0-42.5). In Subgroup 1, QFMT significantly decreased between T0 and T1 (-12.93 ± 14.07 %; $p < 0.001$), and the same was observed in Subgroup 2 (-13.81 ± 13.05 %; $p < 0.001$). However, no differences in QFMT was observed between T1 and T2 (-2.06 ± 13.80 %; $p = 0.936$). Triceps skinfold thickness, mid-upper arm circumference, and upper arm muscle area presented a similar pattern of changes between periods in both groups. Decrease of QFMT at T1 was significantly correlated with the cumulative protein deficit in both subgroups, but not with the cumulative energy deficit.

CONCLUSION: Substantial muscle wasting occurs early in critically ill children and may be related to insufficient protein delivery. Anthropometric measurements are valuable in PICU and POCUS has the potential to play a major role in sarcopenia assessment during critical illnesses.

Lung Ultrasound Examination in Patients with SARS-CoV-2 Infection: Multicenter Study

pubmed: bUS by Natalia Buda / 38d

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J Clin Med. 2021 Jul 23;10(15):3255. doi: 10.3390/jcm10153255.

ABSTRACT

BACKGROUND: The COVID-19 pandemic has, by necessity, contributed to rapid advancements in medicine. Owing to the necessity of following strict anti-epidemic sanitary measures when taking care of infected patients, the accessibility of standard diagnostic methods may be limited. Consequently, the significance and potential of bedside diagnostic modalities increase, including lung ultrasound (LUS).

METHOD: Multicenter registry study involving adult patients with confirmed COVID-19, for whom LUS was performed.

RESULTS: A total of 228 patients (61% males) qualified for the study. The average age was 60 years (± 14), 40% were older than 65 years of age. In 130 from 173 hospitalized patients, HRCT (high-resolution computed tomography) was performed. In 80% of patients, LUS findings indicated interstitial pneumonia. In hospitalized patients multifocally located single B-lines, symmetrical B-lines, and areas of white lung were significantly more frequent as compared to ambulatory patients. LUS findings, both those indicating interstitial syndrome and consolidations, were positively correlated with HRCT images. As compared to HRCT, the sensitivity and specificity of LUS in detecting interstitial pneumonia were 97% and 100%, respectively.

CONCLUSIONS: As compared to HRCT, LUS is characterized by a very high sensitivity and specificity in detecting interstitial pneumonia in COVID-19 patients. Potentially, LUS can be a particularly useful diagnostic modality for COVID-19 patients pneumonia.

Pleural Effusions Identified by Point-of-Care Ultrasound Predict Poor Outcomes in Decompensated Cirrhosis

pubmed: bUS by Erick Joel Rendón-Ramírez / 36d

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Add note

Ultrasound Med Biol. 2021 Aug 5:S0301-5629(21)00303-3. doi: 10.1016/j.ultrasmedbio.2021.07.006. Online ahead of print.

ABSTRACT

Chronic liver disease (CLD) may be associated with pleural effusions (PEs). This article prospectively evaluates whether detection of PEs on thoracic ultrasound (TUS) at the bedside independently predicts

mortality and length of stay (LOS) in hospitalized patients with a decompensated CLD. A total of 116 consecutive inpatients with decompensated cirrhosis underwent antero-posterior chest radiographs (CXR) and TUS to detect PEs. Their median age was 54 y (interquartile range, 47-62), 90 (70.6%) were male, and 61 (52.6%) fell into the Child-Pugh class C categorization. TUS identified PEs in 58 (50%) patients, half of which were small enough to preclude thoracentesis. CXR failed to recognize approximately 40% of PEs seen on TUS. The identification of PEs by TUS was associated with a longer LOS (10 vs. 5.5 d, $p < 0.001$) and double mortality (39.7% vs. 20.7%, $p = 0.021$). In multivariate analysis, PEs were independently related to poor survival (hazard ratio 2.08, 95% confidence interval [CI] 1.02-4.25; $p = 0.044$). Patients with both Child-Pugh C stage and PEs had the lowest survival rate (70 vs. 317 d, $p = 0.001$). In conclusion, PEs identified by TUS in hospitalized patients with decompensated CLD independently predict a poor outcome and portend a longer LOS.

Detection of Central Retinal Artery Occlusion by Point-of-Care Ultrasound in the Emergency Department: A Case Series

[pubmed: bUS](#) by Kevin R Caja / 35d

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Add note

Cureus. 2021 Jul 3;13(7):e16142. doi: 10.7759/cureus.16142. eCollection 2021 Jul.

ABSTRACT

Central retinal artery occlusion (CRAO) is a rare, but serious, diagnosis that can lead to blindness, most often due to thromboembolic disease. In the emergency department (ED), CRAO can present as acute, painless loss of vision. Physicians need quick ways to rule in this diagnosis due to the time-sensitive nature of the event. We describe two patients in this cases series who present to the same ED with unilateral painless vision loss and histories that include notable risk factors such as thromboembolic and atherosclerotic disease. Upon arrival, point-of-care ultrasound (POCUS) done at the bedside allowed for quick determination of CRAO. The importance of this case series is to emphasize the efficacy of POCUS in evaluating patients with painless vision loss in the ED setting.

Description of the Use of Incentives and Penalties for Point-of-Care Ultrasound Documentation Compliance in an Academic Emergency Department

[pubmed: point of care ultras...](#) by Myles Melton / 35d

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Cureus. 2021 Jul 5;13(7):e16199. doi: 10.7759/cureus.16199. eCollection 2021 Jul.

ABSTRACT

Objectives Incomplete documentation and submission to the electronic health record of performed point-of-care ultrasound (POCUS) studies is problematic from a patient care, medicolegal, and billing

standpoint. Positive and negative financial incentives may be used to motivate physicians to complete documentation workflow. The most efficacious route to improve POCUS workflow completion remains to be determined. Materials and methods A retrospective analysis of POCUS documentation in an academic emergency department during four distinct six-month blocks was performed. POCUS workflow completion was assessed without incentives (Baseline), with financial bonus (Incentive), interim period (Washout), and with a negative financial incentive (Penalty) to determine the effect of these incentives on workflow completion. Results There was an appreciable increase in the rate of POCUS studies documented between the "Baseline" (no incentive) and "Incentive" (small financial bonus) time periods. The improvement remained stable during the "Washout" (interim) period, and then increased further in the "Penalty" (negative financial incentive) period. This improvement was relatively diffuse among the providers studied. A similar pattern - improvements in the Incentive and Penalty periods with stability in the Washout - was also observed in the POCUS volume data (number of studies performed). Conclusions This study reveals a positive association between the implementation of both financial incentives and financial penalties, which increases in POCUS documentation among attending physicians at an academic emergency department.

Automated detection of pneumonia in lung ultrasound using deep video classification for COVID-19

[pubmed: point of care ultras...](#) by Salehe Erfanian Ebadi / 35d

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Inform Med Unlocked. 2021;25:100687. doi: 10.1016/j.imu.2021.100687. Epub 2021 Aug 4.

ABSTRACT

There is a crucial need for quick testing and diagnosis of patients during the COVID-19 pandemic. Lung ultrasound is an imaging modality that is cost-effective, widely accessible, and can be used to diagnose acute respiratory distress syndrome in patients with COVID-19. It can be used to find important characteristics in the images, including A-lines, B-lines, consolidation, and pleural effusion, which all inform the clinician in monitoring and diagnosing the disease. With the use of portable ultrasound transducers, lung ultrasound images can be easily acquired, however, the images are often of poor quality. They often require an expert clinician interpretation, which may be time-consuming and is highly subjective. We propose a method for fast and reliable interpretation of lung ultrasound images by use of deep learning, based on the Kinetics-I3D network. Our learned model can classify an entire lung ultrasound scan obtained at point-of-care, without requiring the use of preprocessing or a frame-by-frame analysis. We compare our video classifier against ground truth classification annotations provided by a set of expert radiologists and clinicians, which include A-lines, B-lines, consolidation, and pleural effusion. Our classification method achieves an accuracy of 90% and an average precision score of 95% with the use of 5-fold cross-validation. The results indicate the potential use of automated analysis of portable lung ultrasound images to assist clinicians in screening and diagnosing patients.

Quantification analysis of pleural line movement for the diagnosis of pneumothorax

["lung ultrasound" or "lung ultrasonograp...](#) by Rui Xiao / 35d

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ABSTRACT

BACKGROUND: There is no research on quantitative pleural line movement. In this study, we assume that tissue Doppler and its quantitative technology can quantify the pleural line movement and can be used to diagnose pneumothorax.

AIM: To evaluate the quantitative assessment of pleural line movement measured by tissue Doppler imaging (TDI) for pneumothorax diagnosis.

METHODS: Adult patients ($n = 45$) diagnosed with unilateral pneumothorax were included in this study. Each patient underwent TDI of both lungs. The pneumothorax side and contralateral normal lung side were compared using several indices obtained from TDI: peak pleural line velocity (PV_{max}), peak chest wall tissue velocity (CV_{max}), peak pleural line strain value (PS_{max}), peak chest wall tissue strain value (CS_{max}), PV_{max}/CV_{max} and PS_{max}/CS_{max} . The receiver operating characteristic analysis was used to evaluate the performance of these quantitative assessments for pneumothorax diagnosis.

RESULTS: Various quantitative variables of the pneumothorax side were all lower than that of the non-pneumothorax side and included the PV_{max} (0.36 cm/s vs 0.59 cm/s, $P < 0.001$), PS_{max} (1.14% vs 1.90%, $P = 0.001$), PV_{max}/CV_{max} (1.06 vs 4.93, $P < 0.001$), and PS_{max}/CS_{max} (0.76 vs 1.74, $P < 0.001$). For the discrimination of pneumothorax, the cut-off values of the PV_{max} , PS_{max} , PV_{max}/CV_{max} , and PS_{max}/CS_{max} were calculated as 0.50 cm/s, 0.94%, 1.96, and 1.12, respectively. Similarly, the sensitivities and specificities of PV_{max} , PS_{max} , PV_{max}/CV_{max} , and PS_{max}/CS_{max} were 96% and 62%, 47% and 91%, 93% and 96%, and 82% and 93%, respectively. The area under the receiver operating characteristic curve were 0.84, 0.72, 0.99, and 0.91, respectively, for PV_{max} , PS_{max} , PV_{max}/CV_{max} , and PS_{max}/CS_{max} .

CONCLUSION: Quantification analysis of pleural line movement using TDI is a useful tool for the diagnosis of pneumothorax.

Doppler ultrasound improves diagnostic accuracy for testicular torsion

[acute scrotum or testicular torsion](#) by Karl Teurneau-Hermansson / 35d

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Scand J Urol. 2021 Aug 9:1-5. doi: 10.1080/21681805.2021.1962404. Online ahead of print.

ABSTRACT

BACKGROUND: Doppler ultrasound can diagnose testicular torsion with high sensitivity and specificity but may delay surgical treatment. This study aims to assess whether the use of doppler ultrasound, in cases with intermediate clinical suspicion of testicular torsion, can improve diagnostic accuracy compared to clinical assessment alone.

METHODS: We implemented a new clinical algorithm where patients with intermediate suspicion of testicular torsion undergo doppler ultrasound within 60 min. This study compared the patients that presented within one year prior to the implementation (group 1) to the patients who presented within one year after the implementation (group 2). The primary outcome measure was failure to confirm testicular torsion upon surgical exploration (negative surgical exploration). Missed testicular torsion was one of the secondary endpoints.

RESULTS: 590 consecutive patients were included. 322 (55%) in group 1 and 268 (45%) in group 2. There were 9 (2.8%) testicular torsions in group 1 vs 9 (3.4%) in group 2 ($p = 0.69$) and 2 (0.6%) missed testicular torsions in group 1 vs 0 in group 2 ($p = 0.50$). Doppler ultrasound was performed in 65 patients (24.2%) in group 2 vs 0 in group 1 ($p < 0.01$). Negative surgical exploration was performed in 27 (8.4%) patients in group 1 vs 8 (3.0%) in group 2 ($p < 0.01$).

CONCLUSION: Doppler ultrasound assessment of patients at intermediate clinical risk of testicular torsion significantly reduced the frequency of negative surgical explorations without increased rate of missed testicular torsions.

Remote ultrasound diagnostics disrupting traditional military frontline healthcare delivery

[pubmed: point of care ultras...](#) by Georgina Blenkinsop / 35d

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INSIGHTS

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BMJ Mil Health. 2021 Aug 9:bmjmilitary-2021-001821. doi: 10.1136/bmj-military-2021-001821. Online ahead of print.

ABSTRACT

Accurate and reliable diagnostic capability is essential in deployed healthcare to aid decision-making and mitigate risk. This is important for both the patient and the deployed healthcare system, especially when considering the prioritisation of scarce aeromedical evacuation assets and frontline resources. Novel ultrasound tele-guidance technology presents a valuable diagnostic solution for remotely deployed military clinicians. This report discusses the first use of a consultant radiologist guiding a clinician, untrained in ultrasound, to perform an ultrasound scan via a live tele-guidance feed in the deployed environment using the Butterfly iQ+ tele-guidance system. Distance scanning provided a diagnostic quality report when compared with locally performed imaging to improve patient care and maintain operational output. This example demonstrates feasibility of remote point-of-care imaging systems in provision of location-agnostic high-quality diagnostic capability. Future opportunities to develop care pathways using bedside tele-diagnostics will democratise access, drive efficiency and improve patient care experience and outcomes.

Limited Chest Ultrasound to Replace CXR in Diagnosis of Pneumothorax Post Image-Guided Transthoracic Interventions

[pubmed: bUS](#) by Hooman Hosseini-Nik / 34d

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Can Assoc Radiol J. 2021 Aug 10;8465371211034016. doi: 10.1177/08465371211034016. Online ahead of print.

ABSTRACT

PURPOSE: To assess the diagnostic accuracy of limited chest ultrasound in detecting pneumothorax following percutaneous transthoracic needle interventions using chest X-ray (CXR) as the reference standard.

METHODS: With IRB approval, after providing consent, asymptomatic patients after percutaneous transthoracic needle interventions were enrolled to undergo limited chest ultrasound in addition to CXR. A chest Radiologist blinded to the patient's prior imaging performed a bedside ultrasound, scanning only the first 3 anterior intercostal spaces. Pneumothorax diagnosed on CXR was categorized as small or large and on ultrasound as grades 1, 2, or 3 when detected in 1, 2, or 3 intercostal spaces, respectively.

RESULTS: 38 patients underwent 36 biopsies (34 lungs, 1 pleura, and 1 mediastinum) and 2 coil localizations. CXR showed pneumothorax in 13 patients. Ultrasound was positive in 10 patients, with 9 true-positives, 1 false-positive, 4 false-negatives, and 24 true-negatives. The false positive results were due to apical subpleural bullae. The false-negative results occurred in 2 small apical and 2 focal pneumothoraces at the needle entry sites. Four pneumothoraces were categorized as large on CXR, all of which were categorized as grade 3 on ultrasound. Sensitivity and specificity of US for detection of pneumothorax of any size were 69.23% (95%CI 38.6%, 90.1%) and 96.0% (95%CI 79.6%, 99.9%), and for detection of large pneumothorax were 100% (95%CI 39.8%, 100%) and 100% (95%CI 89.7%, 100%).

CONCLUSIONS: Results of this prospective study is promising. Limited chest ultrasound could potentially replace CXR in the management of postpercutaneous transthoracic needle intervention patients.

Point-of-Care Ultrasound in the Diagnosis of an Incarcerated Inguinal Hernia

[pubmed: point of care ultras...](#)by Kristina Jacomino / 33d

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Cureus. 2021 Jul 9;13(7):e16281. doi: 10.7759/cureus.16281. eCollection 2021 Jul.

ABSTRACT

Emergency physicians can use point-of-care ultrasound to diagnose inguinal hernias as well as their potential complications, including small bowel obstruction, incarceration, and even strangulation. We provide an overview of the sonographic appearance of inguinal hernias, as well as the diagnostic criteria of serious complications. In this case report, point-of-care ultrasound findings included a non-reducible inguinal hernia associated with significant bowel dilation in multiple loops without signs of intestinal ischemia or necrosis.

The Inter-Rater Reliability of Pediatric Point-of-Care Lung Ultrasound Interpretation in Children with Acute Respiratory Failure

[pubmed: point of care ultras...by Ryan L DeSanti / 33d](#)
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INSIGHTS

Add note

J Ultrasound Med. 2021 Aug 11. doi: 10.1002/jum.15805. Online ahead of print.

ABSTRACT

OBJECTIVES: Use of point-of-care lung ultrasound (POC-LUS) has increased significantly in pediatrics yet it remains under-studied in the pediatric intensive care unit (PICU). No studies explicitly evaluate the reliability of POC-LUS artifact interpretation among critically ill children with acute respiratory failure (ARF) in the PICU. We thus designed this study to determine the inter-rater reliability of POC-LUS interpretation in pediatric ARF among pediatric intensivists trained in POC-LUS and an expert intensivist.

METHODS: We compared the interpretation of lung sliding, pleural line characteristics, ultrasound artifacts, and POC-LUS diagnoses among pediatric intensivists and an expert intensivist in a cohort of children admitted to the PICU for ARF. Kappa statistics (k) adjusted for maximum attainable agreement (k/k_{max}) were used to quantify chance-correct agreement between the pediatric intensivist and expert physician.

RESULTS: We enrolled 88 patients, evaluating 3 zones per hemithorax (anterior, lateral, and posterior) for lung sliding, pleural line characteristics, ultrasound artifacts, and diagnosis. There was moderate agreement between the PICU intensivist and expert-derived diagnoses with 56% observed agreement ($k/k_{max} = 0.46$, 95% confidence interval [CI] 0.31-0.65). Agreement in identification of lung sliding ($k = 0.19$, 95% CI -0.17 to 0.56) and pleural line characteristics ($k = 0.24$, 95% CI 0.08-0.40) was slight and fair, respectively, while agreement in the interpretation of ultrasound artifacts ranged from moderate to substantial.

CONCLUSIONS: Evidence supporting the evaluation of neonatal and adult patients with POC-LUS should not be extrapolated to critically ill pediatric patients. This study adds to the evidence supporting use of POC-LUS in the PICU by demonstrating moderate agreement between PICU intensivist and expert-derived POC-LUS diagnoses.

The role of lung ultrasonography in predicting the clinical outcome of complicated community-acquired pneumonia in hospitalized children

["lung ultrasound" or "lung ultrasonograp...by Marcela Daniela Ionescu / 33d](#)
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INSIGHTS

Add note

Med Ultrason. 2021 Aug 4. doi: 10.11152/mu-3124. Online ahead of print.

ABSTRACT

AIMS: This study's objective was to analyze lung ultrasonography (LUS) characteristics in hospitalized pediatric patients with complicated community-acquired pneumonia (CAP). We hypothesized that LUS could be correlated with the clinical outcome in these cases.

MATERIALS AND METHODS: In this retrospective study, we evaluated the LUS appearances (at admission and five days after the beginning of the treatment) and the progression of complicated CAP.

RESULTS: We identified 45 patients who fulfilled the inclusion criteria. Several complications occurred in these subjects during follow-up including: serofibrinous pleurisy (62.2%), empyema (15.6%), encapsulated pleurisy (11.1%), lung abscess (6.7%) and necrotizing pneumonia (2.2%). In addition, 22.2% of the patients required surgical treatment: draining tube (11.1%), decortication (6.7%) and resection (4.4%). Intensive care unit admission was needed in 8.9% of patients. The median duration of hospitalization was 14 [9.7; 19.7] days. The thickness of pleural effusion with a cut-off value of 10 mm seen by LUS was a predictor for the need for continuous thoracic drainage ($p < 0.01$), segmentectomy or thoracoscopic surgery ($p = 0.03$) and prolonged hospitalization over 10 days ($p < 0.01$). Hyperechogenic pleural effusion, presence of septa and fluid bronchogram on 1st LUS evaluation were independent predictors of segmentectomy or thoracoscopic decortication ($p < 0.01$) and of longer hospitalization ($p = 0.02$, $p < 0.01$, $p < 0.01$ respectively).

CONCLUSIONS: The ultrasound characteristics of complicated CAP can offer valuable information to predict the clinical evolution of CAP and so can help the development of personalized medical management plans in these patients.

Role of point-of-care ultrasound (POCUS) in the diagnosis of an abscess in paediatric skin and soft tissue infections: a systematic review and meta-analysis

[pubmed: point of care ultras...](#) by Jiangfeng Wu / 33d

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INSIGHTS

Add note

Med Ultrason. 2021 Aug 4. doi: 10.11152/mu-3166. Online ahead of print.

ABSTRACT

AIMS: To evaluate the effect of point-of-care ultrasound (POCUS) for the diagnosis of an abscess and to compare the diagnostic accuracy of POCUS and physical examination (PE) in paediatric patients with skin and soft tissue infections (SSTI) in the emergency department.

MATERIAL AND METHODS: A comprehensive literature search was carried out to identify Englishlanguage studies on POCUS for differentiating an abscess from cellulitis in paediatric patients with SSTI. The quality of the study was assessed by the Quality Assessment of Diagnostic Accuracy Studies 2 tool, and pooled sensitivity and specificity of various POCUS findings were determined.

RESULTS: Seven studies with a total of 870 patients were included. There was significant heterogeneity across the included studies. The pooled sensitivity, specificity, positive likelihood ratio, negative likelihood ratio, and diagnostic odds ratio for the diagnosis of abscess by POCUS were 0.90 (95% confidence interval [CI], 0.82-0.95), 0.80 (95% CI, 0.72-0.86), 4.5 (95% CI, 3.1-6.4), 0.13 (95% CI, 0.07-0.23), and 36 (95% CI, 17-75), respectively, with an area under the curve (AUC) was 0.89 (95% CI, 0.86-0.91). Four

studies provided data regarding the PE method. The pooled sensitivity, specificity, and AUC of PE for the abscess were 0.84 (95% CI, 0.80-0.88), 0.69 (95% CI, 0.62-0.76), and 0.85 (95% CI, 0.81-0.88).

CONCLUSIONS: POCUS is useful in identifying abscesses in paediatric patients with SSTI in emergency department, especially when PE is equivocal and outperforms PE alone.

Prevalence and significance of pulmonary disease on lung ultrasonography in outpatients with SARS-CoV-2 infection

["lung ultrasound" or "lung ultrasonograp..."](#) by Robert M Fairchild / 32d

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INSIGHTS

Add note

BMJ Open Respir Res. 2021 Aug;8(1):e000947. doi: 10.1136/bmjresp-2021-000947.

ABSTRACT

BACKGROUND: The majority of patients with SARS-CoV-2 infection are diagnosed and managed as outpatients; however, little is known about the burden of pulmonary disease in this setting. Lung ultrasound (LUS) is a convenient tool for detection of COVID-19 pneumonia. Identifying SARS-CoV-2 infected outpatients with pulmonary disease may be important for early risk stratification.

OBJECTIVES: To investigate the prevalence, natural history and clinical significance of pulmonary disease in outpatients with SARS-CoV-2.

METHODS: SARS-CoV-2 PCR positive outpatients (CV(+)) were assessed with LUS to identify the presence of interstitial pneumonia. Studies were considered positive based on the presence of B-lines, pleural irregularity and consolidations. A subset of patients underwent longitudinal examinations. Correlations between LUS findings and patient symptoms, demographics, comorbidities and clinical outcomes over 8 weeks were evaluated.

RESULTS: 102 CV(+) patients underwent LUS with 42 (41%) demonstrating pulmonary involvement. Baseline LUS severity scores correlated with shortness of breath on multivariate analysis. Of the CV(+) patients followed longitudinally, a majority showed improvement or resolution in LUS findings after 1-2 weeks. Only one patient in the CV(+) cohort was briefly hospitalised, and no patient died or required mechanical ventilation.

CONCLUSION: We found a high prevalence of LUS findings in outpatients with SARS-CoV-2 infection. Given the pervasiveness of pulmonary disease across a broad spectrum of LUS severity scores and lack of adverse outcomes, our findings suggest that LUS may not be as useful as a risk stratification tool in SARS-CoV-2 in the general outpatient population.

Point-of-Care Ultrasound Evaluation of Ankle Injuries in Children

[pubmed: point of care ultras...](#) by Laurie Malia / 31d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Aug 13. doi: 10.1002/jum.15807. Online ahead of print.

ABSTRACT

OBJECTIVES: To determine if point-of-care ultrasound (POCUS) of ankle injuries in children, in conjunction with validated ankle injury clinical prediction rules, can accurately diagnose ankle fracture in children.

METHODS: A prospective observational study was conducted on patients (birth-21 years) presenting to a pediatric emergency department with an ankle injury requiring ankle radiograph. POCUS of the injured ankle was performed to evaluate for fracture. Clinical prediction rule scores (Ottawa Ankle and Low Risk Ankle) were recorded along with pre- and post-ultrasound clinical suspicion for fracture. Diagnosis of ankle fracture was confirmed via radiology radiograph report. Test characteristics of sensitivity, specificity, positive and negative predictive values were calculated.

RESULTS: Forty-eight patients were enrolled, 58% were female, with a mean age of 12.2 years (SD 3.8). Twelve (25%) patients had ankle POCUS positive or indeterminate for fracture. Nine (19%) patients had fracture based on radiograph, and 6 of the 9 (67%) patients with fracture had open growth plates. Ankle POCUS was found to have a sensitivity of 56% (95% confidence interval [CI], 23-85%), specificity of 82% (95% CI, 66-92%), positive predictive value of 42% (95% CI, 17-71%), and negative predictive value of 89% (95% CI, 73-96%).

CONCLUSIONS: Our findings suggest that ankle POCUS in children is a difficult application to perform and interpret compared with radiographic diagnosis of fracture. Open growth plates may complicate accurate identification of fracture using POCUS and at this time serves as a poor screening exam to assess for fracture or the need for radiographs.

Deep-learning based detection of COVID-19 using lung ultrasound imagery

["lung ultrasound" or "lung ultrasonograp...](#) by Julia Diaz-Escobar / 31d

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INSIGHTS

Add note

PLoS One. 2021 Aug 13;16(8):e0255886. doi: 10.1371/journal.pone.0255886. eCollection 2021.

ABSTRACT

BACKGROUND: The COVID-19 pandemic has exposed the vulnerability of healthcare services worldwide, especially in underdeveloped countries. There is a clear need to develop novel computer-assisted diagnosis tools to provide rapid and cost-effective screening in places where massive traditional testing is not feasible. Lung ultrasound is a portable, easy to disinfect, low cost and non-invasive tool that can be used to identify lung diseases. Computer-assisted analysis of lung ultrasound imagery is a relatively recent approach that has shown great potential for diagnosing pulmonary conditions, being a viable alternative for screening and diagnosing COVID-19.

OBJECTIVE: To evaluate and compare the performance of deep-learning techniques for detecting COVID-19 infections from lung ultrasound imagery.

METHODS: We adapted different pre-trained deep learning architectures, including VGG19, InceptionV3, Xception, and ResNet50. We used the publicly available POCUS dataset comprising 3326 lung ultrasound frames of healthy, COVID-19, and pneumonia patients for training and fine-tuning. We conducted two experiments considering three classes (COVID-19, pneumonia, and healthy) and two classes (COVID-19 versus pneumonia and COVID-19 versus non-COVID-19) of predictive models. The obtained results were also compared with the POCOVID-net model. For performance evaluation, we calculated per-class classification metrics (Precision, Recall, and F1-score) and overall metrics (Accuracy, Balanced Accuracy, and Area Under the Receiver Operating Characteristic Curve). Lastly, we performed a statistical analysis of performance results using ANOVA and Friedman tests followed by post-hoc analysis using the Wilcoxon signed-rank test with the Holm's step-down correction.

RESULTS: InceptionV3 network achieved the best average accuracy (89.1%), balanced accuracy (89.3%), and area under the receiver operating curve (97.1%) for COVID-19 detection from bacterial pneumonia and healthy lung ultrasound data. The ANOVA and Friedman tests found statistically significant performance differences between models for accuracy, balanced accuracy and area under the receiver operating curve. Post-hoc analysis showed statistically significant differences between the performance obtained with the InceptionV3-based model and POCOVID-net, VGG19-, and ResNet50-based models. No statistically significant differences were found in the performance obtained with InceptionV3- and Xception-based models.

CONCLUSIONS: Deep learning techniques for computer-assisted analysis of lung ultrasound imagery provide a promising avenue for COVID-19 screening and diagnosis. Particularly, we found that the InceptionV3 network provides the most promising predictive results from all AI-based techniques evaluated in this work. InceptionV3- and Xception-based models can be used to further develop a viable computer-assisted screening tool for COVID-19 based on ultrasound imagery.

Point-of-Care Ultrasound in Acute Care Nephrology

[pubmed: point of care ultras...](#)by Nithin Karakala / 31d

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INSIGHTS

Add note

Adv Chronic Kidney Dis. 2021 Jan;28(1):83-90. doi: 10.1053/j.ackd.2021.06.003.

ABSTRACT

The use of point-of-care ultrasound (POCUS) is rapidly increasing in nephrology. It provides the opportunity to obtain complementary information that is more accurate than the classic physical examination. One can quickly follow the physical examination with a systematic POCUS evaluation of the kidneys, ureter bladder, inferior vena cava, heart, and lungs, which can provide diagnostic information and an accurate assessment of the patient's hemodynamics and volume status. Moreover, because it is safe and relatively easy to perform, it can be performed in a repeated manner as often as necessary so that the physician can reassess the patient's hemodynamics and volume status and adjust their therapy accordingly, permitting a more personalized approach to patient care (rather than blindly following protocols), especially to patients in acute care nephrology. Despite these advantages, nephrologists have been slow to adopt this diagnostic modality, perhaps because of lack of expertise. This review will provide an overview of the most commonly used POCUS examinations performed by nephrologists in the acute

care setting. Its aim is to spark interest in in POCUS and to lay the foundation for readers to pursue more advanced training so that POCUS becomes a readily available tool in your diagnostic arsenal.

Deep learning and lung ultrasound for Covid-19 pneumonia detection and severity classification

["lung ultrasound" or "lung ultrasonograp...](#)by Marco La Salvia / 31d

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INSIGHTS

Add note

Comput Biol Med. 2021 Aug 8;136:104742. doi: 10.1016/j.compbimed.2021.104742. Online ahead of print.

ABSTRACT

The Covid-19 European outbreak in February 2020 has challenged the world's health systems, eliciting an urgent need for effective and highly reliable diagnostic instruments to help medical personnel. Deep learning (DL) has been demonstrated to be useful for diagnosis using both computed tomography (CT) scans and chest X-rays (CXR), whereby the former typically yields more accurate results. However, the pivoting function of a CT scan during the pandemic presents several drawbacks, including high cost and cross-contamination problems. Radiation-free lung ultrasound (LUS) imaging, which requires high expertise and is thus being underutilised, has demonstrated a strong correlation with CT scan results and a high reliability in pneumonia detection even in the early stages. In this study, we developed a system based on modern DL methodologies in close collaboration with Fondazione IRCCS Policlinico San Matteo's Emergency Department (ED) of Pavia. Using a reliable dataset comprising ultrasound clips originating from linear and convex probes in 2908 frames from 450 hospitalised patients, we conducted an investigation into detecting Covid-19 patterns and ranking them considering two severity scales. This study differs from other research projects by its novel approach involving four and seven classes. Patients admitted to the ED underwent 12 LUS examinations in different chest parts, each evaluated according to standardised severity scales. We adopted residual convolutional neural networks (CNNs), transfer learning, and data augmentation techniques. Hence, employing methodological hyperparameter tuning, we produced state-of-the-art results meeting F1 score levels, averaged over the number of classes considered, exceeding 98%, and thereby manifesting stable measurements over precision and recall.

Point-of-care ultrasound in a multiplace hyperbaric chamber

[pubmed: point of care ultras...](#)by Kirsten Hornbeak / 30d

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INSIGHTS

Add note

Undersea Hyperb Med. 2021 Third-Quarter;48(3):221-226.

ABSTRACT

Historically, electronic devices have been generally prohibited during hyperbaric oxygen (HBO₂) therapy due to risk of fire in a pressurized, oxygen-rich environment. Point-of-care ultrasound (POCUS) however has emerged as a useful imaging modality in diverse clinical settings. Hyperbaric chambers treating critically ill patients would benefit from the application of POCUS at pressure to make real-time patient assessments. Thus far, POCUS during HBO₂ therapy has been limited due to required equipment modifications to meet safety standards. Here we demonstrate proof of concept, safety, and successful performance of an off-the-shelf handheld POCUS system (SonoSite iViz) in a clinical hyperbaric environment without need for modification.

Transoesophageal Echocardiography in Cardiac Arrest: A Systematic Review

[pubmed: point of care ultras...](#) by Laila Hussein / 30d

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INSIGHTS

Add note

Resuscitation. 2021 Aug 11:S0300-9572(21)00295-1. doi: 10.1016/j.resuscitation.2021.08.001. Online ahead of print.

ABSTRACT

AIMS: To identify, appraise and synthesize all available clinical evidence to evaluate the diagnostic role of transoesophageal echocardiography (TEE) during resuscitation of in-hospital (IHCA) and out-of-hospital cardiac arrest (OHCA) in the identification of reversible causes of cardiac arrest and cardiac contractility.

METHODS: We conducted a systematic review following PRISMA guidelines. Medline, EMBASE, Web of Science Core Collection, Proquest Dissertations, Open Grey, CDSR, Cochrane Central, Cochrane Clinical Answers, and the clinicaltrials.gov registry were searched for eligible studies. Studies involving adult patients, with non-traumatic cardiac arrest in whom TEE was used for intra-arrest evaluation, were included. Case studies and case series, animal studies, reviews, guidelines and editorials were excluded. The QUADAS-2 tool was used for quality assessment of all studies.

RESULTS: Eleven studies with a total of 358 patients were included. Four studies involved perioperative IHCA, three involved OHCA, and four were mixed population settings. Overall, the risk of bias in the selected studies was either high or unclear due to evidence or lack of information. In all 11 studies, TEE allowed the identification of reversible causes of arrest. We found significant heterogeneity in the criteria used to interpret findings, TEE protocol used, and timing of TEE.

CONCLUSION: Due to heterogeneity of studies, small sample size and inconsistent reference standard, the evidence for TEE in cardiac arrest resuscitation is of low certainty and is affected by a high risk of bias. Further studies are needed to better understand the true diagnostic accuracy of TEE in identifying reversible causes of arrest and cardiac contractility.

Independent learning of the sonographic FAST exam technique using a tablet-based training module

[focused assessment sonography trauma](#) by Rachel M Leavitt / 29d

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INSIGHTS

Add note

Am J Disaster Med. 2021 Spring;16(2):95-104. doi: 10.5055/ajdm.2021.0392.

ABSTRACT

OBJECTIVE: The aim of this study is to determine if a specific tablet-based training module can be used as an effective tool for independently training novice sonographers in the components of the focused assessment for sonography in trauma (FAST) exam.

DESIGN: Participants attended a 15-minute orientation presentation followed by a 2-hour ultrasound scanning workshop where they used a novel tablet-based training module to learn the components of the FAST exam independently.

SETTING: This study took place at an accredited United States college of osteopathic medicine.

PARTICIPANTS: Thirty-two first-year medical student volunteers without any prior ultrasound training in abdominal scanning.

INTERVENTIONS: Training activities included brief didactic training and participation in an independent learning FAST exam workshop.

MAIN OUTCOME MEASURES: Participants filled out subjective pre- and post-training self-confidence questionnaires and were objectively assessed and scored on their scanning skills.

RESULTS: Comparison of the pre- and post-training subjective questionnaires showed a statistically significant ($p < 0.001$) increase in participant confidence in performing all components of the FAST exam. During skill evaluation, participants collectively demonstrated correct technique in 366 (82 percent) of the 448 total FAST exam scanning tasks they attempted.

CONCLUSIONS: Based on these findings, the authors believe that learning to perform the FAST exam with this digital training module is an effective means of independently acquiring ultrasound skill. Digital ultrasound training modules like this one could have several useful applications, such as serving as an educational resource, or functioning as a point-of-care scanning adjunct to medical professionals in underdeveloped and rural areas where formal ultrasound training is not available.

Endotracheal Tube Placement Confirmation with Bedside Ultrasonography in the Pediatric Intensive Care Unit: A Validation Study

pubmed: [pediatric intubation](#) by Harsha K Chandnani / 29d

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INSIGHTS

Add note

J Pediatr Intensive Care. 2021 Sep;10(3):180-187. doi: 10.1055/s-0040-1715484. Epub 2020 Aug 20.

ABSTRACT

Critically ill patients who are intubated undergo multiple chest X-rays (CXRs) to determine endotracheal tube position; however, other modalities can save time, medical expenses, and radiation exposure. In this article, we evaluated the validity and interrater reliability of ultrasound to confirm endotracheal tube (ETT) position in patients. A prospective study was performed on intubated patients with cuffed ETTs. The accuracy of ultrasound to confirm correct ETT placement in 92 patients was 97.8%. Sensitivity, positive predictive value, and agreement of 97.7, 93.3, and 91.3% were found on comparing ultrasound to CXR findings. Ultrasound is feasible, reliable, and has good interrater reliability in assessing correct ETT position in children.

Sonographic Findings of Left Ventricular Dysfunction to Predict Shock Type in Undifferentiated Hypotensive Patients: An Analysis From the Sonography in Hypotension and Cardiac Arrest in the Emergency Department (SHoC-ED) Study

[pubmed: point of care ultras...](#) by Sam Keefer / 29d

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INSIGHTS

Add note

Cureus. 2021 Jul 13;13(7):e16360. doi: 10.7759/cureus.16360. eCollection 2021 Jul.

ABSTRACT

Introduction Patients that present to the emergency department (ED) with undifferentiated hypotension have a high mortality rate. Hypotension can be divided into four categories: obstructive, hypovolemic, distributive, and cardiogenic. While it is possible to have overlapping or concomitant shock states, being able to differentiate between cardiogenic shock and the other categories is important as it entails a different treatment regime and extra cautions. In this secondary analysis, we investigate if using focused cardiac ultrasonography (FOCUS) to determine left ventricular dysfunction (LVD) can serve as a reliable test for cardiogenic shock. **Methods** We prospectively collected FOCUS findings performed in 135 ED patients with undifferentiated hypotension as part of an international study. Patients with clearly identified etiologies for hypotension were excluded, along with other specific presumptive diagnoses. LVD was defined as the identification of a generally hypodynamic left ventricle in the setting of shock. FOCUS findings were collected using a standardized protocol and data collection form. All scans were performed by emergency physicians trained in ultrasound. Final shock type was defined as cardiogenic or noncardiogenic by independent specialist blinded chart review. **Results** In our findings, 135 patients had complete records for assessment of left ventricular function and additional follow-up data and so were included in this secondary analysis. The median age was 56 years and 53% of patients were male. Disease prevalence for cardiogenic shock was 12% and the mortality rate was 24%. The presence of LVD on FOCUS had a sensitivity of 62.50% (95% confidence interval 35.43% to 84.80%), specificity of 94.12% (88.26% to 97.60%), positive likelihood ratio (LR) 10.62 (4.71 to 23.95), negative LR 0.40 (0.21 to 0.75) and accuracy of 90.37% (84.10% to 94.77%) for detecting cardiogenic shock. **Conclusion** Detecting left ventricular dysfunction on FOCUS may be useful in the early identification of cardiogenic shock in otherwise undifferentiated hypotensive adult patients in the emergency department.

Point-of-Care Ultrasound-Guided Versus Conventional Bladder Catheterization for Urine Sampling in Children Aged 0 to 24 Months

[pubmed: point of care ultras...](#) by Ayla Akca Caglar / 28d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Aug 1;37(8):413-416. doi: 10.1097/PEC.0000000000002490.

ABSTRACT

OBJECTIVES: It can be difficult to obtain urine samples, especially in children aged 0 to 24 months who have not yet completed toilet training. Bladder catheterization is a common method for urine sampling in this age group. However, if the bladder is not adequately filled, this process fails and repeat catheterization is necessary. Point-of-care ultrasonography (POCUS) is often used to assist invasive procedures in the pediatric emergency department. This study aimed to compare success rates of bladder catheterization in patients with and without POCUS to guide the timing of the procedure.

METHODS: This was a prospective cohort study of children 0 to 24 months presenting to a pediatric emergency department in a tertiary center hospital. Patients were divided into 2 groups; the one group received conventional catheterization (CC group) without POCUS and the other group had catheterization after POCUS (POCUS group). The transverse and anterior-posterior diameter measurements of the bladder were obtained from one view in the transverse orientation using the (6-3 MHz) convex probe. Successful catheterization was defined by obtaining 3 mL or more of urine.

RESULTS: A total of 110 patients were included in the study, with 56 in the POCUS group and 54 in the CC group. There was no difference between the mean age and sex of the groups. The success rates of obtaining urine samples were 93% and 78% in the POCUS group and CC group, respectively. This difference was statistically significant ($P = 0.03$). No significant difference was found between measurements of bladder catheterizations with and without obtaining 3 mL or greater urine volumes in the ultrasound group ($P > 0.05$).

CONCLUSIONS: The use of POCUS during bladder catheterization in children was found to be effective and successful. In addition, the detection of any amount of urine in the bladder using POCUS increases the success rate of bladder catheterization.

Diagnosis of Posterior Urethral Valves in an Infant Using Point-of-Care Ultrasound

[pubmed: point of care ultras...](#)by Jason T Gillon / 28d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Aug 1;37(8):435-436. doi: 10.1097/PEC.0000000000002393.

ABSTRACT

This case describes a 7-week-old male infant presenting with vomiting and decreased urine output. Initial point-of-care ultrasound (POCUS) demonstrated a normal pylorus; however, assessment of bladder volume revealed the problem. The bladder was distended with a thickened, trabeculated wall and there was bilateral hydronephrosis, consistent with bladder outlet obstruction. Renal POCUS revealed bilateral

hydronephrosis and perinephric fluid collections consistent with calyceal rupture. A voiding cystourethrogram confirmed the diagnosis of posterior urethral valves which were eventually ablated by urology. To our knowledge, this is the first case report of POCUS leading to a diagnosis of posterior urethral valves in an infant. This case highlights how POCUS can expedite evaluation of decreased urine output.

Point-of-Care Ultrasound on Management of Cellulitis Versus Local Angioedema in the Pediatric Emergency Department

[pubmed: point of care ultras...](#)by Ee Tein Tay / 28d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Mar 29. doi: 10.1097/PEC.0000000000002416. Online ahead of print.

ABSTRACT

OBJECTIVES: To evaluate whether ultrasound can differentiate between cellulitis and angioedema from insect bites in pediatric patients.

METHODS: A prospective, pre-post study in an urban pediatric emergency department of patients younger than 21 years with soft tissue swelling from insect bites without abscesses were enrolled. Treating physician's pretest opinions regarding the diagnosis and need for antibiotics were determined. Ultrasound of the affected areas was performed, and effects on management were recorded. Further imaging, medications, and disposition were at the discretion of the enrolling physician. Phone call follow-ups were made within a week of presentation.

RESULTS: Among 103 patients enrolled with soft tissue swelling secondary to insect bites, ultrasound changed the management in 27 (26%) patients (95% confidence interval [CI], 18-35%). Of the patients who were indeterminate or believed to require antibiotics, ultrasound changed management in 6 (23%) of 26 patients (95% CI, 6%-40%). In those patients who were believed not to require antibiotics, ultrasound changed management in 12 (16%) 77 patients (95% CI, 7%-24%). Patients with diagnosis of local angioedema achieved symptom resolution 1.4 days sooner than patients diagnosed with cellulitis (mean, -1.389; 95% CI, -2.087 to -0.690; $P < 0.001$). No patient who was initially diagnosed as local angioedema received antibiotics upon patient follow-up.

CONCLUSIONS: Point-of-care ultrasound changed physician management in 1 of 4 patients in the pediatric emergency department with soft tissue swelling secondary to insect bites. Ultrasound may guide the management in these patients and lead to improved antibiotic stewardship in conjunction with history and physical examination.

Value of standard echocardiography at the bedside for COVID-19 patients in intensive care units: a Japanese single-center analysis

[pubmed: bUS](#)by Tomoo Nagai / 27d

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INSIGHTS

Add note

J Med Ultrason (2001). 2021 Aug 17. doi: 10.1007/s10396-021-01122-1. Online ahead of print.

ABSTRACT

PURPOSE: In the era of COVID-19, those special settings or indications for which standard transthoracic echocardiography (TTE) can safely produce benefits or advantages over minimized ultrasound imaging procedures need to be identified. Thus, the purpose of this study was to conduct a retrospective analysis with offline comprehensive conventional measurement of bilateral heart function and develop an appropriate prognostic model for in-hospital death.

METHODS: We performed a retrospective analysis of 37 consecutive patients with COVID-19, confirmed by real-time reverse-transcriptase polymerase chain reaction assay, who had undergone clinically indicated standard two-dimensional echocardiographic studies in intensive care wards. Offline comprehensive measurement was also performed. We further integrated the echocardiographic findings as paired evidence of vital organ involvement (possible respiratory distress assessed using right ventricular functional parameters, possible myocardial injury assessed using increased wall thickness, effusion or asynergy) and circulatory failure (suspected low flow status assessed using stroke volume index, suspected congestion assessed using elevated right or left atrial pressure). We evaluated its value for in-hospital death along with other echocardiographic findings.

RESULTS: The most common features included a normal-sized left atrium and left ventricle with preserved left ventricular ejection fraction, despite deteriorated left ventricular flow volume. Less frequent findings, such as abnormalities in the right heart and left ventricular abnormalities suggesting myocarditis, were observed. Although the single echocardiographic parameters failed to show predictive values for in-hospital death, integration of the echocardiographic findings suggested predictive value ($p = 0.04$, odds ratio: 12.28).

CONCLUSION: Standard TTE at the bedside with offline comprehensive conventional measurement may provide prognostic information that is valuable for the management of patients with COVID-19.

Point-of-Care Ultrasound Is a Valuable Modality During Mass COVID-19 Vaccination Campaigns

pubmed: [point of care ultras...](#)by Wang-Sheng Lin / 27d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Aug 17. doi: 10.1002/jum.15813. Online ahead of print.

ABSTRACT

Coronavirus disease 2019 has become a widespread public health crisis across the globe, requiring multiple approaches to containment, treatment, and prevention. Vaccines are an important tool to prevent morbidity and mortality from this devastating virus. Ensuring direct administration of vaccines into target tissue helps provide an optimal immune response while decreasing unintended adverse effects. Point-of-care ultrasound can better assist clinicians to determine appropriate needle length and penetration level

especially in special populations. Examples include patients who are obese, pregnant, or with refractory lymphedema, and those living in areas where needle supply is unstable or insufficient.

The Role of Cardiac Arrest Sonographic Exam (CASE) in Predicting the Outcome of Cardiopulmonary Resuscitation; a Cross-sectional Study

pubmed: [bUS](#) by Babak Masoumi / 26d

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INSIGHTS

Add note

Arch Acad Emerg Med. 2021 Jun 28;9(1):e48. doi: 10.22037/aaem.v9i1.1272. eCollection 2021.

ABSTRACT

INTRODUCTION: Ultrasonography (US) has been suggested as an integral part of resuscitation to identify potentially reversible causes of cardiac arrest (CA). This study aimed to evaluate the association between cardiac activity on ultrasonography during resuscitation and outcome of patients with non-shockable rhythms.

METHODS: We conducted a prospective, observational study on adult patients presenting with CA or experiencing CA in the emergency department (ED), and initial non-shockable rhythm. US examination of the sub-xiphoid region was performed during the 10-second interval of rhythm and pulse check and the association of US findings and patients' outcomes was evaluated.

RESULTS: 151 patients with the mean age of 65.32 ± 11.68 years were evaluated (76.2% male). 43 patients (28.5%) demonstrated cardiac activity on the initial US. The rate of asystole in initial rhythm was 58.9% (n=89). Return of spontaneous circulation (ROSC) was achieved in 36 (23.8%) patients, twenty (13.2%) survived to hospital admission and seven (4.6%) survived to hospital discharge. When the cardiac standstill duration increased to six minutes, no patient survived hospital discharge. Potentially reversible causes were detected in 15 cases (9.9%), and four of them survived to hospital discharge. Cardiac activity on first scan was associated with ROSC (OR: 6.86, 95%CI: 2.92-16.09; $p < 0.001$), survival to hospital admission (OR: 17.80, 95%CI: 3.95-80.17; $p < 0.001$), and survival to hospital discharge (OR: 17.35, 95%CI: 2.02-148.92; $p = 0.001$).

CONCLUSION: In non-traumatic cardiac arrest patients with non-shockable rhythms, bedside US is of great importance in predicting ROSC. The presence of pulseless electrical activity (PEA) rhythm and cardiac activity on initial US were associated with ROSC, survival to hospital admission, and hospital discharge. When the cardiac standstill duration increased to six minutes, no patient survived hospital discharge.

Comparison of Emergency Echocardiographic Results between Cardiologists and an Emergency Medicine Resident in Acute Coronary Syndrome

pubmed: [point of care echo](#) by Fatemeh Rasooli / 26d

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ABSTRACT

INTRODUCTION: Early detection of regional wall motion abnormality (RWMA) can be a reliable tool for rapid disposition of patients with acute coronary syndrome (ACS) in the emergency department. In this study, the diagnostic accuracy of point-of-care echocardiography performed by a trained emergency medicine resident was evaluated in comparison with board-certified cardiologists.

METHODS: A prospective, cross-sectional study was implemented on adult patients with ACS. A trained emergency medicine (EM) PGY-3 resident performed point-of-care echocardiography under the supervision of two cardiologists and the reports were compared with cardiologists as a reference test.

RESULTS: 100 patients with the mean age of 54.1 ± 11.5 years were recruited (65% male). Based on Thrombolysis in Myocardial Infarction (TIMI) and History, EKG, Age, Risk factors, and troponin (HEART) scores, 43.0% and 25.0% of patients were categorized as low-risk for ACS, respectively. The absolute measure of agreement between cardiologists to determine ejection fraction (EF) was 0.829 (95% CI: 0.74-0.89) based on intraclass correlation coefficient (ICC) estimation. The measurements of agreement between specialists and the EM resident based on the analysis of Kappa coefficient were 0.677 and 0.884 for RWMA and pericardial effusion, respectively. Moreover, 25 patients were in the low risk group according to the HEART score with an agreement rate of 92% for the lack of RWMA between the EM resident and cardiologists.

CONCLUSION: This study found acceptable agreement between the EM resident and cardiologists in assessing RWMA in different ACS risk groups. In addition, there was acceptable agreement between the EM resident and cardiologists in determining left ventricular ejection fraction (LVEF) and pericardial effusion.

Pediatric Ovarian Torsion on Point-of-Care Ultrasound: A Case Series

[pubmed: point of care ultras...](#) by Eric Scheier / 26d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Aug 16. doi: 10.1097/PEC.0000000000002522. Online ahead of print.

NO ABSTRACT

PMID:34406995 | DOI:10.1097/PEC.0000000000002522

Lung Ultrasound Effectively Detects HIV-Associated Interstitial Pulmonary Disease

[pubmed: point of care ultras...](#) by Daniel T Marggrander / 26d

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INSIGHTS

Add note

Int J Infect Dis. 2021 Aug 15:S1201-9712(21)00663-9. doi: 10.1016/j.ijid.2021.08.030. Online ahead of print.

ABSTRACT

OBJECTIVES AND METHODS: Prospective evaluation of lung ultrasound in comparison to radiography and CT for detection of HIV-related lung diseases. Ultrasound examinations in HIV-positive patients were evaluated by three raters, available conventional imaging was evaluated by another rater. Results were compared to each other and to the definite diagnosis, interrater reliability was calculated for each finding.

RESULTS: 80 HIV-positive patients received lung ultrasound examinations, 74 received conventional imaging. The overall sensitivity was 97.5% for CT, 90.7% for ultrasound and 78.1% for radiography. The most common diagnoses were *Pneumocystis jirovecii* pneumonia (21 cases) and bacterial pneumonia (17 cases). The most frequent and sensitive ultrasonographic findings were interstitial abnormalities indicated by B-Lines, independent of the etiology. Interrater reliability was high for interstitial abnormalities (ICC=0.82). The interrater reliability for consolidations and effusion increased during the study ($r=0.88$ and 0.37 , respectively).

CONCLUSIONS: Ultrasound is a fast, reliable, and sensitive point-of-care tool particularly in detecting interstitial lung disease, which is common in HIV-associated illness. It does not effectively discriminate between different etiologies. A longer learning period might be required to reliably identify consolidations and effusions.

The effect of norepinephrine on common carotid artery blood flow in septic shock patients

[pubmed: point of care ultras...](#) by Seok Goo Kim / 25d

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INSIGHTS

Add note

Sci Rep. 2021 Aug 18;11(1):16763. doi: 10.1038/s41598-021-96082-4.

ABSTRACT

This study was designed to evaluate the hemodynamic effect of norepinephrine (NE) on the peak systolic velocity (PSV), diameter, and blood flow of the common carotid artery (CCA) using the point-of-care ultrasound (POCUS) in patients with septic shock. The study involved patients above 18 years old with septic shock. Arterial monitoring, carotid ultrasonography, and transthoracic echocardiography were performed before NE administration (T_0). When the mean arterial pressure exceeded 65 mmHg after NE administration (T_1), the measurement was repeated. Twenty-four patients (median age 67 [interquartile range: 54-77] years; 42% female) with septic shock were examined in this study. Before (T_0) and after (T_1) NE administration, the PSV (mean, standard deviation [SD]) changed from 85.3 (21.1) cm/s to 83.5 (23.5) cm/s ($p = 0.417$); this change was not significant. However, the diameter and blood flow of the CCA increased significantly from 0.6 (0.09) cm and 0.75 (0.27) L/min to 0.66 (0.09) cm and 0.85 (0.27) L/min,

respectively ($p < 0.001$). The diameter of the left ventricular outflow tract (LVOT) remained unchanged, but the velocity time integral of the LVOT increased significantly from 21.7 (4.39) cm to 23.6 (5.14) cm. There was no significant correlation between changes in blood flow of the CCA and changes in cardiac output (coefficient -0.365, $p = 0.079$). In conclusion, NE increased the diameter and blood flow of the CCA significantly, without changing the PSV in patients with septic shock.

Why do pre-clinical medical students learn ultrasound? Exploring learning motivation through ERG theory

pubmed: bUSby Ting-Cheng Wang / 25d

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INSIGHTS

Add note

BMC Med Educ. 2021 Aug 19;21(1):438. doi: 10.1186/s12909-021-02869-4.

ABSTRACT

BACKGROUND: In recent years, point-of-care ultrasound (POCUS) has become an essential field of medical education. Bedside ultrasound has become a necessary skill for clinical physicians. Previous studies have already discussed the importance of advancements in ultrasound education. However, learning motivations for ultrasound education have seldom been analyzed in the literature. For medical students, learning ultrasound could have a relevance for their future career. The Existence, Relatedness and Growth (ERG) theory extended Maslow's hierarchy of needs through these three concepts. This theory has been widely used in the workplace to analyze employee job performance but has not yet been applied in medical education. In this study ERG theory was applied to analyze pre-clinical medical students' learning motivation toward ultrasound education.

METHOD: This mixed method study used online questionnaires consisting of open-ended questions as a data collection tool, and based on these results, both qualitative and quantitative analysis were conducted. Participants answered a series of neutral and open-ended questions regarding their motivations to learn ultrasonography. After data collection, a three-step analysis was conducted based on the grounded theory approach. Finally, the results of the thematic coding were used to complete additional quantitative analysis.

RESULTS: The study involved 140 pre-clinical medical students, and their responses fell into 13 specific categories. The analysis demonstrated that students' motivations toward ultrasound education were unbalanced across the three ERG domains ($F = 41.257$, $p < .001$). Pairwise comparisons showed that students mentioned existence motivation (MD = 39.3%; $p < .001$) and growth motivation (MD = 40.7%; $p < .001$) more frequently than relatedness motivation. However, there was no significant difference between existence motivation and growth motivation (MD = - 1.4%; $p = .830$).

CONCLUSION: The results revealed that students placed a high value on existence and growth needs rather than relatedness based on the survey. In addition, the findings suggest that ERG theory can be a useful tool to conduct medical education motivation analysis.

Gravity-induced loss of aeration and atelectasis development in the preterm lung: a serial sonographic assessment

"lung ultrasound" or "lung ultrasonograp...by Yusuke Hoshino / 24d

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INSIGHTS

Add note

J Perinatol. 2021 Aug 20. doi: 10.1038/s41372-021-01189-1. Online ahead of print.

ABSTRACT

OBJECTIVE: To assess the impact of gravity and time on the changes in the distribution patterns of loss of aeration and atelectasis development in very preterm infants.

STUDY DESIGN: Preterm infants less than 32 weeks gestation were included in this prospective, observational study. Infants were assessed via serial lung ultrasound (LUS) score in four lung zones, performed on days 7, 14, 21, and 28 after birth.

RESULT: Eighty-eight patients were enrolled. There was a significant main effect of gravity ($P < 0.001$) and time ($P = 0.01$) on the LUS score between gravity-dependent lungs and non-dependent lungs. Moreover, there was a significant main effect of gravity ($P = 0.003$) on atelectasis development between the lungs.

CONCLUSION: Gravity and time have an impact on the changes in the distribution patterns of gravity-induced lung injuries in preterm infants.

A randomized multicenter trial on a lung ultrasound guided treatment strategy in patients on chronic hemodialysis with high cardiovascular risk

["lung ultrasound" or "lung ultrasonograp...](#)by Carmine Zoccali / 23d

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INSIGHTS

Add note

Kidney Int. 2021 Aug 18:S0085-2538(21)00748-1. doi: 10.1016/j.kint.2021.07.024. Online ahead of print.

ABSTRACT

Lung congestion, estimated by lung ultrasound is a risk factor for all-cause and cardiovascular mortality in patients on chronic hemodialysis and may be useful to guide ultrafiltration and drug therapy in this population. In an international, multi-center randomized controlled trial (NCT02310061) we investigated whether a lung ultrasound-guided treatment strategy improved a composite end point (all-cause death, non-fatal myocardial infarction, decompensated heart failure) vs usual care in patients receiving chronic hemodialysis with high cardiovascular risk. Patient Reported Outcomes (Depression and the Standard Form 36 Quality of Life Questionnaire, SF36) were assessed as secondary outcomes. A total of 367 patients were enrolled; 183 in the active arm and 180 in the control arm. In the active arm, the pre-dialysis lung scan was used to titrate ultrafiltration during dialysis and drug treatment. Three hundred and seven patients completed the study; 152 in the active arm and 155 in the control arm. During a mean follow-up of 1.49 years, lung congestion was significantly more frequently relieved in the active (78%) than in the control (56%) arm and the intervention was safe. The primary composite end point did not significantly differ between the two study arms (Hazard Ratio 0.88; 95% Confidence Interval: 0.63-1.24). The risk for

all cause and cardiovascular hospitalization and the changes of left ventricular mass and function did not differ among the two groups. A post hoc analysis for recurrent episodes of decompensated heart failure (0.37; 0.15-0.93) and cardiovascular events (0.63; 0.41-0.97) showed a risk reduction for these outcomes in the active arm. There were no differences in patient reported outcomes between groups. Thus, in patients on chronic hemodialysis with high cardiovascular risk a treatment strategy guided by lung-ultrasound effectively relieved lung congestion but was not more effective than usual care in improving the primary or secondary end points of the trial.

A prospective, multicenter evaluation of point-of-care ultrasound for appendicitis in the emergency department

[pubmed: point of care ultras...](#) by Brent A Becker / 22d

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INSIGHTS

Add note

Acad Emerg Med. 2021 Aug 22. doi: 10.1111/acem.14378. Online ahead of print.

ABSTRACT

OBJECTIVE: The main objective of this study was to evaluate the accuracy of point-of-care ultrasound (POCUS) for the diagnosis of appendicitis in a general emergency department (ED) population as performed by emergency physicians with variable ultrasound experience.

METHODS: We performed a prospective, multicenter, observational study examining a convenience sample of adult patients with potential appendicitis presenting to the ED between July 2014 and February 2020. Each emergency physician-performed POCUS was interpreted at the bedside and retrospectively by an expert reviewer. Test characteristics were calculated for POCUS and blinded expert interpretation as compared to surgical pathology in patients undergoing appendectomy and advanced imaging in patients managed non-operatively.

RESULTS: A total of 256 subjects were included in the primary analysis with an overall appendicitis prevalence of 28.1%. For the diagnosis of appendicitis, POCUS demonstrated an overall sensitivity, specificity, +LR and -LR of 0.85 [95% CI 0.74-0.92], 0.63 [0.56-0.70], 2.29 [1.85-2.84] and 0.24 [0.14-0.42], respectively. Expert review yielded a lower sensitivity (0.74 [0.62-0.83]) with a similar specificity (0.63 [0.56-0.70]).

CONCLUSION: POCUS is moderately accurate for acute appendicitis as performed by emergency physicians with a wide range of ultrasound expertise, but lacks adequate sensitivity and specificity to function as a definitive test in an undifferentiated ED population. Further study is warranted to elucidate the optimal role of integrated POCUS in the general approach to suspected appendicitis.

Handheld ultrasound in training - The future is getting smaller!

[pubmed: point of care ultras...](#) by Jonathan N Wilkinson / 22d

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INSIGHTS

Add note

ABSTRACT

Traditional ultrasound teaching is normally delivered using large, costly and often quite advanced cart-based systems. These carts are often large systems on wheels, usually limited to the departments that own them i.e. clinics, wards or radiology. Portability has been further improved by the development of laptop style systems, which are easier to wheel in-between patients/departments. In our experience and anecdotally, many of these systems can be intimidating to the novice and can lead to early attrition or poor uptake of ultrasound into clinical practice. Carts can also restrict the amount of training deliverable to practitioners, as they are limited in number due to cost and can take quite some time to boot up, reducing convenience. This dogma is being progressively changed with the advent of smaller handheld devices, some clearly within the financial grasps of most practitioners, and even to the point of medical schools offering students their own personal device.^{1,2} This relative inexpensiveness can lead to the purchase of these devices for novelty and convenience, over need. Obvious caution is needed in these circumstances, but with increased ease of purchase, better availability and inbuilt simplicity, ultrasound learning can be seamlessly integrated into day-to-day practice. This review discusses how one of the most disruptive innovations in modern medicine is changing ultrasound from a classic imaging modality to become integrated as the fifth pillar of clinical examination, and how these new devices can serve as springboards to more advanced ultrasound training. In fact, within what has become a bigger area of clinical examination, things are getting smaller.

A case report of ruptured ectopic pregnancy plus massive hemoperitoneum on a heterotrophic pregnancy in a resource-poor setting, Mbengwi, Cameroon

[pubmed: bedside ultrasonography](#) by Nzozone Henry Fomukong / 22d

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ABSTRACT

Heterotopic pregnancy is a rare obstetrics phenomenon and carries significant maternal morbidity and mortality due to the risk of rupture of the ectopic pregnancy. Physicians tend to feel comfortable and relieved when an intrauterine gestation sac is seen. This results in an inadequate inspection of the adnexae and remaining structures during emergency bedside ultrasound despite a strong initial clinical suspicion of ectopic pregnancy. We present a case report of ruptured ectopic pregnancy and massive hemoperitoneum in a patient with heterotopic pregnancy. The diagnosis was done on bedside ultrasonography in a clinically unstable 32-year-old patient with a history of infertility. She presented with acute abdominal pain, body weakness, and amenorrhea. She underwent emergency laparotomy and salpingectomy. In our context where ultrasound is not readily available, practitioners carrying out salpingectomy for ruptured ectopic pregnancies should bear in mind the plausibility of heterotopic pregnancy to properly handle the uterus.

A Novel Thoracic Ultrasound Measurement After Congenital Diaphragmatic Hernia Repair Identifies Decreased Diaphragmatic Excursion Associated With Adverse Respiratory and Surgical Outcomes

pubmed: [diaphragm AND ultrasound variant...](#)by James T Ross / 22d

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INSIGHTS

Add note

Front Pediatr. 2021 Aug 5;9:707052. doi: 10.3389/fped.2021.707052. eCollection 2021.

ABSTRACT

Background and Aim: Congenital diaphragmatic hernia (CDH) is a rare defect often associated with pulmonary hypoplasia and abnormal pulmonary vascular development. Even after successful hernia repair, pulmonary disease may persist into adulthood. Impaired diaphragmatic motility may lead to compromised respiratory function long after index repair. This study investigates whether a novel ultrasound measurement, the diaphragmatic excursion ratio, can be a simple and non-invasive method to evaluate routine diaphragmatic motion after CDH repair, and whether it correlates with adverse surgical and respiratory outcomes. **Materials and Methods:** A cross-sectional study was conducted in consecutive patients who presented at medium-term follow-up visit between December 2017 and December 2018 after CDH repair at single pediatric hospital. Transthoracic ultrasound was performed with craniocaudal diaphragmatic excursion measured bilaterally during routine breathing. Diaphragmatic excursion ratios (diaphragmatic excursion of repaired vs. unrepaired side) were calculated and retrospectively compared with clinical data including demographics, length of stay, respiratory adjuncts, oral feeding, and need for gastrostomy. **Results:** Thirty-eight patients (median age at ultrasound, 24 months, interquartile range 11-60) were evaluated. Nine patients underwent primary repair, 29 had non-primary repair (internal oblique muscle flap or mesh patch). Patients with a diaphragmatic excursion ratio below the median (0.54) had longer hospital stays (median 77 vs. 28 days, $p = 0.0007$) more ventilator days (median 16 vs. 9 days, $p = 0.004$), and were more likely to have been discharged on oxygen (68 vs. 16%, $p = 0.001$). They were also less likely to be exclusively taking oral feeds at 1-year post-surgery (37 vs. 74%, $p = 0.02$) and more likely to require a gastrostomy tube in the first year of life (74 vs. 21%, $p = 0.003$). **Conclusions:** Transthoracic ultrasound after CDH repair is practical method to assess diaphragm motion, and decreased diaphragm excursion ratio is associated with worse respiratory outcomes, a longer length of stay, and dependence on gastrostomy tube feeding within 1 year. Further prospective studies may help validate this novel ultrasound measurement and offer prognostic value.

Lung Ultrasound in Patients With Dyspnea From Infective Lung Disease

pubmed: [bUS](#)by Pierluigi Bracciale / 22d

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INSIGHTS

Add note

Front Med (Lausanne). 2021 Aug 5;8:709239. doi: 10.3389/fmed.2021.709239. eCollection 2021.

ABSTRACT

Infective lung disease is a spectrum of pulmonary disorders with high prevalence in clinical practice. In the last decade, many studies focused on the clinical usefulness of lung ultrasound (LUS) in the management of patients presenting with dyspnea from infective lung disease. We report data on the methodological and standardized use of bedside LUS in the differential diagnosis of patients with acute dyspnea from infective lung diseases. We performed a cross-sectional study in 439 patients (160 women and 279 men, mean age 64.2 ± 11.5 years, age range 23-91 years) with infective lung diseases. A bedside LUS with a convex probe and chest X-ray were performed in all subjects. Chest CT was performed in a subgroup of patients, as clinically needed. We observed a statistically significant difference in the percentage of pleural effusion and pulmonary consolidation assessed by LUS, compared to X-ray (52.7 vs. 20%, respectively, $p < 0.05$; 93.6 vs. 48.2%, $p < 0.001$). The majority of the consolidations detected by LUS were mixed, hypo- and hyperechoic, lesions, with air bronchogram in 40% of cases. All findings assessed by LUS were confirmed by chest CT, when performed. We describe the actual role of LUS in the assessment of patients with infective lung disease. It has higher sensitivity compared to chest X-ray in the detection of pleural effusion. Consolidations from infective lung disease have mostly mixed echogenicity by LUS.

Lung ultrasound may support internal medicine physicians in predicting the diagnosis, bacterial etiology and favorable outcome of community-acquired pneumonia

["lung ultrasound" or "lung ultrasonograp...](#) by Filippo Mearelli / 21d

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INSIGHTS

Add note

Sci Rep. 2021 Aug 23;11(1):17016. doi: 10.1038/s41598-021-96380-x.

ABSTRACT

To assess the usefulness of lung ultrasound (LUS) for identifying community-acquired pneumonia (CAP) among adult patients with suspected lower respiratory tract infection (LRTI) and for discriminating between CAP with different cultural statuses, etiologies, and outcomes. LUS was performed at internal medicine ward admission. The performance of chest X-ray (CXR) and LUS in diagnosing CAP in 410 patients with suspected LRTI was determined. All possible positive results for pneumonia on LUS were condensed into pattern 1 (consolidation + / - alveolar-interstitial syndrome) and pattern 2 (alveolar-interstitial syndrome). The performance of LUS in predicting culture-positive status, bacterial etiology, and adverse outcomes of CAP was assessed in 315 patients. The area under the receiver operating characteristic curve for diagnosing CAP by LUS was significantly higher than for diagnosis CAP by CXR (0.93 and 0.71, respectively; $p < 0.001$). Pattern 1 predicted CAP with bacterial and mixed bacterial and viral etiologies with positive predictive values of 99% (95% CI, 94-100%) and 97% (95% CI, 81-99%), respectively. Pattern 2 ruled out mortality with a negative predictive value of 95% (95% CI, 86-98%), respectively. In this study, LUS was useful in predicting a diagnosis of CAP, the bacterial etiology of CAP, and favorable outcome in patients with CAP.

Diagnostic performance of lung ultrasound compared to CT scan in the diagnosis of pulmonary lesions of COVID-19 induced pneumonia: a preliminary study

["lung ultrasound" or "lung ultrasonograp...](#) by Jafar Roshandel / 20d

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INSIGHTS

Add note

Virusdisease. 2021 Aug 18:1-7. doi: 10.1007/s13337-021-00736-w. Online ahead of print.

ABSTRACT

Chest CT scan is currently used to assess the extent of lung involvement in patients with the coronavirus disease 2019 (COVID-19). The aim of this study was to evaluate the diagnostic performance of lung ultrasound in the diagnosis of COVID-19 pulmonary manifestations in comparison to CT scan. Thirty-three symptomatic patients with suspected COVID-19 pneumonia were evaluated by lung ultrasound and then, at a short interval, chest CT scan. In the anterior chest, each hemithorax was divided into four areas. In the posterior chest, eight zones similar to the anterior part were examined. The axillary areas were also divided into upper and lower zones (20 zones were determined per patient). Mean age of the patients was 58.66 years. The sensitivity (95% CI) and specificity (95% CI) of lung ultrasound for the diagnosis of parenchymal lesions were 90.5% (69.6-98.8%) and 50% (21.1-78.9%), respectively. In the evaluation of pleural lesions, the sensitivity (95% CI) and specificity (95% CI) of lung ultrasound were 100% (71.5-100%) and 22.7% (7.8-45.4%), respectively. Owing to the high sensitivity of ultrasound in identifying lung lesions in patients with COVID-19 pneumonia, it can be recommended to use lung ultrasound as a tool for initial screening of patients with high clinical suspicion for SARS-CoV-2 infection during the pandemic.

Results from a Spanish national survey on the application of ultrasound in pulmonology services

"lung ultrasound" or "lung ultrasonograp...by Cristina Ramos-Hernández / 20d

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INSIGHTS

Add note

Ultrasound J. 2021 Aug 24;13(1):38. doi: 10.1186/s13089-021-00240-8.

ABSTRACT

BACKGROUND: This was an observational, cross-sectional, and multicentre study carried out from October to December 2020, through a survey sent to Spanish Society of Pulmonology and Thoracic Surgery members in public hospitals with different levels of complexity. Our objective was to complete a national analysis of clinical practice, organisation, infrastructure, the services portfolio, teaching, and research activity related to ultrasound.

RESULTS: Data from 104 hospitals were analysed. Ultrasound was used in 56.7% of cases, both in the area of bronchopleural techniques and on conventional wards, with no differences between centres. Lung ultrasound (LUS) was performed more often in the procedures area in intermediate-complexity centres compared to high- and low-complexity centres (36% vs. 31% and 6.25%, respectively). More high-complexity centres had three or more ultrasound scanners than intermediate-complexity centres (38% vs. 16%); 43% of low-complexity centres shared their ultrasound equipment with other specialties. Fewer than 6% of centres did not have an ultrasound machine. LUS was most often used during the treatment of pleural effusion (91.3%), in the differential diagnosis of dyspnoea (51.9%), and to rule out iatrogenic pneumothorax (50.9%). Only 5.7% of the centres had a pulmonologist specialised in LUS. Finally, fewer than 35% of the hospitals were teaching centres and fewer than 18% participated in research projects.

CONCLUSIONS: The use and availability of LUS has grown in pulmonology services, however, still relatively few pulmonologists are specialised in its use. Moreover, teaching and research activity in this field is scarce. Strategies are necessary to improve physicians' skill at using LUS and to promote its use, with the ultimate goal of improving healthcare activity.

Quantitative Analysis of Pleural Line and B-lines in Lung Ultrasound Images for Severity Assessment of COVID-19 Pneumonia

["lung ultrasound" or "lung ultrasonograp...](#) by Yuanyuan Wang / 20d

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INSIGHTS

Add note

IEEE Trans Ultrason Ferroelectr Freq Control. 2021 Aug 24;PP. doi: 10.1109/TUFFC.2021.3107598. Online ahead of print.

ABSTRACT

Specific patterns of lung ultrasound images are utilized to assess the severity of COVID-19 pneumonia, while such assessment is mainly based on clinicians' qualitative and subjective observations. In this study, we quantitatively analyze the LUS images to assess the severity of COVID-19 pneumonia by characterizing the patterns related to the pleural line and B-lines. 27 patients with COVID-19 pneumonia, including 13 moderate cases, 7 severe cases, and 7 critical cases, are enrolled. Features related to the pleural line, including the thickness (TPL) and roughness of the pleural line (RPL), and the mean (MPLI) and standard deviation (SDPLI) of the pleural line intensities are extracted from the LUS images. Features related to the B-lines, including the number (NBL), accumulated width (AWBL), attenuation coefficient (ACBL), and accumulated intensity (AIBL) of B-lines are also extracted. The correlations of these features with the disease severity are evaluated. The performances of the binary severe / non-severe classification are assessed for each feature and support vector machine (SVM) classifiers with various combinations of features as input. Several features, including the RPL, NBL, AWBL, and AIBL show significant correlations with disease severity (all $p < 0.05$). The classification performance is optimal by employing the SVM classifier using all the features as input (area under the receiver operating characteristic curve = 0.96, sensitivity = 0.93, specificity = 1). These findings demonstrate that the proposed method may be a promising tool for automatic grading diagnosis and follow-up of patients with COVID-19 pneumonia.

Inguinal ovarian hernia on point of care ultrasound: case reports and review of the literature

[pubmed: point of care ultras...](#) by Eric Scheier / 20d

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INSIGHTS

Add note

Emerg Radiol. 2021 Aug 24. doi: 10.1007/s10140-021-01981-8. Online ahead of print.

ABSTRACT

An inguinal mass may be an incidental finding on physical examination. There are few descriptions of pediatric hernia with ovarian content in the pediatric emergency literature, and no recommendations for routine point of care ultrasound (POCUS) evaluation of inguinal hernia. We present three cases of ovarian content within an inguinal hernia sac found on POCUS by a pediatric emergency physician, and discuss ultrasound technique and implications of these findings. Inguinal masses should routinely be evaluated with POCUS in order to prevent forceful reduction efforts that may damage the ovary, and to allow for effective surgical triage and early involvement of surgical subspecialists.

Airway Ultrasound in Critically Ill Patients: A Narrative Review

[pubmed: intubation ultrasoun...](#) by Carmen Diaz-Tormo / 20d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Aug 24. doi: 10.1002/jum.15817. Online ahead of print.

ABSTRACT

Airway assessment and management have a central role in critical care medicine. Airway ultrasound can help us evaluate the anatomy, facilitate interventions such as intubation in difficult airways and tracheostomy, prevent post-extubation complications, and diagnose dysphagia. In this review, we will summarize the current use of ultrasound in airway assessment and management in critically ill patients.

Detection of Unknown Pregnancy With Complications Using Point-of-Care Ultrasound

[pubmed: point of care ultras...](#) by Allison N Kayne / 19d

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INSIGHTS

Add note

Cureus. 2021 Jul 20;13(7):e16510. doi: 10.7759/cureus.16510. eCollection 2021 Jul.

ABSTRACT

Eclampsia, a condition diagnosed in pre-eclamptic patients who experience seizures, can lead to maternal and fetal death if not treated early. The present case discusses the clinical management of an 18-year-old female who presented to the emergency department (ED) after a generalized tonic-clonic seizure. A physical examination revealed that she was also hypertensive. Based on these symptoms which required urgency due to the patient's instability, and the suspicion that the patient could be pregnant, point-of-care ultrasound (POCUS) was performed. In this case, a POCUS was a faster more accessible modality than a urine or serum human chorionic gonadotropin test. Although the patient denied that she was pregnant, POCUS identified that she was approximately 22-24 weeks pregnant. The patient was promptly diagnosed with eclampsia and given medication to control her blood pressure and seizures. This case highlights the benefits of using POCUS in the ED to expedite clinical decisions by identifying the etiology of a patient's condition and lends itself to the discussion of its utility in a critically ill pregnant woman. It also serves to reinforce the importance of keeping eclampsia as part of an

emergency physician's differential when confronted with a potentially pregnant patient with relevant symptoms.

Artificial intelligence-enhanced echocardiography in the emergency department

[pubmed: point of care ultras...](#)by Jonathon E Stewart / 19d

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INSIGHTS

Add note

Emerg Med Australas. 2021 Aug 25. doi: 10.1111/1742-6723.13847. Online ahead of print.

ABSTRACT

A focused cardiac ultrasound performed by an emergency physician is becoming part of the standard assessment of patients in a variety of clinical situations. The development of inexpensive, portable handheld devices promises to make point-of-care ultrasound even more accessible over the coming decades. Many of these handheld devices are beginning to integrate artificial intelligence (AI) for image analysis. The integration of AI into focused cardiac ultrasound will have a number of implications for emergency physicians. This perspective presents an overview of the current state of AI research in echocardiography relevant to the emergency physician, as well as the future possibilities, challenges and risks of this technology.

Can follow up lung ultrasound in Coronavirus Disease-19 patients indicate clinical outcome?

["lung ultrasound" or "lung ultrasonograp...](#)by Tatjana Hoffmann / 19d

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INSIGHTS

Add note

PLoS One. 2021 Aug 25;16(8):e0256359. doi: 10.1371/journal.pone.0256359. eCollection 2021.

ABSTRACT

PURPOSE: To evaluate whether there is a change in findings of coronavirus disease 2019 patients in follow up lung ultrasound and to determine whether these findings can predict the development of severe disease.

MATERIALS AND METHODS: In this prospective monocentric study COVID-19 patients had standardized lung ultrasound (12 area evaluation) at day 1, 3 and 5. The primary end point was detection of pathologies and their change over time. The secondary end point was relationship between change in sonographic results and clinical outcome. Clinical outcome was assessed on development of severe disease defined as need for intensive care unit.

RESULTS: Data of 30 patients were analyzed, 26 patients with follow-up lung ultrasound. All of them showed lung pathologies with dynamic patterns. 26,7% developed severe disease tending to have an

ubiquitous lung involvement in lung ultrasound. In patients with need for intensive care unit a previously developed increase in B-lines, subpleural consolidations and pleural line irregularities was more common. A statistically significant association between change in B-lines as well as change in pleural line irregularities and development of severe disease was observed ($p < 0,01$).

CONCLUSION: The present study demonstrates that follow up lung ultrasound can be a powerful tool to track the evolution of disease and suggests that lung ultrasound is able to indicate an impending development of severe disease in COVID-19 patients.

Point-of-care-ultrasound (POCUS) in Canadian hospitals during the COVID-19 pandemic: a cross-sectional survey

[pubmed: point of care ultras...](#) by Marcie Beaulac / 19d

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INSIGHTS

Add note

Can J Anaesth. 2021 Aug 25. doi: 10.1007/s12630-021-02093-0. Online ahead of print.

NO ABSTRACT

PMID:34435323 | DOI:10.1007/s12630-021-02093-0

Legionella Pneumonia on Point-of-care Ultrasound in the Emergency Department: A Case Report

[pubmed: point of care ultras...](#) by Robert W Lopez / 18d

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Clin Pract Cases Emerg Med. 2021 May;5(2):155-158. doi: 10.5811/cpcem.2021.1.50314.

ABSTRACT

INTRODUCTION: Legionella is an uncommon, atypical organism that can cause community-acquired pneumonia. Commonly associated with high fevers, gastrointestinal symptoms, and hyponatremia, it can be easily overlooked, especially during the coronavirus disease of 2019 (COVID-19) pandemic. Legionella has specific antibiotic treatment that will improve outcome; thus, its recognition is important.

CASE REPORT: We present a case of Legionella pneumonia in a man presenting with shortness of breath and fever. The patient's initial chest radiography was negative. With the use of point-of-care ultrasound (POCUS) the changes of atypical pneumonia could be seen. Ultimately Legionella was confirmed with urine antigen testing, and appropriate antibiotic treatment was started.

DISCUSSION: Given the increased awareness of COVID-19 it is important to consider a broad differential with respiratory illness. Legionella pneumonia on POCUS is consistent with atypical pneumonia descriptions on ultrasound. Point-of-care ultrasound can be used to diagnose atypical pneumonia, specifically caused by Legionella in our case.

CONCLUSION: Legionella is evident on POCUS but is difficult to distinguish from other infections with POCUS alone. One should consider Legionella if POCUS is positive for signs of atypical infection.

Point-of-care Ultrasound in Early Diagnosis of Cardiomyopathy in a Child with Viral Myocarditis: A Case Report

[pubmed: point of care ultras...](#) by Ayush Gupta / 18d

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Clin Pract Cases Emerg Med. 2021 May;5(2):186-189. doi: 10.5811/cpcem.2021.2.51266.

ABSTRACT

INTRODUCTION: Pediatric myocarditis is a commonly missed diagnosis in the pediatric emergency department (ED) with high morbidity and mortality. The presentation of cardiogenic shock secondary to myocarditis and septic shock can be difficult to differentiate during initial resuscitation, and incorrect treatment can lead to poor prognosis. Early diagnosis may provide a better prognosis for this life-threatening condition.

CASE REPORT: We report a case of a five-year-old female who presented to the ED with non-specific symptoms of myocarditis. Rapid point-of-care ultrasound led to early diagnosis, correct management, and great prognosis for the patient.

CONCLUSION: Providers must maintain a high index of suspicion for cardiogenic shock in patients with nonspecific symptoms and fluid unresponsiveness. Point-of-care ultrasound can help in the identification of cardiac disorders and guide practitioners in their management plans.

Point-of-care Ultrasound to Distinguish Subgaleal and Cephalohematoma: Case Report

[pubmed: point of care ultras...](#) by Josie Acuña / 18d

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Clin Pract Cases Emerg Med. 2021 May;5(2):198-201. doi: 10.5811/cpcem.2021.3.51375.

ABSTRACT

INTRODUCTION: Cephalohematomas generally do not pose a significant risk to the patient and resolve spontaneously. Conversely, a subgaleal hematoma is a rare but more serious condition. While it may be challenging to make this diagnostic distinction based on a physical examination alone, the findings that differentiate these two conditions can be appreciated on point-of-care ultrasound (POCUS). We describe two pediatric patient cases where POCUS was used to distinguish between a subgaleal hematoma and a cephalohematoma.

CASE REPORTS: We describe one case of a 14-month-old male brought to the pediatric emergency department (PED) with concern for head injury. A POCUS examination revealed a large fluid collection that did not cross the sagittal suture. Thus, the hematoma was more consistent with a cephalohematoma and less compatible with a subgaleal hematoma. Given these findings, further emergent imaging was deferred in the PED and the patient was kept for observation. In the second case an 8-week-old male presented with suspected swelling over the right parietal region. A POCUS examination was performed, which demonstrated an extensive, simple fluid collection that extended across the suture line, making it more concerning for a subgaleal hematoma. Given the heightened suspicion for a subgaleal hematoma, the patient was admitted for further imaging and evaluation.

CONCLUSION: Point-of-care ultrasound can be used to help differentiate between a subgaleal hematoma and a cephalohematoma to risk-stratify patients and determine the need for further imaging.

A Baffling Bump: A Case Report of an Unusual Chest Wall Mass in a Pediatric Patient

[pubmed: point of care ultras...](#) by Haley Vertelney / 18d

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Clin Pract Cases Emerg Med. 2021 Aug;5(3):316-319. doi: 10.5811/cpcem.2021.3.51958.

ABSTRACT

INTRODUCTION: Chest wall masses are rare in children, but the differential diagnosis is broad and can include traumatic injury, neoplasm, and inflammatory or infectious causes. We report a novel case of an eight-year-old, previously healthy female who presented to the emergency department (ED) with one month of cough, fevers, weight loss, and an anterior chest wall mass.

CASE REPORT: The patient's ultimate diagnosis was necrotizing pneumonia with pneumatocele extending into the chest wall. This case is notable for the severity of the patient's pulmonary disease given its extension through the chest wall, and for the unique speciation of her infection.

CONCLUSION: Although necrotizing pneumonia is a rare complication of community-acquired pneumonia, it is important for the emergency physician to recognize it promptly as it indicates severe progression of pulmonary disease even in children with normal and stable vital signs, as in this case. The emergency physician should consider complications of pneumonia including pneumatocele and empyema necessitans when presented with an anterior chest wall mass in a pediatric patient. Additionally, point-of-care ultrasound was used in the ED to facilitate the diagnosis of this illness and was particularly useful in determining the continuity of the patient's lung infection with her extrathoracic chest wall mass.

Case Report: Diagnosis of Late Spontaneous Intraocular Lens Dislocation on Point-of-care Ultrasound

[pubmed: point of care ultras...](#) by Alexandra Pizarro / 18d

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Clin Pract Cases Emerg Med. 2021 Aug;5(3):332-334. doi: 10.5811/cpcem.2021.3.52208.

ABSTRACT

INTRODUCTION: Spontaneous intraocular lens (IOL) dislocation is a rare, but serious, complication following cataract surgery.

CASE REPORT: We report a case of patient with a remote history of cataract surgery presenting to the emergency department with monocular blurred vision. Ocular point-of-care ultrasound (POCUS) facilitated diagnosis of a late spontaneous IOL dislocation.

DISCUSSION: Prosthetic IOL dislocations are being reported with increasing frequency. Prompt recognition of IOL dislocation is essential to prevent secondary complications, including acute angle-closure glaucoma and retinal detachment, which can result in permanent vision loss.

CONCLUSION: Point-of-care ultrasound is a rapid, noninvasive imaging modality for early detection of IOL dislocation to help guide management, improve patient outcomes, and mitigate long-term sequelae.

Acute Thromboembolism from Trauma in a Patient with Abdominal Aortic Aneurysm

pubmed: [point of care ultras...](#)by Solomon Sebt / 18d

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Clin Pract Cases Emerg Med. 2021 Aug;5(3):357-359. doi: 10.5811/cpcem.2021.4.52137.

ABSTRACT

CASE PRESENTATION: A 64-year-old man with a history of a 5.5-centimeter (cm) abdominal aortic aneurysm (AAA) presented to the emergency department (ED) complaining of severe back pain after climbing over a fence and falling a distance of eight feet. Prior to arrival, the prehospital paramedics reported that the patient did not have palpable pulses in either lower extremity. The initial physical examination in the ED was significant for absent dorsalis pedis pulses bilaterally as well as absent posterior tibialis pulses bilaterally and cold, insensate lower extremities. Point-of-care ultrasound identified an approximate 7-cm infrarenal AAA with a mural thrombus present. After receiving several computed tomography (CT) studies including CT head without contrast and CT angiography of the chest, abdomen and pelvis, the patient was diagnosed with acute thrombosis of AAA and associated thromboembolic occlusion of both his right and left distal iliac vessels causing bilateral acute limb ischemia. He immediately received unfractionated heparin and was admitted to the hospital for embolectomy and intra-arterial tissue plasminogen activator.

DISCUSSION: Acute thrombosis of AAA and subsequent thromboembolic events are a rare but significant complication that can occur in patients with a history of AAA. Thromboembolic events may occur spontaneously or in the setting of blunt abdominal trauma. Common presenting signs and symptoms include distal limb ischemia and absent femoral pulses. Timely management and recognition of this rare complication is vital as this condition can ultimately result in limb loss or death if not treated in a timely manner. Heparinization after confirmation of non-ruptured AAA as well as vascular surgery, and therapeutic and vascular interventional radiology consultations are key steps that should be taken to decrease patient morbidity and mortality.

Uveal Melanoma Identified as Ocular Mass on Point-of-care Ultrasound

[pubmed: point of care ultras...](#) by Hannah Spungen / 18d

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Clin Pract Cases Emerg Med. 2021 Aug;5(3):367-368. doi: 10.5811/cpcem.2021.4.52115.

ABSTRACT

CASE PRESENTATION: A 41-year-old man presented to the emergency department with five months of progressive monocular vision loss in his right eye, which he described as a gradually descending and enlarging black spot. He had no light perception in his right eye with elevated intraocular pressure and an afferent pupillary defect, while his left eye visual acuity and pupillary exam was normal. Point-of-care ultrasound demonstrated a hyperechoic, pedunculated mass in the posterior chamber of his right eye, consistent with a diagnosis of ocular melanoma. Ophthalmology scheduled the patient for an elective, right eye enucleation the following week, after which a diagnosis of uveal melanoma (UM) was confirmed on histopathology.

DISCUSSION: Uveal melanoma is an uncommon diagnosis that requires prompt intervention and surveillance due to the possibility of distant metastases arising in up to 50% of patients. Emergency department diagnosis of UM may be confounded by features of other intraocular pathology, such as increased ocular pressure or the finding of retinal detachment on fundoscopy. When emergency providers encounter glaucoma or retinal detachment on physical exam, point-of-care ultrasonography represents a key adjunct in the timely diagnosis and referral of this potentially vision- and life-threatening malignancy.

Is point-of-care ultrasound a reliable predictor of outcome during traumatic cardiac arrest? A systematic review and meta-analysis from the SHoC investigators

[pubmed: point of care ultras...](#) by Elizabeth Lalonde / 18d

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Resuscitation. 2021 Aug 23:S0300-9572(21)00327-0. doi: 10.1016/j.resuscitation.2021.08.027. Online ahead of print.

ABSTRACT

AIM: Point-of-care ultrasound (POCUS) has been shown to assist in predicting outcomes in cardiac arrest. We evaluated the test characteristics of POCUS in predicting poor outcomes: failure of return of spontaneous circulation (ROSC), survival to hospital admission (SHA), survival to hospital discharge (SHD) and neurologically intact survival to hospital discharge (NISHD) in adult and paediatric patients with blunt and penetrating traumatic cardiac arrest (TCA) in out-of-hospital or emergency department settings.

METHODS: We conducted a systematic review and meta-analysis using the PRISMA guidelines. We searched Clinicaltrials.gov, CINAHL, Cochrane library, EMBASE, Medline and the World Health Organization-International Clinical Trials Registry from 1974 to November 9, 2020. Risk of bias was assessed using QUADAS-2 tool. We used a random-effects meta-analysis model with 95% confidence intervals with I^2 statistics for heterogeneity.

RESULTS: We included 8 studies involving 710 cases of TCA. For all blunt and penetrating TCA patients who failed to achieve ROSC, the specificity (proportion of patients with cardiac activity on POCUS who achieved ROSC) was 98% (95% CI 0.13 to 1.0). The sensitivity (proportion of patients with cardiac standstill on POCUS who failed to achieve ROSC) was 91% (95% CI 0.67 to 0.98). No patient with cardiac standstill survived. Substantial level of heterogeneity was noted.

CONCLUSIONS: Patients in TCA without cardiac activity on POCUS have a high likelihood of death and negligible chance of SHD. The numbers of patients included in published studies remains too low for practice recommendations for termination of resuscitation based solely upon the absence of cardiac activity on POCUS.

Real-Time Evaluation of Optic Nerve Sheath Diameter (ONSD) in Awake, Spontaneously Breathing Patients [optic nerve diameter](#) by Nick Weidner / 18d

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INSIGHTS

Add note

J Clin Med. 2021 Aug 12;10(16):3549. doi: 10.3390/jcm10163549.

ABSTRACT

(1) Background: Reliable ultrasonographic measurements of optic nerve sheath diameter (ONSD) to detect increased intracerebral pressure (ICP) has not been established in awake patients with continuous invasive ICP monitoring. Therefore, in this study, we included fully awake patients with and without raised ICP and correlated ONSD with continuously measured ICP values. (2) Methods: In a prospective study, intracranial pressure (ICP) was continuously measured in 25 patients with an intraparenchymatic P-tel probe. Ultrasonic measurements were carried out three times for each optic nerve in vertical and horizontal directions. ONSD measurements and ICP were correlated. Patients with ICP of 2.0-10.0 mmHg were compared with patients suffering from an ICP of 10.1-24.2 mmHg. (3) Results: In all patients, the ONSD vertical and horizontal measurement for both eyes correlated well with the ICP (Pearson R = 0.68-0.80). Both measurements yielded similar results (Bland-Altman: vertical bias: -0.09 mm, accuracy: ± 0.66 mm; horizontal bias: -0.06 mm, accuracy: ± 0.48 mm). For patients with an ICP of 2.0-10.0 mmHg compared to an ICP of 10.1-24.2, ROC (receiver operating characteristic) analyses showed that ONSD measurement accurately predicts elevated ICP (optimal cut-off value 5.05 mm, AUC of 0.91, sensitivity

92% and specificity 90%, $p < 0.001$). (4) Conclusions: Ultrasonographic measurement of ONSD in awake, spontaneously breathing patients provides a valuable method to evaluate patients with suspected increased ICP. Additionally, it provides a potential tool for rapid assessment of ICP at the bedside and to identify patients at risk for a poor neurological outcome.

Hospitalist Perceptions of Barriers to Lung Ultrasound Adoption in Diverse Hospital Environments

[pubmed: point of care ultras...](#) by Anna M Maw / 18d

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Diagnostics (Basel). 2021 Aug 11;11(8):1451. doi: 10.3390/diagnostics11081451.

ABSTRACT

Despite the many advantages of lung ultrasound (LUS) in the diagnosis and management of patients with dyspnea, its adoption among hospitalists has been slow. We performed semi-structured interviews of hospitals from four diverse health systems in the United States to understand determinants of adoption within a range of clinical settings. We used the diffusion of innovation theory to guide a framework analysis of the data. Of the 27 hospitalists invited, we performed 22 interviews from four hospitals of diverse types. Median years post-residency of interviewees was 10.5 [IQR:5-15]. Four main themes emerged: (1) There are important clinical advantages to LUS despite operator dependence, (2) LUS enhances patient and clinician experience, (3) Investment of clinician time to learn and perform LUS is a barrier to adoption but yields improved efficiency for the health system and (4) Mandated training and use may be necessary to achieve broad adoption as monetary incentives are less effective. Despite the perceived benefits of LUS for patients, clinicians and health systems, a significant barrier to broad LUS adoption is the experience of time scarcity by hospitalists. Future implementation strategies should focus on changes to the clinical environment that address clinician barriers to learning and adoption of new skills.

Point-of-care ultrasound (POCUS) practices in the helicopter emergency medical services in Europe: results of an online survey

[pubmed: point of care ultras...](#) by Peter Hilbert-Carius / 18d

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Add note

Scand J Trauma Resusc Emerg Med. 2021 Aug 26;29(1):124. doi: 10.1186/s13049-021-00933-y.

ABSTRACT

BACKGROUND: The extent to which Point-of-care of ultrasound (POCUS) is used in different European helicopter EMS (HEMS) is unknown. We aimed to study the availability, perception, and future aspects of POCUS in the European HEMS using an online survey.

METHOD: A survey about the use of POCUS in HEMS was conducted by a multinational steering expert committee and was carried out from November 30, 2020 to December 30, 2020 via an online web portal. Invitations for participation were sent via email to the medical directors of the European HEMS organizations including two reminding notes.

RESULTS: During the study period, 69 participants from 25 countries and 41 different HEMS providers took part in the survey. 96% (n = 66) completed the survey. POCUS was available in 75% (56% always when needed and 19% occasionally) of the responding HEMS organizations. 17% were planning to establish POCUS in the near future. Responders who provided POCUS used it in approximately 15% of the patients. Participants thought that POCUS is important in both trauma and non-trauma-patients (73%, n = 46). The extended focused assessment sonography for trauma (eFAST) protocol (77%) was the most common protocol used. A POCUS credentialing process including documented examinations was requested in less than one third of the HEMS organizations.

CONCLUSIONS: The majority of the HEMS organizations in Europe are able to provide different POCUS protocols in their services. The most used POCUS protocols were eFAST, FATE and RUSH. Despite the enthusiasm for POCUS, comprehensive training and clear credentialing processes are not available in about two thirds of the European HEMS organizations. Due to several limitations of this survey further studies are needed to evaluate POCUS in HEMS.

The Role of Lung Ultrasound in the Management of the Critically Ill Neonate-A Narrative Review and Practical Guide

["lung ultrasound" or "lung ultrasonograp..."](#) by Lukas Aichhorn / 18d

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Children (Basel). 2021 Jul 24;8(8):628. doi: 10.3390/children8080628.

ABSTRACT

Lung ultrasound makes use of artifacts generated by the ratio of air and fluid in the lung. Recently, an enormous increase of research regarding lung ultrasound emerged, especially in intensive care units. The use of lung ultrasound on the neonatal intensive care unit enables the clinician to gain knowledge about the respiratory condition of the patients, make quick decisions, and reduces exposure to ionizing radiation. In this narrative review, the possibilities of lung ultrasound for the stabilization and resuscitation of the neonate using the ABCDE algorithm will be discussed.

Lung Ultrasound Is More Sensitive for Hospitalized Consolidated Pneumonia Diagnosis Compared to CXR in Children

["lung ultrasound" or "lung ultrasonograp..."](#) by Ioana Mihaiela Ciuca / 18d

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Children (Basel). 2021 Jul 29;8(8):659. doi: 10.3390/children8080659.

ABSTRACT

BACKGROUND: Pneumonia is the leading cause of death among children; thus, a correct early diagnosis would be ideal. The imagistic diagnosis still uses chest X-ray (CXR), but lung ultrasound (LUS) proves to be reliable for pneumonia diagnosis. The aim of our study was to evaluate the sensitivity and specificity of LUS compared to CXR in consolidated pneumonia.

METHODS: Children with clinical suspicion of bacterial pneumonia were screened by LUS for pneumonia, followed by CXR. The agreement relation between LUS and CXR regarding the detection of consolidation was evaluated by Cohen's kappa test.

RESULTS: A total of 128 patients with clinical suspicion of pneumonia were evaluated; 74 of them were confirmed by imagery and biological inflammatory markers. The highest frequency of pneumonia was in the 0-3 years age group (37.83%). Statistical estimation of the agreement between LUS and CXR in detection of the consolidation found an almost perfect agreement, with a Cohen's kappa coefficient of $K = 0.89 \pm 0.04$ SD, $p = 0.000$. Sensitivity of LUS was superior to CXR in detection of consolidations.

CONCLUSION: Lung ultrasound is a reliable method for the detection of pneumonia consolidation in hospitalized children, with sensitivity and specificity superior to CXR. LUS should be used for rapid and safe evaluation of child pneumonia.

A Comparison of Lung Ultrasound and Computed Tomography in the Diagnosis of Patients with COVID-19: A Systematic Review and Meta-Analysis

"lung ultrasound" or "lung ultrasonograp...by Mengshu Wang / 18d

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Add note

Diagnostics (Basel). 2021 Jul 27;11(8):1351. doi: 10.3390/diagnostics11081351.

ABSTRACT

Background Lung ultrasound (LUS) and computed tomography (CT) can both be used for diagnosis of interstitial pneumonia caused by coronavirus disease 2019 (COVID-19), but the agreement between LUS and CT is unknown. Purpose to compare the agreement of LUS and CT in the diagnosis of interstitial pneumonia caused by COVID-19. **Materials and Methods** We searched PubMed, Cochrane library, Embase, Chinese Biomedicine Literature, and WHO COVID-19 databases to identify studies that compared LUS with CT in the diagnosis of interstitial pneumonia caused by COVID-19. We calculated the pooled overall, positive and negative percent agreements, diagnostic odds ratio (DOR) and the area under the standard receiver operating curve (SROC) for LUS in the diagnosis of COVID-19 compared with CT. **Results** We identified 1896 records, of which nine studies involving 531 patients were finally included. The pooled overall, positive and negative percentage agreements of LUS for the diagnosis of interstitial pneumonia caused by COVID-19 compared with CT were 81% (95% confidence interval [CI] 43-99%), 96% (95% CI, 80-99%, $I^2 = 92.15\%$) and 80% (95%CI, 60-92%, $I^2 = 92.85\%$), respectively. DOR was 37.41 (95% CI, 9.43-148.49, $I^2 = 63.9\%$), and the area under the SROC curve was 0.94 (95% CI, 0.92-0.96). The quality of evidence for both specificity and sensitivity was low because of heterogeneity and risk of bias. **Conclusion** The level of diagnostic agreement between LUS and CT in the

diagnosis of interstitial pneumonia caused by COVID-19 is high. LUS can be therefore considered as an equally accurate alternative for CT in situations where molecular tests are not available.

Hand-Held Ultrasound of the Lung: A Systematic Review

["lung ultrasound" or "lung ultrasonograp...](#)by Mariam Haji-Hassan / 18d

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Diagnostics (Basel). 2021 Jul 31;11(8):1381. doi: 10.3390/diagnostics11081381.

ABSTRACT

BACKGROUND: The ultrasound examination is a surface technique with an accurate diagnosis of pathological processes adjacent to the pleural line. The purpose of the study was to evaluate the role of hand-held ultrasound devices (visual stethoscopes) in the diagnosis of peripheral lung disease.

METHODS: We conducted a systematic search of literature comparing the diagnostic accuracy of truly hand-held ultrasound devices compared to conventional high-end ultrasound devices, chest X-rays, thoracic CT (computer tomography), or physical examinations to diagnose peripheral lung lesions. ScienceDirect, PubMed, and PubMed Central bibliographic databases were searched within a time limit of 15 years.

RESULTS: The applied search strategy retrieved 439 studies after removing duplicates; 34 were selected for full-text review, and 15 articles met all inclusion criteria and were included in the analysis. When comparing hand-held ultrasound devices to chest X-rays, negative predictive values were above 90%, while positive predictive values tended to be lower (from 35% to 75.8%). Hand-held ultrasound reached a correlation of 0.99 as associated with conventional ultrasound with a Bland-Altman bias close to zero.

CONCLUSIONS: Being accessible, radiation-free, and comparatively easy to decontaminate, hand-held ultrasound devices could represent a reliable tool for evaluating peripheral lung diseases. This method can be successfully employed as an alternative to repeated X-ray examinations for peripheral lung disease monitoring.

Lung Ultrasound-Guided Fluid Management versus Standard Care in Surgical ICU Patients: A Randomised Controlled Trial

["lung ultrasound" or "lung ultrasonograp...](#)by Daniel-Mihai Rusu / 18d

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Diagnostics (Basel). 2021 Aug 10;11(8):1444. doi: 10.3390/diagnostics11081444.

ABSTRACT

The value of lung ultrasound (LU) in assessing extravascular lung water (EVLW) was demonstrated by comparing LU with gold-standard methods for EVLW assessment. However, few studies have analysed the value of B-Line score (BLS) in guiding fluid management during critical illness. The purpose of this trial was to evaluate if a BLS-guided fluid management strategy could improve fluid balance and short-term mortality in surgical intensive care unit (ICU) patients. We conducted a randomised, controlled trial within the ICUs of two university hospitals. Critically ill patients were randomised upon ICU admission in a 1:1 ratio to BLS-guided fluid management (active group) or standard care (control group). In the active group, BLS was monitored daily until ICU discharge or day 28 (whichever came first). On the basis of BLS, different targets for daily fluid balance were set with the aim of avoiding or correcting moderate/severe EVLW increase. The primary outcome was 28-day mortality. Over 24 months, 166 ICU patients were enrolled in the trial and included in the final analysis. Trial results showed that daily BLS monitoring did not lead to a different cumulative fluid balance in surgical ICU patients as compared to standard care. Consecutively, no difference in 28-day mortality between groups was found (10.5% vs. 15.6%, $p = 0.34$). However, at least 400 patients would have been necessary for conclusive results.

Ruling Out Coronavirus Disease 2019 in Patients with Pneumonia: The Role of Blood Cell Count and Lung Ultrasound

["lung ultrasound" or "lung ultrasonograp..."](#) by Gianni Biolo / 18d

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INSIGHTS

Add note

J Clin Med. 2021 Aug 6;10(16):3481. doi: 10.3390/jcm10163481.

ABSTRACT

Coronavirus disease 2019 (COVID-19) is characterized by a distinctive blood leucocyte pattern and B-lines on lung ultrasound (LUS) as marker of alveolar-interstitial syndrome. We aimed to evaluate the accuracy of blood leucocyte count alone or in combination with LUS for COVID-19 diagnosis. We retrospectively enrolled consecutive patients diagnosed with community acquired pneumonia (CAP) at hospital admission to derive and validate cutoff values for blood cell count that could be predictive of COVID-19 before confirmation by the nucleic acid amplification test (NAAT). Cutoff values, generated and confirmed in inception (41/115, positive/negative patients) and validation (100/180, positive/negative patients) cohorts, were ≤ 17 and ≤ 10 cells/mm³ for basophils and eosinophils, respectively. Basophils and/or eosinophils below cutoff were associated with sensitivity of 98% (95%CI, 94-100) and negative likelihood ratio of 0.04 (95%CI, 0.01-0.11). In a subgroup of 265 subjects, the sensitivity of B-line on LUS was 15% lower ($p < 0.001$) than that of basophils and/or eosinophils below cutoff. The combination of B-lines with basophils and eosinophils below cutoff was associated with a moderate increase of the positive likelihood ratio: 5.0 (95%CI, 3.2-7.7). In conclusion, basophil and eosinophil counts above the generated cutoff virtually rule out COVID-19 in patients with CAP. Our findings can help optimize patient triage pending the NAAT results.

Lung Ultrasound in Pediatrics and Neonatology: An Update

["lung ultrasound" or "lung ultrasonograp..."](#) by Angela Ammirabile / 18d

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Add note

Healthcare (Basel). 2021 Aug 7;9(8):1015. doi: 10.3390/healthcare9081015.

ABSTRACT

The potential role of ultrasound for the diagnosis of pulmonary diseases is a recent field of research, because, traditionally, lungs have been considered unsuitable for ultrasonography for the high presence of air and thoracic cage that prevent a clear evaluation of the organ. The peculiar anatomy of the pediatric chest favors the use of lung ultrasound (LUS) for the diagnosis of respiratory conditions through the interpretation of artefacts generated at the pleural surface, correlating them to disease-specific patterns. Recent studies demonstrate that LUS can be a valid alternative to chest X-rays for the diagnosis of pulmonary diseases, especially in children to avoid excessive exposure to ionizing radiations. This review focuses on the description of normal and abnormal findings during LUS of the most common pediatric pathologies. Current literature demonstrates usefulness of LUS that may become a fundamental tool for the whole spectrum of lung pathologies to guide both diagnostic and therapeutic decisions.

Role of Lung Ultrasound in Predicting Clinical Severity and Fatality in COVID-19 Pneumonia

"lung ultrasound" or "lung ultrasonograp...by Ivan Skopljanac / 18d

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INSIGHTS

Add note

J Pers Med. 2021 Jul 30;11(8):757. doi: 10.3390/jpm11080757.

ABSTRACT

BACKGROUND: Lung ultrasound (LUS) is a useful imaging method for identifying COVID-19 pneumonia. The aim of this study was to explore the role of LUS in predicting the severity of the disease and fatality in patients with COVID-19.

METHODS: This was a single-center, follow-up study, conducted from 1 November 2020, to 22 March 2021. The LUS protocol was based on the assessment of 14 lung zones with a total score up to 42, which was compared to the disease severity and fatality.

RESULTS: A total of 133 patients with COVID-19 pneumonia confirmed by RT-PCR were enrolled, with a median time from hospital admission to lung ultrasound of one day. The LUS score was correlated with clinical severity at hospital admission (Spearman's rho 0.40, 95% CI 0.24 to 0.53, $p < 0.001$). Patients with higher LUS scores were experiencing greater disease severity; a high flow nasal cannula had an odds ratio of 1.43 (5% CI 1.17-1.74) in patients with LUS score > 29 ; the same score also predicted the need for mechanical ventilation (1.25, [1.07-1.48]). An LUS score > 30 (1.41 [1.18-1.68]) and age over 68 (1.26 [1.11-1.43]) were significant predictors of fatality.

CONCLUSIONS: LUS at hospital admission is shown to have a high predictive power of the severity and fatality of COVID-19 pneumonia.

Clinical Method Applied to Focused Ultrasound: The Case of Wells' Score and Echocardiography in the Emergency Department: A Systematic Review and a Meta-Analysis

pubmed: bUSby Lorenzo Falsetti / 18d

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Medicina (Kaunas). 2021 Jul 28;57(8):766. doi: 10.3390/medicina57080766.

ABSTRACT

Background and Objectives: bedside cardiac ultrasound is a widely adopted method in Emergency Departments (ED) for extending physical examination and refining clinical diagnosis. However, in the setting of hemodynamically-stable pulmonary embolism, the diagnostic role of echocardiography is still the subject of debate. In light of its high specificity and low sensitivity, some authors suggest that echocardiographic signs of right ventricle overload could be used to rule-in pulmonary embolism. In this study, we aimed to clarify the diagnostic role of echocardiographic signs of right ventricle overload in the setting of hemodynamically-stable pulmonary embolism in the ED. *Materials and Methods:* we performed a systematic review of literature in PubMed, Web of Science and Cochrane databases, considering the echocardiographic signs for the diagnosis of pulmonary embolism in the ED. Studies considering unstable or shocked patients were excluded. Papers enrolling hemodynamically stable subjects were selected. We performed a diagnostic test accuracy meta-analysis for each sign, and then performed a critical evaluation according to pretest probability, assessed with Wells' score for pulmonary embolism. *Results:* 10 studies were finally included. We observed a good specificity and a low sensitivity of each echocardiographic sign of right ventricle overload. However, once stratified by the Wells' score, the post-test probability only increased among high-risk patients. *Conclusions:* signs of echocardiographic right ventricle overload should not be used to modify the clinical behavior in low- and intermediate- risk patients according to Wells' score classification. Among high-risk patients, however, echocardiographic signs could help a physician in detecting patients with the highest probability of pulmonary embolism, necessitating a confirmation by computed tomography with pulmonary angiography. However, a focused cardiac and thoracic ultrasound investigation is useful for the differential diagnosis of dyspnea and chest pain in the ED.

Assessment of Sarcopenia in the Intensive Care Unit and 1-Year Mortality in Survivors of Critical Illness

pubmed: bUSby Naoya Yanagi / 18d

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INSIGHTS

Add note

Nutrients. 2021 Aug 8;13(8):2726. doi: 10.3390/nu13082726.

ABSTRACT

Skeletal muscle wasting in the intensive care unit (ICU) has been associated with mortality, but it is unclear whether sarcopenia, defined by skeletal muscle mass and function, is useful for detailed risk

stratification after ICU discharge. In this cohort study, 72 critically ill patients with an ICU stay of ≥ 48 h were identified. Skeletal muscle mass was assessed from the muscle thickness (MT) of the patients' quadriceps using ultrasound images before ICU discharge. Skeletal muscle function was assessed from the patients' muscle strength (MS) before ICU discharge according to the Medical Research Council sum score. A diagnosis of sarcopenia in the ICU was made in patients with low MT and low MS. The study endpoint was 1-year mortality. Sarcopenia in the ICU was diagnosed in 26/72 patients (36%). After adjusting for covariates in the Cox regression, sarcopenia in the ICU was significantly associated with 1-year mortality (hazard ratio 3.82; 95% confidence interval, 1.40-10.42). Sarcopenia in the ICU, defined by low skeletal muscle mass and function, was associated with 1-year mortality in survivors of critical illness. Skeletal muscle mass and function assessed at the bedside could be used to identify higher-risk patients in the ICU.

Diagnosis Accuracy of Lung Ultrasound for ARF in Critically Ill Patients: A Systematic Review and Meta-Analysis

["lung ultrasound" or "lung ultrasonograp...](#) by Xueyan Yuan / 17d

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INSIGHTS

Add note

Front Med (Lausanne). 2021 Aug 10;8:705960. doi: 10.3389/fmed.2021.705960. eCollection 2021.

ABSTRACT

Background: Acute respiratory failure (ARF) is a commonly distressing condition in critically ill patients. Its early recognition and treatment may improve clinical outcomes. Mounting evidence suggests that lung ultrasound (LUS) could be an alternative to chest X-ray (CXR) or computed tomography (CT) for the diagnosis of ARF in critically ill patients. This meta-analysis aimed to determine whether LUS can be an alternative tool used to investigate the cause of ARF or thoracic pathologies associated with the diagnosis of ARF in critically ill patients. **Method:** A systematic literature search of the PubMed, Web of Science, Embase, and Cochrane Library databases was conducted from inception to March 2020. Two researchers independently screened studies investigating the accuracy of LUS with CXR or CT for adult critically ill patients with ARF. Data with baseline, true positives, false positives, false negatives, and true negatives were extracted. The study quality was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 tool. The pooled sensitivity and specificity were obtained using a bivariate model. **Results:** Eleven studies, including 1,232 patients, were included in the meta-analysis. Most studies were of low quality. LUS had a pooled sensitivity of 92% (95% confidence interval [CI]: 85-96) and a pooled specificity of 98% (95% CI: 94-99). The area under the summary receiver operating characteristic curve was 98% (95% CI: 97-99). The sensitivity and specificity of LUS to identify different pathological types of ARF were investigated. For consolidation (1,040 patients), LUS had a sensitivity of 89% and a specificity of 97%. For pleural effusion (279 patients), LUS had a pooled sensitivity of 95% and a specificity of 99%. For acute interstitial syndrome (174 patients), LUS had a pooled sensitivity of 95% and a specificity of 91%. **Conclusions:** LUS is an adjuvant tool that has a moderate sensitivity and high specificity for the diagnosis of ARF in critically ill patients.

Ultrasound at the Role 1: An Analysis of After-Action Reviews from the Prehospital Trauma Registry

[pubmed: point of care ultras...](#) by Melissa A Myers / 17d

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INSIGHTS

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Med J (Ft Sam Houst Tex). 2021 Jul-Sep;(PB 8-21-07/08/09):20-24.

ABSTRACT

BACKGROUND: Ultrasound is a portable and adaptable imaging modality used widely in the care of trauma patients. The initial exam, known as the "Focused Assessment in Trauma (FAST) exam focused on the evaluation for hemoperitoneum and hemopericardium. In recent years, the exam has expanded to include evaluate for thoracic pathology, including pneumothorax, and is now known as the "Extended Focused Assessment in Trauma" (E-FAST) exam.

METHODS: We reviewed after-action reviews (AAR) from the Joint Trauma System Prehospital Trauma Registry from 2013-2014 in which the use of an ultrasound exam was noted. Given the largely unstructured nature of the AARs, we selected relevant information from the free text available.

RESULTS: Our initial dataset contained 705 casualties, of which we identified 45 cases containing the key words with AAR data for review: 39 cases involved the use of the FAST exam, three explicitly described the use of pulmonary ultrasound and they were categorized as E-FAST exams, two cases described the use of point of care echo to evaluate for cardiac standstill, and two cases described the use of ultrasound to evaluate for vascular injury. Of those with vital signs documented, 25% (11) reported at least one episode of tachycardia ($\geq 120/\text{min}$) and 16% (7) with at least one episode of systolic hypotension (less than 90mmHg). Of the 45 cases reviewed, six were recorded as equivocal, which we interpreted to indicate more training in either performance or interpretation of the exam was needed.

CONCLUSIONS: Our findings suggest that training in both the FAST exam and E-FAST has the potential to improve patient care for military trauma patients. A performance improvement system would enable real-time confirmation of findings and feedback for training and quality improvement.

Combat Medic eFAST with Novel and Conventional Portable Ultrasound Devices: A Prospective, Randomized, Crossover Trial

[pubmed: fast sonography tra...](#)by Roland F Salazar / 17d

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INSIGHTS

Add note

Med J (Ft Sam Houst Tex). 2021 Jul-Sep;(PB 8-21-07/08/09):36-43.

ABSTRACT

BACKGROUND: Extended Focused Assessment with Ultrasonography in Trauma (eFAST) reliably identifies noncompressible torso hemorrhage (NCTH), a major cause of battlefield death. Increased portability of ultrasound enables eFAST far forward on the battlefield, and published data demonstrate combat medics can learn and reliably perform ultrasound exams. One medical company developed an ultrasound device with an intuitive graphical user interface (GUI) and novel, finger-worn transducer with built-in linear and phased arrays, referred to as the novel device. We evaluated combat medic eFAST performance between the novel and conventional device.

METHODS: This was a prospective, randomized, crossover trial completed at a single US military installation. Subjects were US Army combat medics with no previous ultrasound experience. Subjects performed an eFAST on a live human and a simulation model with both devices after a brief training intervention. Our primary outcome was time in seconds for eFAST completion, limited to 600 seconds. Secondary outcomes included diagnostic accuracy, technical adequacy using a validated task-specific checklist, and end-user appraisal of device ease-of-use with 5-point Likert items. This study was approved by the local institutional review board.

RESULTS: Forty subjects volunteered, most were male (67.5%), less than 36 years old (95.0%), and grade E-4 or below (75.0%). Subjects performed a total of 160 eFAST scans (80 novel, 80 conventional). We found no significant difference in time for eFAST completion between the novel and conventional devices (391 seconds [95% CI 364, 417] versus 352 seconds [95% CI 325, 379]; $p = 0.71$). We also found no significant differences between the novel and conventional devices with respect to diagnostic accuracy (91.5% versus 89.2%; $p = 0.28$) and technical adequacy (75.0% versus 72.5%; $p = 0.28$). However, we did find that subjects favored the image quality of the novel device (4.3 versus 3.6; p is less than 0.01), while favoring the conventional transducer (3.8 versus 4.3; $p = 0.04$).

CONCLUSION: Combat medic eFAST performance utilizing both devices did not differ with respect to time to completion, diagnostic accuracy, and technical adequacy. Medics with limited ultrasound experience performed diagnostically accurate eFAST after a brief training intervention. Future research should assess learning gaps and skill retention in order to guide development of US military ultrasound training programs for combat medics.

Pulmonary COVID-19: Learning Spatiotemporal Features Combining CNN and LSTM Networks for Lung Ultrasound Video Classification

["lung ultrasound" or "lung ultrasonograp...](#) by Bruno Barros / 17d

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INSIGHTS

Add note

Sensors (Basel). 2021 Aug 14;21(16):5486. doi: 10.3390/s21165486.

ABSTRACT

Deep Learning is a very active and important area for building Computer-Aided Diagnosis (CAD) applications. This work aims to present a hybrid model to classify lung ultrasound (LUS) videos captured by convex transducers to diagnose COVID-19. A Convolutional Neural Network (CNN) performed the extraction of spatial features, and the temporal dependence was learned using a Long Short-Term Memory (LSTM). Different types of convolutional architectures were used for feature extraction. The hybrid model (CNN-LSTM) hyperparameters were optimized using the Optuna framework. The best hybrid model was composed of an Xception pre-trained on ImageNet and an LSTM containing 512 units, configured with a dropout rate of 0.4, two fully connected layers containing 1024 neurons each, and a sequence of 20 frames in the input layer (20x2018). The model presented an average accuracy of 93% and sensitivity of 97% for COVID-19, outperforming models based purely on spatial approaches. Furthermore, feature extraction using transfer learning with models pre-trained on ImageNet provided comparable results to models pre-trained on LUS images. The results corroborate with other studies showing that this model for LUS classification can be an important tool in the fight against COVID-19 and other lung diseases.

3D Printed Heart Models Illustrating Myocardial Perfusion Territories to Augment Echocardiography and Electrocardiography Interpretation

pubmed: bUSby Geoffroy P J C Noël / 15d

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INSIGHTS

Add note

Med Sci Educ. 2021 Jan 8;31(2):439-446. doi: 10.1007/s40670-020-01177-8. eCollection 2021 Apr.

ABSTRACT

Visualizing the vascular territories of coronary arteries during echocardiography or electrocardiography (ECG) requires trainees to mentally relate and overlay 2D sonographic images or cardiac lead projections with 3D anatomical representations of the ventricular walls and their respective blood supply. To facilitate the acquisition of these competencies, this study focuses on the feasibility of developing low-cost, open-sourced 3D printed heart models with standard ultrasound views or ECG lead projections illustrating the myocardial perfusion territories. A 3D digital heart model was cut to reflect the typical cardiac ultrasound views. The 4-chamber view model was further punctured for the paths of the precordial and limb leads of an ECG. Painting coronary arteries on the surface and internal views of the 3D prints illustrated vessel territories. Students, residents, and staff were surveyed during bedside ultrasound simulation sessions and ECG teaching half-days. Results demonstrated clear appreciation of 3D printed models, which suggests such models can easily be implemented by other institutions to augment trainees' experience during skill acquisition.

Point of care ultrasound (POCUS) in diagnosis of proximal deep vein thrombosis among COVID-19 hospitalized patients with a high rate of low molecular weight heparin prophylaxis

"clinical ultrasound" or "clinical ultra...by Pedro M García-Ceberino / 14d

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INSIGHTS

Add note

Med Clin (Engl Ed). 2021 Aug 27;157(4):172-175. doi: 10.1016/j.medcle.2021.01.013. Epub 2021 Aug 20.

ABSTRACT

BACKGROUND: Deep vein thrombosis (DVT) and pulmonary embolism (PE) are both complications linked with COVID-19. Lower limb point-of-care clinical ultrasound (POCUS) could detect occult clots, helping decide whom to treat with anticoagulation.

OBJECTIVES: To determine proximal DVT prevalence with POCUS screening among hospitalized COVID-19 patients.

PATIENTS/METHODS: Lower limb POCUS was performed in all patients admitted either to the ward or intensive care unit (ICU) between April 22nd and 30th 2020. Clinical and laboratory features, prescriptions, thrombotic complications and outcomes were assessed.

RESULTS: 87 patients were screened, of which 26 (29.8%) either had been discharged from ICU (19.5%) or were still in critical condition (10.3%). DVT was found in 4 patients (3 femoral, 1 popliteal), of which 1 had not received low molecular weight heparin (LMWH) prophylaxis. 21 CT pulmonary angiograms were performed, being positive for PE in 5 cases (23.8%); only 2 of these patients suffered DVT.

CONCLUSIONS: Screening lower extremities with POCUS did not find a high rate of DVT among patients receiving LMWH-prophylaxis. However, there was a noteworthy amount of PE without DVT.

Lung ultrasound: a narrative review and proposed protocol for patients admitted to Cardiac Rehabilitation Unit

["lung ultrasound" or "lung ultrasonograp..."](#) by Dario Tino Bertolone / 14d

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INSIGHTS

Add note

Monaldi Arch Chest Dis. 2021 Aug 23. doi: 10.4081/monaldi.2021.1753. Online ahead of print.

ABSTRACT

Lung ultrasonography (LUS) has become in the last 10 years a technique that has reduced the need of second level diagnostic methods such as chest X-ray (CXR) and computerize tomography (CT) for the diagnostic imaging of lung and pleural space, throughout its diagnostic accuracy, radiation free, low cost, real time and bedside approach. The common use of LUS has been recently extend to cardiac and pulmonary disease even in context of Cardiac Rehabilitation Unit and it could be an additional tool for physiotherapist for the management of patients during Rehabilitation course. The authors performed a literature review in PubMed and suggested a new standardize protocol for LUS, based on guidelines and expert consensus document, for patients admitted to Cardiac Rehabilitation Unit. In this protocol, LUS should be performed in six scan each hemithorax, covering twelve imagine regions. For each scan will be noted a specific physiologic or pathological patterns. Furthermore, we suggest for each patient, the use of the Lung Ultrasound Score (LUS score) to obtain a global view of lung aeration and to monitor any changes during the hospitalization. An increase in score range indicates a more severe condition. This Lung Ultrasonography Protocol should be performed in all patients at the time of admission to Cardiac Rehabilitation Unit to monitoring the aeration of the lungs and the possible lung and/or pleura complications after a cardiac disease avoiding the use of second level surveys.

Point-of-Care Ultrasound Identification of Right-Sided Cardiac Chamber Collapse Associated With Pericardial Effusions Without Hypotension: A Case Series

[pubmed: point of care ultras...](#) by Kelly R Bergmann / 13d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Sep 1;37(9):480-483. doi: 10.1097/PEC.0000000000002405.

ABSTRACT

We present a case series of 6 children in whom point-of-care ultrasound revealed a pericardial effusion with right atrial or ventricular collapse, and show how this may heighten concern for development of pericardial tamponade and expedite care.

Prediction of postoperative nausea and vomiting by point-of-care gastric ultrasound: can we improve complications and length of stay in emergency surgery? A cohort study

[pubmed: point of care ultras...](#)by Valerio Cozza / 13d

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INSIGHTS

Add note

BMC Anesthesiol. 2021 Aug 31;21(1):211. doi: 10.1186/s12871-021-01428-0.

ABSTRACT

BACKGROUND: Postoperative nausea and vomiting and postoperative ileus are common after major digestive surgery and represent one of the significant problems in Acute Care Surgery. The delivery model of emergency surgery needs to be improved in order to foster a patient-centered care. The multimodal approach suggested by Enhanced Recovery After Surgery (ERAS®) Guidelines is gaining widespread acceptance but is difficult to apply to emergency surgery. Ultrasound examination of the gastric antrum allows a reliable assessment of gastric contents and volume and might help contribute to improve perioperative care in the emergency setting.

METHODS: Gastric ultrasound examinations were performed preoperatively and postoperatively on forty-one patients undergoing emergency abdominal surgery. Gastric cross-sectional area (CSA) was measured, in order to estimate the gastric volume. The data obtained were used to evaluate a possible relationship between delayed gastric emptying and postoperative adverse event.

RESULTS: Gastric antrum detection rate varied from 31.8% in open up to 78.9% in laparoscopic surgeries ($p = 0.003$). Six patients experienced adverse outcomes, had an antiemetic therapy administered and/or a nasogastric tube inserted. Mean CSA was significantly higher in this group (12.95 cm^2 vs 6.12 cm^2 ; $p = 0.040$).

CONCLUSIONS: Sensitivity of gastric ultrasound varies depending on surgical technique. A dilated gastric antrum is significantly related to postoperative adverse outcomes and a careful ultrasound follow-up might help tailor postoperative nutrition and antiemetic therapy. In patients who experienced adverse events, antral CSA showed an average increase of more than 50% over a period of 72 h after surgery. A relative measure could be used to predict the risk of postoperative ileus. Overall, gastric ultrasound seems to be a promising diagnostic tool and a useful way to integrate ERAS® protocol in emergency abdominal surgery.

Ultrasound Measurement of the Intervertebral Space in the Lateral Recumbent Versus Sitting Positions

[pubmed: point of care ultras...](#)by Dorothy Shi / 13d

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INSIGHTS

Add note

J Emerg Med. 2021 Aug 29:S0736-4679(21)00553-9. doi: 10.1016/j.jemermed.2021.07.015. Online ahead of print.

ABSTRACT

BACKGROUND: Diagnostic lumbar puncture (LP) is an invasive procedure routinely performed within the emergency department (ED). LP is traditionally performed with the patient in either the lateral recumbent or sitting position. We investigated if the intervertebral space is larger in one of these positions. If one position is larger than the other, this would imply that one position offers a higher chance of a successful lumbar puncture than the other position.

OBJECTIVE: We sought to determine if there is a significant size difference of the L4/L5 intervertebral space in the lateral recumbent compared with the sitting position.

METHODS: Point-of-care ultrasound (POCUS) was performed to measure the size of each volunteer's L4/L5 intervertebral space in both the seated and lateral recumbent positions. All volunteers >18 years of age were eligible for the study. Thirty volunteers had measurements taken. Three measurements were taken by each investigator in both positions for each volunteer.

RESULTS: The median L4/L5 intervertebral space distance was 1.7511 cm in the lateral recumbent position and 1.9511 cm in the seated position with a Wilcoxon signed rank p value <.0001. The interspinous space in the seated position was found to be significantly larger than in the lateral recumbent position.

CONCLUSION: The size of the interspinous space in the seated position on ultrasound was found to be larger than the lateral recumbent position, suggesting that LP may be more successful in the seated position.

Point-of-Care Ultrasound Predicts Clinical Outcomes in Patients With COVID-19

[pubmed: intubation ultrasoun...](#) by Andre Kumar / 12d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Sep 1. doi: 10.1002/jum.15818. Online ahead of print.

ABSTRACT

OBJECTIVES: Point-of-care ultrasound (POCUS) detects the pulmonary manifestations of COVID-19 and may predict patient outcomes.

METHODS: We conducted a prospective cohort study at four hospitals from March 2020 to January 2021 to evaluate lung POCUS and clinical outcomes of COVID-19. Inclusion criteria included adult patients hospitalized for COVID-19 who received lung POCUS with a 12-zone protocol. Each image was

interpreted by two reviewers blinded to clinical outcomes. Our primary outcome was the need for intensive care unit (ICU) admission versus no ICU admission. Secondary outcomes included intubation and supplemental oxygen usage.

RESULTS: N = 160 patients were included. Among critically ill patients, B-lines (94 vs 76%; P < .01) and consolidations (70 vs 46%; P < .01) were more common. For scans collected within 24 hours of admission (N = 101 patients), early B-lines (odds ratio [OR] 4.41 [95% confidence interval, CI: 1.71-14.30]; P < .01) or consolidations (OR 2.49 [95% CI: 1.35-4.86]; P < .01) were predictive of ICU admission. Early consolidations were associated with oxygen usage after discharge (OR 2.16 [95% CI: 1.01-4.70]; P = .047). Patients with a normal scan within 24 hours of admission were less likely to require ICU admission (OR 0.28 [95% CI: 0.09-0.75]; P < .01) or supplemental oxygen (OR 0.26 [95% CI: 0.11-0.61]; P < .01). Ultrasound findings did not dynamically change over a 28-day scanning window after symptom onset.

CONCLUSIONS: Lung POCUS findings detected within 24 hours of admission may provide expedient risk stratification for important COVID-19 clinical outcomes, including future ICU admission or need for supplemental oxygen. Conversely, a normal scan within 24 hours of admission appears protective. POCUS findings appeared stable over a 28-day scanning window, suggesting that these findings, regardless of their timing, may have clinical implications.

Point-of-care Doppler ultrasound in the management of hyponatremia: Another string to nephrologists' Bow

[pubmed: point of care ultras...](#) by Samira Samant / 11d

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INSIGHTS

Add note

Clin Case Rep. 2021 Aug 26;9(8):e04687. doi: 10.1002/ccr3.4687. eCollection 2021 Aug.

ABSTRACT

Objective assessment of fluid status is vital for the appropriate management of patients with hyponatremia. Conventional physical examination suffers from several limitations in this regard, and point-of-care Doppler ultrasonography can be used as an adjunct to clinical and laboratory data in evaluating these patients.

Outcomes of Simplified Lung Ultrasound Exam in COVID-19: Implications for Self-Imaging

["lung ultrasound" or "lung ultrasonograp...](#) by Bruce J Kimura / 11d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Sep 2. doi: 10.1002/jum.15820. Online ahead of print.

ABSTRACT

OBJECTIVES: Lung ultrasound B-lines represent interstitial thickening or edema and relate to mortality in COVID-19. As B-lines can be detected with minimal training using point-of-care ultrasound (POCUS), we examined the frequency, clinical associations, and outcomes of B-lines when found using a simplified POCUS method in acutely ill patients with COVID-19.

METHODS: In this retrospective cohort study, hospital data from COVID-19 patients who had undergone lung imaging during standard echocardiography or POCUS were reviewed for an ultrasound lung comet (ULC) sign, defined as the presence of ≥ 3 B-lines from images of only the antero-apex of either lung (ULC+). Clinical risk factors, oximetry and radiographic results, and disease severity were analyzed for associations with ULC+. Clinical risk factors and ULC+ were analyzed for associations with hospital mortality or the need for intensive care in multivariable models.

RESULTS: Of $N = 160$ patients, age (mean \pm standard deviation) was 64.8 ± 15.5 years, and 46 (29%) died. ULC+ was present in 100/160 (62%) of patients overall, in 81/103 (79%) of severe-or-greater disease versus 19/57 (33%) of moderate-or-less disease ($P < .0001$) and was associated with mortality (odds ratio [OR] = 2.4 [95% confidence interval [CI]: 1.1-5.4], $P = .02$) and the need for intensive care (OR = 5.23 [95% CI: 2.42-12.40], $P < .0001$). In the multivariable models, symptom duration and severe-or-greater disease were associated with ULC+, and ULC+, diabetes, and symptom duration were associated with the need for intensive care.

CONCLUSIONS: B-lines in the upper chest were common and related to disease severity, intensive care, and hospital mortality in COVID-19. Validation of a simplified lung POCUS exam could provide the evidence basis for a self-imaging application during the pandemic.

The use of point-of-care ultrasound in a regional emergency department in KwaZulu-Natal, South Africa

"emergency ultrasound" by Halalisiwe B Khanyi / 10d

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INSIGHTS

Add note

S Afr Fam Pract (2004). 2021 Aug 23;63(1):e1-e6. doi: 10.4102/safp.v63i1.5269.

ABSTRACT

BACKGROUND: Formal ultrasonography has advanced to point-of-care ultrasound (POCUS) in the emergency department (ED) for the purpose of acute critical care. While POCUS application expands, little is known about POCUS utilisation in public hospital EDs. This study aimed to describe the use of POCUS in an ED in KwaZulu-Natal.

METHODS: A retrospective chart review study was conducted on all patients who had POCUS exams performed in the ED at the General Justice Gizenga Mpanza Regional Hospital from 01 September 2019 to 31 March 2020. A data collection tool was used to extract the required data from the Mindray M6 ultrasound machine. The data were processed using the Statistical Package for Social Sciences (SPSS version 26) and descriptive statistics were used to summarise the data.

RESULTS: A total of 978 POCUS were performed on 784 patients. Point-of-care ultrasound was utilised more often for focused emergency echocardiography in resuscitation ($n = 383$) and extended focused assessment with sonography for trauma ($n = 319$). The findings were normal in 17% of exams, 31% were positive, 9% were unspecified and 43% of POCUS exams were inconclusive. Seven percent of POCUS

exams were performed by accredited level 1 emergency POCUS providers and ultrasounds occurred more frequently during day-shift hours than after-hours.

CONCLUSION: Point-of-care ultrasound core applications were utilised by ED doctors for various emergency care scenarios, mainly for trauma and cardiac assessments.

A case of traumatic rupture of the urinary bladder due to a fall from a chair-style ski lift
[focused assessment sonography trauma](#) by Yukihiro Tatekawa / 10d

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INSIGHTS

Add note

J Surg Case Rep. 2021 Aug 31;2021(8):rjab395. doi: 10.1093/jscr/rjab395. eCollection 2021 Aug.

ABSTRACT

We report our experience with an 8-year-old boy who incurred a traumatic rupture of the urinary bladder due to a fall from a chair-type ski lift. This boy felt like he needed to urinate before getting on the lift, but he did not do so. He was trembling from the sensation of needing to urinate and fell from the lift while it was at least 6 m in the air. He complained of abdominal pain, and on-site emergency physicians performed focused assessment with sonography for trauma, which showed fluid in the abdomen. He subsequently developed abdominal guarding. Enhanced abdominal computed tomography revealed a rupture of the urinary bladder. At laparotomy, two ruptures were seen along the dome of the bladder; the bladder wall was repaired in three layers. The patient was discharged with a cast on his foot for a fracture of the left heel bone on postoperative day 16.

Examination of the diaphragm in obstructive sleep apnea using ultrasound imaging
[diaphragm and \(ultrasound or ultrasonogr...](#) by Viktória Molnár / 10d

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INSIGHTS

Add note

Sleep Breath. 2021 Sep 3. doi: 10.1007/s11325-021-02472-3. Online ahead of print.

ABSTRACT

PURPOSE: The aim of this study was to analyze the effect of obstructive sleep apnea (OSA) on the ultrasound (US) features of the diaphragm and to determine if diaphragmatic US may be a useful screening tool for patients with possible OSA.

METHODS: Patients complaining of snoring were prospectively enrolled for overnight polygraphy using the ApneaLink Air device. Thickness and motion of the diaphragm during tidal and deep inspiration were measured. Logistic regression was used to assess parameters of the diaphragm associated with OSA.

RESULTS: Of 100 patients, 64 were defined as having OSA. Thicknesses of the left and right hemidiaphragms were significantly different between OSA and control groups. Using a combination of diaphragmatic dimensions, diaphragm dilation, age, sex, and BMI, we developed an algorithm that predicted the presence of OSA with 91% sensitivity and 81% specificity.

CONCLUSION: A combination of anthropometric measurements, demographic factors, and US imaging may be useful for screening patients for possible OSA. These findings need to be confirmed in larger sample sizes in different clinical settings.

The Impact of Lung Ultrasound on Coronavirus Disease 2019 Pneumonia Suspected Patients Admitted to Emergency Departments

["lung ultrasound" or "lung ultrasonograp...](#)by Leyla Öztürk Sönmez / 10d

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INSIGHTS

Add note

Ultrasound Q. 2021 Mar 3;37(3):261-266. doi: 10.1097/RUQ.0000000000000559.

ABSTRACT

OBJECTIVE: The aim of this study was to identify the sensitivity and specificity of lung ultrasound (LUS) and show its place in diagnosing patients with known coronavirus disease 2019 (COVID-19) pneumonia, according to chest computed tomography and the COVID-19 reporting and data system (CO-RADS).

METHODS: Nineteen patients who admitted to a single university hospital emergency department between March 5, 2020, and April 27, 2020, describing dyspnea were included in the study and underwent LUS by a single emergency specialist. The patient population was divided into 2 groups, COVID-19 positive and negative, and the sensitivity and specificity of LUS according to chest computed tomography were calculated for COVID-19 pneumonia diagnosis. In the subgroup analysis, the patient group was divided into real-time reverse transcription-polymerase chain reaction positive (n = 7) and negative (n = 12), and sensitivity and specificity were calculated according to the CO-RADS.

RESULTS: According to the CO-RADS, significant differences were detected between the LUS positive and negative groups in terms of COVID-19 pneumonia presence. Only 1 patient was evaluated as CO-RADS 2 in the LUS positive group, and 2 patients were evaluated as CO-RADS 4 in the LUS negative group (P = 0.04). The sensitivity of LUS according to the CO-RADS for COVID-19 pneumonia diagnosis was measured to be 77.78% (95% confidence interval [CI], 39.9%-97.1%), specificity was 90% (95% CI, 55.5%-99.75%), positive predictive value was 87.5% (95% CI, 51.35%-97.8%), and accuracy was 84.21% (95% CI, 60.4%-96.62%; P = 0.004).

CONCLUSIONS: In conclusion, LUS is easily used in the diagnosis of COVID-19 pneumonia because it has bedside application and is fast, easy to apply, reproducible, radiation free, safe for pregnant women, and cheap.

Clinical Ultrasound Education for Medical Students: Virtual Reality Versus e-Learning, a Randomized Controlled Pilot Trial

["clinical ultrasound" or "clinical ultra...](#)by Mathias Rosenfeldt Nielsen / 10d

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INSIGHTS

Add note

Ultrasound Q. 2021 Sep 1;37(3):292-296. doi: 10.1097/RUQ.0000000000000558.

ABSTRACT

The primary aim was to evaluate the effect of immersive virtual reality learning for training medical students in basic clinical ultrasound. Secondary outcomes were to explore if virtual reality learning had an effect on hand-eye coordination skills and if the medical students wanted more virtual reality learning. This pilot study was a double-blind, parallel-group, block-randomized, controlled trial. Participants (n = 20) were blinded and randomized to virtual reality or e-learning for basic ultrasound education. Medical students with no previous ultrasound education were recruited voluntarily from the University of Southern Denmark. Data were collected during introductory courses on ultrasound from March to May 2019. Participants were assessed with Objective Structured Assessment on Ultrasound Skills. Assessing supervisors were blinded. The virtual reality group (n = 11) scored a significantly higher Objective Structured Assessment on Ultrasound Skills score (143 [95% confidence interval {CI}, 135 to 151]) compared with the e-learning group (n = 9; 126 [95% CI, 113 to 138]; mean difference, 17 points [95% CI, 4 to 30]; P < 0.01). No significant effect on the hand-eye score was found (mean difference, 3 points [95% CI, -3 to 9]; P = 0.32). Ninety-one percent of the virtual reality group wanted more virtual reality learning. Immersive virtual reality learning improved medical students' ultrasound skills significantly compared with e-learning. The hand-eye score was higher in the virtual reality group, although not at a significant level. Students wanted more virtual reality learning. Further research is needed to clarify immersive virtual reality's educational role in the future.

Suture Granuloma Diagnosed and Treated With Bedside Ultrasound

pubmed: bUS by Bradley S Jackson / 10d

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INSIGHTS

Add note

J Emerg Med. 2021 Aug 31:S0736-4679(21)00565-5. doi: 10.1016/j.jemermed.2021.07.026. Online ahead of print.

ABSTRACT

BACKGROUND: Emergency physicians frequently evaluate patients with postoperative wound issues. The differential is broad, but obviously includes postoperative site infections. We present a case where a suspected postoperative abscess was evaluated with bedside ultrasound prior to incision and drainage. Suture material was recognized, shifting our approach to treatment of the lesion.

CASE REPORT: A 24-year-old female patient presented with pain, swelling, and drainage from a left lower quadrant abdominal wound that had been present since undergoing a laparoscopic appendectomy 1 year prior. A computed tomography scan was performed, which was negative for foreign bodies. Prior to incision and drainage, a bedside ultrasound was performed to evaluate the lesion, which was notable for sonographic findings consistent with suture material. Suture granuloma was diagnosed, and

ultrasound was then used to successfully guide retrieval of the suture. To our knowledge, this is the first published case where ultrasound was used to both diagnose and dynamically remove the offending suture material. We briefly discuss suture granulomas, their sonographic appearance, and management. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** Emergency physicians frequently perform ultrasound on suspected abscesses prior to incision and drainage and should be aware of the sonographic appearance of suture material as it would change management if present. If a suture granuloma is suspected due to swelling at a postoperative site, ultrasound use should be strongly considered for evaluation.

Bolus intravenous 0.9% saline leads to interstitial permeability pulmonary edema in healthy volunteers

["lung ultrasound" or "lung ultrasonograp...](#) by Hanmo Li / 9d

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INSIGHTS

Add note

Eur J Appl Physiol. 2021 Sep 4. doi: 10.1007/s00421-021-04805-2. Online ahead of print.

ABSTRACT

PURPOSE: Bolus intravenous administration of 0.9% saline has been associated with the development of pulmonary edema, and increased mortality. An animal model has previously demonstrated that rapid intravenous administration of 0.9% saline was associated with non-hydrostatic lung injury with increased lung lavage protein. We hypothesized that this non-hydrostatic effect would also occur in human volunteers.

METHODS: In a randomized, cross-over study of 14 healthy male subjects, the lung lavage protein concentration and cardiorespiratory effects of an intervention with rapid intravenous administration of 30 mL/kg of 0.9% saline were compared with sham intervention. Bronchoalveolar lavage (BAL) was performed after fluid administration. Doppler echocardiography, lung ultrasound, pulmonary function tests, and blood sampling were performed before and after each intervention.

RESULTS: The BAL total protein concentration was greater after 0.9% saline administration than with sham (196.1 μ g/mL (SD 87.6) versus 129.8 μ g/mL (SD 55.4), respectively ($p = 0.020$). Plasma angiotensin-2 concentration was also increased to 2.26 ng/mL (SD 0.87) after 0.9% saline administration compared with sham 1.53 ng/mL (SD 0.69) ($p < 0.001$). There were small increases in stroke volume (from 58 mL (IQR 51-74) to 66 mL (IQR 58-74), $p = 0.045$) and Doppler echocardiography left ventricle E/e' ratio (from 5.0 (IQR 4.5-6.0) to 5.7 (IQR 5.3-6.3), $p = 0.007$), but no changes to right ventricular function.

CONCLUSION: Rapid intravenous administration of 0.9% saline leads to interstitial permeability pulmonary edema in healthy human volunteers. Further research is now warranted to understand these effects in critically ill patients.

The Value of Lung Ultrasound to Detect the Early Pleural and Pulmonary Pathologies in Nonhospitalized COVID-19-Suspected Cases in a Population with a Low Prevalence of COVID-19 Infection: A Prospective Study in 297 Subjects

["lung ultrasound" or "lung ultrasonograp...](#) by Ehsan Safai Zadeh / 9d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Sep 4. doi: 10.1002/jum.15822. Online ahead of print.

ABSTRACT

OBJECTIVES: This prospective study aimed to evaluate the value of B-mode lung ultrasound (LUS) for the early diagnosis of coronavirus disease 2019 (COVID-19) infection in nonhospitalized COVID-19 suspected cases in a population with a low prevalence of disease.

METHODS: From April 2020 to June 2020, in an ambulatory testing center for COVID-19-suspected cases, 297 subjects were examined by LUS before a nasopharyngeal swab was taken for a reverse transcription polymerase chain reaction (RT-PCR) test. The following LUS findings were defined as pathological ultrasound findings and were analyzed: the presence of 1) pleural effusion, 2) B-lines, 3) fragmented visceral pleura, 4) consolidation, and 5) air bronchogram in the consolidation. The LUS findings were compared with the RT-PCR test results.

RESULTS: The result of the RT-PCR test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was positive in 11 and negative in 286 subjects, and the prevalence of COVID-19 infection in the study participants was 3.7%. On LUS, a pathological finding could be detected in 56/297 (18.9%) study participants. The LUS revealed a sensitivity of 27.3%, a specificity of 81.5%, a positive predictive value of 5.4%, a negative predictive value of 96.7%, and a diagnostic accuracy of 79.9% for the identification of COVID-19 infection.

CONCLUSIONS: For the identification of COVID-19 infection, LUS is highly sensitive to the patient spectrum and to the prevalence of the disease. Due to the low diagnostic performance in nonhospitalized COVID-19 cases in low-prevalence areas, LUS cannot be considered to be an adequate method for making a diagnosis in this group.

Point-of-care diagnostic lung ultrasound is highly applicable to the practice of medicine in Saudi Arabia but the current skills gap limits its use

[pubmed: point of care ultras...](#) by Rajkumar Rajendram / 8d

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INSIGHTS

Add note

Ann Thorac Med. 2021 Jul-Sep;16(3):266-273. doi: 10.4103/atm.ATM_358_20. Epub 2021 Jul 20.

ABSTRACT

CONTEXT: Coronavirus disease 2019 (COVID-19) has put a spotlight on point-of-care diagnostic lung ultrasound (POCDLUS). However, the spectra of respiratory disease and resources available for investigation vary internationally. The applicability of POCDLUS to internal medicine (IM) practice in Saudi Arabia and the current use by Saudi physicians are unknown.

AIMS: The aim of the present study was to determine the applicability of POCDLUS to IM practice in Saudi Arabia and quantify the residents' current skills, accreditation, and use of POCDLUS.

METHODS: A questionnaire was distributed to the IM residents at our institution to assess their knowledge, use of POCDLUS, and their perceptions of its applicability in IM.

STATISTICAL ANALYSIS: Standard descriptive statistical techniques were used. Categorical data, presented as frequency, were compared using the Chi-squared test. The Likert scale responses, presented as mean \pm standard deviation, were compared with a Student's t-test.

RESULTS: In total, 100 residents participated (response rate 92.6%) and reported that POCDLUS was applicable to their practice. Identifying pleural effusions was most applicable. A small proportion ($n = 7$) had received training, nine used POCDLUS regularly, none were accredited and the overall self-reported level of knowledge was poor.

CONCLUSIONS: Whilst POCDLUS is applicable to IM practice in Saudi Arabia, the significant skills gap preclude the provision of a POCDLUS service. As COVID-19 can cause an interstitial syndrome, our pandemic preparation response should include POCDLUS training. The current study is supported by a similar Canadian study and the international standardisation of POCDLUS training may be feasible. The findings of the current study may facilitate the development of POCDLUS training programs for internists throughout Saudi Arabia.

Anesthetic management during whole-lung lavage using lung ultrasound in a patient with pulmonary alveolar proteinosis

["lung ultrasound" or "lung ultrasonograp..."](#) by Jae Wan Jung / 8d

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INSIGHTS

Add note

Yeungnam Univ J Med. 2021 Sep 6. doi: 10.12701/yujm.2021.01284. Online ahead of print.

ABSTRACT

Pulmonary alveolar proteinosis (PAP) is an uncommon disease characterized by progressive accumulation of lipoprotein material in the lungs due to impaired surfactant clearance. Whole-lung lavage (WLL) is the current standard treatment and consists of sequential lavage of each lung to mechanically remove the residual material from the alveoli. Although WLL is considered safe, unexpected complications can occur. Moreover, due to the rarity of the disease itself, this procedure is unknown to many physicians, and management of intraoperative complications can be challenging for anesthesiologists. Lung ultrasound (LUS) provides reliable and valuable information for detecting perioperative pulmonary complications and, in particular, quantitation of lung water content. There have been reports on monitoring the different stages of controlled deaeration of the non-ventilated lung during WLL using LUS. However, it has been limited to non-ventilated lungs. Therefore, we report the use of LUS in WLL to proactively detect pulmonary edema in the ventilated lung and implement a safe and effective anesthesia strategy. Given the limited diagnostic tools available to anesthesiologists in the operating room, LUS is a reliable, fast, and noninvasive method for identifying perioperative pulmonary complications in patients with PAP undergoing WLL.

The Effectiveness of Self-Instructional Video vs. Classroom Teaching Method on Focused Assessment With Sonography in Trauma Among House Officers in University Hospital

[focused assessment sonography trauma](#) by Mohd Hisham Isa / 7d

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INSIGHTS

Add note

Front Surg. 2021 Aug 17;8:698774. doi: 10.3389/fsurg.2021.698774. eCollection 2021.

ABSTRACT

Background: The aim of this study was to compare the effectiveness of self-instructional-video (SIV) and classroom training method (CTM) in learning Focus-Assessment with Sonography-in-Trauma (FAST) among house officers (HO). **Method:** A randomized controlled study involving house officers working in the university hospital in Malaysia was conducted where participants were randomized into SIV group (intervention) and CTM group (control). Each group had to undergo a 4 h hands-on training. The intervention group has undergone self-training using the video material without any facilitation while the control group received lecture and hands-on training with facilitators. Participants' performance was assessed using a validated Objective Structured Clinical Examination checklist for landmark identification and interpretation of images generated. Learning preference and confidence level were also assessed. **Result:** A total of 33 HO were enrolled in this study. Marks obtained in image acquisition by the intervention and control were 25.3 (SD = 5.3) and 25.6 (SD = 2.3) $p > 0.05$, respectively. While in image interpretation, the mean score for the intervention and control group was 10.3 (SD 1.7) and 9.8 (SD = 1.7) $p > 0.05$, respectively. Overall performance assessment, showed the intervention group obtained 35.6 (SD = 5.9) compared to control 35.3 (SD = 3.4), $p > 0.05$. Based on pre-specified determinant these scores difference falls within the 10% of non-inferiority margin. The absolute difference between both groups was 0.3 (CI = -3.75 to 3.21, $p = 0.871$), which proves non-inferiority but not superiority. In terms of learning preference and confidence to perform FAST, most of the participants preferred the control group approach. **Conclusion:** The SIV method is as effective as the CTM for learning FAST among the house officers and served as an alternative to classroom teaching. However, this technique needs improvement in promoting their confidence and preference. Perhaps incorporating a feedback session after going through the SIV would improve the confidence.

Comparing accuracy of bedside ultrasound examination with physical examination for detection of pleural effusion

[pubmed: point of care ultras...](#) by Michael H Walsh / 7d

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INSIGHTS

Add note

Ultrasound J. 2021 Sep 6;13(1):40. doi: 10.1186/s13089-021-00241-7.

ABSTRACT

BACKGROUND: In detecting pleural effusion, bedside ultrasound (US) has been shown to be more accurate than auscultation. However, US has not been previously compared to the comprehensive physical examination. This study seeks to compare the accuracy of physical examination with bedside US in detecting pleural effusion.

METHODS: This study included a convenience sample of 34 medical inpatients from Calgary, Canada and Spokane, USA, with chest imaging performed within 24 h of recruitment. Imaging results served as the reference standard for pleural effusion. All patients underwent a comprehensive lung physical examination and a bedside US examination by two researchers blinded to the imaging results.

RESULTS: Physical examination was less accurate than US (sensitivity of 44.0% [95% confidence interval (CI) 30.0-58.8%], specificity 88.9% (95% CI 65.3-98.6%), positive likelihood (LR) 3.96 (95% CI 1.03-15.18), negative LR 0.63 (95% CI 0.47-0.85) for physical examination; sensitivity 98% (95% CI 89.4-100%), specificity 94.4% (95% CI 72.7-99.9%), positive LR 17.6 (95% CI 2.6-118.6), negative LR 0.02 (95% CI 0.00-0.15) for US). The percentage of examinations rated with a confidence level of 4 or higher (out of 5) was higher for US (85% of the seated US examination and 94% of the supine US examination, compared to 35% of the PE, $P < 0.001$), and took less time to perform ($P < 0.0001$).

CONCLUSIONS: US examination for pleural effusion was more accurate than the physical examination, conferred higher confidence, and required less time to complete.

Comparison of in-person versus tele-ultrasound point-of-care ultrasound training during the COVID-19 pandemic

pubmed: [point of care ultras...](#) by Nilam J Soni / 7d

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INSIGHTS

Add note

Ultrasound J. 2021 Sep 6;13(1):39. doi: 10.1186/s13089-021-00242-6.

ABSTRACT

BACKGROUND: Lack of training is currently the most common barrier to implementation of point-of-care ultrasound (POCUS) use in clinical practice, and in-person POCUS continuing medical education (CME) courses have been paramount in improving this training gap. Due to travel restrictions and physical distancing requirements during the COVID-19 pandemic, most in-person POCUS training courses were cancelled. Though tele-ultrasound technology has existed for several years, use of tele-ultrasound technology to deliver hands-on training during a POCUS CME course has not been previously described.

METHODS: We conducted a retrospective observational study comparing educational outcomes, course evaluations, and learner and faculty feedback from in-person versus tele-ultrasound POCUS courses. The same POCUS educational curriculum was delivered to learners by the two course formats. Data from the most recent pre-pandemic in-person course were compared to tele-ultrasound courses during the COVID-19 pandemic.

RESULTS: Pre- and post-course knowledge test scores of learners from the in-person ($n = 88$) and tele-ultrasound course ($n = 52$) were compared. Though mean pre-course knowledge test scores were higher among learners of the tele-ultrasound versus in-person course (78% vs. 71%; $p = 0.001$), there was no significant difference in the post-course test scores between learners of the two course formats (89% vs.

87%; $p = 0.069$). Both learners and faculty rated the tele-ultrasound course highly (4.6-5.0 on a 5-point scale) for effectiveness of virtual lectures, tele-ultrasound hands-on scanning sessions, and course administration. Faculty generally expressed less satisfaction with their ability to engage with learners, troubleshoot image acquisition, and provide feedback during the tele-ultrasound course but felt learners completed the tele-ultrasound course with a better basic POCUS skillset.

CONCLUSIONS: Compared to a traditional in-person course, tele-ultrasound POCUS CME courses appeared to be as effective for improving POCUS knowledge post-course and fulfilling learning objectives. Our findings can serve as a roadmap for educators seeking guidance on development of a tele-ultrasound POCUS training course whose demand will likely persist beyond the COVID-19 pandemic.

In acute dyspnea with diagnostic uncertainty, ACP suggests POCUS may be added to the standard diagnostic pathway

[pubmed: point of care ultras...](#) by Jonathan M Kirschner / 7d

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INSIGHTS

Add note

Ann Intern Med. 2021 Sep 7. doi: 10.7326/ACPJ202109210-099. Online ahead of print.

ABSTRACT

Qaseem A, Etzeandia-Ikobaltzeta I, Mustafa RA, et al. **Appropriate use of point-of-care ultrasonography in patients with acute dyspnea in emergency department or inpatient settings: a clinical guideline from the American College of Physicians.** Ann Intern Med. 2021;174:985-93. 33900792.

Diagnostic and Prognostic Value of Lung Ultrasound B-Lines in Acute Heart Failure With Concomitant Pneumonia

["lung ultrasound" or "lung ultrasonograp...](#) by Matteo Mazzola / 6d

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INSIGHTS

Add note

Front Cardiovasc Med. 2021 Aug 19;8:693912. doi: 10.3389/fcvm.2021.693912. eCollection 2021.

ABSTRACT

Purpose: To evaluate the potential confounding effect of concomitant pneumonia (PNM) on lung ultrasound (LUS) B-lines in acute heart failure (AHF). **Methods:** We enrolled 86 AHF patients with (31 pts, AHF/PNM) and without (55 pts, AHF) concomitant PNM. LUS B-lines were evaluated using a combined antero-lateral (AL) and posterior (POST) approach at admission (T0), after 24 h from T0 (T1), after 48 h from T0 (T2) and before discharge (T3). B-lines score was calculated at each time point on AL and POST chest, dividing the number of B-lines by the number of explorable scanning sites. The decongestion rate (DR) was calculated as the difference between the absolute B-lines number at

discharge and admission, divided by the number of days of hospitalization. Patients were followed-up and hospital readmission for AHF was considered as adverse outcome. **Results:** At admission, AHF/PNM patients showed no difference in AL B-lines score compared with AHF patients [AHF/PNM: 2.00 (IQR: 1.44-2.94) vs. AHF: 1.65 (IQR: 0.50-2.66), $p = 0.072$], whereas POST B-lines score was higher [AHF/PNM: 3.76 (IQR: 2.70-4.77) vs. AHF = 2.44 (IQR: 1.20-3.60), $p < 0.0001$]. At discharge, AL B-lines score [HR: 1.907 (1.097-3.313), $p = 0.022$] and not POST B-lines score was found to predict adverse events (AHF rehospitalization) after a median follow-up of 96 days (IQR: 30-265) in the overall population. **Conclusions:** Assessing AL B-lines alone is adequate for diagnosis, pulmonary congestion (PC) monitoring and prognostic stratification in AHF patients, despite concomitant PNM.

Evaluating the diagnostic accuracy of point-of-care ultrasound for cholelithiasis and cholecystitis in a canadian emergency department

[pubmed: point of care ultras...](#)by Sameer Sharif / 6d

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INSIGHTS

Add note

CJEM. 2021 Sep;23(5):626-630. doi: 10.1007/s43678-020-00068-6. Epub 2021 Jan 14.

ABSTRACT

OBJECTIVES: Cholelithiasis and cholecystitis are common conditions that frequently require patients to come to the Emergency Department (ED) and undergo diagnostic imaging. The purpose of this study was to evaluate the test characteristics of emergency physician performed point-of-care ultrasound (POCUS) to diagnose cholelithiasis and cholecystitis in a Canadian ED.

METHODS: A health records review was performed on all ED patients > 17 years of age for whom POCUS was performed to diagnose cholelithiasis and cholecystitis in a Canadian academic ED over a 5-year period. The sensitivity, specificity, predictive values, and likelihood ratios were calculated. The gold standard used for diagnosis was pathology, laparoscopy, radiology-performed comprehensive ultrasonography, followed by computed tomography scans.

RESULTS: A total of 577 patients were included in the study. The sensitivity and specificity of POCUS to diagnose cholelithiasis was 95.2% (95% CI 91.1-97.8%) and 93.1% (95% CI 90.1-95.4%). The positive and negative likelihood ratios for POCUS to diagnose cholelithiasis were found to be 14 and 0.05; the negative predictive value was 97.6% (95% CI 95.5-98.7%). The sensitivity and specificity of POCUS to diagnose cholecystitis was 67.1% (95% CI 54.9-77.9%) and 97.6% (95% CI 95.9-98.8%). The positive and negative likelihood ratios for POCUS to diagnose cholecystitis were found to be 28 and 0.34; the negative predictive value was 95.6% (95% CI 93.9-96.8%).

CONCLUSION: POCUS is reliable for the diagnosis of cholelithiasis and for ruling in cholecystitis. In cases where POCUS is negative or indeterminate for cholecystitis, further imaging should be obtained as clinical suspicion warrants.

First year internal medicine residents' self-report point-of-care ultrasound knowledge and skills: what (Little) difference three years make

[pubmed: point of care ultras...](#)by Tanner Chahley / 6d

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INSIGHTS

Add note

BMC Med Educ. 2021 Sep 7;21(1):476. doi: 10.1186/s12909-021-02915-1.

ABSTRACT

BACKGROUND: With increasing availability of point-of-care ultrasound (POCUS) education in medical schools, it is unclear whether or not learning needs of junior medical residents have evolved over time.

METHODS: We invited all postgraduate year (PGY)-1 residents at three Canadian internal medicine residency training programs in 2019 to complete a survey previously completed by 47 Canadian Internal Medicine PGY-1 s in 2016. Using a five-point Likert scale, participants rated perceived applicability of POCUS to the practice of internal medicine and self-reported skills in 15 diagnostic POCUS applications and 9 procedures.

RESULTS: Of the 97 invited residents, 58 (60 %) completed the survey in 2019. Participants reported high applicability but low skills across all POCUS applications and procedures. The 2019 cohort reported higher skills in assessing pulmonary B lines than the 2016 cohort ($2.3 \pm SD 1.0$ vs. $1.5 \pm SD 0.7$, adjusted p-value = 0.01). No other differences were noted.

CONCLUSIONS: POCUS educational needs continue to be high in Canadian internal medicine learners. The results of this needs assessment study support ongoing inclusion of basic POCUS elements in the current internal medicine residency curriculum.

Association of Diaphragm Movement During Cough, as Assessed by Ultrasonography, With Extubation Outcome

[diaphragm and \(ultrasound or ultrasonogr...](#) by Yasuhiro Norisue / 5d

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INSIGHTS

Add note

Respir Care. 2021 Sep 7:respcare.09007. doi: 10.4187/respcare.09007. Online ahead of print.

ABSTRACT

BACKGROUND: A cough peak flow (CPF) of < 60 L/min was associated with increased risk of extubation failure after a successful spontaneous breathing trial (SBT). Passive cephalic excursion of the diaphragm (PCED), measured by ultrasonography during cough expiration, was reported to predict CPF in healthy adults. We hypothesized that PCED, diaphragm peak velocity, or both during cough, as measured by ultrasonography, might predict CPF and extubation outcomes in mechanically ventilated patients. This study attempted to identify associations of diaphragm movement during cough, as assessed by ultrasonography with simultaneously measured CPF, and to determine predictive values of ultrasonographic indices for extubation outcomes after a successful SBT.

METHODS: In the study, 252 mechanically ventilated subjects with a successful SBT were enrolled in a prospective cohort study. Right hemidiaphragm passive cephalic excursion and peak velocity were measured by ultrasonography during voluntary cough expiration with maximum effort. CPF was measured simultaneously by ultrasonography.

RESULTS: A multiple regression model adjusted for age and sex showed a significant association between PCED and CPF ($P < .001$, adjusted β coefficient 11.4, 95% CI 8.88-14.0, adjusted $R^2 = 0.287$) and between diaphragm peak velocity and CPF ($P < .001$, adjusted β coefficient 1.71, 95% CI 1.91-2.24, adjusted $R^2 = 0.235$). The areas under the curves of PCED, diaphragm peak velocity, and CPF for extubation failure were 0.791 (95% CI 0.668-0.914), 0.587 (95% CI 0.426-0.748), and 0.765 (95% CI 0.609-0.922), respectively.

CONCLUSIONS: PCED on ultrasonography was significantly associated with CPF and extubation failure after a successful SBT. Future studies should investigate if this method is applicable for determination of tracheostomy decannulation in stable patients in general wards.

Lung ultrasound as a predictor of mortality of patients with COVID-19

pubmed: [point of care ultras...](#) by Fernando A Sosa / 5d

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INSIGHTS

Add note

J Bras Pneumol. 2021 Sep 3;47(4):e20210092. doi: 10.36416/1806-3756/e20210092. eCollection 2021.

ABSTRACT

OBJECTIVE: To evaluate the performance of lung ultrasound to determine short-term outcomes of patients with COVID-19 admitted to the intensive care unit.

METHODS: This is a Prospective, observational study. Between July and November 2020, 59 patients were included and underwent at least two LUS assessments using LUS score (range 0-42) on day of admission, day 5th, and 10th of admission.

RESULTS: Age was 66.5 ± 15 years, APACHE II was 8.3 ± 3.9 , 12 (20%) patients had malignancy, 46 (78%) patients had a non-invasive ventilation/high-flow nasal cannula and 38 (64%) patients required mechanical ventilation. The median stay in ICU was 12 days (IQR 8.5-20.5 days). ICU or hospital mortality was 54%. On admission, the LUS score was 20.8 ± 6.1 ; on day 5th and day 10th of admission, scores were 27.6 ± 5.5 and 29.4 ± 5.3 , respectively ($P=0.007$). As clinical condition deteriorated the LUS score increased, with a positive correlation of 0.52, $P < 0.001$. Patients with worse LUS on day 5th versus better score had a mortality of 76% versus 33% (OR 6.29, 95%CI 2.01-19.65, $p = 0.003$); a similar difference was observed on day 10. LUS score of 5th day of admission had an area under the curve of 0.80, best cut-point of 27, sensitivity and specificity of 0.75 and 0.78 respectively.

CONCLUSION: These findings position LUS as a simple and reproducible method to predict the course of COVID-19 patients.

First diagnosis of multisystem inflammatory syndrome in children (MIS-C): an analysis of PoCUS findings in the ED

[pubmed: point of care ultras...](#)by Angelo G Delmonaco / 5d
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INSIGHTS

Add note

Ultrasound J. 2021 Sep 8;13(1):41. doi: 10.1186/s13089-021-00243-5.

ABSTRACT

Children with multisystem inflammatory syndrome (MIS-C) tend to develop a clinical condition of fluid overload due both to contractile cardiac pump deficit and to endotheliitis with subsequent capillary leak syndrome. In this context, the ability of point-of-care ultrasound (PoCUS) to simultaneously explore multiple systems and detect polyserositis could promote adequate therapeutic management of fluid balance. We describe the PoCUS findings in a case-series of MIS-C patients admitted to the Emergency Department. At admission 10/11 patients showed satisfactory clinical condition without signs and symptoms suggestive for cardiovascular impairment/shock, but PoCUS showed pathological findings in 11/11 (100%). In particular, according to Rapid Ultrasound in SHock (RUSH) protocol, cardiac hypokinesia was detected in 5/11 (45%) and inferior vena cava dilatation in 3/11 (27%). Peritoneal fluid was reported in 6/11 cases (54%). Lung ultrasound (LUS) evaluation revealed an interstitial syndrome in 11/11 (100%), mainly localized in posterior basal lung segments. We suggest PoCUS as a useful tool in the first evaluation of children with suspected MIS-C for the initial therapeutic management and the following monitoring of possible cardiovascular deterioration.

Bedside echocardiography to predict mortality of COVID-19 patients beyond clinical data: Data from the PROVAR-COVID study

[pubmed: bedside echo](#)by Sander Luis Gomes Pimentel / 5d
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INSIGHTS

Add note

Rev Soc Bras Med Trop. 2021 Sep 6;54:e03822021. doi: 10.1590/0037-8682-0382-2021. eCollection 2021.

ABSTRACT

INTRODUCTION: Cardiac involvement seems to impact prognosis of COVID-19, being more frequent in critically ill patients. We aimed to assess the prognostic value of right ventricular (RV) and left ventricular (LV) dysfunction, evaluated by bedside echocardiography (echo), in patients hospitalized with COVID-19.

METHODS: Patients admitted in 2 reference hospitals in Brazil from Jul to Sept/2020 with confirmed COVID-19 and moderate/severe presentations underwent clinical and laboratory evaluation, and focused bedside echo (GE Vivid-IQ), at the earliest convenience, with remote interpretation. The association

between demographics, clinical comorbidities and echo variables with all-cause hospital mortality was assessed, and factors significant at $p < 0.10$ were put into multivariable models.

RESULTS: Total 163 patients were enrolled, 59% were men, mean age 64 ± 16 years, and 107 (66%) were admitted to intensive care. Comorbidities were present in 144 (88%) patients: hypertension 115 (71%), diabetes 61 (37%) and heart failure 22 (14%). In-hospital mortality was 34% (N=56). In univariate analysis, echo variables significantly associated with death were: LV ejection fraction (LVEF, OR=0.94), RV fractional area change (OR=0.96), tricuspid annular plane systolic excursion (TAPSE, OR=0.83) and RV dysfunction (OR=5.3). In multivariate analysis, after adjustment for clinical and demographic variables, independent predictors of mortality were age ≥ 63 years (OR=5.53, 95%CI 1.52-20.17), LVEF < 64% (OR=7.37, 95%CI 2.10-25.94) and TAPSE < 18.5 mm (OR=9.43, 95% CI 2.57-35.03), and the final model had good discrimination, with C-statistic=0.83 (95%CI 0.75-0.91).

CONCLUSION: Markers of RV and LV dysfunction assessed by bedside echo are independent predictors of mortality in hospitalized COVID-19 patients, after adjustment for clinical variables.

Diagnostic accuracy of focused deep venous, lung, cardiac and multiorgan ultrasound in suspected pulmonary embolism: a systematic review and meta-analysis

pubmed: [point of care ultras...](#) by Casper Falster / 5d

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INSIGHTS

Add note

Thorax. 2021 Sep 8:thoraxjnl-2021-216838. doi: 10.1136/thoraxjnl-2021-216838. Online ahead of print.

ABSTRACT

OBJECTIVE: To determine the diagnostic accuracy of point-of-care ultrasound in suspected pulmonary embolism.

DESIGN: Systematic review and meta-analysis.

DATA SOURCES: MEDLINE, Embase, CINAHL and Cochrane library were searched on 2 July 2020 with no restrictions on the date of publication. Subject headings or subheadings combined with text words for the concepts of pulmonary embolism, ultrasound and diagnosis were used.

ELIGIBILITY CRITERIA AND DATA ANALYSIS: Eligible studies reported sensitivity and specificity of deep venous, lung, cardiac or multiorgan ultrasound in patients with suspected pulmonary embolism, using an adequate reference-test. Prospective, cross-sectional and retrospective studies were considered for eligibility. No restrictions were made on language. Studies were excluded if a control group consisted of healthy volunteers or if transesophageal or endobronchial ultrasound was used. Risk of bias was assessed using quality assessment of diagnostic accuracy studies-2. Meta-analysis of sensitivity and specificity was performed by construction of hierarchical summary receiver operator curves. I^2 was used to assess the study heterogeneity.

MAIN OUTCOME MEASURES: The primary outcome was overall sensitivity and specificity of reported ultrasound signs, stratified by organ approach (deep venous, lung, cardiac and multiorgan). Secondary outcomes were stratum-specific sensitivity and specificity within subgroups defined by pretest probability of pulmonary embolism.

RESULTS: 6378 references were identified, and 70 studies included. The study population comprised 9664 patients with a prevalence of pulmonary embolism of 39.9% (3852/9664). Risk of bias in at least one domain was found in 98.6% (69/70) of included studies. Most frequently, 72.8% (51/70) of studies reported >24 hours between ultrasound examination and reference test or did not disclose time interval at all. Level of heterogeneity ranged from 0% to 100%. Most notable ultrasound signs were bilateral compression of femoral and popliteal veins (22 studies; 4708 patients; sensitivity 43.7% (36.3% to 51.4%); specificity 96.7% (95.4% to 97.6%)), presence of at least one hypoechoic pleural-based lesion (19 studies; 2134 patients; sensitivity 81.4% (73.2% to 87.5%); specificity 87.4% (80.9% to 91.9%)), D-sign (13 studies; 1579 patients; sensitivity 29.7% (24.6% to 35.4%); specificity 96.2% (93.1% to 98.0%)), visible right ventricular thrombus (5 studies; 995 patients; sensitivity 4.7% (2.7% to 8.1%); specificity 100% (99.0% to 100%)) and McConnell's sign (11 studies; 1480 patients; sensitivity 29.1% (20.0% to 40.1%); specificity 98.6% (96.7% to 99.4%)).

CONCLUSION: Several ultrasound signs exhibit a high specificity for pulmonary embolism, suggesting that implementation of ultrasound in the initial assessment of patients with suspected pulmonary embolism may improve the selection of patients for radiation imaging.

Validation of Point-of-Care Ultrasound to Measure Perioperative Edema in Infants With Congenital Heart Disease

[pubmed: point of care ultras...](#) by Jessica N Persson / 4d
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INSIGHTS

Add note

Front Pediatr. 2021 Aug 23;9:727571. doi: 10.3389/fped.2021.727571. eCollection 2021.

ABSTRACT

Purpose: Fluid overload is a common post-operative issue in children following cardiac surgery and is associated with increased morbidity and mortality. There is currently no gold standard for evaluating fluid status. We sought to validate the use of point-of-care ultrasound to measure skin edema in infants and assess the intra- and inter-user variability. **Methods:** Prospective cohort study of neonates (≤ 30 d/o) and infants (31 d/o to 12 m/o) undergoing cardiac surgery and neonatal controls. Skin ultrasound was performed on four body sites at baseline and daily post-operatively through post-operative day (POD) 3. Subcutaneous tissue depth was manually measured. Intra- and inter-user variability was assessed using intraclass correlation coefficient (ICC). **Results:** Fifty control and 22 surgical subjects underwent skin ultrasound. There was no difference between baseline surgical and control neonates. Subcutaneous tissue increased in neonates starting POD 1 with minimal improvement by POD 3. In infants, this pattern was less pronounced with near resolution by POD 3. Intra-user variability was excellent (ICC 0.95). Inter-user variability was very good (ICC 0.82). **Conclusion:** Point-of-care skin ultrasound is a reproducible and reliable method to measure subcutaneous tissue in infants with and without congenital heart disease. Acute increases in subcutaneous tissue suggests development of skin edema, consistent with extravascular fluid overload. There is evidence of skin edema starting POD 1 in all subjects with no substantial improvement by POD 3 in neonates. Point-of-care ultrasound could be an objective way to measure extravascular fluid overload in infants. Further research is needed to determine how extravascular fluid overload correlates to clinical outcomes.

Point-of-Care Ultrasound Diagnosis of High Flow Priapism

[pubmed: point of care ultras...](#) by Kelly McHugh / 4d

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Add note

J Emerg Med. 2021 Sep 6:S0736-4679(21)00614-4. doi: 10.1016/j.jemermed.2021.07.037. Online ahead of print.

ABSTRACT

BACKGROUND: Priapism can be categorized as low flow or high flow. Low flow priapism is a compartment syndrome and requires immediate treatment to avoid long-term ischemic damage. Alternatively, high flow priapism is not an emergent condition and can be managed as an outpatient. The diagnosis has traditionally been made via cavernosal blood gas analysis; however, this is painful and can cause iatrogenic harm.

CASE REPORT: We present a case of high flow priapism whereby point-of-care ultrasound (POCUS) identified the presence of pulsatile cavernosal arterial flow to confirm the diagnosis. This is the first case report in the emergency medicine literature to highlight the utility of POCUS in the diagnosis and management of high flow priapism. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** Low flow priapism accounts for 95% of cases and is a urologic emergency requiring immediate invasive intervention. High flow priapism is much less common and does not require emergent management. While blood gas analysis can differentiate between high and low flow priapism, POCUS is a rapid, noninvasive, accurate diagnostic means to identify the presence or absence of cavernosal pulsatile arterial flow.

Focused Assessment with Sonography for Trauma (FAST) training for first-year resident physicians at a university hospital in Japan: A longitudinal, observational study

[pubmed: fast sonography trau...](#)by Koshi Ota / 4d

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SAGE Open Med. 2021 Sep 3;9:20503121211044367. doi: 10.1177/20503121211044367. eCollection 2021.

ABSTRACT

BACKGROUND: Ultrasound training is an essential part of residency programs during emergency medicine rotations for first-year trainees (postgraduate year 1). The Focused Assessment with Sonography for Trauma examination used to assess for internal bleeding in trauma patients is one of the essential skills postgraduate year 1 residents must acquire during the emergency medicine rotation.

METHOD: A prospective, longitudinal, observational study of postgraduate year 1 residents during a 2-month long emergency medicine rotation conducted from 1 April 2019 to 31 May 2021. The primary

outcome was the mean difference between the hands-on Focused Assessment with Sonography for Trauma examination scores of the first week of the emergency medicine rotation and the same hands-on Focused Assessment with Sonography for Trauma examination scores of the last week of the emergency medicine rotation. All postgraduate year 1 residents had open access to the ultrasound machine to practice examining on other postgraduate year 1 residents or could use it on real patients under supervision of emergency medicine physicians.

RESULT: A total of 91 postgraduate year 1 residents (65 male and 26 female) were recruited and submitted to the hands-on Focused Assessment with Sonography for Trauma test in both the first and last weeks of the rotation. The mean test score for the postgraduate year 1 residents in the first week was 7.81 (standard deviation = 2.11). The mean test score in the last week was 16.17 (standard deviation = 2.60). The primary outcome of this study was the score difference between the first and last weeks (mean = 8.35, 95% confidence interval = 7.73 to 8.94, $p < 0.001$, paired t -test).

CONCLUSION: Hands-on practical Focused Assessment with Sonography for Trauma training for postgraduate year 1 residents during emergency medicine rotations significantly improved their Focused Assessment with Sonography for Trauma test scores.

The evaluation of intracranial pressure evaluation by optic nerve sheath diameter measurement on bedside ultrasonography after ischemic stroke

[optic nerve ultrasound](#) by Goknur Yildiz / 3d

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INSIGHTS

Add note

Clin Neurol Neurosurg. 2021 Aug 28;209:106914. doi: 10.1016/j.clineuro.2021.106914. Online ahead of print.

ABSTRACT

INTRODUCTION: We aimed to predict intracranial pressure(ICP)after cerebral ischemic stroke by measuring diameter of the optic nerve sheath(ONSD)with bedside ultrasonography(US). In order to see the ICP changes,it was planned to record delta ICP changes at the 3rd and 5th day follow-up of the patients **METHODS:** Patients aged 18 years or older who were admitted to the emergency department(ED)with stroke symptoms for one year were included.Demographic data,time elapsed since the onset of symptoms,neurological status assesment scales,ONSD values measured by US in three time periods(the day the patient was admitted to the ED,the 3rd and 5th days of hospitalization),MDCT findings when the patient was admitted,ONSD values in MDCT,whether they received tissue plasminogen activator(tPA)and whether they underwent decompression surgery were recorded.

RESULTS: The average age of the 82 patients was 67.5(range 33-89)years.Forty-two patients(51.2%)were male.On both the right and left sides,ONSD on the 3rd day was larger(>5 mm)than on first day($p < 0.05$). ONSD on the 5th day was larger than on the first day($p > 0.05$). All ONSD results measured using both US and MDCT showed a positive correlation between the same eye and contralateral eye measurements($p < 0.05$).

DISCUSSION: CT is the most critical radiological method for stroke patients.Transport to radyology unit in unstable patients carries risk and is not recommended.Optic nerve US can be used in the early diagnosis

of ICP increase and provides early treatment. The ease of use and safety in unstable patients have increased its popularity.

CONCLUSION: We believe that measuring ONSD using US is an appropriate choice on ICP management in stroke patients.

Amyand Hernia: As Seen on Point-of-Care Emergency Ultrasound

["emergency ultrasound"](#) by Elaine Chiang / 3d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Sep 9. doi: 10.1097/PEC.0000000000002529. Online ahead of print.

ABSTRACT

Amyand hernia is a rare type of inguinal hernia defined by the presence of the appendix in the inguinal hernia sac. Clinical diagnosis of Amyand hernia can be challenging because this diagnosis is typically made intraoperatively, often as an incidental finding. Preoperative diagnosis by computed tomography and radiology ultrasound has previously been reported; however, there exists no reports of the diagnosis being made by point-of-care ultrasound. We present a case of Amyand hernia visible on point-of-care ultrasound performed by a pediatric emergency medicine physician.

Takotsubo syndrome as an overlooked and elusive cause of a single episode of dyspnea in young women: a case report

[pubmed: bedside echo](#) by Sung Eun Lee / 3d

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Add note

BMC Cardiovasc Disord. 2021 Sep 10;21(1):430. doi: 10.1186/s12872-021-02239-4.

ABSTRACT

BACKGROUND: Dyspnea is a common symptom in patients presenting to the emergency department. It has a variety of causes that range from non-urgent to life-threatening. One episode of dyspnea in a healthy young person is easy to overlook. However, if the symptoms occur after physically or emotionally stressful events, careful evaluation needs to be undertaken because it may be associated with Takotsubo syndrome, which is rarely expected but can be fatal. Herein, we report the case of Takotsubo syndrome in a healthy young woman who arrived at the emergency department after experiencing a short single episode of dyspnea following a minor surgery.

CASE PRESENTATION: A 23-year old woman with no underlying chronic disease underwent closed reduction surgery for a nasal bone fracture under general anesthesia (with sevoflurane as the anesthetic).

Approximately 5 h later, she presented to the emergency department with dyspnea, which improved soon upon arrival at the emergency department. There were no other symptoms. The dyspnea occurred about 5 h after being discharged on observation, with an uneventful postoperative course. Her electrocardiogram and chest X-ray findings were unremarkable. On testing, troponin I and creatine kinase myocardial band levels were elevated at 6.122 ng/mL and 11.2 µg/L (reference ranges: 0.000-0.046 ng/mL and 0.0-5.0 µg/L), respectively. Bedside echocardiography revealed an ejection fraction of 25%, with mid-ventricular and apical akinesia and basal hyperkinesia. The pulmonary and coronary angiographic computed tomographic scans were unremarkable. Hence, apical Takotsubo syndrome was suspected. A follow-up echocardiogram taken 5 days after admission showed full recovery with a normalized ejection fraction (60%) and no regional wall motion abnormality. The patient was discharged on the sixth day with no other complications.

CONCLUSION: When atypical symptoms, such as transient dyspnea, manifest, it becomes necessary to suspect and diagnose Takotsubo syndrome to ensure timely and appropriate medical management, especially when a preceding stressful event, such as minor surgery has occurred. It might be helpful to perform bedside point-of-care echocardiography to check for regional wall motion abnormalities that are typically associated with Takotsubo syndrome.

Feasibility of pneumoperitoneum diagnosis using point-of-care ultrasound: a pilot study using a fresh cadaver model

[pubmed: point of care ultras...](#) by Meghan Kelly Herbst / 2d

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INSIGHTS

Add note

Med Ultrason. 2021 Sep 11. doi: 10.11152/mu-3238. Online ahead of print.

ABSTRACT

AIMS: To assess the accuracy of point-of-care ultrasound (PoCUS) in the hands of two trained and blinded emergency physicians (EPs) in detecting very small amounts of free intraperitoneal air injected intra-abdominally, using a fresh human cadaver model.

MATERIAL AND METHODS: Fifteen cadavers were injected on 3 occasions with predefined quantities of free intraperitoneal air ranging from 0-10 mL. Seven cadavers were injected in the mid-epigastrium (ME), while 8 were injected in the left lower quadrant (LLQ). Each cadaver was scanned after each of the 3 injections by 2 trained and blinded EPs, resulting in 45 scans per sonographer. Scans were performed using previously validated and standardized techniques. All scans were recorded, time-stamped and labeled. For each scan the sonographers indicated "yes" or "no" to whether pneumoperitoneum was detected. A chi square analysis was performed to determine the sensitivity and specificity of PoCUS utilized by each sonographer of pneumoperitoneum based on the location and volume of air injected.

RESULTS: Free air (0.25-10 mL) injected into the ME was successfully diagnosed in 36/42 instances (86% sensitivity), but only detected in 10/36 instances when injected into the LLQ (28% sensitivity). Both EPs detected all air injections of ≥2 mL into the ME.

CONCLUSION: Detection of free air originating from the midepigastric region may become a future PoCUS indication for adequately trained EPs.

Early Use of Transcranial Doppler Ultrasonography to Stratify Neonatal Encephalopathy

pubmed: bUS by Kiran R Natique / 2d

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INSIGHTS

Add note

Pediatr Neurol. 2021 Jul 8;124:33-39. doi: 10.1016/j.pediatrneurol.2021.07.004. Online ahead of print.

ABSTRACT

BACKGROUND: The dynamic nature of neonatal hypoxic-ischemic encephalopathy (HIE) after birth necessitates reliable biomarkers to identify infants with evolving brain injury. This prospective cohort aims to use serial Doppler ultrasonography (US) to measure cerebral blood flow velocity and resistance index (RI) to help detect the time and evolution of the clinical encephalopathy.

METHODS: A total of 60 neonates were enrolled all ≥ 36 weeks' gestation with perinatal acidemia, defined as a blood gas pH ≤ 7.0 or base deficit ≥ 16 mmol/L and encephalopathy including a matched control group without encephalopathy. Each neonate received one to three serial Doppler recordings starting at six to 24 hours of life. Mean RI ≤ 0.55 was considered abnormal.

RESULTS: Mean RIs obtained shortly after birth were significantly lower with increasing severity of encephalopathy. On the first Doppler recordings, abnormal mean RIs were seen in 11 of 18 (61%) neonates with mild, 13 of 17 (76%) with moderate, and two of two (100%) with severe HIE. Of the neonates with mild HIE and abnormal mean RIs, congruity abnormal amplitude electroencephalography (45%), brain magnetic resonance imaging (45%), and abnormal head ultrasound (44%) are here reported.

CONCLUSIONS: Doppler measurements can provide bedside adjunct biomarkers indicating the time and severity of neonatal HIE.

Comparison of B-Scan Ultrasound and MRI-Based Optic Nerve Sheath Diameter (ONSD) Measurements in Children

optic nerve ultrasound by Susanne R Kerscher / 2d

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INSIGHTS

Add note

Pediatr Neurol. 2021 Aug 16;124:15-20. doi: 10.1016/j.pediatrneurol.2021.08.002. Online ahead of print.

ABSTRACT

BACKGROUND: Qualitative, noninvasive assessment of intracranial pressure is of eminent importance in pediatric patients in many clinical situations and can reliably be performed using transorbital ultrasonographic measurement of the optic nerve sheath diameter (ONSD). MRI-based determination of

ONSD can serve as an alternative if ultrasound (US) is not possible or available for various reasons, for example, in small, in compliant children. This study investigates repeatability and observer reliability of US ONSD and correlation and bias of US- versus MRI-based ONSD assessment in pediatric patients.

METHODS: One hundred fifty children diagnosed with tumor (n = 40), hydrocephalus (n = 42), and other cranial pathologies (n = 68) were included. Bilateral ONSD was quantified by US using a 12-MHz linear array transducer. This was compared with ONSD measured in simultaneously acquired (≤ 24 h) T2-weighted MRI scans of the orbit.

RESULTS: Repeatability of individual US values and intraobserver ONSD was outstanding (Cronbach's $\alpha = 0.984$ and 0.996 , respectively). Overall mean values for ONSD were 5.8 ± 0.88 mm and 5.7 ± 0.89 mm for US and MRI, respectively. Correlation between US and MRI-based ONSD was strong ($r = 0.976$, $P < 0.01$). Bland and Altman analysis showed a mean bias of 0.078 mm. A repeated-measures correlation (r_{rm}) in 9 patients showed an excellent value ($r_{rm} = 0.94$, $P < 0.01$).

CONCLUSIONS: Repeatability and reliability of US ONSD determination is excellent. In case US ONSD assessment is not possible or available, MRI scans can serve as an excellent alternative. The difference of US and MRI ONSD is minimal and insignificant, and thus, both techniques can complement each other.

Evaluation of Distal Radial Artery Cross-sectional Internal Diameter in Neonates and Infants by Ultrasound and Adequate Selection of an Intra-arterial Catheter Size

pubmed: [point of care ultras...](#) by Ana C Mavarez / 1d

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INSIGHTS

Add note

Paediatr Anaesth. 2021 Sep 12. doi: 10.1111/pan.14293. Online ahead of print.

ABSTRACT

BACKGROUND: Radial artery catheterization in neonates, infants and young children is a common and useful invasive procedure that brings technical placement challenges and potential complications due to the small diameter size of the radial artery in these patients. The aim of this study is to determine appropriate catheter sizes in infants up to 6 months of age.

MATERIALS AND METHODS: 50 infants undergoing general anesthesia or hospitalized in the neonatal intensive care unit were included. Images of the radial artery diameter were obtained from the infant's wrist using Philips EPIQ Diagnostic Ultrasound System CVX Release 4.0. All images obtained were distal in the forearm, medial to the border of the styloid process of the radius, at the point of maximal impulse of the radial artery, and with the wrist at a 45-degree angle position. We recorded postmenstrual age, chronological age, gender, weight, location, comorbidities, medications, weight, and vital signs of each individual.

RESULTS: In this single cohort study of 50 children whose ages ranged from 0 to 6 months chronological age, their radial artery diameters were averaged proportionally to their weight and age. Use of a 22G catheter would result in 100% occlusion of the diameter of the artery in most study subjects. Use of a 24G catheter would result in a range of 75-99% occlusion depending on weight, postmenstrual age and chronological age of the infants.

CONCLUSIONS: In view of these findings, we recommend using US to measure the diameter of the radial artery and choose the most appropriate catheter size before proceeding with US-guidance for radial artery cannulation in infants. This will prevent inappropriate sizing of the catheter and the thrombotic complications this can incur.

Point-of-Care Ultrasound Assisting in the Rapid Diagnosis of Acute Cholangitis 60 Years After Cholecystectomy

[pubmed: point of care ultras...](#) by Nikkitta Georges / 1d

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Add note

J Emerg Med. 2021 Sep 9:S0736-4679(21)00539-4. doi: 10.1016/j.jemermed.2021.07.001. Online ahead of print.

ABSTRACT

BACKGROUND: Point-of-care ultrasound (POCUS) is used frequently to evaluate the right upper quadrant of patients with high suspicion for biliary pathology. In patients with a history of cholecystectomy, the utility of POCUS can be overlooked.

CASE REPORT: We report the case of an 83-year-old female patient who was ultimately diagnosed with cholangitis more than 60 years after undergoing cholecystectomy. POCUS demonstrated a dilated common bile duct (CBD), which was confirmed by computed tomography and magnetic resonance cholangiopancreatography to be due to a large stone. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** Choledocholithiasis and cholangitis can still occur in patients with a remote history of cholecystectomy. POCUS can be used to rapidly evaluate the CBD for dilatation in patients post cholecystectomy.

Ultrasound for Endotracheal Tube Tip Position in Term and Preterm Infants

[pubmed: pediatric endotrache...](#) by Sabrina Salvadori / 1d

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INSIGHTS

Add note

Neonatology. 2021 Sep 8:1-9. doi: 10.1159/000518278. Online ahead of print.

ABSTRACT

BACKGROUND AND OBJECTIVE: Placing an endotracheal tube (ETT) in neonates is challenging and currently requires timely radiographic confirmation of correct tip placement. The objective was to establish the reliability of ultrasound (US) for assessing ETT position in the neonatal intensive care unit (NICU), time needed to do so, and patients' tolerance.

METHODS: A prospective study on 71 newborns admitted to our NICU whose ETT placement was evaluated with US (ETT-echo) and confirmed on chest X-rays (CXR). Data were collected by 3 operators (2 neonatologists and a resident in pediatrics). The right pulmonary artery (RPA) was used as a landmark for US. The distance between the tip of the ETT and the upper margin of the RPA was measured using US and compared with the distance between the tube's tip and the carina on the CXR.

RESULTS: Seventy-one intubated newborns were included in the study (n = 34 < 1,000 g, n = 18 1,000-2,000 g, n = 19 > 2,000 g). Statistical analysis (Bland-Altman plot and Lin's concordance correlation coefficient) showed an excellent consistency between ETT positions identified on US and chest X-ray. The 2 measures (ETT-echo and CXR) were extremely concordant both in the whole sample and in the subgroups. Minimal changes in patients' vital signs were infrequently observed during US, confirming the tolerability of ETT-echo. The mean time to perform US was 3.2 min (range 1-13).

CONCLUSIONS: ETT-echo seems to be a rapid, tolerable, and highly reliable method worth further investigating for future routine use in neonatology with a view to reducing radiation exposure.

Lung Ultrasound in Bronchopulmonary Dysplasia: Patterns and Predictors in Very Preterm Infants

pubmed: [neonate lung ultrasound](#) by Victoria Aldecoa-Bilbao / 23h

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Add note

Neonatology. 2021 Aug 13:1-9. doi: 10.1159/000517585. Online ahead of print.

ABSTRACT

INTRODUCTION: Lung ultrasound (LUS) is useful for respiratory management in very preterm infants (VPI), but little is known about the echographic patterns in bronchopulmonary dysplasia (BPD), the relation between the image findings, and the severity of the disease and its long-term outcomes. We aimed to describe LUS patterns in BPD and analyze the accuracy of LUS to predict the need for respiratory support at 36 weeks postmenstrual age (PMA) in VPI.

METHODS: Preterm infants ≤ 30.6 weeks of gestational age were recruited. LUS was performed at admission, at 7th, and 28th day of life (DOL) with a standardized protocol (6 zones: anterior, lateral, and posterior fields). Clinical data, respiratory outcomes, and image findings were recorded.

RESULTS: Eighty-nine patients were studied. Infants with BPD had significantly higher LUS score at admission, at 7th, and 28th DOL. Patients with BPD exhibited more consolidations and pleural line abnormalities at 7th and 28th DOL than those without BPD ($p < 0.001$), regardless of the definition used for BPD. LUS at 7th DOL predicted NICHD 2001-BPD with $R^2 = 0.522$; $AUC = 0.87$ (0.79-0.94), $p < 0.001$, and Jensen 2019-BPD with $R^2 = 0.315$ ($AUC = 0.80$ [0.70-0.90], $p < 0.001$). A model including mechanical ventilation >5 days, oxygen therapy for 7 days and LUS score at 7th DOL accurately predicted the need for respiratory support at 36 weeks PMA ($R^2 = 0.655$, $p < 0.001$) with an $AUC = 0.90$ (0.84-0.97), $p < 0.001$.

CONCLUSION: LUS score, pleural line abnormalities, and consolidations can be useful to diagnose BPD in VPI and to predict its severity after the first week of life.

Classification of Lung Disease in Children by Using Lung Ultrasound Images and Deep Convolutional Neural Network

["lung ultrasound" or "lung ultrasonograp...](#)by Silvia Magrelli / 23h

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INSIGHTS

Add note

Front Physiol. 2021 Aug 27;12:693448. doi: 10.3389/fphys.2021.693448. eCollection 2021.

ABSTRACT

Bronchiolitis is the most common cause of hospitalization of children in the first year of life and pneumonia is the leading cause of infant mortality worldwide. Lung ultrasound technology (LUS) is a novel imaging diagnostic tool for the early detection of respiratory distress and offers several advantages due to its low-cost, relative safety, portability, and easy repeatability. More precise and efficient diagnostic and therapeutic strategies are needed. Deep-learning-based computer-aided diagnosis (CADx) systems, using chest X-ray images, have recently demonstrated their potential as a screening tool for pulmonary disease (such as COVID-19 pneumonia). We present the first computer-aided diagnostic scheme for LUS images of pulmonary diseases in children. In this study, we trained from scratch four state-of-the-art deep-learning models (VGG19, Xception, Inception-v3 and Inception-ResNet-v2) for detecting children with bronchiolitis and pneumonia. In our experiments we used a data set consisting of 5,907 images from 33 healthy infants, 3,286 images from 22 infants with bronchiolitis, and 4,769 images from 7 children suffering from bacterial pneumonia. Using four-fold cross-validation, we implemented one binary classification (healthy vs. bronchiolitis) and one three-class classification (healthy vs. bronchiolitis vs. bacterial pneumonia) out of three classes. Affine transformations were applied for data augmentation. Hyperparameters were optimized for the learning rate, dropout regularization, batch size, and epoch iteration. The Inception-ResNet-v2 model provides the highest classification performance, when compared with the other models used on test sets: for healthy vs. bronchiolitis, it provides 97.75% accuracy, 97.75% sensitivity, and 97% specificity whereas for healthy vs. bronchiolitis vs. bacterial pneumonia, the Inception-v3 model provides the best results with 91.5% accuracy, 91.5% sensitivity, and 95.86% specificity. We performed a gradient-weighted class activation mapping (Grad-CAM) visualization and the results were qualitatively evaluated by a pediatrician expert in LUS imaging: heatmaps highlight areas containing diagnostic-relevant LUS imaging-artifacts, e.g., A-, B-, pleural-lines, and consolidations. These complex patterns are automatically learnt from the data, thus avoiding hand-crafted features usage. By using LUS imaging, the proposed framework might aid in the development of an accessible and rapid decision support-method for diagnosing pulmonary diseases in children using LUS imaging.

COVID-19 Pneumonia: The Great Ultrasonography Mimicker

["lung ultrasound" or "lung ultrasonograp...](#)by Donato Lacedonia / 23h

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Add note

Front Med (Lausanne). 2021 Aug 25;8:709402. doi: 10.3389/fmed.2021.709402. eCollection 2021.

ABSTRACT

The pandemic spread of the new severe acute respiratory syndrome coronavirus 2 has raised the necessity to identify an appropriate imaging method for early diagnosis of coronavirus disease 2019 (COVID-19). Chest computed tomography (CT) has been regarded as the mainstay of imaging evaluation for pulmonary involvement in the early phase of the pandemic. However, due to the poor specificity of the radiological pattern and the disruption of radiology centers' functionality linked to an excessive demand for exams, the American College of Radiology has advised against CT use for screening purposes. Lung ultrasound (LUS) is a point-of-care imaging tool that is quickly available and easy to disinfect. These advantages have determined a "pandemic" increase of its use for early detection of COVID-19 pneumonia in emergency departments. However, LUS findings in COVID-19 patients are even less specific than those detectable on CT scans. The scope of this perspective article is to discuss the great number of diseases and pathologic conditions that may mimic COVID-19 pneumonia on LUS examination.

Correlation Analysis between Mechanical Power and Lung Ultrasound Score and Their Evaluation of Severity and Prognosis in ARDS Patients

["lung ultrasound" or "lung ultrasonograp...](#) by Yongpeng Xie / 23h

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Biomed Res Int. 2021 Sep 1;2021:4156162. doi: 10.1155/2021/4156162. eCollection 2021.

ABSTRACT

METHODS: A total of 121 patients with moderate to severe ARDS admitted to the intensive care unit (ICU) from June 2017 to April 2020 and treated with invasive mechanical ventilation were sequentially included in this study. Their general information was collected, and MP was recorded at 0 h, 24 h, 48 h, and 72 h after admission to the ICU. Professionally trained researchers performed the LUS assessments. Patients were divided into the death and survival groups according to their 28-day prognosis. The trend of MP and LUS at the four time points was analyzed. A receiver operating characteristic curve (ROC) was used to analyze the predictive value of MP and LUS scores at 0 h and 72 h for the prognosis (28-day mortality rate) of patients with moderate to severe ARDS.

RESULTS: 121 patients were included in the analysis, of which 73 were male and 48 were female. When patients entered the ICU, their oxygenation index (t : 30885, $P < 0.01$), APACHE II score (t : 2.105, $P < 0.05$), and SOFA score (t : 4.134, $P < 0.001$) were higher in the death group than the survival group. The death group had significantly higher MP and LUS at each time point (0 h, 24 h, 48 h, and 72 h) compared to the survival group (all $P < 0.05$). There was a significant upward trend over time in the MP and LUS of the death group, contrasting to a significant downward trend in the survival group (all $P < 0.05$). The Pearson correlation analysis showed that MP and LUS were significantly positively correlated at each time point (r values: 0 h: 0.3027; 24 h: 0.3705; 48 h: 0.3902; 72 h: 0.5916; all $P < 0.01$). The ROC curves showed that MP and LUS at 72 h were of significant value in predicting the prognosis of ARDS patients, with areas under the curve of 0.866 ± 0.032 and 0.839 ± 0.037 , respectively.

CONCLUSION: There was a significant correlation between the MP and LUS of ARDS patients at four time points from 0 to 72 h, which has a clinical value in evaluating severity and prognosis.

Prognostic Significance of Chest Imaging by LUS and CT in COVID-19 Inpatients: The ECOVID Multicenter Study

["lung ultrasound" or "lung ultrasonograp..."](#) by Claudio Tana / 23h

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Respiration. 2021 Aug 31:1-10. doi: 10.1159/000518516. Online ahead of print.

ABSTRACT

BACKGROUND: Point-of-care lung ultrasound (LUS) score is a semiquantitative score of lung damage severity. High-resolution computed tomography (HRCT) is the gold standard method to evaluate the severity of lung involvement from the novel coronavirus disease (COVID-19). Few studies have investigated the clinical significance of LUS and HRCT scores in patients with COVID-19. Therefore, the aim of this study was to evaluate the prognostic yield of LUS and of HRCT in COVID-19 patients.

METHODS: We carried out a multicenter, retrospective study aimed at evaluating the prognostic yield of LUS and HRCT by exploring the survival curve of COVID-19 inpatients. LUS and chest CT scores were calculated retrospectively by 2 radiologists with >10 years of experience in chest imaging, and the decisions were reached in consensus. LUS score was calculated on the basis of the presence or not of pleural line abnormalities, B-lines, and lung consolidations. The total score (range 0-36) was obtained from the sum of the highest scores obtained in each region. CT score was calculated for each of the 5 lobes considering the anatomical extension according to the percentage parenchymal involvement. The resulting overall global semiquantitative CT score was the sum of each single lobar score and ranged from 0 (no involvement) to 25 (maximum involvement).

RESULTS: One hundred fifty-three COVID-19 inpatients (mean age 65 ± 15 years; 65% M), including 23 (15%) in-hospital deaths for any cause over a mean follow-up of 14 days were included. Mean LUS and CT scores were 19 ± 12 and 10 ± 7 , respectively. A strong positive linear correlation between LUS and CT scores (Pearson correlation $r = 0.754$; $R^2 = 0.568$; $p < 0.001$) was observed. By ROC curve analysis, the optimal cut-point for mortality prediction was 20 for LUS score and 4.5 for chest CT score. According to Kaplan-Meier survival analysis, in-hospital mortality significantly increased among COVID-19 patients presenting with an LUS score ≥ 20 (log-rank 0.003; HR 9.87, 95% CI: 2.22-43.83) or a chest CT score ≥ 4.5 (HR 4.34, 95% CI: 0.97-19.41). At multivariate Cox regression analysis, LUS score was the sole independent predictor of in-hospital mortality yielding an adjusted HR of 7.42 (95% CI: 1.59-34.5).

CONCLUSION: LUS score is useful to stratify the risk in COVID-19 patients, predicting those that are at high risk of mortality.

Two-point compression ultrasonography: Enough to rule out lower extremity deep venous thrombosis?

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INSIGHTS

Add note

ABSTRACT

BACKGROUND: Deep venous thrombosis (DVT) is a major cause of morbidity and is a common presenting complaint to the emergency department (ED). Point-of-care two-point compression ultrasonography has evolved as a quick and effective way of diagnosing DVT. The purpose of this study is to validate the prevalence and distribution of venous thrombi isolated to proximal lower extremity veins, other than common femoral and popliteal veins in patients with DVT.

METHODS: This is a single-center retrospective study that looked at patients presenting to the ED of a tertiary care hospital between January 2014 and August 2018. The clinical presentation and laboratory and imaging results were obtained using the hospital's electronic medical record.

RESULTS: A total of 2,507 patients underwent a lower extremity duplex ultrasound during the study period. Among them, 379 (15%) were included in the study. The percentages of isolated thrombi to the femoral vein and deep femoral vein were 7.92% and 0.53%, respectively. When the patients were stratified into the two groups of isolated DVT and two-point compression DVT, there were no statistically significant differences in the laboratory results between both groups. However, immobilized patients and patients with recent surgeries were more likely to have an isolated DVT.

CONCLUSIONS: Thrombi isolated to proximal lower extremity veins other than the common femoral and popliteal veins make up 8.45% of DVTs. Given this significant number of missed DVTs, the authors recommend the addition of the femoral and deep femoral veins to the two-point compression exam.