

JOURNAL SCANNING – July 2021

Anaesthesia for Awake Fiberoptic Intubation: Ultrasound-Guided Airway Nerve Block versus Ultrasonic Nebulisation with Lignocaine

[pubmed: intubation ultrasoun...](#)by Jharana Mohanta / 48d

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INSIGHTS

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Discoveries (Craiova). 2021 Mar 31;9(1):e125. doi: 10.15190/d.2021.4.

ABSTRACT

BACKGROUND: In anticipated difficult airway, awake fiberoptic guided intubation should be the ideal plan of management. It requires sufficient upper airway anesthesia for patient's comfort and cooperation. We compared the efficacy of ultrasound guided airway nerve blocks and ultrasonic nebulisation with lignocaine for airway anesthesia before performing awake fibreoptic guided intubation.

METHODS: This prospective, randomised study included sixty consenting adult patients of both genders (American Society of Anesthesiologists' physical status 1-3) with anticipated difficult airway undergoing surgery. Ultrasound guided airway nerve blocks group received ultrasound-guided bilateral superior laryngeal (1 ml of 2% lignocaine) and transtracheal recurrent laryngeal (2 ml of 2% lignocaine) airway nerve blocks and ultrasonic nebulisation with lignocaine group received ultrasonic nebulisation of 4 ml of lignocaine 4%. The primary outcome was to compare the time required to intubate, whereas the secondary outcomes were to compare cough reflex and gag reflex, hemodynamic changes, number of attempts required, and comfort score during awake fibreoptic guided intubation in both the groups.

RESULTS: The time taken for intubation was significantly lower in the ultrasound guided airway nerve blocks group 69.27 ± 21.85 s than ultrasonic nebulisation with lignocaine group 92.43 ± 42.90 s ($p = 0.015$). Hemodynamic variables changed during the procedure but the values were comparable in both groups. There were no statistical differences in cough and gag reflexes, number of attempts, and comfort score in both groups.

CONCLUSIONS: This study shows that significant lesser time required for performing awake fiberoptic intubation when patient received ultrasound guided airway nerve block in comparison to ultrasonic nebulisation for airway anaesthesia.

Identification of an Infected Urachal Cyst Using Point-of-Care Ultrasound

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

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jun 1;37(6):323-324. doi: 10.1097/PEC.0000000000002343.

ABSTRACT

This case describes a 6-year-old girl who presented to the pediatric emergency department with 3 days of fever and suprapubic pain in the setting of 1 month of worsening, dull abdominal pain. On presentation, she had a tender, erythematous, and fluctuant mass on her lower abdomen. Point-of-care ultrasound was used to identify an abnormal fluid collection anterior to her bladder, suspicious for an infected urachal cyst. In this case, point-of-care ultrasound helped identify this uncommon finding in a timely fashion, which expedited definitive care and prevented unnecessary exposure to ionizing radiation.

Current Use, Perceived Barriers, and Learning Preference of Point of Care Ultrasound (POCUS) in the Emergency Medicine in Qatar - A Mixed Design

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

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Open Access Emerg Med. 2021 May 18;13:177-182. doi: 10.2147/OAEM.S304153. eCollection 2021.

ABSTRACT

INTRODUCTION: Point of care ultrasound (POCUS) has been a part of emergency medicine (EM) training for almost two decades. EM training program has a very broad and rigorous POCUS curricula which, in several cases, does not translate to routine application in clinical settings. This study therefore sought to compare the indications, utilization, barriers, and preferred POCUS educational method in a large Middle Eastern academic EM.

METHODOLOGY: A validated questionnaire was emailed to 50 EM faculties between April and May 2019. Volunteer faculty members partook in a semi-structured interview to better understand the indications, current use, barriers, and preferred learning method. Responses were anonymous, and data were analyzed with descriptive statistics.

RESULTS: This was a mixed design study. 30/50 (60%) of faculty responded to the survey, with a mean age of 39.2 years and a mean number of years in practice, 13.1. 55% (n=28) completed POCUS training in less than five years, while 45% completed more than five years ago and 5% never completed it. Forty percent of EM physicians were trained in Africa, while 55% were qualified in Asia and 5% completed their training in Europe. The indications and frequently performed procedures were consistent with the previous research. The common barrier

reported was lack of time, lack of credentialing, lack of quality assurance, and national guidelines. The majority of the faculty preferred a blended learning approach for POCUS.

CONCLUSION: POCUS perceived barriers to its full use include time constraints, lack of national guidelines, and credentialing (awarding POCUS qualifications) of the faculty. Blended learning appears to be the preferred approach towards acquiring the knowledge and skills of POCUS.

The Ultrasound Competency Assessment Tool (UCAT): Development and Evaluation of a Novel Competency-based Assessment Tool for Point-of-care Ultrasound

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

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AEM Educ Train. 2020 Oct 3;5(3):e10520. doi: 10.1002/aet2.10520. eCollection 2021 Jul.

ABSTRACT

OBJECTIVES: Point-of-care ultrasound (POCUS) has become an integral diagnostic and interventional tool. Barriers to POCUS training persist, and it continues to remain heterogeneous across training programs. Structured POCUS assessment tools exist, but remain limited in their feasibility, acceptability, reliability, and validity; none of these tools are entrustment-based. The objective of this study was to derive a simple, entrustment-based POCUS competency assessment tool and pilot it in an assessment setting.

METHODS: This study was composed of two phases. First, a three-step modified Delphi design surveyed 60 members of the Canadian Association of Emergency Physicians Emergency Ultrasound Committee (EUC) to derive the anchors for the tool. Subsequently, the derived ultrasound competency assessment tool (UCAT) was used to assess trainee ($N = 37$) performance on a simulated FAST examination. The intraclass correlation (ICC) for inter-rater reliability and Cronbach's alpha for internal consistency were calculated. A statistical analysis was performed to compare the UCAT to other competency surrogates.

RESULTS: The three-round Delphi had 22, 26, and 26 responses from the EUC members. Consensus was reached, and anchors for the domains of preparation, image acquisition, image optimization, and clinical integration achieved approval rates between 92 and 96%. The UCAT pilot revealed excellent inter-rater reliability (with ICC values of 0.69-0.89; $p < 0.01$) and high internal consistency ($\alpha = 0.91$). While UCAT scores were not impacted by level of training, they were significantly impacted by the number of previous POCUS studies completed.

CONCLUSIONS: We developed and successfully piloted the UCAT, an entrustment-based bedside POCUS competency assessment tool suitable for rapid deployment. The findings from this study indicate early validity evidence for the use of the UCAT as an assessment of trainee POCUS competence on FAST. The UCAT should be trialed in different populations performing several POCUS study types.

Evaluating a Web-based Point-of-care Ultrasound Curriculum for the Diagnosis of Intussusception

pubmed: [point of care ultras...](#)by Margaret Lin-Martore / 47d

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Add note

AEM Educ Train. 2020 Sep 23;5(3):e10526. doi: 10.1002/aet2.10526. eCollection 2021 Jul.

ABSTRACT

OBJECTIVES: Intussusception is a pediatric medical emergency that can be difficult to diagnose. Radiology-performed ultrasound is the diagnostic study of choice but may lead to delays due to lack of availability. Point-of-care ultrasound for intussusception (POCUS-I) studies have shown excellent accuracy and reduced lengths of stay, but there are limited POCUS-I training materials for pediatric emergency medicine (PEM) providers.

METHODS: We performed a prospective cohort study assessing PEM physicians undergoing a primarily Web-based POCUS-I curriculum. We developed the POCUS-I curriculum using Kern's six-step model. The curriculum included a Web-based module and a brief, hands-on practice that was developed with a board-certified pediatric radiologist. POCUS-I technical skill, knowledge, and confidence were determined by a direct observation checklist, multiple-choice test, and a self-reported Likert-scale survey, respectively. We assessed participants immediately pre- and postcourse as well as 3 months later to assess for retention of skill, knowledge, and confidence.

RESULTS: A total of 17 of 17 eligible PEM physicians at a single institution participated in the study. For the direct observation skills test, participants scored well after the course with a median (interquartile range [IQR]) score of 20 of 22 (20-21) and maintained high scores even after 3 months (20 [20-21]). On the written knowledge test, there was significant improvement from 57.4% (95% CI = 49.8 to 65.2) to 75.3% (95% CI = 68.1 to 81.6; $p < 0.001$) and this improvement was maintained at 3 months at 81.2% (95% CI = 74.5 to 86.8). Physicians also demonstrated improved confidence with POCUS-I after exposure to the curriculum, with 5.9% reporting somewhat or very confident prior to the course to 76.5% both after the course and after 3 months ($p < 0.001$).

CONCLUSION: After a primarily Web-based curriculum for POCUS-I, PEM physicians performed well in technical skill in POCUS-I and showed improvement in knowledge and confidence, all of which were maintained over 3 months.

Chest sonography versus chest radiograph in children admitted to paediatric intensive care - A prospective study

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

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Trop Doct. 2021 May 27:494755211016650. doi: 10.1177/00494755211016650. Online ahead of print.

ABSTRACT

There is a paucity of studies on the correlation between chest radiograph and ultrasound (US) in children. Our objective was to study the correlation between bedside chest radiograph and ultrasound findings in 413 children with 1002 episodes of chest radiograph and US enrolled for a prospective, double-blinded observational study in a multidisciplinary paediatric intensive care unit. Weighted κ statistic for agreement was different for right and left lungs and varied from 50% for left pleural effusion to 98% for right pneumothorax. Pulmonary oedema, pneumothorax and pleural effusion were diagnosed by ultrasound alone in a significantly higher number of patients as compared to chest radiograph ($P = 0.001$). Chest ultrasound is therefore deemed more sensitive than chest radiograph in detection of pleural effusion, pulmonary oedema and pneumothorax.

Correlation of Oxygenation and Radiographic Assessment of Lung Edema (RALE) Score to Lung Ultrasound Score (LUS) in Acute Respiratory Distress Syndrome (ARDS) Patients in the Intensive Care Unit

["lung ultrasound" or "lung ultrasonograp...](#) by Pratibha Todur / 47d

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Add note

Can J Respir Ther. 2021 May 19;57:53-59. doi: 10.29390/cjrt-2020-063. eCollection 2021.

ABSTRACT

BACKGROUND: Lung ultrasound score (LUS) as well as radiographic assessment of lung edema (RALE) score as calculated from chest radiography (CXR) have been applied to assess Acute Respiratory Distress Syndrome (ARDS) severity. CXRs, which are frequently performed in ARDS patients, pose a greater risk of radiation exposure to patients and health care staff.

AIMS AND OBJECTIVES: The aim of the study was to evaluate if LUS had a better correlation to oxygenation ($\text{PaO}_2/\text{FiO}_2$) compared with the RALE score in ARDS patients. We also aimed to analyse if there was a correlation between RALE score and LUS. We wanted to determine the LUS and RALE score cut-off, which could predict a prolonged length of intensive care unit (ICU) stay (≥ 10 days) and survival.

METHODS: Thirty-seven patients aged above 18 years with ARDS as per Berlin definition and admitted to the ICU were included in the study. It was a retrospective study done over a period of 11 months. On the day of admission to ICU, the global and basal LUS, global and basal RALE score, and PaO₂/FiO₂ were recorded. Outcome and days of ICU stay were noted.

RESULTS: Global LUS score and PaO₂/FiO₂ showed the best negative correlation ($r = -0.491$), which was significant ($p = 0.002$), followed by global RALE score and PaO₂/FiO₂ ($r = -0.422$, $p = 0.009$). Basal LUS and PaO₂/FiO₂ also had moderate negative correlation ($r = -0.334$, $p = 0.043$) followed by basal RALE score and PaO₂/FiO₂ ($r = -0.34$, $p = 0.039$). Global RALE score and global LUS did not show a significant correlation. Similarly, there was no significant correlation between basal RALE score and basal LUS. Global and basal LUS as well as global and basal RALE score were not beneficial in predicting either a prolonged length of ICU stay or survival as the area under curve was low.

CONCLUSION: In ARDS patients, global LUS had the best correlation to oxygenation (PaO₂/FiO₂), followed by global RALE score. Basal LUS and basal RALE score also had moderate correlation to oxygenation. However, there was no significant correlation between global LUS and global RALE score as well as between basal LUS and basal RALE score. Global and basal LUS as well as global and basal RALE scores were not able to predict a prolonged ICU stay or survival in ARDS patients.

Efficiency of Lung Ultrasonography in the Diagnosis and Follow-up of Viral Pneumonia in Newborn

["lung ultrasound" or "lung ultrasonograp..."](#) by Ahmet Öktem / 46d

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INSIGHTS

Add note

Am J Perinatol. 2021 May 27. doi: 10.1055/s-0041-1729880. Online ahead of print.

ABSTRACT

OBJECTIVE: Lung ultrasonography (LUS) is a useful method for diagnosis of lung diseases such as respiratory distress syndrome, transient tachypnea of the newborn, pneumonia, and pneumothorax in the neonatal period. LUS has become an important tool in the diagnosis and follow-up of lung diseases. LUS is easy to apply at the bedside and is a practical and low-cost method for diagnosing pneumonia.

STUDY DESIGN: This study was conducted in neonatal intensive care unit of Dr. Sami Ulus Obstetrics, Children's Health and Diseases Training and Research Hospital. From September 2019 to April 2020, 50 patients who were diagnosed with viral pneumonia were included in the study. Also, 24 patients with sepsis-related respiratory failure were included in the study as a control group. LUS was performed at the bedside three times, by a single expert, once each before treatment for diagnosis, on discharge, and after discharge in outpatient clinic control.

RESULTS: Before treatment, LUS findings were lung consolidation with air bronchograms (50/50), pleural line abnormalities (35/50), B-pattern (25/50), disappearance of lung sliding (21/50), lung pulse (5/50), and pleural effusion (9/50). During discharge, we found significant changes: lung consolidation with air bronchograms (6/50), pleural line abnormalities (7/50), B-pattern (12/50), and pleural effusion (1/50) ($p < 0.05$). Outpatient clinic control LUS findings were lung consolidation with air bronchograms (0/50), pleural line abnormalities (0/50), B-pattern (0/50), disappearance of lung sliding (0/50), and pleural effusion (0/50) ($p < 0.05$). Also, B-pattern image, disappearance of lung sliding, and pleural line abnormalities were higher in control group ($p < 0.05$).

CONCLUSION: Ultrasound gives no hazard, and the application of bedside ultrasonography is comfortable for the patients. Pneumonia is a serious infection in the neonatal period. Repeated chest radiography may be required depending on the clinical condition of the patient with pneumonia. This study focuses on adequacy of LUS in neonatal pneumonia.

KEY POINTS: · Lung ultrasound is a practical and low-cost method in diagnosing pneumonia.. · Neonatal pneumonia is a very important cause of morbidity and mortality in NICU.. · We can evaluate neonatal pneumonia with combination of clinical presentations and LUS findings..

Effect of Percutaneous Tracheostomy on Optic Nerve Sheath Diameter [TONS Trial]

[pubmed: bUS](#) by Indu Kapoor / 46d

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Indian J Crit Care Med. 2021 Apr;25(4):382-387. doi: 10.5005/jp-journals-10071-23783.

ABSTRACT

BACKGROUND: Elective percutaneous tracheostomy [PCT] is the widely performed procedure in neurocritically ill patients as an airway management choice in neurocritical care unit [NICU]. Intracranial pressure [ICP] is a vital parameter to be monitored in these patients while undergoing any surgical procedure including PCT. Optic nerve sheath diameter [ONSD], being a surrogate of ICP, can be done bedside and carries less complications than invasive ICP monitoring. The aim of our study was to assess the effect of PCT on ONSD at different stages of PCT.

MATERIALS AND METHODS: A total of 158 patients with various intracranial pathologies scheduled for PCT in NICU were screened for eligibility in our study. We assessed mean values of ONSD, HR, MBP, and SpO₂ for changes over various time points during PCT using generalized estimating equation (GEE). A p value of <0.05 was considered significant.

RESULTS: A total of 135 patients who underwent PCT were analyzed for the study. The values of ONSD changed significantly at different stages of PCT procedure compared to baseline. The baseline ONSD value was 0.39 ± 0.05 cm. ONSD rose significantly to 0.40 ± 0.06 cm during

positioning, 0.41 ± 0.06 cm during skin incision, 0.42 ± 0.07 cm during dilatation of tract, 0.41 ± 0.07 cm during insertion of tracheostomy, and 0.41 ± 0.06 cm at the end of the procedure.

CONCLUSIONS: PCT leads to a significant rise of ONSD values during all stages of PCT. The available evidences point toward detrimental rise in ICP during PCT. ICP can be monitored noninvasively by measuring ONSD using bedside ultrasound.

Prediction of gastric fluid volume by ultrasonography in infants undergoing general anaesthesia

[pubmed: point of care ultrasonography](#) by Eun-Hee Kim / 46d

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INSIGHTS

Add note

Br J Anaesth. 2021 May 24:S0007-0912(21)00245-2. doi: 10.1016/j.bja.2021.03.039. Online ahead of print.

ABSTRACT

BACKGROUND: Point-of-care ultrasonography can estimate gastric contents and volume to assess the risk of pulmonary aspiration; however, its use in infants has not been well validated. We aimed to develop a predictive model for estimating gastric fluid volume using ultrasonography in infants.

METHODS: This prospective observational study enrolled 200 infants (≤ 12 months) undergoing general anaesthesia. After anaesthetic induction, while preserving spontaneous respiration, we measured gastric antral cross-sectional area using ultrasonography in both the supine and right lateral decubitus positions. We then suctioned the gastric content and measured its volume. The primary outcome was development of a gastric fluid volume prediction model with multiple regression analysis. Agreement between the predicted volume and the suctioned volume was evaluated using a Bland-Altman plot.

RESULTS: Overall, 192 infants were included in the final analysis. Pearson correlation analysis showed that the gastric antral cross-sectional area in the supine ($P < 0.001$; correlation coefficient: 0.667) and right lateral decubitus ($P < 0.001$; correlation coefficient: 0.845) positions and qualitative antral grade ($P < 0.001$; correlation coefficient: 0.581) correlated with suctioned volume. We developed a predictive model: predicted volume (ml) = $-3.7 + 6.5 \times$ (right lateral decubitus cross-sectional area [cm^2]) $- 3.9$ (supine cross-sectional area [cm^2]) $+ 1.7 \times$ grade ($P < 0.01$). When comparing the predicted volume and suctioned volume, the mean bias was 0.01 ml kg^{-1} and the limit of agreement was -0.58 to 0.62 ml kg^{-1} .

CONCLUSIONS: Gastric fluid volume can be estimated using a predictive model based on ultrasonography data in infants.

Does age affect the test performance of secondary sonographic findings for pediatric appendicitis?

[pubmed: pediatric appendicit...by Jeffrey T Neal / 46d](#)
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INSIGHTS

Add note

Pediatr Radiol. 2021 May 27. doi: 10.1007/s00247-021-05100-0. Online ahead of print.

ABSTRACT

BACKGROUND: Secondary sonographic findings of appendicitis can aid image analysis and support diagnosis with and without visualization of an appendix.

OBJECTIVE: We sought to determine if age affected the test performance of secondary findings for pediatric appendicitis.

MATERIALS AND METHODS: We performed a medical record review of emergency department patients younger than 19 years of age who had a sonogram for suspected appendicitis. Our primary patient outcome was appendicitis, as determined by pathology or by image-confirmed perforation/abscess. Our primary analysis was test performance of secondary sonographic findings as recorded by sonographers on the final diagnosis of appendicitis stratified by age (<6 years, 6 to <11 years, 11 to <19 years).

RESULTS: A total of 1,219 patients with suspected appendicitis were evaluated by ultrasound, and 1,147 patients met the criteria for analysis. Of the 1,147 patients, 431 (37.6%) had a final diagnosis of appendicitis. Across all age groups, echogenic fat was the most accurate secondary finding (92.5% [95% confidence interval (CI): 91.0, 94.0]) and free fluid was the least accurate secondary finding (54.7% [95% CI: 51.8, 57.5]). There was no significant difference in the age-stratified test performance of secondary sonographic findings except that (1) appendicolith was a more accurate predictor in patients <6 years old than in the middle group ($P<0.001$) or the oldest group ($P<0.001$), and (2) free fluid was a more accurate predictor in the middle group than in the oldest group ($P=0.02$).

CONCLUSION: There are no significant differences in the age-stratified test performance of secondary sonographic findings in the prediction of pediatric appendicitis except that appendicolith is more predictive in younger patients.

Role of point-of-care ultrasound study in early disposition of patients with undifferentiated acute dyspnea in emergency department: a multi-center prospective study

[pubmed: point of care ultras...by Mohammad Amin Zare / 44d](#)
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INSIGHTS

Add note

J Ultrasound. 2021 May 29. doi: 10.1007/s40477-021-00582-y. Online ahead of print.

ABSTRACT

INTRODUCTION: Sonography is a safe and simple diagnostic modality which can help emergency physicians in their clinical decision makings and improve the patient disposition process in emergency departments.

OBJECTIVE: This prospective multi-center study evaluates the role of bedside ultrasound performed by emergency physicians in accelerating the patient disposition process in cases with acute undifferentiated dyspnea.

METHODS: 103 patients were randomized to "early ultrasound" and "routine assessment" groups. In early ultrasound group, emergency physicians performed bedside ultrasound scans on heart and lungs as soon as possible after triage and randomization. In routine assessment group, ultrasound was used whenever the emergency physician or other consultant services ordered or performed it. Mean randomization-to-diagnosis time was compared in two studied groups.

RESULTS: Mean randomization-to-diagnosis time was 79.33 (\pm 38.90) min in routine assessment and 42.61 (\pm 19.20) min in early ultrasound groups, showing a statistically significant difference (p value < 0.01).

CONCLUSION: Using early sonography in assessing the patients with undifferentiated acute dyspnea in emergency department decreases the patient turnover time while increasing the diagnostic accuracy.

Pediatric point-of-care ultrasound of optic disc elevation for increased intracranial pressure: A pilot study

[pubmed: point of care ultras...](#)by Mark O Tessaro / 44d

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INSIGHTS

Add note

Am J Emerg Med. 2021 May 21;49:18-23. doi: 10.1016/j.ajem.2021.05.051. Online ahead of print.

ABSTRACT

OBJECTIVE: Papilledema is often difficult to detect in children. Ocular point-of-care ultrasound (POCUS) measurement of the optic nerve sheath diameter (ONSD) is a non-invasive test for

increased intracranial pressure (ICP), but no consensus exists on normal pediatric ONSD values. Detection of optic disc elevation (ODE, a component of papilledema) using POCUS has recently been qualitatively described. We sought to establish the diagnostic accuracy of different ODE cutoffs to detect increased ICP in children who underwent ocular POCUS in our pediatric emergency department (PED).

METHODS: We retrospectively reviewed charts of patients ages 0-18 years who received ocular POCUS in our tertiary PED between 2011 and 2016. Patients were included if their archived POCUS examinations were deemed high-quality by a POCUS expert and they underwent ICP determination within 48 h after ocular POCUS. A blinded POCUS expert measured ODE, optic disc width at mid-height (ODWAMH), and ONSD. Receiver-operator curve analysis was performed for various cutoffs for these measurements in detecting increased ICP.

RESULTS: 76 eyes from 40 patients met study criteria. 26 patients had increased ICP. The mean ODE of both eyes (ODE-B) generated the largest area under the curve (0.962, 95% CI 0.890-1). The optimal ODE-B cutoff was 0.66 mm, with a sensitivity of 96% (95% CI 79-100%) and a specificity of 93% (95% CI 79-100%). 1/40 (2.5%) of patients with ODE-B < 0.66 had increased ICP.

CONCLUSIONS: ODE-B may represent the optimal ocular POCUS measurement for detecting increased ICP in children, and future prospective studies could more accurately describe the diagnostic performance of different pediatric ODE-B cutoffs.

Comparison of vena cava distensibility and pulse pressure variation for the evaluation of intravascular volume in critically ill children

pubmed: [bUS](#) by Serkan Özsoylu / 43d

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J Pediatr (Rio J). 2021 May 27:S0021-7557(21)00074-7. doi: 10.1016/j.jped.2021.04.005. Online ahead of print.

ABSTRACT

OBJECTIVE: In this study, the authors aimed to evaluate the effectiveness of the vena cava distensibility index (dIVC) and pulse pressure variation (PPV) as dynamic parameters for estimating intravascular volume in critically ill children.

METHODS: Patients aged 1 month to 18 years, who were hospitalized in the present study's pediatric intensive care unit, were included in the study. The patients were divided into two groups according to central venous pressure (CVP): hypovolemic (< 8 mmHg) and non-hypovolemic (CVP ≥ 8 mmHg) groups. In both groups, dIVC was measured using bedside ultrasound and PPV. Measurements were recorded and evaluated under arterial monitoring.

RESULTS: In total, 19 (47.5%) of the 40 subjects included in the study were assigned to the CVP \geq 8 mmHg group, and 21 (52.5%) to the CVP < 8 mmHg group. A moderate positive correlation was found between PPV and dIVC ($r = 0.475$, $p < 0.01$), while there were strong negative correlations of CVP with PPV and dIVC ($r = -0.628$, $p < 0.001$ and $r = -0.760$, $p < 0.001$, respectively). In terms of predicting hypovolemia, the predictive power for dIVC was > 16% (sensitivity, 90.5%; specificity, 94.7%) and that for PPV was > 14% (sensitivity, 71.4%; specificity, 89.5%).

CONCLUSION: dIVC has higher sensitivity and specificity than PPV for estimating intravascular volume, along with the advantage of non-invasive bedside application.

The effect of point-of-care ultrasound on length of stay in the emergency department in children with neck swelling

pubmed: [point of care ultras...](#) by Mary Kate Claiborne / 43d

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INSIGHTS

Add note

Am J Emerg Med. 2021 May 4;48:295-300. doi: 10.1016/j.ajem.2021.05.009. Online ahead of print.

ABSTRACT

BACKGROUND: Ultrasound is the imaging modality of choice in children presenting to the emergency department (ED) with soft tissue neck swelling. Point of care ultrasound (POCUS) has good accuracy when compared to comprehensive radiology department ultrasound (RADUS). POCUS could potentially improve ED length of stay (LOS) by improving efficiency. We aimed to evaluate the LOS of pediatric patients seen in ED with soft tissue neck swelling who received POCUS compared to RADUS. We determined unscheduled 30-day return visit rates in both groups as a balancing measure.

METHODS: We performed a retrospective review of the electronic medical record for our cross-sectional study of discharged patients ≤ 21 years of age who had a neck ultrasound performed by a credentialed POCUS physician or by the radiology department between July 2014 and January 2020. We included patients who had both POCUS and RADUS in the POCUS group. We compared median ED LOS in both groups using the Mann Whitney U test and proportion of unscheduled return visits to the ED in both groups using odds ratio and 95% CI.

RESULTS: There were 925 patients: 76 with only POCUS, 6 with POCUS and RADUS, and 843 with only RADUS performed. Median LOS in the POCUS group was 68.5 min (IQR 38.3120.3) versus 154.0 min (IQR 111.0, 211.0) in the RADUS group ($p < 0.001$). Return visit overall was 7.6%: 13.2% in the POCUS group versus 7.1% in the RADUS group ($p = 0.07$).

CONCLUSION: Pediatric patients evaluated in the ED for soft tissue neck swelling had a shorter LOS with POCUS than with RADUS without a statistically significant increase in 30-day return visits. We suggest a "POCUS First" approach to the care of these patients.

Using remote consultation to enhance diagnostic accuracy of bedside transthoracic echocardiography during COVID-19 pandemic

pubmed: bUS by Jing Lu / 43d

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Add note

Echocardiography. 2021 May 31. doi: 10.1111/echo.15124. Online ahead of print.

ABSTRACT

OBJECTIVE: The aim of this study was to evaluate the clinical significance of remote consultation over bedside transthoracic echocardiography (RC-B-TTE) for patients with coronavirus disease 2019 (COVID-19).

METHODS: Five frontline echocardiographers performed and interpreted B-TTE for 30 patients with COVID-19 in the isolation wards, and the on-site B-TTE reports (OSR) were generated. Then remote consultation over the 30 B-TTE studies was conducted by two experienced echocardiographic consultants while blinded to the OSR, and the corresponding remote consultation reports (RCR) were generated. Subsequently, the five frontline echocardiographers were convened together to discuss the difference between the OSR and RCR, and to confirm the correct interpretation and the misdiagnosis using a "majority-vote" consensus as the diagnostic "gold standard". Afterwards the reasons for the misdiagnosis were given by the frontline echocardiographers themselves. The inter-rater agreement between the OSR and the "gold standard" was assessed using Kappa coefficient and percent agreement.

RESULTS: Complete correctness of the 30 copies of the RCR were determined by the 5 frontline echocardiographers. The reliability of the OSR in the findings of cardiac chamber dilation, left ventricular hypertrophy and pulmonary hypertension were weak (Kappa <0.6). The reliability of the OSR in the recognition of major cardiac abnormalities was very weak (Kappa =0.304, percent agreement =63.3%). Misdiagnosis of major abnormalities was found in 11 copies of OSR (11/30, 36.7%).

CONCLUSIONS: The protocol of RC-B-TTE has shown noticeable superiority in ameliorating diagnostic accuracy of echocardiography, which should be generalized to clinical practice during the COVID-19 or similar pandemic.

Optic Nerve Sheath Diameter in Acute Liver Failure: A Prospective Cohort Study

optic nerve diameter by Filipe S Cardoso / 43d

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ABSTRACT

INTRODUCTION: Acute liver failure (ALF) is a rare disease that may lead to cerebral edema and death. An increased optic nerve sheath diameter (ONSD) may reflect an early increase in intracranial pressure. We assessed the feasibility and safety of the ONSD measurement and its association with outcomes in patients with ALF.

METHODS: This was an open-label prospective cohort study including adult patients with ALF admitted to a liver-specialized intensive care unit (ICU) in an academic center between October 2018 and February 2020 (among 24): 20 as intention-to-treat and 17 as per-protocol analyses. The ONSD measurement (primary exposure) used an ultrasound transducer (3 determinations on each eye per patient). The primary outcome was hospital mortality.

RESULTS: Among the 20 patients, 11 (55.0%) were females and the mean age was 45 ± 16 years. On the day of ONSD measurement (median 32.4 h post-ICU admission; IQR 19.8-59.8): 8 patients (40.0%) were in a coma, the mean international normalized ratio (INR) was 3.3 ± 1.4 , median bilirubin was 12.3 mg/dL (IQR 4.7-24.5), mean ammonia was 163 ± 101 $\mu\text{mol/L}$, and mean SOFA score was 11 ± 5 . The mean bilateral ONSD was 5.6 ± 0.7 mm, with a very good correlation between right and left eyes (Pearson's $r = 0.90$). Ten (50.0%) patients were transplanted and 13 (65.0%) patients survived the hospital stay (all with a 2-month extended Glasgow Outcome Scale of 8). The mean ONSD was significantly higher for hospital non-survivors than survivors both in the intention-to-treat (6.2 vs. 5.3 mm; $p = 0.004$) and per-protocol (6.2 vs. 5.2 mm; $p = 0.004$) analyses. No adverse effects from ONSD measurements were reported.

CONCLUSIONS: In patients with ALF, a higher ONSD was associated with higher hospital mortality. ONSD measurement is feasible and safe and may have prognostic value.

Longitudinal remotely mentored self-performed lung ultrasound surveillance of paucisymptomatic Covid-19 patients at risk of disease progression

["lung ultrasound" or "lung ultrasonograp..."](#) by Andrew W Kirkpatrick / 43d

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INSIGHTS

Add note

Ultrasound J. 2021 May 30;13(1):27. doi: 10.1186/s13089-021-00231-9.

ABSTRACT

COVID-19 has impacted human life globally and threatens to overwhelm health-care resources. Infection rates are rapidly rising almost everywhere, and new approaches are required to both prevent transmission, but to also monitor and rescue infected and at-risk patients from severe complications. Point-of-care lung ultrasound has received intense attention as a cost-effective technology that can aid early diagnosis, triage, and longitudinal follow-up of lung health.

Detecting pleural abnormalities in previously healthy lungs reveal the beginning of lung inflammation eventually requiring mechanical ventilation with sensitivities superior to chest radiographs or oxygen saturation monitoring. Using a paradigm first developed for space-medicine known as Remotely Telementored Self-Performed Ultrasound (RTSPUS), motivated patients with portable smartphone support ultrasound probes can be guided completely remotely by a remote lung imaging expert to longitudinally follow the health of their own lungs. Ultrasound probes can be couriered or even delivered by drone and can be easily sterilized or dedicated to one or a commonly exposed cohort of individuals. Using medical outreach supported by remote vital signs monitoring and lung ultrasound health surveillance would allow clinicians to follow and virtually lay hands upon many at-risk paucisymptomatic patients. Our initial experiences with such patients are presented, and we believe present a paradigm for an evolution in rich home-monitoring of the many patients expected to become infected and who threaten to overwhelm resources if they must all be assessed in person by at-risk care providers.

Diagnostic Point-of-Care Ultrasound: Recommendations From an Expert Panel

["lung ultrasound" or "lung ultrasonograp...](#)by Yuriy S Bronshteyn / 42d

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INSIGHTS

Add note

J Cardiothorac Vasc Anesth. 2021 Apr 17:S1053-0770(21)00342-6. doi: 10.1053/j.jvca.2021.04.016. Online ahead of print.

ABSTRACT

Diagnostic point-of-care ultrasound (PoCUS) has emerged as a powerful tool to help anesthesiologists guide patient care in both the perioperative setting and the subspecialty arenas. Although anesthesiologists can turn to guideline statements pertaining to other aspects of ultrasound use, to date there remains little in the way of published guidance regarding diagnostic PoCUS. To this end, in 2018, the American Society of Anesthesiologists chartered an ad hoc committee consisting of 23 American Society of Anesthesiologists members to provide recommendations on this topic. The ad hoc committee convened and developed a committee work product. This work product was updated in 2021 by an expert panel of the ad hoc committee to produce the document presented herein. The document, which represents the consensus opinion of a group of practicing anesthesiologists with established expertise in diagnostic ultrasound, addresses the following issues: (1) affirms the practice of diagnostic PoCUS by adequately trained anesthesiologists, (2) identifies the scope of practice of diagnostic PoCUS relevant to anesthesiologists, (3) suggests the minimum level of training needed to achieve competence, (4) provides recommendations for how diagnostic PoCUS can be used safely and ethically, and (5) provides broad guidance about diagnostic ultrasound billing.

The Use of Point-of-care Ultrasound in Emergency Medical Centers in Korea: a National Cross-sectional Survey

[focused assessment sonography trauma](#)by Jonghoon Yoo / 42d

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INSIGHTS

Add note

J Korean Med Sci. 2021 May 31;36(21):e141. doi: 10.3346/jkms.2021.36.e141.

ABSTRACT

BACKGROUND: Point-of-care ultrasound (POCUS) is an essential tool in emergency medicine (EM). We aimed to investigate the current status and perception of POCUS use in emergency medical centers in Korea.

METHODS: A cross-sectional, nationwide survey was conducted using a mobile survey of physicians at emergency medical centers in Korea. The first message was sent on November 27, 2020, and the second message was sent on December 3, 2020 to the non-responders. The questionnaire comprised 6 categories and 24 questionnaires on demographics, current practice, education, perception, and barriers to the use of POCUS.

RESULTS: A total of 467 physicians participated in the survey (a response rate of 32% among 1,458 target physicians), of which 43% were residents and 57% were EM specialists. Most of the respondents (96%) answered that they use POCUS, of which 89% reported using it at least once a week. The most frequently used types of POCUS were focused assessment with sonography for trauma (68%) and echocardiography (66%). Musculoskeletal, male genital, and pediatric scans were rarely performed tests but ranked as of the scans physicians most wanted to learn. About 73% of the respondents received ultrasound education, and 41% received ultrasound education at their own institutions. Nevertheless, education-related barriers are still the biggest deterrent to POCUS use (60%). In addition, multivariate multinomial logistic regression analysis revealed that the greater the number of ultrasound devices and the total number of physicians in the emergency center, the more likely they were to use POCUS every day.

CONCLUSION: This study found that most physicians currently working in emergency medical centers in Korea more frequently perform various types of ultrasound scans compared to those 10 years prior. To further promote the use of POCUS, it is important to have an appropriate number of ultrasound devices and physicians in the emergency center along with systematic POCUS education.

Diaphragm thickness, thickness change, and excursion in subjects with and without nonspecific low back pain using B-mode and M-mode ultrasonography

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

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INSIGHTS

Add note

Physiother Theory Pract. 2021 Jun 1:1-11. doi: 10.1080/09593985.2021.1926022. Online ahead of print.

ABSTRACT

Background: Previous studies have demonstrated that respiratory dysfunction has a potential association with low back pain (LBP). Despite the role of the diaphragm for respiration and spinal stability, knowledge of the function of both sides of the diaphragm in subjects with LBP is still limited. **Objective:** This study aimed to compare the structural integrity and function of the right and left hemidiaphragm by ultrasonography (USG) in subjects with and without nonspecific chronic low back pain (NS-CLBP). **Methods:** A total of 37 subjects with NS-CLBP and 34 healthy subjects participated in this case-control study. The thickness, thickness change, and excursion of the right and left hemidiaphragm were compared within and between the groups during quiet breathing (QB) and deep breathing (DB) through B-mode and M-mode ultrasound imaging. **Results:** The LBP group had a significantly smaller degree of right hemidiaphragm thickness change ($P = .001$) compared with the healthy control group, with a strong effect size. Nevertheless, there was no significant change for diaphragm thickness and excursion between the two groups. The result showed that, in the healthy group, the right hemidiaphragm had a significantly smaller thickness at expiration and larger thickness change compared with the left hemidiaphragm, with a moderate effect size. Based on the multivariate prediction analysis, the right hemidiaphragm thickness change might significantly predict LBP. **Conclusion:** We found that participants with LBP had a smaller degree of right hemidiaphragm thickness change. Also, the right hemidiaphragm thickness change might significantly predict LBP.

Diagnostic Accuracy of 3D Ultrasound and Artificial Intelligence for Detection of Pediatric Wrist Injuries

pubmed: bUS by Jack Zhang / 41d

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INSIGHTS

Add note

Children (Basel). 2021 May 21;8(6):431. doi: 10.3390/children8060431.

ABSTRACT

Wrist trauma is common in children, typically requiring radiography for diagnosis and treatment planning. However, many children do not have fractures and are unnecessarily exposed to radiation. Ultrasound performed at bedside could detect fractures prior to radiography. Modern tools including three-dimensional ultrasound (3DUS) and artificial intelligence (AI) have not yet been applied to this task. Our purpose was to assess (1) feasibility, reliability, and accuracy of 3DUS for detection of pediatric wrist fractures, and (2) accuracy of automated fracture detection via AI from 3DUS sweeps. Children presenting to an emergency department with unilateral upper extremity injury to the wrist region were scanned on both the affected and unaffected

limb. Radiographs of the symptomatic limb were obtained for comparison. Ultrasound scans were read by three individuals to determine reliability. An AI network was trained and compared against the human readers. Thirty participants were enrolled, resulting in scans from fifty-five wrists. Readers had a combined sensitivity of 1.00 and specificity of 0.90 for fractures. AI interpretation was indistinguishable from human interpretation, with all fractures detected in the test set of 36 images (sensitivity = 1.0). The high sensitivity of 3D ultrasound and automated AI ultrasound interpretation suggests that ultrasound could potentially rule out fractures in the emergency department.

The Evaluation Point-of-Care Ultrasound in the Post-Anesthesia Unit-A Multicenter Prospective Observational Study

pubmed: [bUS](#) by Davinder Ramsingh / 41d

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INSIGHTS

Add note

J Clin Med. 2021 May 28;10(11):2389. doi: 10.3390/jcm10112389.

ABSTRACT

INTRODUCTION: Point-of-care ultrasound (POCUS) is the most rapidly growing imaging modality for acute care. Despite increased use, there is still wide variability and less evidence regarding its clinical utility for the perioperative setting compared to other acute care settings. This study sought to demonstrate the impact of POCUS examinations for acute hypoxia and hypotension occurring in the post-anesthesia care unit (PACU) versus traditional bedside examinations.

METHODS: This study was designed as a multi-center prospective observational study. Adult patients who experienced a reduced mean arterial blood pressure (MAP < 60mmHG) and/or a reduced oxygen saturation (SpO₂ < 88%) in the PACU from 7AM to 4PM were targeted. POCUS was available or not for patient assessment based on PACU team training. All providers who performed POCUS exams received standardized training on cardiac and pulmonary POCUS. All POCUS exam findings were recorded on a standardized form and the number of suspected mechanisms to trigger the acute event were captured before and after the POCUS exam. PACU length of stay (minutes) across groups was the primary outcome. Results: In total, 128 patients were included in the study, with 92 patients receiving a POCUS exam. Comparison of PACU time between the POCUS group (median = 96.5 min) and no-POCUS groups (median = 120.5 min) demonstrated a reduction for the POCUS group, $p = 0.019$. Hospital length of stay and 30-day hospital readmission did not show a significant difference between groups. Finally, there was a reduction in the number of suspected diagnoses from before to after the POCUS examination for both pulmonary and cardiac exams, p -values < 0.001.

CONCLUSIONS: Implementation of POCUS for assessment of acute hypotension and hypoxia in the PACU setting is associated with a reduced PACU length of stay and a reduction in suspected number of diagnoses.

The use of real-time sonography-assisted fracture reduction in children with displaced forearm fractures

[pubmed: bUS](#) by Pavel Kotlarsky / 41d
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INSIGHTS

Add note

J Pediatr Orthop B. 2021 May 28. doi: 10.1097/BPB.0000000000000886. Online ahead of print.

ABSTRACT

Pediatric forearm and wrist fractures are common; furthermore, some are displaced and require manipulation and reduction. The procedure is commonly performed without real-time image guidance and evaluated radiographically after reduction and casting, leading to multiple reduction attempts and malalignment. Although fluoroscopy can provide real-time assessment of fracture alignment during the procedure, it is not readily available in many emergency departments (EDs) and involves radiation exposure. Ultrasonography is an alternative real-time imaging modality that is inexpensive and readily available. The purpose of this study was to determine whether the use of real-time bedside sonography during closed reduction of distal and middle third forearm fractures can decrease the number of reduction attempts and reduce the number of patients requiring surgery. We compared the results of a conventional blind manipulation, fracture reduction, and casting to fracture reduction under real-time ultrasonographic guidance, in patients treated in our ED between 2014 and 2016. Overall, 458 patients with distal or middle third fractures were included. Of these reductions, 289 were performed without real-time imaging (group 1) and 169 under real-time ultrasound guidance (group 2). In group 1, 10% of patients required re-reduction, and 5% of patients needed surgery. In group 2, only one patient (0.6%) required re-reduction and 1% of patients required surgery due to fracture instability. In conclusion, the current study shows that real-time ultrasound-guided forearm fracture reduction is an effective and inexpensive method for correction of displaced forearm and wrist fractures in children, which does not involve any radiation exposure.

Significance of Lung Ultrasound in Patients with Suspected COVID-19 Infection at Hospital Admission

["lung ultrasound" or "lung ultrasonograp..."](#) by Holger Gutsche / 41d
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INSIGHTS

Add note

Diagnostics (Basel). 2021 May 21;11(6):921. doi: 10.3390/diagnostics11060921.

ABSTRACT

With a lung ultrasound (LUS) the typical findings are interstitial pneumonia. COVID-19 pneumonia is often manifested in sub-pleural areas, which is preferably detected by sonography. An RT-PCR test cannot always ensure a safe differentiation of COVID-19- and non-diseased cases. Clinically challenging is that a reliable and time efficient decision regarding COVID-19 suspects requiring isolation. Therefore, this study was aimed at evaluating the significance of LUS in symptomatic patients with COVID-19 suspicion at hospital admission. A total of 101 patients admitted to a suspect ward with COVID-19-typical symptoms were assessed. All patients received prospectively a standardized LUS at admission. Patients were classified as LUS-positive and -negative cases based on a specific LUS score. The RT-PCR test in combination with the clinical findings served as a reference. Correctly classified were 14/15 COVID-19 diseased suspects as LUS-positive (sensitivity: 93.3%). Twenty-seven out of 61 non-positive cases were classified as false positive with LUS (specificity: 55.7%). In 34/35 patients who were assessed as LUS negative, no COVID-19 disease was detected during the hospitalization. The PPV and NPV of the LUS were 34.1% and 97.1%. LUS is a valuable tool in symptomatic patients for the assessment of COVID-19-disease. The high negative predictive value of LUS is helpful to rule out the disease.

Low Dose Chest CT and Lung Ultrasound for the Diagnosis and Management of COVID-19

["lung ultrasound" or "lung ultrasonograp..."](#) by Julie Finance / 41d

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INSIGHTS

Add note

J Clin Med. 2021 May 19;10(10):2196. doi: 10.3390/jcm10102196.

ABSTRACT

BACKGROUND: The COVID-19 pandemic has provided an opportunity to use low- and non-radiating chest imaging techniques on a large scale in the context of an infectious disease, which has never been done before. Previously, low-dose techniques were rarely used for infectious diseases, despite the recognised danger of ionising radiation.

METHOD: To evaluate the role of low-dose computed tomography (LDCT) and lung ultrasound (LUS) in managing COVID-19 pneumonia, we performed a review of the literature including our cases.

RESULTS: Chest LDCT is now performed routinely when diagnosing and assessing the severity of COVID-19, allowing patients to be rapidly triaged. The extent of lung involvement assessed by LDCT is accurate in terms of predicting poor clinical outcomes in COVID-19-infected patients. Infectious disease specialists are less familiar with LUS, but this technique is also of great interest for a rapid diagnosis of patients with COVID-19 and is effective at assessing patient prognosis.

CONCLUSIONS: COVID-19 is currently accelerating the transition to low-dose and "no-dose" imaging techniques to explore infectious pneumonia and their long-term consequences.

Validity of Lung Ultrasound: Is an Image Worth More Than a Thousand Sounds?

"lung ultrasound" or "lung ultrasonograp...by Cristina Ramos-Hernández / 41d

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INSIGHTS

Add note

J Clin Med. 2021 May 25;10(11):2292. doi: 10.3390/jcm10112292.

ABSTRACT

INTRODUCTION: There is debate as to whether lung-ultrasound (LUS) can replace lung-auscultation (LA) in the assessment of respiratory diseases.

METHODOLOGY: The diagnostic validity, safety, and reliability of LA and LUS were analyzed in patients admitted in a pulmonary ward due to decompensated obstructive airway diseases, decompensated interstitial diseases, and pulmonary infections, in a prospective study. Standard formulas were used to calculate the diagnostic sensitivity, specificity, and accuracy. The interobserver agreement with respect to the LA and LUS findings was evaluated based on the Kappa coefficient (κ).

RESULTS: A total of 115 patients were studied. LUS was more sensitive than the LA in evaluating pulmonary infections (93.59% vs. 77.02%; $p = 0.001$) and more specifically in the case of decompensated obstructive airway diseases (95.6% vs. 19.10%; $p = 0.001$). The diagnostic accuracy of LUS was also greater in the case of pulmonary infections (75.65% vs. 60.90%; $p = 0.02$). The sensitivity and specificity of the combination of LA and LUS was 95.95%, 50% in pulmonary infections, 76.19%, 100% in case of decompensated obstructive airway diseases, and (100%, 88.54%) in case of interstitial diseases. (κ) was 0.71 for an A-pattern, 0.73 for pathological B-lines, 0.94 for condensations, 0.89 for pleural-effusion, 0.63 for wheezes, 0.38 for rhonchi, 0.68 for fine crackles, 0.18 for coarse crackles, and 0.29 for a normal LA.

CONCLUSIONS: There is a greater interobserver agreement in the interpretation of LUS-findings compared to that of LA-noises, their combined use improves diagnostic performance in all diseases examined.

Ambulatory blood pressure changes with lung ultrasound-guided dry-weight reduction in hypertensive hemodialysis patients: 12-month results of a randomized controlled trial

"lung ultrasound" or "lung ultrasonograp...by Charalampos Loutradis / 41d

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INSIGHTS

Add note

ABSTRACT

OBJECTIVES: Hypertension is highly prevalent and independently associated with adverse outcomes in patients undergoing hemodialysis. Volume overload is the main mechanism of increased blood pressure (BP) in these individuals. This study examines the long-term effects of dry-weight reduction with a standardized lung-ultrasound (US)-guided strategy on ambulatory BP in hypertensive hemodialysis patients.

METHODS: This is the report of the 12-month follow-up of a randomized controlled trial in 71 clinically euvolemic, hemodialysis patients with hypertension. Patients were randomized to dry-weight reduction guided by prehemodialysis lung ultrasound and to standard care. A 48-h ambulatory BP monitoring (ABPM) was performed in all study participants at baseline and after 12 months.

RESULTS: During follow-up, a greater proportion of patients in the active group underwent dry-weight reduction compared with the control group (71.4% vs. 22.2%; $P < 0.001$). The number of lung US-B lines (a metric of lung water) reduced in the active (-4.83 ± 13.73) and increased in the control arm ($+5.53 \pm 16.01$; $P = 0.005$) paralleling dry-weight changes (-1.68 ± 2.38 vs. 0.54 ± 2.32 kg; $P < 0.001$). At 12 months, 48-h systolic BP (136.19 ± 14.78 vs. 130.31 ± 13.57 mmHg; $P = 0.034$) and diastolic BP (80.72 ± 9.83 vs. 76.82 ± 8.97 mmHg; $P = 0.008$) were lower compared to baseline in the active but similar in the control group. Changes in 48-h systolic BP (-7.78 ± 13.29 vs. -0.10 ± 14.75 mmHg; $P = 0.021$) were significantly greater in the active compared to the control group. The proportion of patients experiencing ≥ 1 episode of intradialytic hypotension was nominally lower in the active group (71.4% vs. 88.9%, $P = 0.065$).

CONCLUSIONS: Lung-US-guided dry-weight reduction can effectively and safely decrease ambulatory BP levels in the long-term.

Effectiveness of ultrasonography for peripheral catheter insertion and catheter failure prevention in visible and palpable veins

pubmed: [point of care ultras...](#) by Mari Abe-Doi / 41d

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INSIGHTS

Add note

J Vasc Access. 2021 Jun 2;11297298211022078. doi: 10.1177/11297298211022078. Online ahead of print.

ABSTRACT

BACKGROUND: The increase in the success rate of peripheral intravenous catheterization against a difficult intravenous access (DIVA) using ultrasonography is reported; however, reports related to the effectiveness of using ultrasonography in increasing the success rate for visible and palpable veins is limited. Furthermore, according to a previous study, first attempt success in catheterization contributes to low catheter failure incidence. Thus, we developed a catheterization method using ultrasonography for peripheral veins including visible and palpable veins. This study investigates the effectiveness of ultrasonography use in improving the success rate of catheterization and preventing the catheter failure for peripheral veins including visible and palpable veins.

METHODS: Adult inpatients were recruited. Trained nurses inserted intravenous catheters using ultrasonography. Ultrasonography was used for all vein assessment, target vein selection, and puncturing (i.e. target point selection and/or needle guidance), regardless of the target vein's visibility or palpability. Catheters with over a 24-h dwelling time were followed for catheter failure incidence.

RESULTS: Thirty-one patients were recruited, and they required 34 catheterizations. Total number of catheterization attempts were 39. Of the peripheral veins, 51.3% (20/39) were visible and palpable, 48.7% (19/39) were DIVA. The rate of successful intravenous cannulation was 29 of 34 (85.3%) after one attempt and 4 of 34 (total 97.0%) after two attempts. The catheterization failure incidence was 3.2% (1/31) in the catheter that had an over 24-h dwelling time.

CONCLUSIONS: Using ultrasonography to all target veins might have contributed to higher success rates of catheterization and extremely low incidence of catheter failure based on objective findings. Selecting the vein with larger diameters and healthy tissue as puncture point and showing center of vessel lumen clearly using ultrasonography might have been contributed the results.

Ultrasound of the Optic Nerve Does Not Appear to Be a Consistently Reliable or Generalizable Method to Monitor Changes in Intracranial Pressure

[optic nerve diameter](#) by Christine Butts / 41d

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INSIGHTS

Add note

J Intensive Care Med. 2021 Jun 2;8850666211021737. doi: 10.1177/08850666211021737. Online ahead of print.

ABSTRACT

OBJECTIVE: Invasive intracranial pressure (ICP) monitoring is the gold standard, but is not always readily accessible or practical. Ultrasound of the optic nerve sheath diameter (ONSD) has been proposed for detecting both elevation and change in the ICP. Our study is a prospective observational trial that seeks to determine if ultrasound can be reliably used to identify changes in ICP with naturally occurring variations in patient care.

METHODS: A convenience sample of patients with invasive ICP monitoring were enrolled. Patients were identified prior to interventions that were suspected to cause a change in ICP. Measurement of ICP and ONSD was obtained prior to the intervention, with repeated measurements of both variables obtained immediately following the intervention.

RESULTS: 36 total patients were enrolled. There was a positive correlation between the ICP and the right ONSD ($r = 0.255$, $P = 0.0003$) and the ICP and the left ONSD ($r = 0.274$, $P < 0.0001$). There was no statistically significant relationship between the change in either the ICP and the right ONSD ($r -0.2$ $P = 0.282$) or left ONSD ($r 0.05$ $P = 0.805$). The location of the lesion in the brain appears to significantly affect discordance between the ONSD and the ICP.

CONCLUSIONS: Ultrasound of the ONSD has shown promise as both a marker of elevated ICP and as a method to identify changes in pressure. Although the size of the ONSD and the measurement of ICP were correlated in our study, the ability to follow changes in ICP was not statistically significant. This indicates that use of ultrasound to track changes in ICP cannot be generalized and may be limited to specific circumstances. The location of the intracranial pathology appears to be a significant factor in discordance between the ICP and ONS diameter.

Inter-observer agreement in interpretation of chest radiographs for pediatric community acquired pneumonia - findings of the pedCAPNETZ-cohort

[pneumonia and pediatric](#) by Gesche Maria Voigt / 41d

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INSIGHTS

Add note

Pediatr Pulmonol. 2021 Jun 2. doi: 10.1002/ppul.25528. Online ahead of print.

ABSTRACT

Although chest radiograph (CXR) is commonly used in diagnosing pediatric community acquired pneumonia (pCAP), limited data on inter-observer agreement among radiologists exist.

Automated AI labeling of optic nerve head enables insights into cross-ancestry glaucoma risk and genetic discovery in >280,000 images from UKB and CLSA

[optic nerve diameter](#) by Xikun Han / 41d

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INSIGHTS

Add note

Am J Hum Genet. 2021 May 25:S0002-9297(21)00189-0. doi: 10.1016/j.ajhg.2021.05.005.
Online ahead of print.

ABSTRACT

Cupping of the optic nerve head, a highly heritable trait, is a hallmark of glaucomatous optic neuropathy. Two key parameters are vertical cup-to-disc ratio (VCDR) and vertical disc diameter (VDD). However, manual assessment often suffers from poor accuracy and is time intensive. Here, we show convolutional neural network models can accurately estimate VCDR and VDD for 282,100 images from both UK Biobank and an independent study (Canadian Longitudinal Study on Aging), enabling cross-ancestry epidemiological studies and new genetic discovery for these optic nerve head parameters. Using the AI approach, we perform a systematic comparison of the distribution of VCDR and VDD and compare these with intraocular pressure and glaucoma diagnoses across various genetically determined ancestries, which provides an explanation for the high rates of normal tension glaucoma in East Asia. We then used the large number of AI gradings to conduct a more powerful genome-wide association study (GWAS) of optic nerve head parameters. Using the AI-based gradings increased estimates of heritability by ~50% for VCDR and VDD. Our GWAS identified more than 200 loci associated with both VCDR and VDD (double the number of loci from previous studies) and uncovered dozens of biological pathways; many of the loci we discovered also confer risk for glaucoma.

Point-of-Care Ultrasound for Family Medicine Residents: Attitudes and Confidence

[pubmed: point of care ultras...](#) by Jerica Johnson / 41d

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INSIGHTS

Add note

Fam Med. 2021 Jun;53(6):457-460. doi: 10.22454/FamMed.2021.930080.

ABSTRACT

BACKGROUND AND OBJECTIVES: Point-of-care ultrasound (POCUS) is increasingly being incorporated into family medicine residency training. Attitudes towards POCUS among family medicine residents (FMRs) are largely unknown, and confidence levels with performing and interpreting POCUS exams are also unknown among this group of learners. Our aim was to evaluate FMRs' attitudes and confidence levels before and after the implementation of a new POCUS curriculum.

METHODS: Study participants included FMRs in all postgraduate years (ie, PGY1-PGY3) at the University of New Mexico (UNM) Family Medicine Residency Program. Our intervention was a yearlong implementation of a new POCUS curriculum based on the American Academy of Family Physicians POCUS curriculum guidelines. Our interventions included hands-on training sessions for both FMRs and faculty along with a resource website. We assessed attitudes and confidence levels with various POCUS exams using a pre- and postintervention survey.

RESULTS: Overall, FMRs felt significantly more confident in their ability to perform and interpret a point-of-care ultrasound after the implementation of POCUS curriculum. There was no significant difference in participants' expectations of their use of POCUS during or after residency.

Point-of-care ultrasonography for the hospitalist

[pubmed: point of care ultras...](#) by Guramrinder Singh Thind / 40d

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INSIGHTS

Add note

Cleve Clin J Med. 2021 Jun 2;88(6):345-359. doi: 10.3949/ccjm.88a.20141.

ABSTRACT

Point-of-care ultrasonography (POCUS) has emerged as a vital tool in medicine. Initially used for procedural guidance, POCUS is now used for diagnostics and monitoring of the lung, heart, abdomen, and deep vein thrombosis. This wide applicability makes it an essential tool for hospitalists in daily clinical practice. This article provides an overview of the clinical integration of POCUS and basic image interpretation.

Point of care ultrasound screening for deep vein thrombosis in critically ill COVID-19 patients, an observational study

[pubmed: bUS](#) by Sarah Galien / 40d

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INSIGHTS

Add note

Thromb J. 2021 Jun 2;19(1):38. doi: 10.1186/s12959-021-00272-z.

ABSTRACT

BACKGROUND: Deep vein thrombosis (DVT) is common in critically ill patients with Coronavirus disease 2019 (COVID-19) and may cause fatal pulmonary embolism (PE) prior to diagnosis due to subtle clinical symptoms. The aim of this study was to explore the feasibility of bedside screening for DVT in critically ill COVID-19 patients performed by physicians with limited experience of venous ultrasound. We further aimed to compare inflammation, coagulation and organ dysfunction in patients with and without venous thromboembolism (VTE).

METHODS: This observational study included patients with COVID-19 admitted to the intensive care unit (ICU) of a tertiary hospital in Sweden and screened for DVT with proximal

compression ultrasound of the lower extremities between April and July 2020. Screening was performed by ICU residents having received a short online education and one hands-on-session. Pathological screening ultrasound was confirmed by formal ultrasound whereas patients with negative screening underwent formal ultrasound on clinical suspicion. Clinical data, laboratory findings and follow-up were extracted from medical records.

RESULTS: Of 90 eligible patients, 56 were screened by seven ICU residents with no (n = 5) or limited (n = 2) previous experience of DVT ultrasound who performed a median of 4 (IQR 2-19) examinations. Four (7.1%) patients had pathological screening ultrasound of which three (5.6%) were confirmed by formal ultrasound. None of the 52 patients with negative screening ultrasound were diagnosed with DVT during follow-up. Six patients were diagnosed with PE of which four prior to negative screening and two following negative and positive screening respectively. Patients with VTE (n = 8) had higher median peak D-dimer (24.0 (IQR 14.2-50.5) vs. 2.8 (IQR 1.7-7.2) mg/L, p = 0.004), mean peak C-reactive protein (363 (SD 80) vs. 285 (SD 108) mg/L, p = 0.033) and median peak plasma creatinine (288 (IQR 131-328) vs. 94 (IQR 78-131) μ mol/L, p = 0.009) compared to patients without VTE (n = 48). Five patients (63%) with VTE received continuous renal replacement therapy compared to six patients (13%) without VTE (p = 0.005).

CONCLUSION: ICU residents with no or limited experience could detect DVT with ultrasound in critically ill COVID-19 patients following a short education. VTE was associated with kidney dysfunction and features of hyperinflammation and hypercoagulation.

Non-invasive detection of intracranial pressure related to the optic nerve

papilledema ultrasound by Jian Li / 40d

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INSIGHTS

Add note

Quant Imaging Med Surg. 2021 Jun;11(6):2823-2836. doi: 10.21037/qims-20-1188.

ABSTRACT

Intracranial pressure (ICP) is associated with a variety of diseases. Early diagnosis and the timely intervention of elevated ICP are effective means to clinically reduce the morbidity and mortality of some diseases. The detection and judgment of reduced ICP are beneficial to glaucoma doctor and neuro ophthalmologist to diagnose optic nerve disease earlier. It is important to evaluate and monitor ICP clinically. Although invasive ICP detection is the gold standard, it can have complications. Most non-invasive ICP tests are related to the optic nerve and surrounding tissues due to their anatomical characteristics. Ultrasound, magnetic resonance imaging, transcranial Doppler, papilledema on optical coherence tomography, visual evoked potential, ophthalmodynamometry, the assessment of spontaneous retinal venous pulsations, and eye-tracking have potential for application. Although none of these methods can completely replace invasive technology; however, its repeatable, low risk, high accuracy, gradually attracted people's attention. This review summarizes the non-invasive ICP detection methods related to the optic nerve and the role of the diagnosis and prognosis of neurological

disorders and glaucoma. We discuss the advantages and challenges and predict possible areas of development in the future.

Value of quantitative analysis in lung computed tomography in patients severely ill with COVID-19

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

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INSIGHTS

Add note

PLoS One. 2021 May 20;16(5):e0251946. doi: 10.1371/journal.pone.0251946. eCollection 2021.

ABSTRACT

INTRODUCTION: Quantitative computed tomography (QCT) is used to objectively assess the degree of parenchymal impairment in COVID-19 pneumonia.

MATERIALS AND METHODS: Retrospective study on 61 COVID-19 patients (severe and non-severe; 33 men, age 63±15 years) who underwent a CT scan due to tachypnea, dyspnoea or desaturation. QCT was performed using VCAR software. Patients' clinical data was collected, including laboratory results and oxygenation support. The optimal cut-off point for CT parameters for predicting death and respiratory support was performed by maximizing the Youden Index in a receiver operating characteristic (ROC) curve analysis.

RESULTS: The analysis revealed significantly greater progression of changes: ground-glass opacities (GGO) (31,42% v 13,89%, $p < 0.001$), consolidation (11,85% v 3,32%, $p < 0.001$) in patients with severe disease compared to non-severe disease. Five lobes were involved in all patients with severe disease. In non-severe patients, a positive correlation was found between severity of GGO, consolidation and emphysema and sex, tachypnea, chest x-ray (CXR) score on admission and laboratory parameters: CRP, D-dimer, ALT, lymphocyte count and lymphocyte/neutrophil ratio. In the group of severe patients, a correlation was found between sex, creatinine level and death. ROC analysis on death prediction was used to establish the cut-off point for GGO at 24.3% (AUC 0.8878, 95% CI 0.7889-0.9866; sensitivity 91.7%, specificity 75.5%), 5.6% for consolidation (AUC 0.7466, 95% CI 0.6009-0.8923; sensitivity 83.3%, specificity 59.2%), and 37.8% for total (GGO+consolidation) (AUC 0.8622, 95% CI 0.7525-0.972; sensitivity 75%, specificity 83.7%). The cut-off point for predicting respiratory support was established for GGO at 18.7% (AUC 0.7611, 95% CI 0.6268-0.8954; sensitivity 87.5%, specificity 64.4%), consolidation at 3.88% (AUC 0.7438, 95% CI 0.6146-0.8729; sensitivity 100%, specificity 46.7%), and total at 23.5% (AUC 0.7931, 95% CI 0.673-0.9131; sensitivity 93.8%, specificity 57.8%).

CONCLUSION: QCT is a good diagnostic tool which facilitates decision-making regarding intensification of oxygen support and transfer to an intensive care unit in patients severely ill with COVID-19 pneumonia. QCT can make an independent and simple screening tool to assess

the risk of death, regardless of clinical symptoms. Usefulness of QCT to predict the risk of death is higher than to assess the indications for respiratory support.

A retrospective evaluation of point of care ultrasound for acute cholecystitis in a tertiary academic hospital setting

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

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Add note

Ultrasound J. 2021 Jun 3;13(1):28. doi: 10.1186/s13089-021-00228-4.

ABSTRACT

BACKGROUND: In 2008 the Council of Emergency Medicine Residency Directors delineated consensus recommendations for training in biliary ultrasound for the "detection of biliary pathology".

OBJECTIVES: While studies have looked at the accuracy of emergency provider performed clinical ultrasound (ECUS), we sought to evaluate if ECUS could be diagnostic for acute cholecystitis and thus obviate the need for follow-up imaging.

METHOD: We reviewed all ECUS performed between 2012 and 2017 that had a matching radiology performed ultrasound (RADUS) and a discharge diagnosis. 332 studies were identified. The sensitivity and specificity of both ECUS and RADUS were compared to the patient's discharge diagnosis. The agreement between the ECUS and RADUS was assessed using an unweighted Cohen's Kappa. The time from patient arrival to diagnosis by ECUS and RADUS was also compared.

RESULTS: Using discharge diagnosis as the gold standard ECUS was 67% (56-78%) sensitive, 88% (84-92%) specific, NPV 90% (87-95%), PPV 60% (50-71%), +LR 5.6 (3.9-8.2), -LR 0.37 (0.27-0.52) for acute cholecystitis. RADUS was 76% (66-87%) sensitive, 97% (95-99%) specific, NPV 95% (92-97%), PPV 86% (76-95%), +LR 25.6 (12.8-51.4), and -LR 0.24 (0.15-0.38). ECUS was able to detect gallstones with 93% (89-96%) sensitivity and 94% (90-98%) specificity leading to a NPV 90% (85-95%), PPV of 95% (92-98%), +LR 14.5 (7.7-27.4), -LR 0.08 (0.05-0.13). The unweighted kappa between ECUS and RADUS was 0.57. The median time between obtaining ECUS vs. RADUS diagnosis was 124 min.

CONCLUSIONS: ECUS can be beneficial in ruling out acute cholecystitis, but lacks the test characteristics to be diagnostic for acute cholecystitis.

A narrative review of diaphragmatic ultrasound in pediatric critical care

[pubmed: point of care ultras...](#) by Mark D Weber / 40d

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Add note

Pediatr Pulmonol. 2021 Jun 3. doi: 10.1002/ppul.25518. Online ahead of print.

ABSTRACT

The use of point of care ultrasound (POCUS) at the bedside has increased dramatically within emergency medicine and in critical care. Applications of POCUS have spread to include diaphragmatic assessments in both adults and children. Diaphragm POCUS can be used to assess for diaphragm dysfunction (DD) and atrophy or to guide ventilator titration and weaning. Quantitative, semi-quantitative and qualitative measurements of diaphragm thickness, diaphragm excursion, and diaphragm thickening fraction provide objective data related to DD and atrophy. The potential for quick, noninvasive, and repeatable bedside diaphragm assessments has led to a growing amount of literature on diaphragm POCUS. To date, there are no reviews of the current state of diaphragm POCUS in pediatric critical care. The aims of this narrative review are to summarize the current literature regarding techniques, reference values, applications, and future innovations of diaphragm POCUS in critically ill children. A summary of current practice and future directions will be discussed.

Evaluation of a survey for acute care programme directors on the utilisation of point-of-care ultrasound

[pubmed: bUS](#) by Annie Wang / 39d

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Add note

Postgrad Med J. 2021 Jun 2;postgradmedj-2021-140127. doi: 10.1136/postgradmedj-2021-140127. Online ahead of print.

ABSTRACT

PURPOSE: Point-of-care ultrasound (POCUS) is ultrasound brought to the patient's bedside and performed in 'real time' by the healthcare provider. The utility of POCUS to facilitate management of the acutely ill patient has been demonstrated for multiple pathologies. However, the integration of ultrasonography and echocardiography training into residency curriculum varies across the acute care specialties.

STUDY DESIGN: After an institutional review board approval, anaesthesiology, emergency medicine, family medicine, internal medicine, paediatrics and general surgery programme directors (PDs) were surveyed. The survey consisted of 11 questions evaluating the primary bedside assessment tool for common acute care situations, POCUS topics that the PDs were

comfortable practising and topics that the PDs felt were useful for their specialty. Barriers to POCUS use, certification and documentation were also surveyed.

RESULTS: Overall, 270 PD surveys were completed. The preferred primary assessment tool for common acute care situations varied with specialty; emergency medicine PDs consistently responded that POCUS was the diagnostic modality of choice ($p < 0.0001$). The majority of the PDs reported lack of educational opportunities as the primary barrier to learning POCUS (64%). Most PDs indicated that POCUS examinations should be documented (95.7%), and 39% reported that departmental certification would be sufficient.

CONCLUSIONS: This study is the first to evaluate differences in the preferred initial bedside assessment tool between the acute care specialties. Although POCUS is a superior tool for evaluating acute pathologies, disconnect between education and utilisation remains. This study highlights the need to incorporate POCUS into the acute care specialty curriculum.

Ultrasonography: An Uncharted Modality in the Current Pandemic - A Study among Patients Admitted in the COVID-19 Intensive Care Unit

"lung ultrasound" or "lung ultrasonograp..." by Humsheer Singh Sethi / 39d

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Add note

J Med Ultrasound. 2021 Mar 20;29(1):15-21. doi: 10.4103/JMU.JMU_147_20. eCollection 2021 Jan-Mar.

ABSTRACT

BACKGROUND: The objectives were to perform an analysis of lung ultrasonography (LUS) findings in severely ill patients with novel coronavirus disease-2019 (COVID-19) and to compare the accuracy with high-resolution computed tomography (HRCT) of the thorax.

METHODS: Sixty-two intensive care unit (ICU) patients with COVID-19 were evaluated during their hospital stay. LUS was performed with convex and linear transducers using a designated ultrasonography machine placed in the COVID-19 ICU. The thorax was scanned in 12 areas. Initial LUS was performed on admission and follow-up LUS was done in 7 (mean) days. At the time of the initial LUS, HRCT was performed in 28/62 patients and a chest radiography in 19/62 patients.

RESULTS: On admission, LUS detected pleural line thickening (>6 lung areas) in 49/62, confluent B-lines in 38/62, and separate B-lines in 34/62, consolidation in 12/62, C prime profile in 19/62, and pleural and cardiac effusions in 4/62 and 1/62, respectively. The single beam "torchlight" artifact was seen in 16/62, which may possibly be a variation of the B-line which has not been described earlier. Follow-up LUS detected significantly lower rates ($P < 0.05$) of abnormalities.

CONCLUSION: Ultrasound demonstrated B-lines, variable consolidations, and pleural line irregularities. This study also sheds light on the appearance of the C prime pattern and "torchlight" B-lines which were not described in COVID-19 earlier. LUS findings were significantly reduced by the time of the follow-up scan, insinuating at a rather slow but consistent reduction in some COVID-19 lung lesions. However, the lung ultrasound poorly correlated with HRCT as a diagnostic modality in COVID-19 patients.

Can Asymptomatic or Non-Severe SARS-CoV-2 Infection Cause Medium-Term Pulmonary Sequelae in Children?

["lung ultrasound" or "lung ultrasonograp..."](#) by Ilaria Bottino / 39d

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Add note

Front Pediatr. 2021 May 13;9:621019. doi: 10.3389/fped.2021.621019. eCollection 2021.

ABSTRACT

Pulmonary complications in adults who recovered from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) have been reported even in minimally symptomatic patients. In this study, lung ultrasound (LUS) findings and pulmonary function of children who recovered from an asymptomatic or mildly symptomatic SARS-CoV-2 infection were evaluated. We prospectively followed up for at least 30 days patients younger than 18 years who recovered from SARS-CoV-2 infection at the Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan (Italy). All enrolled patients underwent LUS. Airway resistance measured by the interrupter technique test was assessed in subjects aged 4-6 years, whereas forced spirometry and measurement of diffusing capacity of the lungs for carbon monoxide were performed in subjects older than 6 years. To evaluate a possible correlation between pulmonary alterations and immune response to SARS-CoV-2, two semiquantitative enzyme immune assays were used. We enrolled 16 out of 23 eligible children. The median age of enrolled subjects was 7.5 (0.5-10.5) years, with a male to female ratio of 1.7. No subject presented any abnormality on LUS, airway resistance test, forced spirometry, and diffusing capacity of the lungs for carbon monoxide. On the other hand, all subjects presented Ig G against SARS-CoV-2. In contrast in adults, we did not detect any pulmonary complications in our cohort. These preliminary observations suggest that children with an asymptomatic or mildly symptomatic SARS-CoV-2 infection might be less prone to develop pulmonary complications than adults.

Impacted Fish Bone in Buccal Space Associated with an Abscess: Role of Point-of-care Ultrasonography in Dental Emergencies

[pubmed: point of care ultrasonography](#) by Naren Kishore Rayudu / 39d

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Add note

J Med Ultrasound. 2020 Jul 14;29(1):53-56. doi: 10.4103/JMU.JMU_18_20. eCollection 2021 Jan-Mar.

ABSTRACT

Fish bone impaction in buccal space abscess is an uncommon dental scenario. A case of young adult with partially edentulous state contributing to this emergency is presented. The history, clinical imaging findings, surgical procedure, and checklist for clinical assessment are briefly described. The point-of-care ultrasonography (POCUS) was used in our case to identify, locate, and perform an ultrasonography-guided removal of impacted fish bone in consolidated abscess of the buccal space. The role of POCUS in cases of dental swellings or uncommon emergencies is emphasized in clinical settings.

Application of Point-of-care Cardiac Ultrasonography in COVID-19 Infection: Lessons Learned from the Early Experience

[pubmed: point of care ultras...](#) by Mingxing Xie / 39d

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Add note

J Med Ultrasound. 2021 Mar 20;29(1):3-8. doi: 10.4103/JMU.JMU_140_20. eCollection 2021 Jan-Mar.

ABSTRACT

The outbreak of the SARS-CoV-2 infection, also known as coronavirus disease 2019 (COVID-19), was formally defined a pandemic by the World Health Organization (WHO) in March 2020, and is still a global health issue. Since there is a high prevalence of acute cardiac injury in patients with COVID-19 infection, point-of-care cardiac ultrasound (PoCCUS) may be used for longitudinal monitoring of patients infected with COVID-19. However, there is still limited experience on the application of PoCCUS in the COVID-19 pandemic. Within the point of care setting in our system, focused cardiac US exams were performed with specific imaging protocols on the basis of suspicion of a specific disease, such as ruling out tamponade or thrombotic complications. Our preliminary experience shows that PoCCUS helps distinguish the causes of dyspnea in febrile patients. The COVID-19 infection may play a role in unmasking or exacerbating underlying chronic cardiovascular conditions, especially in patients with inadequate past history. In hospitalized patients with COVID-19, CURB-65 score for pneumonia severity and raised D-dimer were significantly associated with deep vein thrombosis (DVT). COVID-19 patients with DVT had worse prognosis, and patients with lower leg edema deserve further evaluation by using point-of-care ultrasound for the lower legs and heart. In COVID-19 patients with arrhythmia, PoCCUS used by experienced hands may reveal abnormal right ventricle (RV) functional parameters and lead to a more comprehensive cardiac US study.

When there is suspicion of cardiac disease, PoCCUS can be done first, and if information is inadequate, limited transthoracic echocardiography (TTE), and critical care echocardiography (CCE) can be followed. Ultrasound practitioners should follow the standard precautions for COVID-19 as outlined by the Centers for Disease Control and Prevention to prevent transmission of infection, regardless of suspected or confirmed COVID-19.

Point of Care Ultrasound in Coronavirus Disease 2019 Pandemic: One Modality Helping Multiple Specialties

[pubmed: point of care ultras...](#)by Sangam Yadav / 39d

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Add note

J Med Ultrasound. 2021 Mar 20;29(1):9-14. doi: 10.4103/JMU.JMU_114_20. eCollection 2021 Jan-Mar.

ABSTRACT

After the detection of novel coronavirus (2019) as the cause of a cluster of pneumonia in Wuhan, China, at the end of 2019, more than 10 million confirmed cases of coronavirus disease 2019 (COVID-19) have been reported around the globe. In the COVID-19 intensive care unit (ICU), the use of stethoscope is minimal for obvious reasons. Shifting of COVID-19 patients out of ICU setup increases the risk of transmission of infection to health-care workers as well as jeopardizes the safety of patients. Hence, diagnostic imaging has emerged as a fundamental component of the current management of COVID-19. Lung ultrasound (LUS) imaging has become a safe bedside imaging alternative that does not expose the patient to radiation and minimizes the risk of contamination. Ultrasound (USG) can be used to scan almost all vital organs (heart, kidney, vascular, brain, etc.) and also help in rapid decision-making regarding the management of COVID-19 patients. In this note, we review the current state of the art of LUS in evaluating pulmonary changes induced by COVID-19. The goal is to identify characteristic sonographic findings most suited for the diagnosis of COVID-19 pneumonia infections as well as to assess the impact of infection on other organs and utilizing the same in the management of COVID patients without compromising on the safety of patient or health-care provider.

Appropriateness of lung ultrasound for the diagnosis of COVID-19 pneumonia

[pubmed: bUS](#)by Zouheir Ibrahim Bitar / 39d

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INSIGHTS

Add note

Health Sci Rep. 2021 May 24;4(2):e302. doi: 10.1002/hsr2.302. eCollection 2021 Jun.

ABSTRACT

BACKGROUND: Chest radiography (CXR) and computerized tomography (CT) are the standard methods for lung imaging in diagnosing COVID-19 pneumonia in the intensive care unit (ICU), despite their limitations. This study aimed to assess the performance of bedside lung ultrasound examination by a critical care physician for the diagnosis of COVID-19 pneumonia during acute admission to the ICU.

METHOD: This was an observational, prospective, single-center study conducted in the intensive care unit of Adan General Hospital from April 10, 2020, to May 26, 2020. The study included adults with suspicion of COVID-19 Infection who were transferred to the ICU. Patients were admitted to the ICU directly from the ED after reverse transcriptase-polymerase chain reaction (RT-PCR) swabs were sent to the central virology laboratory in Kuwait, and the results were released 16 to 24 hours after the time of admission. A certified intensivist in critical care ultrasound performed the lung ultrasound within 12 hours of the patient's admission to the ICU. The treating physician confirmed the diagnosis of COVID-19 pneumonia based on a set of clinical features, inflammatory markers, biochemical profile studies, RT-PCR test results, and CXR.

RESULTS: Of 77 patients with suspected COVID-19 pneumonia, 65 (84.4%) were confirmed. The median age of the patients was 48 (31-68) years, and 51 (71%) were men. In the group of patients with confirmed COVID-19 pneumonia, LUS revealed four signs suggestive of COVID-19 pneumonia in 63 patients (96.9%) (sensitivity 96.9%, CI 85%-99.5%). Two patients presented with unilateral lobar pneumonia without other ultrasonic signs of COVID-19 pneumonia but with positive RT-PCR results. Among patients in the group without COVID-19 pneumonia who had negative RT-PCR results, 11 (91.7%) were LUS negative for COVID-19 pneumonia (specificity 91.7%, 95% CI 58.72%-99.77%).

CONCLUSIONS: During the COVID-19 outbreak, LUS allows the identification of early signs of interstitial pneumonia. LUS patterns that show a combination of the four major signs offer high sensitivity and specificity compared to nasopharyngeal RT-PCR.

Modified BLUE protocol ultrasonography can diagnose thrombotic complications of COVID-19 with normal lung ultrasound

["lung ultrasound" or "lung ultrasonograp..."](#) by Tamer Mohamed Zaalouk / 39d
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INSIGHTS

Add note

Clin Case Rep. 2021 Mar 28;9(5):e04075. doi: 10.1002/ccr3.4075. eCollection 2021 May.

ABSTRACT

The BLUE protocol provides an excellent step-by-step approach for diagnosis of acute dyspnea. Adding FECHO (Focused Echocardiography) to the BLUE protocol completes the picture and helps make solid diagnoses, especially in submassive and massive PE (Pulmonary embolism).

COVID-19 infection can present with thrombotic manifestations like DVT (Deep vein thrombosis) and PE with no ultrasonographic evidence of lung parenchymal affection.

Novel Approach to Ultrasound-Guided Thoracostomy

[focused assessment sonography trauma](#) by Lindsay A Taylor / 39d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Jun 4. doi: 10.1002/jum.15759. Online ahead of print.

ABSTRACT

OBJECTIVES: Thoracostomy is often a required treatment in patients with thoracic trauma; however, performing a thoracostomy using traditional techniques can have complications. Ultrasound can be a beneficial tool for identifying the correct thoracostomy insertion site. We designed a randomized prospective study to assess if ultrasound guidance can improve thoracostomy site identification over traditional techniques.

METHODS: Emergency medicine residents were randomly assigned to use palpation or ultrasound to identify a safe insertion site for thoracostomy placement. The target population comprised of hemodynamically stable trauma patients who received an extended focused assessment with sonography for trauma (EFAST) and a chest computed tomography (CT) exam. The resident placed a radiopaque marker on the skin of the patient where a safe intercostal space was believed to be located, either by palpation or ultrasound. Clinical ultrasound faculty reviewed the CT to confirm marker placement relative to the diaphragm. A Fischer's exact test was used to analyze the groups.

RESULTS: One hundred and forty-seven patients were enrolled in the study, 75 in the ultrasound group and 72 in the landmark group. This resulted in the placement of 271 total thoracostomy site markers, 142 by ultrasound and 129 by palpation and landmarks. The ultrasound group correctly identified thoracostomy insertion sites above the diaphragm in 97.2% (138/142) of patients, while the palpation group identified a safe insertion site in 88.4% (114/129) of patients ($P = .0073$).

CONCLUSION: This study found that emergency medicine residents are more likely to identify a safe tube thoracostomy insertion site in trauma patients by using ultrasound, as compared to using landmarks and palpation.

Point-of-care ultrasound for treatment and triage in austere military environments

[pubmed: point of care ultras...](#) by Christophe Dubecq / 39d

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INSIGHTS

Add note

J Trauma Acute Care Surg. 2021 Jun 4. doi: 10.1097/TA.0000000000003308. Online ahead of print.

ABSTRACT

BACKGROUND: Assessment and triage in an austere environment represent a major challenge in casualty care. Modern conflicts involve a significant proportion of multiple wounds, either superficial or penetrating, which complicate clinical evaluation. Furthermore, there is often poor accessibility to computed tomography (CT) scans and a limited number of surgical teams. Therefore, ultrasound (US) represents a potentially valuable tool for distinguishing superficial fragments or shrapnel from penetrating trauma requiring immediate damage control surgery.

METHODS: This retrospective observational multicenter study assessed casualties treated over 8 months by five medical teams deployed in Africa and Middle East. Two experts, who were experienced in military emergency medicine but did not take part in the missions, carried out an independent analysis for each case, evaluating the contribution of US to the following five items: triage categorization, diagnosis, clinical severity, prehospital therapeutic choices, and priority to operation room. Consensus was obtained using the Delphi method with three rounds.

RESULTS: Out of 325 casualties, 189 underwent US examination. The mean injury severity scale score was 25.6, and 76% were wounded by an improvised explosive device. US was useful for confirming (23%) or excluding (63%) the suspected diagnosis made in the clinical assessment. It also helped obtain a diagnosis that had not been considered for 3% of casualties and was responsible for a major change in procedure or therapy in 4%. US altered the surgical priority in 43% of cases. For 30% of cases, US permitted surgery to be temporarily delayed to prioritize another more urgent casualty.

CONCLUSION: Ultrasound is a valuable tool for the management of mass casualties by improving treatment and triage, especially when surgical resources are limited. In some situations, US can also correct a diagnosis or improve prehospital therapeutic choices. Field medical teams should be trained to integrate US into their prehospital protocols.

Modified Lung Ultrasound Score in Evaluating the Severity of Covid-19 Pneumonia

["lung ultrasound" or "lung ultrasonograp...](#) by Hilmi Erdem Sumbul / 38d

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INSIGHTS

Add note

Ultrasound Med Biol. 2021 Apr 30:S0301-5629(21)00202-7. doi: 10.1016/j.ultrasmedbio.2021.04.023. Online ahead of print.

ABSTRACT

Severe acute respiratory syndrome coronavirus 2 causes coronavirus disease 2019 (Covid-19), which has been declared as a pandemic by the World Health Organization. The aim of the study described here was to determine the severity of pneumonia and the clinical parameters related to a modified lung ultrasound score (mLUS) in patients with COVID-19 pneumonia. The study included 44 patients with proven COVID-19 pneumonia. Patients were divided into three groups on the basis of pneumonia severity: mild/moderate pneumonia (group I), severe pneumonia (group II) and critically ill patients (group III). It was determined that mLUS values in groups I-III were 6.51 ± 4.12 , 23.5 ± 5.9 and 24.7 ± 3.9 , respectively. mLUS values were significantly higher in group II and III patients than in group I patients. There was a positive relationship between mLUS and age and N-terminal pro-brain natriuretic peptide level and a negative relationship with P_aO_2/F_iO_2 ($p = 0.032$, $\beta = 0.275$ vs. $p = 0.012$, $\beta = 0.315$ vs. $p = 0.001$, $\beta = -0.520$, respectively). In patients with COVID-19 pneumonia, mLUS increases significantly with the severity of the disease.

Lung Ultrasound Can Predict the Clinical Course and Severity of COVID-19 Disease

["lung ultrasound" or "lung ultrasonograp..."](#) by Cecilia Gómez Ravetti / 38d

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Add note

Ultrasound Med Biol. 2021 May 3:S0301-5629(21)00205-2. doi: 10.1016/j.ultrasmedbio.2021.04.026. Online ahead of print.

ABSTRACT

Coronavirus disease 2019 (COVID-19) compromises the lung in large numbers of people. The development of minimally invasive methods to determine the severity of pulmonary extension is desired. This study aimed to describe the characteristics of sequential lung ultrasound and to test the prognostic usefulness of this exam in a group of patients admitted to the hospital with COVID-19. We prospectively evaluated patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection admitted to our hospital between April and August 2020. Bedside lung ultrasound exams were performed at three time points: at inclusion in the study, after 48 h and on the seventh day of follow-up. Lung ultrasound scores were quantified according to the aeration loss in each of eight zones scanned. Sixty-six participants were included: 42 (63.6%) in the intensive care unit and 24 (36.3%) in the ward. Lung ultrasound scores were higher in participants admitted to the intensive care unit than in those admitted to the ward at the time of inclusion (16 [13-17] vs. 10 [4-14], $p < 0.001$), after 48 h (15.5 [13-17] vs. 12.5 [8.2-14.7], $p = 0.001$) and on the seventh day (16 [14-17] vs. 7 [4.5-13.7], $p < 0.001$) respectively. Lung ultrasound score measured at the time of inclusion in the study was independently associated with the need for admission to the intensive care unit (odds ratio = 1.480; 95% confidence interval, 1.093-2.004; $p = 0.011$) adjusted by the Sequential Organ Failure Assessment score.

Quantitative Characterization of Left Ventricular Function During Pulseless Electrical Activity Using Echocardiography During Out-of-Hospital Cardiac Arrest

[pubmed: point of care ultras...](#) by Felipe Teran / 38d

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INSIGHTS

Add note

Resuscitation. 2021 Jun 1:S0300-9572(21)00200-8. doi: 10.1016/j.resuscitation.2021.05.016. Online ahead of print.

ABSTRACT

BACKGROUND: Several prospective studies have demonstrated that the echocardiographic detection of any myocardial activity during PEA is strongly associated with higher rates of return of spontaneous circulation (ROSC). We hypothesized that PEA represents a spectrum of disease in which not only the presence of myocardial activity, but more specifically that the degree of left ventricular (LV) function would be a predictor of outcomes. The purpose of this study was to retrospectively assess the association between LV function and outcomes in patients with OHCA.

MATERIALS AND METHODS: Using prospectively obtained data from an observational cohort of patients receiving focused echocardiography during cardiopulmonary resuscitation (CPR) in the Emergency Department (ED) setting, we analyzed 312 consecutive subjects with available echocardiography images with initial rhythm of PEA. We used left ventricular systolic fractional shortening (LVFS), a unidimensional echocardiographic parameter to perform the quantification of LV function during PEA. Regression analyses were performed independently to evaluate for relationships between LVFS and a primary outcome of ROSC and secondary outcome of survival to hospital admission. We analyzed LVFS both as a continuous variable and as a categorical variable using the quartiles and the median to perform multiple different comparisons and to illustrate the relationship of LVFS and outcomes of interest. We performed survival analysis using Cox proportional hazards model to evaluate the hazard corresponding to length of resuscitation.

RESULTS: We found a positive association between LVFS and the primary outcome of ROSC (OR 1.04, 95%CI 1.01-1.08), but not with the secondary outcome of survival to hospital admission (OR 1.02, 95%CI 0.96-1.08). Given that the relationship was not linear and that we observed a threshold effect in the relationship between LVFS and outcomes, we performed an analysis using quartiles of LVFS. The predicted probability of ROSC was 75% for LVFS between 23.4-96% (fourth quartile) compared to 47% for LVFS between 0-4.7% (first quartile). The hazard of not achieving ROSC was significantly greater for subjects with LVFS below the median (13.1%) compared to the subgroup with LVFS greater than 13.1% ($p < 0.05$), with the separation of the survival curves occurring at approximately 40 min of resuscitation duration.

CONCLUSIONS: Left ventricular function measured by LVFS is positively correlated with higher probability of ROSC and may be associated with higher chances of survival in patients with PEA arrest.

A point-of-care thoracic ultrasound protocol for hospital medical emergency teams (METUS) improves diagnostic accuracy

[pubmed: point of care ultras...by Blans M J / 38d](#)
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INSIGHTS

Add note

Ultrasound J. 2021 Jun 4;13(1):29. doi: 10.1186/s13089-021-00229-3.

ABSTRACT

BACKGROUND: Point-of-care ultrasound (POCUS) has proven itself in many clinical situations. Few data on the use of POCUS during Medical Emergency Team (MET) calls exist. In this study, we hypothesized that the use of POCUS would increase the number of correct diagnosis made by the MET and increase MET's certainty.

METHODS: Single-center prospective observational study on adult patients in need for MET assistance. Patients were included in blocks (weeks). During even weeks, the MET physician performed a clinical assessment and registered an initial diagnosis. Subsequently, the POCUS protocol was performed and a second diagnosis was registered (US+). During uneven weeks, no POCUS was performed (US-). A blinded expert reviewed the charts for a final diagnosis. The number of correct diagnoses was compared to the final diagnosis between both groups. Physician's certainty, mortality and possible differences in first treatment were also evaluated.

RESULTS: We included 100 patients: 52 in the US + and 48 in the US- group. There were significantly more correct diagnoses in the US+ group compared to the US- group: 78 vs 51% (P = 0.006). Certainty improved significantly with POCUS (P < 0.001). No differences in 28-day mortality and first treatment were found.

CONCLUSIONS: The use of thoracic POCUS during MET calls leads to better diagnosis and increases certainty.

Management of testicular torsion in the ER: lessons learned from medical professional liability claims

[acute scrotum or testicular torsion](#)by C Vargas-Blasco / 38d
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INSIGHTS

Add note

Actas Urol Esp (Engl Ed). 2021 Jun;45(5):391-397. doi: 10.1016/j.acuroe.2021.04.001. Epub 2021 May 14.

ABSTRACT

OBJECTIVE: To evaluate emergency care for testicular torsion (TT) in medical professional liability (MPL) claims.

METHODS: Claims related to TT from 2000 to 2018 were located. The assistance provided and the association with MPL were analyzed.

RESULTS: Eighty complaints were identified, testicular pain was reported in 83.75% of first consultations, with a mean evolution time of 15.5 h. The mean time to diagnosis was 7.98 days. The first consultation was at the hospital in 75.1% of cases, but an ultrasound was performed only in 7.5%. When TT diagnosis was performed, 97.3% had undergone ancillary tests. The MPL was significantly associated with non-criminal proceedings and with less than 6 h of symptoms' evolution, and, within this subgroup, without undergoing an ultrasound scan.

CONCLUSIONS: Late consultations, wrong diagnosis and late diagnosis are claimed. When MPL are claimed by means of non-criminal law, the existence of responsibility is frequently considered, even more in those cases when the consultation took place before 6 h of evolution with no ancillary tests having been performed.

Lung Ultrasound to Diagnose Pulmonary Congestion Among Patients on Hemodialysis: Comparison of Full Versus Abbreviated Scanning Protocols

["lung ultrasound" or "lung ultrasonograp..."](#) by Nathaniel Reisinger / 37d
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INSIGHTS

Add note

Am J Kidney Dis. 2021 May 27:S0272-6386(21)00632-6. doi: 10.1053/j.ajkd.2021.04.007.
Online ahead of print.

ABSTRACT

RATIONALE & OBJECTIVE: Pulmonary congestion contributes to morbidity and mortality in patients with kidney failure on hemodialysis, but physical assessment is an insensitive approach to its detection. Lung ultrasound is useful for assessing the presence and severity of pulmonary congestion, but the most widely validated 28-zone study is cumbersome. We sought to compare abbreviated 4-, 6-, and 8-zone studies to 28-zone studies.

STUDY DESIGN: Diagnostic test study.

SETTING & PARTICIPANTS: Convenience sample of 98 patients with kidney failure on hemodialysis presenting to an emergency department in the United States.

TESTS COMPARED: 4, 6, and 8-zone lung ultrasound studies versus a 28-zone lung ultrasound.

OUTCOMES: Prediction of pulmonary congestion and 30-day mortality.

RESULTS: All patients completed a 28-zone lung ultrasound. Correlation coefficients (non-parametric Spearman) between each of the studies were high (all values >0.84). Bland-Altman analysis showed good agreement. Each of the short-form studies discriminated well with area under the receiver-operator characteristic curve >0.83 for no-to-mild versus moderate-to-severe pulmonary congestion. During a median follow-up of 778 days, 46 (47%) died. Patients with moderate-to-severe pulmonary congestion on lung ultrasound had a 30-day mortality rate similar to that observed among patients with no-to-mild pulmonary congestion (OR 0.95, 95% CI 0.70-1.29).

LIMITATIONS: Single-center study conducted in emergency care setting, convenience sample of patients and lack of long-term follow-up data.

CONCLUSIONS: Among hemodialysis patients presenting to an emergency department, 4, 6, or 8-zone lung ultrasounds were comparable to 28-zone studies for the assessment of pulmonary congestion. Mortality rates did not differ between those with no-to-mild and moderate-to-severe pulmonary congestion.

Ultrasonographic Assessment of Extravascular Lung Water in Hospitalized Patients Requiring Hemodialysis: A Prospective Observational Study

["lung ultrasound" or "lung ultrasonograp..."](#) by Jing Miao / 37d

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INSIGHTS

Add note

Cardiorenal Med. 2021 Jun 4:1-9. doi: 10.1159/000516474. Online ahead of print.

ABSTRACT

INTRODUCTION: Sonographic technologies can estimate extravascular lung water (EVLW) in hemodialysis (HD) patients. This study investigated the suitability of a handheld scanner in contrast to a portable scanner for quantifying EVLW in hospitalized patients requiring HD.

METHODS: In this prospective study, 54 hospitalized HD patients were enrolled. Bedside lung ultrasound was performed within 30 min before and after dialysis using handheld (phased array transducer, 1.7-3.8 MHz) and portable (curved probe, 5-2 MHz) ultrasound devices. Eight lung zones were scanned for total B-lines number (TBLN). The maximum diameter of inferior vena cava (IVC) was measured. We performed Passing-Bablok regression, Deming regression, Bland-Altman, and logistic regression analysis.

RESULTS: The 2 devices did not differ in measuring TBLN and IVC ($p > 0.05$), showing a high correlation ($r = 0.92$ and $r = 0.51$, respectively). Passing-Bablok regression had a slope of 1.11 and an intercept of 0 for TBLN, and the slope of Deming regression was 1.02 within the CI bands of 0.94 and 1.11 in the full cohort. TBLN was logarithmically transformed for Bland-Altman analysis, showing a bias of 0.06 (TBLN = 1.2) between devices. The slope and intercept

of the Deming regression in IVC measurements were 0.77 and 0.46, respectively; Bland-Altman plot showed a bias of -0.07. Compared with predialysis, TBLN significantly ($p < 0.001$) decreased after dialysis, while IVC was unchanged ($p = 0.16$). Univariate analysis showed that cardiovascular disease (odds ratio [OR] 8.94 [2.13-61.96], $p = 0.002$), smoking history (OR 5.75 [1.8-20.46], $p = 0.003$), and right pleural effusion (OR 5.0 [1.2-25.99], $p = 0.03$) were strong predictors of EVLW indicated by TBLN ≥ 4 .

CONCLUSION: The lung and IVC findings obtained from handheld and portable ultrasound scanners are comparable and concordant. Cardiovascular disease and smoking history were strong predictors of EVLW. The use of TBLN to assess EVLW in hospitalized HD patients is feasible. Further studies are needed to determine if TBLN can help guide volume removal in HD patients.

COVID-19: persistence of symptoms and lung alterations after 3-6 months from hospital discharge

"lung ultrasound" or "lung ultrasonograp...by Alberto Fortini / 37d

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INSIGHTS

Add note

Infection. 2021 Jun 6. doi: 10.1007/s15010-021-01638-1. Online ahead of print.

ABSTRACT

PURPOSE: Few data are currently available on persistent symptoms and late organ damage in patients who have suffered from COVID-19. This prospective study aimed to evaluate the results of a follow-up program for patients discharged from a nonintensive COVID-19 ward.

METHODS: 3-6 months after hospital discharge, 59 of 105 COVID-19 patients (31 males, aged 68.2 ± 12.8 years) were recruited in the study. Forty-six patients were excluded because of nontraceability, refusal, or inability to provide informed consent. The follow-up consisted of anamnesis (including a structured questionnaire), physical examination, blood tests, ECG, lower limb compression venous ultrasound (US), thoracic US, and spirometry with diffusion lung capacity for carbon monoxide (DLCO).

RESULTS: 22% of patients reported no residual symptoms, 28.8% 1 or 2 symptoms and 49.2% 3 or more symptoms. The most frequently symptoms were fatigue, exertional dyspnea, insomnia, and anxiety. Among the inflammatory and coagulation parameters, only the median value of fibrinogen was slightly above normal. A deep vein thrombosis was detected in 1 patient (1.7%). Thoracic US detected mild pulmonary changes in 15 patients (25.4%), 10 of which reported exertional dyspnea. DLCO was mildly or moderately reduced in 19 patients (37.2%), 13 of which complained of exertional dyspnea.

CONCLUSION: These results highlight that a substantial percentage of COVID-19 patients (77.8%) continue to complain of symptoms 3-6 months after hospital discharge. Exertional dyspnea was significantly associated with the persistence of lung US abnormalities and

diffusing capacity alterations. Extended follow-up is required to assess the long-term evolution of postacute sequelae of COVID-19.

Detection of a Urethral Foreign Body in a Pediatric Patient: Another Useful Application of Point-of-Care Ultrasound

[pubmed: point of care ultras...](#) by Takaaki Mori / 37d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 2:S0736-4679(21)00303-6. doi: 10.1016/j.jemermed.2021.03.020. Online ahead of print.

ABSTRACT

BACKGROUND: Urethral foreign bodies (UFBs) are rare in pediatric emergency care, but require immediate diagnosis and intervention when they occur. Although radiography, computed tomography, and cystography are available for diagnosing UFBs, these modalities are undesirable because they involve radiation exposure. Point-of-care ultrasound (POCUS) is used as an alternative imaging modality for UFB detection in adult patients, but reports of its use in pediatric emergency departments are still scarce. We report a pediatric case of a UFB detected by POCUS.

CASE REPORT: A 10-year-old boy with a history of a learning disorder presented to our pediatric emergency department with a paper clip in his penis, which he had intentionally inserted during play. He denied any symptoms, such as abdominal pain, vomiting, and hematuria. Physical examination failed to reveal the tip of the FB, but showed a palpable mass in the penile urethra accompanied by mild tenderness in the area. POCUS demonstrated a hyperechoic structure with reverberation artifact extending to the bulbar urethra. Endoscopic removal was planned, but the tip of the FB emerged from the external urethral meatus with postural change. Manual removal was successfully performed, after which the hyperechoic structure in the urethra was no longer visible on ultrasonography. The patient was discharged on the same day of the procedure. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** POCUS is a noninvasive procedure that can be useful for detecting UFBs in children.

Diagnosing Acute Heart Failure in the Pediatric Emergency Department Using Point-of-Care Ultrasound

[pubmed: point of care ultras...](#) by Alia Hamad / 37d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 3:S0736-4679(21)00298-5. doi: 10.1016/j.jemermed.2021.03.015. Online ahead of print.

ABSTRACT

BACKGROUND: Acute heart failure (AHF) in children is associated with significant disease burden with high rates of morbidity, mortality, and resource utilization. These children often present to the emergency department with clinical features that mimic common childhood illnesses. Cardiac point-of-care ultrasound (POCUS) can be an effective tool for rapidly identifying abnormal cardiac function.

CASE REPORTS: This case series documents 10 children presenting with AHF between 2016 and 2019 and demonstrates how pediatric emergency physicians used cardiac POCUS to expedite their diagnosis, management, and disposition. All cardiac POCUS was performed before comprehensive echocardiograms were completed. One case is described in detail; the other cases are summarized in a Table. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** Early recognition of AHF is critical to reduce pediatric morbidity and mortality. With proper training, cardiac POCUS can be an effective adjunct and should be considered for the early diagnosis and treatment of infants and children with AHF.

Complementary use of priors for pulmonary imaging with electrical impedance and ultrasound computed tomography

[pubmed: bUS](#) by Melody Alsaker / 37d
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INSIGHTS

Add note

J Comput Appl Math. 2021 Oct 15;395:113591. doi: 10.1016/j.cam.2021.113591. Epub 2021 Apr 20.

ABSTRACT

For medical professionals caring for patients undergoing mechanical ventilation due to respiratory failure, the ability to quickly and safely obtain images of pulmonary function at the patient's bedside would be highly desirable. Such images could be used to provide early warnings of developing pulmonary pathologies in real time, thereby reducing the incidence of complications and improving patient outcomes. Electrical impedance tomography (EIT) and low-frequency ultrasound computed tomography (USCT) are two imaging techniques with the potential to provide real-time non-ionizing pulmonary monitoring in the ICU setting, and each method has its own unique advantages as well as drawbacks. In this work, we describe a new algorithm for a system in which the strengths of the two modalities are combined in a complementary fashion. Specifically, preliminary reconstructions from each modality are used as priors to stabilize subsequent reconstructions, providing improved spatial resolution, sharper organ boundaries, and enhanced appearance of pathologies and other features. Results are validated using three numerically simulated thoracic phantoms representing pulmonary pathologies.

Cardiac injury following blunt chest trauma: diagnosis, management, and uncertainty

[pubmed: bUS](#)by Saeed Shoar / 37d

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INSIGHTS

Add note

Int J Burns Trauma. 2021 Apr 15;11(2):80-89. eCollection 2021.

ABSTRACT

Due to the evolving nature of injuries caused by high-speed motor vehicle accidents, the incidence rate of blunt chest trauma is continuously increasing. Blunt cardiac injury (BCI) is a potentially lethal entity as a result of trauma to the chest. Due to its indistinct clinical presentation and heterogeneous definition, BCI might be missed during the initial survey of trauma patients in the acute care setting. Additionally, unnecessary operation in hemodynamically stable patients in whom the extent of cardiac injury has not been thoroughly evaluated might result in adverse clinical outcome. Due to ongoing advances in the diagnostic modalities and minimally invasive procedures in the acute care and trauma setting, patients with blunt trauma to the chest, who are also suspected of having a BCI, can be monitored with more confidence and managed accordingly as the clinical scenario evolves. While low-yield diagnostics such as chest X ray, electrocardiogram, and a bedside ultrasonography are still routinely performed in patients with suspected BCI, high-yield modalities such as computed tomography, highly sensitive cardiac biomarkers, and transesophageal echocardiography are all a next step in the management approach. In either case, the clinical judgment of the medical team plays a pivotal role in transition to the next step with adequate resuscitation remaining an inevitable part.

Modified lung ultrasound scoring system to evaluate the feasibility of pregnant women with COVID-19 pneumonia

[pubmed: neonate lung ultrasound](#)by Ying Zhang / 37d

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INSIGHTS

Add note

J Matern Fetal Neonatal Med. 2021 Jun 6:1-6. doi: 10.1080/14767058.2021.1874912. Online ahead of print.

ABSTRACT

OBJECTIVE: To investigate whether physicians with short-term training can use a modified lung ultrasound scoring system for coronavirus disease 2019 (COVID-19) pneumonia to assess lung damage in pregnant women.

METHODS: Sixteen consecutively hospitalized third-trimester pregnant women with pregnancy-induced hypertension, preeclampsia, rheumatoid arthritis or connective tissue disease were selected as the study subjects for the simulation of COVID-19 pneumonia. Two physicians (imaging and internal medicine) without ultrasonic experience performed lung examinations on pregnant women after six days of lung ultrasound training, and their consistency with examinations by the expert was assessed. In addition, 54 healthy third-trimester pregnant women and 54 healthy nonpregnant women of the same age who were continuously treated in the outpatient clinic of this hospital were selected for comparisons of abnormalities on lung ultrasound.

RESULTS: (1) Third trimester pregnant women with pregnancy-induced hypertension, preeclampsia, rheumatoid arthritis or connective tissue disease had the same lung ultrasound patterns as those associated with COVID-19 pneumonia. (2) There was no statistically significant difference between the scores of the two trained doctors and the expert when the modified ultrasound scoring system was used ($p > .05$). (3) The evaluations of the two trained doctors and the expert showed good consistency (kappa value = 0.833-0.957). (4) The incidence of abnormal ultrasound manifestations of the pleura and lung parenchyma was higher among healthy third-trimester pregnant women than among healthy women of the same age ($p < .001$).

CONCLUSIONS: After receiving short-term training, imaging and internal medicine physicians can use the modified lung ultrasound scoring system to evaluate pregnant women's pulmonary damage, but caution is needed to avoid false-positive results among pregnant women with suspected COVID-19 pneumonia.

Lung Ultrasound Scans During Whole Lung Lavage

["lung ultrasound" or "lung ultrasonograp..."](#) by Matthew J G Sigakis / 36d

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INSIGHTS

Add note

Chest. 2021 Jun;159(6):e433-e436. doi: 10.1016/j.chest.2020.06.089.

NO ABSTRACT

PMID:34099165 | DOI:10.1016/j.chest.2020.06.089

Association between preoperative evaluation with lung ultrasound and outcome in frail elderly patients undergoing orthopedic surgery for hip fractures: study protocol for an Italian multicenter observational prospective study (LUSHIP)

["lung ultrasound" or "lung ultrasonograp..."](#) by Luigi Vetrugno / 36d

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INSIGHTS

Add note

Ultrasound J. 2021 Jun 7;13(1):30. doi: 10.1186/s13089-021-00230-w.

ABSTRACT

BACKGROUND: Hip fracture is one of the most common orthopedic causes of hospital admission in frail elderly patients. Hip fracture fixation in this class of patients is considered a high-risk procedure. Preoperative physical examination, plasma natriuretic peptide levels (BNP, Pro-BNP), and cardiovascular scoring systems (ASA-PS, RCRI, NSQIP-MICA) have all been demonstrated to underestimate the risk of postoperative complications. We designed a prospective multicenter observational study to assess whether preoperative lung ultrasound examination can predict better postoperative events thanks to the additional information they provide in the form of "indirect" and "direct" cardiac and pulmonary lung ultrasound signs.

METHODS: LUSHIP is an Italian multicenter prospective observational study. Patients will be recruited on a nation-wide scale in the 12 participating centers. Patients aged > 65 years undergoing spinal anesthesia for hip fracture fixation will be enrolled. A lung ultrasound score (LUS) will be generated based on the examination of six areas of each lung and ascribing to each area one of the four recognized aeration patterns-each of which is assigned a subscore of 0, 1, 2, or 3. Thus, the total score will have the potential to range from a minimum of 0 to a maximum of 36. The association between 30-day postoperative complications of cardiac and/or pulmonary origin and the overall mortality will be studied. Considering the fact that cardiac complications in patients undergoing hip surgery occur in approx. 30% of cases, to achieve 80% statistical power, we will need a sample size of 877 patients considering a relative risk of 1.5.

CONCLUSIONS: Lung ultrasound (LU), as a tool within the anesthesiologist's armamentarium, is becoming increasingly widespread, and its use in the preoperative setting is also starting to become more common. Should the study demonstrate the ability of LU to predict postoperative cardiac and pulmonary complications in hip fracture patients, a randomized clinical trial will be designed with the scope of improving patient outcome.

Early diagnosis of diaphragm palsy after pediatric cardiac surgery and outcome after diaphragm plication - A single-center experience

[pubmed: bedside ultrasonography](#) by Divyakant Parmar / 35d

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ABSTRACT

OBJECTIVE: The aims of our prospective observational study were to evaluate the (1) reliability of clinical signs in the early detection of diaphragm palsy (DP); (2) reliability of ultrasonography using echo machine as a bedside tool for the diagnosis of DP; and (3) does early diaphragm plication result in the improved outcome? We also sought to determine the incidence and predominant risk factors for DP and diaphragm plication at our center.

MATERIALS AND METHODS: This prospective observational study included patients with suspected DP from January 2015 to December 2018. Patients with suspected DP were initially evaluated by bedside ultrasonography using echo machine and confirmed by fluoroscopy. Diaphragm plication was considered for patients having respiratory distress, difficult weaning, or failed extubation attempt without any obvious cardiac or pulmonary etiology. Patients were followed for 3 months after discharge to assess diaphragm function.

RESULTS: A total of 87 patients were suspected of DP based on clinical signs. DP was diagnosed in 61 patients on fluoroscopy. The median time from index operation to diagnosis was 10 (1-59) days. Diaphragm plication was done among 52 patients and not done in nine patients. Bedside ultrasonography using echo machine was 96.7% sensitive and 96.15% specific in diagnosing DP. Early plication (<14 days) significantly reduced the need for nasal continuous positive airway pressure (65% vs. 96%, $P = 0.02$), duration of mechanical ventilation (12 vs. 25 days, $P = 0.018$), intensive care unit (ICU) stay (25 days vs. 39 days, $P = 0.019$), and hospital stay (30 days vs. 46 days, $P = 0.036$).

CONCLUSION: Hoover's sign and raised hemidiaphragm on chest X-ray are the most specific clinical signs to suspect unilateral DP. Bedside ultrasonography using an echo machine is a good diagnostic investigation comparable to fluoroscopy. Early plication facilitates weaning from the ventilator and thereby decreases the ICU stay and hospital stay.

Massive Pulmonary Embolism and Deep Vein Thrombosis in COVID-19 Pneumonia: Two Case Reports

[pubmed: bUS](#) by Siddharth Chopra / 35d
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INSIGHTS

Add note

Cureus. 2021 May 4;13(5):e14833. doi: 10.7759/cureus.14833.

ABSTRACT

Coronavirus disease 2019 (COVID-19) is known to cause a severe acute respiratory syndrome with increased morbidity and mortality due to multiorgan involvement. COVID-19 is associated with an increased risk of venous thromboembolism (VTE), ranging from asymptomatic to

potentially fatal presentations. Predictors of VTE in COVID-19 are not fully defined, and the role of anticoagulation in these patients is debatable. Here we discuss two cases of COVID-19, who initially presented with mild COVID-19 symptoms and later with potentially fatal VTE within 30 days of initial presentation. The first case is of a 42-year-old gentleman with a history of sarcoidosis and a recent diagnosis of COVID-19 pneumonia who was in isolation at home and presented with syncope and worsening shortness of breath. He was hemodynamically unstable and resuscitated with fluid management in the emergency department. The chest angiogram imaging studies showed massive pulmonary embolism with right heart strain, which was confirmed with bedside point-of-care ultrasound. The patient deteriorated clinically and received an intravenous tissue plasminogen activator in the emergency. He was discharged home under stable condition on oral anticoagulation. The second patient is a 63-year-old gentleman with chronic obstructive pulmonary disease, obesity, sleep apnea, and a recent diagnosis of COVID-19 pneumonia, which was complicated with an ischemic stroke, who presented with worsening complaints of shortness of breath and palpitation. The chest angiogram imaging showed bilateral pulmonary embolism. An echocardiogram showed mild right heart strain. The lower extremity duplex ultrasound showed bilateral deep vein thrombosis. The patient underwent catheter-directed thrombolysis and discharged on oral anticoagulation. There is a need to develop stronger predictors to provide thromboprophylaxis in COVID-19 pneumonia to prevent life-threatening VTE.

Military Use of Point of Care Ultrasound (POCUS)

[pubmed: point of care ultras...](#)by Sheila C Savell / 35d

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INSIGHTS

Add note

J Spec Oper Med. 2021 Summer;21(2):35-42.

ABSTRACT

BACKGROUND: Point of care ultrasound (POCUS) offers multiple capabilities in a relatively small, lightweight device to military clinicians of all types and levels in multiple environments. Its application in diagnostics, procedural guidance, and patient monitoring has not been fully explored by the Military Health System (MHS). The purpose of this narrative review of the literature was to examine the overall use of POCUS in military settings, as well as the level of ultrasound training provided.

METHODS: Studies related to use of POCUS by military clinicians with reported sensitivity/specificity, accuracy of exam, and/or clinical decision impact met inclusion criteria. After initial topical review and removal of duplicates, two authors selected 17 papers for consideration for inclusion. Four of the authors reviewed the 17 papers and determined the final inclusion of 14 studies.

RESULTS: We identified seven prospective studies, of which three randomized subjects to groups. Five reports described use of POCUS in patients, two used healthy volunteers, two were in simulation training environments, four used animal models to simulate specific

conditions, and one used a cadaver model. Clinician subjects ranged from one to 34. Conventional medics were subjects in six studies. Four studies included special operations medics. One study included nonmedical food service inspectors. The use of ultrasound in theater by deployed consultant radiologists is described in three reports.

CONCLUSIONS: Military clinicians demonstrated the ability to perform focused exams, including FAST exams and fracture detection with acceptable sensitivity and specificity. POCUS in the hands of trained military clinicians has the potential to improve diagnostic accuracy and ultimately care of the war fighter.

Preoperative Lung Ultrasound to Detect Pleural Adhesions: A Systematic Review and Meta-Analysis

["lung ultrasound" or "lung ultrasonograp...](#)by Akihiro Shiroshita / 34d

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INSIGHTS

Add note

Cureus. 2021 May 6;13(5):e14866. doi: 10.7759/cureus.14866.

ABSTRACT

The usage of lung ultrasound as a preoperative examination for thoracic surgeries remains controversial. Our systematic review and meta-analysis aimed to evaluate preoperative lung ultrasound diagnostic accuracy for detecting pleural adhesions. We searched articles published in MEDLINE, Embase, CENTRAL, and the International Clinical Trials Registry Platform until October 2020. Inclusion criteria were observational studies, case-control studies, and case series assessing preoperative lung ultrasound diagnostic accuracy. The study quality of included articles was evaluated using the modified quality assessment of diagnostic accuracy studies-2 tool. The pooled sensitivity and specificity were calculated using the bivariate random-effects model. The overall quality of evidence was summarized using the grading of recommendations, assessment, development, and evaluation approach. Eleven articles were included in our systematic review. A high risk of bias was noted regarding undefined pleural adhesions and non-predefined pathological diagnosis. Based on the ten articles included for meta-analysis, the pooled sensitivity and specificity were 71% [95% confidence interval (CI), 56%-82%], and 96% (95% CI, 89%-99%), respectively. The overall quality of evidence was moderate. Our systematic review revealed that lung ultrasound had high specificity. It may serve as a rule-in test for detecting pleural adhesions before thoracic surgeries, which may assist surgeons in preparation for a prolonged surgery or increased risk of complications that occurred by trocar insertion such as bleeding and persistent air leak.

Lung ultrasound promising method for assessing acute dyspnea and monitoring decompensated heart failure

["lung ultrasound" or "lung ultrasonograp...](#)by Caroline Heijl / 34d

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INSIGHTS

Add note

Lakartidningen. 2021 Jun 8;118:20219.

ABSTRACT

Ultrasound plays an important role in several medical fields. The heart was the first organ for which ultrasound gained clinical utility, followed by obstetric and gynecological applications. Shortly thereafter, abdominal organs and blood vessels became targets for ultrasound examination. The lung was long considered inaccessible for ultrasound due to its high air content. Work since the 1990s has however established a role for lung ultrasound, in leveraging several technical artefacts generated in the normal lung and in conditions with reduced air content, to allow rapid diagnosis of interstitial fluid accumulation, pneumothorax, pneumonia among others. In this article, we provide an overview of the potential of lung ultrasound, particularly as a promising method for assessment of patients presenting with acute dyspnea in the emergency department and for monitoring residual fluid in patients with decompensated heart failure. We also discuss limitations and caveats of the method.

Can the ultrasound suggest the emergency operation of a sliding ovary in a hernia sac?

["emergency ultrasound"](#) by Katerina Kambouri / 34d
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INSIGHTS

Add note

SAGE Open Med Case Rep. 2021 May 30;9:2050313X211020079. doi:
10.1177/2050313X211020079. eCollection 2021.

ABSTRACT

In this case, it is described the importance of ultrasound in children with sliding ovaries in inguinal hernias. If the child has no symptoms, an emergency ultrasound could suggest the manner of the operation, scheduled or emergency.

Lung ultrasound score as a tool to monitor disease progression and detect ventilator-associated pneumonia during COVID-19-associated ARDS

["lung ultrasound" or "lung ultrasonograp..."](#) by Auguste Dargent / 34d
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INSIGHTS

Add note

Heart Lung. 2021 May 31;50(5):700-705. doi: 10.1016/j.hrtlng.2021.05.003. Online ahead of print.

ABSTRACT

BACKGROUND: Lung ultrasound can accurately detect pandemic coronavirus disease (COVID-19) pulmonary lesions. A lung ultrasound score (LUS) was developed to improve reproducibility of the technique.

OBJECTIVES: To evaluate the clinical value of LUS monitoring to guide COVID-19-associated acute respiratory distress syndrome (ARDS) management.

METHODS: We conducted a single center, prospective observational study, including all patients admitted with COVID-19-associated ARDS between March and April 2020. A systematic daily LUS evaluation was performed.

RESULTS: Thirty-three consecutive patients were included. LUS was significantly and negatively correlated to P_{aO_2}/F_{IO_2} . LUS increased significantly over time in non-survivors compared to survivors. LUS increased in 83% of ventilatory associated pneumonia (VAP) episodes, when compared to the previous LUS evaluation. LUS was not significantly higher in patients presenting post-extubation respiratory failure.

CONCLUSIONS: In conclusion, our study demonstrates that LUS variations are correlated to disease severity and progression, and LUS monitoring could contribute to the early diagnosis of VAPs.

Are Lung Ultrasound Findings in COVID-19 Pneumonia Typical or Specific?

[pubmed: point of care ultras...](#)by Giovanni Volpicelli / 34d

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INSIGHTS

Add note

Praxis (Bern 1994). 2021 Jun;110(8):421-425. doi: 10.1024/1661-8157/a003696.

ABSTRACT

The application of point-of-care lung ultrasound (LUS) in the first diagnosis and management of Corona Virus Disease 2019 (COVID-19) has gained a great interest during a pandemic that is undermining even the most advanced health systems. LUS demonstrated high sensitivity in the visualization of the interstitial signs of the typical pneumonia complicating the infection. However, although this disease gives typical lung alterations, the same LUS signs observed in

COVID-19 pneumonia can be detected in other common pulmonary conditions. While being non-specific when considered separately, the analysis of the distribution of the sonographic typical signs allows the assignment of 4 LUS patterns of probability for COVID-19 pneumonia when the whole chest is examined and attention is paid to the presence of other atypical signs. Moreover, the combination of LUS likelihood with the clinical phenotype at presentation increases the accuracy. This mini-review will analyze the LUS signs of COVID-19 pneumonia and how they can be combined in patterns of probability in the first approach to suspected cases.

Surgeon-performed Ultrasound for the Staging of Acute Diverticulitis: Preliminary Results of a Prospective Study

[pubmed: point of care ultras...](#) by Mauro Zago / 34d

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INSIGHTS

Add note

J Trauma Acute Care Surg. 2021 Apr 8. doi: 10.1097/TA.0000000000003229. Online ahead of print.

ABSTRACT

INTRODUCTION: Although contrast-enhanced abdominal computed tomography (CEACT) is still considered the gold standard for the assessment of suspected acute diverticulitis, in recent years the use of point-of-care ultrasound (POCUS) has been spreading more and more in this setting. The aim of this study is to compare CEACTION to POCUS for the diagnosis and staging of suspected acute diverticulitis.

METHODS: This is a prospective study conducted on 55 patients admitted to the Emergency Department of two Italian Hospitals with a clinical suspicion of acute diverticulitis between January 2014 and December 2017. All the patients included underwent POCUS first and CEACTION immediately afterwards, with the diagnosis and the staging reported according to the Hinchey (H) classification modified by Wasvary et al. Three surgeons performed all the POCUS and the same two radiologists retrospectively analyzed all the CEACTION images. The radiologists were informed of the clinical suspicion but unaware of the POCUS findings. The CEACTION was used as the gold standard for the comparison.

RESULTS: The final cohort included 30 (55%) females and 25 (45%) males. The median age was 62 (24-88) and the median body mass index was 26 (19-42).Forty-six out of 55 patients had a confirmed diagnosis of acute diverticulitis on both POCUS and CEACTION, whereas in seven patients the diagnosis was not confirmed by both methods. POCUS sensitivity and specificity were 98% and 88% respectively. POCUS positive and negative predictive values were 98% and 88% respectively. POCUS accuracy was 96%.POCUS classified 33 H1a, 11 H1b, 1 H2 and 1 H3 acute diverticulitis. This staging was confirmed in all patients but three (93%) by CEACTION.

CONCLUSIONS: Point-of-care ultrasound appeared a reliable technique for the diagnosis and the staging of clinically suspected H1 and H2 acute diverticulitis. It could contribute in saving time and resources and in avoiding unnecessary radiation exposure to most patients.

POCUS - Thoracic Sonography in Times of Corona: What Sonographing Family Physicians Should Examine

[pubmed: intubation ultrasoun...](#)by Rudolf Horn / 34d

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INSIGHTS

Add note

Praxis (Bern 1994). 2021 Jun;110(8):439-448. doi: 10.1024/1661-8157/a003699.

ABSTRACT

POCUS - Thoracic Sonography in Times of Corona: What Sonographing Family Physicians Should Examine **Abstract.** When performing chest sonography of patients with symptoms such as respiratory infection, dyspnea and chest pain, the primary goal is to find or exclude significant diagnoses such as pneumothorax, pleural effusion, pulmonary edema, tumors, pulmonary emboli, etc. as the cause of the symptoms. If infection with SARS-CoV-2 is present, COVID-19 pneumonia can be confirmed or excluded as the cause of the symptoms with a high degree of probability based on the sonographic signs. COVID-19 pneumonia shows typical changes in the lungs, which are easily accessible to ultrasound due to their usually peripheral location. These are ubiquitous signs, such as a thickened, fragmented pleura with subpleural consolidations, multiple comet tail artifacts of varying size and thickness, some of which are coascent, broad bright light beams, and possibly small encapsulated pleural effusions. The more of these sonographic signs are present and the more pronounced they are, the sooner the patient must be hospitalized and possibly intubated. Ultrasound is also useful as a follow-up tool, together with clinical and laboratory findings.

Strong Increase in Lung Ultrasound Due to COVID-19

["lung ultrasound" or "lung ultrasonograp...](#)by Gebhard Mathis / 34d

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INSIGHTS

Add note

Praxis (Bern 1994). 2021 Jun;110(8):427-430. doi: 10.1024/1661-8157/a003698.

ABSTRACT

Strong Increase in Lung Ultrasound Due to COVID-19 **Abstract**. Due to the COVID-19 pandemic, lung ultrasound is experiencing a tremendous upswing and rapid diffusion. This affects both publications and clinical use. The typical changes are described here, also for lung consolidations of other genesis and in interstitial lung diseases. Comparisons with other imaging techniques and indications of the accuracy of lung ultrasound are also presented hereafter.

COVID-19 and Pulmonary Ultrasound: An Innovative Approach to the Disease in the GP's Office

["lung ultrasound" or "lung ultrasonograp...](#)by Andrea Griffa / 34d

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INSIGHTS

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Praxis (Bern 1994). 2021 Jun;110(8):431-437. doi: 10.1024/1661-8157/a003697.

ABSTRACT

COVID-19 and Pulmonary Ultrasound: An Innovative Approach to the Disease in the GP's Office **Abstract**. SARS-CoV-2 disease has required significant efforts from treating physicians to adapt their working methods. In a short time, we had to get to know the disease and implement a strategy for patient care. The goal is to provide safe consultation in the office (without contaminating patients), providing an early diagnosis and reproducible follow-up. Lung ultrasound proved to be a safe and reliable method for diagnosing this disease during the pandemic. This article describes the experience gained by treating 116 patients between February 2020 and March 2021.

Can emergency nurses safely and effectively insert fascia iliaca blocks in patients with a fractured neck of femur? A prospective cohort study in an Australian emergency department

[pubmed: fascia iliaca](#)by Julie Gawthorne / 33d

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INSIGHTS

Add note

J Clin Nurs. 2021 Jun 9. doi: 10.1111/jocn.15883. Online ahead of print.

ABSTRACT

AIMS AND OBJECTIVES: To compare the effectiveness and safety of ultrasound-guided fascia iliaca block (FIB) insertion in patients with fractured neck of femur by trained emergency nurses with insertion by doctors.

BACKGROUND: The FIB is an effective and safe form of analgesia for patients with hip fracture presenting to the emergency department (ED). While it has traditionally been inserted by medical doctors, no evidence exists comparing the effectiveness and safety of FIB insertion by nurses compared with doctors.

DESIGN: A prospective cohort study.

METHODS: The study was conducted in an Australian metropolitan ED. Patients admitted to the ED with suspected or confirmed fractured neck of femur had a FIB inserted under ultrasound guidance by either a trained emergency nurse or doctor. A retrospective medical record audit was undertaken of consecutive ED patients presenting between January 2013-December 2017. Reporting of this study followed the Strengthening the Reporting of Observational Studies in Epidemiology guidelines for cohort studies.

RESULTS: Of the 472 patients eligible for a FIB, 322 (68%) had one inserted. A majority were inserted by doctors (n = 207, 64.3%) with 22.4% (n = 72) by nurses and in 13.3% (n = 43) of patients the clinician was not documented. There were no differences between the nurse-inserted and doctor-inserted groups for mean pain scores 1 hr post-FIB insertion; clinically significant reduction ($\geq 30\%$) in pain score 1 hr post-FIB insertion; pain score 4 hr post-FIB insertion; delirium incidence; opioid use post-FIB insertion; or time to FIB insertion. No adverse events were identified in either group.

CONCLUSION: Insertion of FIBs by trained emergency nurses is as effective and safe as insertion by doctors in patients with fractured neck of femur in the ED. Senior emergency nurses should routinely be inserting FIB as a form of analgesia for patients with hip fracture.

Point-of-care ultrasound to assess volume status and pulmonary oedema in malaria patients

["lung ultrasound" or "lung ultrasonograp...](#)by Christina M Pugliese / 33d

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INSIGHTS

Add note

Infection. 2021 Jun 10. doi: 10.1007/s15010-021-01637-2. Online ahead of print.

ABSTRACT

PURPOSE: Fluid management is challenging in malaria patients given the risks associated with intravascular fluid depletion and iatrogenic fluid overload leading to pulmonary oedema. Given the limitations of the physical examination in guiding fluid therapy, we evaluated point-of-care ultrasound (POCUS) of the inferior vena cava (IVC) and lungs as a novel tool to assess volume status and detect early oedema in malaria patients.

METHODS: To assess the correlation between IVC and lung ultrasound (LUS) indices and clinical signs of hypovolaemia and pulmonary oedema, respectively, concurrent clinical and sonographic examinations were performed in an observational study of 48 malaria patients and 62 healthy participants across age groups in Gabon.

RESULTS: IVC collapsibility index (CI) $\geq 50\%$ on enrolment reflecting intravascular fluid depletion was associated with an increased number of clinical signs of hypovolaemia in severe and uncomplicated malaria. With exception of dry mucous membranes, IVC-CI correlated with most clinical signs of hypovolaemia, most notably sunken eyes ($r = 0.35$, $p = 0.0001$) and prolonged capillary refill ($r = 0.35$, $p = 0.001$). IVC-to-aorta ratio ≤ 0.8 was not associated with any clinical signs of hypovolaemia on enrolment. Among malaria patients, a B-pattern on enrolment reflecting interstitial fluid was associated with dyspnoea ($p = 0.0003$), crepitations and $SpO_2 \leq 94\%$ (both $p < 0.0001$), but not tachypnoea ($p = 0.069$). Severe malaria patients had increased IVC-CI ($p < 0.0001$) and more B-patterns ($p = 0.004$) on enrolment relative to uncomplicated malaria and controls.

CONCLUSION: In malaria patients, POCUS of the IVC and lungs may improve the assessment of volume status and detect early oedema, which could help to manage fluids in these patients.

Application progress of ultrasound monitoring of diaphragm function in clinic diaphragm and (ultrasound or ultrasonogr...

by Xiang Wang / 33d

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INSIGHTS

Add note

Zhonghua Wei Zhong Bing Ji Jiu Yi Xue. 2021 May;33(5):638-640. doi: 10.3760/cma.j.cn121430-20200824-00591.

ABSTRACT

In recent years, point of care ultrasound (POCUS) has developed rapidly in the fields of anesthesia and critical care. POCUS is widely used in clinic to monitor the function of human tissues and organs such as the heart, lungs, and diaphragm due to its visual, non-invasive, portable, and repeatable characters at the bedside. Diaphragm is an important structure to maintain respiratory function. Diaphragm paralysis or dysfunction can cause a significant decrease in inspiratory function. The patient's diaphragm function can be assessed through monitoring diaphragm thickness and activity by POCUS, and combined with other clinical indicators, the patient's recovery of respiratory function can be comprehensively evaluated, and rapidly identify the pathological conditions, such as diaphragm paralysis, diaphragm atrophy, diaphragmatic hypoplasia and amyotrophic lateral sclerosis. Dynamic evaluation of the process from diaphragmatic dysfunction to recovery can provide guidance for weaning and extubation, and real-time feedback on the treatment effect. This article reviews the ultrasound evaluation methods and clinical applications to the diaphragm, in order to guide clinicians to use relevant indicators to comprehensively evaluate the structure and function of the diaphragm, and then diagnose and treat diaphragm dysfunction, which may help making clinical decision.

Lung Ultrasound Score as a Predictor of Mortality in Patients With COVID-19

"lung ultrasound" or "lung ultrasonograp...by Zhenxing Sun / 33d

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INSIGHTS

Add note

Front Cardiovasc Med. 2021 May 25;8:633539. doi: 10.3389/fcvm.2021.633539. eCollection 2021.

ABSTRACT

Background: Lung injury is a common condition among hospitalized patients with coronavirus disease 2019 (COVID-19). However, whether lung ultrasound (LUS) score predicts all-cause mortality in patients with COVID-19 is unknown. The aim of the present study was to explore the predictive value of lung ultrasound score for mortality in patients with COVID-19. **Methods:** Patients with COVID-19 who underwent lung ultrasound were prospectively enrolled from three hospitals in Wuhan, China between February 2020 and March 2020. Demographic, clinical, and laboratory data were collected from digital patient records. Lung ultrasound scores were analyzed offline by two observers. Primary outcome was in-hospital mortality. **Results:** Of the 402 patients, 318 (79.1%) had abnormal lung ultrasound. Compared with survivors ($n = 360$), non-survivors ($n = 42$) presented with more B2 lines, pleural line abnormalities, pulmonary consolidation, and pleural effusion (all $p < 0.05$). Moreover, non-survivors had higher global and anterolateral lung ultrasound score than survivors. In the receiver operating characteristic analysis, areas under the curve were 0.936 and 0.913 for global and anterolateral lung ultrasound score, respectively. A cutoff value of 15 for global lung ultrasound score had a sensitivity of 92.9% and specificity of 85.3%, and 9 for anterolateral score had a sensitivity of 88.1% and specificity of 83.3% for prediction of death. Kaplan-Meier analysis showed that both global and anterolateral scores were strong predictors of death (both $p < 0.001$). Multivariate Cox regression analysis showed that global lung ultrasound score was an independent predictor (hazard ratio, 1.08; 95% confidence interval, 1.01-1.16; $p = 0.03$) of death together with age, male sex, C-reactive protein, and creatine kinase-myocardial band. **Conclusion:** Lung ultrasound score as a semiquantitative tool can be easily measured by bedside lung ultrasound. It is a powerful predictor of in-hospital mortality and may play a crucial role in risk stratification of patients with COVID-19.

Autonomous Robotic Point-of-Care Ultrasound Imaging for Monitoring of COVID-19-Induced Pulmonary Diseases

[pubmed: point of care ultras...](#)by Lidia Al-Zogbi / 33d

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INSIGHTS

Add note

Front Robot AI. 2021 May 25;8:645756. doi: 10.3389/frobt.2021.645756. eCollection 2021.

ABSTRACT

The COVID-19 pandemic has emerged as a serious global health crisis, with the predominant morbidity and mortality linked to pulmonary involvement. Point-of-Care ultrasound (POCUS) scanning, becoming one of the primary determinative methods for its diagnosis and staging, requires, however, close contact of healthcare workers with patients, therefore increasing the risk of infection. This work thus proposes an autonomous robotic solution that enables POCUS scanning of COVID-19 patients' lungs for diagnosis and staging. An algorithm was developed for approximating the optimal position of an ultrasound probe on a patient from prior CT scans to reach predefined lung infiltrates. In the absence of prior CT scans, a deep learning method was developed for predicting 3D landmark positions of a human ribcage given a torso surface model. The landmarks, combined with the surface model, are subsequently used for estimating optimal ultrasound probe position on the patient for imaging infiltrates. These algorithms, combined with a force-displacement profile collection methodology, enabled the system to successfully image all points of interest in a simulated experimental setup with an average accuracy of 20.6 ± 14.7 mm using prior CT scans, and 19.8 ± 16.9 mm using only ribcage landmark estimation. A study on a full torso ultrasound phantom showed that autonomously acquired ultrasound images were 100% interpretable when using force feedback with prior CT and 88% with landmark estimation, compared to 75 and 58% without force feedback, respectively. This demonstrates the preliminary feasibility of the system, and its potential for offering a solution to help mitigate the spread of COVID-19 in vulnerable environments.

Point-of-Care Ultrasound to Evaluate the Acute Abdomen: A Case of Bowel Perforation After Unknown Single Magnet Ingestion

[pubmed: point of care ultras...](#) by Rabia Malik / 32d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 May 18. doi: 10.1097/PEC.0000000000002460. Online ahead of print.

ABSTRACT

We report the case of a 3-year-old boy who presented to the pediatric emergency department in undifferentiated shock with an acute abdomen. Point-of-care ultrasound revealed viscous perforation with a large amount of free fluid. Intraoperatively, a single magnet was discovered as the likely cause of bowel perforation and the resulting state of shock.

Lung ultrasound score based on the BLUE-plus protocol is associated with the outcomes and oxygenation indices of intensive care unit patients

["lung ultrasound" or "lung ultrasonograp...](#) by Qian-Yi Peng / 32d

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ABSTRACT

PURPOSE: The primary objective was to demonstrate the relationship between lung ultrasound (LUS) manifestations and the outcomes of intensive care unit (ICU) patients. The secondary objective was to determine the characteristics of LUS manifestations in different subgroups of ICU patients.

METHODS: This prospective multi-center cohort study was conducted in 17 ICUs. A total of 1702 patients admitted between August 31, 2017 and February 16, 2019 were included. LUS was performed according to the bedside lung ultrasound in emergency (BLUE)-plus protocol, and LUS scores were calculated. Data on the outcomes and oxygenation indices were analyzed and compared between different primary indication groups.

RESULTS: The LUS scores were significantly higher for non-survivors than for survivors and were significantly different between the oxygenation index groups, with higher scores in the lower oxygenation index groups. The LUS score was an independent risk factor for the 28-day mortality. The area under the receiver operating characteristic curve was 0.663 for prediction of the 28-day mortality and 0.748 for prediction of an oxygenation index ≤ 100 .

CONCLUSIONS: The LUS score based on the BLUE-plus protocol was an independent risk factor for the 28-day mortality and was important for the prediction of an oxygenation index ≤ 100 . An early LUS score within 24 hours of ICU admission helps predicting the outcome of ICU patients.

Paramedic-performed Prehospital Point-of-care Ultrasound for Patients with Undifferentiated Dyspnea: A Pilot Study

["lung ultrasound" or "lung ultrasonograp...](#) by Jacob H Schoeneck / 30d

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ABSTRACT

INTRODUCTION: Thoracic ultrasound is frequently used in the emergency department (ED) to determine the etiology of dyspnea, yet its use is not widespread in the prehospital setting. We sought to investigate the feasibility and diagnostic performance of paramedic acquisition and assessment of thoracic ultrasound images in the prehospital environment, specifically for the detection of B-lines in congestive heart failure (CHF).

METHODS: This was a prospective observational study of a convenience sample of adult patients with a chief complaint of dyspnea. Paramedics participated in a didactic and hands-on session instructing them how to use a portable ultrasound device. Paramedics assessed patients for the presence of B-lines. Sensitivity and specificity for the presence of bilateral B-lines and any B-lines were calculated based on discharge diagnosis. Clips archived to the ultrasound units were reviewed and paramedic interpretations were compared to expert sonologist interpretations.

RESULTS: A total of 63 paramedics completed both didactic and hands-on training, and 22 performed ultrasounds in the field. There were 65 patients with B-line findings recorded and a discharge diagnosis for analysis. The presence of bilateral B-lines for diagnosis of CHF yielded a sensitivity of 80.0% (95% confidence interval [CI], 51.4-94.7%) and specificity of 72.0% (95% CI, 57.3-83.3), while presence of any B-lines was 93.3% sensitive (95% CI, 66.0-99.7%), and 50% specific (95% CI, 35.7-64.2%) for CHF. Paramedics archived 117 ultrasound clips of which 63% were determined to be adequate for interpretation. Comparison of paramedic and expert sonologist interpretation of images showed good inter-rater agreement for detection of any B-lines ($k = 0.60$; 95% CI, 0.36-0.84).

CONCLUSION: This observational pilot study suggests that prehospital lung ultrasound for B-lines may aid in identifying or excluding CHF as a cause of dyspnea. The presence of bilateral B-lines as determined by paramedics is reasonably sensitive and specific for the diagnosis of CHF and pulmonary edema, while the absence of B lines is likely to exclude significant decompensated heart failure. The study was limited by being a convenience sample and highlighted some of the difficulties related to prehospital research. Larger funded trials will be needed to provide more definitive data.

Optic disc drusen mimicking Idiopathic Intracranial Hypertension (IIH): rely on ultrasound papilledema ultrasound by Eleni Bakola / 30d

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INSIGHTS

Add note

Neurol Res Pract. 2021 Jun 14;3(1):33. doi: 10.1186/s42466-021-00133-0.

ABSTRACT

Optic nerve ultrasound is an established routine supplementary diagnostic tool for idiopathic intracranial pressure but it can also be helpful in avoiding misdiagnoses. We describe a case of an obese 15-year-old girl with persistent headaches, fundoscopic findings suggesting papilledema, normal brain imaging who underwent two lumbar punctures with unremarkable cerebrospinal fluid findings before ultrasound revealed optic disc drusen as the cause of the optic disc elevation.

The evolution of cardiac point of care ultrasound for the neonatologist
pubmed: bUS by Yogen Singh / 30d

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INSIGHTS

Add note

Eur J Pediatr. 2021 Jun 14. doi: 10.1007/s00431-021-04153-5. Online ahead of print.

ABSTRACT

Cardiac point of care ultrasound (POCUS) is increasingly being utilized in neonatal intensive care units to provide information in real time to aid clinical decision making. While training programs and scope of practice have been well defined for other specialties, such as adult critical care and emergency medicine, there is a lack of structure for neonatal cardiac POCUS. A more comprehensive and advanced hemodynamic evaluation by a neonatologist has previously published its own clinical guidelines and specific rigorous training programs have been established to achieve competency in neonatal hemodynamics. However, it is becoming increasingly evident that access and training for basic cardiac assessment by ultrasound enhances bedside clinical care for specific indications. Recently, expert consensus POCUS guidelines for use in neonatal and pediatric intensive care endorsed by the European Society of Pediatric and Neonatal Intensive Care (ESPNIC) have been published to guide the clinicians in using POCUS for specific indications, though the line between cardiac POCUS and advanced hemodynamic evaluation remains somewhat fluid. Conclusion: This article is focused on neonatal cardiac POCUS and its evolution, value, and limitations in the modern neonatal clinical practice. Cardiac POCUS can provide physiological and hemodynamic information in making clinical decisions while dealing with neonatal emergencies. However, it should be applied only for the specific indications and should be performed by a clinician trained in cardiac POCUS. There is an urgent need of developing cardiac POCUS curriculum and certification to support a widespread and safe use in neonates. What is Known: • International training guidelines and curriculum have been published for neonatologist-performed echocardiography (NPE) or targeted neonatal echocardiography (TNE). • International evidence-based guidelines for use of point of care ultrasound (POCUS) in neonates and children have been recently published. What is New: • Cardiac POCUS is increasingly being incorporated in neonatal practice for emergency situations. However, one must be aware of its specific indications and limitations, especially for the neonatal clinical practice. • Cardiac POCUS and NPE/TNE are continuum of cardiac imaging with different indications and training requirements.

Defining an Ultrasound-guided Regional Anesthesia Curriculum for Emergency Medicine

[pubmed: fascia iliaca](#) by Ryan V Tucker / 30d

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AEM Educ Train. 2020 Dec 11;5(3):e10557. doi: 10.1002/aet2.10557. eCollection 2021 Jul.

ABSTRACT

OBJECTIVES: Ultrasound-guided regional anesthesia (UGRA) can be a powerful tool in the treatment of painful conditions commonly encountered in emergency medicine (EM) practice. UGRA can benefit patients while avoiding the risks of procedural sedation and opioid-based systemic analgesia. Despite these advantages, many EM trainees do not receive focused education in UGRA and there is no published curriculum specifically for EM physicians. The objective of this study was to identify the components of a UGRA curriculum for EM physicians.

METHODS: A list of potential curriculum elements was developed through an extensive literature review. An expert panel was convened that included 13 ultrasound faculty members from 12 institutions and from a variety of practice environments and diverse geographical regions. The panel voted on curriculum elements through two rounds of a modified Delphi process.

RESULTS: The panelists voted on 178 total elements, 110 background knowledge elements, and 68 individual UGRA techniques. A high level of agreement was achieved for 65 background knowledge elements from the categories: benefits to providers and patients, indications, contraindications, risks, ultrasound skills, procedural skills, sterile technique, local anesthetics, and educational resources. Ten UGRA techniques achieved consensus: interscalene brachial plexus, supraclavicular brachial plexus, radial nerve, median nerve, ulnar nerve, serratus anterior plane, fascia iliaca, femoral nerve, popliteal sciatic nerve, and posterior tibial nerve blocks.

CONCLUSIONS: The defined curriculum represents ultrasound expert opinion on a curriculum for training practicing EM physicians. This curriculum can be used to guide the development and implementation of more robust UGRA education for both residents and independent providers.

Useful Ultrasonographic Parameters to Predict Difficult Laryngoscopy and Difficult Tracheal Intubation-A Systematic Review and Meta-Analysis

[pubmed: intubation ultrasoun...](#) by Sara H Gomes / 30d

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Add note

Front Med (Lausanne). 2021 May 28;8:671658. doi: 10.3389/fmed.2021.671658. eCollection 2021.

ABSTRACT

Unexpected difficult airway management can cause significant morbidity and mortality in patients admitted for elective procedures. Ultrasonography is a promising tool for perioperative airway assessment, nevertheless it is still unclear which sonographic parameters are useful predictors of difficult laryngoscopy and tracheal intubation. To determine the ultrasonographic predictors of a difficult airway that could be applied for routine practice, a systematic review and meta-analysis was conducted. Literature search was performed on PubMed, Web of Science

and Embase using the selected keywords. Human primary studies, published in English with the use of ultrasonography to prediction of difficult laryngoscopy or tracheal intubation were included. A total of 19 articles (4,570 patients) were analyzed for the systematic review and 12 articles (1,141 patients) for the meta-analysis. Standardized mean differences between easy and difficult laryngoscopy groups were calculated and the parameter effect size quantified. A PRISMA methodology was used and the critical appraisal tool from Joanna Briggs Institute was applied. Twenty-six sonographic parameters were studied. The overall effect of the distance from skin to hyoid bone ($p = 0.02$); skin to epiglottis ($p = 0.02$); skin to the anterior commissure of vocal cords ($p = 0.02$), pre-epiglottis space to distance between epiglottis and midpoint between vocal cords ($p = 0.01$), hyomental distance in neutral ($p < 0.0001$), and extended ($p = 0.0002$) positions and ratio of hyomental distance in neutral to extended ($p = 0.001$) was significant. This study shows that hyomental distance in the neutral position is the most reliable parameter for pre-operative airway ultrasound assessment. The main limitations of the study are the small sample size, heterogeneity of studies, and absence of a standardized ultrasonographic evaluation method [Registered at International prospective register of systematic reviews (PROSPERO): number 167931].

Point-of-care Ultrasound-guided Central Venous Catheter Confirmation in Ultrasound Nonexperts

pubmed: [point of care ultras...](#)by Enyo A Ablordeppey / 30d

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AEM Educ Train. 2020 Oct 13;5(3):e10530. doi: 10.1002/aet2.10530. eCollection 2021 Jul.

ABSTRACT

OBJECTIVE: Emerging evidence suggests that chest radiography (CXR) following central venous catheter (CVC) placement is unnecessary when point-of-care ultrasound (POCUS) is used to confirm catheter position and exclude pneumothorax. However, few providers have adopted this practice, and it is unknown what contributing factors may play a role in this lack of adoption, such as ultrasound experience. The objective of this study was to evaluate the diagnostic accuracy of POCUS to confirm CVC position and exclude a pneumothorax after brief education and training of nonexperts.

METHODS: We performed a prospective cohort study in a single academic medical center to determine the diagnostic characteristics of a POCUS-guided CVC confirmation protocol after brief training performed by POCUS nonexperts. POCUS nonexperts (emergency medicine senior residents and critical care fellows) independently performed a POCUS-guided CVC confirmation protocol after a 30-minute didactic training. The primary outcome was the diagnostic accuracy of the POCUS-guided CVC confirmation protocol for malposition and pneumothorax detection. Secondary outcomes were efficiency and feasibility of adequate image acquisition, adjudicated by POCUS experts.

RESULTS: Twenty-six POCUS nonexperts collected data on 190 patients in the final analysis. There were five (2.5%) CVC malpositions and six (3%) pneumothoraxes on CXR. The positive

likelihood ratios of POCUS for malposition detection and pneumothorax were 12.33 (95% confidence interval [CI] = 3.26 to 46.69) and 3.41 (95% CI = 0.51 to 22.76), respectively. The accuracy of POCUS for pneumothorax detection compared to CXR was 0.93 (95% CI = 0.88 to 0.96) and the sensitivity was 0.17 (95% CI = 0.00 to 0.64). The median (interquartile range) time for CVC confirmation was lower for POCUS (9 minutes [8.5-9.5 minutes]) compared to CXR (29 minutes [1-269 minutes]; Mann-Whitney U, $p < 0.01$). Adequate protocol image acquisition was achieved in 76% of the patients.

CONCLUSION: Thirty-minute training of POCUS in nonexperts demonstrates adequate diagnostic accuracy, efficiency, and feasibility of POCUS-guided CVC position confirmation, but not exclusion of pneumothorax.

Use of Hand-motion Analysis to Assess Competence and Skill Decay for Cardiac and Lung Point-of-care Ultrasound

[pubmed: point of care ultras...](#) by Daniel J Ackil / 30d

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INSIGHTS

Add note

AEM Educ Train. 2020 Dec 15;5(3):e10560. doi: 10.1002/aet2.10560. eCollection 2021 Jul.

ABSTRACT

OBJECTIVES: Assessment of competence in technical skills, including point-of-care ultrasound (POCUS), is required before a novice can safely perform the skill independently. Ongoing assessment of competence is also required because technical skills degrade over time, especially when they are infrequently performed or complex. Hand-motion analysis (HMA) is an objective assessment tool that has been used to evaluate competency in many technical skills. The purpose of this study was to demonstrate the feasibility and validity of HMA as an assessment tool for competence in both simple and complex technical skills as well as skill degradation over time.

METHODS: This prospective cohort study included 36 paramedics with no POCUS experience and six physicians who were fellowship trained in POCUS. The novices completed a 4-hour didactic and hands-on training program for cardiac and lung POCUS. HMA measurements, objective structured clinical examinations (OSCE), and written examinations were collected for novices immediately before and after training as well as 2 and 4 months after training. Expert HMA metrics were also recorded.

RESULTS: Expert HMA metrics for cardiac and lung POCUS were significantly better than those of novices. After completion of the training program, the novices improved significantly in all HMA metrics, knowledge test scores, and OSCE scores. Novices showed skill degradation in cardiac POCUS based on HMA metrics and OSCE scores while lung POCUS image acquisition skills were preserved. Novices deemed competent by OSCE score performed significantly better in HMA metrics than those not deemed competent.

CONCLUSION: We have demonstrated that HMA is a feasible and valid tool for assessment of competence in technical skills and can also evaluate skill degradation over time. Skill degradation appears more apparent in complex skills, such as cardiac POCUS. HMA may provide a more efficient and reliable assessment of technical skills, including POCUS, when compared to traditional assessment tools.

Longitudinal accuracy analysis of ultrasound performed during a four-year emergency medicine residency

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

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INSIGHTS

Add note

AEM Educ Train. 2021 Feb 17;5(3):e10574. doi: 10.1002/aet2.10574. eCollection 2021 Jul.

ABSTRACT

BACKGROUND: The objective of this study was to analyze patterns of point-of-care ultrasound (POCUS) performance over 4 years of emergency medicine (EM) residency. Specifically, we aimed to study how accuracy and adherence to standards of scanning changed by postgraduate year (PGY).

METHODS: This was a retrospective observational study of resident-performed POCUS at an academic emergency department over 6 years. We reviewed records of POCUS scans performed by PGY-1 to -4 residents that had been collected for quality assurance purposes. Data that were collected about EM residents' performance included the total number and type of scans per year, rate of technically limited scans (TLS), and accuracy on interpreting ultrasound images. Resident performances in each year (PGY-1 to -4) were independently evaluated and reported.

RESULTS: During a 6-year period, 137 different EM residents performed 50,815 ultrasound scans. The median number of scans was 177 for PGY-1, 124 for PGY-2, 118 for PGY-3, and 76 for residents in PGY-4. The accuracy of scan interpretations were high across all PGY levels (>97%), but slight degradation was observed as residents progressed through residency. The TLS rate increased from 4.7% among PGY-1s to 13.6% as PGY-4s.

CONCLUSIONS: In this large cohort of POCUS studies by EM residents, POCUS accuracy rates decreased and rates of TLS significantly increased as residents progressed through residency.

Rates and clinical impact of discordant X-ray and CT imaging in transfers to a pediatric emergency department

[pneumonia and pediatric](#) by Jason P Miller / 29d

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INSIGHTS

Add note

Am J Emerg Med. 2021 May 29;49:166-171. doi: 10.1016/j.ajem.2021.05.063. Online ahead of print.

ABSTRACT

OBJECTIVES: Children are often transferred to a Pediatric Emergency Department (PED) for definitive care after completion of diagnostic imaging. There is a paucity of data on the concordance rates of interpretation of imaging studies between referral and PED. Our objective is to describe the rates and clinical impact of discordant interpretation of X-rays and CT in children transferred to a PED.

METHODS: This was a retrospective cohort study of patients over a 12-month period from 12/1/2017-11/30/2018 with X-ray (XR) and CT performed prior to transfer to our PED. We compared referral radiology interpretations to those of pediatric radiologists to determine concordance. Encounters with discordant imaging interpretations were further evaluated for clinical impact (none, minor or major) based on need for additional laboratory workup, consultation, and changes in management and disposition.

RESULTS: We analyzed 899 patient encounters. There were high rates of concordance in both XR and CT interpretation (668/743; 89.9%, 95% CI 0.87-0.91 and 205/235; 87.2%, 95% CI 0.82-0.91, respectively). XR discordance resulted in minor clinical impact in 34 patients (45%, 95% CI 0.35-0.57) and a major clinical impact in 28 patients (37%, 95% CI 0.27-0.49). CT discordance resulted in minor clinical impact in 10 patients (33%, 95% CI 0.19-0.51) of patients and major clinical impact in 15 patients (50%, 95% CI 0.33-0.67). The most common discordances with major clinical impact were related to pneumonia on XR chest and appendicitis or inflammatory bowel disease on CT abdomen.

CONCLUSIONS: In patients transferred to the PED, concordance of XR and CT interpretations was high. A majority of discordant interpretations led to clinical impact meaningful to the patient and emergency medicine (EM) physician. Referring EM physicians might consider the benefit of pediatric radiology consultation upon transfer, especially for imaging diagnoses related to pneumonia, appendicitis, or inflammatory bowel disease.

A prompt diagnosis of late-onset congenital diaphragmatic hernia with Point of Care Ultrasound (POCUS) in a Pediatric Emergency Department

[pubmed: point of care ultras...](#)by Angelo Giovanni Delmonaco / 29d

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INSIGHTS

Add note

Pediatr Neonatol. 2021 May 29:S1875-9572(21)00089-9. doi: 10.1016/j.pedneo.2021.05.010.
Online ahead of print.

NO ABSTRACT

Early lung ultrasound assessment for the prognosis of patients hospitalized for COVID-19 pneumonia. A pilot study

["lung ultrasound" or "lung ultrasonograp...](#)by A Kalkanis / 28d

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INSIGHTS

Add note

Respir Med Res. 2021 Jun 4;80:100832. doi: 10.1016/j.resmer.2021.100832. Online ahead of print.

ABSTRACT

OBJECTIVE: SARS CoV-2 is an epidemic viral infection that can cause mild to severe lung involvement. Newly apprehended knowledge on thoracic imaging abnormalities and the growing clinical experience on the evolution of this disease make the radiographic follow-up of hospitalized patients relevant. The value of consecutive bedside lung ultrasonography in the follow-up of hospitalized patients with SARS CoV-2 pneumonia and its correlation with other clinical and laboratory markers needs to be evaluated.

METHODS: We assessed 39 patients [age: 64 y(60.1-68.7)] with confirmed SARS CoV-2 pneumonia. A total of 24 patients were hospitalized until the follow-up test, 9 were discharged early and 6 required a transfer to critical care unit. Two ultrasound scans of the lung were performed on day 1 and 4 of patients' hospitalization. Primary endpoint was the magnitude of association between a global lung ultrasound score (LUS) and clinical and laboratory markers. Secondary endpoint was the association between the evolution of LUS with the corresponded changes in clinical and laboratory outcomes during hospitalization period.

RESULTS: LUS score on admission was higher among the deteriorating patients and significantly ($P=0.038-0.0001$) correlated (Spearman's rho) with the levels of C-reactive protein (0.58), lymphocytes (-0.33), SpO₂ (-0.48) and oxygen supplementation (0.48) upon admission. The increase in LUS score between the two scans was significantly correlated (0.544, $P=0.006$) with longer hospital stay.

CONCLUSION: Lung ultrasound assessment can be a useful as an imaging modality for SARS CoV-2 patients. Larger studies are needed to further investigate the predictive role of LUS in the duration and the outcome of the hospitalization of these patients.

Point-of-Care Ultrasound Assists in Rapid Diagnosis of T-cell Lymphoblastic Lymphoma in a Young Boy

[pubmed: point of care ultras...](#)by Ceyda H Sablak / 28d

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INSIGHTS

Add note

Cureus. 2021 May 12;13(5):e14978. doi: 10.7759/cureus.14978.

ABSTRACT

T-cell lymphoblastic lymphoma (T-cell LBL) is an uncommon diagnosis for acute dyspnea in pediatric emergencies. This case details a 13-year-old boy presenting to the ED with dyspnea, who was diagnosed with T-cell LBL. It was a unique presentation in which there was no obvious mediastinal mass on the examination or primary imaging. As a safe and cost-effective modality for a patient that was too unstable to transfer to the radiology department for computed tomography, point-of-care ultrasound (POCUS) was useful in the patient's rapid assessment for suspected pericardial and pleural effusion. This case highlights the advantage of early utilization of POCUS for pediatric patients with dyspnea.

A practical guide to the lung ultrasound for the assessment of congestive heart failure

[pubmed: bUS](#) by Katsuomi Iwakura / 28d

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INSIGHTS

Add note

J Echocardiogr. 2021 Jun 16. doi: 10.1007/s12574-021-00528-7. Online ahead of print.

ABSTRACT

Dyspnea is one of the major symptoms encountered in the emergency department, and lung ultrasound (LUS) is recommended for the rapid diagnosis of the underlying disease. B-lines, the "comet-tail"-like vertical lines moving with respiration, are an ultrasound finding relevant to the pulmonary congestion. They may be observed in the normal lung, but bilateral, ≥ 3 B-lines are considered pathological. B-lines with lung sliding (B profile) are a specific sign of heart failure, while B-lines with abolished lung sliding (B' profile) are related with the lung diseases such as acute respiratory distress syndrome. B profile is reported to detect pulmonary edema with about 95% sensitivity and 95% specificity in patients with dyspnea. LUS also can assess the severity of pulmonary congestion semi-quantitatively by counting the number of B-lines or that of positive areas. Whereas the original BLUE protocol requires scanning at 12 zones on the chest, more rapid 8- or 6-zone scan is sufficient for the diagnosis of heart failure, and 2- or 4-zone scan may be used for the critical patients. LUS may be used for the evaluation of heart failure treatment, or can be performed as a part of exercise stress test. LUS can be performed easily and rapidly at the bedside using almost any kind of ultrasound apparatus, and it should be performed more widely in the daily practice as well as in the emergent department.

Deep Learning Pitfall: Impact of Novel Ultrasound Equipment Introduction on Algorithm Performance and the Realities of Domain Adaptation

[pubmed: point of care ultras...](#) by Michael Blaivas / 28d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Jun 16. doi: 10.1002/jum.15765. Online ahead of print.

ABSTRACT

OBJECTIVES: To test deep learning (DL) algorithm performance repercussions by introducing novel ultrasound equipment into a clinical setting.

METHODS: Researchers introduced prospectively obtained inferior vena cava (IVC) videos from a similar patient population using novel ultrasound equipment to challenge a previously validated DL algorithm (trained on a common point of care ultrasound [POCUS] machine) to assess IVC collapse. Twenty-one new videos were obtained for each novel ultrasound machine. The videos were analyzed for complete collapse by the algorithm and by 2 blinded POCUS experts. Cohen's kappa was calculated for agreement between the 2 POCUS experts and DL algorithm. Previous testing showed substantial agreement between algorithm and experts with Cohen's kappa of 0.78 (95% CI 0.49-1.0) and 0.66 (95% CI 0.31-1.0) on new patient data using the same ultrasound equipment.

RESULTS: Challenged with higher image quality (IQ) POCUS cart ultrasound videos, algorithm performance declined with kappa values of 0.31 (95% CI 0.19-0.81) and 0.39 (95% CI 0.11-0.89), showing fair agreement. Algorithm performance plummeted on a lower IQ, smartphone device with a kappa value of -0.09 (95% CI -0.95 to 0.76) and 0.09 (95% CI -0.65 to 0.82), respectively, showing less agreement than would be expected by chance. Two POCUS experts had near perfect agreement with a kappa value of 0.88 (95% CI 0.64-1.0) regarding IVC collapse.

CONCLUSIONS: Performance of this previously validated DL algorithm worsened when faced with ultrasound studies from 2 novel ultrasound machines. Performance was much worse on images from a lower IQ hand-held device than from a superior cart-based device.

Point-of-care ultrasound for the diagnosis of small bowel occlusion: practical implications for emergency and primary care use

[pubmed: point of care ultras...](#) by Dimitri Roustan / 28d

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INSIGHTS

Add note

Rev Med Suisse. 2021 Jun 16;17(743):1183-1185.

ABSTRACT

Point-of-care ultrasound is a diagnostic tool that is gaining increasingly more ground in general and emergency practice; it allows the clinician to answer certain precise questions, including the presence of a small bowel occlusion. For this indication, ultrasound is useful in rapidly establishing a diagnosis and planning further work up.

Lung Point Sign in Ultrasound Diagnostics of Pneumothorax: Imitations and Variants

[pubmed: point of care ultras...](#) by Roman Skulec / 27d

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INSIGHTS

Add note

Emerg Med Int. 2021 May 28;2021:6897946. doi: 10.1155/2021/6897946. eCollection 2021.

ABSTRACT

BACKGROUND: Pulmonary ultrasound plays a key role in the diagnosis of pneumothorax in emergency and intensive-care medicine. The lung point sign has been generally considered a pathognomonic diagnostic sign. Recently, several other situations have been published that can mimic the lung point, as well as a few different variants of the true lung point sign.

MATERIALS AND METHODS: Based on years of monitoring the literature and collecting our database of ultrasound findings, we prepared a review of ultrasound findings mimicking the lung point sign and ultrasound variants of the true lung point sign.

RESULTS: We present four imitations of the lung point sign (physiological lung point sign, pseudo-lung point sign, bleb point sign, and pleurofascial point sign) and two variants of the true lung point sign (double lung point sign and hydro point sign) documented by images and video records.

CONCLUSIONS: Knowledge of ultrasound imitations and variants of the lung point sign may increase the reliability of pneumothorax diagnosis and may reduce the risk of performing unindicated interventions.

Point-of-care ultrasound for diagnosis of purulent flexor tenosynovitis

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

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Add note

Emerg Med J. 2021 Jun 17:emermed-2020-211113. doi: 10.1136/emermed-2020-211113.
Online ahead of print.

NO ABSTRACT

PMID:34140320 | DOI:10.1136/emermed-2020-211113

Point-of-Care Ultrasound for the Evaluation of Neck Masses in the Pediatric Emergency

Department: A Case Series

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

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jun 17. doi: 10.1097/PEC.0000000000002463. Online ahead of print.

ABSTRACT

Point-of-care ultrasound can be an effective tool for pediatric emergency medicine providers in the evaluation of soft tissue lesions. We present a series of 4 pediatric patients with neck lesions in whom point-of-care ultrasound identified the type of lesion, guided decision-making on the need for computed tomography imaging, and led to definitive management.

Point-of-Care Ultrasound of a Shoulder Effusion in a Child With Septic Arthritis: A Case Report

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

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jun 17. doi: 10.1097/PEC.0000000000002465. Online ahead of print.

ABSTRACT

Point-of-care musculoskeletal ultrasound can facilitate diagnosis of joint effusions and help guide management of suspected septic joints. This case report describes a previously healthy

pediatric patient with acute onset shoulder pain and fever who was found to have leukocytosis and bacteremia. Point-of-care ultrasound (POCUS) demonstrated a unilateral shoulder joint effusion. After POCUS was performed, purulent fluid was aspirated from the joint, and she was diagnosed with a septic shoulder. We review the ultrasound technique, sonographic findings, and literature regarding POCUS for shoulder effusions.

Ultrasound-Guided Distal Forearm Fracture Reduction by Pediatric Emergency Physicians: A Single Center Retrospective Study

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

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jun 17. doi: 10.1097/PEC.0000000000002464. Online ahead of print.

ABSTRACT

INTRODUCTION: Fracture reduction under point-of-care ultrasound (POCUS) guidance facilitates measurement of residual angulation or displacement that may not be apparent on examination. Point-of-care ultrasound is without patient or staff exposure to ionizing radiation and enlists no additional staffing resources or patient transfer.

METHODS: We conducted a chart review of all children who underwent reduction of a distal forearm fracture in the pediatric emergency department over a 2-year period, from September 2018 to September 2020. We compared length of stay (LOS) with that for orthopedist-performed distal forearm reductions during the study period. We allowed a 6-week lag period to ensure no missed rereduction before analyzing the data. After reduction, children were instructed to follow up with an orthopedist within 1 week. Children with loss of reduction on orthopedic follow-up are referred back through our emergency department for operative reduction.

RESULTS: A total of 74 children with 75 distal forearm fractures were identified. Average LOS was 179 minutes for the pediatric emergency medicine physician reductions and 215 minutes for the orthopedist reductions ($P < 0.001$). Ninety-six percent of reductions were completed with POCUS assistance, and 61% had less than 5 degrees of angulation on postreduction radiography. Only 2.7% of children underwent rereduction.

CONCLUSIONS: Distal forearm fracture reductions by a pediatric emergency medicine physician under POCUS guidance have a high rate of excellent alignment, low rate of failed reduction, and significantly shorter LOS ($P < 0.001$) than reductions performed by orthopedists.

The Impact of Diagnostic Decisions on Patient Experience in the Pediatric Emergency Department
[pediatric and \(medication or antibiotic\)...](#)by Jillian K Gorski / 26d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jun 17. doi: 10.1097/PEC.0000000000002485. Online ahead of print.

ABSTRACT

OBJECTIVE: Patient experience serves as both a subjective measure of value-based health care delivery and a metric to inform operational decision making. The objective of this study was to determine if specific diagnostic and therapeutic interventions affect patient experience scores for children seen in the emergency department.

METHODS: We performed a retrospective observational study in the emergency department of a large quaternary care children's hospital on patients who were discharged to home and later completed a National Research Corporation Health patient experience survey. We matched the survey results to electronic health record (EHR) data and were able to extract demographics, operational metrics, and order information for each patient. We performed multiple logistic regression analyses to determine the association of image acquisition, laboratory test ordering, medication administration, and discharge prescribing with likelihood to recommend the facility as our measure of patient experience.

RESULTS: Of the 4103 patients who met inclusion criteria for the study, 75% strongly recommended the facility. Longer wait times were associated with lower patient experience scores [odds ratio (OR) per waiting room hour increase, 0.72; 95% confidence interval (CI), 0.65-0.81]. Significant diagnostic factors associated with higher patient experience included magnetic resonance imaging ordering (OR, 2.38; 95% CI, 1.00-5.67), x-ray ordering (OR, 1.19; 95% CI, 1.00-1.42), and electrocardiogram ordering (OR, 1.62; 95% CI, 1.07-2.44). Of the treatment factors studied, only antibiotic prescribing at discharge was found to have a significant positive association with patient experience (OR, 1.32; 95% CI, 1.08-1.63).

CONCLUSION: The positive association between more intensive diagnostic workups and patient experience could have implications on the utility of patient experience scores to evaluate pediatric care teams. Consideration should be taken to interpret patient experience scores in the context of compliance with approaches in evidence-based medicine.

Evaluation of third ventriculostomy outcome by measuring optic nerve sheath diameter in adult hydrocephalus

[optic nerve diameter](#) by Mehmet Emin Akyüz / 26d

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ABSTRACT

OBJECTIVE: It is difficult to demonstrate the success of the procedure in patients with third ventriculostomy. We evaluated that optic nerve sheath diameter (ONSD) measurement, which can reflect intracranial pressure, may be a criterion for decision of endoscopic third ventriculostomy (ETV) success.

METHODS: 28 adult patients suffering long overt standing ventriculomegaly (LOVA) who performed ETV were included in this retrospective study. The patients were divided into two groups as successful (group A) and failed ETV group (group B) according to their postoperative evaluation. ONSD was measured on pre- and post-operative computed tomography (CT) and Evan's index (EI), diameter of third ventricle (V3), the patency of ETV stoma and periventricular edema were evaluated by magnetic resonance imaging (MRI).

RESULTS: The mean ONSD was measured as 6.39 ± 0.92 mm for the right eye, 6.50 ± 0.91 mm for the left eye on preoperative CT. The mean ONSD by CT (after surgery) was 4.89 ± 0.87 mm for the right eye, 5.02 ± 0.1 mm for the left eye ($p<0.05$). Postoperative group A and group B were compared according to ONSD measurement; mean ONSD in group A was 4.52 ± 0.69 mm for the right and 4.59 ± 0.9 mm for the left, mean ONSD in group B was 5.82 ± 0.51 mm for the right and 6.1 ± 0.32 mm for the left ($p<0.05$). The best ONSD value for detecting failed ETV was 5.40mm (sensitivity 90%, specificity 75%, AUROC 0.938) for right and 5.91mm (sensitivity 90%, specificity 75%, AUROC 0.950) for left. EE was measured as 0.39 ± 0.12 mm on preoperative MRI and 0.39 ± 0.12 mm on postoperative MRI ($p=0.3$). V3 was measured as 14.7 ± 2.47 mm on preoperative MRI and 10.47 ± 1.99 mm on postoperative MRI ($p<0.05$).

CONCLUSION: The statistical values obtained from study show that the ONSD measurement can help in the postoperative evaluation of patients, who had a ETV surgery.

Highlighting COVID-19: What the imaging exams show about the disease

pubmed: [bUS](#) by Lorena Sousa de Carvalho / 26d

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INSIGHTS

Add note

World J Radiol. 2021 May 28;13(5):122-136. doi: 10.4329/wjr.v13.i5.122.

ABSTRACT

Coronavirus disease 2019 (COVID-19), a global emergency, is caused by severe acute respiratory syndrome coronavirus 2. The gold standard for its diagnosis is the reverse transcription polymerase chain reaction, but considering the high number of infected people, the low availability of this diagnostic tool in some contexts, and the limitations of the test, other tools that aid in the identification of the disease are necessary. In this scenario, imaging exams such

as chest X-ray (CXR) and computed tomography (CT) have played important roles. CXR is useful for assessing disease progression because it allows the detection of extensive consolidations, besides being a fast and cheap method. On the other hand, CT is more sensitive for detecting lung changes in the early stages of the disease and is also useful for assessing disease progression. Of note, ground-glass opacities are the main COVID-19-related CT findings. Positron emission tomography combined with CT can be used to evaluate chronic and substantial damage to the lungs and other organs; however, it is an expensive test. Lung ultrasound (LUS) has been shown to be a promising technique in that context as well, being useful in the screening and monitoring of patients, disease classification, and management related to mechanical ventilation. Moreover, LUS is an inexpensive alternative available at the bedside. Finally, magnetic resonance imaging, although not usually requested, allows the detection of pulmonary, cardiovascular, and neurological abnormalities associated with COVID-19. Furthermore, it is important to consider the challenges faced in the radiology field in the adoption of control measures to prevent infection and in the follow-up of post-COVID-19 patients.

A randomized controlled trial of simulation-based mastery learning to teach the extended focused assessment with sonography in trauma

[focused assessment sonography trauma](#) by Siobhan Smith / 26d

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INSIGHTS

Add note

AEM Educ Train. 2021 May 18;5(3):e10606. doi: 10.1002/aet2.10606. eCollection 2021 Jul.

ABSTRACT

BACKGROUND: Mastery learning has gained popularity for training residents in procedural skills due to its demonstrated superiority over traditional methods. However, no studies have compared the efficacy of traditional versus mastery learning methods in residency point-of-care ultrasound education. We hypothesized that mastery learning would improve residents' skills in performing the extended focused assessment with sonography in trauma (eFAST).

METHODS: All first-year emergency medicine (EM) resident physicians at a single university hospital underwent a crossover randomized controlled trial to receive mastery-learning eFAST training either at the beginning of the academic year or 6 months into intern year. Participants were taught using a checklist validated by a panel of experts using Mastery Angoff methods and were given feedback on missed tasks until each trainee completed the eFAST with a minimum passing standard (MPS). Our primary outcome was technical proficiency between the two groups for eFAST examinations performed in the emergency department during the academic year.

RESULTS: Sixteen interns were enrolled; eight were randomized to each group. The group that received mastery training at the beginning of the year had mean clinical eFAST proficiency scores above the MPS in the first two quarters of the academic year, while the control group did

not. Once the control group underwent eFAST mastery training at the midpoint of the year, both groups had mean proficiency scores above the MPS for the remainder of the year.

CONCLUSION: Simulation-based mastery learning is an effective method of teaching the eFAST examination. This training during intern orientation conferred early proficiency in clinical performance of eFAST among EM residents. This difference in proficiency was no longer present after the control group received mastery learning education halfway through the academic year.

What is the ideal approach for emergent pericardiocentesis using point-of-care ultrasound guidance?

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

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INSIGHTS

Add note

World J Emerg Med. 2021;12(3):169-173. doi: 10.5847/wjem.j.1920-8642.2021.03.001.

ABSTRACT

BACKGROUND: Traditionally performed using a subxiphoid approach, the increasing use of point-of-care ultrasound in the emergency department has made other approaches (parasternal and apical) for pericardiocentesis viable. The aim of this study is to identify the ideal approach for emergency-physician-performed ultrasound-guided pericardiocentesis as determined by ultrasound image quality, distance from surface to pericardial fluid, and likely obstructions or complications.

METHODS: A retrospective review of point-of-care cardiac ultrasound examinations was performed in two urban academic emergency departments for the presence of pericardial effusions. The images were reviewed for technical quality, distance of effusion from skin surface, and predicted complications.

RESULTS: A total of 166 pericardial effusions were identified during the study period. The mean skin-to-pericardial fluid distance was 5.6 cm (95% confidence interval [95% CI] 5.2-6.0 cm) for the subxiphoid views, which was significantly greater than that for the parasternal (2.7 cm [95% CI 2.5-2.8 cm], $P<0.001$) and apical (2.5 cm [95% CI 2.3-2.7 cm], $P<0.001$) views. The subxiphoid view had the highest predicted complication rate at 79.7% (95% CI 71.5%-86.4%), which was significantly greater than the apical (31.9%; 95% CI 21.4%-44.0%, $P<0.001$) and parasternal (20.2%; 95% CI 12.8%-29.5%, $P<0.001$) views.

CONCLUSIONS: Our results suggest that complication rates with pericardiocentesis will be lower via the parasternal or apical approach compared to the subxiphoid approach. The distance from skin to fluid collection is the least in both of these views.

Teaching emergency ultrasound to emergency medicine residents: a scoping review of structured training methods

"emergency ultrasound" by Leila L PoSaw / 26d

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INSIGHTS

Add note

J Am Coll Emerg Physicians Open. 2021 Jun 14;2(3):e12439. doi: 10.1002/emp2.12439.
eCollection 2021 Jun.

ABSTRACT

BACKGROUND: Over the past 2 decades, emergency ultrasound has become essential to patient care, and is a mandated competency for emergency medicine residency graduation. However, the best evidence regarding emergency ultrasound education in residency training is not known. We performed a scoping review to determine the (1) characteristics and (2) outcomes of published structured training methods, (3) the quality of publications, and (4) the implications for research and training.

METHODS: We searched broadly on multiple electronic databases and screened studies from the United States and Canada describing structured emergency ultrasound training methods for emergency medicine residents. We evaluated methodological quality with the Medical Education Research Study Quality Instrument (MERSQI), and qualitatively summarized study and intervention characteristics.

RESULTS: A total of 109 studies were selected from 6712 identified publications. Publications mainly reported 1 group pretest-posttest interventions (38%) conducted at a single institution (83%), training in image acquisition (82%) and interpretation (94%) domains with assessment of knowledge (44%) and skill (77%) outcomes, and training in cardiac (18%) or vascular access (15%) applications. Innovative strategies, such as gamification, cadaver models, and hand motion assessment are described. The MERSQI scores of 48 articles ranged from 0 to 15.5 (median, 11.5; interquartile range, 9.6-13.0) out of 18. Low scores reflected the absence of reported valid assessment tools (73%) and higher level outcomes (90%).

CONCLUSIONS: Although innovative strategies are illustrated, the overall quality of research could be improved. The use of standardized planning and assessment tools, intentionally mapped to targeted domains and outcomes, might provide valuable formative and summative information to optimize emergency ultrasound research and training.

Patients' experiences of the use of point-of-care ultrasound in general practice - a cross-sectional study

pubmed: point of care ultrasonography by Camilla Aakjær Andersen / 25d

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INSIGHTS

Add note

BMC Fam Pract. 2021 Jun 18;22(1):116. doi: 10.1186/s12875-021-01459-z.

ABSTRACT

BACKGROUND: The use of point-of-care ultrasonography (POCUS) performed by general practitioners (GPs) in primary care settings is increasing. Previous studies have focused on GP-reported outcomes and little is known about patients' perspectives on the use of POCUS technology within the general practice consultation. The purpose of this study was to examine patients' experiences with POCUS in general practice within the areas where GPs have indicated that POCUS affected aspects of the consultation.

METHODS: A questionnaire was developed using a mixed methods sequential design. Analytical themes from interviews with GPs were converted into items in a questionnaire by the research team. The questionnaire was then further developed in several rounds of pilot tests involving both patients and GPs. The final questionnaire was used in a cohort study conducted in 18 Danish office-based general practice clinics from January 2018 to August 2018. All patients examined with POCUS were asked to complete the questionnaire on tablets immediately after their consultation.

RESULTS: Out of 691 patients examined, 564 (81.6%) questionnaires were available for analysis. The patients reported that they were well informed about the purpose (98%) and the results (97%) of the POCUS examination; however, 29% reported that they were not informed about the difference between POCUS and an imaging-specialist's ultrasound examination. Almost all patients (99%) reported that POCUS was integrated naturally into the consultation, and 45% reported that POCUS improved the doctor-patient relationship. The majority of patients felt that they had been more thoroughly examined (92%) and taken more seriously (58%) when POCUS was part of the consultation. They felt POCUS gave them a better understanding of their health problem (82%), made them feel more secure (86%) and increased their trust in the physician's assessment (65%). Moreover, the patients reported that POCUS use improved the level of service (95%) they experienced and the quality of care (94%) in general practice.

CONCLUSION: We found that an examination including POCUS in general practice was a positive experience overall for the majority of patients. Future research should further explore reasons for patient confidence in POCUS and whether or not the reassuring value of POCUS is valid.

The role of lung ultrasound in COVID-19 disease

[pubmed: point of care ultras...](#) by European Society of Radiology (ESR) / 25d

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INSIGHTS

Add note

Insights Imaging. 2021 Jun 19;12(1):81. doi: 10.1186/s13244-021-01013-6.

ABSTRACT

This statement summarises basic settings in lung ultrasonography and best practice recommendations for lung ultrasonography in COVID-19, representing the agreed consensus of experts from the Ultrasound Subcommittee of the European Society of Radiology (ESR). Standard lung settings and artefacts in lung ultrasonography are explained for education and training, equipment settings, documentation and self-protection.

Role of lung ultrasound for the etiological diagnosis of acute lower respiratory tract infection (ALRTI) in children: a prospective study

["lung ultrasound" or "lung ultrasonograp...](#) by Danilo Buonsenso / 25d

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INSIGHTS

Add note

J Ultrasound. 2021 Jun 19. doi: 10.1007/s40477-021-00600-z. Online ahead of print.

ABSTRACT

OBJECTIVE AND DESIGN: Our prospective study assesses the role of detailed lung ultrasound (LUS) features to discriminate the etiological diagnosis of acute lower respiratory tract infection (ALRTI) in children.

METHODOLOGY: We analyzed patients aged from 1 month to 17 years admitted between March 2018 and April 2020 who were hospitalized for ALRTI. For all patients, history, clinical parameters, microbiological data, and lung ultrasound data were collected. Patients were stratified into three main groups ("bacterial", "viral", "atypical") according to the presumed microbial etiology and LUS findings evaluated according to the etiological group. Nasopharyngeal swabs were obtained from all patients. A qualitative diagnostic test developed by Nurex S.r.l. was used for identification of bacterial and fungal DNA in respiratory samples. The Seegene Allplex™ Respiratory assays were used for the molecular diagnosis of viral respiratory pathogens. In addition, bacterial culture of blood and respiratory samples were performed, when indicated.

RESULTS: A total of 186 children with suspected ALRTI (44% female) with an average age of 6 were enrolled in the study. We found that some ultrasound findings as size, number and distribution of consolidations, the position and motion of air bronchograms, pleural effusions and distribution of vertical artifacts significantly differ ($p < 0.05$) in children with bacterial, viral and atypical ALRTI.

CONCLUSION: Our study provides a detailed analysis of LUS features able to predict the ALRTI etiology in children. These findings may help the physicians to better manage a child with ALRTI and to offer personalized approach, from diagnosis to treatment and follow-up.

Association of lung ultrasound score with mortality and severity of COVID-19: A Meta-analysis and Trial Sequential Analysis

["lung ultrasound" or "lung ultrasonograp...](#)by Guang Song / 24d

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INSIGHTS

Add note

Int J Infect Dis. 2021 Jun 16:S1201-9712(21)00513-0. doi: 10.1016/j.ijid.2021.06.026. Online ahead of print.

ABSTRACT

OBJECTIVES: The coronavirus disease 2019 (COVID-19) pandemic has rapidly spread all over the world. Lung ultrasound (LUS) has emerged as a useful tool for diagnosis of many respiratory diseases. The prognostic role of LUS in COVID-19 patients has not yet been established.

METHODS: Several databases were searched on April 9, 2021. The difference of LUS score between the death and survival groups, and the relationship between LUS score and COVID-19 severity were both assessed.

RESULTS: The LUS score was significantly higher in the death group compared to the survival group (weighted mean difference (WMD) = 8.21, 95% CI: 4.74-11.67, $P < 0.001$), confirm by the trial sequential analysis. Those with mild/moderate, severe, and critical COVID-19 had a progressively higher LUS score (Critical vs. severe: WMD = 8.78, 95% CI: 4.17-13.38, $P < 0.001$; Critical vs. mild/moderate/severe: WMD = 10.00, 95% CI: 6.83-13.17, $P < 0.001$; Severe vs. moderate: WMD = 5.96, 95% CI: 3.48-8.44, $P < 0.001$; Severe vs. mild/moderate: WMD = 7.31, 95% CI: 4.45-10.17, $P < 0.001$).

CONCLUSIONS: The LUS score was associated with mortality and severity of COVID-19. The LUS score might be a risk stratification tool for COVID-19 patients.

Impact of point-of-care ultrasound on treatment time for ectopic pregnancy

[pubmed: point of care ultras...](#)by Bethsabée S Stone / 24d

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INSIGHTS

Add note

Am J Emerg Med. 2021 Jun 9;49:226-232. doi: 10.1016/j.ajem.2021.05.071. Online ahead of print.

ABSTRACT

BACKGROUND: Point-of-care ultrasound (POCUS) is useful in the evaluation of early pregnancy by confirming intrauterine pregnancy and recognizing hemorrhage from ectopic pregnancy. We sought to determine whether transabdominal POCUS by itself or in conjunction with consultative radiology ultrasound (RADUS), reduces Emergency Department (ED) treatment time for patients with ectopic pregnancy requiring operative care, when compared to RADUS alone. A secondary objective was to determine whether the incorporation of POCUS reduces time to operative care for patients with ruptured ectopic pregnancy specifically, when compared to RADUS alone.

METHODS: We performed a retrospective review of patients admitted for operative management of ectopic pregnancy. We excluded patients with known ectopic pregnancy and/or imaging prior to arriving to the treatment area, found not to have an ectopic pregnancy, or did not undergo operative care. Descriptive statistics, classical and nonparametric statistical analysis, and linear regression were performed.

RESULTS: There were 220 patients admitted with ectopic pregnancy, 111 met exclusion criteria, yielding 109 for analysis. Of 109, 36 received POCUS (23/36 also had RADUS), while 73 received RADUS only. Among the POCUS group 31/36 (86%) were classified as ruptured versus 47/73 (64%) in the RADUS group. The average ED treatment time in the POCUS group for all admitted ectopic pregnancies was 157.9 min (standard deviation [SD] 101.3) versus 206.3 min (SD 76.6) in the RADUS group ($p = 0.0141$). The median time to operating room (OR) for ruptured ectopic pregnancies was 203.0 min (interquartile range [IQR] 159.0) in the POCUS group versus 293.0 min (IQR 139.0) in the RADUS group ($p = 0.0002$). Regression analysis of the primary outcome was limited by multiple interactions and sample size. When controlling for race, positive shock index and ED visit time, POCUS was found to be associated with a significantly shorter time to OR among ruptured ectopic pregnancies compared to RADUS ($p = 0.0052$).

CONCLUSION: Compared to RADUS alone, incorporation of POCUS was associated with significantly faster ED treatment time for all ectopic pregnancies and significantly faster time to OR for ruptured ectopic pregnancies, even when combined with RADUS. When controlling for clinical differences, time to OR was still faster for patients who underwent POCUS. The integration of POCUS should be considered to expedite care for patients with ectopic pregnancy requiring operative care.

Impact of an epic-integrated point-of-care ultrasound workflow on ultrasound performance, compliance, and potential revenue

[pubmed: point of care ultras...](#) by Katie Rong / 24d

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INSIGHTS

Add note

Am J Emerg Med. 2021 Jun 7;49:233-239. doi: 10.1016/j.ajem.2021.06.009. Online ahead of print.

ABSTRACT

OBJECTIVES: The purpose of this study was to describe the design and impact of a point-of-care ultrasound (PoCUS) workflow integrated into the electronic medical record (EMR) on PoCUS utilization, documentation compliance, and resultant revenue potential.

METHODS: This was a single-center retrospective study at an academic center. The study period spanned from December 1, 2018 to June 30, 2019 (pre-implementation) to August 1, 2019 to February 29, 2020 (post-implementation). The implementation date was July 11, 2019 at which time a PoCUS workflow was integrated into the EMR in the emergency department without the purchase of middleware. Prior to this new workflow, a non-automated workflow was in place. PoCUS scan data were extracted from the EMR and archived examinations. The mean number of PoCUS examinations performed per month per 100 ED visits before and after implementation of the new workflow were compared using an unpaired t-test, stratified by all health care professionals, and attending physicians alone. The rate of documentation compliance before and after implementation of the new workflow were compared using a chi square contingency test. Potential revenue was calculated for each period by multiplying the number of eligible examinations by the respective 2020 Medicare conversion factor Relative Value Units.

RESULTS: Utilization of PoCUS from pre-implementation to post-implementation increased 28.7% from 5.01 to 6.45 mean examinations per month per 100 ED visits by all health care professionals ($p = 0.063$), and 75.1% from 2.01 to 3.52 by attending physicians ($p = 0.0001$). Examinations in compliance with workflow requirements increased from 153 (14.7%) to 1307 (94.0%). The rate of workflow compliance improved from 14.7% to 94.0% of examinations ($p < 0.0001$). Potential revenue increased from \$546.01 to \$22,014.47.

CONCLUSIONS: The implementation of a middleware-free PoCUS workflow at our institution was associated with increased PoCUS utilization, documentation compliance, and potential revenue.

Confidence and use of physical examination and point-of-care ultrasonography for detection of abdominal or pleural free fluid. A cross-sectional survey

[pubmed: point of care ultrasonography](#) by Antonio Leidi / 23d

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INSIGHTS

Add note

Intern Emerg Med. 2021 Jun 20. doi: 10.1007/s11739-021-02781-1. Online ahead of print.

ABSTRACT

Physical examination (PE) has always been a corner stone of medical practice. The recent advances in imaging and fading of doctors' ability in performing it, however, raised doubts on PE usefulness. Point-of-care ultrasonography (POCUS) is gaining ground in medicine with the

detection of free fluids being one of its main applications. To estimate physicians' confidence and use of PE and POCUS for the detection of abdominal or pleural free fluid, we conducted a cross-sectional survey. In all, 246 internal and emergency medicine physicians answered to the survey (197 in-hospital physicians and 49 general practitioners; response rate 28.5%). Almost all declared to perform PE in case of suspected ascites or pleural effusion (88% and 90%, respectively). The highest rates of confidence were observed in conventional PE signs (91% for diminished breath sounds, 80% for dullness to thorax percussion, and 66% for abdominal flank dullness). For the remaining signs, rates of confidence were less than 53%. Physicians with > 15 years of experience and POCUS-naïve doctors reported higher confidence in PE. Most of emergency and almost half of internal medicine physicians (78% and 44%, respectively) attended a structured POCUS course. POCUS use was higher among trained physicians for both ascites (84% vs 50%, $p < 0.001$) and pleural effusion (80% vs 34%, $p < 0.001$). Similarly, higher POCUS use was observed in younger physicians. In conclusion, PE is frequently performed and rates of confidence are low for most PE signs, especially among young doctors and POCUS users. This detailed inventory suggests an ongoing shift towards POCUS integration in clinical practice.

Assessment of the Effect of Recruitment Maneuver on Lung Aeration Through Imaging Analysis in Invasively Ventilated Patients: A Systematic Review

["lung ultrasound" or "lung ultrasonograp..."](#) by Charalampos Pierrakos / 23d

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INSIGHTS

Add note

Front Physiol. 2021 Jun 4;12:666941. doi: 10.3389/fphys.2021.666941. eCollection 2021.

ABSTRACT

Background: Recruitment maneuvers (RMs) have heterogeneous effects on lung aeration and have adverse side effects. We aimed to identify morphological, anatomical, and functional imaging characteristics that might be used to predict the RMs on lung aeration in invasively ventilated patients. **Methods:** We performed a systemic review. Studies included invasively ventilated patients who received an RM and in whom re-aeration was examined with chest computed tomography (CT), electrical impedance tomography (EIT), and lung ultrasound (LUS) were included. **Results:** Twenty studies were identified. Different types of RMs were applied. The amount of re-aerated lung tissue after an RM was highly variable between patients in all studies, irrespective of the used imaging technique and the type of patients (ARDS or non-ARDS). Imaging findings suggesting a non-focal morphology (i.e., radiologic findings consistent with attenuations with diffuse or patchy loss of aeration) were associated with higher likelihood of recruitment and lower chance of overdistention than a focal morphology (i.e., radiological findings suggestive of lobar or segmental loss of aeration). This was independent of the used imaging technique but only observed in patients with ARDS. In patients without ARDS, the results were inconclusive. **Conclusions:** ARDS patients with imaging findings suggestive of non-focal morphology show most re-aeration of previously consolidated lung tissue after RMs. The role of imaging techniques in predicting the effect of RMs on re-aeration in patients without ARDS remains uncertain.

Wireless point-of-care ultrasound: First experiences with a new generation handheld device

pubmed: [point of care ultras...](#)by E M Jung / 23d

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INSIGHTS

Add note

Clin Hemorheol Microcirc. 2021 Jun 11. doi: 10.3233/CH-211197. Online ahead of print.

ABSTRACT

AIM: To evaluate the diagnostic reliability of a new generation wireless point-of care ultrasound device for abdominal and thoracic findings.

MATERIAL AND METHODS: 40 patients (16 females, 24 males 19 -80 years, on average 56.1 years) were scanned by an experienced examiner using the new wireless Vscan Air device for abdominal and thoracic findings. The probe frequencies were 2-5 MHz (convex probe) and 3-12 MHz for the linear probe. As a reference standard, all patients were also examined using high-end ultrasound (LOGIQ E9/10). Results were interpreted independently by two examiners in consensus, also with regard to the image quality (0-4, from not assessable = 0, to excellent 4).

RESULTS: In all 40 patients (100%) examination with conventional high-end ultrasound and the Vscan Air ultrasound device was feasible. Sensitivity, specificity, positive and negative predictive value for the diagnosis of abdominal and thoracic findings were 63.3%, 100%, 100%, and 40%, respectively. Most main diagnostic findings were detected using the mobile device compared to the high-end ultrasound. Limitations were found regarding characterization and classification of hepatic and renal tumorous lesions. Image quality revealed mostly minor diagnostic limitations for the mobile device, mean 2.9 (SD -0.300) and was excellent or with only minor diagnostic limitations for conventional high-end ultrasound, mean 3.25 (SD -0.438).

CONCLUSION: Due to its easy application and its high diagnostic reliability, point-of-care ultrasound systems of the latest generation represent a valuable imaging method for the primary assessment of abdominal and thoracic findings, especially in patients on intensive care units or in emergency situations.

Lung ultrasound guided pulmonary recruitment during mechanical ventilation in neonates: A case series

"lung ultrasound" or "lung ultrasonograp..."by M Pierro / 23d

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INSIGHTS

Add note

J Neonatal Perinatal Med. 2021 Jun 17. doi: 10.3233/NPM-210722. Online ahead of print.

ABSTRACT

BACKGROUND: Recently, the first report of lung ultrasound (LUS) guided recruitment during open lung ventilation in neonates has been published. LUS guided recruitment can change the approach to open lung ventilation, which is currently performed without any measure of lung function/lung expansion in the neonatal population.

METHODS: We included all the newborn infants that underwent a LUS-guided recruitment maneuver during mechanical ventilation as a rescue attempt for an extremely severe respiratory condition with oxygen saturation/fraction of inspired oxygen (SpO₂/FIO₂) ratio below 130 or the inability to wean off mechanical ventilation.

RESULTS: We report a case series describing 4 LUS guided recruitment maneuvers, underlying crucial aspects of this technique that can improve the effectiveness of the procedure. In particular, we describe a novel pattern (the S-pattern) that allows us to distinguish the recruitable from the unrecruitable lung and guide the pressure titration phase. Additionally, we describe the optimal LUS-guided patient positioning.

CONCLUSIONS: We believe that the inclusion of specifications regarding patient positioning and the S-pattern in the LUS-guided protocol may be beneficial for the success of the procedure.

Images in Primary Care Medicine: Point-of-Care Ultrasound in Gout

[pubmed: point of care ultras...](#) by Dennis Espejo / 22d

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INSIGHTS

Add note

Cureus. 2021 May 18;13(5):e15096. doi: 10.7759/cureus.15096.

ABSTRACT

Gout is the most common crystal arthropathy and is frequently diagnosed and managed by primary care physicians. Point-of-care ultrasound (POCUS) is a valuable tool to aid in the diagnosis of gout via the identification of the double contour sign, aggregates of crystals, tophi, and erosions. In addition, POCUS can aid in the management of gout by recognizing early signs of gout, monitoring the effectiveness of urate-lowering therapy, and guiding aspiration and corticosteroid injection.

Effect of point-of-care gastrointestinal ultrasound on decision-making and management in inflammatory bowel disease

[pubmed: point of care ultras...](#) by Antony B Friedman / 22d

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INSIGHTS

Add note

Aliment Pharmacol Ther. 2021 Jun 22. doi: 10.1111/apt.16452. Online ahead of print.

ABSTRACT

BACKGROUND: Gastrointestinal ultrasound is increasingly used for point of care assessment of inflammatory bowel disease.

AIMS: To explore the utility of gastrointestinal ultrasound as a point-of-care assessment tool from the perspectives of the clinician and patient.

METHODS: A prospective, observational cohort study was designed utilising routine outpatient consultations. Adult patients with inflammatory bowel disease were allocated to receive gastrointestinal ultrasound or not at the discretion of their treating clinician. Patients completed self-reported session experience questionnaires at study entry, immediately after their consultation, and 4 and 16 weeks later. Clinicians reported disease activity status, therapeutic decisions and clinical management.

RESULTS: Of 259 participants, mean age 40 (SD: 13) years, 54% male, 73 (28%) underwent ultrasound. Time since diagnosis was 9.2 (8.5) years (ultrasound) and 11.3 (9.2) years (no ultrasound). Immediately after ultrasound, patients who self-reported active disease reported better understanding of all aspects of their disease and disease symptoms were more confident in their ability to make informed decisions about managing their disease and had improved knowledge domain scores compared with the non-ultrasound group (all $P < 0.05$). Ultrasound had no influence over the patients' ability to manage their own healthcare but tended to be associated with transient improvement in medication adherence. After the ultrasound, the clinician's assessment of patient's disease activity changed in 22% (16/73) and management was altered in 56% (41/73) with anti-inflammatory therapy escalated in 33. About 47% (23/49) patients with Crohn's disease had their medication changed in the ultrasound group, compared to only 22% (25/112) in the nonultrasound group ($P = 0.002$). For patients with ulcerative colitis, medications were altered in 68% (15/22) compared to 26% (24/70) in the nonultrasound group ($P = 0.005$) When stratified for disease activity, medication change was more likely in those having ultrasound ($P = 0.024$).

CONCLUSIONS: Point-of-care gastrointestinal ultrasound has the potential to enhance the clinical management of inflammatory bowel disease by contributing to clinician decision-making and education of patients regarding their disease.

SONO case series: how to recognise an LV thrombus when you see one, a review of cardiac point-of-care ultrasound

[pubmed: point of care ultras...](#) by Eric Tam / 21d

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INSIGHTS

Add note

Emerg Med J. 2021 Jun 22:emermed-2021-211210. doi: 10.1136/emermed-2021-211210.
Online ahead of print.

NO ABSTRACT

PMID:34158389 | DOI:10.1136/emermed-2021-211210

Painless loss of vision: rapid diagnosis of a central retinal artery occlusion utilizing point-of-care ultrasound

[pubmed: point of care ultras...](#) by Gregory M Taylor / 21d
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INSIGHTS

Add note

Oxf Med Case Reports. 2021 Jun 18;2021(6):omab038. doi: 10.1093/omcr/omab038.
eCollection 2021 Jun.

ABSTRACT

Point-of-care ultrasound (POCUS) has become an essential part of the evaluation of vision loss among emergency physicians in the emergency department (ED). It is frequently used to evaluate for vitreous hemorrhage, foreign bodies, retinal detachment, optic neuritis and posterior vitreous detachment; however, it can also be used to evaluate for a central retinal artery occlusion (CRAO). A POCUS can reveal a hyperechoic density in the optic nerve sheath just proximal to the retinal surface, and this is referred to as a retrobulbar 'spot sign' (RBSS). We present the case of an 88-year-old male that presented to our community ED with a painless loss of vision to his right eye. A POCUS revealed an RBSS of the central retinal artery and he was subsequently diagnosed with a CRAO. At his 1-month follow-up, he has regained light perception and 15% of his vision, however, remains with significant visual impairment.

Use of ultrasound to diagnose and monitor interstitial lung disease in rheumatic diseases

["lung ultrasound" or "lung ultrasonograp...](#) by Esther F Vicente-Rabaneda / 21d
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INSIGHTS

Add note

Clin Rheumatol. 2021 Jun 23. doi: 10.1007/s10067-021-05761-0. Online ahead of print.

ABSTRACT

Interstitial lung disease (ILD) is one of the most relevant extra-articular manifestations of rheumatic diseases resulting in a substantial increase in morbidity and mortality. Early diagnosis and close monitoring to identify patients at high risk of progression are crucial to establish the need for targeted treatment with immunomodulatory and antifibrotic drugs, with potential ability to change the course of the disease. However, there are unmet needs in this field as pulmonary auscultation, chest radiography, or pulmonary function studies do not allow identification of the most incipient stages of the disease. High-resolution computed tomography (HRCT), which is the current gold standard for diagnosis and evolutionary control, is problematic owing to ionizing radiation, cost, and accessibility. In this context, lung ultrasound (LUS) is an attractive tool in a growing research and validation process. The identification of vertical artifacts, such as B lines, and alterations of the pleural line present a good correlation with the presence of ILD by HRCT and have a good concordance with the extent and severity of the disease, with sensitivity and negative predictive values of up to 100%. Regarding the monitoring of the evolution, the validation process of LUS is in a more preliminary phase but data is encouraging. All this, together with its safety, accessibility, low cost, and good patient acceptance, postulate LUS as a useful tool for the screening of ILD and for the optimization of the indications of HRCT. Key Points • The good sensitivity and negative predictive values of LUS postulate this technique as a useful tool for the screening of ILD and for the optimization of the indications of HRCT in rheumatic diseases.

A-lines and B-lines in patients with acute heart failure

["lung ultrasound" or "lung ultrasonograp..."](#) by Øyvind Johannessen / 21d

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INSIGHTS

Add note

Eur Heart J Acute Cardiovasc Care. 2021 Jun 23:zuab046. doi: 10.1093/ehjacc/zuab046.
Online ahead of print.

ABSTRACT

AIMS: Lung ultrasound (LUS) relies on detecting artefacts, including A-lines and B-lines, when assessing dyspnoeic patients. A-lines are horizontal artefacts and characterize normal lung, whereas multiple vertical B-lines are associated with increased lung density. We sought to assess the prevalence of A-lines and B-lines in patients with acute heart failure (AHF) and examine their clinical correlates and their relationship with outcomes.

METHODS AND RESULTS: In a prospective cohort study of adults with AHF, eight-zone LUS and echocardiography were performed early during the hospitalization and pre-discharge at an imaging depth of 18 cm. A- and B-lines were analysed separately off-line, blinded to clinical and outcome data. Of 164 patients [median age 71 years, 61% men, mean ejection fraction (EF) 40%], the sum of A-lines at baseline ranged from 0 to 19 and B-line number from 0 to 36. One

hundred and fifty-six patients (95%) had co-existing A-lines and B-lines at baseline. Lower body mass index and lower chest wall thickness were associated with a higher number of A-lines (P trend < 0.001 for both). In contrast to B-lines, there was no significant change in the number of A-lines from baseline to discharge (median 6 vs. 5, P = 0.80). While B-lines were associated with 90-day HF readmission or death, A-lines were not [HR 1.67, 95% confidence interval (CI) 1.11-2.51 vs. HR 0.97, 95% CI 0.65-1.43].

CONCLUSIONS: A-lines and B-lines on LUS co-exist in the vast majority of hospitalized patients with AHF. In contrast to B-lines, A-lines were not associated with adverse outcomes.

Lung ultrasound may improve COVID-19 safety protocols

["lung ultrasound" or "lung ultrasonograp...](#)by Szymon Skoczyński / 20d

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INSIGHTS

Add note

J Thorac Dis. 2021 May;13(5):2698-2704. doi: 10.21037/jtd-21-295.

NO ABSTRACT

PMID:34164162 | PMC:PMC8182528 | DOI:10.21037/jtd-21-295

Lung ultrasound may help in the differential diagnosis of suspected oligosymptomatic COVID-19 patients on hemodialysis: A case report

["lung ultrasound" or "lung ultrasonograp...](#)by Marco Allinovi / 20d

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INSIGHTS

Add note

Hemodial Int. 2021 Jun 24. doi: 10.1111/hdi.12958. Online ahead of print.

ABSTRACT

INTRODUCTION: Considering that patients on dialysis showed a poor outcome during COVID-19 pandemic, and that COVID-19 symptoms in dialysis patients are often mild or absent, each dialysis unit should implement local strategies to early recognize patients affected by COVID-19. However, many available SARS-CoV-2 diagnostic tests demonstrated a moderate sensitivity, 70%-80% is probably a reasonable estimate. Consequently, having useful tools for differential diagnosis becomes essential. In this scenario, lung ultrasound (LUS) may have an important role in the evaluation of lung involvement in hemodialysis patients during COVID-19 pandemic.

METHODS: We present two cases of hemodialysis patients with COVID-19 pneumonia in whom LUS had a central role in the diagnostic process. Ultrasound images of COVID-19 pneumonia show a typical bilateral pattern characterized by multiple or confluent B-lines with spared areas, thickened and irregular pleural line, and rare subpleural consolidations. LUS showed high accuracy in diagnosing COVID-19 pneumonia.

FINDINGS: Despite both patients appeared clinically euvolemic and afebrile, they presented with acute diarrhea and oxygen saturation level of 92%-93%. Although clinical manifestations were mild and not specific in both patients, LUS raised suspicion on the possible COVID-19 diagnosis which was confirmed by a positive nasopharyngeal RT-PCR.

DISCUSSION: There are many reasons for a patient on dialysis to present shortness of breath, fever, and multiple B-lines at LUS assessment (such as heart failure, fluid overload, vascular access infection, interstitial pneumonia) but the recognition of typical ultrasound patterns of the COVID-19 pneumonia is helpful for differential diagnosis. LUS may have an important role in the screening process of hemodialysis patients during the COVID-19 pandemic, especially in oligosymptomatic patients before the SARS-CoV-2 diagnostic tests, and in those with suspected symptoms and/or known exposure with unexpected negative SARS-CoV-2 diagnostic tests.

Scoring System for Differentiation of Complicated Appendicitis in Pediatric Patients: Appendicitis Scoring System in Children

[pubmed: pediatric appendicit...by Yujin Lee / 20d](#)

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INSIGHTS

Add note

Glob Pediatr Health. 2021 Jun 8;8:2333794X211022268. doi: 10.1177/2333794X211022268. eCollection 2021.

ABSTRACT

Although several scoring systems have been used to differentiate simple acute appendicitis from perforated appendicitis, no particular system has been widely accepted. Therefore, this study aimed to investigate preoperative factors associated with complicated appendicitis and to develop a scoring system that distinguishes complicated appendicitis in children aged <10 years. Patients aged <10 years who underwent surgical treatment for acute appendicitis between 2011 and 2019 were included in this study, after excluding those with insufficient medical records, with other diseases that affect the length of hospitalization, or without formal reports of abdominal computed tomography (CT) or ultrasonography (US). Complicated appendicitis was defined as hospitalization for ≥ 5 days postoperatively or readmission within 30 days postoperatively. Patient characteristics, symptoms, physical examination, laboratory data, and radiographic results were collected to determine predictors of complicated appendicitis. The mean age of 279 patients was 7.3 years. Among them, 57 patients had complicated appendicitis. A scoring system was developed based on the following 5 independent risk factors derived from multiple logistic regression analysis: body temperature, anorexia, diarrhea, C-reactive protein (CRP) level, and presence of periappendiceal free fluid on CT or US. The

scoring system resulted in an area under the curve of .898 ($P < .001$). For patients aged <10 years, a new model that includes objective factors, such as body temperature, CRP levels, and radiography results, might help predict complicated appendicitis and determine treatment plans.

Assessing the accuracy of ultrasound measurements of tracheal diameter: an in vitro experimental study

[pubmed: intubation ultrasoun...](#)by Ran Ye / 20d

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INSIGHTS

Add note

BMC Anesthesiol. 2021 Jun 24;21(1):177. doi: 10.1186/s12871-021-01398-3.

ABSTRACT

BACKGROUND: Recent studies indicate that ultrasound can detect changes in tracheal diameter during endotracheal tube (ETT) cuff inflation. We sought to assess the accuracy of ultrasound measurement of tracheal diameter, and to determine the relationship between tracheal wall pressure (TWP), cuff inflation volume (CIV), and the degree of tracheal deformation.

METHODS: Our study comprised two parts: the first included 45 porcine tracheas, the second 41 porcine tracheas. Each trachea was intubated with a cuffed ETT, which was connected to an injector and the manometer via a three-way tap. The cuff was inflated and the cuff pressure recorded before and after intubation. The tracheal diameter was measured using ultrasound. This included three separate measurements: outer transverse diameter (OTD), internal transverse diameter (ITD), and anterior tracheal wall thicknesses (ATWT). A precision electronic Vernier caliper was also used to measure tracheal diameter. We calculated TWP and the percentage change of tracheal diameter. The Bland-Altman method, linear regression, and locally weighted regression (LOESS) were used to analyze the data.

RESULTS: There were strong correlation and agreement for OTD ($r = 0.97$, $P < 0.001$) and ITD ($r = 0.90$, $P < 0.001$) as measured by ultrasound and by precision electronic Vernier caliper, but a poor correlation for ATWT ($r = 0.58$, $P < 0.001$). There was a strong correlation between the percentage change of OTD (OTD%, $r = 0.75$, $P < 0.001$) and CIV, the percentage change of ITD (ITD%, $r = 0.77$, $P < 0.001$) and CIV, TWP ($r = 0.75$, $P < 0.001$) and CIV. And a strong correlation was also found between TWP and OTD% ($r = 0.84$, $P < 0.001$), TWP and ITD% ($r = 0.84$, $P < 0.001$).

CONCLUSIONS: Use of ultrasound to measure OTD and ITD is accurate, but is less accurate for ATWT. There is a close correlation between OTD%, ITD%, CIV and TWP.

Ultrasound Assessment of the Inferior Vena Cava for Fluid Responsiveness: Making the Case for Skepticism

[pubmed: bUS](#)by Scott J Millington / 19d

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INSIGHTS

Add note

J Intensive Care Med. 2021 Jun 25:8850666211024176. doi: 10.1177/08850666211024176. Online ahead of print.

ABSTRACT

Determining whether a patient in shock is in a state of fluid responsiveness (FR) has long been the Holy Grail for clinicians who care for acutely ill patients. While various tools have been put forth as solutions to this important problem, ultrasound assessment of the inferior vena cava has received particular attention of late. Dozens of studies have examined its ability to determine whether a patient should receive volume expansion, and general enthusiasm has been strengthened by the fact that it is easy to perform and non-invasive, unlike many competing FR tests. A deeper examination of the technique, however, reveals important concerns regarding inaccuracies in measurement and a high prevalence of confounding factors. Furthermore, a detailed review of the evidence (small individual studies, multiple meta-analyses, and a single large trial) reveals that the tool performs poorly in general and is unlikely to be helpful at the bedside in circumstances where genuine clinical uncertainty exists.

Quantitative measurements of haemophilic joint tissues by point-of-care musculoskeletal ultrasound: Associations with clinical and functional joint outcome parameters

[pubmed: point of care ultras...](#)by Akram Mesleh Shayeb / 19d

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INSIGHTS

Add note

Haemophilia. 2021 Jun 25. doi: 10.1111/hae.14368. Online ahead of print.

ABSTRACT

BACKGROUND: Painful arthropathy is a long-term complication in patients with hemophilia (PWH), affecting mobility and quality of life. A major barrier for the appraisal of joint health is the absence of point-of-care (POC) imaging modalities to promptly identify and manage arthropathic changes. Accordingly, we developed the Joint tissue Activity and Damage Exam (JADE) POC musculoskeletal ultrasound (MSKUS) protocol. JADE is validated for haemophilic joint tissue recognition with high intra/inter-rater and inter-operator reliability.

AIMS: Evaluate associations of JADE with clinical (Hemophilia Joint Health Score, [HJHS]) and functional (total arc [combined flexion and extension range of motion [ROM]]) parameters.

METHODOLOGY: In this multi-centre prospective study, we recruited PWH A or B with at least one arthropathic joint. We evaluated joint health (both elbows, knees, and ankles) by comparing JADE measurements (soft tissue and cartilage thickness, and osteochondral alterations) with HJHS and total arc.

RESULTS: Of 44 PWH, most had hemophilia A (35/44), were severe (36/44) and had a median age of 36 years. Increasing HJHSs and declining total arc, indicating worsening arthropathy, were associated with JADE measurements in the expected direction, including (1) increasing length of osteochondral alterations, (2) diminished cartilage thickness, and (3) greater soft tissue expansion. The ankles had the highest proportion of joints without measurable (missing) cartilage. In multivariable models MSKUS measurements explained 68% and 71% of the variation in HJHS and total arc respectively for the elbow, 55% and 29% respectively for the knee, and 50% and 73% for the ankle.

CONCLUSIONS: This study highlights the associations of direct intra-articular ultrasonography measurements using the JADE protocol with clinical and functional parameters. Our findings underscore the clinical value of POC MSKUS using the JADE protocol as a complementary instrument for the diagnosis and management of haemophilic arthropathy.

Ultrasound versus Computed Tomography Assessment of Focal Lung Aeration in Invasively Ventilated ICU Patients

["lung ultrasound" or "lung ultrasonograp...](#) by Marry R Smit / 18d
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INSIGHTS

Add note

Ultrasound Med Biol. 2021 Jun 22:S0301-5629(21)00249-0. doi: 10.1016/j.ultrasmedbio.2021.05.019. Online ahead of print.

ABSTRACT

It is unknown whether and to what extent the penetration depth of lung ultrasound (LUS) influences the accuracy of LUS findings. The current study evaluated and compared the LUS aeration score and two frequently used B-line scores with focal lung aeration assessed by chest computed tomography (CT) at different levels of depth in invasively ventilated intensive care unit (ICU) patients. In this prospective observational study, patients with a clinical indication for chest CT underwent a 12-region LUS examination shortly before CT scanning. LUS images were compared with corresponding regions on the chest CT scan at different subpleural depths. For each LUS image, the LUS aeration score was calculated. LUS images with B-lines were scored as the number of separately spaced B-lines (B-line count score) and the percentage of the screen covered by B-lines divided by 10 (B-line percentage score). The fixed-effect correlation

coefficient (β) was presented per 100 Hounsfield units. A total of 40 patients were included, and 372 regions were analyzed. The best association between the LUS aeration score and CT was found at a subpleural depth of 5 cm for all LUS patterns ($\beta = 0.30$, $p < 0.001$), 1 cm for A- and B1-patterns ($\beta = 0.10$, $p < 0.001$), 6 cm for B1- and B2-patterns ($\beta = 0.11$, $p < 0.001$) and 4 cm for B2- and C-patterns ($\beta = 0.07$, $p = 0.001$). The B-line percentage score was associated with CT ($\beta = 0.46$, $p = 0.001$), while the B-line count score was not ($\beta = 0.07$, $p = 0.305$). In conclusion, the subpleural penetration depth of ultrasound increased with decreased aeration reflected by the LUS pattern. The LUS aeration score and the B-line percentage score accurately reflect lung aeration in ICU patients, but should be interpreted while accounting for the subpleural penetration depth of ultrasound.

Audit of ultrasound usage in emergency departments in greater metropolitan Brisbane

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

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INSIGHTS

Add note

Emerg Med Australas. 2021 Jun 25. doi: 10.1111/1742-6723.13817. Online ahead of print.

ABSTRACT

OBJECTIVE: The Australasian College for Emergency Medicine identifies five ultrasound applications which the College deem core to the practice of emergency medicine but there is scant information as to the uptake of ultrasound or the qualification of users. This study aims to determine the percentage of ED physicians in one metropolitan area who utilise ultrasound for core diagnostic and procedural applications in participating hospitals and the percentage of users who have been formally assessed in any ultrasound application.

METHODS: The EDs of eight major public hospitals in greater metropolitan Brisbane area participated in this audit. Data-collectors at each participating ED approached every senior house officer, registrar and senior medical officer in the department and, after obtaining informed consent, asked the participant six questions pertaining to their use of ultrasound for five core applications and about ultrasound training and recorded the answers without information as to the identity of the participant.

RESULTS: 94.4% of the physicians participated. Of those participating, 90% used ultrasound for venous access, with progressively fewer using E-FAST (69%), AAA (51%), Lung (40%) and BELS (29%) for diagnostic purposes. Ninety-eight percent of participants were in favour of enhanced departmental training. Only 33% of participants had their ultrasound skills assessed by a qualified person for even one application.

CONCLUSION: While use of ultrasound in some applications is widespread, few users have had their skills assessed. Assessment being a routine part of structured training, it cannot be assumed that these users can competently use ultrasound for procedural or diagnostic applications.

Determining the optimal number of lung ultrasound zones to monitor COVID-19 patients: can we keep it ultra-short and ultra-simple?

["lung ultrasound" or "lung ultrasonograp...](#)by Micah L A Heldeweg / 18d
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INSIGHTS

Add note

Intensive Care Med. 2021 Jun 26. doi: 10.1007/s00134-021-06463-6. Online ahead of print.

NO ABSTRACT

PMID:34173859 | DOI:10.1007/s00134-021-06463-6

Evaluation of High Altitude Interstitial Pulmonary Edema in Healthy Participants Using Rapid 4-View Lung Ultrasound Protocol During Staged Ascent to Everest Base Camp

["lung ultrasound" or "lung ultrasonograp...](#)by Craig D Nowadly / 17d
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INSIGHTS

Add note

Wilderness Environ Med. 2021 Jun 23:S1080-6032(21)00065-X. doi: 10.1016/j.wem.2021.03.004. Online ahead of print.

ABSTRACT

INTRODUCTION: Prior research identified possible interstitial pulmonary fluid, concerning for early high altitude pulmonary edema (HAPE), in a large percentage of trekkers above 3000 m using a comprehensive 28-view pulmonary ultrasound protocol. These trekkers had no clinical symptoms of HAPE despite these ultrasound findings. The more common 4-view lung ultrasound protocol (LUP) is accurate in rapidly detecting interstitial edema during resource-rich care. The objective of this study was to evaluate whether the 4-view LUP detects interstitial fluid in trekkers ascending to Everest Base Camp.

METHODS: Serial 4-view LUP was performed on 15 healthy trekkers during a 9-d ascent from Kathmandu to Everest Base Camp. Ascent protocols complied with Wilderness Medical Society guidelines for staged ascent. A 4-view LUP was performed in accordance with the published 2012 international consensus protocols on lung ultrasound. Symptom assessment and 4-view LUP were obtained at 6 waypoints along the staged ascent. A 4-view LUP was positive for interstitial edema if ≥ 3 B-lines were detected in 2 ultrasound windows.

RESULTS: A single participant had evidence of interstitial lung fluid at 5380 m as defined by the 4-view LUP. There was no evidence of interstitial fluid in any participant below 5380 m. One participant was evacuated for acute altitude sickness at 4000 m but showed no preceding sonographic evidence of interstitial fluid.

CONCLUSIONS: In this small study, sonographic detection of interstitial fluid, suggestive of early HAPE, was not identified by the 4-view LUP protocol.

Diaphragm thickening fraction predicts noninvasive ventilation outcome: a preliminary physiological study

[pubmed: diaphragm AND ultrasound variant...](#) by Giovanna Mercurio / 17d
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INSIGHTS

Add note

Crit Care. 2021 Jun 26;25(1):219. doi: 10.1186/s13054-021-03638-x.

ABSTRACT

BACKGROUND: A correlation between unsuccessful noninvasive ventilation (NIV) and poor outcome has been suggested in de-novo Acute Respiratory Failure (ARF) patients. Consequently, it is of paramount importance to identify accurate predictors of NIV outcome. The aim of our preliminary study is to evaluate the Diaphragmatic Thickening Fraction (DTF) and the respiratory rate/DTF ratio as predictors of NIV outcome in de-novo ARF patients.

METHODS: Over 36 months, we studied patients admitted to the emergency department with a diagnosis of de-novo ARF and requiring NIV treatment. DTF and respiratory rate/DTF ratio were measured by 2 trained operators at baseline, at 1, 4, 12, 24, 48, 72 and 96 h of NIV treatment and/or until NIV discontinuation or intubation. Receiver operating characteristic (ROC) curve analysis was performed to evaluate the ability of DTF and respiratory rate/DTF ratio to distinguish between patients who were successfully weaned and those who failed.

RESULTS: Eighteen patients were included. We found overall good repeatability of DTF assessment, with Intra-class Correlation Coefficient (ICC) of 0.82 (95% confidence interval 0.72-0.88). The cut-off values of DTF for prediction of NIV failure were < 36.3% and < 37.1% for the operator 1 and 2 ($p < 0.0001$), respectively. The cut-off value of respiratory rate/DTF ratio for prediction of NIV failure was > 0.6 for both operators ($p < 0.0001$).

CONCLUSION: DTF and respiratory rate/DTF ratio may both represent valid, feasible and noninvasive tools to predict NIV outcome in patients with de-novo ARF.

Diaphragm thickening fraction predicts noninvasive ventilation outcome: a preliminary physiological study

[pubmed: diaphragm AND ultrasound variant...](#) by Giovanna Mercurio / 17d
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INSIGHTS

Add note

Crit Care. 2021 Jun 26;25(1):219. doi: 10.1186/s13054-021-03638-x.

ABSTRACT

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METHODS: Over 36 months, we studied patients admitted to the emergency department with a diagnosis of de-novo ARF and requiring NIV treatment. DTF and respiratory rate/DTF ratio were measured by 2 trained operators at baseline, at 1, 4, 12, 24, 48, 72 and 96 h of NIV treatment and/or until NIV discontinuation or intubation. Receiver operating characteristic (ROC) curve analysis was performed to evaluate the ability of DTF and respiratory rate/DTF ratio to distinguish between patients who were successfully weaned and those who failed.

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CONCLUSION: DTF and respiratory rate/DTF ratio may both represent valid, feasible and noninvasive tools to predict NIV outcome in patients with de-novo ARF.

Lung Ultrasound in COVID-19: Clinical Correlates and Comparison with Chest Computed Tomography

["lung ultrasound" or "lung ultrasonograp..."](#) by Grazia Portale / 17d

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INSIGHTS

Add note

SN Compr Clin Med. 2021 Jun 18:1-7. doi: 10.1007/s42399-021-00986-1. Online ahead of print.

ABSTRACT

Lung ultrasound (LUS) and chest computed tomography (chest CT) are largely employed to evaluate coronavirus disease 2019 (COVID-19) pneumonia. We investigated semi-quantitative

LUS and CT scoring in hospitalized COVID-19 patients. LUS and chest CT were performed within 24 h upon admission. Both were analyzed according to semi-quantitative scoring systems. Subgroups were identified according to median LUS score. Patients within higher LUS score group were older (79 vs 60 years, $p < 0.001$), had higher C-reactive protein (CRP) (7.2 mg/dl vs 1.3 mg/dl, $p < 0.001$) and chest CT score (10 vs 4, $p = 0.027$) as well as lower PaO₂/FiO₂ (286 vs 356, $p = 0.029$) as compared to patients within lower scores. We found a significant correlation between scores ($r = 0.390$, $p = 0.023$). Both LUS and CT scores correlated directly with patients age ($r = 0.586$, $p < 0.001$ and $r = 0.399$, $p = 0.021$ respectively) and CRP ($r = 0.472$, $p = 0.002$ and $r = 0.518$, $p = 0.002$ respectively), inversely with PaO₂/FiO₂ ($r = -0.485$, $p = 0.003$ and $r = -0.440$, $p = 0.017$ respectively). LUS score only showed significant correlation with hs-troponin T, NT-pro-BNP, and creatinine ($r = 0.433$, $p = 0.019$; $r = 0.411$, $p = 0.027$, and $r = 0.497$, $p = 0.001$, respectively). Semi-quantitative bedside LUS is related to the severity of COVID-19 pneumonia similarly to chest CT. Correlation of LUS score with markers of cardiac and renal injury suggests that LUS might contribute to a more comprehensive evaluation of this heterogeneous population.

Perioperative Point-of-Care Ultrasound Use by Anesthesiologists

[pubmed: bUS](#) by Abdullah Naji / 17d

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INSIGHTS

Add note

Cureus. 2021 May 24;13(5):e15217. doi: 10.7759/cureus.15217.

ABSTRACT

Point-of-Care ultrasound (POCUS) is the bedside utilization of ultrasound, in real-time, to aid in the diagnosis and treatment of patients. Image acquisition from POCUS utilization by anesthesiologists involves the assessment of multiple organs in different perioperative situations. POCUS can be utilized to enhance clinical decision-making in a variety of perioperative situations due to its ability to assess endotracheal tube placement, cardiac function, pulmonary function, aspiration risk, hemodynamics, vascular access, and nerve visualization for regional procedures. The mounting clinical evidence for the value of POCUS in perioperative settings, its growing affordability, and its low associated risks are responsible for the nationwide movement across many anesthesiology residency programs to increase the focus on perioperative ultrasound training. The purpose of this review is to present to current anesthesiologists and anesthesiology trainees, a broad discussion regarding the diverse utility and importance of POCUS in perioperative settings.

Bladder Point-of-Care Ultrasound: A Time Saver in the Pediatric Emergency Department

[pubmed: point of care ultras...](#) by Rachel A O'Brian / 17d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 25:S0736-4679(21)00383-8. doi: 10.1016/j.jemermed.2021.04.010. Online ahead of print.

ABSTRACT

BACKGROUND: Pediatric patients undergoing transabdominal pelvic ultrasound require a full bladder as an acoustic window. Patients are typically relied upon to subjectively identify bladder fullness, but inaccurate reporting often leads to delays in test results, diagnosis, and treatment.

OBJECTIVES: Our aim was to objectively evaluate bladder fullness by comparing the height of the bladder to the height of the uterus on point-of-care ultrasound (POCUS). Our hypothesis was that this method would result in faster time to imaging and decrease emergency department length of stay (ED LOS).

METHODS: Bladder fullness was assessed using POCUS every 30 min until the bladder was full. If the height of the bladder was equal to or greater than the height of the uterus in the sagittal view, the bladder was considered full. The POCUS group was compared with a control group that relied solely on patients' self-identified bladder fullness.

RESULTS: Females aged 8-18 years old with pelvic pain in the pediatric ED were included in the study. Forty POCUS patients were compared with a control group of 105 patients. The POCUS group demonstrated a decrease in time to pelvic imaging by 38.7 min (95% confidence interval -59.2 to -18.2; $p < 0.0001$) and a decrease in LOS by 49.2 min (95% CI -89.7 to -8.61; $p = 0.004$). There was poor overall agreement on bladder fullness between patient's subjective sensation and POCUS ($k = 0.04$).

CONCLUSION: POCUS to evaluate bladder fullness by comparing the height of the bladder with the height of the uterus reduces time to pelvic imaging and ED LOS.

Virtual Multi-Specialty Point-of-Care Ultrasound Rotation for 4(th) Year Medical Students during COVID-19: Innovative Teaching Techniques Improve Ultrasound Knowledge and Image Interpretation

[pubmed: point of care ultras...](#) by Joshua Zavitz / 17d

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INSIGHTS

Add note

AEM Educ Train. 2021 Jun 4:e10632. doi: 10.1002/aet2.10632. Online ahead of print.

ABSTRACT

OBJECTIVES: Point-of-Care Ultrasound (PoCUS) has been integrated into undergraduate medical education. The COVID-19 pandemic forced medical schools to evolve clinical rotations to minimize interruption through implementation of novel remote learning courses. To address the students' need for remote clinical education, we created a virtual PoCUS course for our fourth year class. We present details of the course's development, implementation, quality improvement processes, achievements, and limitations.

METHODS: A virtual PoCUS course was created for 141 fourth-year medical students. The learning objectives included ultrasound physics, performing and interpreting ultrasound applications, and incorporating PoCUS into clinical decisions and procedural guidance. Students completed a 30-question pre and post-test focused on ultrasound and knowledge of clinical concepts. PoCUS educators from 10 different specialties delivered the course over 10 days using video-conferencing software. Students watched live scanning demonstrations and practiced ultrasound probe maneuvers using a cellular telephone to simulate ultrasound probe. Students completed daily course evaluations which were used as a continuous needs assessment to make improvements.

RESULTS: 141 students participated in the course, all received a passing grade. The mean pre and post-test scores improved from 58% to 88% ($p < 0.001$) through the course duration. Daily evaluations revealed the percentage of students who rated the course's live scanning sessions and didactic components as "very well" increased from 32.7% on day 1 to 69.7% on day 10. The end-of-course evaluation revealed 91% of students agreed they received effective teaching.

CONCLUSIONS: In response to the COVID-19 pandemic, our multi-specialty faculty expeditiously developed a virtual PoCUS curriculum for the entire fourth year class. This innovative course improved students' ultrasound knowledge, image interpretation and clinical application while utilizing novel techniques to teach a hands-on skill virtually. As the demand for PoCUS instruction continues to increase, the accessibility of virtual training and blended learning will be beneficial.

Intracranial hemorrhage detected through a craniotomy site with point of care ultrasound

pubmed: [point of care ultras...](#)by Svetlana Zakharchenko / 17d

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INSIGHTS

Add note

J Am Coll Emerg Physicians Open. 2021 Jun 18;2(3):e12419. doi: 10.1002/emp2.12419. eCollection 2021 Jun.

ABSTRACT

A 60-year-old male presented to the emergency department with acute change in mental status while recovering from a recent hemicraniectomy. During evaluation by the emergency physician, a point-of-care ultrasound (POCUS) was performed using the patient's existing craniectomy site as a sonographic window. Multiple areas of intracranial hemorrhage were visualized on POCUS and head computed tomography scan ultimately requiring urgent neurosurgical intervention. Our

case report demonstrates an innovative application of POCUS in the emergency department-setting that has potential to expedite diagnosis and management of life-threatening neurosurgical etiologies, such as hemorrhage and midline shift, in a unique patient population.

Ocular Point-of-Care Ultrasound: Description of Intermediate Uveitis in an Adolescent Female

[pubmed: point of care ultras...](#) by Rahul Shah / 16d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jul 1;37(7):382-383. doi: 10.1097/PEC.0000000000002353.

ABSTRACT

Ocular point-of-care ultrasound has been used to assess for intraocular pathology, including retinal and vitreous detachment. We describe a pediatric patient whose initial point-of-care ultrasound examination appeared to be consistent with bilateral posterior vitreous detachment but who was ultimately diagnosed with intermediate uveitis.

Lung ultrasound predicts clinical course but not outcome in COVID-19 ICU patients: a retrospective single-center analysis

[pubmed: intubation ultrasoun...](#) by Stephanie-Susanne Stecher / 16d

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INSIGHTS

Add note

BMC Anesthesiol. 2021 Jun 28;21(1):178. doi: 10.1186/s12871-021-01396-5.

ABSTRACT

BACKGROUND: Point-of-care lung ultrasound (LU) is an established tool in the first assessment of patients with coronavirus disease (COVID-19). Purpose of this study was to evaluate the value of lung ultrasound in COVID-19 intensive care unit (ICU) patients in predicting clinical course and outcome.

METHODS: We analyzed lung ultrasound score (LUS) of all COVID-19 patients admitted from March 2020 to December 2020 to the Internal Intensive Care Unit, Ludwig-Maximilians-University (LMU) of Munich. LU was performed according to a standardized protocol at ICU admission and in case of clinical deterioration with the need for intubation. A normal lung scores

0 points, the worst LUS has 24 points. Patients were stratified in a low (0-12 points) and a high (13-24 points) lung ultrasound score group.

RESULTS: The study included 42 patients, 69% of them male. The most common comorbidities were hypertension (81%) and obesity (57%). The values of pH (7.42 ± 0.09 vs 7.35 ± 0.1 ; $p = 0.047$) and p_aO_2 ($107 [80-130]$ vs $80 [66-93]$ mmHg; $p = 0.034$) were significantly reduced in patients of the high LUS group. Furthermore, the duration of ventilation ($12.5 [8.3-25]$ vs $36.5 [9.8-70]$ days; $p = 0.029$) was significantly prolonged in this group. Patchy subpleural thickening ($n = 38$; 90.5%) and subpleural consolidations ($n = 23$; 54.8%) were present in most patients. Pleural effusion was rare ($n = 4$; 9.5%). The median total LUS was 11.9 ± 3.9 points. In case of clinical deterioration with the need for intubation, LUS worsened significantly compared to baseline LU. Twelve patients died during the ICU stay (29%). There was no difference in survival in both LUS groups (75% vs 66.7%, $p = 0.559$).

CONCLUSIONS: LU can be a useful monitoring tool to predict clinical course but not outcome of COVID-19 ICU patients and can early recognize possible deteriorations.

Specification and guideline for technical aspects and scanning parameter settings of neonatal lung ultrasound examination

"lung ultrasound" or "lung ultrasonograp...by Jing Liu / 16d

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INSIGHTS

Add note

J Matern Fetal Neonatal Med. 2021 Jun 28:1-15. doi: 10.1080/14767058.2021.1940943. Online ahead of print.

ABSTRACT

Lung ultrasound (LUS) is now widely used in the diagnosis and monitor of neonatal lung diseases. Nevertheless, in the published literatures, the LUS images may display a significant variation in technical execution, while scanning parameters may influence diagnostic accuracy. The inter- and intra-observer reliabilities of ultrasound exam have been extensively studied in general and in LUS. As expected, the reliability declines in the hands of novices when they perform the point-of-care ultrasound (POC US). Consequently, having appropriate guidelines regarding to technical aspects of neonatal LUS exam is very important especially because diagnosis is mainly based on interpretation of artifacts produced by the pleural line and the lungs. The present work aimed to create an instrument operation specification and parameter setting guidelines for neonatal LUS. Technical aspects and scanning parameter settings that allow for standardization in obtaining LUS images include (1) select a high-end equipment with high-frequency linear array transducer (12-14 MHz). (2) Choose preset suitable for lung examination or small organs. (3) Keep the probe perpendicular to the ribs or parallel to the intercostal space. (4) Set the scanning depth at 4-5 cm. (5) Set 1-2 focal zones and adjust them close to the pleural line. (6) Use fundamental frequency with speckle reduction 2-3 or similar techniques. (7) Turn off spatial compounding imaging. (8) Adjust the time-gain compensation to get uniform image from the near-to far-field.

Association between lung ultrasound B-lines and exercise-induced pulmonary hypertension in patients with connective tissue disease

["lung ultrasound" or "lung ultrasonograp...](#)by Kazuki Kagami / 15d

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INSIGHTS

Add note

Echocardiography. 2021 Jun 29. doi: 10.1111/echo.15141. Online ahead of print.

ABSTRACT

BACKGROUND: Identification of elevation in pulmonary pressures during exercise may provide prognostic and therapeutic implications in patients with connective tissue disease (CTD). Interstitial lung disease (ILD) is common in CTD patients and subtle interstitial abnormalities detected by lung ultrasound could predict exercise-induced pulmonary hypertension (PH).

METHODS AND RESULTS: Echocardiography and lung ultrasound were performed at rest and bicycle exercise in CTD patients (n = 41) and control subjects without CTD (n = 24). Ultrasound B-lines were quantified by scanning four intercostal spaces in the right hemithorax. We examined the association between total B-lines at rest and the development of exercise-induced PH during ergometry exercise. Compared to controls, the number of total B-lines at rest was higher in CTD patients (0 [0, 0] vs 2 [0, 9], P < .0001) and was correlated with radiological severity of ILD assessed by computed tomography (fibrosis score, r = .70, P < .0001). Pulmonary artery systolic pressure (PASP) was increased with ergometry exercise in CTD compared to controls (48 ± 14 vs 35 ± 13 mm Hg, P = .0006). The number of total B-lines at rest was highly correlated with higher PASP (r = .52, P < .0001) and poor right ventricular pulmonary artery coupling (tricuspid annular plane systolic excursion/PASP ratio, r = -.31, P = .01) during peak exercise. The number of resting B-lines predicted the development of exercise-induced PH with an area under the curve .79 (P = .0003).

CONCLUSIONS: These data may suggest the value of a simple resting assessment of lung ultrasound as a potential tool for assessing the risk of exercise-induced PH in CTD patients.

Just the facts: point-of-care ultrasound for painless loss of vision

[pubmed: point of care ultras...](#)by Michael Gottlieb / 15d

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INSIGHTS

Add note

CJEM. 2021 Jun 29. doi: 10.1007/s43678-021-00169-w. Online ahead of print.

NO ABSTRACT

PMID:34185306 | DOI:10.1007/s43678-021-00169-w

Basic certification process for point-of care-ultrasound in emergency medicine: an European perspective

[pubmed: point of care ultras...](#)by Prem Sukul / 15d

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INSIGHTS

Add note

Eur J Emerg Med. 2021 Aug 1;28(4):254-256. doi: 10.1097/MEJ.0000000000000843.

NO ABSTRACT

PMID:34187989 | DOI:10.1097/MEJ.0000000000000843

Diagnostic Accuracy of Extended Focused Assessment with Sonography for Trauma Performed by Paramedic Students: A Simulation-Based Pilot Study

[focused assessment sonography trauma](#)by Phudit Buaprasert / 14d

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INSIGHTS

Add note

Open Access Emerg Med. 2021 Jun 21;13:249-256. doi: 10.2147/OAEM.S311376. eCollection 2021.

ABSTRACT

BACKGROUND: Training on how to perform a prehospital extended focused assessment with sonography in trauma (EFAST) has resulted in improved outcomes for trauma patients in several countries. The result of previous studies showed good accuracy despite minimal training. However, data on the diagnostic accuracy among untrained paramedic students and the course length in middle-income countries is scarce. In Thailand, the current paramedic education does not include training on prehospital ultrasounds. In the present study, we aimed to investigate the diagnostic accuracy of EFAST among ultrasound-naïve paramedic students and factors that are associated with successful posttest training.

METHODS: Final-year paramedic students attending a 4-year university program were included in this study. A 2-h didactic training session and 1-h hands-on workshop were led by

experienced emergency physicians. The diagnostic indices for EFAST interpretation were obtained pretraining and posttraining. The participants' ultrasound image acquisition was also evaluated individually on a mannequin model using a standardized assessment tool.

RESULTS: In total, 47 paramedic students were voluntarily enrolled and underwent EFAST training. Of these participants, 31 (66%) reported having >1 year of experience in the prehospital field. Four were advanced emergency medical technicians before becoming paramedic students. The sensitivity, specificity, positive predictive value, and negative predictive value after training were 85.7% (95% CI, 81.5-89.3), 81.6% (95% CI, 74.2-87.6), 91.6% (95% CI, 87.9-94.4), and 71% (95% CI, 63.3-77.8), respectively. Previous prehospital experience was not associated with accuracy.

CONCLUSION: This study demonstrated that paramedic students in Thailand were able to achieve a competency comparable with that of other medical professionals in a simulated environment. The total 3 h training course was sufficient for them to acquire EFAST skills.

Lung ultrasound training and evaluation for proficiency among physicians in a low-resource setting

[pubmed: point of care ultras...](#) by Darlene R House / 14d
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INSIGHTS

Add note

Ultrasound J. 2021 Jun 30;13(1):34. doi: 10.1186/s13089-021-00236-4.

ABSTRACT

BACKGROUND: Lung ultrasound (LUS) is helpful for the evaluation of patients with dyspnea in the emergency department (ED). However, it remains unclear how much training and how many LUS examinations are needed for ED physicians to obtain proficiency. The objective of this study was to determine the threshold number of LUS physicians need to perform to achieve proficiency for interpreting LUS on ED patients with dyspnea.

METHODS: A prospective study was performed at Patan Hospital in Nepal, evaluating proficiency of physicians novice to LUS. After eight hours of didactics and hands-on training, physicians independently performed and interpreted ultrasounds on patients presenting to the ED with dyspnea. An expert sonographer blinded to patient data and LUS interpretation reviewed images and provided an expert interpretation. Interobserver agreement was performed between the study physician and expert physician interpretation. Cumulative sum analysis was used to determine the number of scans required to attain an acceptable level of training.

RESULTS: Nineteen physicians were included in the study, submitting 330 LUS examinations with 3288 lung zones. Eighteen physicians (95%) reached proficiency. Physicians reached proficiency for interpreting LUS accurately when compared to an expert after 4.4 (SD 2.2) LUS studies for individual zone interpretation and 4.8 (SD 2.3) studies for overall interpretation, respectively.

CONCLUSIONS: Following 1 day of training, the majority of physicians novice to LUS achieved proficiency with interpretation of lung ultrasound after less than five ultrasound examinations performed independently.

B-line quantification: comparing learners novice to lung ultrasound assisted by machine artificial intelligence technology to expert review

["lung ultrasound" or "lung ultrasonograp...](#)by Frances M Russell / 14d

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INSIGHTS

Add note

Ultrasound J. 2021 Jun 30;13(1):33. doi: 10.1186/s13089-021-00234-6.

ABSTRACT

BACKGROUND: The goal of this study was to assess the ability of machine artificial intelligence (AI) to quantitatively assess lung ultrasound (LUS) B-line presence using images obtained by learners novice to LUS in patients with acute heart failure (AHF), compared to expert interpretation.

METHODS: This was a prospective, multicenter observational study conducted at two urban academic institutions. Learners novice to LUS completed a 30-min training session on lung image acquisition which included lecture and hands-on patient scanning. Learners independently acquired images on patients with suspected AHF. Automatic B-line quantification was obtained offline after completion of the study. Machine AI counted the maximum number of B-lines visualized during a clip. The criterion standard for B-line counts was semi-quantitative analysis by a blinded point-of-care LUS expert reviewer. Image quality was blindly determined by an expert reviewer. A second expert reviewer blindly determined B-line counts and image quality. Intraclass correlation was used to determine agreement between machine AI and expert, and expert to expert.

RESULTS: Fifty-one novice learners completed 87 scans on 29 patients. We analyzed data from 611 lung zones. The overall intraclass correlation for agreement between novice learner images post-processed with AI technology and expert review was 0.56 (confidence interval [CI] 0.51-0.62), and 0.82 (CI 0.73-0.91) between experts. Median image quality was 4 (on a 5-point scale), and correlation between experts for quality assessment was 0.65 (CI 0.48-0.82).

CONCLUSION: After a short training session, novice learners were able to obtain high-quality images. When the AI deep learning algorithm was applied to those images, it quantified B-lines with moderate-to-fair correlation as compared to semi-quantitative analysis by expert review. This data shows promise, but further development is needed before widespread clinical use.

'Diagnosis of Boerhaave's Syndrome With Aid of Bedside Ultrasound

[pubmed: bUS](#)by Naillid Felipe / 14d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 27:S0736-4679(21)00473-X. doi: 10.1016/j.jemermed.2021.05.017. Online ahead of print.

ABSTRACT

BACKGROUND: Boerhaave's syndrome is characterized by transmural rupture of the distal esophagus in the setting of increased intraluminal pressures combined with negative intrathoracic pressure. It is a rare condition with high mortality (20-50% mortality rate).

CASE REPORT: This is a case of a 47-year-old man who appeared acutely ill, presenting with shortness of breath, chest and abdominal pain, and diagnosed with Boerhaave's syndrome with the assistance of bedside ultrasound. **WHY SHOULD AN EMERGENCY PHYSICIANS BE AWARE OF THIS?:** Emergency physicians must have a heightened suspicion of this diagnosis in patients presenting with chest and abdominal pain and can use bedside ultrasound skills to aid with diagnosis.

Bioeffects and Safety of Lung Ultrasound in Neonates

["lung ultrasound" or "lung ultrasonograp...](#)by Jacques S Abramowicz / 13d

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INSIGHTS

Add note

J Ultrasound Med. 2021 Jun 30. doi: 10.1002/jum.15772. Online ahead of print.

NO ABSTRACT

PMID:34196023 | DOI:10.1002/jum.15772

Machine learning-based analysis of operator pupillary response to assess cognitive workload in clinical ultrasound imaging

["clinical ultrasound" or "clinical ultra...](#)by Harshita Sharma / 13d

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INSIGHTS

Add note

ABSTRACT

INTRODUCTION: Pupillometry, the measurement of eye pupil diameter, is a well-established and objective modality correlated with cognitive workload. In this paper, we analyse the pupillary response of ultrasound imaging operators to assess their cognitive workload, captured while they undertake routine fetal ultrasound examinations. Our experiments and analysis are performed on real-world datasets obtained using remote eye-tracking under natural clinical environmental conditions.

METHODS: Our analysis pipeline involves careful temporal sequence (time-series) extraction by retrospectively matching the pupil diameter data with tasks captured in the corresponding ultrasound scan video in a multi-modal data acquisition setup. This is followed by the pupil diameter pre-processing and the calculation of pupillary response sequences. Exploratory statistical analysis of the operator pupillary responses and comparisons of the distributions between ultrasonographic tasks (fetal heart versus fetal brain) and operator expertise (newly-qualified versus experienced operators) are performed. Machine learning is explored to automatically classify the temporal sequences into the corresponding ultrasonographic tasks and operator experience using temporal, spectral, and time-frequency features with classical (shallow) models, and convolutional neural networks as deep learning models.

RESULTS: Preliminary statistical analysis of the extracted pupillary response shows a significant variation for different ultrasonographic tasks and operator expertise, suggesting different extents of cognitive workload in each case, as measured by pupillometry. The best-performing machine learning models achieve receiver operating characteristic (ROC) area under curve (AUC) values of 0.98 and 0.80, for ultrasonographic task classification and operator experience classification, respectively.

CONCLUSION: We conclude that we can successfully assess cognitive workload from pupil diameter changes measured while ultrasound operators perform routine scans. The machine learning allows the discrimination of the undertaken ultrasonographic tasks and scanning expertise using the pupillary response sequences as an index of the operators' cognitive workload. A high cognitive workload can reduce operator efficiency and constrain their decision-making, hence, the ability to objectively assess cognitive workload is a first step towards understanding these effects on operator performance in biomedical applications such as medical imaging.

Optic Nerve Ultrasound Evaluation in Intracranial Hypertension Detection

[optic nerve ultrasound](#) by Livio Vitiello / 13d

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INSIGHTS

Add note

Clin Neurol Neurosurg. 2021 Jun 11:106758. doi: 10.1016/j.clineuro.2021.106758. Online ahead of print.

NO ABSTRACT

PMID:34210563 | DOI:10.1016/j.clineuro.2021.106758

Multi-Level Stakeholder Perspectives on Determinants of Point of Care Ultrasound Implementation in a US Academic Medical Center

[pubmed: point of care ultras...](#) by Anna M Maw / 13d

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INSIGHTS

Add note

Diagnostics (Basel). 2021 Jun 28;11(7):1172. doi: 10.3390/diagnostics11071172.

ABSTRACT

There is growing interest from multiple specialties, including internal medicine, to incorporate diagnostic point of care ultrasound (POCUS) into standard clinical care. However, few internists currently use POCUS. The objective of this study was to understand the current determinants of POCUS adoption at both the health system and clinician level at a U.S. academic medical center from the perspective of multi-level stakeholders. We performed semi-structured interviews of multi-level stakeholders including hospitalists, subspecialists, and hospital leaders at an academic medical center in the U.S. Questions regarding the determinants of POCUS adoption were asked of study participants. Using the framework method, team-based analysis of interview transcripts were guided by the contextual domains of the Practical Robust Implementation and Sustainability Model (PRISM). Thirty-one stakeholders with diverse roles in POCUS adoption were interviewed. Analysis of interviews revealed three overarching themes that stakeholders considered important to adoption by clinicians and health systems: clinical impact, efficiency and cost. Subthemes included two that were deemed essential to high-fidelity implementation: the development of credentialing policies and robust quality assurance processes. These findings identify potential determinants of system and clinician level adoption that may be leveraged to achieve high-fidelity implementation of POCUS applications that result in improved patient outcomes.

Ultrasound-Assisted Diagnosis of Embolic Cerebrovascular Accident From Left Atrial Myxoma in the Emergency Department

[pubmed: point of care ultras...](#) by Jace C Bradshaw / 13d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 28:S0736-4679(21)00464-9. doi: 10.1016/j.jemermed.2021.05.010. Online ahead of print.

ABSTRACT

BACKGROUND: Acute-onset, unilateral weakness is an alarming presentation due to the possibility of a cerebrovascular accident. When considering cerebrovascular accidents in patients younger than 35 years, emergency physicians should evaluate embolic sources.

CASE REPORT: A 28-year-old man with no reported past medical history presented to the Emergency Department with a complaint of acute-onset left-sided hemiparesis and facial droop that started a day prior to arrival. He was stable, had unilateral weakness, hyperreflexia, and slightly slurred speech. He reported no sensory deficits. A computed tomography scan of the head demonstrated areas of ischemia. Patient demographics suggested an embolic source, so point-of-care-ultrasound (POCUS) was performed by emergency practitioners, leading to the discovery of a large, mobile, left atrial mass. After admission and confirmatory imaging, the mass was surgically removed. **WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?:** In young, otherwise healthy individuals, heart masses should be considered as a cause of unexplained stroke-like symptoms. POCUS can identify these masses and expedite care.

Point-of-Care Ultrasound as a Tool to Assess Wound Size and Tissue Regeneration after Skin Grafting

[pubmed: point of care ultras...](#) by Yash Mantri / 13d

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INSIGHTS

Add note

Ultrasound Med Biol. 2021 Jun 28:S0301-5629(21)00246-5. doi: 10.1016/j.ultrasmedbio.2021.05.016. Online ahead of print.

ABSTRACT

Chronic wounds can be difficult to heal and are often accompanied by pain and discomfort. Multiple skin substitutes or cellularized/tissue-based skin products have been used in an attempt to facilitate closure of complex wounds. Allografts from cadaveric sources have been a viable option in achieving such closure. However, early assessment of graft incorporation has been difficult clinically, often with delayed evidence of failure. Visual cues to assess graft integrity have been limited and remain largely superficial at the skin surface. Furthermore, currently used optical imaging techniques can penetrate only a few millimeters deep into tissue. Ultrasound (US) imaging offers a potential solution to address this limitation. This work evaluates the use of US to monitor wound healing and allograft integration. We used a commercially available dual-mode (US and photoacoustic) scanner operating only in US mode. We compared the reported wound size from the clinic with the size measured using US in 45 patients. Two patients from this cohort received an allogenic skin graft and underwent multiple US scans over a 110-d period. All data were processed by two independent analysts; one of

them was blinded to the study. We measured change in US intensity and wound contraction as a function of time. Our results revealed a strong correlation ($R^2 = 0.81$, $p < 0.0001$) between clinically and US-measured wound sizes. Wound contraction $>91\%$ was seen in both patients after skin grafting. An inverse relationship between wound size and US intensity ($R^2 = 0.77$, $p < 0.0001$) indicated that the echogenicity of the wound bed increases as healthy cells infiltrate the allograft matrix, regenerating and leading to healthy tissue and re-epithelization. This work indicates that US can be used to measure wound size and visualize tissue regeneration during the healing process.

The Risk of Hospitalization in COVID-19 Patients Can Be Predicted by Lung Ultrasound in Primary Care

["lung ultrasound" or "lung ultrasonograp...](#)by Javier Martínez-Redondo / 13d

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INSIGHTS

Add note

Int J Environ Res Public Health. 2021 Jun 4;18(11):6083. doi: 10.3390/ijerph18116083.

ABSTRACT

BACKGROUND: The usefulness of Lung Ultrasound (LUS) for the diagnosis of interstitial syndrome caused by COVID-19 has been broadly described. The aim of this study was to evaluate if LUS may predict the complications (hospital admission) of COVID-19 pneumonia in primary care patients.

METHODS: This observational study collects data from a cohort of 279 patients with clinical symptoms of COVID-19 pneumonia who attended the Balaguer Primary Health Care Area between 16 March 2020 and 30 September 2020. We collected the results of LUS scans reported by one general practitioner. We created a database and analysed the absolute and relative frequencies of LUS findings and their association with hospital admission. We found that different LUS patterns (diffuse, attenuated diffuse, and predominantly unilateral) were risk factors for hospital admission ($p < 0.05$). Additionally, an evolutionary pattern during the acute phase represented a risk factor ($p = 0.0019$). On the contrary, a normal ultrasound pattern was a protective factor ($p = 0.0037$). Finally, the presence of focal interstitial pattern was not associated with hospital admission ($p = 0.4918$).

CONCLUSION: The lung ultrasound was useful to predict complications in COVID-19 pneumonia and to diagnose other lung diseases such as cancer, tuberculosis, pulmonary embolism, chronic interstitial pneumopathy, pleuropericarditis, pneumonia or heart failure.

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

[optic nerve diameter](#)by Heekyung Lee / 13d

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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.

Unilateral diaphragmatic dysfunction following thoracic outlet surgery diagnosed by point-of-care ultrasound

[pubmed: diaphragm AND ultrasound variant...](#) by Wesley Cain / 12d
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INSIGHTS

Add note

J Community Hosp Intern Med Perspect. 2021 Jun 21;11(4):551-553. doi: 10.1080/20009666.2021.1915550.

ABSTRACT

A patient with recent thoracic outlet decompression surgery presented with acute dyspnea and was found by point-of-care ultrasound to have diaphragm dysfunction. This case highlights an unexpected cause of respiratory complaints in the outpatient setting discovered at the bedside, utilizing point-of-care ultrasound protocol.

Ultrasound diaphragmatic excursion during non-invasive ventilation in ICU: a prospective observational study

[pubmed: intubation ultrasoun...](#) by Federico Barbariol / 12d
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INSIGHTS

Add note

Acta Biomed. 2021 Jul 1;92(3):e2021269. doi: 10.23750/abm.v92i3.11609.

ABSTRACT

BACKGROUND AND AIM: Diaphragmatic dysfunction is seen in up to 60% of critically ill patients with respiratory failure, and it is associated with worse outcomes. The functionality of the diaphragm can be studied with simple and codified bedside ultrasound evaluation. Diaphragm excursion is one of the most studied parameters. The aim of this study was to assess the prevalence of diaphragmatic dysfunction in critically ill non-intubated patients admitted to a general intensive care unit with acute respiratory failure.

METHODS: We collected data, including ultrasound diaphragm excursion, at 2 time points: at T0 (at the time of recruitment, just before starting NIV) and at T1 (after one hour of NIV).

RESULTS: A total of 47 patients were enrolled. The prevalence of diaphragm dysfunction was 42.5% (95% CI 28, 3 - 57,8). Surgical patients showed a higher incidence (relative risk of 1.97) than medical patients. Mean DE was not significantly different between NIV responders ($1,35 \pm 0.78$ cm) and non-responders (1.21 ± 0.85 cm, $p = 0,6$). Patients with diaphragmatic dysfunction responded positively to NIV in 60% (95% CI 36.0 - 80.9%) of cases, while patients without diaphragmatic dysfunction responded positively to the NIV trial in 70.4% (95% CI 49.8 - 86.2%) of cases ($p = 0.54$). Taking the use of ultrasound diaphragm excursion as a potential predictor of NIV response, the corresponding ROC curve had an area under the curve of 0.53; the best balance between sensitivity (58.1%) and specificity (62.5%) was obtained with a cut-off diaphragm excursion of 1.37 cm.

CONCLUSIONS: Diaphragm dysfunction is particularly frequent in critically ill patients with respiratory failure. The functionality of the diaphragm can be effectively and easily tested by bedside ultrasound examination. Overall, our results point towards tentative evidence of a trend of a different response to NIV in patients with vs without diaphragmatic dysfunction.

Clinical applications of Lung Ultrasound in children in Pediatric Emergency Setting: a lesson from a child with severe heart disease

["lung ultrasound" or "lung ultrasonograp...](#) by Cristina De Rose / 12d

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INSIGHTS

Add note

Acta Biomed. 2021 Jul 1;92(3):e2021209. doi: 10.23750/abm.v92i3.11351.

ABSTRACT

BACKGROUND AND AIM: Rheumatic Heart Disease (RHD) often evolves in congestive heart failure with development of pulmonary edema after a period of asymptomatic, latent phase. In the last years, Lung Ultrasound (LUS) has gained a primary role in the diagnosis and management of pleuropulmonary disorders, also in pediatric practice and in the diagnosis and follow-up of pulmonary edema through the qualitative analysis of ultrasound B-lines. Aim of this case report is that to keep high clinicians' attention to the diagnosis that of Rheumatic Heart Disease also in high-income countries and to deepen the role and importance of lung ultrasound, in clinical practice, in diagnosis and follow-up of pediatric lung diseases, especially in emergency settings as happened in our case.

METHODS: We present the case of a 14-year-old Italian boy from a medium-low socio-economic and cultural class Italian family, who was diagnosed with severe and advanced stage RHD, which had remained undiagnosed until then.

RESULTS AND CONCLUSIONS: In the diagnostic process of our case, LUS played a fundamental role because it quickly directed us, contextually to the clinical and anamnestic evaluation, towards the right diagnosis, in a Pediatric Emergency Department. In clinical practice, the only LUS findings and the only qualitative analysis of the B-lines, does not make clinicians able to make a clear characterization yet. Thus the study of cardiovascular function, laboratory parameters, anamnestic and clinical data continue to be useful tools to assist the LUS in the diagnostic processes of lung diseases, as was the case in our case.

Lung ultrasound findings in hospitalized COVID-19 patients in relation to venous thromboembolic events: the ECHOVID-19 study

["lung ultrasound" or "lung ultrasonograp...](#) by Kristoffer Grundtvig Skaarup / 12d
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INSIGHTS

Add note

J Ultrasound. 2021 Jul 2. doi: 10.1007/s40477-021-00605-8. Online ahead of print.

ABSTRACT

PURPOSE: Several studies have reported thromboembolic events to be common in severe COVID-19 cases. We sought to investigate the relationship between lung ultrasound (LUS) findings in hospitalized COVID-19 patients and the development of venous thromboembolic events (VTE).

METHODS: A total of 203 adults were included from a COVID-19 ward in this prospective multi-center study (mean age 68.6 years, 56.7% men). All patients underwent 8-zone LUS, and all ultrasound images were analyzed off-line blinded. Several LUS findings were investigated (total number of B-lines, B-line score, and LUS-scores).

RESULTS: Median time from admission to LUS examination was 4 days (IQR: 2, 8). The median number of B-lines was 12 (IQR: 8, 18), and 44 (21.7%) had a positive B-line score. During hospitalization, 17 patients developed VTE (4 deep-vein thrombosis, 15 pulmonary embolism), 12 following and 5 prior to LUS. In fully adjusted multivariable Cox models (excluding participants with VTE prior to LUS), all LUS parameters were significantly associated with VTE (total number of B-lines: HR = 1.14, 95% CI (1.03, 1.26) per 1 B-line increase), positive B-line score: HR = 9.79, 95% CI (1.87, 51.35), and LUS-score: HR = 1.51, 95% CI (1.10, 2.07), per 1-point increase). The B-line score and LUS-score remained significantly associated with VTE in sensitivity analyses.

CONCLUSION: In hospitalized COVID-19 patients, pathological LUS findings were common, and the total number of B-lines, B-line score, and LUS-score were all associated with VTE. These findings indicate that the LUS examination may be useful in risk stratification and the clinical management of COVID-19. These findings should be considered hypothesis generating.

Twitter as an educational tool for point-of-care ultrasonography in nephrology: A "Reach" analysis
[pubmed: point of care ultrasonography](#) by Abhilash Koratala / 12d
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INSIGHTS

Add note

Educ Health (Abingdon). 2021 Jan-Apr;34(1):43-44. doi: 10.4103/efh.EfH_192_19.

NO ABSTRACT

PMID:34213446 | DOI:10.4103/efh.EfH_192_19

Use of Handheld Ultrasound to Estimate Right Atrial Pressure in a Pulmonary Hypertension Clinic
[pubmed: point of care ultrasonography](#) by Sneha Samant / 12d
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INSIGHTS

Add note

Ann Am Thorac Soc. 2021 Jul 2. doi: 10.1513/AnnalsATS.202101-092OC. Online ahead of print.

ABSTRACT

RATIONALE: Point-of-care ultrasonography is an invaluable asset for inpatient decision-making. Whether handheld ultrasound can be utilized in the outpatient management of pulmonary hypertension (PH) is unknown.

OBJECTIVES: We investigated whether a handheld ultrasound estimate of right atrial pressure correlates with B-type natriuretic peptide (BNP) and clinical outcome over time in PH outpatients.

METHODS: This prospective study included outpatients in a PH Comprehensive Care Center clinic who had a same-day BNP level. We used a handheld ultrasound to measure inferior vena cava (IVC) size and collapsibility, which were used to estimate right atrial pressure (eRAP) and categorize it as normal, intermediate, or high. Correlation analysis was used to compare these ultrasound measurements to BNP at baseline and over time. Cox regression was used to determine if these measurements were associated with time to clinical worsening.

RESULTS: Ninety patients (60% Group 1 PH) were enrolled. Patients with an intermediate or high eRAP category at baseline had higher BNP levels than patients with normal eRAP. For every transition in eRAP category (e.g. from normal to intermediate) between clinic visits, BNP changed by an average of 155 pg/mL (95% CI 84 to 227). Higher baseline eRAP category was independently associated with more than two-fold increased risk for clinical worsening (HR 2.44, 95% CI 1.47-4.07).

CONCLUSIONS: Right atrial pressure estimated by portable handheld ultrasound correlates with BNP at baseline and serially over time. Furthermore, eRAP is independently associated with clinical worsening. The use of portable handheld ultrasound to estimate right atrial pressure should be considered in PH clinics.

Hemopericardium and Cardiac Tamponade After Blunt Thoracic Trauma: A Case Series and the Essential Role of Cardiac Ultrasound

[focused assessment sonography trauma](#) by Joseph Offenbacher / 12d

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INSIGHTS

Add note

J Emerg Med. 2021 Jun 29:S0736-4679(21)00469-8. doi: 10.1016/j.jemermed.2021.05.013. Online ahead of print.

ABSTRACT

BACKGROUND: Severe cardiac injury caused by penetrating rib or sternal fractures after blunt chest trauma is a rare clinical entity that has been described in only a few case reports over the last half-century. As a result, questions have arisen about the utility of the cardiac component in the Focused Assessment with Sonography in Trauma (cFAST) examination in evaluating blunt trauma patients.

CASE REPORT: We present a series of 3 patients who sustained blunt trauma and were discovered on cFAST examination to have developed pericardial tamponade from overlying rib or sternal fractures in the emergency departments of two academic level I trauma hospitals in the United States. Why Should an Emergency Physician Be Aware of This? These cases highlight the need for emergency and trauma physicians to be aware of blunt-induced,

penetrating trauma to the heart and mediastinum, and for future trauma care guidelines to consider the importance of the cFAST examination.

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

[pubmed: pediatric endotrache...](#) by Ashkon Shaahinfar / 12d

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INSIGHTS

Add note

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

[pubmed: point of care ultras...](#) by Margaret Lin-Martore / 12d

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INSIGHTS

Add note

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.

Mean value of B-mode optic nerve sheath diameter as an indicator of increased intracranial pressure: a systematic review and meta-analysis

[pubmed: point of care ultras...](#)by Lisandro Montorfano / 12d

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INSIGHTS

Add note

Ultrasound J. 2021 Jul 2;13(1):35. doi: 10.1186/s13089-021-00235-5.

ABSTRACT

OBJECTIVES: Timely diagnosis and treatment of increased intracranial pressure can decrease morbidity and prevent mortality. The present meta-analysis aims to determine the mean value of the ONSD measured in patients with various elevated ICP etiologies under different clinical settings, as well as comparing the value of ONSD between patients with and without elevated ICP.

METHODS: This meta-analysis complied with the Preferred Reporting Items for Systematic Reviews and Meta-analysis Statement⁸. PubMed, Embase, and Cochrane Library were searched to identify ONSD measured by US for patients with increased ICP from establishment to October 2020.

RESULTS: A total of 779 patients with elevated ICP among 22 studies were included in the present meta-analysis. Studies were published between 2003 and 2020. Eighteen were comparative (18/22, 81.8%), and four were single-armed study (4/22, 18.2%). Twenty were prospective studies (20/22, 90.9%). There was moderate-to-high heterogeneity based on the prediction ellipse area and variance logit of sensitivity and specificity.

CONCLUSIONS: The mean value of the ONSD among patients diagnosed with increased ICP was 5.82 mm (95% CI 5.58-6.06 mm). Variations were observed based on etiology of intracranial hypertension, clinical settings where ONSD was measured, and standards for diagnosing intracranial hypertension. The US-ONSD among patient with elevated ICP was significantly higher than the normal control. Although a cut-off value is not clearly determined, these mean values can be implemented to evaluate the sensitivity and specificity of US-ONSD in diagnosing intracranial hypertension in future studies.

High-Risk Medicolegal Conditions in Pediatric Emergency Medicine

[acute scrotum or testicular torsion](#)by Michael B Weinstock / 12d

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INSIGHTS

Add note

Emerg Med Clin North Am. 2021 Aug;39(3):479-491. doi: 10.1016/j.emc.2021.04.001. Epub 2021 Jun 9.

ABSTRACT

The top 5 reasons for pediatric malpractice are cardiac or cardiorespiratory arrest, appendicitis, disorder of male genital organs, encephalopathy, and meningitis. Malpractice is most likely to result from an "error in diagnosis." Claims involving a "major permanent injury" were more likely to pay out money, but of all claims, only 30% result in a monetary pay out. Consideration of "high-risk misses" may help to direct a history, examination, testing, and discharge instructions.

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 diameter](#) by Sha Zhu / 12d

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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.

Implementation of lung ultrasound in low- to middle-income countries: a new challenge global health?

["lung ultrasound" or "lung ultrasonograp...](#) by Danilo Buonsenso / 11d

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INSIGHTS

Add note

Eur J Pediatr. 2021 Jul 3. doi: 10.1007/s00431-021-04179-9. Online ahead of print.

ABSTRACT

Pneumonia remains the leading cause of death globally in children under the age of five. The poorest children are the ones most at risk of dying. In the recent years, lung ultrasound has been widely documented as a safe and easy tool for the diagnosis and monitoring of pneumonia and several other respiratory infections and diseases. During the pandemic, it played a primary role to achieve early suspicion and prediction of severe COVID-19, reducing the risk of exposure of healthcare workers to positive patients. However, innovations that can improve diagnosis and treatment allocation, saving hundreds of thousands of lives each year, are not reaching those who need them most. In this paper, we discuss advantages and limits of different tools for the diagnosis of pneumonia in low- to middle-income countries, highlighting potential benefits of a wider access to lung ultrasound in these settings and barriers to its implementation, calling international organizations to ensure the indiscriminate access, quality, and sustainability of the provision of ultrasound services in every setting. **What is Known:** • Pneumonia remains the leading cause of death globally in children under the age of five. The poorest children are the ones most at risk of dying. In the recent years, lung ultrasound has been widely documented as a safe and easy tool for the diagnosis and monitoring of pneumonia and several other respiratory infections and diseases. During the pandemic, it played a primary role to achieve early suspicion and prediction of severe COVID-19, reducing the risk of exposure of healthcare workers to positive patients. However, innovations that can improve diagnosis and treatment allocation, saving hundreds of thousands of lives each year, are not reaching those who need them most. **What is New:** • We discuss advantages and limits of different tools for the diagnosis of pneumonia in low- to middle-income countries, highlighting potential benefits of a wider access to lung ultrasound in these settings and barriers to its implementation, calling international organizations to ensure the indiscriminate access, quality, and sustainability of the provision of ultrasound services in every setting.

Ultrasound of the chest and mediastinum in children, interventions and artefacts. WFUMB review paper (part 3)

[pubmed: bUS](#) by Cheng Fang / 11d
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INSIGHTS

Add note

Med Ultrason. 2021 Jun 23. doi: 10.11152/mu-3323. Online ahead of print.

ABSTRACT

Ultrasound (US) is an ideal diagnostic tool for paediatric patients owing to its high spatial and temporal resolution, realtime imaging, and lack of ionizing radiation and bedside availability. The lack of superficial adipose tissue and favourable acoustic windows in children makes US the first line of investigation for evaluation of pleural and chest wall abnormalities. In the first part of the topic the technical requirements were explained and the use of ultrasound in the lung and pleura in paediatric patients were discussed. In the second part lung parenchymal diseases with their subpleural consolidations are reflected. In the third part, the use of ultrasound for chest wall, mediastinum, diaphragmatic diseases, trachea, interventions and artifacts in paediatric patients are summarized.

Ultrasonography indicators for predicting difficult intubation: a systematic review and meta-analysis

[pubmed: intubation ultrasoun...](#) by Mehran Sotoodehnia / 10d
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INSIGHTS

Add note

BMC Emerg Med. 2021 Jul 3;21(1):76. doi: 10.1186/s12873-021-00472-w.

ABSTRACT

BACKGROUND: Ultrasonography (US) is recently used frequently as a tool for airway assessment prior to intubation (endotracheal tube (ETT) placement), and several indicators have been proposed in studies with different reported performances in this regard. This systematic review and meta-analysis reviewed the performance of US in difficult airway assessment.

METHODS: This systematic review and meta-analysis was conducted according to the guideline of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and the Cochrane book. All the studies that had carried out difficult airway assessments using

US, had compared the indicators in difficult and easy groups, and had published the results in English by the time we conducted our search in April 28, 2020, were included.

RESULTS: In the initial search, 17,156 articles were retrieved. After deleting the duplicate articles retrieved from multiple databases, 7578 articles remained for screening based on the abstracts and titles. Finally, the full text of 371 articles were assessed and the data from 26 articles were extracted, which had examined a total of 45 US indicators for predicting difficult intubation. The most common US index was the "thickness of anterior neck soft tissue at the vocal cords level". Also, "skin to epiglottis" and "anterior neck soft tissue at the hyoid bone level" were among the most common indicators examined in this area.

CONCLUSION: This systematic review showed that US can be used for predicting difficult airway. Of note, "skin thickness at the epiglottis and hyoid levels", "the hyomental distance", and "the hyomental distance ratio" were correlated with difficult laryngoscopy in the meta-analysis. Many other indicators, including some ratios, have also been proposed for accurately predicting difficult intubation, although there have been no external validation studies on them.

Combined accuracy of optic nerve sheath diameter, strain ratio, and shear wave elastography of the optic nerve in patients with idiopathic intracranial hypertension

[optic nerve diameter](#) by Ahmed Abdel Khalek Abdel Razek / 10d
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INSIGHTS

Add note

Ultrasonography. 2021 Apr 20. doi: 10.14366/usg.20165. Online ahead of print.

ABSTRACT

PURPOSE: This study assessed the combined accuracy of optic nerve sheath diameter (ONSD), strain ratio (SR), and shear wave elastography (SWE) of the optic nerve (ON) in patients with idiopathic intracranial hypertension (IIH).

METHODS: This prospective study was carried out on both ONs of 34 consecutive patients diagnosed with IIH and 16 age- and sex-matched healthy volunteers. All of the study participants were women. The ONSD, SR, and SWE of the ON were measured. The severity of papilledema of IIH patients was sub-classified into mild papilledema and moderate/severe papilledema.

RESULTS: The mean ONSD (5.6 ± 1.1 mm), SR (0.7 ± 0.1), and SWE (30.1 ± 16.7 kPa) of the IIH patients were significantly different ($P=0.001$) from the ONSD (4.1 ± 0.5 mm), SR (0.9 ± 0.1), and SWE (8.2 ± 3.4 kPa) of controls. The cutoff values of ONSD, SR, and SWE of the ON for differentiating IIH patients from controls were 5.45 mm, 0.8, and 10.3 kPa with areas under the curve (AUCs) of 0.91, 0.86, and 0.96 and accuracy values of 91%, 81%, and 93%, respectively. Combined SWE and ONSD and combined SWE, ONSD, and SR for differentiating IIH patients from controls revealed AUCs of 0.98 and 0.99 and accuracy values of 96% and 96%, respectively. ONSD, SR, and SWE showed significant differences between mild and

moderate/severe papilledema ($P=0.001$). Papilledema was correlated with SWE ($r=0.8$, $P=0.001$), ONSD ($r=0.4$, $P=0.001$), and SR ($r=-0.4$, $P=0.001$).

CONCLUSION: The combination of ONSD, SR, and SWE may be helpful for diagnosing IIH, and a good indicator of the degree of papilledema.

Echocardiographic pre-pause imaging and identifying the acoustic window during CPR reduces CPR pause time during ACLS - A prospective Cohort Study

[pubmed: intubation ultrasoun...](#) by Romolo Gaspari / 9d
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INSIGHTS

Add note

Resusc Plus. 2021 Mar 6;6:100094. doi: 10.1016/j.resplu.2021.100094. eCollection 2021 Jun.

ABSTRACT

OBJECTIVES: Pre-pause imaging during cardiopulmonary resuscitation (CPR) involves the acquisition of poor-quality, brief images immediately prior to stopping CPR to allow shorter, better-quality images during the pause. We hypothesize that pre-pause imaging is associated with a decrease in CPR pause length and shorter image acquisition time.

METHODS: Prospective, interventional cohort study enrolling out-of-hospital (OOH) cardiac arrest patients. Pre-pause imaging involves pre-localizing of the approximate sonographic window during CPR to support subsequent fine tuning when CPR pauses. Physicians were educated on pre-pause imaging and data was recorded prior- and post- introduction of pre-pause imaging into American cardiac life support (ACLS). Timing of CPR pauses and identification of interventions and events during pause were recorded (e.g., intubation, defibrillation, multiple cardiac ultrasounds). Ultrasound (US) images were reviewed for image quality using a 5-point scale. Primary outcome was length of CPR pause with and without pre-pause imaging. Secondary outcome included US length.

RESULTS: One hundred and forty five subjects presenting after OOH cardiac arrest were enrolled over 13 months, 70 during the baseline period prior to pre-pause imaging and 75 after pre-pause imaging was integrated into ACLS. Pre-pause imaging decreased CPR pause length from 28.3 s (95%CI 25.1-31.5) to 12.8 s (95%CI 11.9-13.7). US image acquisition time decreased with pre-pause imaging from 20.4 (95%CI 18.0-22.7) to 11.0 s (95%CI 10.1-11.8). US image quality was unchanged despite the decrease in image acquisition time. (3.0 (95%CI 2.8-3.2) vs 2.7 (95%CI 2.5-2.9)). Multivariate modeling showed that ultrasound did not prolong CPR pause length.

CONCLUSION: Pre-pause imaging was associated with significant decrease in CPR pause length and US image acquisition time. Pre-pause imaging should be encouraged for any clinicians who use ultrasound during ACLS.

Implementation of point of care ultrasound to assess umbilical venous catheter position in the neonatal intensive care unit

[pubmed: point of care ultras...](#)by Patrick Louis Polonio / 9d

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INSIGHTS

Add note

J Matern Fetal Neonatal Med. 2021 Jul 5:1-3. doi: 10.1080/14767058.2021.1946508. Online ahead of print.

ABSTRACT

Point of care ultrasound (POCUS) is an emerging method for assessing umbilical venous catheter (UVC) position. We implemented a training module for neonatal providers geared toward POCUS proficiency in assessing UVC position in our neonatal intensive care unit. Over 14 months, the percentage of providers qualified to use POCUS for UVC placement increased from 0 to 33%. The median time to achieve proficiency was 5 months (interquartile range: 3-14 months). Additionally, we discovered that a minimum of two views were required to correctly assess catheter tip location. The two views in which it was easiest to correctly identify the catheter tip were the subcostal and parasternal short view using the cardiac ultrasound windows, and the phased array ultrasound probe.

Simplified 8-site lung ultrasound examination to assess fluid overload in children on haemodialysis

["lung ultrasound" or "lung ultrasonograp...](#)by Marco Allinovi / 9d

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INSIGHTS

Add note

Clin Kidney J. 2021 Feb 25;14(7):1851-1852. doi: 10.1093/ckj/sfab041. eCollection 2021 Jul.

NO ABSTRACT

PMID:34221393 | PMC:PMC8243277 | DOI:10.1093/ckj/sfab041

"Playing it SAFE in the NICU" SAFE-R: a targeted diagnostic ultrasound protocol for the suddenly decompensating infant in the NICU

[pubmed: point of care ultras...](#)by Nadya Yousef / 9d

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INSIGHTS

Add note

Eur J Pediatr. 2021 Jul 5. doi: 10.1007/s00431-021-04186-w. Online ahead of print.

ABSTRACT

Rapid diagnosis of sudden, unexpected, and potentially fatal complications in the neonatal intensive care unit (NICU) is essential for the initiation of prompt and life-saving management. Point-of-care ultrasound (POCUS) protocols are widely used in adult emergency situations to diagnose and guide treatment, but none has been specifically developed for the neonate. We propose a targeted diagnostic ultrasound protocol for the suddenly decompensating infant in the NICU for rapid screening for the most common life-threatening complications needing immediate attention. We integrated current knowledge on the use of POCUS for diagnosis of the most critical neonatal complications into the "SAFE-R protocol" (Sonographic Assessment of liFe-threatening Emergencies - Revised). The ultrasound algorithm was evaluated at the bedside for suitability and ease of use. Main features of SAFE-R are the use of standardized ultrasound points and a simple one-probe rule-in/rule-out approach. The flowchart is designed by order of urgency and priority is given to treatable causes. Hence, ruling out cardiac tamponade is the first step in the decision tree, followed by pneumothorax, pleural effusion, then acute critical aortic occlusion, acute abdominal complications, and severe intraventricular hemorrhage. Conclusion: SAFE-R is the first ultrasound algorithm specifically conceived for use in the NICU to screen for the most common urgent neonatal complications leading to sudden deterioration, thereby providing critical information within minutes. The simplified and rapid approach is designed for the neonatologist and is easy to learn and quick to perform. What is Known: • The fields of neonatal and pediatric critical care are undergoing a transformation with the adoption of POCUS and the recent publication of the first international guidelines on POCUS for critically ill children and neonates. • Targeted emergency ultrasound protocols are widely used in adult emergency and critical care medicine, but specific and adapted ultrasound algorithms are lacking for the pediatric and neonatal population. What is New: • We propose the first targeted ultrasound protocol specifically designed for the suddenly decompensating infant in the NICU for rapid screening of the most common life-threatening complications needing immediate attention. • The SAFE-R ultrasound algorithm integrates current knowledge on ultrasound diagnosis of the most critical neonatal complications into a simple and easy-to-perform emergency scanning protocol aimed to guide initial management and resuscitation efforts.

Testicular Torsion Patients Should Be Manually Detorsed at Diagnosis: A Propensity Score Matched Analysis of the Influence of Interhospital Transfer and Surgical Wait Times on Surgical Organ Salvage

[acute scrotum or testicular torsion](#) by Aderivaldo Cabral Dias Filho / 9d

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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jul 2. doi: 10.1097/PEC.0000000000002492. Online ahead of print.

ABSTRACT

OBJECTIVE: The aim of the study was to assess organ salvage in testicular torsion patients submitted to manual detorsion according to interhospital transfer and surgical wait times.

METHODS: Retrospective analysis of consecutive surgically treated testicular torsion patients between 2012 and 2018. We compared testicular surgical salvage in testicular torsion patients submitted to manual detorsion either at clinical diagnosis (immediate detorsion) or after interhospital transfer from lower level-of-care facilities (delayed detorsion) and estimated the influence of interhospital transfer and surgical wait times on outcomes. Analysis included Bayesian logistic regression after propensity score matching. We excluded patients first examined at off-state and private facilities, with prediagnostic time of more than 24 hours, not initially diagnosed with testicular torsion or not submitted to manual detorsion at any time.

RESULTS: One hundred sixty-two patients (median age, 15.8 years) fulfilled inclusion criteria. The median prediagnostic, transfer, and surgical wait times were respectively 4.9, 2.4, and 4.3 hours, with 58 patients undergoing immediate and 104 delayed detorsion. Propensity score matching for prediagnostic and surgical wait times paired 58 immediate with 40 delayed detorsion patients, with corresponding surgical salvage rates of 54/58 (93%) and 33/40 (82%). Forty-seven patients (29%) still had torsion at surgery. Transfer time was inversely associated with testicular salvage, with median 13% greater probability of an unfavorable outcome for each hour of transfer time. Similarly, each hour of surgical wait time decreased surgical salvage by 6%.

CONCLUSIONS: Immediate detorsion led to improved surgical outcomes in testicular torsion patients. Because of residual torsion, surgery for detorsed patients should not be postponed.

Introduction of convenient conus to coccyx point-of-care ultrasound (C3PO) in children with a sacral dimple

[pubmed: point of care ultras...by Fumio Watanabe / 9d](#)

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INSIGHTS

Add note

J Clin Anesth. 2021 Jul 2;74:110446. doi: 10.1016/j.jclinane.2021.110446. Online ahead of print.

NO ABSTRACT

PMID:34225186 | DOI:10.1016/j.jclinane.2021.110446

Evaluation of COVID-19-Associated Myocarditis Via Point-of-Care Ultrasound in a Pediatric Patient
[pubmed: point of care ultras...](#) by Ndah Akwesi Poteh / 9d
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INSIGHTS

Add note

Pediatr Emerg Care. 2021 Jul 2. doi: 10.1097/PEC.0000000000002509. Online ahead of print.

ABSTRACT

Coronavirus disease 2019 (COVID-19)-associated myocarditis has been reported from the onset of the pandemic. The presumed etiology is direct damage to the myocardium from severe acute respiratory syndrome coronavirus 2. Common findings include electrocardiogram abnormalities, elevated cardiac markers, and diminished cardiac function. This can lead to heart failure and cardiogenic shock with resultant poor perfusion. Thus, myocarditis has been recognized as a cause of death in patients with COVID-19. Unfortunately, it is difficult to predict the prevalence of myocarditis in these patients given the relative novelty of the pandemic and the lack of available data. Point-of-care ultrasound (POCUS) has been shown to be a useful modality to investigate lung pathology in patients with COVID-19. Bedside cardiac POCUS can also be used to investigate cardiac pathology. This case describes a pediatric patient with COVID-19 who had evidence of myocarditis on POCUS in the pediatric emergency department.

Comparison of WHO Clinical Criteria and Radiological Findings of Pneumonia in Children Aged 02-59 Months

[pneumonia and pediatric](#) by A R Mondal / 9d
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INSIGHTS

Add note

Mymensingh Med J. 2021 Jul;30(3):684-689.

ABSTRACT

Despite recent advances, pneumonia contributes substantially to childhood mortality in low and middle-income countries. To reduce case fatality, World Health Organization (WHO) adopted a working formula to identify pneumonia clinically in resource constrained setting. Chest X-ray is the gold standard test to diagnose pneumonia but this tool is not readily available or affordable in primary health facility in developing countries even when it is indicated. Objective of the study was to compare WHO clinical criteria and radiological findings of pneumonia in children aged 02-59 months. This cross-sectional observational study was conducted at inpatient department of Paediatrics of Rangpur Medical College Hospital from July 2015 to June 2017. Total 112 patients aged 2 to 59 months fulfilling selection criteria were enrolled into this study. Data were

collected and chest X-ray was done for each patient. Data were analyzed through SPSS software (version 16.0). Minimum level of significance was predetermined as $p < 0.05$. Among 112 patients, mean age of chest radiograph positive cases of pneumonia was 7.64 ± 7.08 months and that of negative cases 10.75 ± 10.95 months. There was no statistically significant difference of age ($p = 0.083$) between chest radiography positive and negative cases. Radiological findings were positive in 52 (46.43%) cases and negative in 60 (53.57%). Fever, cough and fast breathing were present in all patients with sensitivity 100%. Chest indrawing was significantly more ($p = 0.003$) among 52 (46.43%) cases who demonstrated positive radiological findings with sensitivity 63.46% (95% CI = 48.96% to 76.37%). There was no statistically significant difference of fever, cough and fast breathing between radiograph positive and negative cases. Chest indrawing was significantly more in radiograph positive cases. The results highlighted the importance of adoption of positive radiograph of WHO guideline to identify pneumonia.

Measurement of optic nerve sheath diameter by ultrasound in healthy term neonates

[optic nerve diameter](#) by Shih-Yun Lan / 9d

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INSIGHTS

Add note

Pediatr Neonatol. 2021 Jun 19:S1875-9572(21)00104-2. doi: 10.1016/j.pedneo.2021.05.021. Online ahead of print.

ABSTRACT

BACKGROUND: Optic nerve sheath diameter (ONSD) ultrasound is a noninvasive and repeatable tool to dynamically evaluate intracranial pressure with high diagnostic accuracy; however, data in neonates are scarce. The aim of this study was to determine the reference value of ONSD and potential influencing factors in healthy term neonates.

METHODS: We retrospectively reviewed 250 full-term neonates who underwent cranial ultrasound as part of selective newborn screening over a 2-year period. Neonates with any of the following conditions were excluded: using mechanical ventilation, sedatives and/or vasopressors, or signs of infection which needed cerebrospinal fluid analysis and/or intracranial pathologies. Data on sex, gestational age, birth body weight, birth body height, birth head circumference, Apgar score and types of delivery were collected. The neurodevelopmental outcomes were reviewed.

RESULTS: A total of 234 neonates (123 girls and 111 boys) were included. The mean ONSD value was 3.30 ± 0.27 mm in the right eye and 3.30 ± 0.23 mm in the left eye, with no significant difference between both eyes ($p = 0.797$). Male neonates had a larger ONSD than female neonates (3.34 ± 0.22 mm versus 3.26 ± 0.20 mm, $p = 0.007$), and ONSD was correlated with birth weight in the males. Otherwise, there were no statistically significant associations between ONSD and other birth characteristics in both sexes. Most (63%) cases were followed for at least 12 months, and 98% had normal neurodevelopment.

CONCLUSION: The reference value reported in this study may be used to evaluate the ONSD in healthy term neonates. Sex differences should be considered in this age group.

Diagnostic Accuracy of Point-of-Care Ultrasound for Intussusception: A Multicenter, Noninferiority Study of Paired Diagnostic Tests

tessaroby Kelly R Bergmann / 9d

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INSIGHTS

Add note

Ann Emerg Med. 2021 Jul 2:S0196-0644(21)00340-1. doi: 10.1016/j.annemergmed.2021.04.033. Online ahead of print.

ABSTRACT

STUDY OBJECTIVE: To determine the diagnostic accuracy of point-of-care ultrasound (POCUS) performed by experienced clinician sonologists compared to radiology-performed ultrasound (RADUS) for detection of clinically important intussusception, defined as intussusception requiring radiographic or surgical reduction.

METHODS: We conducted a multicenter, noninferiority, observational study among a convenience sample of children aged 3 months to 6 years treated in tertiary care emergency departments across North and Central America, Europe, and Australia. The primary outcome was diagnostic accuracy of POCUS and RADUS with respect to clinically important intussusception. Sample size was determined using a 4-percentage-point noninferiority margin for the absolute difference in accuracy. Secondary outcomes included agreement between POCUS and RADUS for identification of secondary sonographic findings.

RESULTS: The analysis included 256 children across 17 sites (35 sonologists). Of the 256 children, 58 (22.7%) had clinically important intussusception. POCUS identified 60 (23.4%) children with clinically important intussusception. The diagnostic accuracy of POCUS was 97.7% (95% confidence interval [CI] 94.9% to 99.0%), compared to 99.3% (95% CI 96.8% to 99.9%) for RADUS. The absolute difference between the accuracy of RADUS and that of POCUS was 1.5 percentage points (95% CI -0.6 to 3.6). Sensitivity for POCUS was 96.6% (95% CI 87.2% to 99.1%), and specificity was 98.0% (95% CI 94.7% to 99.2%). Agreement was high between POCUS and RADUS for identification of trapped free fluid (83.3%, n=40/48) and decreased color Doppler signal (95.7%, n=22/23).

CONCLUSION: Our findings suggest that the diagnostic accuracy of POCUS performed by experienced clinician sonologists may be noninferior to that of RADUS for detection of clinically important intussusception. Given the limitations of convenience sampling and spectrum bias, a larger randomized controlled trial is warranted.

Point-of-care ultrasound-guided regional anaesthesia in older ED patients with hip fractures: a

study to test the feasibility of a training programme and time needed to complete nerve blocks by ED physicians after training

pubmed: [point of care ultras...](#)by Jacques Simon Lee / 9d

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INSIGHTS

Add note

BMJ Open. 2021 Jul 5;11(7):e047113. doi: 10.1136/bmjopen-2020-047113.

ABSTRACT

OBJECTIVES: Point-of-care ultrasound-guided regional anaesthesia (POCUS-GRA) provides safe, rapid analgesia for older people with hip fractures but is rarely performed in the emergency department (ED). Self-perceived inadequate training and time to perform POCUS-GRA are the two most important barriers. Our objective is to assess the feasibility of a proposed multicentre, stepped-wedge cluster randomised clinical trial (RCT) to assess the impact of a knowledge-to-practice (KTP) intervention on delirium.

DESIGN: Open-label feasibility study.

SETTING: An academic tertiary care Canadian ED (annual visits 60 000).

PARTICIPANTS: Emergency physicians working at least one ED shift per week, excluding those already performing POCUS-GRA more than four times per year.

INTERVENTION: A KTP intervention, including 2-hour structured training sessions with procedure bundle and email reminders.

PRIMARY AND SECONDARY OUTCOME MEASURES: The primary feasibility outcome is the proportion of eligible physicians that completed training and subsequently performed POCUS-GRA. Secondary outcome is the time needed to complete POCUS-GRA. We also test the feasibility of the enrolment, consent and randomisation processes for the future stepped-wedge cluster RCT (NCT02892968).

RESULTS: Of 36 emergency physicians, 4 (12%) were excluded or declined participation. All remaining 32 emergency physicians completed training and 31 subsequently treated at least one eligible patient. Collectively, 27/31 (87.1%) performed 102 POCUS-GRA blocks (range 1-20 blocks per physician). The median (IQR) time to perform blocks was 15 (10-20) min, and reduction in pain was 6/10 (3-7) following POCUS-GRA. There were no reported complications.

CONCLUSION: Our KTP intervention, consent process and randomisation were feasible. The time to perform POCUS-GRA rarely exceeded 30 min, Our findings reinforce the existing data on the safety and effectiveness of POCUS-GRA, mitigate perceived barriers to more widespread adoption and demonstrate the feasibility of trialling this intervention for the proposed stepped-wedge cluster RCT.

Point of care cardiac ultrasound in the management of hyponatremia: an enhancement to physical examination

[pubmed: point of care ultras...](#)by Totini Chatterjee / 8d

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INSIGHTS

Add note

CEN Case Rep. 2021 Jul 5. doi: 10.1007/s13730-021-00623-9. Online ahead of print.

ABSTRACT

Accurate assessment of fluid status is vital to appropriate management of hyponatremia. However, conventional parameters such as physical examination, vital signs, and laboratory markers such as natriuretic peptides suffer from limitations in this regard. Point of care ultrasonography (POCUS) is a noninvasive bedside diagnostic tool that is emerging as an adjunct to physical examination in internal medicine and subspecialties including nephrology. In this manuscript, we describe a complex case of hyponatremia, where stroke volume assessment using Doppler echocardiography has helped to objectively assess fluid status and guided therapy. A 73-year-old woman was seen for worsening serum sodium. Her urine sodium was high and there was no hypotension suggestive of euvoolemia. However, POCUS demonstrated low stroke volume in the presence of normal left ventricular ejection fraction, indicative of hypovolemia. She was treated with intravenous fluids based on these findings and response was evident by normalization of the stroke volume. Clinicians should adopt a multi-parametric approach integrating all the pieces of hemodynamic puzzle when evaluating complex fluid and electrolyte disorders.

How reliably can ultrasound help determine muscle and adipose tissue thickness in clinical settings? An assessment of intra- and inter-examiner reliability in the USVALID study

[pubmed: bUS](#)by Arabella Fischer / 8d

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INSIGHTS

Add note

Eur J Clin Nutr. 2021 Jul 5. doi: 10.1038/s41430-021-00955-w. Online ahead of print.

ABSTRACT

BACKGROUND/OBJECTIVES: Ultrasound is used to measure muscle and adipose tissue thickness at the bedside. This study was aimed at determining the intra- and inter-examiner reliability for marking points to measure adipose tissue and muscle thickness and assessing it in terms of the performance and evaluation of the corresponding ultrasound scans.

SUBJECTS/METHODS: Intra- and inter-examiner reliability was tested in 120 patients. Limb lengths were measured to mark three and two measuring points on both the thighs and upper arms, respectively. Ultrasound scans were performed at each measuring point to evaluate muscle and adipose tissue thickness.

RESULTS: Regarding the marking of the measuring points, intra- and inter-examiner reliability were high to very high, with correlation coefficients ranging from 0.74 to 0.96. In the performance and evaluation of adipose tissue thickness, all measuring points showed a high to very high reliability, with correlation coefficients ranging from 0.70 to 0.97. In the performance and evaluation of muscle thickness, the ventral measuring point on the thigh and the anterior measuring point on the upper arm showed the best reliability, with high to very high correlation coefficients ranging from 0.77 to 0.93.

CONCLUSIONS: In terms of intra- and inter-examiner reliability, the ventral measuring point on the thigh and the anterior measuring point on the upper arm can be strongly recommended for ultrasound measurements of muscle and adipose tissue thickness.

Comparative Study of Clinical and Ultrasound Parameters for Defining a Difficult Airway in Patients with Obesity

[pubmed: intubation ultrasoun...](#) by Ed Carlos Rey Moura / 8d
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INSIGHTS

Add note

Obes Surg. 2021 Jul 5. doi: 10.1007/s11695-021-05528-1. Online ahead of print.

ABSTRACT

INTRODUCTION: Patients with obesity have anatomical changes due to increased adipose tissue that negatively affect airway accessibility, making it difficult to establish an advanced airway through orotracheal intubation. This article aims to evaluate the correlation of clinical and sonographic parameters as predictors of difficult airway management (DAM) in patients with obesity and to establish the predictive value of the skin-epiglottis distance as an indicator of a probable DAM.

METHODS: This is an observational, prospective study of 100 patients with obesity who underwent bariatric surgery over a 12-month period. The patients were categorized into the easy airway and the difficult airway groups, according to the Cormack-Lehane classification in the laryngoscopy evaluation, and the clinical and sonographic variables collected were statistically evaluated to obtain the relation with the presence of DAM, according to the Cormack-Lehane classification.

RESULTS: The mouth opening ($p = 0.010$) and the skin-epiglottis distance ($p = 0.019$) were statistically significant when comparing the easy airway and the difficult airway groups of the Cormack-Lehane classification. The predictive value of the skin-epiglottis distance for difficult airway assessment was 29.3 mm. The neck circumference ($p = 0.225$), the Mallampati index (p

= 0.260), and the other clinical variables showed no statistical relevance when compared in isolation with the Cormack-Lehane groups.

CONCLUSION: The ultrasound method as a predictor of difficult intubation is promising in anesthetic practice when used according to standardized measurements evaluation and cutoff values.

Focused echocardiography, end-tidal carbon dioxide, arterial blood pressure or near-infrared spectroscopy monitoring during paediatric cardiopulmonary resuscitation: A scoping review
[pubmed: point of care ultras...](#) by Mirjam Kool / 8d

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INSIGHTS

Add note

Resusc Plus. 2021 Mar 30;6:100109. doi: 10.1016/j.resplu.2021.100109. eCollection 2021 Jun.

ABSTRACT

AIM: To evaluate the individual use and predictive value of focused echocardiography, end-tidal carbon dioxide (EtCO₂), invasive arterial blood pressure (BP) and near-infrared spectroscopy (NIRS) during cardiopulmonary resuscitation (CPR) in children.

METHODS: This scoping review was undertaken as part of the continuous evidence evaluation process of the International Liaison Committee on Resuscitation (ILCOR) and based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) extension for scoping reviews. PubMed, MEDLINE, CINAHL and EMBASE were searched from the last ILCOR reviews until September 2020. We included all published studies evaluating the effect of echocardiography, EtCO₂, BP or NIRS guided CPR on clinical outcomes and quality of CPR.

RESULTS: We identified eight observational studies, including 288 children. Two case series reported the use of echocardiography, one in detecting pulmonary emboli, the second in cardiac standstill, where contractility was regained with the use of extracorporeal membrane oxygenation. The two studies describing EtCO₂ were ambivalent regarding the association between mean values and any outcomes. Mean diastolic BP was associated with increased survival and favourable neurological outcome, but not with new substantive morbidity in two studies describing an overlapping population. NIRS values reflected changes in EtCO₂ and cerebral blood volume index in two studies, with lower values in patients who did not achieve return of circulation.

CONCLUSION: Although there seems some beneficial effect of these intra-arrest variables, higher quality paediatric studies are needed to evaluate whether echocardiography, EtCO₂, BP or NIRS guided CPR could improve outcomes.

CME Sonography 100: Emergency Ultrasound of the Soft Tissues and the Musculoskeletal System

[pubmed: point of care ultras...](#) by Joseph Osterwalder / 7d

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INSIGHTS

Add note

Praxis (Bern 1994). 2021 Jul;110(9):488-507. doi: 10.1024/1661-8157/a003712.

ABSTRACT

CME Sonography 100: Emergency Ultrasound of the Soft Tissues and the Musculoskeletal System **Abstract.** The term "emergency sonography" refers to a focused sonography in emergency situations, also called emergency "Point of Care Ultrasound (POCUS)". The attending physician applies it specifically and directly to the patient. As an indispensable part of the physical examination, emergency ultrasound helps to answer simple clinical questions. The corresponding answers provide essential elements for diagnostic and therapeutic decision-making. Furthermore, the emergency ultrasound increases the safety and efficiency of interventions on the musculoskeletal system and soft tissues. In this article we will discuss common clinical emergency situations in a focused way, but we will not address the regional anesthesiologic and analgesia-related applications that are also important in this context.

Comparison of the effects of normal and low blood pressure regulation on the optic nerve sheath diameter in robot assisted laparoscopic radical prostatectomy

[optic nerve diameter](#) by Ji Hoon Park / 7d

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INSIGHTS

Add note

Anesth Pain Med (Seoul). 2021 Apr 23. doi: 10.17085/apm.20097. Online ahead of print.

ABSTRACT

BACKGROUND: Robot-assisted laparoscopic radical prostatectomy is an advanced and popular surgical technique. However, increased intracranial pressure which is caused by CO₂ pneumoperitoneum and Trendelenburg position is the main cerebrovascular effect. Measurement of optic nerve sheath diameter using ocular ultrasound is a noninvasive and reliable method for the assessment of intracranial pressure. The primary endpoint of this study was to identify whether low blood pressure regulation has any benefit in attenuating an increase of optic nerve sheath diameter during robot-assisted laparoscopic radical prostatectomy.

METHODS: Optic nerve sheath diameter and cerebral oxygen saturation were measured at baseline (supine position), one and two hours after pneumoperitoneum and Trendelenburg

position respectively, and after return to supine position in normal (n = 27) and low blood pressure groups (n = 24).

RESULTS: Mean optic nerve sheath diameter values measured at one and two hours after pneumoperitoneum and Trendelenburg position were significantly increased compared to the baseline value (P < 0.001 in normal blood pressure group; P = 0.003 in low blood pressure group). However, the mean optic nerve sheath diameter and cerebral oxygen saturation measured at any of the time points as well as degrees of change between the two groups did not show any significant changes. The peak values of optic nerve sheath diameter in normal and low blood pressure groups demonstrated 14.9% and 9.2% increases, respectively.

CONCLUSIONS: Low blood pressure group demonstrated an effect in maintaining an increase of optic nerve sheath diameter less than 10% during CO₂ pneumoperitoneum and Trendelenburg position.

The Utility of Point-of-Care Ultrasound for Post-Bronchoscopy Pneumothorax Evaluation

[pubmed: point of care ultras...](#)by Dallis Q Ngo / 6d

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INSIGHTS

Add note

Cureus. 2021 May 30;13(5):e15339. doi: 10.7759/cureus.15339. eCollection 2021 May.

ABSTRACT

We present a case of a 65-year-old female with a prior history of B-cell lymphoma with new CT chest findings of a nodule requiring an electromagnetic navigational bronchoscopy with transbronchial biopsies. Post-bronchoscopy, the patient complained of dyspnea and left scapular pain despite two normal anterior-posterior chest X-rays. Point-of-care ultrasound of the lung demonstrated a lack of lung sliding, which was confirmed via a right lateral decubitus chest X-ray. This case illustrates the utility and superiority of lung point-of-care ultrasound while highlighting the limitations of conventional imaging modalities in a post-bronchoscopy evaluation.

Ultrasound in forearm fractures: a pragmatic study assessing the utility of Point of Care Ultrasound (PoCUS) in identifying and managing distal radius fractures

[pubmed: point of care ultras...](#)by Darryl Wood / 6d

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INSIGHTS

Add note

Emerg Radiol. 2021 Jul 8. doi: 10.1007/s10140-021-01957-8. Online ahead of print.

ABSTRACT

BACKGROUND: Point of Care Ultrasound (PoCUS) is a safe, non-invasive tool for identifying distal radius fractures and can potentially be utilised to assist clinicians to reduce displaced fractures. We aim to test whether PoCUS is accurate to identify distal radius fractures and to determine how PoCUS performs as a tool to confirm a successful fracture reduction.

METHODS: A pragmatic prospective observational study was done in adult patients presenting with forearm injuries resulting in Colle's type distal radius fractures. Adults who presented to the emergency department (ED) with a suspected distal forearm fracture from August 2018 to July 2019 were conveniently sampled for inclusion into the study when a trained ED ultrasonographer was available. PoCUS scans over the point of maximal tenderness were done using a high frequency linear transducer (7.5-10 MHz) prior to X-ray. Patients who required a manipulation of the fracture had a second ultrasound scan immediately after the procedure before the second X-ray was ordered. PoCUS scans were compared to X-rays for accuracy in both groups.

RESULTS: Fractures were identified in 44 out of 47 included patients using both PoCUS and X-ray modalities. This showed a sensitivity of 100% (95% CI: 90-100%) and specificity of 100% (95% CI: 31-100%). Fracture manipulation was required in 35 out of 44 patients. The sensitivity and specificity of PoCUS in determining alignment accuracy when compared to X-ray were 100% (95% CI: 83-100%) and 64% (95% CI: 32-88%) respectively. The PPV and NPV were 86% (95% CI: 66-95%) and 100% (95% CI: 56-100%) respectively. Ten out of 44 (23%) patients with distal radius fractures ultimately required an Open Reduction and Internal Fixation (ORIF).

CONCLUSION: Our study supports the use of PoCUS for identifying distal radius forearm fractures and may have some value in assisting clinicians to determine post reduction success. We still advocate using standard X-ray radiographs to confirm successful or adequate cortical alignment following a manipulation.

Echocardiography, lung ultrasound, and cardiac magnetic resonance findings in COVID-19: A systematic review

["lung ultrasound" or "lung ultrasonograp...](#) by Kirolos Barssoum / 6d

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INSIGHTS

Add note

Echocardiography. 2021 Jul 8. doi: 10.1111/echo.15152. Online ahead of print.

ABSTRACT

BACKGROUND: The manifestations of COVID-19 as outlined by imaging modalities such as echocardiography, lung ultrasound (LUS), and cardiac magnetic resonance (CMR) imaging are not fully described.

METHODS: We conducted a systematic review of the current literature and included studies that described cardiovascular manifestations of COVID-19 using echocardiography, CMR, and pulmonary manifestations using LUS. We queried PubMed, EMBASE, and Web of Science for relevant articles. Original studies and case series were included.

RESULTS: This review describes the most common abnormalities encountered on echocardiography, LUS, and CMR in patients infected with COVID-19.

Lung Ultrasound for Prediction of Bronchopulmonary Dysplasia in Extreme Preterm Neonates: A Prospective Diagnostic Cohort Study

["lung ultrasound" or "lung ultrasonograp...](#) by Adel Mohamed / 6d

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INSIGHTS

Add note

J Pediatr. 2021 Jul 5:S0022-3476(21)00661-2. doi: 10.1016/j.jpeds.2021.06.079. Online ahead of print.

ABSTRACT

OBJECTIVES: To evaluate the diagnostic and predictive ability of lung ultrasound at three time points in the first two weeks after birth for predicting BPD among infants < 29 weeks gestational age.

STUDY DESIGN: This was a prospective, diagnostic cohort study. Lung ultrasound was performed on days 3, 7 and 14 after birth and lung ultrasound scores (LUS) were calculated in blinded fashion. Diagnostic test characteristics and area under receiver operating characteristic (AUROC) curves were calculated.

RESULTS: A total of 152 infants were enrolled with mean (SD) gestational age of 25.8 (1.5) weeks gestation. Of them, 87 (57%) infants were diagnosed with BPD. The LUS were significantly higher in infants diagnosed with BPD compared with those without BPD at all scan time points ($p < 0.01$). The score of >10 at all 3 timepoints had higher sensitivity (0.89, 0.89, and 0.77), specificity (0.87, 0.90, and 0.92) and corresponding clinically important positive and negative likelihood ratios. The AUROC for LUS at the three time points were 0.96, 0.97 and 0.95 on day 3, 7 and 14 respectively. Compared with the model using clinical characteristics, LUS alone had higher AUROC ($p < 0.05$ for all three time points).

CONCLUSIONS: In this cohort, LUS in the first two weeks after birth had a very high predictive value for the diagnosis of BPD among infants of <29 weeks' gestation.

A case for mandatory ultrasound training for rural general practitioners: a commentary

pubmed: [point of care ultras...](#)by Annie C Arnold / 6d

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INSIGHTS

Add note

Rural Remote Health. 2021 Jul;21(3):6328. doi: 10.22605/RRH6328. Epub 2021 Jul 9.

ABSTRACT

CONTEXT: Point-of-care ultrasound is a rapidly evolving technology that enables rapid diagnostic imaging to be performed at a patient's bedside, reducing time to diagnosis and minimising the need for patient transfers. This has significant applications for rural emergency and general practice, and could potentially prevent unnecessary transfers of patients from rural communities to more urban centres for the purpose of diagnostic imaging, reducing costs and preventing disruption to patients' lives. Meta-analyses on point-of-care ultrasound have reported extremely high sensitivity and specificity when detecting lung pathology, and the potential applications of the technology are substantial. A significant application of the technology is in the care of rural paediatric patients, where acute lower respiratory pathology is the most common cause of preventable deaths, hospitalisations, and emergency medical retrievals from remote communities for children under five.

ISSUES: Although widely available, point-of-care ultrasound technology is not widely utilised in Australian emergency departments and general practices. Issues with comprehensive training, maintenance of skills, upskilling and quality assurance programs prevent physicians from feeling confident when utilising the technology. In Canada, point-of-care ultrasound training is part of the core competency training in the Royal College of Physicians of Canada emergency medicine fellowship program. Point-of-care ultrasound is widely used in rural practice, although lack of training, funding, maintenance of skills and quality assurance were still listed as barriers to use.

LESSONS LEARNED: Point-of-care ultrasound is a highly sensitive and specific technology with wide potential applications. Issues with quality control and maintenance of skills are preventing widespread use. Coupling point-of-care ultrasound with telemedicine could help increase the usability and accessibility of the technology by reducing the issues associated with maintenance of skills and quality assurance.

Transforming obstetric ultrasound into data science using eye tracking, voice recording, transducer motion and ultrasound video

"[clinical ultrasound](#)" or "[clinical ultra...](#)"by Lior Drukker / 5d

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INSIGHTS

Add note

ABSTRACT

Ultrasound is the primary modality for obstetric imaging and is highly sonographer dependent. Long training period, insufficient recruitment and poor retention of sonographers are among the global challenges in the expansion of ultrasound use. For the past several decades, technical advancements in clinical obstetric ultrasound scanning have largely concerned improving image quality and processing speed. By contrast, sonographers have been acquiring ultrasound images in a similar fashion for several decades. The PULSE (Perception Ultrasound by Learning Sonographer Experience) project is an interdisciplinary multi-modal imaging study aiming to offer clinical sonography insights and transform the process of obstetric ultrasound acquisition and image analysis by applying deep learning to large-scale multi-modal clinical data. A key novelty of the study is that we record full-length ultrasound video with concurrent tracking of the sonographer's eyes, voice and the transducer while performing routine obstetric scans on pregnant women. We provide a detailed description of the novel acquisition system and illustrate how our data can be used to describe clinical ultrasound. Being able to measure different sonographer actions or model tasks will lead to a better understanding of several topics including how to effectively train new sonographers, monitor the learning progress, and enhance the scanning workflow of experts.

Percutaneous ultrasound gastrostomy (PUG): first prospective clinical trial

[pubmed: point of care ultras...](#) by Fabio Accorsi / 5d

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INSIGHTS

Add note

Abdom Radiol (NY). 2021 Jul 9. doi: 10.1007/s00261-021-03200-x. Online ahead of print.

ABSTRACT

GRAPHICAL ABSTARCT: PURPOSE: To report the results of the first-in-human trial evaluating the safety and efficacy of the percutaneous ultrasound gastrostomy (PUG) technique.

METHODS: A prospective, industry-sponsored single-arm clinical trial of PUG insertion was performed in 25 adult patients under investigational device exemption (mean age 64 ± 15 years, 92% men, 80% inpatients, mean BMI 24.5 ± 2.7 kg/m²). A propensity score-matched retrospective cohort of 25 patients who received percutaneous radiologic gastrostomy (PRG) was generated as an institutional control (mean age 66 ± 14 years, 92% men, 80% inpatients, mean BMI 24.0 ± 2.7 kg/m²). Primary outcomes included successful insertion and 30-day procedure-related adverse events (AE's). Secondary outcomes included procedural duration, sedation requirements, and hospital length of stay.

RESULTS: All PUG procedures were successful, including 3/25 [12%] performed bedside within the ICU. There was no significant difference between PUG and PRG in rates of mild AE's (3/25 [12%] for PUG and 7/25 [28%] for PRG, $p = 0.16$) or moderate AE's (1/25 [4%] for PUG and 0/25 for PRG, $p = 0.31$). There were no severe AE's or 30-day procedure-related mortality in either group. Procedural room time was longer for PUG (56.5 ± 14.1 min) than PRG (39.3 ± 15.0 min, $p < 0.001$). PUG procedure time was significantly shorter after a procedural enhancement, the incorporation of a Gauss meter to facilitate successful magnetic gastropexy. Length of stay for outpatients did not significantly differ (2.4 ± 0.5 days for PUG and 2.6 ± 1.0 days for PRG, $p = 0.70$).

CONCLUSION: PUG appears effective with a safety profile similar to PRG. Bedside point-of-care gastrostomy tube insertion using the PUG technique shows promise.

Role of ultrasound in manual detorsion for testicular torsion acute scrotum or testicular torsion by Takahiro Hosokawa / 5d
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INSIGHTS

Add note

J Clin Ultrasound. 2021 Jul 8. doi: 10.1002/jcu.23039. Online ahead of print.

ABSTRACT

PURPOSE: Manual detorsion can be performed for testicular torsion before scrotal exploration. Using sonographic findings, this study investigated the need for additional treatments after manual detorsion for testicular torsion.

METHODS: This study evaluated 13 retrospective cases of testicular torsion subjected to manual detorsion. Manual detorsion was classified as failure or success based on residual spermatic cord twist. The following sonographic findings of the affected testis were compared using the Fisher exact test: whirlpool sign, horizontal or altered lie, and hypoperfusion.

RESULTS: Manual detorsion failed in five patients. There was a significant difference in the incidence of the whirlpool sign between the two groups (present/absent sign in the failure vs. success groups: 4/1 vs. 0/8, $p = 0.007$). Horizontal or altered lie and hypoperfusion in the affected testis were not significantly different between groups (5/0 vs. 3/4, $p = 0.07$, one case excluded, and 5/0 vs. 4/4, $p = 0.10$, respectively).

CONCLUSIONS: Ultrasound findings after manual detorsion, particularly, the whirlpool sign, were useful for planning subsequent treatment such as additional manual detorsion or surgical intervention. The testicular axis and the perfusion of the twisted testis may not recover to normal after successful manual detorsion, but if they recover, this procedure could be judged a success.

Deep learning applied to lung ultrasound videos for scoring COVID-19 patients: A multicenter study

["lung ultrasound" or "lung ultrasonograp...](#)by Federico Mento / 5d
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INSIGHTS

Add note

J Acoust Soc Am. 2021 May;149(5):3626. doi: 10.1121/10.0004855.

ABSTRACT

In the current pandemic, lung ultrasound (LUS) played a useful role in evaluating patients affected by COVID-19. However, LUS remains limited to the visual inspection of ultrasound data, thus negatively affecting the reliability and reproducibility of the findings. Moreover, many different imaging protocols have been proposed, most of which lacked proper clinical validation. To address these problems, we were the first to propose a standardized imaging protocol and scoring system. Next, we developed the first deep learning (DL) algorithms capable of evaluating LUS videos providing, for each video-frame, the score as well as semantic segmentation. Moreover, we have analyzed the impact of different imaging protocols and demonstrated the prognostic value of our approach. In this work, we report on the level of agreement between the DL and LUS experts, when evaluating LUS data. The results show a percentage of agreement between DL and LUS experts of 85.96% in the stratification between patients at high risk of clinical worsening and patients at low risk. These encouraging results demonstrate the potential of DL models for the automatic scoring of LUS data, when applied to high quality data acquired accordingly to a standardized imaging protocol.

Diagnosis of spontaneous intestinal perforation using point of care ultrasound
[pubmed: point of care ultras...](#)by Ignacio Oulego-Erroz / 5d
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INSIGHTS

Add note

Intensive Care Med. 2021 Jul 9. doi: 10.1007/s00134-021-06465-4. Online ahead of print.

NO ABSTRACT

PMID:34241655 | DOI:10.1007/s00134-021-06465-4

Application of bedside ultrasound in predicting the outcome of weaning from mechanical ventilation in elderly patients
[diaphragm and \(ultrasound or ultrasonogr...](#)by Shigang Li / 5d

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INSIGHTS

Add note

BMC Pulm Med. 2021 Jul 9;21(1):217. doi: 10.1186/s12890-021-01605-4.

ABSTRACT

BACKGROUND: With the increased ageing of society, more and more elderly people are admitted to the intensive care unit, How to accurately predict whether elderly patients can successfully wean from the ventilator is more complicated. Diaphragmatic excursion (DE) and diaphragm thickening fraction (DTF) were measured by bedside ultrasound to assess diaphragm function. The lung ultrasound score (LUS) and the rapid shallow breathing index (RSBI) were used as indices of diaphragm function to predict the outcome of weaning from mechanical ventilation. The aim of this study was to examine the clinical utility of these parameters in predicting extubation success.

METHODS: This prospective study included 101 consecutive elderly patients undergoing a trial of extubation in the ICU of Haidian Hospital between June 2017 and July 2020. Patients were divided into the successful weaning group (n = 69) and the failed weaning group (n = 32). Baseline characteristics, including RSBI, were recorded. Measurements of DE, DTF and LUS were made using ultrasound within 24 h before extubation.

RESULTS: Median DE was greater in patients with extubation success than in those with extubation failure (1.64 cm vs. 0.78 cm, p = 0.001). Patients with extubation success had a greater DTF than those with extubation failure (49.48% vs. 27.85%, p = 0.001). The areas under the receiver operating curves for the RSBI, LUS, DE and DTF were 0.680, 0.764, 0.831 and 0.881, respectively. The best cut-off values for predicting successful weaning were DTF \geq 30%, DE \geq 1.3 cm, LUS \leq 11, and RSBI \leq 102. The specificity of DTF (84%) in predicting weaning outcome was higher than that of RSBI (53%), that of LUS (55%), and that of DE (62%). The sensitivity of DTF (94%) was greater than that of RSBI (85%), that of LUS (71%), and that of DE (65%). The combination of RSBI, LUS, DE, and DTF showed the highest AUC (AUC = 0.919), with a sensitivity of 96% and a specificity of 89%.

CONCLUSIONS: DTF has higher sensitivity and specificity for the prediction of successful weaning in elderly patients than the other parameters examined. The combination of RSBI, LUS, DE and DTF performed well in predicting weaning outcome. This has potentially important clinical application and merits further evaluation.

Guideline No. 421: Point of Care Ultrasound in Obstetrics and Gynaecology: (En francais: Echographie au chevet en obstetrique et gynecologie)

[pubmed: point of care ultras...](#) by Venu Jain / 5d

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INSIGHTS

Add note

J Obstet Gynaecol Can. 2021 Jul 6:S1701-2163(21)00504-1. doi: 10.1016/j.jogc.2021.07.003.
Online ahead of print.

ABSTRACT

OBJECTIVE: To provide an opinion regarding the usefulness of point of care ultrasound in obstetrics and gynaecology.

TARGET POPULATION: Women with pregnancy-related complications or issues who could benefit from an urgent bedside sonographic evaluation.

OPTIONS: Point of care ultrasound is a readily accessible option, requiring few resources.

BENEFITS, HARMS, AND COSTS: This low-cost imaging option can expedite appropriate patient management, enhance provider confidence, and allay the patient's anxiety in a timely fashion. However, there is potential for error in imaging or interpretation, resulting in incorrect and potentially harmful patient management.

EVIDENCE: MEDLINE, PubMed, Embase, and the Cochrane Library were searched from 2009 to 2019. Medical Subject Headings (MeSH) and keywords were related to pregnancy, PoCUS, point of care ultrasound, and bedside ultrasound. This document represents an abstraction of the evidence rather than a methodological review.

VALIDATION METHODS: The authors rated the quality of evidence and strength of recommendations using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach. See online Appendix A (Tables A1 for definitions and A2 for interpretations of strong and weak recommendations).

INTENDED AUDIENCE: Providers of urgent care for pregnant women (obstetricians and gynaecologists, family physicians, emergency room physicians, midwives, nurse practitioners, nurses).

Utility of serial optic nerve sheath diameter measurements in patients undergoing cerebral spinal fluid diversion procedures for hydrocephalus

[optic nerve diameter](#) by Susanth Subramanian / 4d

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INSIGHTS

Add note

World Neurosurg. 2021 Jul 7:S1878-8750(21)00997-9. doi: 10.1016/j.wneu.2021.07.003. Online ahead of print.

ABSTRACT

BACKGROUND: Functional status of cerebrospinal fluid (CSF) diversion procedure for hydrocephalus is difficult to assess on several occasions. We report the use of serial ultrasonographic measurement of optic nerve sheath diameter (ONSD) to assess the functional status of CSF diversion procedures in patients with hydrocephalus.

METHODS: In this prospective observational study, ultrasonographic ONSD measurement was performed preoperatively, on postoperative days 1, 3 and 7 (n=51 at each time point) and at follow up (n=31) in patients undergoing ventriculoperitoneal shunt (VPS) or endoscopic third ventriculostomy (ETV) for hydrocephalus. Change in ONSD values during first week after CSF diversion procedure and at follow up were correlated with VPS/ETV function.

RESULTS: ONSD ≥ 5.5 mm strongly correlated with clinical and imaging features of raised ICP ($p < 0.001$). Mean ONSD progressively decreased in the postoperative period and was the lowest on postoperative day 7 ($p < 0.001$) with $>95\%$ of patients having ONSD < 5.5 mm at that time point. At follow up (median, 12 months; n=31), ONSD had further reduced in 78.6% of patients. All three patients with shunt dysfunction had increase in the ONSD value compared to that on postoperative day 7.

CONCLUSION: ONSD measurement on postoperative day 7 after CSF diversion correlates well with early surgical outcome but decreases further in many patients at a follow up of 12 months. Rise in postoperative day 7 ONSD at follow up correlates with failure of the CSF diversion procedure.

Diaphragm dysfunction in severe COVID-19 as determined by neuromuscular ultrasound

[pubmed: diaphragm AND ultrasound variant...](#) by Ellen Farr / 3d

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INSIGHTS

Add note

Ann Clin Transl Neurol. 2021 Jul 11. doi: 10.1002/acn3.51416. Online ahead of print.

ABSTRACT

Many survivors from severe coronavirus disease 2019 (COVID-19) suffer from persistent dyspnea and fatigue long after resolution of the active infection. In a cohort of 21 consecutive severe post-COVID-19 survivors admitted to an inpatient rehabilitation hospital, 16 (76%) of them had at least one sonographic abnormality of diaphragm muscle structure or function. This corresponded to a significant reduction in diaphragm muscle contractility as represented by thickening ratio (muscle thickness at maximal inspiration/end-expiration) for the post-COVID-19 compared to non-COVID-19 cohorts. These findings may shed new light on neuromuscular

respiratory dysfunction as a contributor to prolonged functional impairments after hospitalization for post-COVID-19.

Lung Ultrasound-Guided Emergency Department Management of Acute Heart Failure (BLUSHED-AHF): A Randomized Controlled Pilot Trial

["lung ultrasound" or "lung ultrasonograp...](#)by Peter S Pang / 3d

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INSIGHTS

Add note

JACC Heart Fail. 2021 Jun 29:S2213-1779(21)00232-8. doi: 10.1016/j.jchf.2021.05.008. Online ahead of print.

ABSTRACT

OBJECTIVES: The goal of this study was to determine whether a 6-h lung ultrasound (LUS)-guided strategy-of-care improves pulmonary congestion over usual management in the emergency department (ED) setting. A secondary goal was to explore whether early targeted intervention leads to improved outcomes.

BACKGROUND: Targeting pulmonary congestion in acute heart failure remains a key goal of care. LUS B-lines are a semi-quantitative assessment of pulmonary congestion. Whether B-lines decrease in patients with acute heart failure by targeting therapy is not well known.

METHODS: A multicenter, single-blind, ED-based, pilot trial randomized 130 patients to receive a 6-h LUS-guided treatment strategy versus structured usual care. Patients were followed up throughout hospitalization and 90 days' postdischarge. B-lines ≤ 15 at 6 h was the primary outcome, and days alive and out of hospital (DAOOH) at 30 days was the main exploratory outcome.

RESULTS: No significant difference in the proportion of patients with B-lines ≤ 15 at 6 h (25.0% LUS vs 27.5% usual care; $P = 0.83$) or the number of B-lines at 6 h (35.4 ± 26.8 LUS vs 34.3 ± 26.2 usual care; $P = 0.82$) was observed between groups. There were also no differences in DAOOH (21.3 ± 6.6 LUS vs 21.3 ± 7.1 usual care; $P = 0.99$). However, a significantly greater reduction in the number of B-lines was observed in LUS-guided patients compared with those receiving usual structured care during the first 48 h ($P = 0.04$).

CONCLUSIONS: In this pilot trial, ED use of LUS to target pulmonary congestion conferred no benefit compared with usual care in reducing the number of B-lines at 6 h or in 30 d' DAOOH. However, LUS-guided patients had faster resolution of congestion during the initial 48 h.

Prevalence of exercise-induced oxygen desaturation after recovery from SARS-CoV-2 pneumonia and use of lung ultrasound to predict need for pulmonary rehabilitation

["lung ultrasound" or "lung ultrasonograp...](#)by Annalisa Carlucci / 3d

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INSIGHTS

Add note

Pulmonology. 2021 Jun 4:S2531-0437(21)00117-3. doi: 10.1016/j.pulmoe.2021.05.008. Online ahead of print.

ABSTRACT

BACKGROUND: Persistence of breathlessness after recovery from SARS-CoV-2 pneumonia is frequent. Recovery from acute respiratory failure (ARF) is usually determined by normalized arterial blood gases (ABGs), but the prevalence of persistent exercise-induced desaturation (EID) and dyspnea is still unknown.

METHODS: We investigated the prevalence of EID in 70 patients with normal arterial oxygen at rest after recovery from ARF due to COVID-19 pneumonia. Patients underwent a 6-min walking test (6MWT) before discharge from hospital. We recorded dyspnea score and heart rate during 6MWT. We also investigated the possible role of lung ultrasound (LU) in predicting EID. Patients underwent a LU scan and scores for each explored area were summed to give a total LU score.

RESULTS: In 30 patients (43%), oxygen desaturation was >4% during 6MWT. These patients had significantly higher dyspnea and heart rate compared to non-desaturators. LU score >8.5 was significantly able to discriminate patients with EID.

CONCLUSION: In SARS-CoV-2 pneumonia, ABGs at discharge cannot predict the persistence of EID, which is frequent. LU may be useful to identify patients at risk who could benefit from a rehabilitation program.

Utility of lung ultrasound for extravascular lung water volume estimation during cytoreductive surgery and hyperthermic intraperitoneal chemotherapy

["lung ultrasound" or "lung ultrasonograp..."](#) by Amit Kumar Mittal / 3d

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INSIGHTS

Add note

Indian J Anaesth. 2021 Jun;65(6):458-464. doi: 10.4103/ija.IJA_1513_20. Epub 2021 Jun 22.

ABSTRACT

BACKGROUND AND AIMS: Rising extravascular lung-water index (ELWI) following cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS + HIPEC), if not timely intervened, can progress to pulmonary oedema. Transpulmonary thermodilution (TPTDL) is a standard technique to estimate ELWI (T-ELWI score), and track ongoing changes. Lung

ultrasound (LUS) is another technique for ELWI (L-ELWI score) estimation. However, reproducibility and reliability of LUS for tracking serial L-ELWI changes during CRS + HIPEC remains to be validated.

METHODS: This prospective observational study included 360 L-ELWI and T-ELWI measurements at 12 peri-operative time-points. Cohen's Kappa test was used to assess reproducibility, Inter-rater agreement (between the anaesthetist and radiologist), and agreement between LUS and TPTDL for classifying the severity of pulmonary oedema. Reliability of LUS for 'tracking serial changes' in ELWI over time in individual patients was assessed by determining the repeated measures correlation (z-rrm) between weighted L-ELWI and T-ELWI scores. The ability of both techniques to discriminate pulmonary oedema was compared by analysing the area under ROC curves.

RESULTS: Excellent inter-rater agreement for assigned L-ELWI scores was observed (linear weighted $\kappa = 0.95$ for both). Both techniques had a good agreement in classifying the severity of pulmonary oedema (linear weighted $\kappa = 0.63$, 95% CI 0.51-0.79). T-ELWI and weighted L-ELWI scores correlated strongly (z-rrm = 0.88, 95% CI 0.80-0.92, $P < 0.0001$). Both techniques had comparable ability to discriminate pulmonary oedema (difference in area under ROC curve = 0.0014, 95%CI -0.0027 to 0.0055, $P = 0.5043$).

CONCLUSION: We found the utility of LUS as a reliable and reproducible technique for ELWI estimation and tracking its changes over time in CRS + HIPEC.

A Case Report Utilizing Ultrasound for the Identification of Traumatic Pulmonary Contusion

[focused assessment sonography trauma](#) by Daniel Merrill / 2d

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INSIGHTS

Add note

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 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.