

Committee Work Product on Diagnostic Point-of-Care Ultrasound

Committee of Origin: *Ad Hoc* Committee on Point-of-Care Ultrasound

This committee work product has not been approved by ASA's Board of Directors or House of Delegates and does not represent an ASA Policy, Statement or Guideline.

Background

For purposes of this document, point-of-care ultrasound (POCUS) is the use of ultrasound at the bedside to do either of the following: guide a procedure or answer a clinical question. These two applications of POCUS will henceforth be referred to as procedural and diagnostic POCUS, respectively.

Over the past two decades the clinical use of POCUS has expanded dramatically. This growth has been driven by several factors: the decrease in cost and increase in portability of ultrasound devices; the growing body of evidence demonstrating the value of ultrasound for multiple clinical applications;^{1, 2} and the publication of guideline statements encouraging the use of POCUS by properly trained clinicians.³⁻⁵

Anesthesiologists are supported by published guidelines when they perform transesophageal echocardiography and use ultrasound for procedural guidance.^{6, 7} However, aside from these applications, anesthesiologists' use of POCUS has not previously been backed by professional society guidelines. This is in contrast to other acute care specialties, which have robustly supported the rights of their members to practice in this space, have provided guidance regarding appropriate scope of practice, and have given recommendations for minimum training necessary to achieve competence. This is true for the American College of Emergency Physicians (ACEP), the Society of Critical Care Medicine, and the American College of Chest Physicians.^{1, 2} However, no such guidance has previously been available from an anesthesia-specific society. Not surprisingly, the utilization and teaching of diagnostic POCUS among anesthesiologists remains highly variable.³

The ASA *Ad Hoc* Committee's goals in publishing this document are the following:

- 1) To affirm the practice of diagnostic POCUS by adequately trained anesthesiologists.
- 2) To identify the scope of practice of diagnostic POCUS relevant to anesthesiologists.
- 3) To suggest the minimum level of training in diagnostic POCUS needed to achieve competence.
- 4) To provide recommendations for how diagnostic POCUS can be used safely and ethically.
- 5) To provide broad guidance about diagnostic POCUS billing.

(1) Supporting the right of anesthesiologists to practice diagnostic POCUS.

In 1999, the American Medical Association passed a resolution that emphasized the following:⁴

- (a) Ultrasound imaging is within the scope of practice of properly trained physicians.
- (b) Hospitals should grant privileges to perform ultrasound imaging in accordance with specialty-specific guidelines.

In agreement with the AMA, the ASA *Ad Hoc* Committee supports the rights of properly trained anesthesiologists to practice diagnostic POCUS within the scope of practice defined in this document. Further, the ASA *Ad Hoc* Committee encourages hospital medical staff to respect the right of properly trained anesthesiologists to practice diagnostic POCUS according to the specialty-specific norms delineated in this document.

(2) Anesthesia-relevant scope of practice of diagnostic POCUS.

In the past several years, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Anesthesiologists (ABA) have identified multiple diagnostic POCUS applications as core competencies for anesthesiologists. The ACGME recently updated its Program Requirements for Anesthesiology Residency Programs to state that anesthesiology residents must be trained in the use of surface ultrasound to evaluate “organ function and pathology as related to anesthesia, critical care and resuscitation.” Specific topics listed in the updated program requirements include: transthoracic ultrasound for cardiac function/pathology, pulmonary ultrasound and hemodynamic assessment.⁵ Similarly, the ABA has recently expanded its board certification content outline to include the following POCUS topics: focused ultrasound of the lungs, IVC, bladder and stomach.⁶

Building on this work of the ACGME and the ABA, the ASA *Ad Hoc* Committee proposes the following primary scope of practice of diagnostic POCUS relevant to perioperative anesthesiologists:

- 1) Focused cardiac ultrasound⁷
- 2) Focused gastric ultrasound⁸
- 3) Focused pleural/pulmonary ultrasound⁹

Diagnostic POCUS can certainly be used by anesthesiologists to evaluate additional organ systems, beyond the list above. These additional applications will have particular relevance within certain subspecialties of anesthesiology and for generalist anesthesiologists in special situations. The ASA *Ad Hoc* Committee proposes that these secondary applications of diagnostic POCUS include, at minimum, the following:

- 4) Focused airway ultrasound⁹
- 5) Focused Assessment with Sonography in Trauma (FAST exam)⁹
- 6) Focused musculoskeletal/soft tissue ultrasound¹⁰⁻¹²

- 7) Focused ocular ultrasound⁹
- 8) Focused renal/GU ultrasound¹³
- 9) Focused transcranial Doppler ultrasound¹⁴
- 10) Focused ultrasound for deep venous thrombosis¹⁵

Finally, the number of anesthesia-relevant applications has increased steadily with time and will continue to grow in the future. If/when additional anesthesia-relevant diagnostic POCUS applications emerge, the *ASA Ad Hoc* Committee supports the right of properly trained anesthesiologists to perform these applications.

(3) Minimum training needed to achieve competence in diagnostic POCUS.

Previously published guidelines issued by different professional medical societies offer varying recommendations of the minimum training necessary to achieve competence in diagnostic POCUS. These differences reflect the lack of data available to the guideline authors at the time of publication. Based on more recently published data and the expert opinion of members of this committee, the *ASA Ad Hoc* Committee can provide some recommendations on the minimum level of training required to achieve competence in POCUS (see Appendix A).

These training recommendations are grounded in two major assumptions: (1) the learner has minimal experience using any sort of ultrasound at the outset of training and (2) an expert in diagnostic POCUS is locally available to supervise the learner's acquisition and interpretation of a portfolio of diagnostic POCUS exams. The first assumption (that the learner is ultrasound-naïve) underestimates the ultrasound expertise of many practicing anesthesiologists (e.g., those with expertise in transesophageal echocardiography and/or ultrasound-guided regional anesthesia). The second assumption (that a POCUS mentor is available locally) may not be true in all anesthesiology departments.

Thus, the *ASA Ad Hoc* Committee provides these recommendations for minimum training numbers (Appendix A) with the following caveats:

- Though these training minimums could be used to help practicing anesthesiologists learn POCUS, the specific numbers are intended primarily to guide the training of anesthesiology residents and fellows.
- Though it would be ideal for all anesthesiologists to learn diagnostic POCUS by performing it on real patients under expert supervision, this route of learning may not currently be feasible at many institutions. Each anesthesiology department must adopt credentialing/privileging standards for POCUS that are appropriate for their own local environment.

For instance, some anesthesiologists have developed expertise in diagnostic POCUS through self study guided by POCUS courses, textbooks, published articles, and/or well-vetted online resources. The *ASA Ad Hoc* Committee (i) acknowledges that it is possible for physicians to develop POCUS competence through these routes and (ii) suggests a process to demonstrate that competence to local anesthesiology departments through peer attestation (Appendix A).

(4) Maximizing the safety and ethical practice of diagnostic POCUS.

Diagnostic POCUS, like any other clinical tool, is capable of delivering not just benefit but also harm to patients. To decrease the risk of harm from diagnostic POCUS, the *ASA Ad Hoc* Committee recommends that anesthesiology departments, at minimum, do the following:

- a) Appoint a local Director of Diagnostic POCUS to supervise training, quality improvement (QI) and other administrative matters.

- b) Establish permanent archiving of diagnostic POCUS images/clips to facilitate periodic QI.
- c) Ensure reporting of POCUS findings in the medical record (see Appendix C for sample reporting templates).

Further, the ASA *Ad Hoc* Committee encourages anesthesiologists to seek verbal consent from patients whenever feasible prior to performing diagnostic POCUS. The known risks of diagnostic POCUS are, in general, similar to the risks of a physical exam performed with a stethoscope: (1) the risk of transmitting harmful pathogens between patients and (2) the risk of misinterpretation of data derived from the exam. Additionally, ultrasound energy increases the temperature of nearby tissue. Ultrasound thus has the potential of causing thermal injury, especially in tissues with minimal capacity to dissipate heat such as the eye and fetus. Because of the potential for thermal injury, anesthesiologists performing POCUS should aim to keep ultrasound exposure as low as reasonably achievable (ALARA) for all organs, especially the eye and fetal tissues.¹⁶

(5) Billing.

Billing for diagnostic imaging is complex with many considerations. A detailed statement on billing for POCUS is beyond the scope of this document. As true of every specialty using POCUS, a physician anesthesiologist should comply with current billing rules for reporting POCUS whether performing it as an independent procedure or as part of a more comprehensive physical exam. Since the use and clinical application of POCUS continue to evolve, the documentation, coding and billing requirements are being clarified. Each practice should ensure that the physician-anesthesiologist performing the service is aware of and compliant with the most current requirements.

References

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14. Schmidt BE, Lam AM. "Wave" of the Future in Neuroanesthesiology Too! *Anesthesia and analgesia* 2017; 124: 371.
15. Nazerian P, Volpicelli G, Gigli C, et al. Diagnostic Performance of Wells Score Combined With Point-of-care Lung and Venous Ultrasound in Suspected Pulmonary Embolism. *Academic emergency medicine : official journal of the Society for Academic Emergency Medicine* 2017; 24: 270-280.
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Appendix A: Pathways for Anesthesiologists to Demonstrate Competence in Diagnostic Point-of-Care Ultrasound

IV. Introduction

An anesthesiologist is qualified to perform a specific diagnostic point-of-care ultrasound (POCUS) modality if they perform EITHER of the following as described in this document:

- (1) Complete **supervised training**.
- (2) Provide evidence of **established expertise** by obtaining a written/signed endorsement of competence from three attending physicians.

V. Supervised training pathway

The ASA *Ad Hoc* Committee evaluated recommendations from multiple professional medical societies regarding minimum standards for diagnostic POCUS training.¹⁻⁵ However, these guidelines were found to be problematic for several reasons: (1) minimum training standards vary significantly between societies; (2) the guidelines omit several POCUS applications of relevance to anesthesiologists; and (3) the guidelines may underestimate the amount of training required for novice trainees to achieve competence in POCUS.⁶

To address these issues, the Committee proposes that a higher set of minimum standards be adopted to ensure that anesthesiologists practice POCUS at a level that maximizes patient safety (see Fig 1). These minimum training recommendations reflect the following principles:

- Minimum number of studies both personally performed and interpreted; should be no less than the minimum already recommended by other acute-care societies.
- Minimum number of studies interpreted:
 - should be no less than the minimum already recommended by other medical societies;
 - can be completed through computer-based training.

Additional comment is warranted regarding specific diagnostic POCUS applications. In the case of focused cardiac ultrasound (FoCUS), the Committee based its recommendations on the following observations:

- one large retrospective study of Emergency Medicine (EM) providers found that the learning curve for FoCUS image acquisition and interpretation begins to plateau at about 30 exams⁶
- at least one published study identified 50 performed exams as an appropriate minimum for anesthesiologists to achieve competence in FoCUS image acquisition⁸;
- some institutions have reported high levels of anesthesia resident competence when residents are required to interpret a total of 150 FoCUS exams, of which 50 are personally performed.⁹

With regard to focused airway, deep venous thrombosis, gastric, pleural/pulmonary, and renal/genitourinary ultrasound, the committee based its recommendations on the following observations:

- committee members generally agreed that the level of training required to achieve competence in these modalities is less than what is required for focused cardiac ultrasound;
- critical care and emergency medicine societies each recommend a minimum of 25-30 studies performed and interpreted for these applications^{5,7};
- one published study corroborated a number of ~30 performed exams as sufficient for achieving competence in gastric ultrasound image acquisition.¹⁰

With regard to focused transcranial Doppler ultrasound, the Committee deferred to the American Society of Neuroimaging's recommendations for minimum training standards.¹¹

With regard to focused ocular and musculoskeletal/soft tissue ultrasound, the Committee felt that there was insufficient evidence to provide minimum training recommendations at this time. The ASA defers to individual anesthesia departments to determine locally appropriate minimum training standards for these POCUS applications.

Fig 1: Minimum number of supervised studies recommended to achieve competence in specific diagnostic POCUS domains

POCUS Application	Minimum number of supervised studies personally performed and interpreted	Minimum number of additional supervised studies interpreted but not necessarily personally performed
Focused Airway Ultrasound	30	20
Focused Assessment with Sonography in Trauma (FAST exam)	30	20
Focused Cardiac Ultrasound	50	100
Focused Gastric Ultrasound	30	20
Focused Musculoskeletal/Soft-tissue Ultrasound	***	***
Focused Ocular Ultrasound	***	***
Focused Pleural/Pulmonary Ultrasound	30	20

Focused Renal/Genitourinary Ultrasound	30	20
Focused Transcranial Doppler Ultrasound	100	n/a
Focused Ultrasound for Deep Venous Thrombosis	30	20

*** indicates areas where insufficient data currently exists for the ASA to recommend training minimums

The term “supervised study” raises an important question: Who is qualified to supervise the exams of POCUS learners? The *Ad Hoc* Committee supports the rights of any attending anesthesiologist to supervise the training of learners provided that the anesthesiologist has demonstrated competence in POCUS. Examples of ways to demonstrate competence to supervise others are listed below: III – Established Expertise Pathway – 1 (a), (b) or (c). Further, the Committee acknowledges that individual anesthesia departments may wish to develop different qualifications for “POCUS supervisors” that are more locally appropriate.

III. Established expertise pathway

For anesthesiologists with established expertise in a given POCUS domain, the *Ad Hoc* Committee suggests that they can demonstrate their competence by obtaining a written/signed endorsement from three attending physicians.

The author of each supporting letter should include, at minimum, the following information in the letter:

- (1) Explain why the letter author is qualified to write the letter. For example, the letter author could demonstrate that they have credibility in the relevant POCUS domain through ANY of the following:
 - (a) possession of a relevant national certificate or certification in ultrasound;
 - (b) history of teaching at relevant local/regional/national/international ultrasound workshops;
 - (c) history of performing/interpreting diagnostic ultrasound exams at their home institution (author should mention the estimated annual volume of relevant ultrasound exams that they personally perform/interpret and the number of years they have been practicing this modality of diagnostic ultrasound)
- (2) Describe the letter author's relationship to the candidate applying for POCUS privileging.
- (3) Include whichever attestation statements listed in Fig 2 of this document pertain to the POCUS domain(s) being discussed.

Each supporting letter should come from an attending physician who has directly observed the candidate’s competence in the relevant POCUS domain. However, that physician need not be currently practicing within the candidate's home institution. Further, the letter writer need not be an anesthesiologist. They could be a diagnostic ultrasound expert practicing in any specialty (e.g., cardiology, radiology, internal medicine, critical care, and/or emergency medicine).

Fig 2: Supporting letters for the established expertise pathway should include, among other things, the text below for each POCUS modality (adapted with permission from a national directive under review by the Veterans Health Administration).

POCUS Modality	Suggested wording for attestation statement
Focused Airway Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused airway ultrasound. Specifically, in my time working with him/her, I observed that he/she could properly use ultrasound to evaluate for, among other things, the following: laryngo-tracheal anatomy and endobronchial vs esophageal vs endotracheal intubation." ¹²
Focused Assessment with Sonography in Trauma (FAST exam)	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused assessment with sonography in trauma (FAST exam). Specifically, in my time working with him/her, I have observed that he/she could properly use ultrasound to evaluate for life-threatening conditions in trauma patients, including but not limited to: intraperitoneal fluid/hemorrhage and pericardial effusion/hemopericardium." ^{5, 7, 13}
Focused Cardiac Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused cardiac ultrasound. Specifically, in my time working with him/her, I have observed that he/she could properly use cardiac ultrasound to evaluate for, among other things, the following: pericardial effusion/cardiac tamponade, gross left ventricular dysfunction, gross right ventricular dysfunction, and gross hypovolemia." ^{7, 14-16}
Focused Gastric Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused gastric ultrasound. Specifically, in my time working with him/her, I observed that he/she could properly use ultrasound to evaluate for, among other things, the following: full stomach (defined as solid gastric content or clear fluid in excess of baseline secretions (Grade 2 antrum))." ^{16, 17}
Focused Musculo-skeletal/Soft Tissue Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused musculoskeletal/soft-tissue ultrasound. Specifically, in my time working with him/her, I have observed that he/she could properly use ultrasound to evaluate for, among other things, the following: differentiating cellulitis vs abscess; signs of fasciitis; presence of a foreign body in soft tissue/muscle; bone fractures; tendon injuries; and joint effusions." ⁷
Focused Ocular Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused ocular ultrasound. Specifically, in my time working with him/her, I observed that he/she could properly use ultrasound to evaluate for, among other things, the following: optic nerve sheath diameter."

Focused Pleural/ Pulmonary Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused lung ultrasound. Specifically, in my time working with him/her, I have observed that he/she could properly use lung ultrasound to evaluate for, among other things, the following: pneumothorax, pleural effusions, interstitial syndromes, and consolidation." ^{7, 13, 16, 18}
Focused Renal/ Genito-urinary ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform renal/genitourinary ultrasound. Specifically, in my time working with him/her, I have observed that he/she could properly use ultrasound to assess for, among other things, the following: hydronephrosis and bladder distention." ^{7, 13, 16}
Focused Trans-cranial Doppler Ultrasound	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused transcranial Doppler ultrasound. Specifically, in my time working with him/her, I have observed that he/she could properly use Doppler ultrasound to evaluate for, at minimum, the following: cerebral vasospasm and elevated intracranial pressure." ¹⁹
Focused Ultrasound for Deep Venous Thrombosis	"I personally attest that Dr. <<Insert Provider Name>> is qualified to perform focused ultrasound for evaluation of deep venous thrombosis (DVT). Specifically, in my time working with him/her, I have observed that he/she could properly use ultrasound to evaluate for, among other things, the following: a DVT in the proximal lower extremity veins and in the internal jugular vein." ^{7, 13}

IV) Commentary on scope of practice

The suggested scope of practice of each diagnostic POCUS modality is described in the attestation statements listed in Fig 2 of this document. Additional comment is warranted with regard to *focused cardiac ultrasound* (FoCUS). FoCUS has been defined by the American Society of Echocardiography (ASE)¹⁴ as a limited, qualitative ultrasound exam of the heart and inferior vena cava to screen for the following conditions:

- Gross left ventricular systolic failure
- Gross right ventricular systolic failure (dilation and/or dysfunction)
- Pericardial effusion/tamponade
- Gross hypovolemia
- Gross valvular disease
- Gross signs of chronic heart disease

In contrast to FoCUS, the ASE defines *transthoracic echocardiography* (TTE) as a quantitative assessment for the six conditions above and any other possible cardiac pathology interpreted by someone with comprehensive training in cardiac ultrasound. Consequently, all of the following should be considered elements of TTE that are outside of the scope of practice of FoCUS:

- Regional wall motion assessment
- Quantification of the severity of valvular disease
- Assessment of congenital heart disease
- Evaluation of prosthetic valves

- Diastolic function assessment

This document does not provide suggestions on criteria for granting anesthesiologist privileges in transthoracic echocardiography. This topic may be addressed by the ASA in future documents.

V) Granting of privileges to perform diagnostic POCUS

Once a candidate meets the bare minimum standards outlined in this document, it will be the responsibility of each institution to determine whether that candidate is competent locally through focused peer review and regular quality assessment. This guideline should be considered the minimum endorsed by the ASA *Ad Hoc* Committee on Point-of-Care Ultrasound.

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Appendix B: Sample Resources for Learning Diagnostic Point-of-Care Ultrasound (POCUS)

I. Peer-reviewed "how to" papers on POCUS

1. Focused airway ultrasound

- a. You-Ten KE, Siddiqui N, Teoh WH, Kristensen MS. Point-of-care ultrasound (POCUS) of the upper airway. *Can J Anaesth.* 2018 Apr;65(4):473-484.
- b. Kristensen MS, Teoh WH, Graumann O, Laursen CB. Ultrasonography for clinical decision-making and intervention in airway management: from the mouth to the lungs and pleurae. *Insights Imaging.* 2014 Apr;5(2):253-79.

2. Focused assessment with sonography in trauma (FAST exam)

- a. Montoya J, Stawicki SP, Evans DC, Bahner DP, Sparks S, Sharpe RP, Cipolla J. **From FAST to E-FAST: an overview of the evolution of ultrasound-based traumatic injury assessment.** *Eur J Trauma Emerg Surg.* 2016 Apr;42(2):119-26.
- b. Rippey JC, Royse AG. Ultrasound in trauma. *Best Pract Res Clin Anaesthesiol.* 2009 Sep;23(3):343-62.
- c. Liu RB, Donroe JH, McNamara RL, Forman HP, Moore CL. The Practice and Implications of Finding Fluid During Point-of-Care Ultrasonography: A Review. [JAMA Intern Med.](#) 2017 Dec 1;177(12):1818-1825.

3. Focused cardiac ultrasound

- a. Zimmerman JM, Coker BJ. **The Nuts and Bolts of Performing Focused Cardiovascular Ultrasound (FoCUS).** *Anesthesia and analgesia* 2017; 124: 753-760.
- b. Shillcutt SK, Bick JS. Echo didactics: a comparison of basic transthoracic and transesophageal echocardiography views in the perioperative setting. *Anesth Analg.* 2013 Jun;116(6):1231-6.

- c. Denault AY, Langevin S, Lessard MR, Courval JF, Desjardins G.
Transthoracic echocardiographic evaluation of the heart and great vessels.
Can J Anaesth. 2018 Apr;65(4):449-472.
- d. Ursprung E, Oren-Grinberg A.
Point-of-Care Ultrasound in the Perioperative Period.
Int Anesthesiol Clin. 2016 Winter;54(1):1-21.
- e. Haskins SC, Tanaka CY, Boublik J, Wu CL, Sloth E.
Focused Cardiac Ultrasound for the Regional Anesthesiologist and Pain Specialist.
Regional Anesthesia and Pain Medicine. 2017 Sep/Oct;42(5):632-644.

4. Focused gastric ultrasound

- a. Haskins SC, Kruisselbrink R, Boublik J, Wu CL, Perlas A.
Gastric Ultrasound for the Regional Anesthesiologist and Pain Specialist.
Reg Anesth Pain Med. 2018 Oct;43(7):689-698.
- b. Van de Putte P, Perlas A.
Ultrasound assessment of gastric content and volume.
Br J Anaesth. 2014 Jul;113(1):12-22.
- c. Perlas A, Chan VW, Lupu CM, Mitsakakis N, Hanbidge A.
Ultrasound assessment of gastric content and volume.
Anesthesiology 2009; 111: 82-89.

5. Focused musculoskeletal/soft tissue ultrasound

- a. Chen KC, Lin AC, Chong CF, Wang TL.
An overview of point-of-care ultrasound for soft tissue
and musculoskeletal applications in the emergency department.
J Intensive Care. 2016 Aug 15;4:55.
- b. Connell MJ, Wu TS.
Bedside musculoskeletal ultrasonography..
Crit Care Clin. 2014 Apr;30(2):243-73.

6. Focused ocular ultrasound

- a. Kilker BA1, Holst JM, Hoffmann B.
Bedside ocular ultrasound in the emergency department.
Eur J Emerg Med. 2014 Aug;21(4):246-53.

7. Focused pleural/pulmonary ultrasound

- a. Kruisselbrink R, Chan V, Cibinel GA, Abrahamson S, Goffi A.
I-AIM (Indication, Acquisition, Interpretation, Medical Decision-making) Framework for Point of Care Lung Ultrasound.
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II. Web-based POCUS learning materials

1. FORESIGHT Ultrasound Curriculum

<https://www.foresightultrasound.com/>

2. University of Toronto Point of Care Ultrasound website

<http://pie.med.utoronto.ca/POCUS/index.htm>

3. University of Utah: online POCUS course

<https://echo.anesthesia.med.utah.edu/tee/focus-content/>

4. Gastric UltraSound: a Point-of-care tool for aspiration risk assessment

<http://gastricultrasound.org/>

III. Hands-on workshops

1. FORESIGHT Perioperative and Acute Care Ultrasound Workshop.

<https://www.pocuseducation.com/>

2. SCA Hands-on Perioperative Ultrasound Course

<https://www.scahq.org/education/Online-CME/perioperative-ultrasound-course/hands-on-course>

3. ASRA Introduction to Perioperative Point-of-Care Ultrasound Workshop

<https://www.asra.com/page/2710/introduction-to-perioperative-point-of-care-ultrasound>

4. SCCM Critical Care Ultrasound courses

<https://www.sccm.org/Education-Center/Critical-Care-Ultrasound>

5. ACCP/CHEST Certificate of Completion in Critical Care Ultrasound

<http://www.chestnet.org/Education/Advanced-Clinical-Training/Certificate-of-Completion-Program/Critical-Care-Ultrasonography>

6. Multiple 1 – 4 hour POCUS workshops offered at the annual ASA, IARS, PGA meetings.

Supplementary Document to “Committee Work Product on Diagnostic Point-of-Care Ultrasound”

Committee of Origin: Ad Hoc Committee on Point-of-Care Ultrasound

Appendix C: Sample Templates for Reporting Point-of-Care Ultrasound Findings

Template 1: Sample Point-of-Care Ultrasound (POCUS) Reporting Template for the ICU Environment

Template 2: Sample Focused Cardiac Ultrasound (FoCUS) Reporting Template for the Perioperative Environment

ICU Point of Care Ultrasound Report

Date of Exam: _____ **MRN:** _____

Patient Name: _____ **Performed By:** _____

Patient Background: The patient is a _____ year-old _____ with a history of _____
_____ presenting with _____.

Indication(s): shock/hypotension respiratory failure oliguria/AKI education other: _____

Vasoactive medications: no; yes (list medications & doses): _____

Mode of ventilation: fully spontaneous; assisted; fully passive positive-pressure ventilation

Focused Cardiac not performed;

- Study quality: adequate for interpretation; inadequate for interpretation
- LV gross systolic function:
 - hyperdynamic (LVEF > 70%); grossly normal (LVEF ~50-70%);
 - mildly impaired (LVEF ~40-50%); moderate-to-severely impaired (LVEF < 40%)
- RV
 - _ gross systolic function: hyperdynamic; grossly normal; impaired
 - _ size: small; grossly normal; enlarged (RV/LV size ≥ 1 in any 4-chamber view)
- Pericardial effusion: absent; present (if effusion present, describe its features below)
 - size: trace to mild; moderate to large
 - ultrasound evidence of chamber compression? no; yes:
- IVC:
 - IVC diameter: < 2 cm; > 2cm
 - IVC size respirophasic change: high variability (> 50%); low variability (< 50%);
- Other findings:

Focused Pleural & Pulmonary not performed;

- Study quality: adequate for interpretation; inadequate for interpretation
- Left parenchymal pattern: A + lung sliding diffusely; focal absence of lung sliding
 - focal B/consolidation; diffuse B lines
- Right parenchymal pattern: A + lung sliding diffusely; focal absence of lung sliding
 - focal B/consolidation; diffuse B lines
- Left pleural space: effusion present; consolidation present; B lines present
 - if effusion present: size: _____ ; character: homogenous heterogenous septated
- Right pleural space: effusion present; consolidation present; B lines present
 - if effusion present: size: _____ ; character: homogenous heterogenous septated
- Other findings:

FAST not performed;

- Study quality: adequate for interpretation; inadequate for interpretation
- RUQ: free fluid absent; free fluid present; incomplete exam

- LUQ: free fluid absent; free fluid present; incomplete exam
- Pelvis: free fluid present; free fluid absent; incomplete exam
- Other findings:

Retroperitoneal not performed;

- Study quality: adequate for interpretation; inadequate for interpretation
- Aortic pathology: grossly normal; aneurysm; incomplete exam; other:
- L kidney: no hydro; mild hydro; mod-severe hydro incomplete exam; other:
- R kidney: no hydro; mild hydro; mod-severe hydro incomplete exam; other:
- Bladder size: small/decompressed; distended; unable to visualize
 - if bladder assessed, was Foley balloon visible in bladder? yes; no
- Other findings:

Focused lower extremity venous compression not performed;

- Study quality: adequate for interpretation; inadequate for interpretation
- Left leg
 - femoral region (CFV, GSV, SFV): no DVT; likely DVT; indeterminate/incomplete exam
 - popliteal region (popliteal vein): no DVT; likely DVT; indeterminate/incomplete exam
- Right leg
 - femoral region (CFV, GSV, SFV): no DVT; likely DVT; indeterminate/incomplete exam
 - popliteal region (popliteal vein): no DVT; likely DVT; indeterminate/incomplete exam
- Other findings:

OVERALL ASSESSMENT

Background: These images were obtained to augment the physical exam using point-of-care ultrasound (POCUS). If the treating provider uses the exam findings to guide patient care, a brief interpretation of the ultrasound findings may be included below and/or in the daily ICU progress note. Interpretation of POCUS exams occurs contemporaneously with clinical care and focuses on identifying a cause or causes of acute organ failure in critically ill patients. POCUS exam interpretation does not address other pathology that could possibly be present in the obtained images. When feasible, the findings of a POCUS exam may be confirmed by a second diagnostic modality before they are used to change patient care. However, in urgent/emergent cases, POCUS findings can be used to guide patient care if waiting for a second diagnostic test would be likely to delay appropriate treatment and/or cause patient harm.

Overall impression:_____.

These findings were communicated to the primary intensivist,_____.

<<anesthesiology resident/fellow name and credential>>

Attending Attestation

I have reviewed the point-of-care ultrasound images and agree with the interpretation as described in the resident/fellow report above except as noted below.

<<attending name and credential>

Template developed by: Matthew Read, MD and Yuriy Bronshteyn, MD, FASE with input from Duke Anesthesiology ICU fellows.

Focused Cardiovascular Ultrasound (FoCUS)

Reporting Form

Patient name: _____ Patient MRN: _____

Sonographer: _____ Date of study: ____/____/____

Indication: Murmur Heart failure Hemodynamic instability Other: _____

Location of study: Preop clinic Same day surgery OR PACU Other: _____

Quality of study: Adequate Inadequate Second Opinion Requested: No Yes

Left Heart

Size: Small Normal Enlarged Wall thickness: Normal Significant hypertrophy

Global Function: Normal Moderate dysfunction Severe dysfunction

Regional wall motion abnormalities: Absent Present Left atrium: Not enlarged Enlarged

Right Heart

Size: Small Normal Enlarged Wall thickness: Normal Significant hypertrophy

Global Function: Normal Moderate dysfunction Severe dysfunction

Vent Septum: Normal Flat in diastole Flat in systole Right atrium: Not enlarged Enlarged

IVC Size: Normal Flat Enlarged IVC Collapse (Sniff): NA < 50% > 50%

Pericardial Effusion: Absent Small Large RA syst collapse RV diast collapse

Valves, Masses, Etc.

Aortic Valve: Normal Significant stenosis Coapt defect/significant regurg

Mitral Valve: Normal Significant thickening Coapt defect/significant regurg Large EPSS

Systolic Anterior Motion of MV: Absent Present Present with Obstruction

Tricuspid Valve: Normal Significant thickening Coapt defect/significant regurg

Masses: None On AV On MV Cavitary Lung Sliding: Bilat Absent R Absent L

Other pertinent findings: _____

Conclusions: _____

Developed by Josh Zimmerman, MD, FASE