Table 1. Point of Care Ultrasound Image Acquisition Criteria

Image acquisition is a core element of any POCUS competency program (A in the I-AIM framework). The following elements evaluate learner performance when aquiring images or clips. This section is meant to evaluate the acquisition skills of the performer. Essentially this means we are evaluating the skill of obtaining good quality images. We can achieve this goal by using the following criteria on each organ system. This document also satisfies criteria for the OSCE content on POCUS. This component is part of the formative and summative assessment portions of the program, each evaluated separately.

	CARDIAC	Complete	Incomplete
	For all cardiac images/ clips the following convention should include:		
	i. Preset: Choose abdominal preset (indicator on the left side the sector) or cardiac preset (indicator on the right side of the sector) consistently through the examination to avoid laterality mistakes.	☐	☐
	ii. Probe: Use the phased- array transducer for all views. The subcostal views can be obtained with the use of a curved linear probe.	☐	☐
	iii. Patient position: Ideally on the left lateral decubitus position or in supine if unable to turn.	☐	☐
	iv. Contrast: Clear definition of endocardial borders.	☐	☐
A.	**Parasternal long-axis view:**		
	i. Axis:	☐	☐
	a. The following structures are visible: LV, LA, RV, LVOT, aortic valve and mitral valve		
	b. Functional findings: Both aortic & mitral valve are both seen opening at appropriate part of the cardiac cycle		
	ii. Gain: The blood is relatively black	☐	☐
	iii. Depth: Able to see at least descending thoracic aorta	☐	☐
B.	**Parasternal short-axis view:**		
	i. Axis:	☐	☐
	a. The following structures visible: LV at mid-ventricular level. RV seen as crescent-shaped structure at the top and left portions of the sector and clear view of the free walls. Papillary muscles clearly seen.		
	ii. Gain: The blood is relatively black	☐	☐
	iii. Depth: Able to see deep enough to visualize parietal pericardium	☐	☐
C.	**Apical 4-chamber view:**		
	i. Axis:	☐	☐
	a. The following structures are visible: LV, RV, RA, LA, mitral and tricuspid valve. No foreshortening of the LV apex: it should appear ellipsoid and not rounded. Septa should appear along a vertical line running along the center of the screen.		
	b. Functional findings: The tricuspid & mitral valves both seen opening in diastole.		
	ii. Gain: The blood is relatively black	☐	☐
	iii. Depth: able to see deep enough to see just posterior to the atria	☐	☐
D.	**Subcostal 4-chamber view:**		
	i. Axis: Sector width set to wide to cover all chambers.		
	a. The following structures are visible: LV, RV, RA, LA, tricuspid. Image centered such that the LV apex and medial wall of the RV are clearly visible.	☐	☐
	b. Functional finding: The tricuspid valve and MV is seen opening in diastole.		
	ii. Gain: The blood is relatively black	☐	☐
	iii. Depth: able to see deep enough to just posterior to parietal pericardium deep to the LV	☐	☐
E.	**IVC (long-axis) view:**		
	i. Axis:	☐	☐
	a. The following structures visible: IVC in the long axis (and NOT the aorta or hepatic vein), and liver.		
	ii. Gain: The blood is relatively black	☐	☐
	iii. Depth: Able to see deep enough to see behind the IVC to see if there is liver tissue or spine there (i.e., if liver posterior to IVC, this supports the identification of the structure as being the IVC whereas if spine is posterior, this would support the identification of this structure as being the aorta)	☐	☐
F.	**Formative assessment.**		
	Pass/Fail criteria: A complete study is considered on in which all views are able to be obtained unless the study was deemed technically challengign by mentor; in this case it is up to the discretion of the mentor if the study can be added to the mentee's log of cases		

	Failure of the study also includes: Failure to obtain good/clear views of a structure and/or getting an oblique or off center views in the majority of the windows.			
	i. Pass	☐		
	ii. Fail		☐	
G.	**Summative assessment.**			
	Same as pass/fail criteria. However failure is considered if all views are not obtained or failure to get good/clear views of a structure. or unable to obtain optimal gain (too dark or too bright), off axis view unless there are technical challanges to optimize the view.			
	i. Pass	☐		
	ii. Fail		☐	

2	**LUNG**	**Complete**	**Incomplete**
	For all lung images/ clips the following convention should include:		
	i. Preset: No standarized preset is recommended. Only use the same preset throughout the lung exam	☐	☐
	specially if the exam is to be done serially in the same patient.		
	ii. Probe: Linear probe for anterior chest, curvilinear probe for the postero-lateral lung views.	☐	☐
	of a curved linear probe.		
	iii. Patient position: Supine for anterior views, rotated with arm flexed to look at the posterior views for	☐	☐
	the posterior views.	☐	☐
	iv. Contrast: Clear definition of intercostal muscles		
	v. Remove **focusing** from the exam since it will have an effect on lung artifacts.		
A.	**Anterior chest.**		
	i. Axis:	☐	☐
	a. Cranial & caudal ribs/rib shadows are visible		
	b. You should be able to visualize whether lung sliding is present or absent		
	ii. Gain: gain should be low enough to see pleural line distinct from surround structures	☐	☐
	iii. Depth: if B-lines are visible, sector depth should be enough to see the B-lines obliterate at least 2 A-lines	☐	☐
	(>10cm). If only A-lines are visible, you really only need enough sector depth to see the first A line		
B.	**Postero-lateral lung view**		
	i. Axis:	☐	☐
	a. The following structures are seen: diaphragm, spine caudal to the diaphragm, supradiaphragmatic space		
	ii. Gain: gain should be high enough to see liver/diaphragm as relatively echogenic structures	☐	☐
	iii. Depth: should be set deep enough to see the spine	☐	☐
C.	**Formative assessment.**		
	Pass/Fail criteria: A complete study is considered on in which all views (3 anterior and one posterolateral view per hemithorax)		
	or 6 views are able to be obtained unless deemed technically difficult by mentor: in this case it is up to the discretion of the mentor if		
	the study can be added to the mentee's log of cases.		
	Failure of the study also includes: Failure to obtain good/clear views of the pleural line or of the diaphragm on most of the views		
	i. Pass	☐	
	ii. Fail		☐
D.	**Summative assessment.**		
	Same as pass/fail criteria. However failure is considered if all views are not obtained or failure to get good/clear views of the		
	pleural line or diaphragm unless there are technical challanges to optimize these.		
	i. Pass	☐	
	ii. Fail		☐

3	GASTRIC	Complete	Incomplete
	For al gastric images/ clips the following convention should include:		
	i. Preset: Use abdominal preset	☐	☐
	ii. Probe: Linear probe for pediatrics ortherwise curvilinear probe	☐	☐
	iii. Patient position: Supine and the semirecumbent or right lateral decubitus position.	☐	☐
	iv. Contrast: Clear definition of the liver		
A.	**Gasric antrum view:**		
	i. Axis:	☐	☐
	a. The following structures are visualized: liver, antrum in full circumference, aorta and SMA.		
	If aorta is not seen, then the IVC should be visualized		
	The far field strutures (aorta, SMA, ivc or SMV) may not be seen if there is a full stomach due to acoustic shadowing.		
	ii. Gain: should be set so that the liver appears of medium echogenicity (grey) and the content of aorta appears anechoic	☐	☐
	iii. Depth: should be set deep enough to see the aorta, or where it is expected to be	☐	☐
B.	**Formative assessment.**		
	Pass/Fail criteria: A complete study is considered when the exam is done in the supine and repeatred in the semirecumbent or RLD position unless there is acoustic shadowing or an antrum filled with various degrees of echogenic material denoting a full stomach. If deemed technically challenging by mentor a different patient should be selected before assessment is performed. Failure of the study also includes: Failure to obtain good/clear views of the gastric antrum or off axis view by not visualizing the expected vascular structures.		
	i. Pass	☐	
	ii. Fail		☐
C.	**Summative assessment.**		
	Same as pass/fail criteria.		
	i. Pass	☐	
	ii. Fail		☐

4	Focused Assessment with Sonography in Trauma (FAST) exam	Complete	Incomplete
	For all FAST exams/clips the following convention should include:		
	i. Preset: Choose abdominal preset (indicator on the left side the sector) or cardiac preset (indicator on the right side of the sector) consistently through the examination to avoid laterality mistakes.	☐	☐
	ii. Probe: Use the curved linear probe. A phased array probe can be used for the subcostal view as part of the heart exam; see above for details on that portion of the exam.	☐	☐
	iii. Patient position: Supine for most views. The LUQ may need right patient tilt.	☐	☐
	iv. Contrast: Clear definition of the liver/spleen or respective diaphragm.	☐	☐
A.	**Right Upper Quadrant (RUQ) / Morison's Pouch view**		
	i. Axis:	☐	☐
	a. The following strucutres should be visible: diaphragm, hepato-renal recess (Morison's pouch), and inferior tip of liver.		
	ii. Gain: should be appropriate to allow visualization of free fluid as distinct from surrounding tissues	☐	☐
	iii. Depth: appropriate to visualize spine, but not beyond spine	☐	☐
B.	**Left Upper Quadrant (LUQ) / Spleno-renal recess view**		
	i. Axis:	☐	☐
	a. The following strucutres should be visible: diaphragm, spleno-renal interface, and inferior tip of spleen are visible		
	ii. Gain should be appropriate to allow visualization of free fluid as distinct from surrounding tissues	☐	☐
	iii. Depth: appropriate to visualize spine, but not beyond spine	☐	☐
C	**Pelvic view: Transverse**		
	i. Axis:	☐	☐
	a. The following strucutres should be visible: male pelvis: entire bladder is visualized. Seminal vesicles		

and/or prostate. Female pelvis: entire bladder is visualized.

iii. Gain: set low enough to permit screening for free fluid posterior to the bladder. ☐ ☐

D. Pelvic view: Sagittal

i. Axis: ☐ ☐

a. The following strucutres should be visible: female pelvis: bladder, uterus (if present), and vaginal stripe are visualized.
In both females and males, if the bladder is distended then the maximal size of bladder should be visible visible
(i.e., anterior-posterior dimension of bladder similar in this view to the maximal anterior-posterior dimension of bladder
seen in accompanying transverse view)

ii. Gain: set low enough to permit screening for free fluid posterior to the bladder ☐ ☐

E. Subcostal 4-chamber view:

i. Axis: Sector width set to wide to cover all chambers.

a. The following structures are visible: LV, RV, RA, LA, tricuspid. ☐ ☐

Image centered such that the LV apex and medial wall of the RV are clearly visible.

b. Functional finding: The tricuspid valve and MV is seen opening in diastole.

ii. Gain: The blood is relatively black ☐ ☐

iii. Depth: able to see deep enough to just posterior to parietal pericardium deep to the LV ☐ ☐

F. Formative assessment.

Pass/Fail criteria: A complete study is considered when the exam is done on all views including the subcostal view
If some of the views are deemed technically challenging by mentor then it is up to the discretion of mentor if the complete exam
can be added as part of the mentee's log of cases
Failure of the study also includes: Failure to obtain good/clear views or off axis views in most of the exam by not visualizing
the expected structures.

i. Pass ☐

ii. Fail ☐

G. Summative assessment.

Same as pass/fail criteria. However the trainee is epected to visualize all structures and not some unless deemed technically
by mentor. It is up to the discretion of the mentor to designate a pass or to choose a different patient for an exam.

i. Pass ☐

ii. Fail ☐