



# Critical Care Ultrasound Course

## An Introduction to Hemodynamic Assessment with Echo

**July 2024**

### Learning Outcomes

*At the conclusion of this course, learners should be able to:*

- Perform a critical care echo to assess the key cardiac structures to identify and characterize an array of life-threatening conditions including pericardial tamponade, LV failure, RV failure, pulmonary hypertension and complications of venous thromboembolism etc.
- Integrate colour and spectral Doppler assessment to identify and characterize a range of life-threatening conditions including ventricular failure, obstruction, cor pulmonale, and gross valvular diseases.
- Clinically integrate cardiac ultrasound findings to aid in diagnosis and management of life-threatening illnesses in the acutely unwell patient.

Time	Session	Contents
<b>07:45 to 08:15</b>	<b>Welcome and Registration</b>	Coffee and light breakfast
08:15 to 08:45	Overview & Introduction to advanced critical care ultrasound	Review key learning outcomes, basics
08:45 to 10:15	Hands-on #1 ½ participants  Image Interpretation #1 ½ participants	<b>Step 1:</b> Introduction and review of advanced hemodynamic assessment in echo Hands-on & image interpretation #1
10:15 to 10:30	Refreshment break ( <i>**Flip/alternate hands on to image interpretation and vice versa</i> )	
10:30 to 12:00	Hands-on #1 ½ participants  Image Interpretation #1 ½ participants	<b>Step 1:</b> Introduction and review of advanced hemodynamic assessment in echo Hands-on & image interpretation #1
12:00 to 12:30	Lunch break	
12:30 to 13:45	Hands-on #2 ½ participants  Image Interpretation #2 ½ participants	<b>Step 2:</b> Advanced CCUS in respiratory failure and obstructive shock Hands-on & image interpretation #2
13:45 to 14:00	Refreshment break ( <i>**Flip/alternate hands on to image interpretation and vice versa</i> )	
14:00 to 15:15	Hands-on #2 ½ participants  Image Interpretation #2 ½ participants	<b>Step 2:</b> Advanced CCUS in respiratory failure and obstructive shock Hands-on & image interpretation #2
15:15 to 16:15	Exit exam with hands-on review ~7 participants being examined	<b>Step 3: Putting it all together</b> Hands-on & image interpretation #3



# Critical Care Ultrasound Course

## An Introduction to Hemodynamic Assessment with Echo

	<p>*Participants will cycle between exit exam and interpretation room, until all examined</p> <p>Step #3 Participants not being examined</p>	
16:15 to 16:30	Course Summary and Wrap Up	Review, Q & A

### Step 1: Introduction and review of advanced hemodynamic assessment in echo Hands-on & image interpretation #1

- Core and advanced views review,
- Difficult-to-echo patients
- Color and spectral Doppler (CW, PW)
- Approach to LV function and failure (stroke volume/CO)
- Approach to RV function and failure (septal physiology, TAPSE)
- Troubleshooting and pitfalls

### Step 2: Advanced CCUS in respiratory failure and obstructive shock Hands-on & image interpretation #2:

- Interrogation for tamponade
- Cardiac complications of venous thromboembolism (septal physiology, 60/60, PA notching/ lung findings, McConnell)
- Refractory shock and identifying dynamic and fixed obstruction
- Detecting gross valvular lesions in aortic/mitral/tricuspid valves.

### Step 3: Putting it all together!

#### Hands-on exit assessment & image interpretation #3

- Clinical cases focusing on
  - Tamponade
  - RV failure
  - LV failure
  - Obstructive lesions
  - Massive regurgitation