

# The Applicability of Emergency Point of Care Ultrasound(POCUS) in Patient with Kidney Diseases

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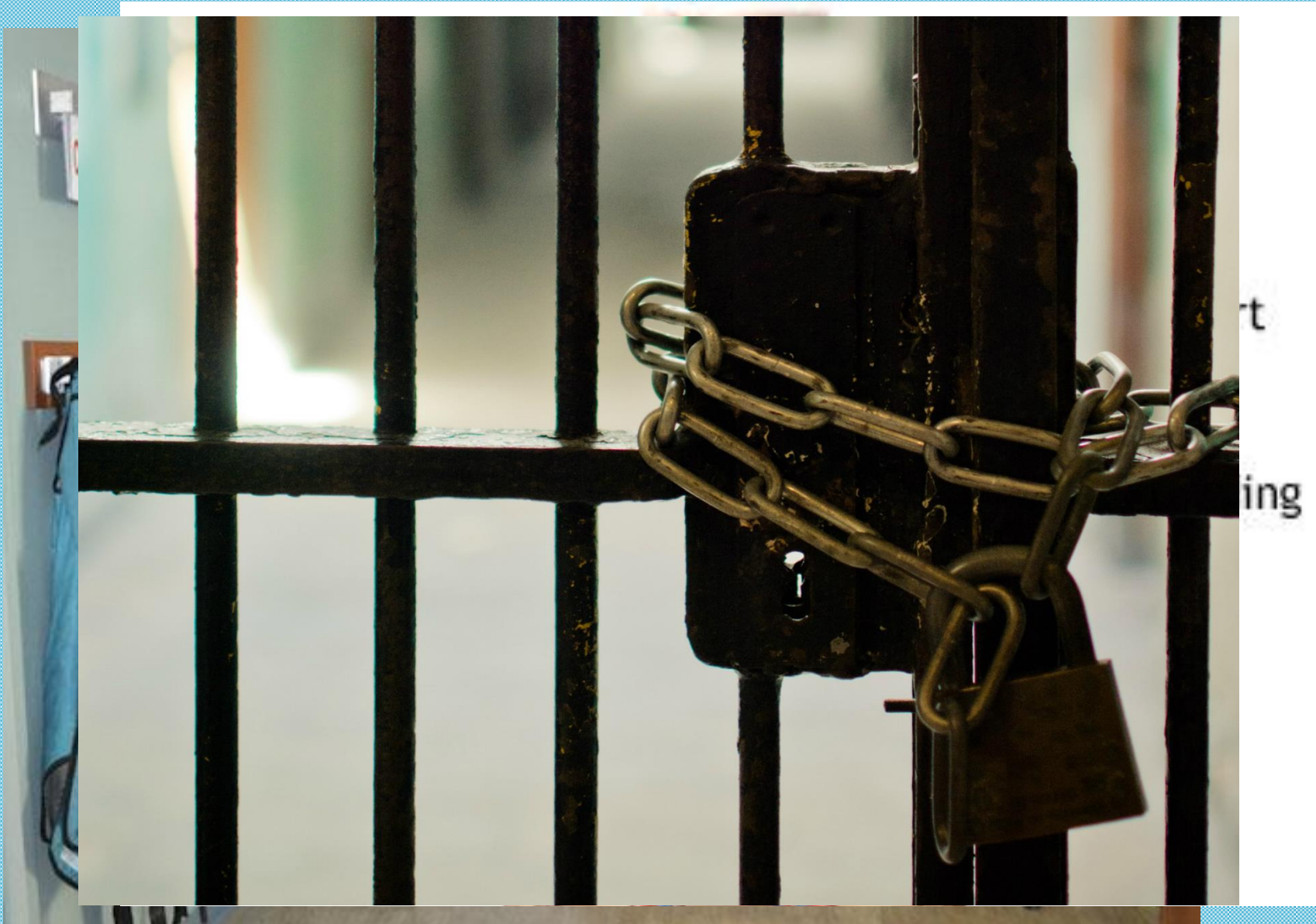
# Diagnostic Tools in Routine and Critical situation

- ▶ Knowledge
- ▶ Experiences
- ▶ Patient Blood Exam
- ▶ Urine Exam
- ▶ Chest X-Ray
- ▶ Ultrasound by Radiologist
- ▶ Ct and so on .....

1. Volume overload(Pulmonary Edema)
2. Volume Depletion
3. Assessing cardiac function(Ejection fraction)
4. Pericardial Effusion
5. Tamponade
6. Pleural Effusion
7. Ascites
8. Urinary Obstruction
9. Bladder Volume(AKI)



# Who or Which tool

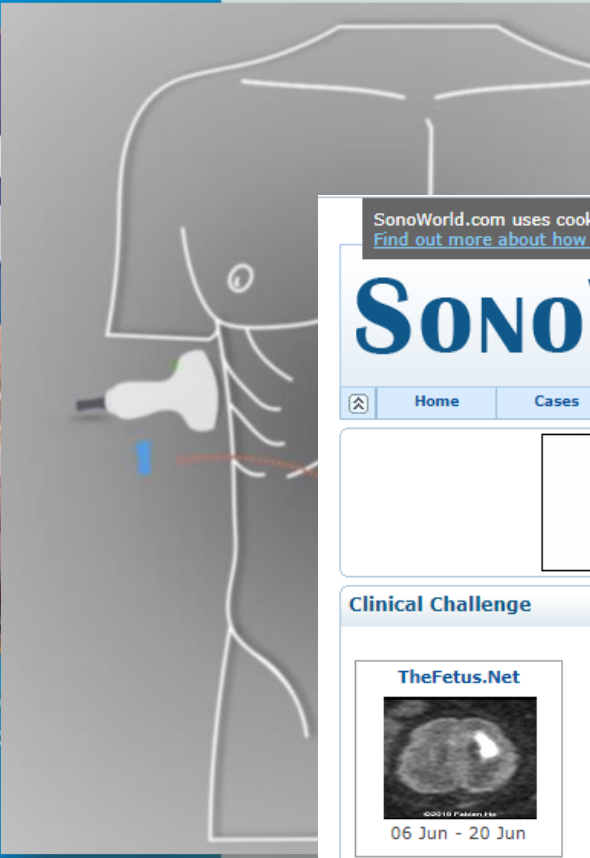




# ATLAS OF Renal Ultrasonography

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**Beverly E. Hashimoto, MD, FACR**  
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Released: May 27, 2019 | Time: 28 min

**Richard G. Barr, MD, PhD**  
Ultrasound Liver Elastography: How I Do It  
Released: May 20, 2019 | Time: 30 min

**Aya Kamaya, MD**  
Color Doppler Sonography in Genitourinary Ultrasound  
Released: May 13, 2019 | Time: 28 min

# The Answer is POCUS



# What is Point of Care Ultrasound?

- ▶ The use of ultrasound by non-radiologists Physicians and the use of portable ultrasonography at a patient's bedside for:
  1. Diagnostic (e.g., symptom or sign-based examination)
  2. Therapeutic (e.g., image-guidance) purposes

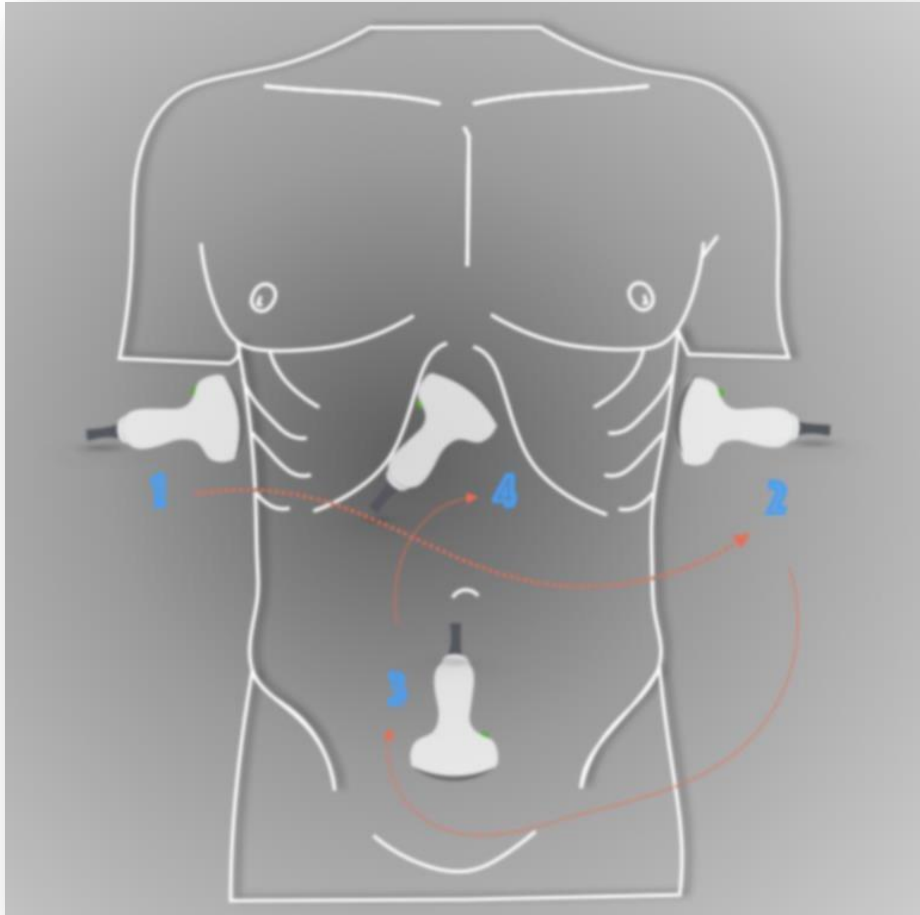
# Pioneers of POCUS are

- ▶ Cardiologists 1960
- ▶ Ob/gyn specialists 1960-70
- ▶ Emergency Medicine 1980 to 2000
- ▶ Surgeon 2000
- ▶ Anesthesiologist 2010 , ....
- ▶ Nephrologist in ??????



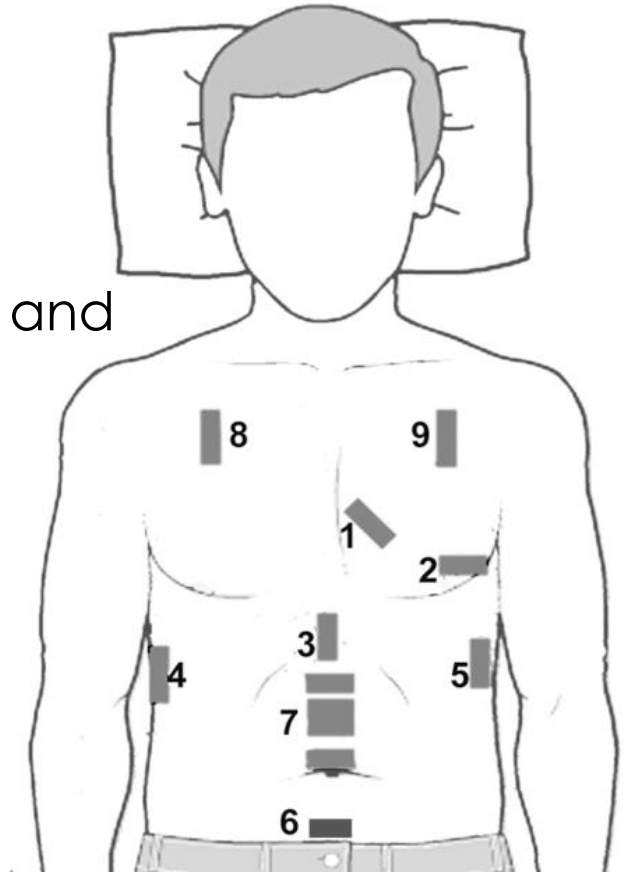
# Emergency Medicine

## FAST(Focused Assessment with Sonography in Trauma)



## RUSH Exam

Rapid **Ultrasound** for Shock and Hypotension

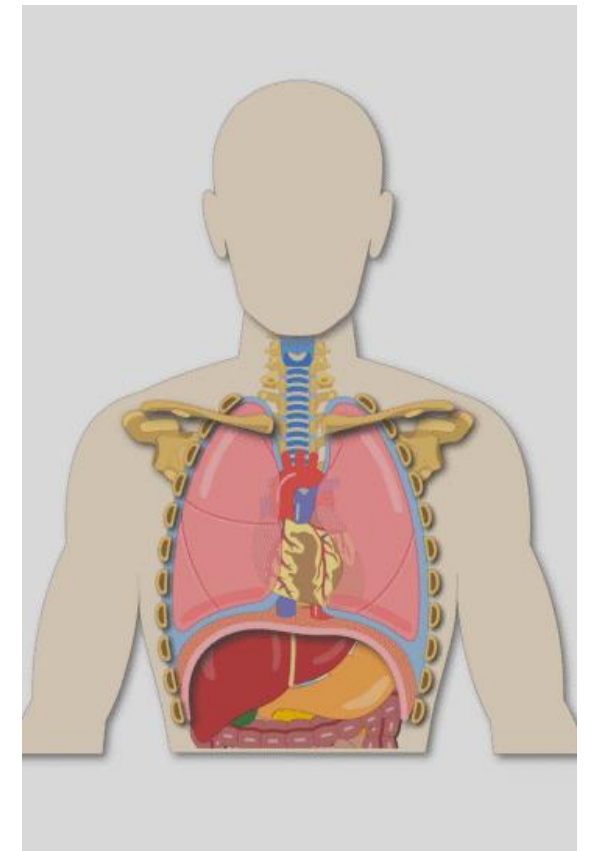
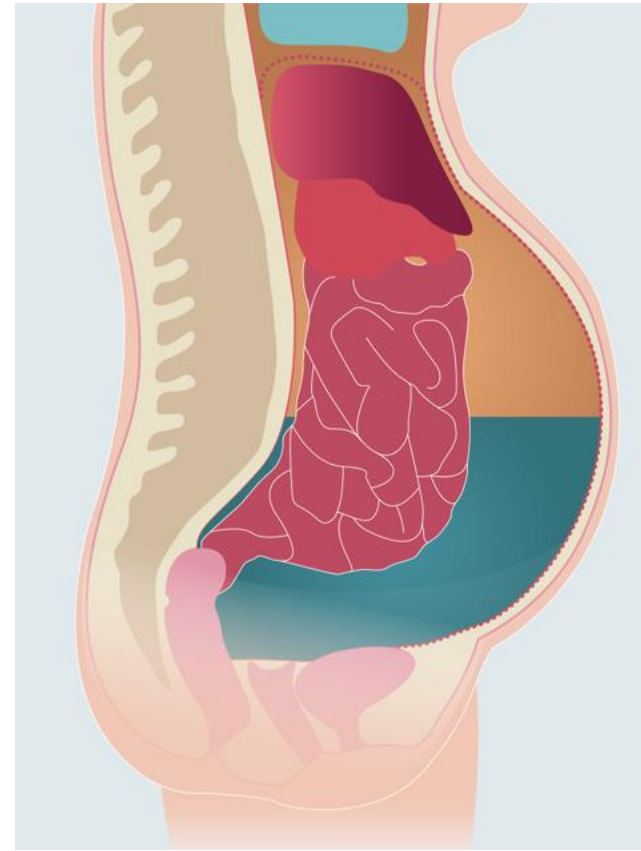
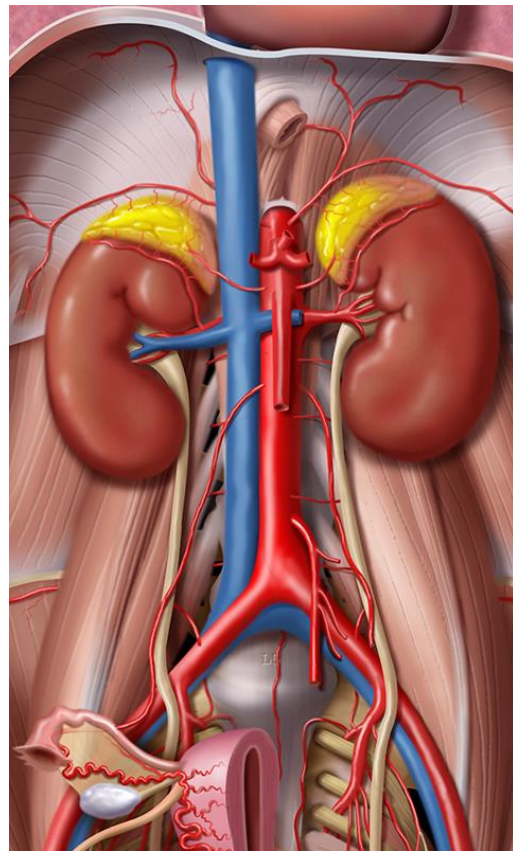
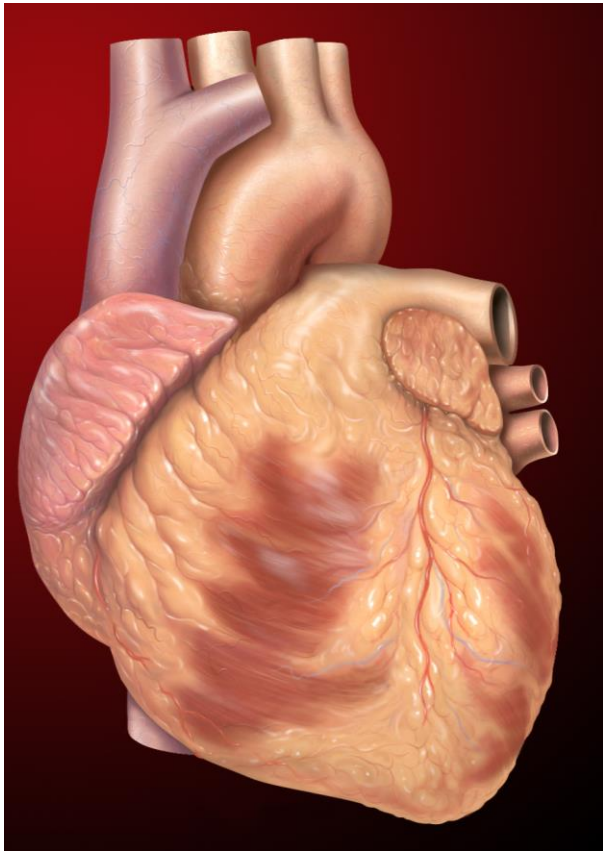


1. Ejection Fraction
2. Pericardial Effusion

1. Volume Depletion
2. Volume Overload

1. Hepatorenal
2. Splenorenal
3. Pelvic

- Pulmonary Edema  
Pneumothorax  
Pleural Effusion



# How to Assess Heart by POCUS

- ▶ Assess LV function and filling
- ▶ Pericardial collection
- ▶ Assess pulseless electrical activity

**Focused cardiac ultrasound** in the emergent setting: a consensus statement of the American Society of Echocardiography and American College of Emergency ...

AJ Labovitz, VE Noble, M Bierig, SA Goldstein... - Journal of the American ... , 2010 - Elsevier

... department, physician use of portable machines substantially increases the detection of **cardiovascular** abnormalities over ... Image Archival and Report Generation for **Focused Cardiac Ultrasound**. Given that the increasing use of **FOCUS** in the emergency department is a result ...

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**International evidence-based recommendations for focused cardiac ultrasound**

G Via, A Hussain, M Wells, R Reardon... - Journal of the American ... , 2014 - Elsevier

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**Focus cardiac ultrasound: the European Association of Cardiovascular Imaging viewpoint**

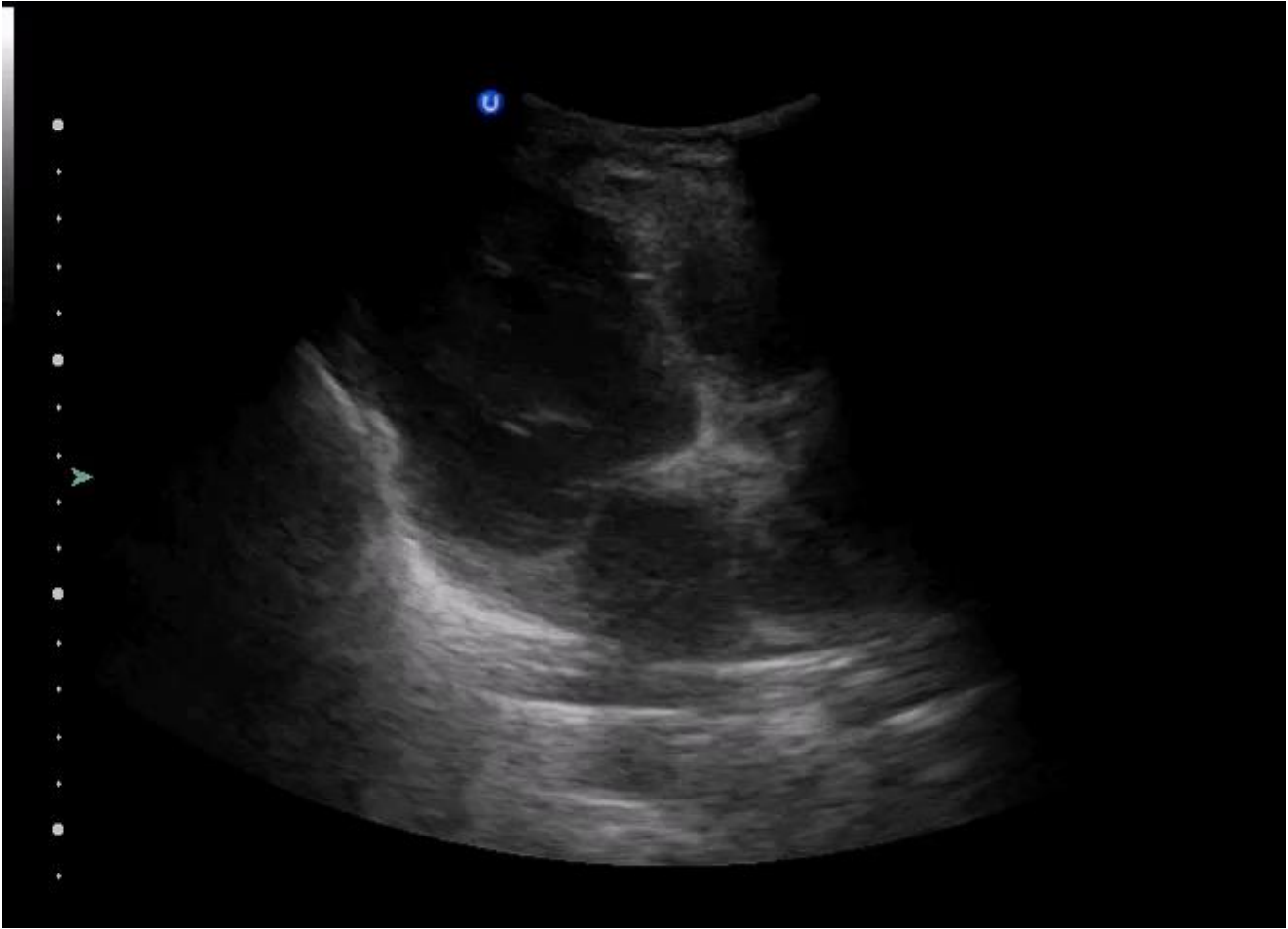
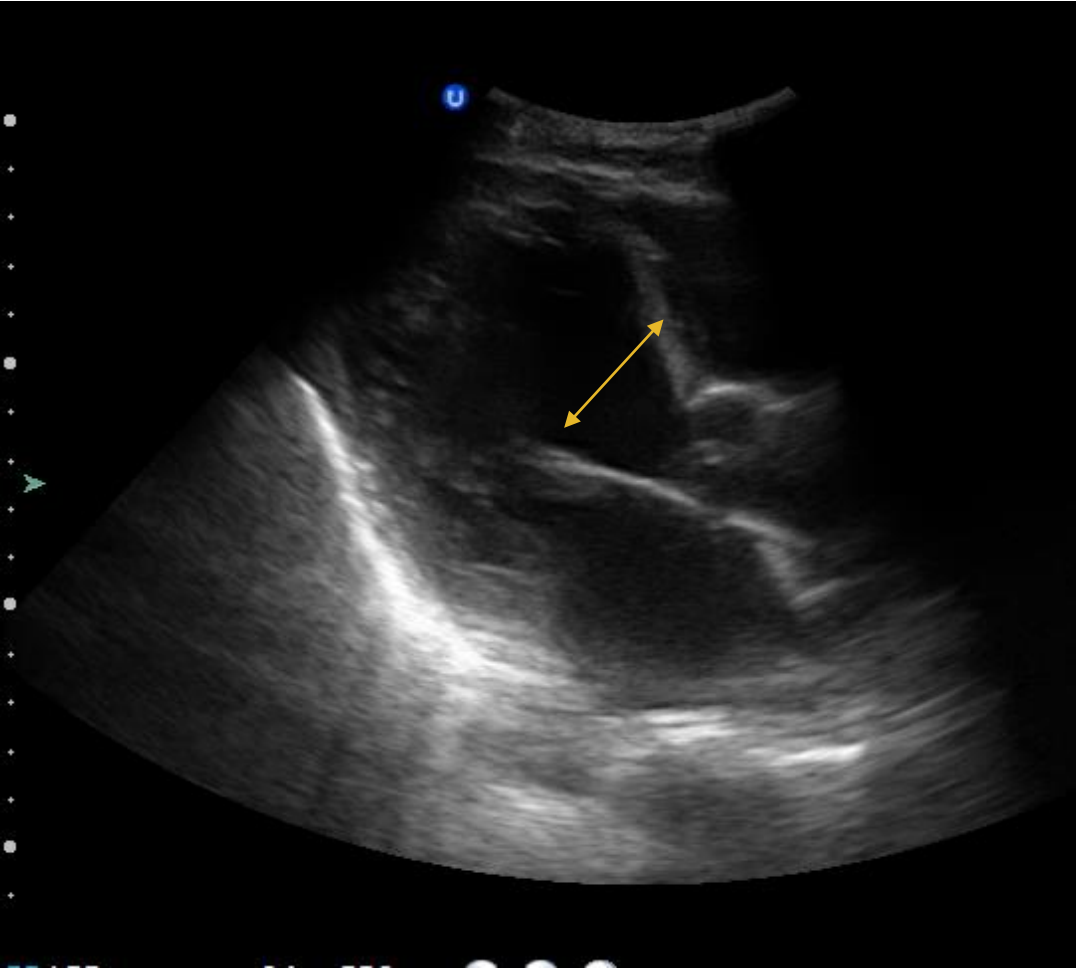
..., European Association of **Cardiovascular** ... - ... -**Cardiovascular** ... , 2014 - academic.oup.com

... **Focus cardiac ultrasound: the European Association of Cardiovascular Imaging viewpoint.**

Aleksandar N. Neskovic. 1Clinical Hospital Center Zemun, Faculty of Medicine, University of Belgrade, Belgrade, Serbia. \*. \*. Corresponding author ...

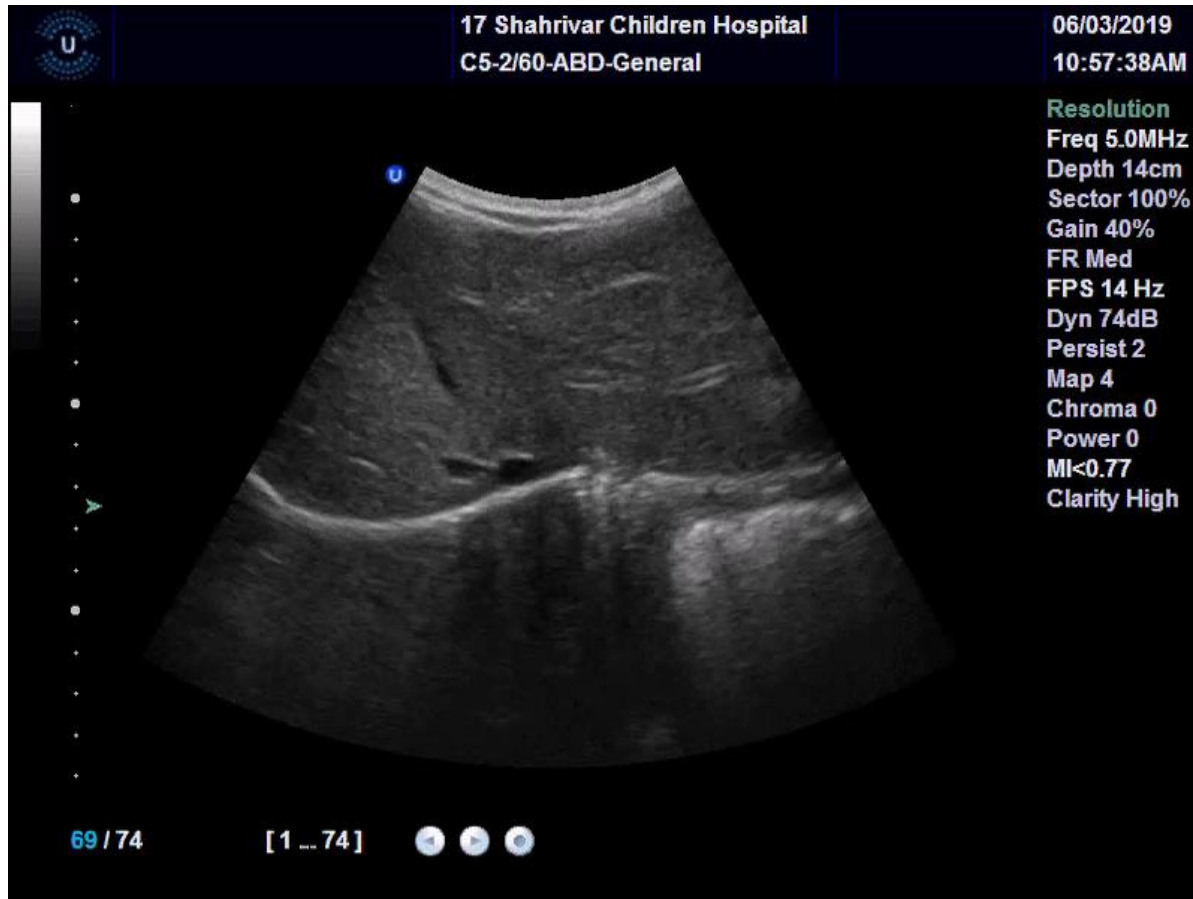
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# Ejection Fraction (PSLA)





# Pericardial effusion

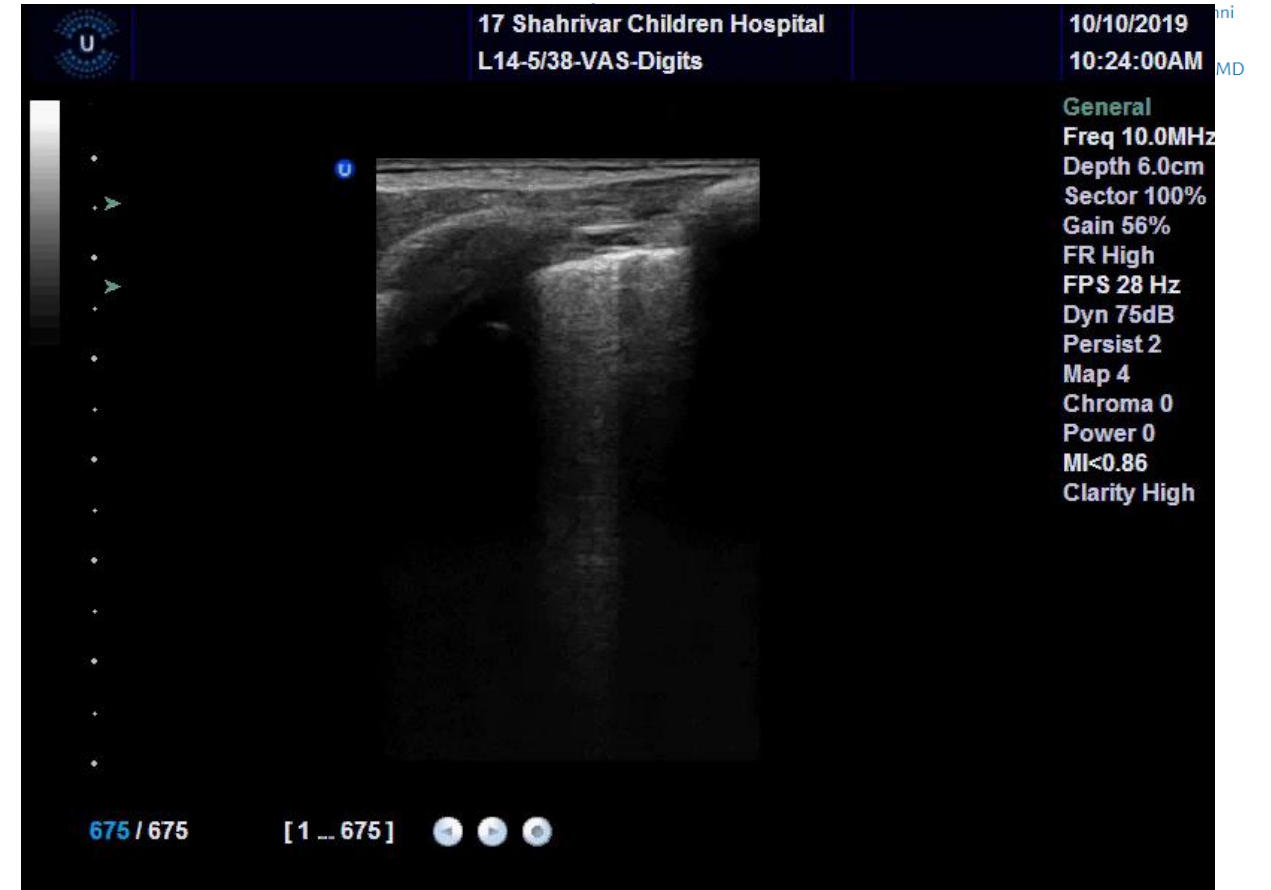


# Pulmonary Edema, Pneumothorax



Original Research: Pulmonary Procedures

## Point-of-Care Ultrasonography for Evaluation of Acute Dyspnea in the ED



# Inferior Vena Cava



Academic Emergency Medicine

Official Journal of the Society for Academic Emergency Medicine

Free Access

## Use of Bedside Ultrasound to Assess Degree of Dehydration in Children With Gastroenteritis

Lei Chen MD, Allen Hsiao MD, Melissa Langhan MD, Antonio Riera MD, Karen A. Santucci MD

First published: 12 October 2010 | <https://doi.org/10.1111/j.1553-2712.2010.00873.x> | Cited by: 51

Address for correspondence and reprints: Lei Chen, MD; e-mail: [lei.chen@yale.edu](mailto:lei.chen@yale.edu).

Presented at the Pediatric Academic Society annual meeting, Baltimore, MD, May 2009.  
Supported in part by CTSA, grant KL2 RR024138 from the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH), and NIH Roadmap for Medical Research.  
Supervising Editor: Bema Bonsu, MD.

## Focused cardiac ultrasound in the emergent setting: a consensus statement of the American Society of Echocardiography and American College of Emergency ...

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... department, physician use of portable machines substantially increases the detection of **cardiovascular** abnormalities over ... Image Archival and Report Generation for **Focused Cardiac Ultrasound**. Given that the increasing use of **FOCUS** in the emergency department is a result ...

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The American Journal of Emergency  
Medicine

Volume 31, Issue 5, May 2013, Pages 763-767

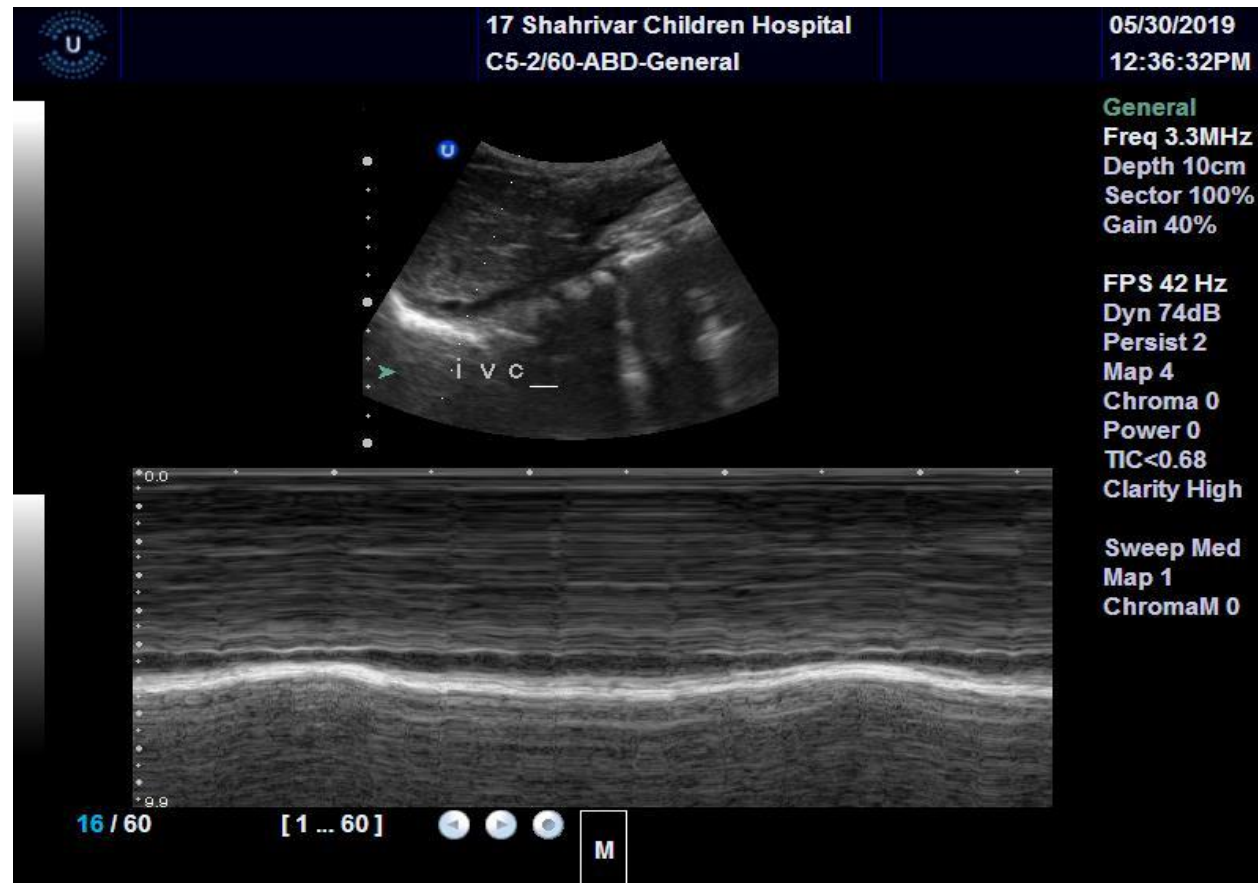


Original Contribution

## Role of inferior vena cava and right ventricular diameter in assessment of volume status: a comparative study: Ultrasound and hypovolemia

Suat Zengin <sup>a</sup> , Behcet Al <sup>a</sup>, Sinan Genc <sup>a</sup>, Cuma Yildirim <sup>a</sup>, Süleyman Ercan <sup>b</sup>, Mehmet Dogan <sup>a</sup>, Gokhan Altunbas <sup>c</sup>

# IVC Diameter





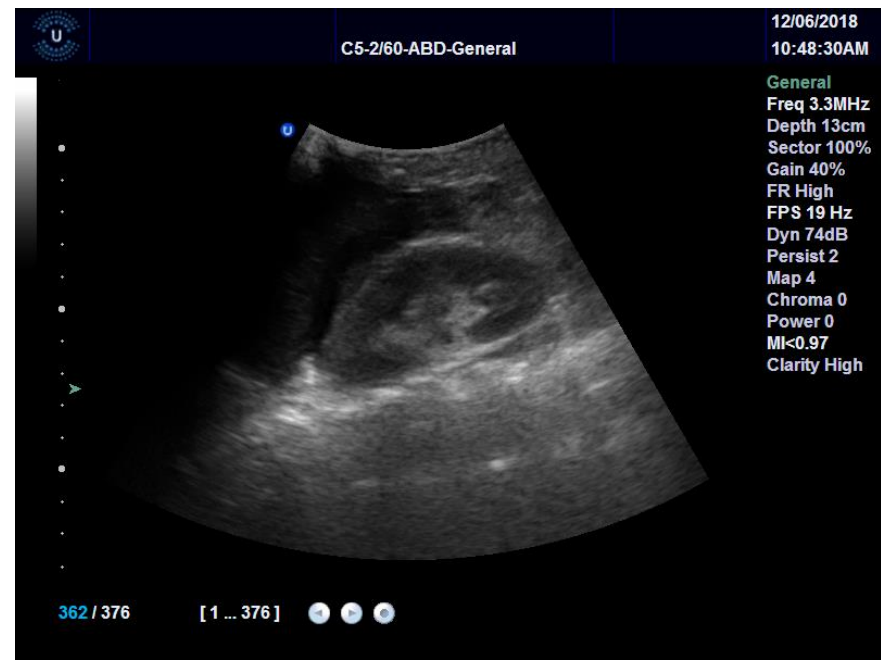
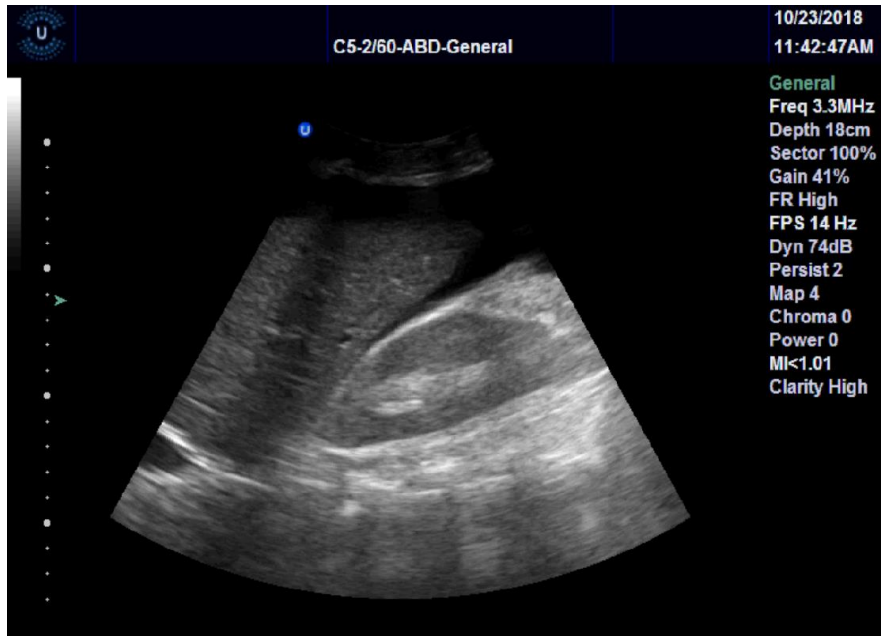
# Lung Ultrasound

## ► Pleural effusion



# Intraperitoneal Fluids

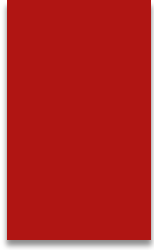
- ▶ RUQ
- ▶ Spleno-Renal Space
- ▶ Pelvic
- ▶ Intestinal Loops



The Main Question is?

How to learn POCUS





# POCUS Workshop

## Course Details (Syllabus) »

### Day 1

- 8:00 - 8:30 - Registration and breakfast
- 8:30 - 9:30 - Practical physics of sonography
- 9:30 - 10:00 - Knobology
- 10:00 - 10:15 - Break
- 10:15 - 11:15 - Imaging techniques: diagnostic, biopsy, vascular access
- 11:15 - 12:30 - Hands-on session: normal kidneys, biopsy guidance
- 12:30 - 1:30 - Lunch
- 1:30 - 2:30 - Interpretation: Developing a mindset for interpreting ultrasonography
- 2:30 - 4:30 - Hands-on session: cysts, stones, hydronephrosis, neoplasms, kidney biopsy
- 4:30 - 5:30 - Interpretation: cysts, stones, hydronephrosis, artifacts, normal variants, artifacts

### Day 2

- 8:00 - 8:30 - Breakfast
- 8:30 - 9:15 - Interpretation: parenchymal disease, vascular disease, neoplasms
- 9:15 - 9:45 - Sonography of the lower urinary tract
- 9:45 - 10:30 - Sonography in renal transplantation
- 10:30 - 12:30 - Hands-on session: vascular access, transplant, practice scan and interpretation
- 12:30 - 1:30 - Lunch
- 1:30 - 2:15 - Logistics: costs, coding, reporting, records, quality assurance
- 2:15 - 2:45 - Interpretation: other abdominal organs
- 2:45 - 3:30 - Hands-on session: bladder, practice interpretation
- 3:30 - 4:00 - Interpretation: practice studies
- 4:00 - Adjourn

# What we need

- ▶ Agreement and support of our administrators and deans in Iranian society of nephrology(adult and pediatric) and IPNA and ISN
- ▶ Make a curricula for our fellowships and residents
- ▶ Making a team of expert mentors in POCUS in Nephrology
- ▶ Establishing short courses and workshops in different region of our country and the world

Thanks



Lahijan