The RUSH Exam: Bedside Ultrasound in Resuscitation and Shock

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Outline
What We’ll Cover

• Why use ultrasound in shock and resuscitation?
• Literature and Protocols
• Recommended RUSH Protocol
• Review technique for included views
• Cases

What we won’t cover

• All techniques of the incorporated exams
• Extensive literature
Why?

- Physical exam is inaccurate
- X-rays and CTs are slow or impossible
- Treatments for shock vary by etiology
- Literature supports it
- You don’t have time for trial and error

The Literature
A Decade of Acronyms

- Trinity Protocol: Bahner D. JEMS 2002
- RCT of ultrasound in hypotension: Jones AE et al. Crit Care Med 2004

The UHP Ultrasound Protocol: A Novel
Ultrasound Approach to the Empiric Evaluation
of the Undifferentiated Hypotensive Patient

JOHN S. ROSE, MD. AARON E. BAIR, MD. DIRKU MANDAVA, MD. AND DONNA J. KINSEY, MD.

1. Heart
   (LV function and large effusion)
2. Morison’s Pouch
   (Free Fluid)
3. Aorta
   (AAA)
Randomized, controlled trial of immediate versus delayed goal-directed ultrasound to identify the cause of nontraumatic hypotension in emergency department patients

Alan E. Jones, MD; Vivek S. Tapal, MD; D. Matthew Sullivan, MD; Jeffrey A. Kline, MD 2004

1. Heart
   (LV fxn, RV size, effusion, tamponade)
2. Morison’s Pouch
   (Free Fluid)
3. Aorta
   (AAA)
4. IVC
   ( Collapse with Inspiration)

Randomized to:
1. Immediate vs. 15-min delayed ultrasound
2. Fill out DDx sheet at 15 & 30 minutes

At 15 minutes into resuscitation:

Immediate Ultrasound Group
1. Fewer items on differential (4 vs 8)
2. More likely to have correct Dx (80% vs 50%)
RUSH Exam #1
Rapid Ultrasound for Shock and Hypotension
(EMcrit podcast)
Scott D. Weingart, MD RDMS, Daniel Duque MD RDMS, Bret Nelson MD RDMS

Mnemonic: “HI-MAP”
- Heart
- IVC
- Morison’s
- Aorta
- Pneumothorax

RUSH Exam #2
The RUSH Exam: Rapid Ultrasound in Shock in the Evaluation of the Critically Ill
Perera, Mailhot, Riley, Mandava

- The Pump
- The Tank
- The Pipes

LV Function
Effusion
Tamponade
RV Dilation

IVA
Morison’s
PTX
Pulm Edema
AAA
Dissection
DVT
Application

- Any Hypotensive patient
- Any PEA arrest (extreme hypotension)

Focus of this Lecture
Rapid Ultrasound for Shock and Hypotension
Scott D. Weingart, MD RDMS, Daniel Duque MD RDMS, Bret Nelson MD RDMS 2008

HI-MAP
- Heart
- IVC
- Morison’s
- Aorta
- Pneumothorax

Advanced Version
The RUSH Exam: Rapid Ultrasound in Shock in the Evaluation of the Critically Ill
Perera, Mailhot, Riley, Mandavia 2010

Pump
Tank
Pipes
LV Function
Effusion
Tamponade
RV Dilation
IVC
Morison’s
PTX
Pulm Edema
AAA
Dissection
DVT
The RUSH Exam
Mnemonic: “HI-MAP”

- Heart
- IVC
- Morison’s
- Aorta
- Pneumothorax

Technique and Key Findings

- How to perform the HIMAP steps?
- What are we looking for?

Cases

- Application of the HIMAP mnemonic
Cases

- Application of the Pump - Tank - Pipes protocol

Echo and RUSH exam Summary

- Sick Patient? grab the ultrasound
- HI-MAP mnemonic is a good foundation
- Pump - Tank - Pipes for advanced learners
- Practice
- Get confirmation with other means if possible until you have more experience