

The RUSH Exam: Bedside Ultrasound in Resuscitation and Shock

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Intro Case



- 80 year old woman
- Hx: Grandma's not herself today
- General: Moaning
- BP= 60/40, HR=110, T=99, RR=22, SaO2=94%
- Exam: otherwise non-focal

Outline

What We'll Cover

- Why use ultrasound in shock and resuscitation?
- Literature and Protocols
- Recommended RUSH Protocol
- Cases

What we won't cover

- 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

2001

- **UHP protocol:** Rose JS et al, Am J Emerg Med 2001
- **Trinity Protocol:** Bahner D, JDMS 2002
- RCT of ultrasound in hypotension: Jones AE et al, Crit Care Med 2004
- **FATE: Focused Assessed Transthoracic Echocardiography:** Jensen et al, Eur J Anaesthesiol 2004
- **FLASH: Emergency Department Assessment Evolution:** Simon and Price, Emerg Med Crit Car 2006
- **FEER: Focused Echocardiographic Evaluation in Resuscitation:** Breitkreutz et al, Crit Care Med 2007
- **CAUSE: Cardiac Arrest Ultrasound Exam:** Hernandez et al, Resuscitation 2008
- **RUSH: Rapid Ultrasound in Shock and Hypotension:** Weingart et al, emCrit.org 2008,
- **ACES: Abdominal and Cardiac Evaluation with Sonography in Shock :** Atkinson et al, Emerg Med J 2009
- **RUSH: Rapid Ultrasound in SHock:** Perera P et al, Emerg Med Clin N Am 2010

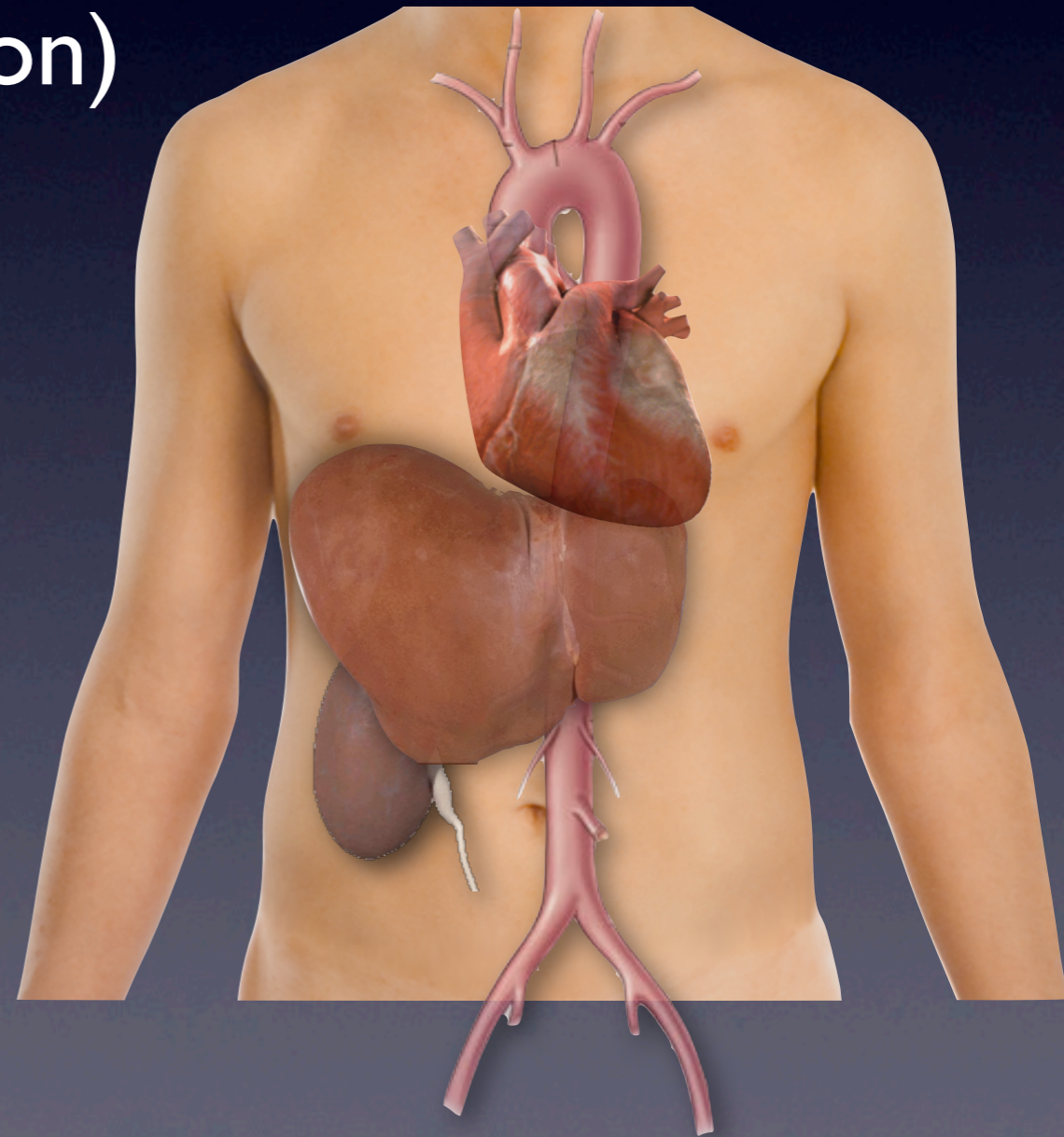
2010

2001

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,* DIKU MANDAVIA, MD,†
AND DONNA J. KINSER, 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. Tayal, MD; D. Matthew Sullivan, MD; Jeffrey A. Kline, MD

2004

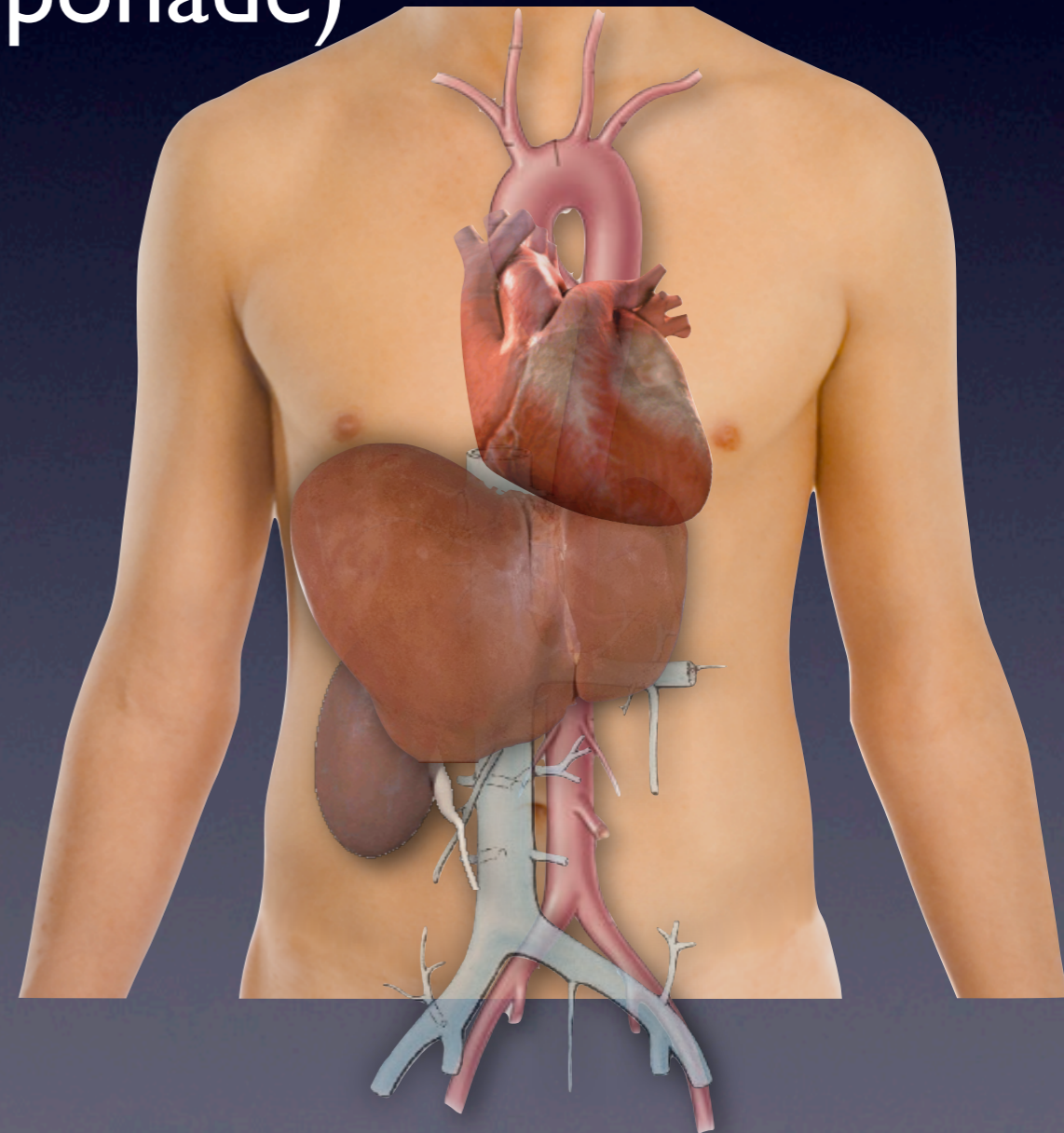
1. Heart

(LV fxn, RV size, effusion, tamponade)

2. Morison's Pouch (Free Fluid)

3. Aorta (AAA)

4. IVC (Collapse with Inspiration)



Randomized, 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. Tayal, MD; D. Matthew Sullivan, MD; Jeffrey A. Kline, MD

2004

Randomized to:

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

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

2004

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

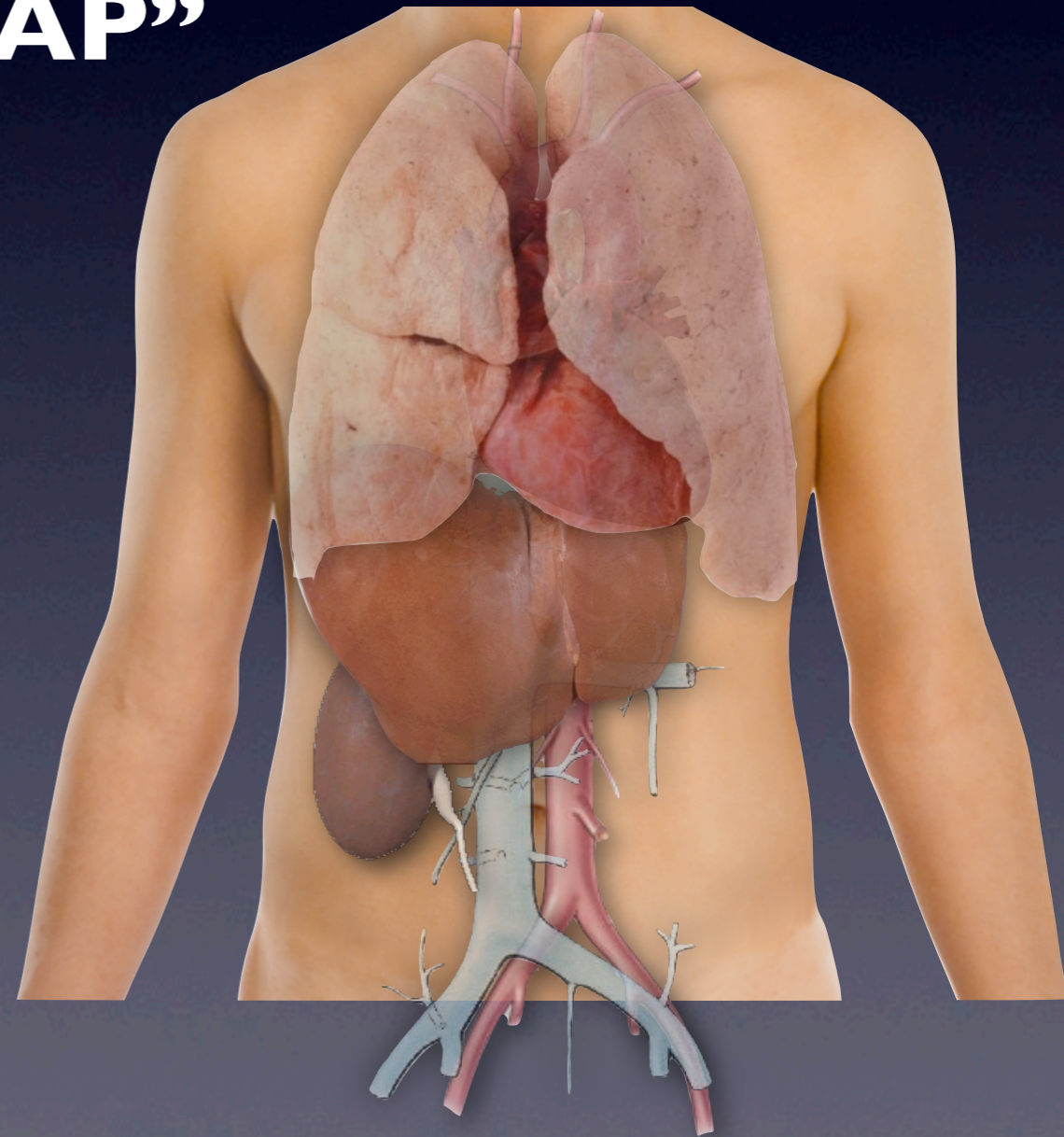
(EMcrit podcast)

Scott D. Weingart, MD RDMS, Daniel Duque MD RDMS, Bret Nelson MD RDMS

2008

Mnemonic: “HI-MAP”

- **H** eart
- **I** VC
- **M** orison’s
- **A** orta
- **P** neumothorax



RUSH Exam #2

The RUSH Exam: Rapid Ultrasound in
SHock in the Evaluation of the Critically Ill

Perera, Mailhot, Riley, Mandavia

2010

Tank

Pump

Pipes

IVC

Morison's

PTX

Pulm Edema

LV Function

Effusion

Tamponade

RV Dilation

AAA

Dissection

DVT

Application

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

