ULTRASOUND: COMING TO AN EMS SYSTEM NEAR YOU?
ULTRASOUND

- It’s easy to learn
- It’s quick
- It’s changes clinical outcome

Uses
- Trauma (FAST Exam)
- Procedures
  - Peripheral intravenous lines
  - Central intravenous lines
Transducer selection--expensive
Patient habitus and body fat—bariatric problem
Adjustments for optimal image
  + Presets
  + Gain
  + Depth
  + Frequency
  + Focus
ULTRASOUND EVALUATION OF BLUNT ABDOMINAL TRAUMA: PROGRAM IMPLEMENTATION, INITIAL EXPERIENCE AND LEARNING CURVE

- Exams Performed by Trauma Fellows
- 8 Hour Didactic Course
- 15 Proctored Human Model Exams

Learning Curve - Sensitivity

Exams 1-100*  Exams 101-200*  Exams 201-300*
Learning Curve - Exam Time

- Exams 1-100*
- Exams 101-200*
- Exams 201-300*
Results

Accuracy* of Initial Ultrasound Dx

(N=320 exams)

*Compared to review by credentialed sonologist
Results

Sensitivity* - Trauma Exam
Based on Final Diagnosis

(N=350 exams)

Exam Number 1-14 15-28 29-42 43-56
Specificity* 96% 97% 93% 100%

*For free fluid in any of 4 major body cavities
IT’S FEASIBLE

- **Cost**
  - Initial purchase
  - Service
  - Transducers
  - Service life

- **Training**
  - Initial
  - Continuing
Specificity and positive predictive values = 100%
Sensitivity = 85%
Negative predictive value = 95%

971 patients
144 pts underwent ultrasound exam
Twelve physicians (six internists, three surgeons, three anaesthetists) performed three (2.1%) to 38 (26.4%) examinations/person, median 14.4 (± 10.4). Examiners were skilled in ultrasound as it is part of their daily job, and they all had at least 2 years experience. They are all specialists and are therefore more familiar with typical diseases and findings in their field (e.g. surgeons different to internists). They were all given an introduction on handling the mobile equipment, which was new to all of them. Introduction and testing time was 1 h/person minimum.
The images look like what?
MORRISON’S POUCH—SUBHEPATIC RECESS
BLOOD IN MORRISON’S POUCH
PROBE LOCATION

FAST EXAMINATION

Position 1. Pericardial Effusion
Cardiac Assessment/IVC

2 and 3. Rt. Pleural Effusion
Morison’s Pouch
Retroperitoneal hematoma
Rt. Paracolic gutter

4 and 5. Lt. Pleural Effusion
Perisplenic fluid
Retroperitoneal hematoma
Lt. Paracolic gutter

Position 6. Fluid Anterior and Posterior
Pelvic Cul-de-sac

GULFCOAST ULTRASOUND
INSTITUTE

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FLUID IN MORRISON’S POUCH
PROBE LOCATION

FAST EXAMINATION

Position 1.
- Pericardial Effusion
- Cardiac Assessment/IVC

2 and 3.
- Rt. Pleural Effusion
- Morison’s Pouch
- Retroperitoneal hematoma
- Rt. Paracolic gutter

4 and 5.
- Lt. Pleural Effusion
- Perisplenic fluid
- Retroperitoneal hematoma
- Lt. Paracolic gutter

Position 6.
- Fluid Anterior and Posterior
- Pelvic Cul-de-sac

INFERIOR VENA CAVA

IMAGE

LIVER

RT ATRIUM

IVC
**FAST EXAMINATION**

**Position 1.** Pericardial Effusion
Cardiac Assessment/IVC

**2 and 3.**
- Rt. Pleural Effusion
- Morison’s Pouch
- Retroperitoneal hematoma
- Rt. Paracolic gutter

**4 and 5.**
- Lt. Pleural Effusion
- Perisplenic fluid
- Retroperitoneal hematoma
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**Position 6.**
- Fluid Anterior and Posterior
- Pelvic Cul-de-sac

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**Heart**

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**PROBE LOCATION**

**IMAGE**
VIEWS: TRANSVERSE VS LONGITUDINAL

[Diagram of arterial and venous structures with annotations]

[Ultrasound image of IV cannulation - forearm]
ULTRASOUND

- It’s wasn’t easy for me to learn
- Duration of procedure
- Changes clinical outcome
- Uses—Yes, but
  - Trauma (FAST Exam)
  - Procedures
    - Peripheral intravenous lines
    - Central intravenous lines
FOR WHAT WILL YOU USE IT?

- Will US change what you do?
- Will US change where you transport patients