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ULTRASOUND: COMING TO AN EMS SYSTEM NEAR YOU?

ELSEVIER

SEPTEMBER 2010

The
Conscience
of EMS

JEMS

JOURNAL OF EMERGENCY MEDICAL SERVICES

2 THIS MONTH
SPECIAL
SUPPLEMENTS
DRIVING THE
COURSE OF CARE
& MAKING
IT REAL

VIEW FROM THE INSIDE

Is ultrasound the
wave of the future?, p. 36

ALSO INSIDE
Lessons learned from
a station build, p. 50
Managing IO
infusion pain, p. 58

Always En Route At **JEMS**
.com

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

IT'S KINDA HARD

- ✘ Transducer selection--expensive
- ✘ Patient habitus and body fat—bariatric problem
- ✘ Adjustments for optimal image
 - + Presets
 - + Gain
 - + Depth
 - + Frequency
 - + Focus

IS IT EASY TO LEARN?

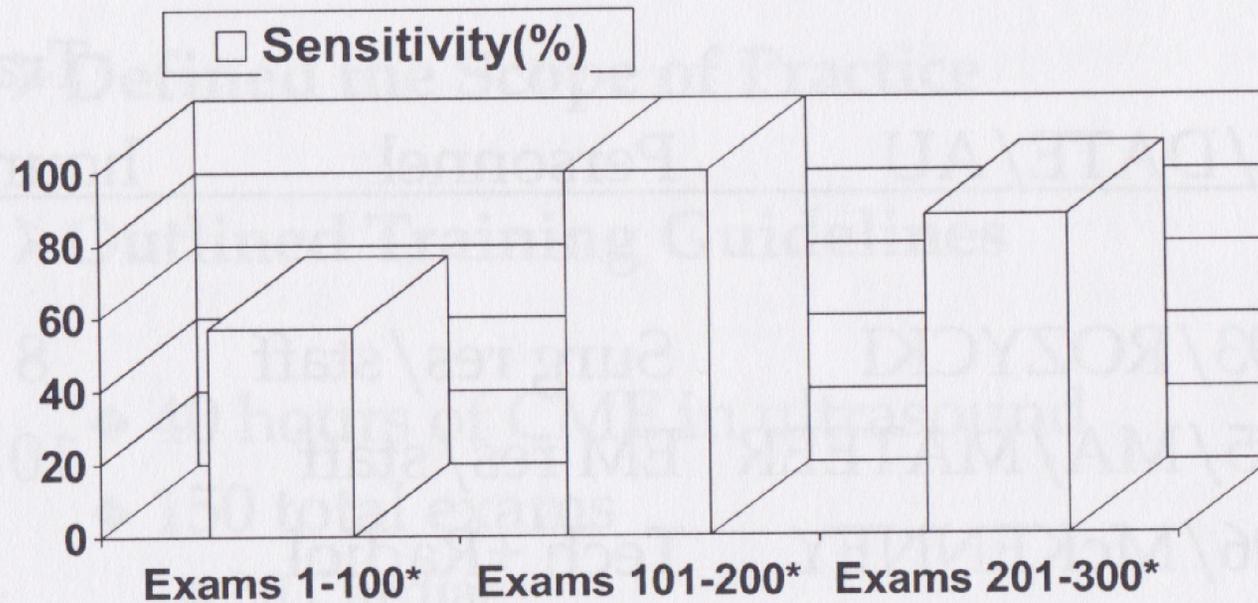
ULTRASOUND EVALUATION OF BLUNT ABDOMINAL TRAUMA: PROGRAM IMPLEMENTATION, INITIAL EXPERIENCE AND LEARNING CURVE

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

Thomas, B. et al: J Trauma 42: 384 -390, 1997

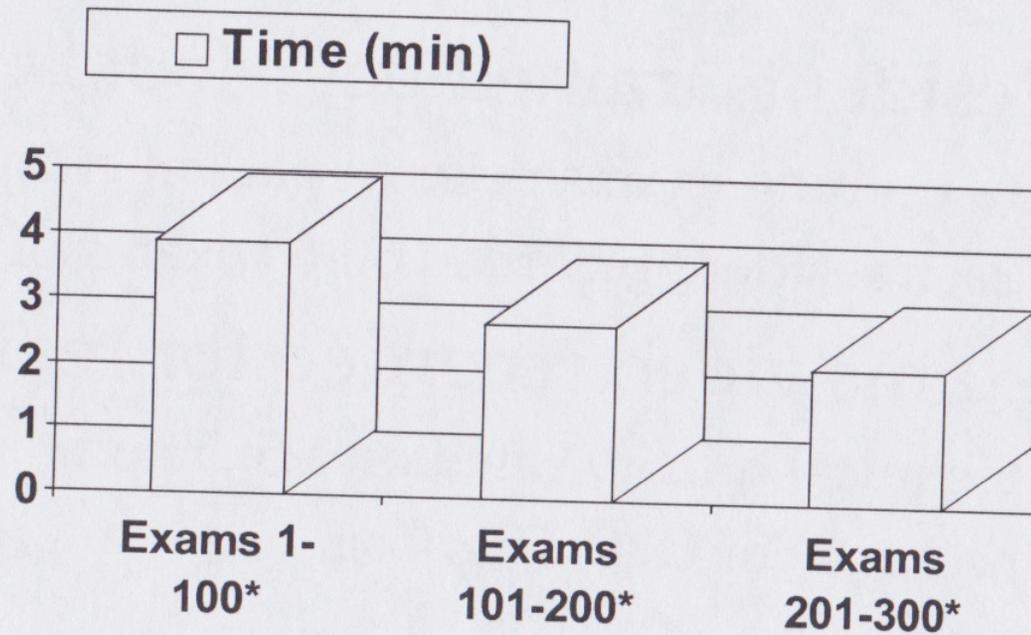
IS IT EASY TO LEARN?

Learning Curve - Sensitivity



IS IT EASY TO LEARN?

Learning Curve - Exam Time

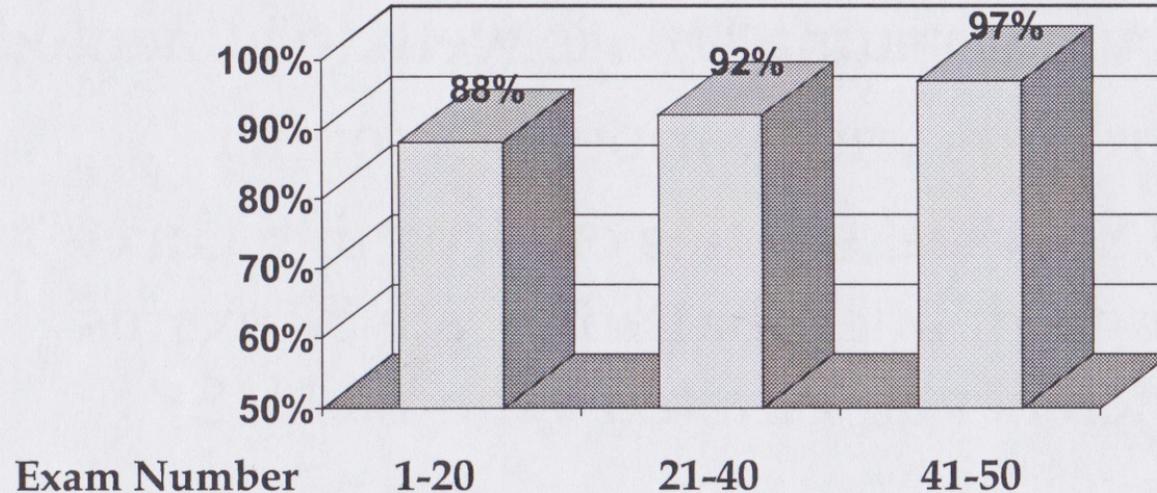


EM RESIDENT CURRICULUM

Results

Accuracy* of Initial Ultrasound Dx

(N=320 exams)



*Compared to review by credentialed sonologist

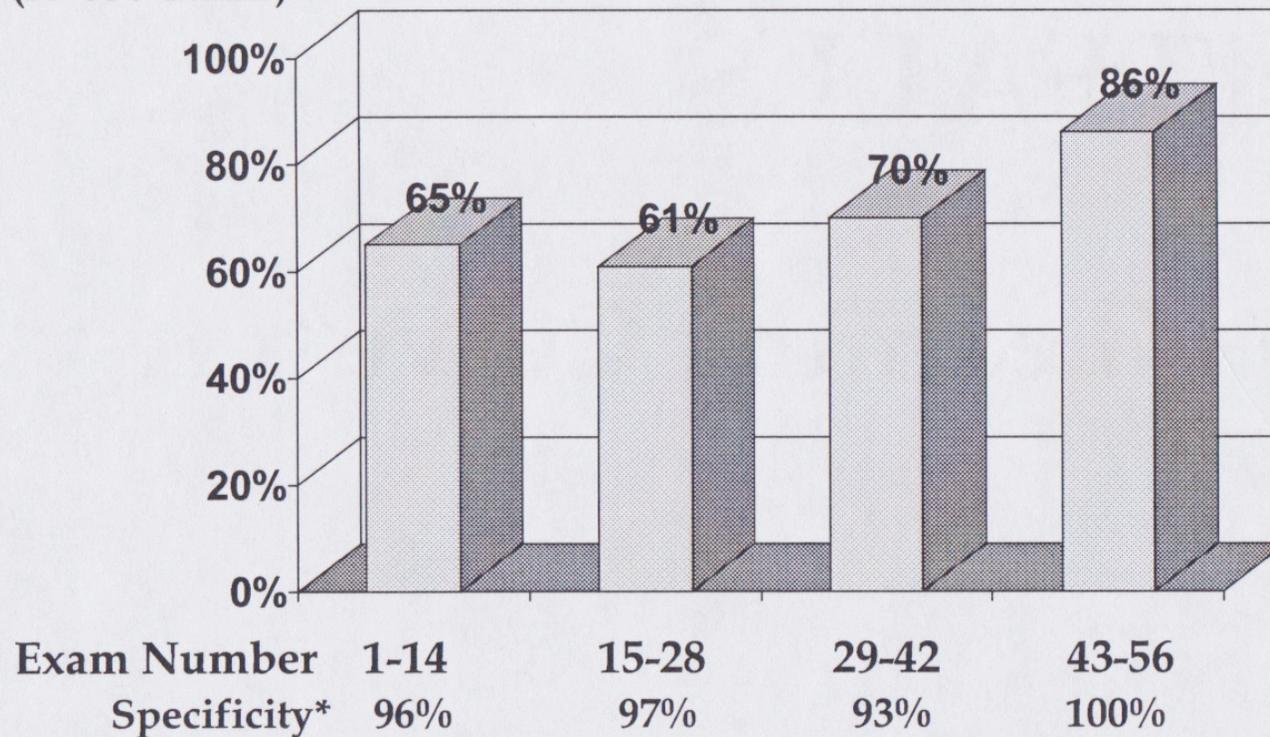
EM RESIDENT CURRICULUM

Results

Sensitivity* - Trauma Exam

Based on Final Diagnosis

(N=350 exams)



*For free fluid in any of 4 major body cavities

IT'S FEASIBLE

- ✘ Cost
 - + Initial purchase
 - + Service
 - + Transducers
 - + Service life
- ✘ Training
 - + Initial
 - + Continuing



HOYER HX PREHOSPITAL ULTRASOUND IN EMERGENCY MEDICINE: INCIDENCE, FEASIBILITY, INDICATIONS AND DIAGNOSIS 2010; 17: 254-259

- ✘ Specificity and positive predictive values = 100%
- ✘ Sensitivity = 85%
- ✘ Negative predictive value = 95%
- ✘ 971 patients
- ✘ 144 pts underwent ultrasound exam

WHO PERFORMED THE ULTRASOUNDS?

Twelve physicians (six internists, three surgeons, three anaesthetists) performed three (2.1%) to 38 (26.4%) examinations/person, median 14.4 (± 10.4).

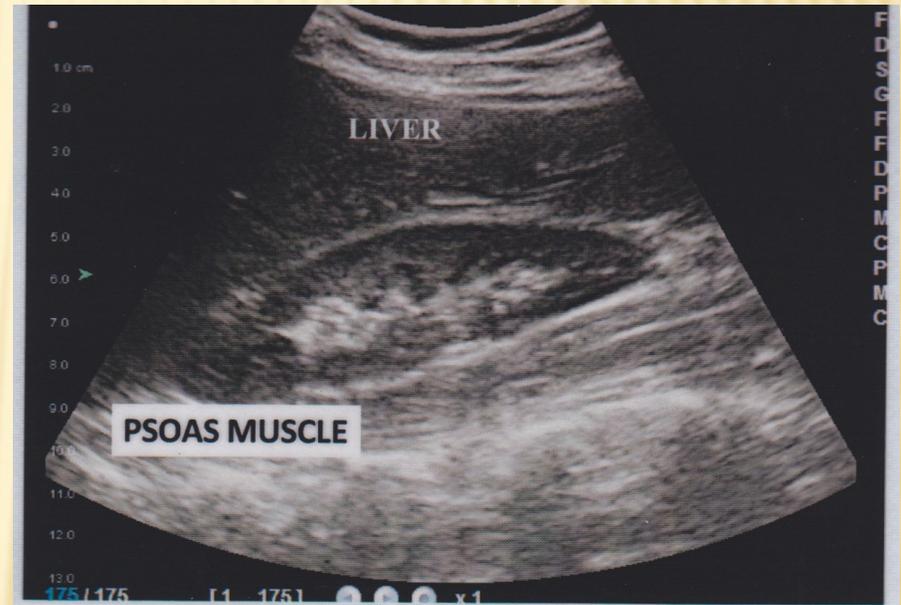
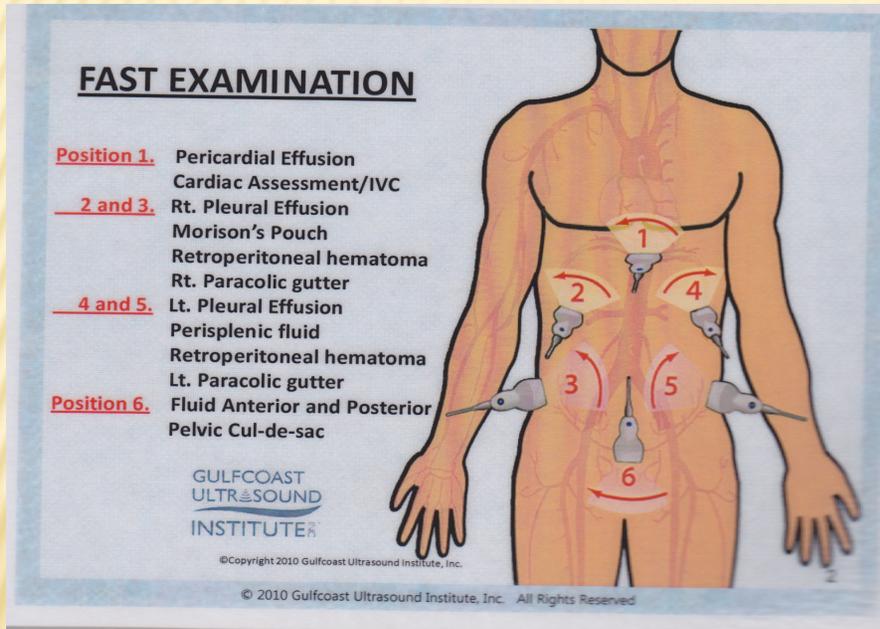
Examiners were skilled in ultrasound as it is part of their daily job, and they all had at least 2 years experience. They are all specialists and are therefore more familiar with typical diseases and findings in their field (e.g. surgeons different to internists). They were all given an introduction 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?



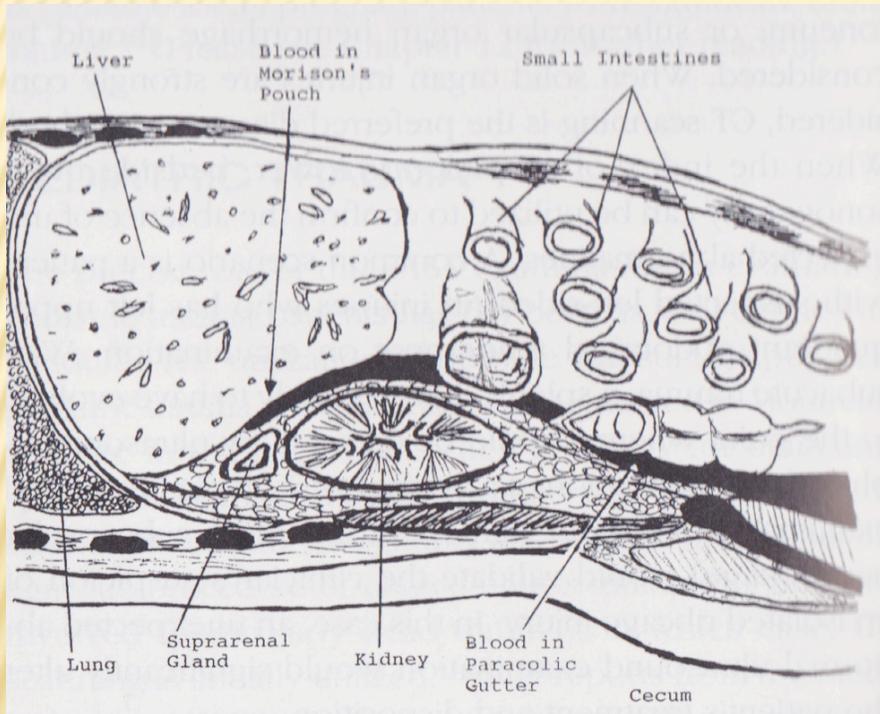
PROBE LOCATION

IMAGE



MORRISON'S POUCH—SUBHEPATIC RECESS

DRAWING



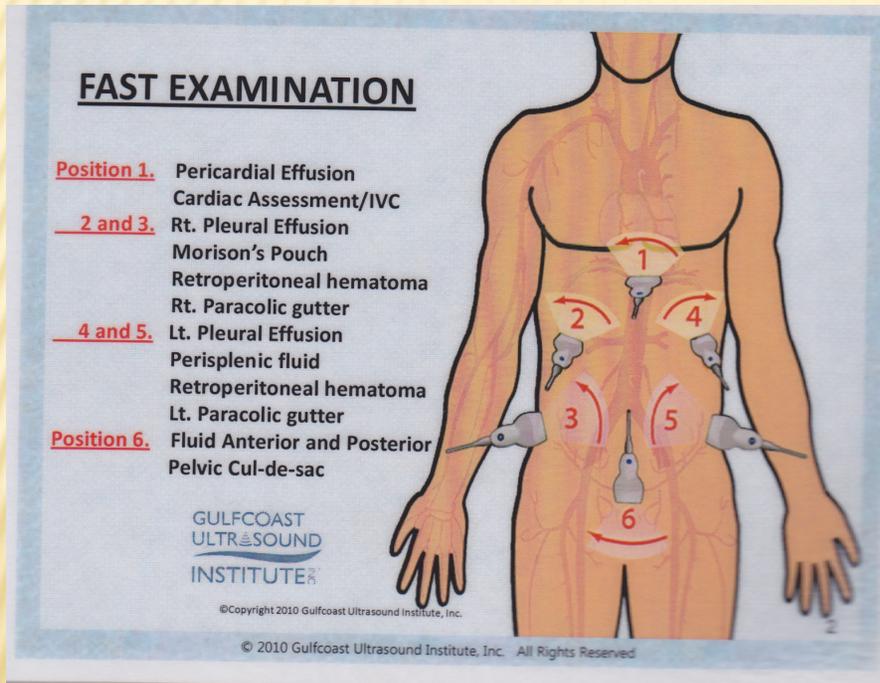
IMAGE



BLOOD IN MORRISON'S POUCH

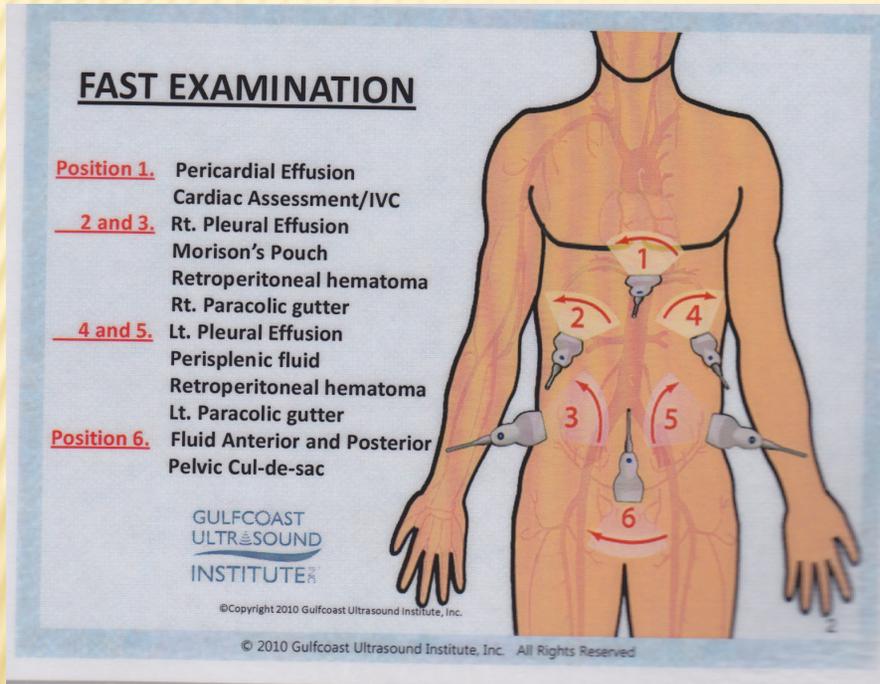
PROBE LOCATION

IMAGE



FLUID IN MORRISON'S POUCH

PROBE LOCATION



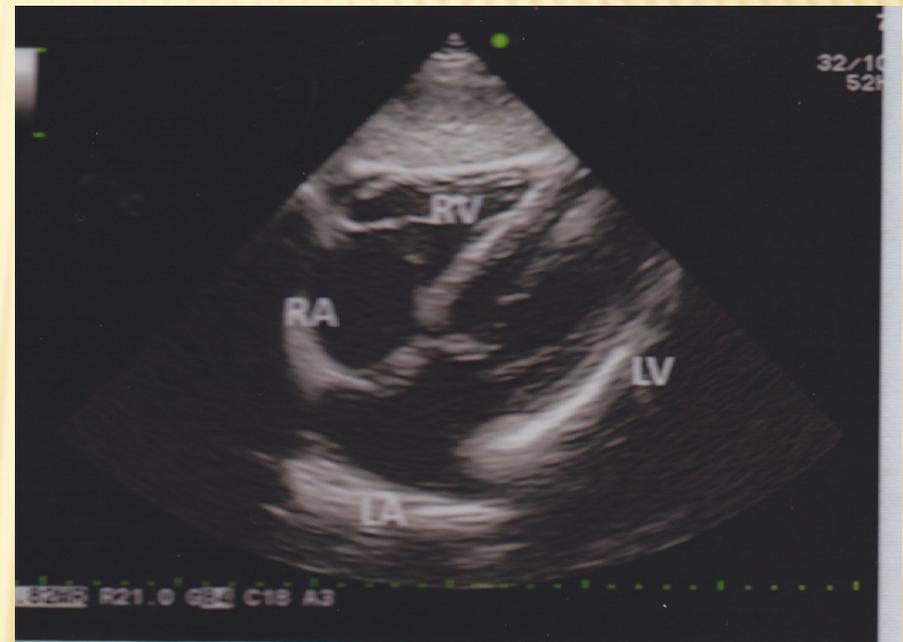
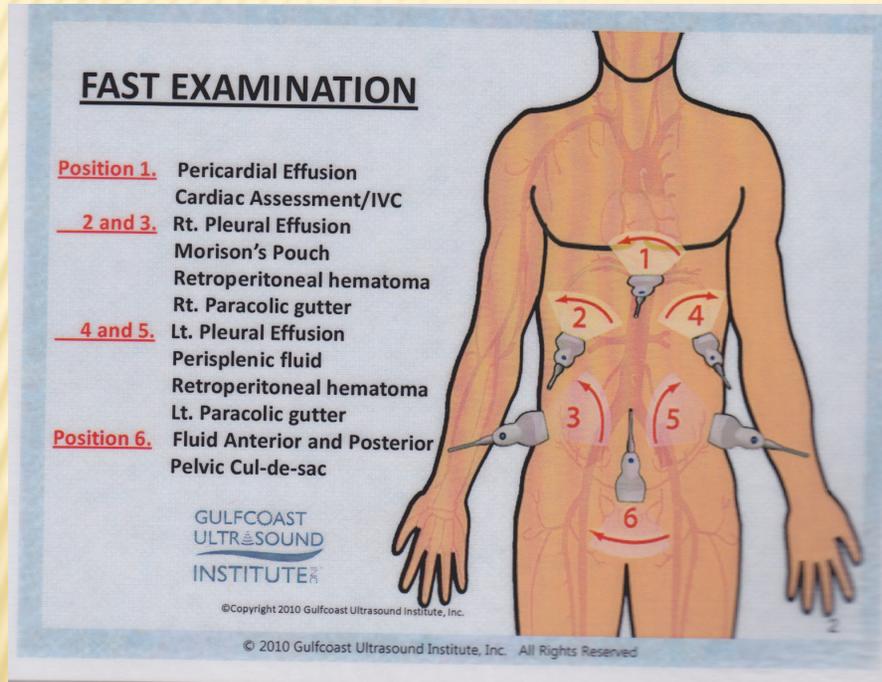
IMAGE



INFERIOR VENA CAVA

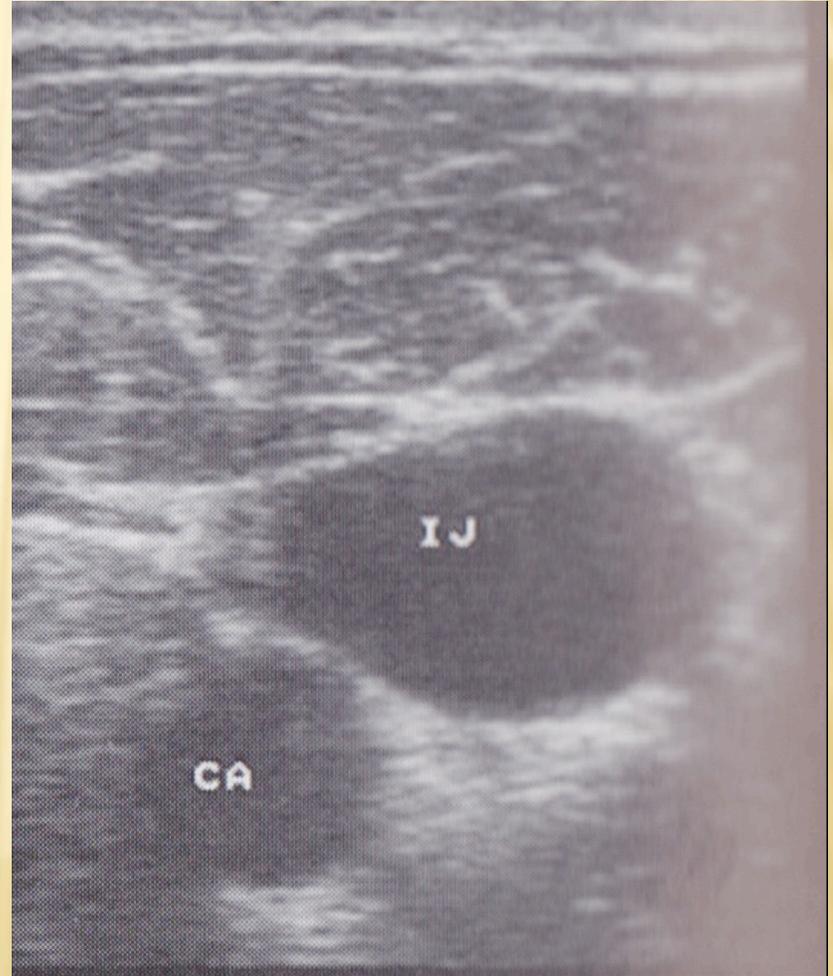
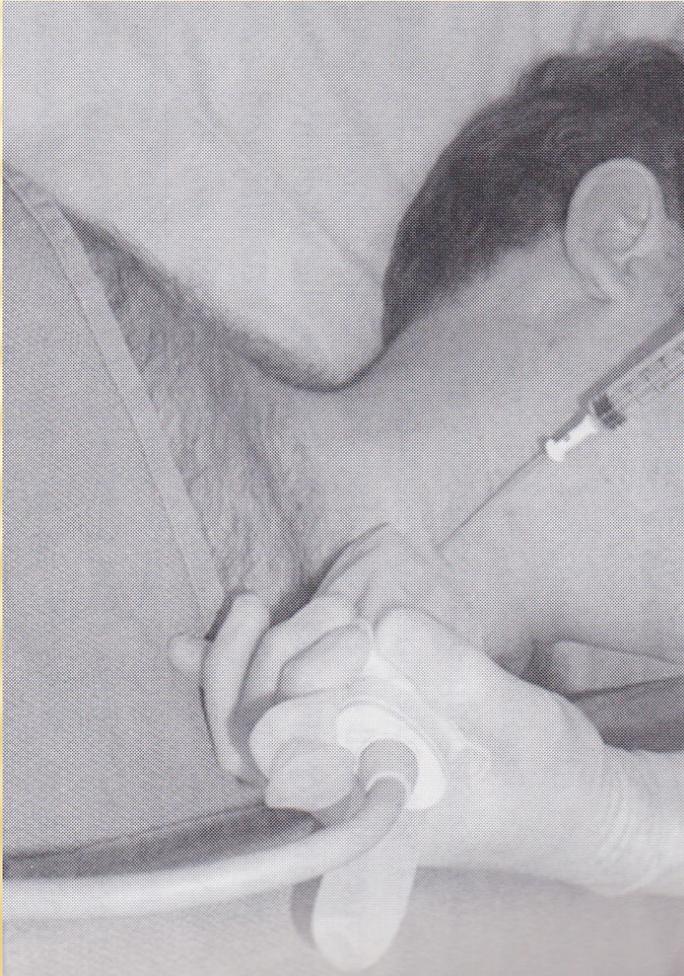
PROBE LOCATION

IMAGE

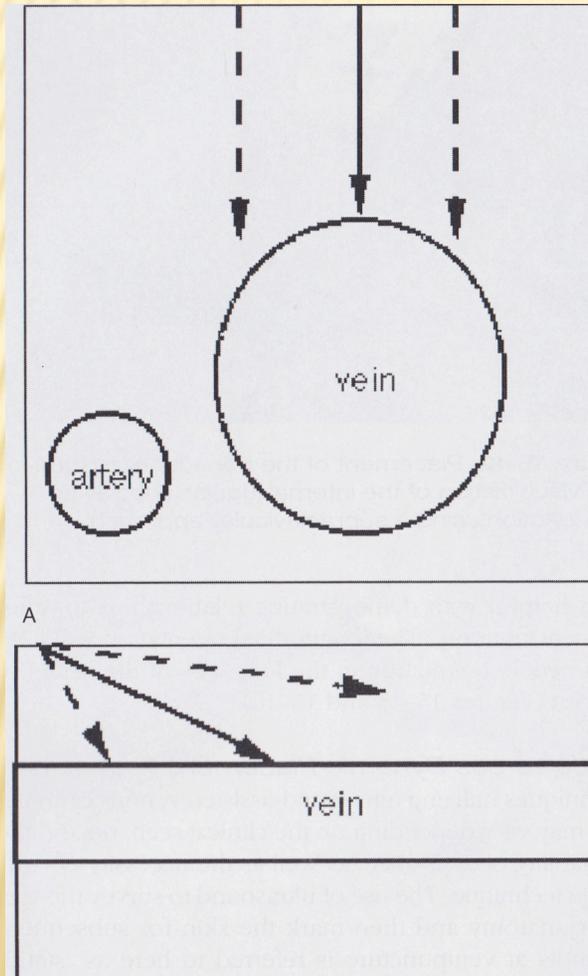


HEART

LINE PLACEMENT



VIEWS TRANSVERSE VS LONGITUDINAL



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

