


CEDARS-SINAI MEDICAL CENTER.

**Use of Ultrasound for Bedside
Examinations and Common
Procedures**

Philip K. Ng, MD
Mark J. Ault, MD, FACEP

Agenda for Today

It's a tag team!!

- Introduction: Dr. Philip Ng
- The Ultrasound Revolution: Dr. Mark Ault
- Hands on Practical with Training Model Demonstration

Let's get started!!

Advantages of Ultrasound

- > Widely available
- > Portable
- > Non-invasive
- > Able to provide serial/repeat examinations
- > Provides immediate diagnostic information not easily obtained by physical examination
- > Allows for guided placement of intravascular or drainage catheters

Hand Carried Ultrasound

- Bedside physical examination can be limited in diagnosis of cardiopulmonary, intra-abdominal and vascular pathology, especially when anatomic challenges exist as body habitus or critical illness
- Goal is not to replace formal ultrasound studies for imaging.
- An extension to the physical examination.

Uses of Ultrasound

- Application for Internists, Hospitalists, and Intensivists
 - Bedside Examination: Screening and Diagnosis
 - Office
 - Hospital
 - Intensive Care Unit
 - Guidance for Common Procedures

Uses of Ultrasound (cont)

- Screening and Diagnosis
 - Vascular
 - Abdominal aortic aneurysm screening
 - Carotid Intimal-medial thickness
 - Cardiac
 - Genito-Urinary
 - Body Cavity fluid
 - Pulmonary
 - Pneumothorax
 - Focused Assessment with Sonography for Trauma (FAST)
 - Upper airway assessment
 - Optic nerve assessment

Uses of Ultrasound (cont)

- Guidance for Common Procedures
 - Vascular
 - Internal Jugular Vein
 - Femoral Vein
 - Axillary Vein
 - Peripheral Veins
 - Accessory or Alternative Routes
 - Arterial Cannulation
 - Cavity Drainage
 - Thoracentesis
 - Paracentesis
 - Pericardiocentesis
 - Abscess Drainage

Uses of Ultrasound (cont)

- Guidance for Common Procedures
 - Solid Organ Biopsy
 - Thyroid
 - Liver
 - Kidney
 - Musculoskeletal
 - Joint space aspiration
 - Soft tissue injection
 - Novel applications
 - Lumbar Puncture
 - Percutaneous Dilatational Tracheostomy

Ultrasound Guidance of Procedures

- Complications of central line placement have been reported in up to 15-20% of cases.
- Use of ultrasound guidance reported to decrease mechanical complication rates
 - Ultrasound can help localize and define the anatomy with subsequent placement by standard use of anatomic landmarks
 - Real-time 2-D ultrasound guidance to locate the vessel and subsequently introduce the needle

**Limitations to Bedside
Ultrasound**

- Acoustic Window
 - Sound is reflected from tissue interfaces
 - Structures hindering the reflection of the acoustic signal will interfere with ultrasound transmission and therefore diminish the quality of the examination
 - Air
 - Pneumothorax
 - Emphysema with hyperinflation
 - Bone
 - Foreign objects
 - Wounds with dressings
 - Increased distance to object of study
 - Obesity
 - Positioning
 - Patient cooperation

**Limitations to Bedside
Ultrasound (cont)**

- Interpretation of Image
 - Knowledge of anatomy
 - Knowledge of instruments
 - Gain control
 - Depth adjustment
 - Transducer choice
 - Transducer placement and orientation
- Point of emphasis
 - Bedside ultrasound examination should be an extension of the physical examination and not a replacement of formal ultrasound examination

**Hands on Practical with Training Model
Demonstration**

- Simulator training with phantom models for diagnostic evaluation
- Simulator training with ultrasound guided central venous catheter placement
- Simulator training with cavity drainage catheters
- Hands on practical with hand carried ultrasound units

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