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CRASH 2018

Ultrasound Guided Regional Anesthesia Workshop

SCHOOL OF MEDICINE
Department of Anesthesiology
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Disclosures

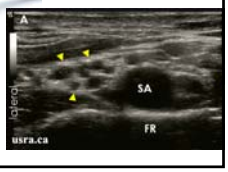
- There are NO disclosures for any of the faculty participating.

Basic Physics

- Ultrasound machines produce sound waves
- They listen for what returns and create image
- Denser tissues reflect more waves
  - tissues are more "hyperechoic" or white
- Less Dense tissues allow them to pass through
  - Tissues which are "hypoechoic" reflect waves poorly or not at all

Basic Physics, cont.

- High frequency waves (short wavelength)
  - Penetrates minimally into tissues
  - Excellent resolution
  - Great for shallow structures (up to about 6cm)
  - Linear probe
  - 99% of use



Basic Physics, cont.

- Low frequency waves
  - Penetrate deep into tissues
  - Resolution not as good
  - Great for deep structures
  - Curvilinear probe
  - Appropriate for deep (>5cm) U/S blocks

Preferred Ultrasound Machine

- High Frequency: 10MHz –15MHz
- Depth 1-6 cm (for linear probe)
- Needle finding technology
- Color capability for vascular structures
- Time Gain Compensation
- Wireless capability for Medical Record upload
- As few buttons as possible/necessary

Ultrasound Basics

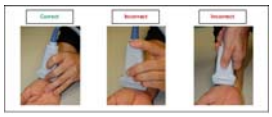
- Depth
  - Find ideal depth!
    - Use as little depth as needed for a block, it will improve your picture of the structures you want
  - Increased depth, means decreased frequency will be needed to have a good picture
    - Due to low frequency, resolution will suffer!

Ultrasound basics

- Gain:
  - Amplifies returning sound waves, to make signal brighter or darker… Need to get it JUUUST right.
  - Newer machines are optimized, don't change

How to use a Probe

- Gel: Allows for transmission of sound waves
- Always support your hand against the patient

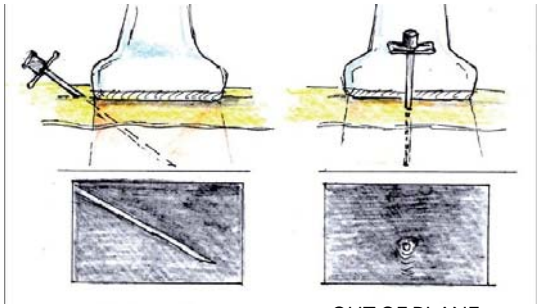


- **Anisotropy**:
  - small changes in tilt of probe can vastly improve picture

How to use a Probe & Needle

- Find your favorite view, and stick with it!
- Only small changes in anisotropy
- Don't chase your needle!
  - Finding it in "no man's land" does not help
  - Improve needle placement
    - So that changes in anisotropy will make it visible
  - Look at your hands, before the screen
  - Practice!

Ultrasound and Needle



IN PLANE OUT OF PLANE

Principles of UGRA

- Before the Block:
  - Know how to manage Local Anesthetic Toxicity!
  - Practice hand/eye coordination
  - Know your anatomy
  - Be patient and optimize picture (depth/gain)
  - Position your patient to optimize view and ergonomics
- Block Time!
  - Use in-plane view when possible
  - Don't advance needle if unsure of position
  - Do not penetrate nerve
    - Paresthesia, pain or difficult injection? Pull back, re-direct
  - Ensure good local anesthetic spread
  - Use less local anesthetic if block looks good

New Format for CRASH 2018

- Two Nights!
- Beginner
- Advanced
- 8 stations with models
- Blue Phantom/needle station for practice!
  - If you are beginner, this is a great place to start!

CRASH 2018 Faculty

Kyle Marshall, MD	UCH
Beth Bennish, MD	DH
Chris Ciarallo, MD	DH/CHC
Seth Eisdorfer, MD	CHC
Roland Flores, MD	UCH
Chris Lace, MD	UCH
Glenn Merritt, MD	CHC
Olivia Romano, MD	UCH
Marina Shindell, DO	UCH

- Fellows: Matt Lyman, MD & Thomas Brinkley, MD

Thank you to our Vendors!

- Mindray: Darryl Wilson
- Philips: Aaron Rhoades
- Sonosite: Kristi Howe