KATIE O’LEARY

WILDERNESS

ULTRASOUND
DISCLAIMER

BRACE YOURSELVES

POWERPOINT SLIDES ARE COMING

DIYLOL.COM
SERIOUSLY, DAWG

DON’T SAY I DIDN’T WARN YOU

ANOTHER POWERPOINT?

REALLY, I CAN’T WAIT TO READ EVERY TINY LITTLE BULLET
OUR OBJECTIVES

Review literature pertaining to use of ultrasound in resource limited environments.

Walk away with a broader understanding of ultrasound utility.
THIS ONE IS IN BIG SKY....

IT'S A THING

Wilderness Ultrasound Certification Course

Revolutionary, pocket size Ultrasound, with spectacular resolution is rapidly becoming state-of-the-art for Wilderness and Expedition Medicine. Ultrasound may be the most important item in your medical kit! It allows the user to more quickly determine the cause of life-threatening illness, and diagnose and treat abdominal, cardiac, pulmonary, obstetric and orthopedic conditions in the field or any austere environment. Participants will learn and practice Ultrasound in our lab with state-of-the-art machines.

Topics include:
- Expanded Fast for Trauma & Internal bleeding
- Pneumothorax, Hemothorax, Pericardial Fluid
- High Altitude Pulmonary Edema
- Pregnancy
- DVT and PE
- Liver, Gallbladder, Aorta and Kidney imaging
- Musculoskeletal Injuries
- Ultrasound Guided Procedures

Class size limited to 25 registrants

Date/Time: Wednesday, July 31, 2013, 7:30am - 4:15pm
Tuition: $695 (Includes: 7 hours of additional Category 1 CME Credits, comprehensive course syllabus, all materials, scanning laboratory, breakfast, lunch and Course Certification)

Course Director: Teresa S. Wu, MD
Transforming medical imaging by making safe, simple, non-invasive, and affordable ultrasound technology available.
Severe shortness of breath at Lobuche, after ascending 700 meters in freezing weather. May 1st. Dr Auerbach reassured I had no fluid in my lungs, got a bit better then. — with Paul S. Auerbach in Lobuche, Nepal.
Suddenly got worse around 9AM, gasping for air, thought I was really dying. Medical team rushed and checked me, fortunately I was still fine. BP, O2sat and BSL still good while I was feeling nearly dead! — with Paul S. Auerbach and Michael Caudell at Gorakshep.
HAPE, YO

At least 2:
Dyspnea at rest
Cough
Weakness/decreased exercises performance
Chest tightness

and two:
crackles/wheezing
central cyanosis
tachypnea
tachycardia
WHY THE B LINES ANYWAY?
ARTICLE 1: CHANGE IN DIFFERENTIAL DIAGNOSIS AND PATIENT MANAGEMENT WITH USE OF PORTABLE ULTRASOUND IN REMOTE SETTING

- Goal: determine whether use of a portable ultrasound device in a remote setting would alter physician diagnosis and management

- What do you think happened?
ARTICLE 1

• Prospective observational - affects of US on decision making in Amazon

• 2 probes: 4-7 MHz intercavitary; 2-5 MHz abdominal

• Local tribal people

• Two physicians

• Survey: initial complaint, PMH, PE, pre-US DDx, planned treatment with expected disposition.

• Post ultrasound, fill out remainder of survey
ARTICLE 1 - RESULTS

- 25 ultrasounds performed
- US scan dramatically altered patient dispo in 7
- 4 patients avoided dangerous evacuation
- 3 found to need referral for surgical eval
- ***portable US provides significant benefit that can dramatically alter disposition and treatment***
ARTICLE 2: “INTO THIN AIR: EXTREME ULTRASOUND ON MT EVEREST”

- Objective: mountaineers face health risks at altitude

- Methods: Two US devices tested in cooled hypobaric chamber (temp 4-5 degree C, altitude simulated to 27000 ft).

- Video stream through internet for remote guidance of novice via expert.
THE SET UP

Figure 1. Remote expert guidance of thoracic ultrasound examinations was done over the Internet using a satellite phone connection. The video output of the ultrasound device was compressed with a streaming device (DistanceDoc; Mediphan, Ottawa, Ontario) for real-time viewing by the remote expert.
CUE CARD PART 2
WHAT DID THEY SEE?

EVEREST 2008
ARTICLE 2: RESULTS

• Results: 25 minute exam, excellent quality

• Comet tails = pulmonary interstitial fluid

• Conclusion: success! Satellite tele-medical connection able to guide thoracic exam

• No degradation of performance.
“COUPLING PORTABLE ULTRASOUND WITH REMOTE EXPERT GUIDANCE TELEMEDICINE PROVIDES A ROBUST DIAGNOSTIC CAPABILITY IN AUSTERE LOCATIONS”
NASA’S JUMPING ON IT, TOO
(AND FUNDED THE LAST STUDY)
ARTICLE 3: CHEST ULTRASONOGRAPHY FOR THE DIAGNOSIS AND MONITORING OF HIGH-ALTITUDE PULMONARY EDEMA.

- Comet tail technique of chest US for diagnosis of cardiogenic pulmonary edema.
- HAPE: Leading COD from altitude illness
ARTICLE 3

• METHODS: 11 patients presenting to HRA in Pheriche (4240 m) with clinical diagnosis of HAPE

• Each patient underwent 1-3 chest US using comet tail technique to determine presence of EVLW

• CTS (comet tail score) and O2 sat measured

• What did we see in the HAPE patients?
ARTICLE 3:

- HAPE patients had a higher CTS and a lower O2 sat than control subjects

- CTS was predictive of O2 Sat

- For every 1-point increase in CTS, O2 sat fell by .67%

- Conclusion: Comet tail technique effectively monitors degree of pulmonary edema in HAPE.

- Reduction in CTS parallels improvement in O2 and clinical status.
ABSTRACT: WHAT ABOUT NOVICES?

- Barrier: training level
- An online training program followed by simulation testing showed ........
EDITORIAL: HOW USEFUL IS ON-MOUNTAIN SONOGRAPHY?

- The new FAST?
- Zafren says…. maybe not.
- Can you think of some issues?
- “For now, the role of ultrasound in wilderness medicine will be limited to use in a few situations, such as field hospitals, which offer a relatively higher level of care.”
THERE’S HOPE FOR ALL OF US

THUG LIFE
REFERENCES YO


- facebook


- Zafren. How useful is on-mountain sonography? Wilderness and Environmental Medicine, 12, 230-231 (2001)

THANKS FOR LISTENING AND PEACE