

Perioperative point-of-care gastric ultrasound

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- Right lateral decubitus
- Curvilinear probe
- Transducer beneath xiphoid process
- Transection of antrum

Gastric Ultrasound **Risk Stratification**

Actual cases:

- Pyloric obstruction: +GUS -> preinduction NGT; suctioned 450 cc's
- GLP1 agonists: anecdotal increased incidence of gastric retention, guidance directionally correct, but evolving
- Achalasia: unremarkable gastric ultrasound, but food found in esophagus

Additional applications:

- Gastroparesis
- Emergency surgeries
- Obstetric

Bolondi formula: $27+(14.6 \times \text{RLDSCA})-(1.28 \times \text{age})$

Right	30	40	50	60	70	80
1	31	18	5	0	0	0
2	45	32	20	7	0	0
4	60	47	34	21	9	0
5	74	62	49	36	23	10
6	89	76	63	51	38	25
7	103	91	78	65	52	40
8	118	105	92	80	67	54
9	133	120	107	94	82	69
10	147	135	122	109	96	83
11	162	149	136	123	111	98
12	177	164	151	138	125	113
13	191	178	165	153	140	127
14	206	193	180	167	154	142

Basic Gastric Ultrasound Findings

- A. Antrum mainly clear fluid, unremarkable
- B. Distended "starry night" antrum CSA 27.34 cm²
- C. Distended "frosted glass" antrum recent ingestion of solids
- D. Heterogeneous echogenicity = mix solids/liquids

Focused Cardiac Ultrasound (FoCUS)

So Many Examples Past 6 Years

- Assess the spectrum of volume status – multiple times daily in ICU
 - Worsening EF in known HF; diuresis
 - Hyperdynamic heart; likely needs volume
- ACLS ->
 - Acute MI in LAD
 - Pulmonary embolism
- Change surgical management
- Tamponade

So Many Examples Past 6 Years

- Aortic regurgitation mistaken for stenosis preoperatively
- Clot in transit in burn patient
- HOCM w/ SAM in severe hyponatremia
- Cardiac vegetations in stroke
- VSD after MI in LAD

Basic Cardiac Views

Ultrasound Cheats

PROBE POSITIONS

- DLAR: LONG AXIS** (Dorsal Left Axillary Region)
- PSAR: SHORT AXIS** (Parasternal Short Axis)
- APIC: APICAL** (Apical)
- SUBCOSTAL: SUBCOSTAL** (Subcostal)

REGIONAL WALL TERRITORIES

- DLA: Diagonal
- PA: Papillary
- IVC: Inferior Vena Cava

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- Hyperdynamic heart
 - BOTH left & right ventricles
 - > 75% EF; ventricles "kissing" one another
- Needs Volume / Blood
- Reduced EF
 - Likely heart failure / volume overload
 - Diurese?

- CA2 during NeuroICU rotation
 - Vegetations -> stroke
- AMS, hypotensive & hyponatremic
 - SAM / LVOT obstruction

Rescue Echo For Advanced Cardiac Life Support

2016 Rescue Talk, Case-Based

ACLS -> 5H's & 5T's

Pneumothorax
Pulmonary Embolism
Tamponade
MI / Cardiogenic shock

Quickly evaluate vitals & ventilatory mechanics

No time for CTPE

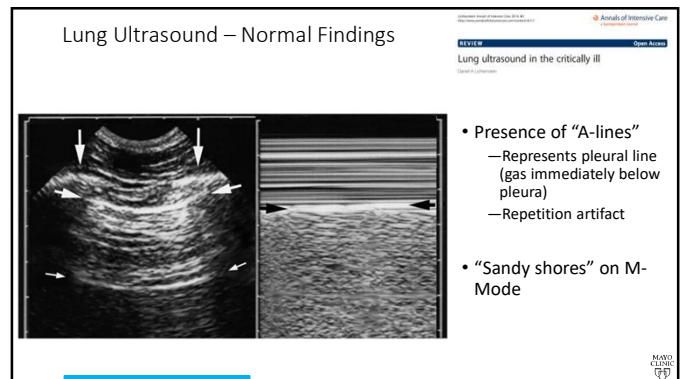
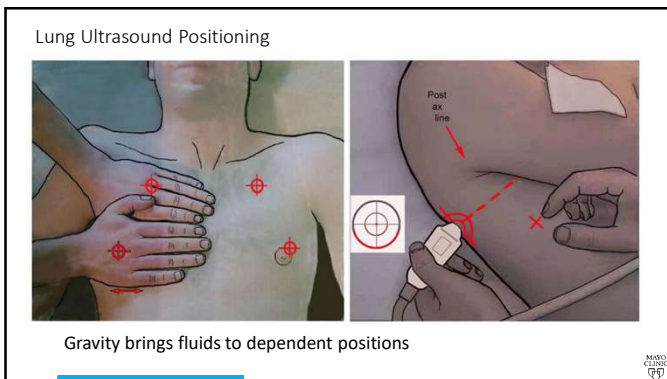
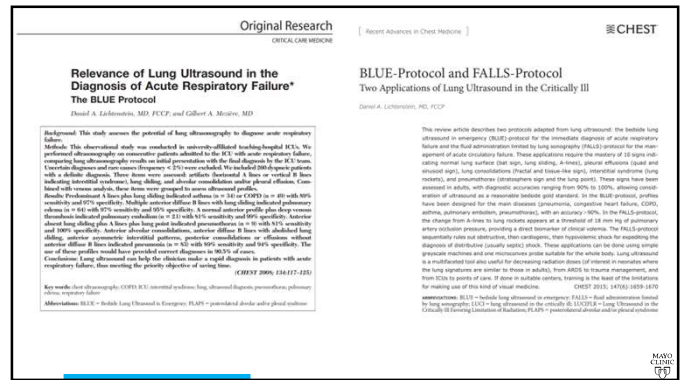
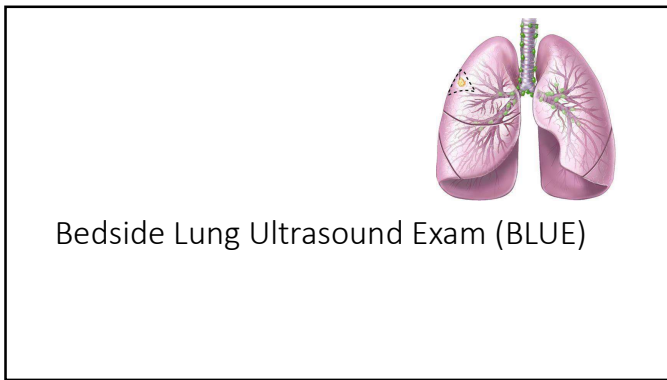
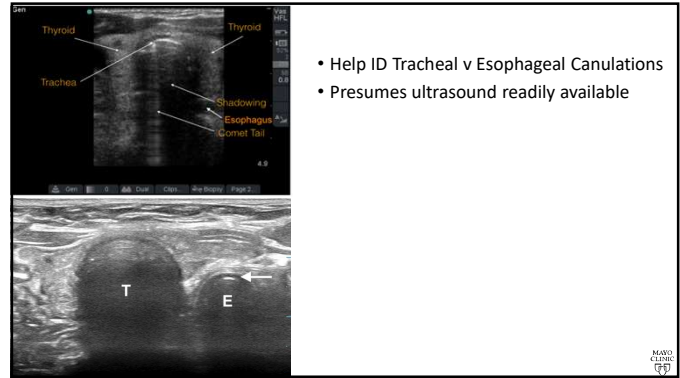
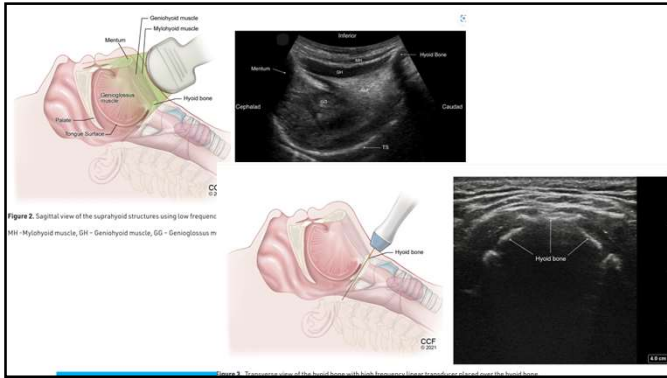
[Rescue Echo - Echocardiography and Perioperative Ultrasound \(utah.edu\)](#)

Airway Ultrasound

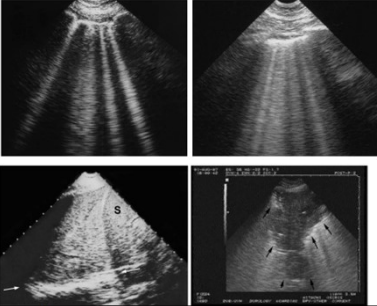
Airway Ultrasound

- Difficult airways
- Check for tracheal v esophageal cannulation
- Help identify nerves / landmarks; injection sites

Figure 1. Anatomy of the neck anterior view (A) and lateral view (B) showing important airway structures.



< 3 Minutes to Diagnose Acute Respiratory Failure



Pulmonary Edema

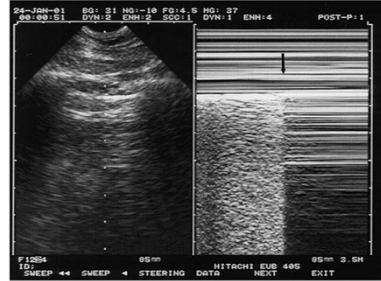
- “B” / “Blast” / Rocket lines
- Specificity / Sensitivity: 88, 90

Lung Consolidation

- “Hepatization”
- “Tissular pattern”

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Lung Ultrasound – Pneumothorax



- Lung point sign
- “Bar code” sign
- Sensitivity / Specificity: 81, 100

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As a profession, we’ve been slower to adopt...

- Critical mass of bench-strength to teach / reinforce trainees
- Guidelines have also been slow to emerge even though clinically proven to be useful
- Anesthesia-focused learning materials have been slow
- ABA Applied OSCE evolving
- Cycle of delayed adoption

Probably going to stay ugly for a while until this gets better

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Pushing Forward

- Learn more about POCUS
- Incorporate into your daily practice
 - Focus in on one area to start
 - Lung, gastric easier to learn
 - Cardiac may take longer
- Make it clinically relevant
- Encourage ASA POCUS Certification
- NMBE Examinations
 - Special Exam for Critical Care
 - Transesophageal Echocardiogram

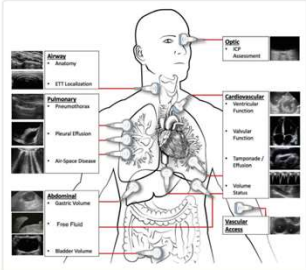


Fig. 1. Anatomic perspective pool-of-care ultrasound examinations. ETT, endotracheal tube; IOP, intraocular pressure.

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Resources

- ASA POCUS Certification
- American Society of Echocardiography (ASE)
- American Society of Regional Anesthesia (ASRA)
- Society of Critical Care Anesthesia (SCCM)
- Toronto Hospital Virtual Echocardiography
- CHEST
- University of Utah

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Thank you for your attention
Please feel free to reach out to me anytime

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