

ACİLDE ULTRASONOGRAFİ KULLANIMI NEREYE KADAR ?

DOÇ. DR. SADIK GİRİŞGİN

*Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi
Acil Tıp Anabilim Dalı*

DOCTORS



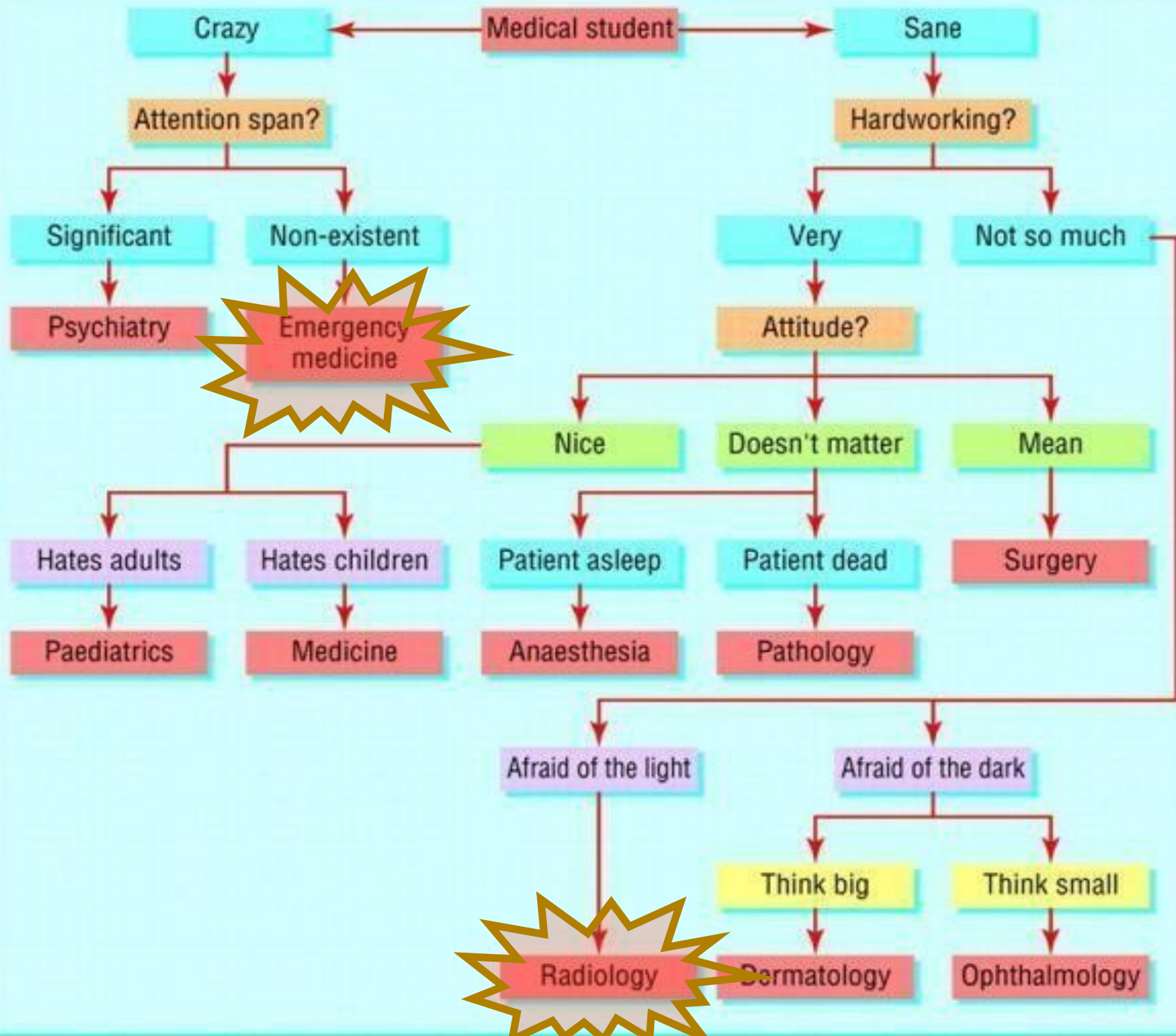
What my friends think I do



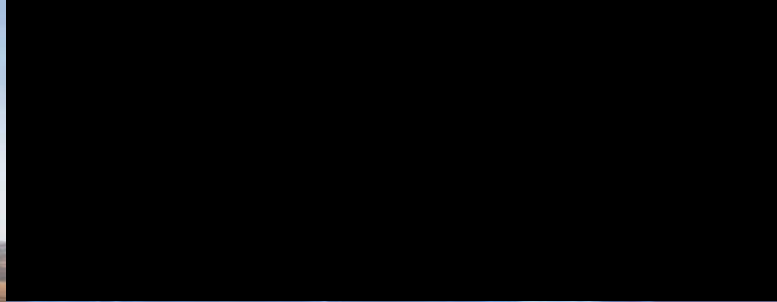
What the government thinks I do



What I really do

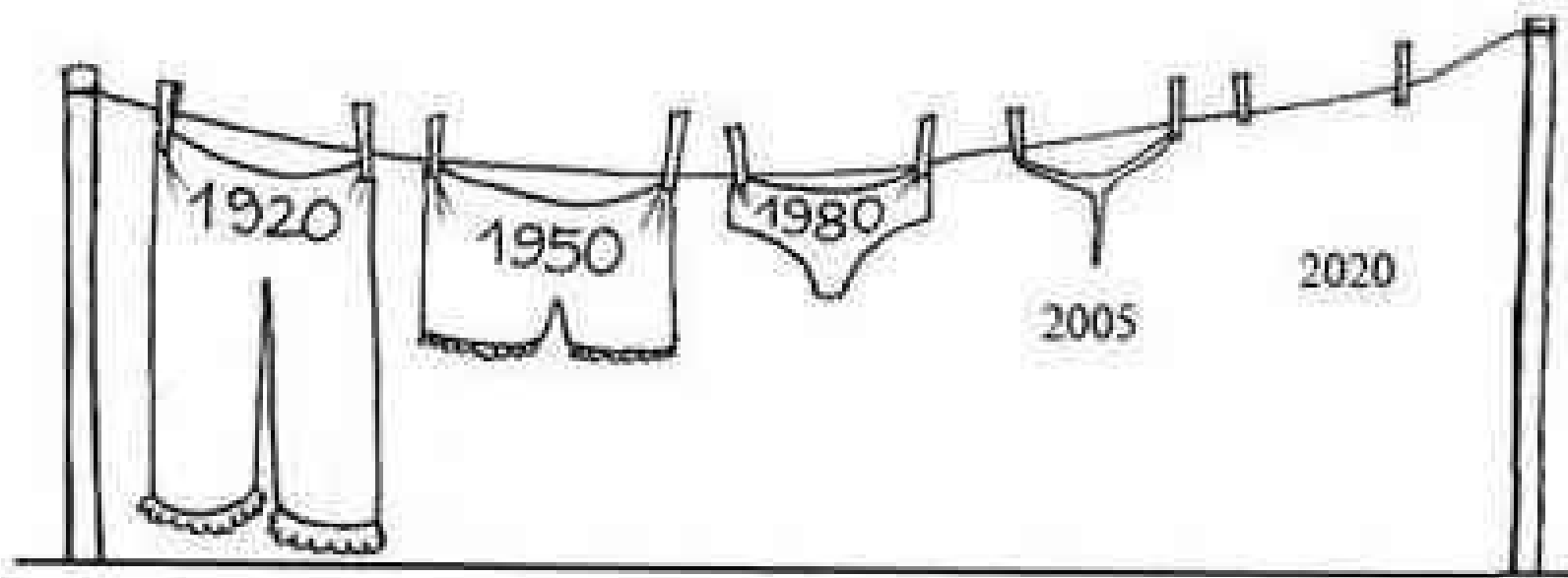






TARİHÇE







USG CİHAZ



ACİL E ÖZEL CİHAZLAR



ACİLE ÖZEL CİHAZLAR





Ultrasonography

- Portable
- Probe çeşitliliği
- Real time görüntü
- No radiation
- Tekrar edilebilir
- Cost effective



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Eğitim

- American College of Radiology (ACR)
- American Institute of Ultrasound in Medicine (AIUM)
- Ultrasound Imaging by Emergency Physicians: ACEP Policy Statement

Best Education Method

TO SIT AND
PRACTICE
WITH
AN EXPERIENCED
SONOLOGIST





American College of
Emergency Physicians®

ADVANCING EMERGENCY CARE 

POLICY STATEMENT

Approved October 2008

Emergency Ultrasound Guidelines

Emergency ultrasound can be classified into the following functional clinical categories:

1. *Resuscitative*: ultrasound use as directly related to an acute resuscitation
2. *Diagnostic*: ultrasound utilized in an emergent diagnostic imaging capacity
3. *Symptom or sign-based*: ultrasound used in a clinical pathway based upon the patient's symptom or sign (eg, shortness of breath)
4. *Procedure guidance*: ultrasound used as an aid to guide a procedure
5. *Therapeutic and Monitoring*: ultrasound use in therapeutics or in physiological monitoring

Display Settings: ☐ Abstract

Send to: ☐

Acad Emerg Med. 2012 Oct;19(10):1119-26. doi: 10.1111/j.1553-2712.2012.01456.x. Epub 2012 Oct 5.

Bedside focused echocardiography as predictor of survival in cardiac arrest patients: a systematic review.

Blyth L, Atkinson P, Gadd K, Lang E.

Dalhousie Medicine New Brunswick, Saint John, New Brunswick.

Abstract

OBJECTIVES: The objective was to determine if focused transthoracic echocardiography (echo) can be used during resuscitation to predict the outcome of cardiac arrest.

METHODS: A literature search of diagnostic accuracy studies was conducted using MEDLINE via PubMed, EMBASE, CINAHL, and Cochrane Library databases. A hand search of references was performed and experts in the field were contacted. Studies were included for further appraisal and analysis only if the selection criteria and reference standards were met. The eligible studies were appraised and scored by two independent reviewers using a modified quality assessment tool for diagnostic accuracy studies (QUADAS) to select the papers included in the meta-analysis.

RESULTS: The initial search returned 2,538 unique papers, 11 of which were determined to be relevant after screening criteria were applied by two independent researchers. One additional study was identified after the initial search, totaling 12 studies to be included in our final analysis. The total number of patients in these studies was 568, all of whom had echo during resuscitation efforts to determine the presence or absence of kinetic cardiac activity and were followed up to determine return of spontaneous circulation (ROSC). Meta-analysis of the data showed that as a predictor of ROSC during cardiac arrest, echo had a pooled sensitivity of 91.6% (95% confidence interval [CI] = 84.6% to 96.1%), and specificity was 80.0% (95% CI = 76.1% to 83.6%). The positive likelihood ratio for ROSC was 4.26 (95% CI = 2.63 to 6.92), and negative likelihood ratio was 0.18 (95% CI = 0.10 to 0.31). Heterogeneity of the results (sensitivity) was nonsignificant (Cochran's Q: $\chi^2(2) = 10.63$, $p = 0.16$, and $I^2(2) = 34.1\%$).

CONCLUSIONS: Echocardiography performed during cardiac arrest that demonstrates an absence of cardiac activity harbors a significantly lower (but not zero) likelihood that a patient will experience ROSC. In selected patients with a higher likelihood of survival from cardiac arrest at presentation, based on established predictors of survival, echo should not be the sole basis for the decision to cease resuscitative efforts. Echo should continue to be used only as an adjunct to clinical assessment in predicting the outcome of resuscitation for cardiac arrest.

[Display Settings:](#) ☒ Abstract

[Send to:](#) ☐

[Ann Emerg Med.](#) 2013 May 15. pii: S0196-0644(13)00315-6. doi: 10.1016/j.annemergmed.2013.03.031. [Epub ahead of print]

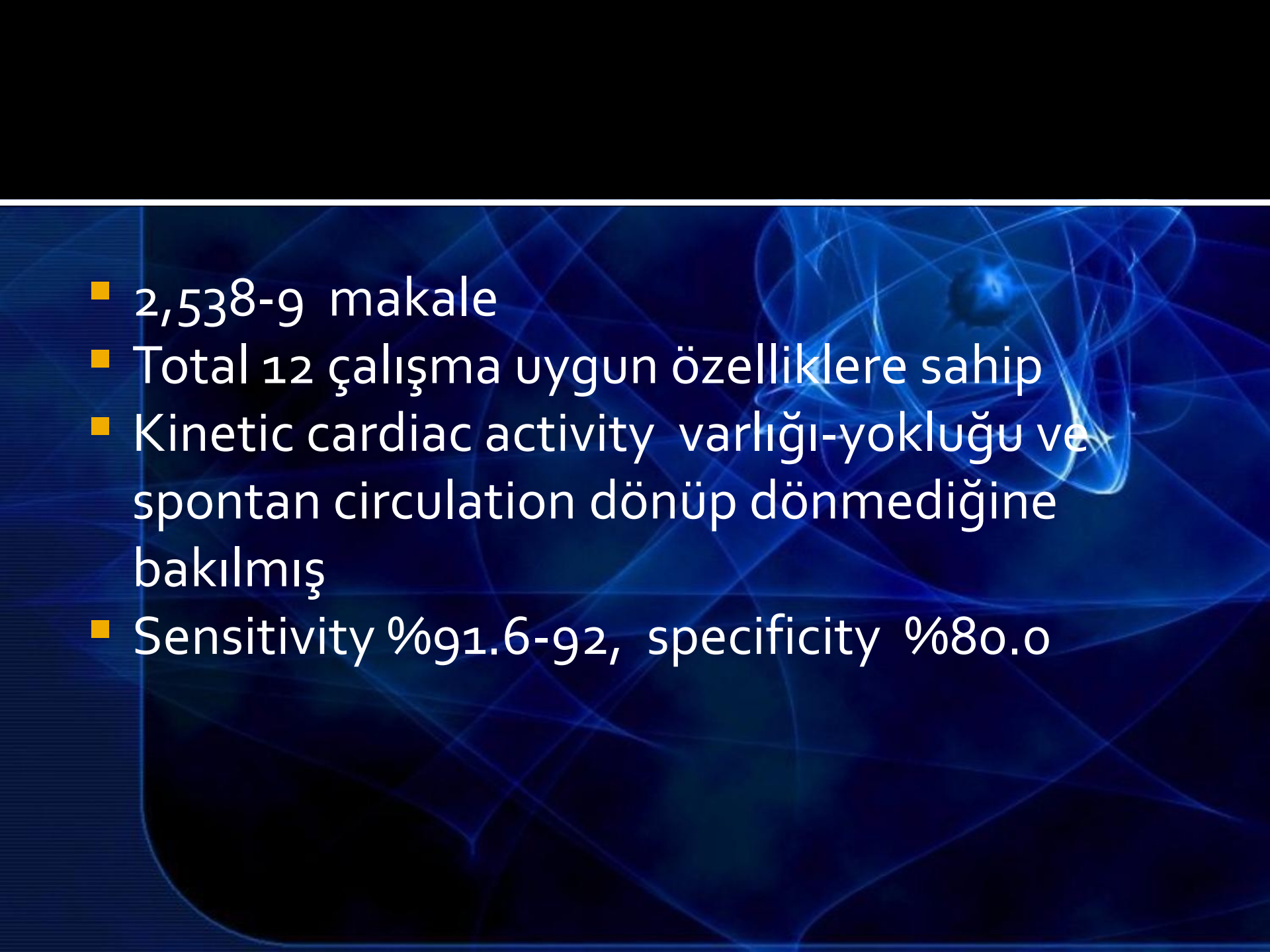
Does the Absence of Cardiac Activity on Ultrasonography Predict Failed Resuscitation in Cardiac Arrest?

[Cohn B.](#)

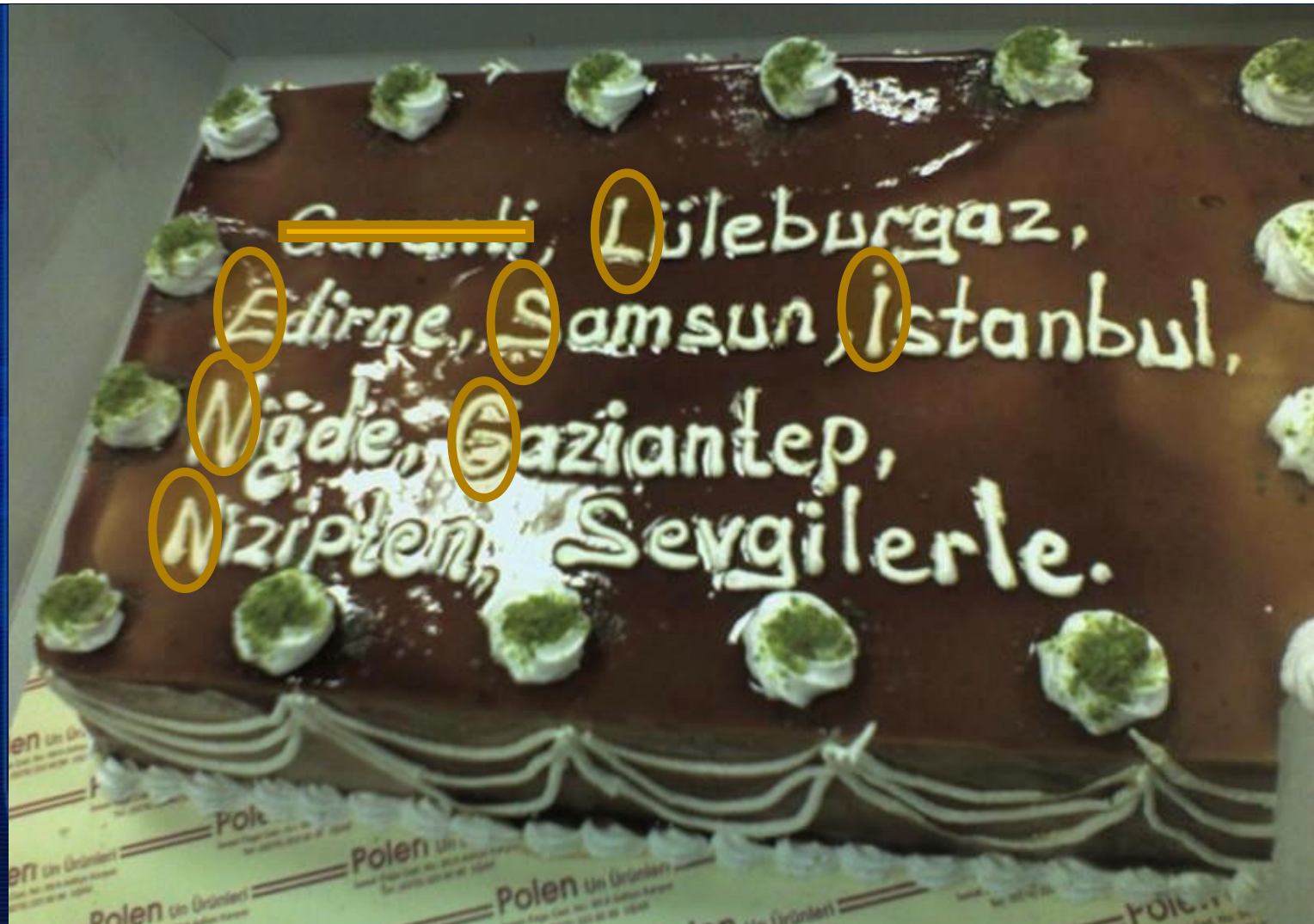
Division of Emergency Medicine, Washington University School of Medicine, St. Louis, MO.

PMID: 23683545 [PubMed - as supplied by publisher]

☒ **Publication Types**

- 
- 2,538-9 makale
 - Total 12 çalışma uygun özelliklere sahip
 - Kinetic cardiac activity varlığı-yokluğu ve spontan circulation dönüp dönmediğine bakılmış
 - Sensitivity %91.6-92, specificity %80.0

~~GARANTİ~~ LESİNGN



FAST

Focused Assessment with Sonography for Trauma



FAST

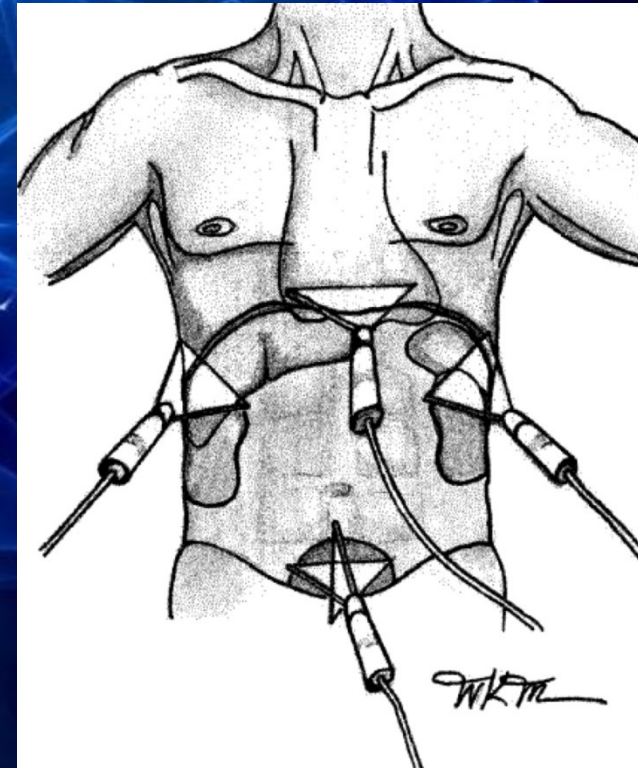
- Focused **Abdominal** Sonography for Trauma
- Focused **Assessment** with Sonography for Trauma

HEDEF:

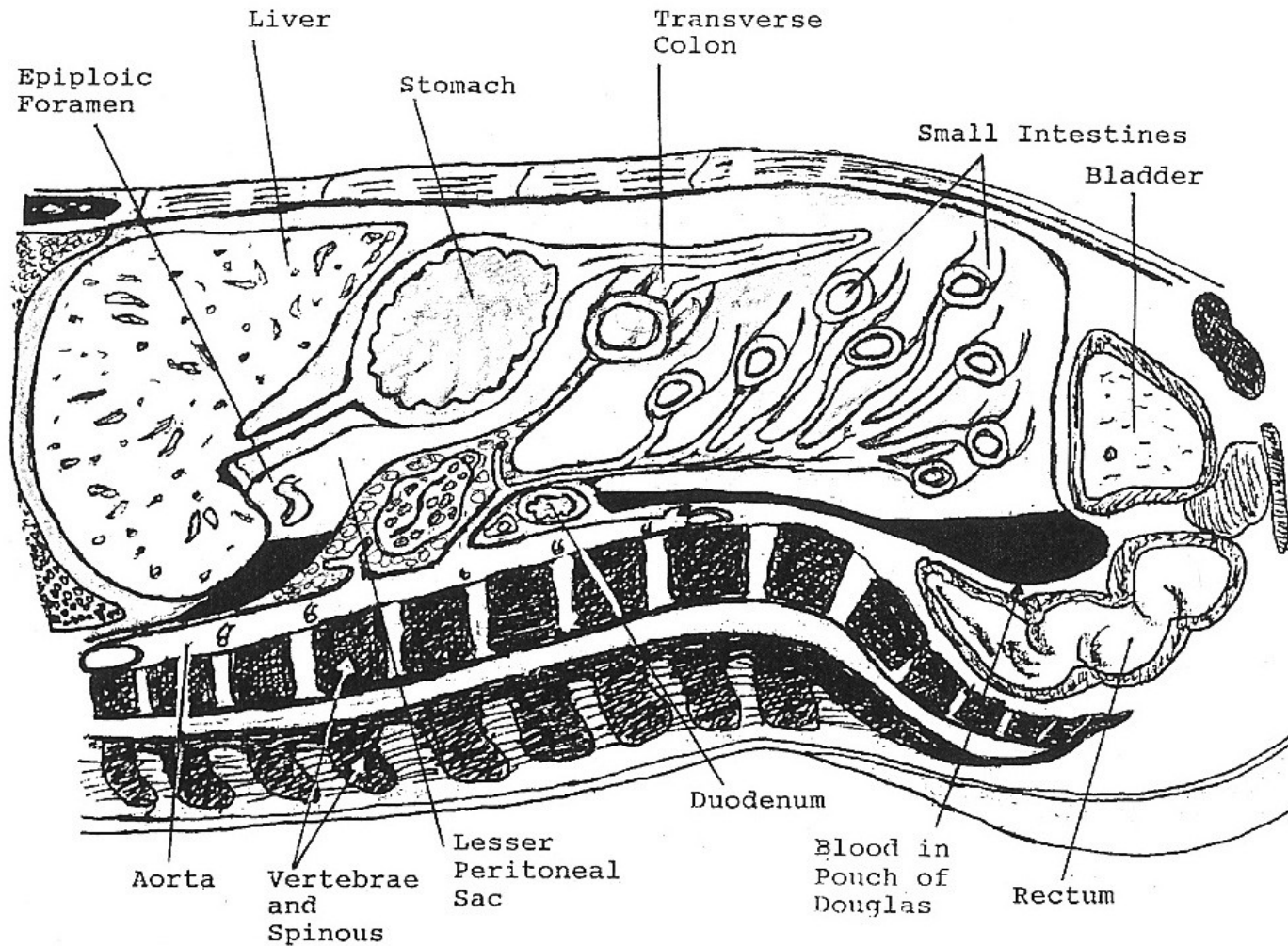
- Intraperitoneal, Intrathoracic, pericardial
SERBEST SIVI ?

FAST

- Perihepatic
- Cardiac
- Perisplenic
- Pelvic



Peritoneal / pleural / pericardial sivi?



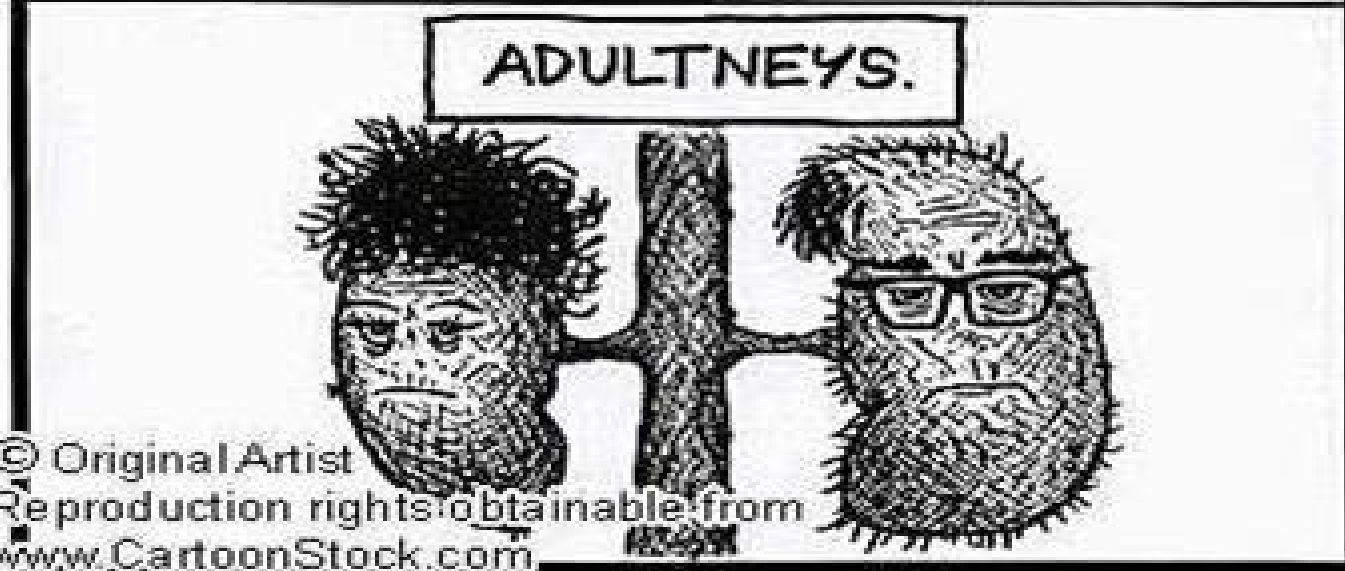
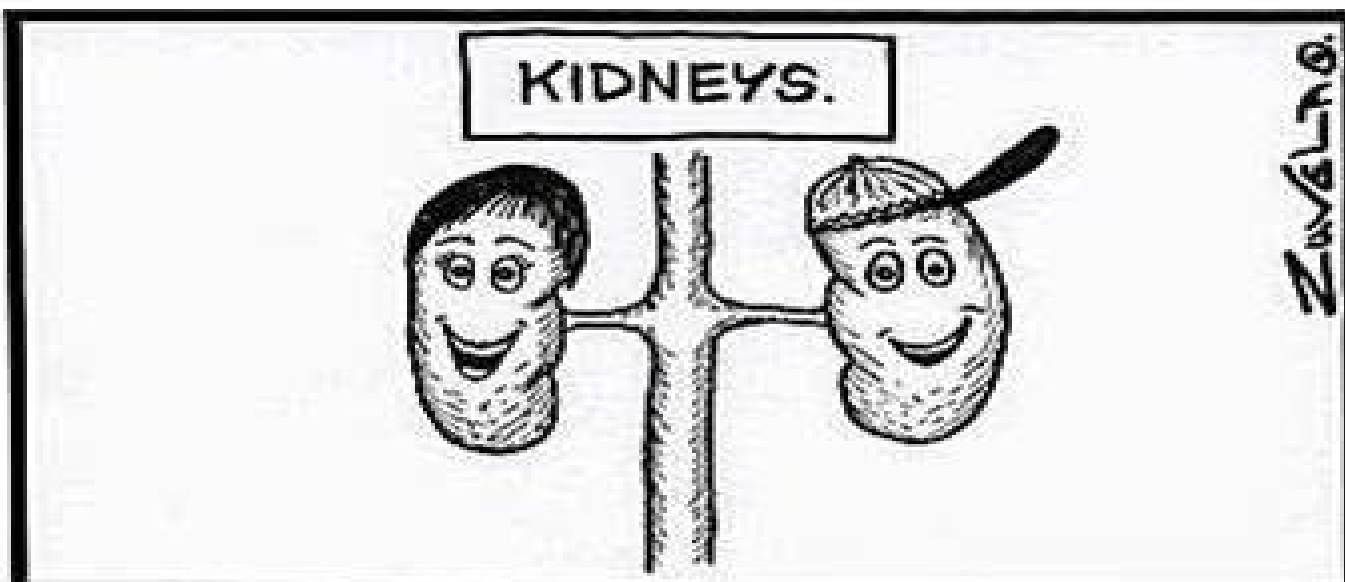
FAST - technic



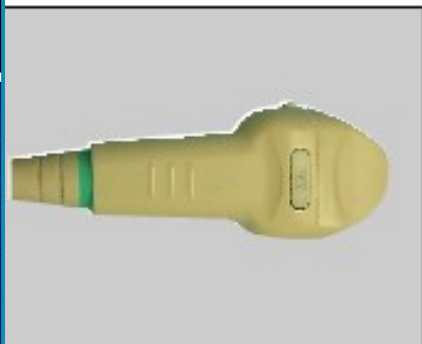
FAST - technic



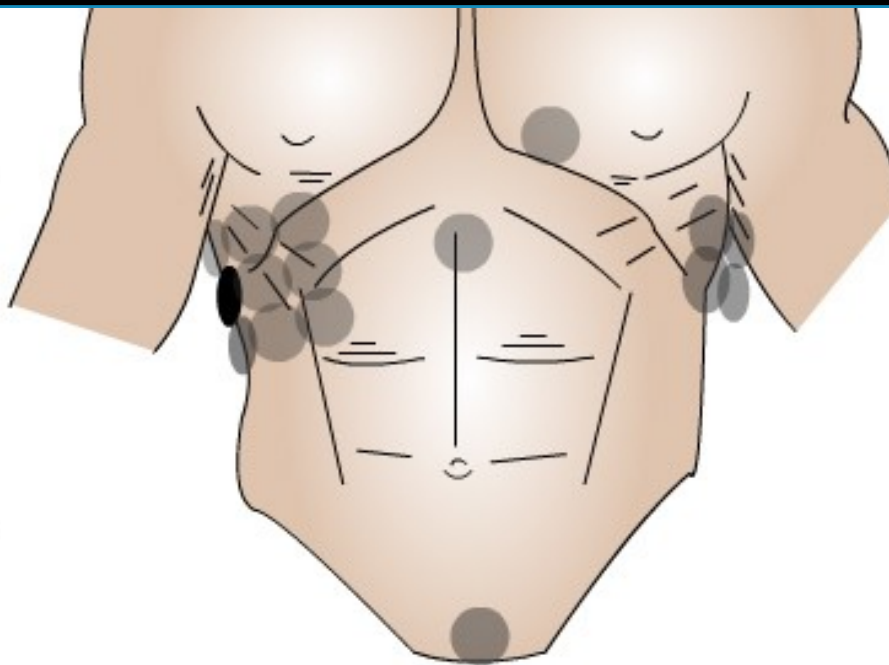
Sağ üst – Perihepatic



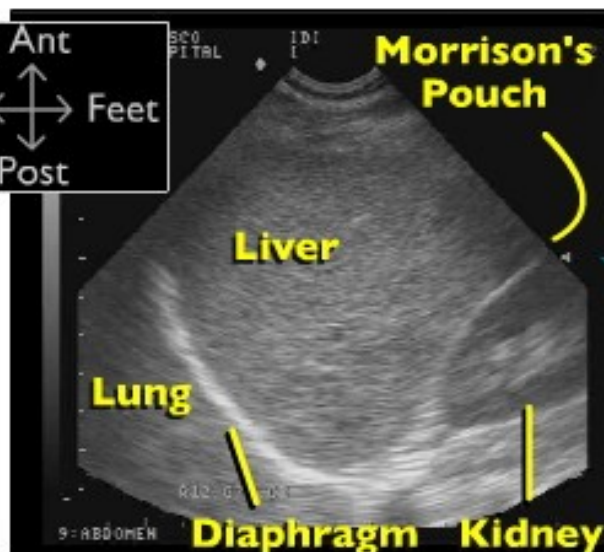
Probe Orientation



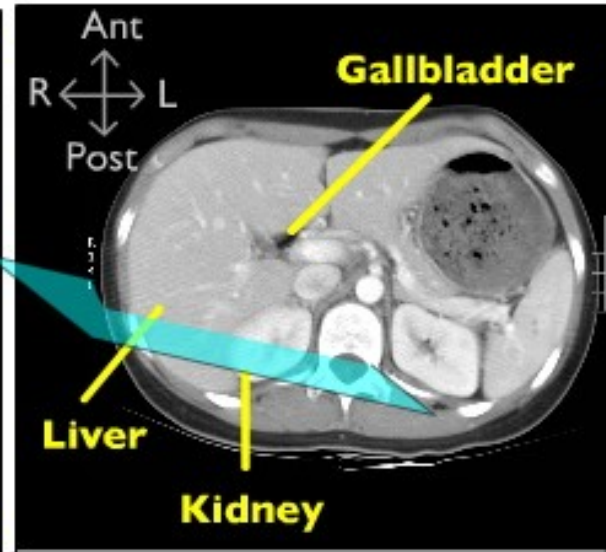
Coronal view



Actual ultrasound image



Labeled ultrasound image



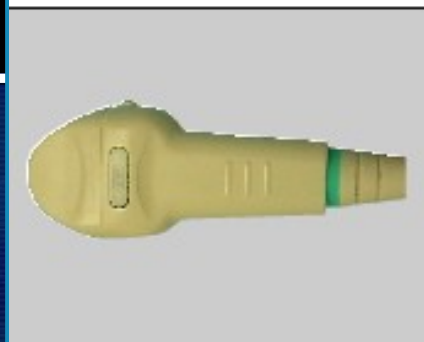
Cross-sectional CT anatomy



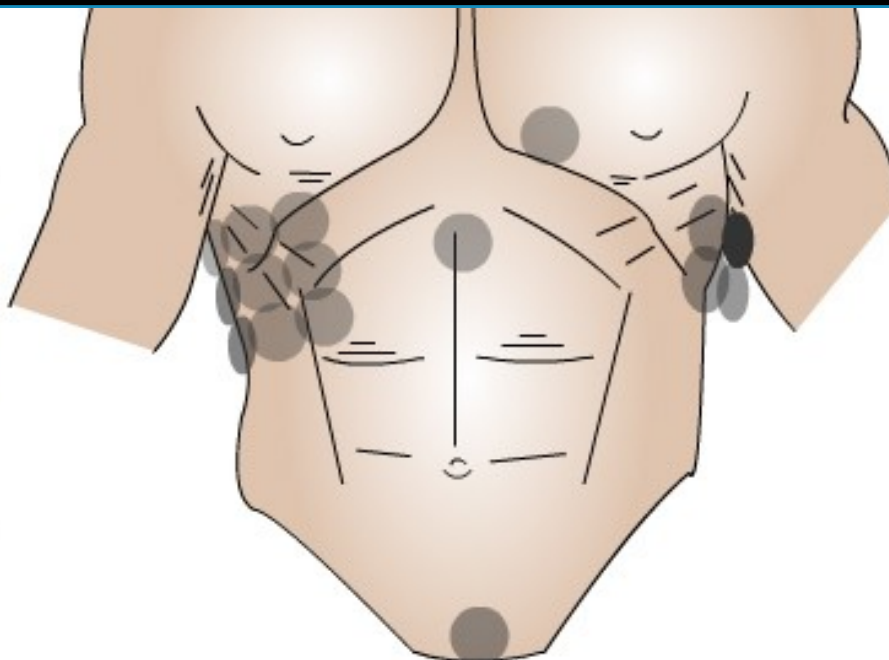
Left Upper - Perisplenic



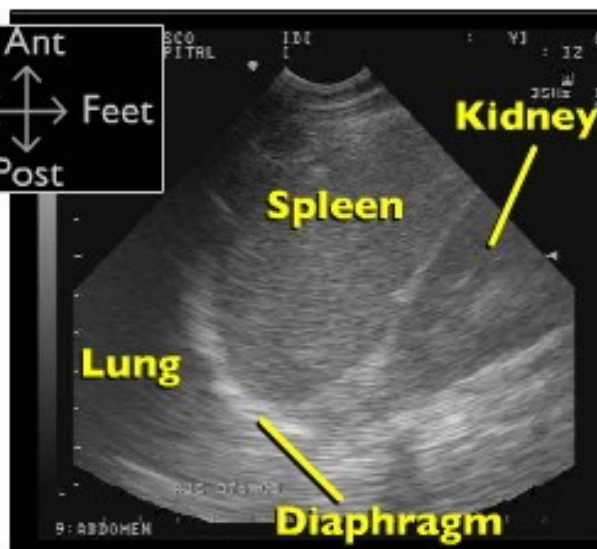
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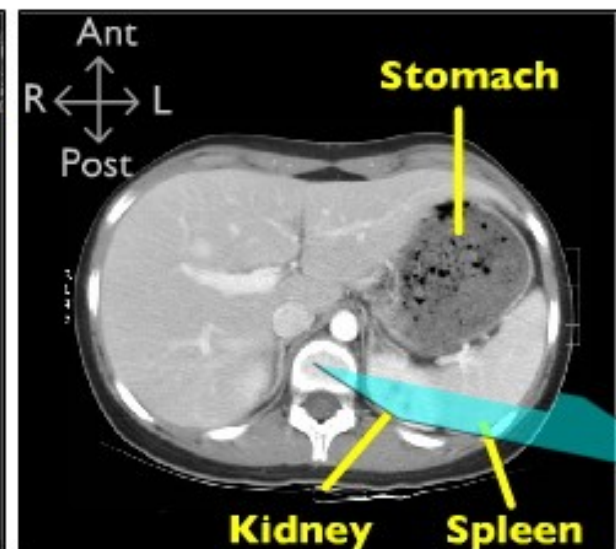
Coronal view



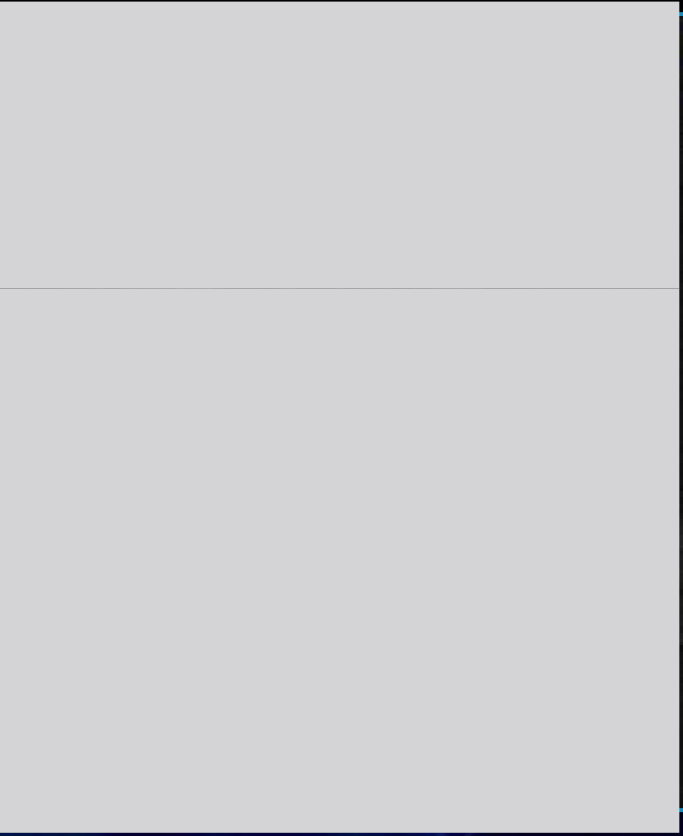
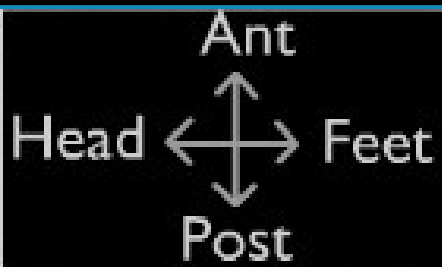
Actual ultrasound image



Labeled ultrasound image



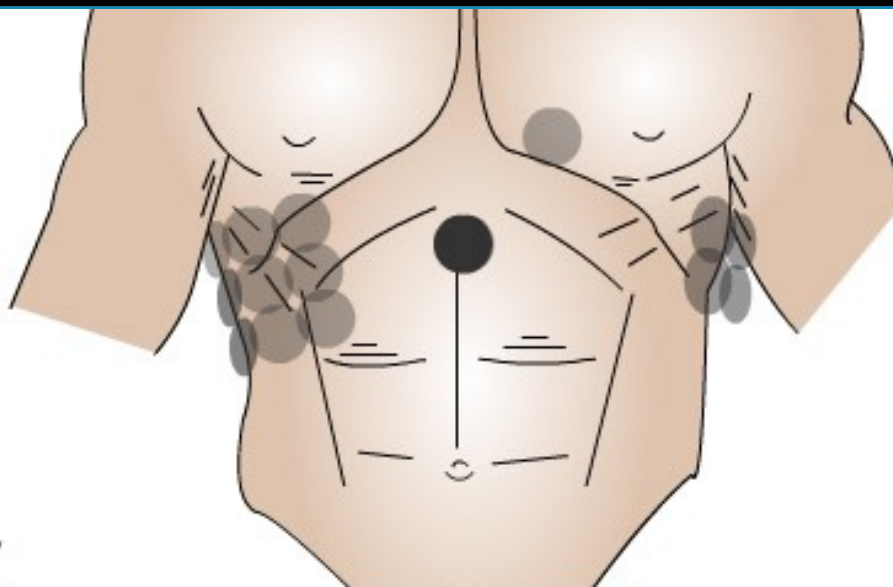
Cross-sectional CT anatomy



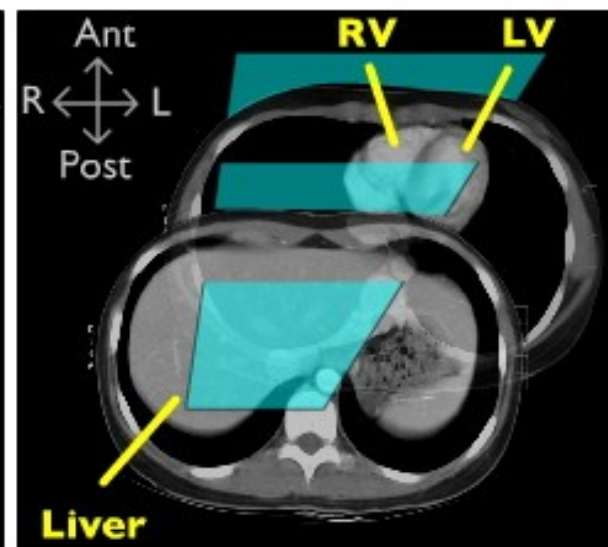
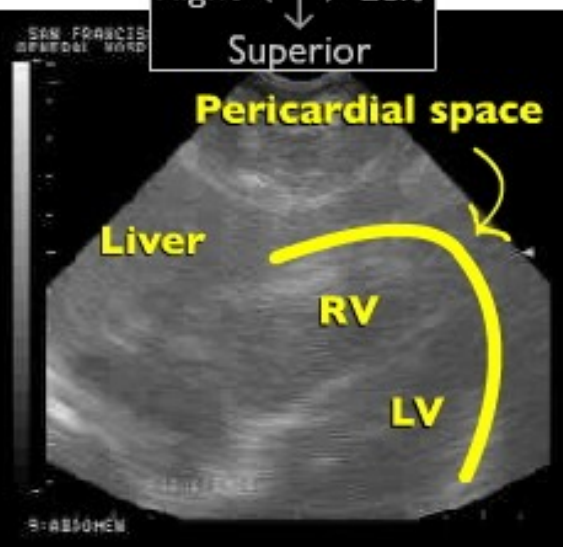
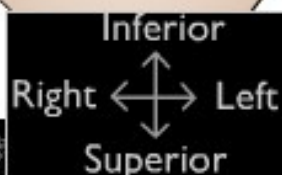
Cardiac - subxyphoid



Probe Orientation



Subcostal coronal view



Actual ultrasound image

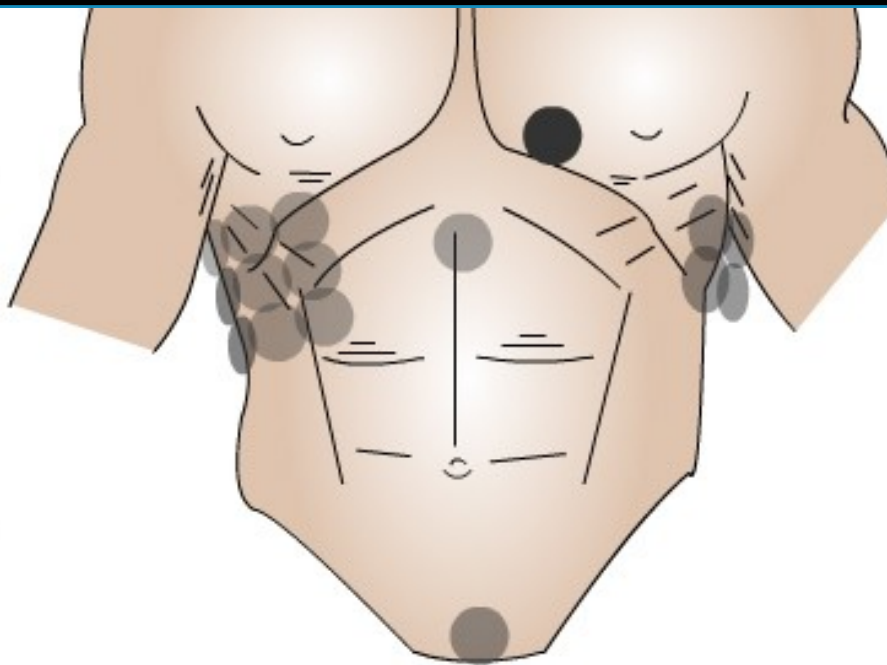
Labeled ultrasound image

Cross-sectional CT anatomy

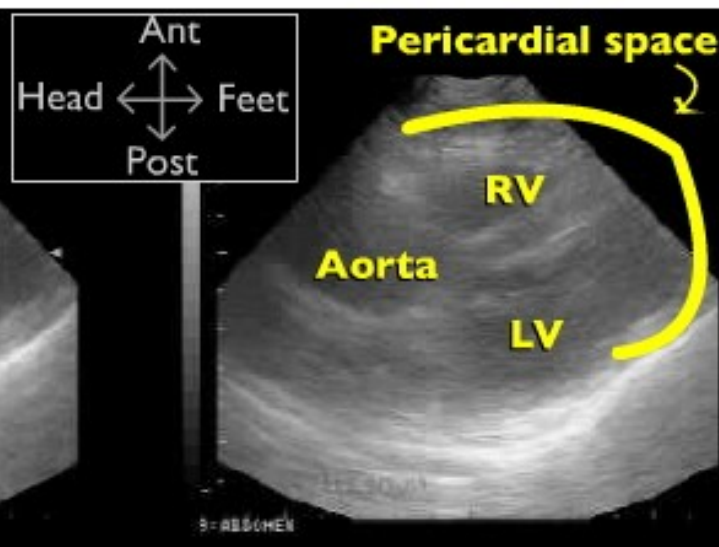
Probe Orientation



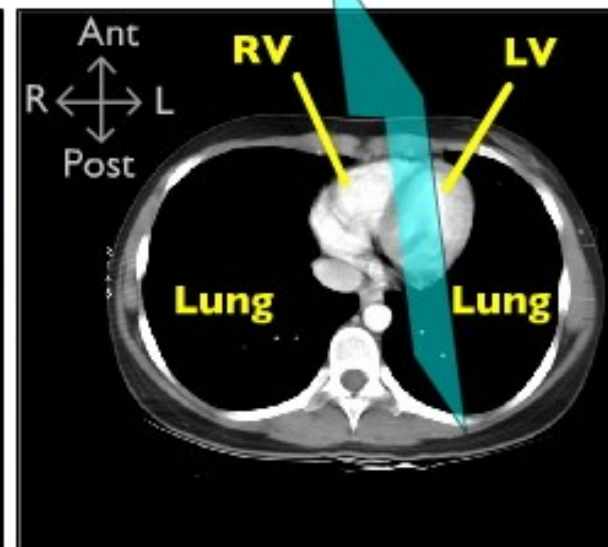
**Parasternal
long axis view**



Actual ultrasound image



Labeled ultrasound image



Cross-sectional CT anatomy

Pelvic - Suprapubic

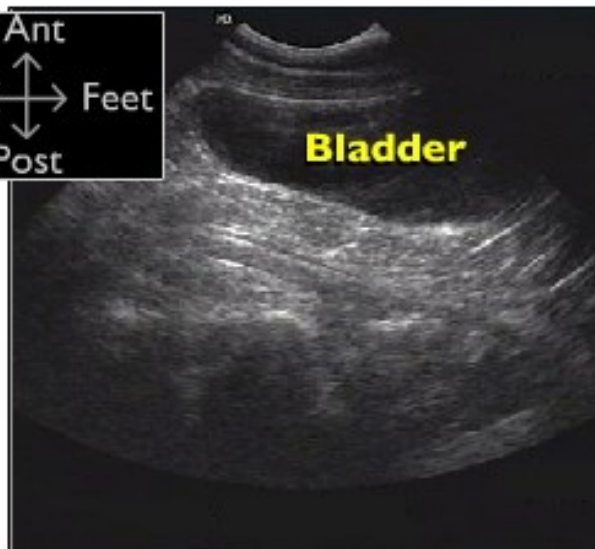
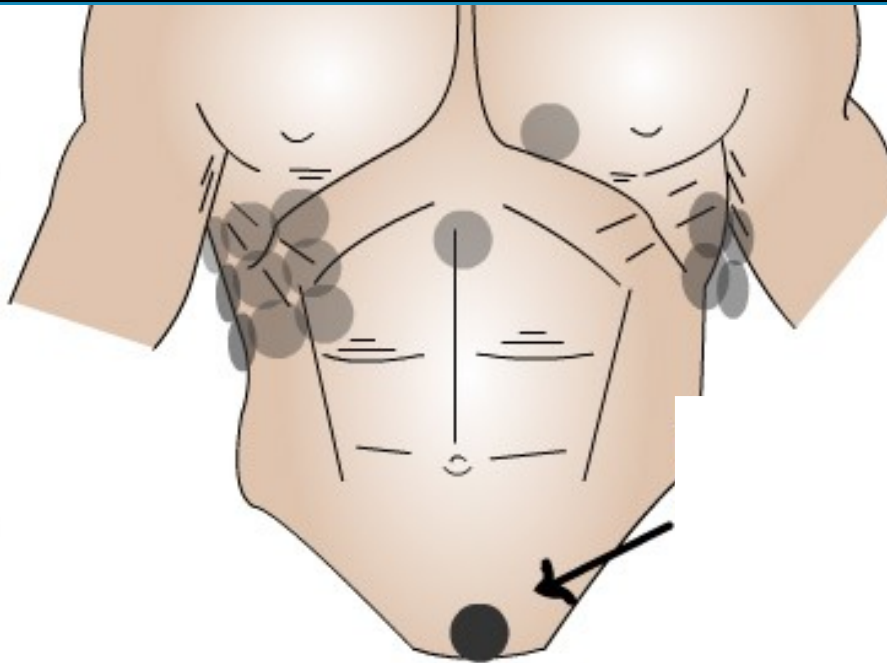


Probe Orientation



Perpendicular to skin

Sagittal view



Actual ultrasound image

Labeled ultrasound image

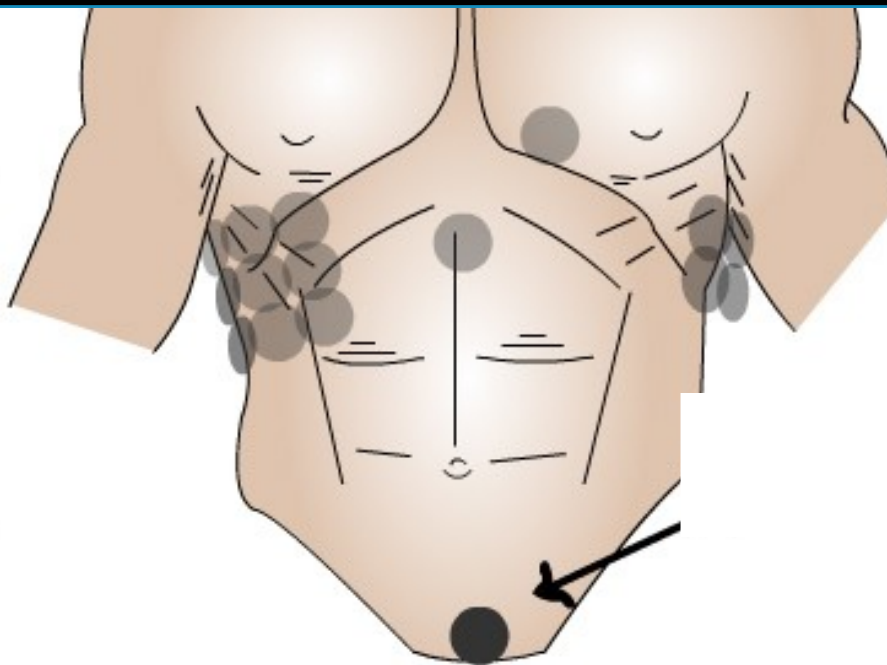
Cross-sectional CT anatomy

Probe Orientation

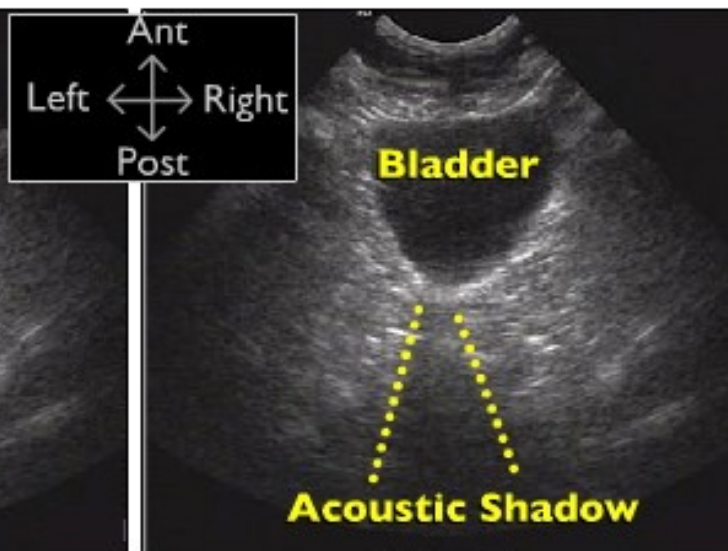


Perpendicular to skin

Transverse view



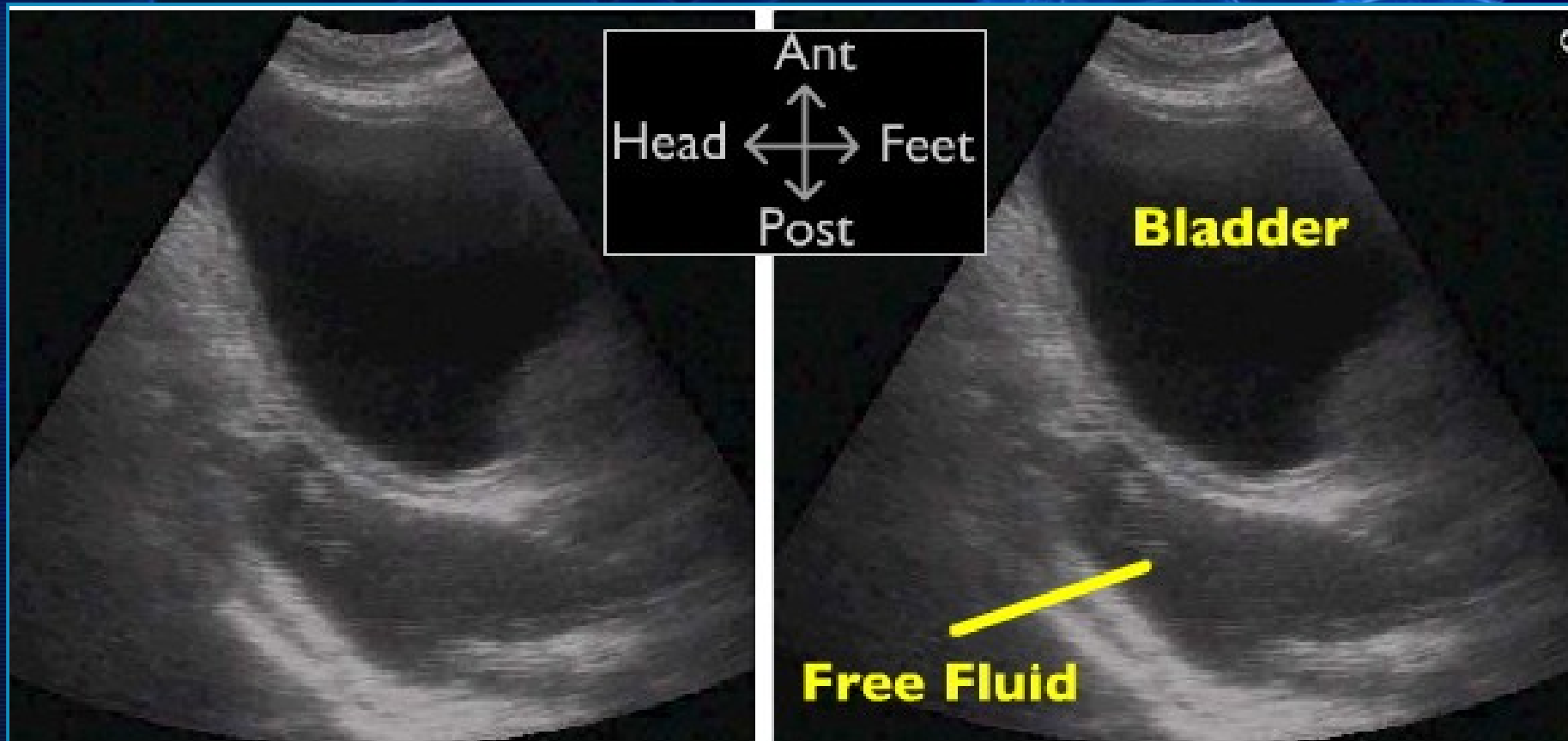
Actual ultrasound image



Labeled ultrasound image



Cross-sectional CT anatomy



FAST

```
graph TD; FAST[FAST] --> UNSTABLE[Hemodynamically UNSTABLE]; FAST --> STABLE[Hemodynamically STABLE]; UNSTABLE --> UNSTABLE_Negative[Negative]; UNSTABLE --> UNSTABLE_Positive[Positive]; UNSTABLE_Negative --> UNSTABLE_Negative_Outcome[other pathology]; UNSTABLE_Positive --> UNSTABLE_Positive_Outcome[surgery]; STABLE --> STABLE_Negative[Negative]; STABLE --> STABLE_Positive[Positive]; STABLE_Negative --> STABLE_Negative_Outcome[Again and again examination / CT]; STABLE_Positive --> STABLE_Positive_Outcome[CT / Surgery];
```

Hemodynamically
UNSTABLE

Negative

other
pathology

Positive

surgery

Hemodynamically
STABLE

Negative

Again and
again
examination /
CT

Positive

CT /
Surgery

Kontrendikasyon

- Acil cerrahi



Sınırlayıcı Faktörler :

- Bazı ciddi traumatic injuriler
 - renal peduncle injury, intestinal injury, pancreas trauma, diaphragm injury, retroperitoneal injury
- Nontraumatic serbest sıvı
- Uzun süre (traumadan sonra)
- İntraperitoneal lipid

Nerdesin lan
yıllardır?

Yaz uykusuna
yatıyorum abi? Siz
yatmıyor musunuz
yaz uykusuna?

Biz kış
uykusuna
yatıyoruz.

Hadi
canım!

EDİT

RUSH

(Rapid Ultrasound for Shock and Hypotension)





- Trauma hastası

FAST

- NON-Traumatic hypotension or shock

RUSH

RUSH

- Yatakbaşında
 - Heart
 - Inferior Vena Cava
 - Morison's/FAST, lower thorax (or abdominal thorax window)
 - Aorta
 - Pneumothorax
- mnemonic: HI-MAP

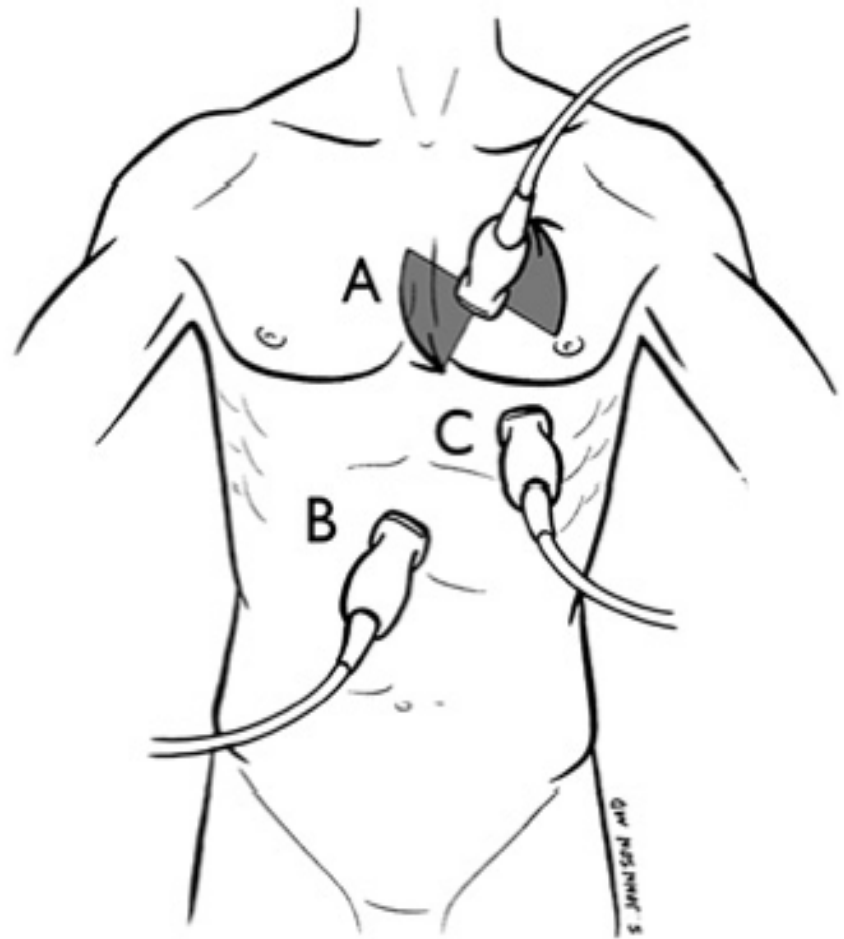
Heart

- Pericardial effusion/tamponade;
- Sağ ventricular yetmezlik (pulmonary embolism)
- Sol ventricular function. (parasternal long axis and the four chamber view)

A) Parasternal Views
Long / Short Axis

B) Subxiphoid View

C) Apical View



Rapid *U*ltrasound in *S*Hock (RUSH) step 1. Evaluation of the pump.

Pericardial
Effusion

RV

LV

LA

Pericardium

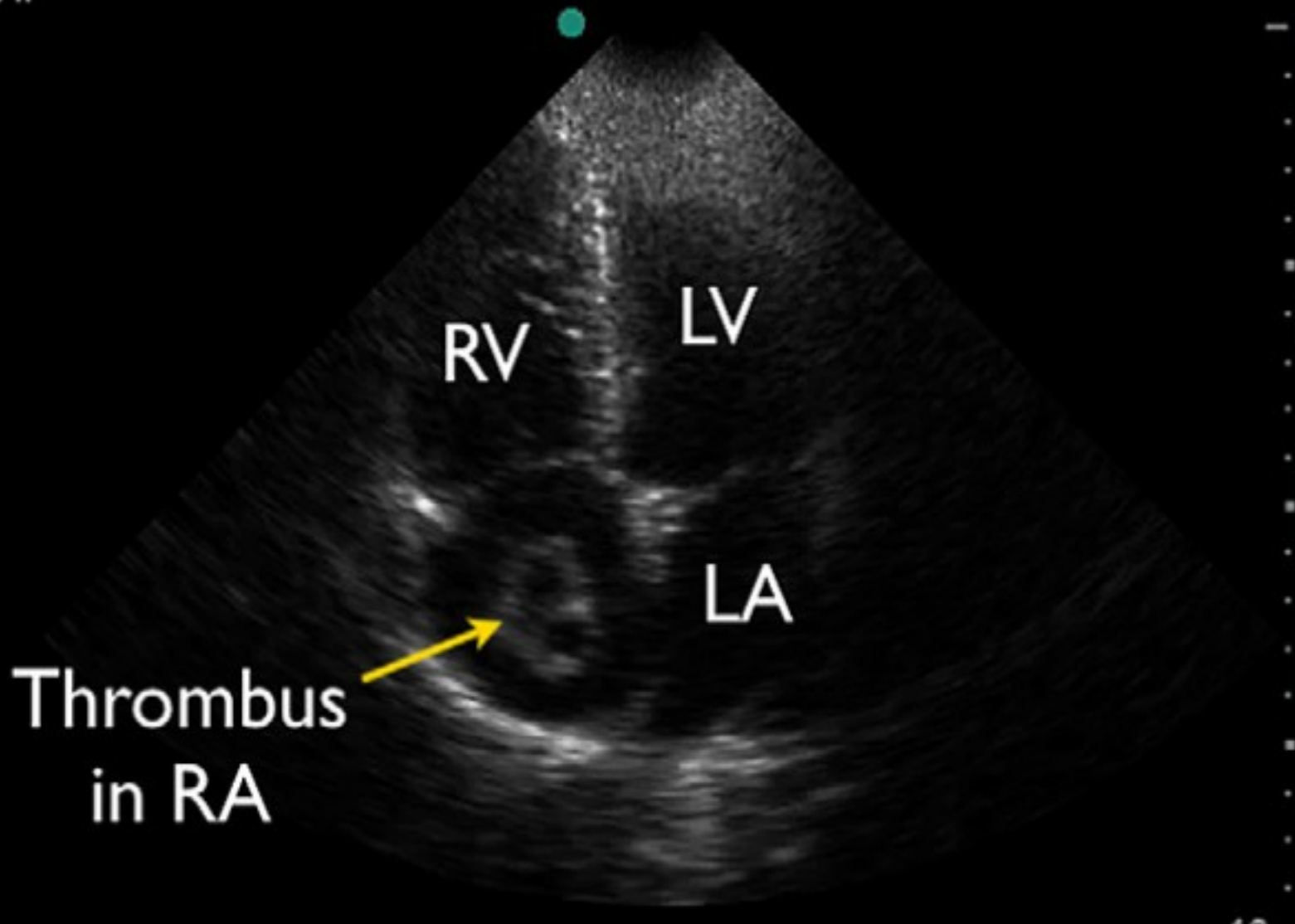
Descending
Aorta

5

10

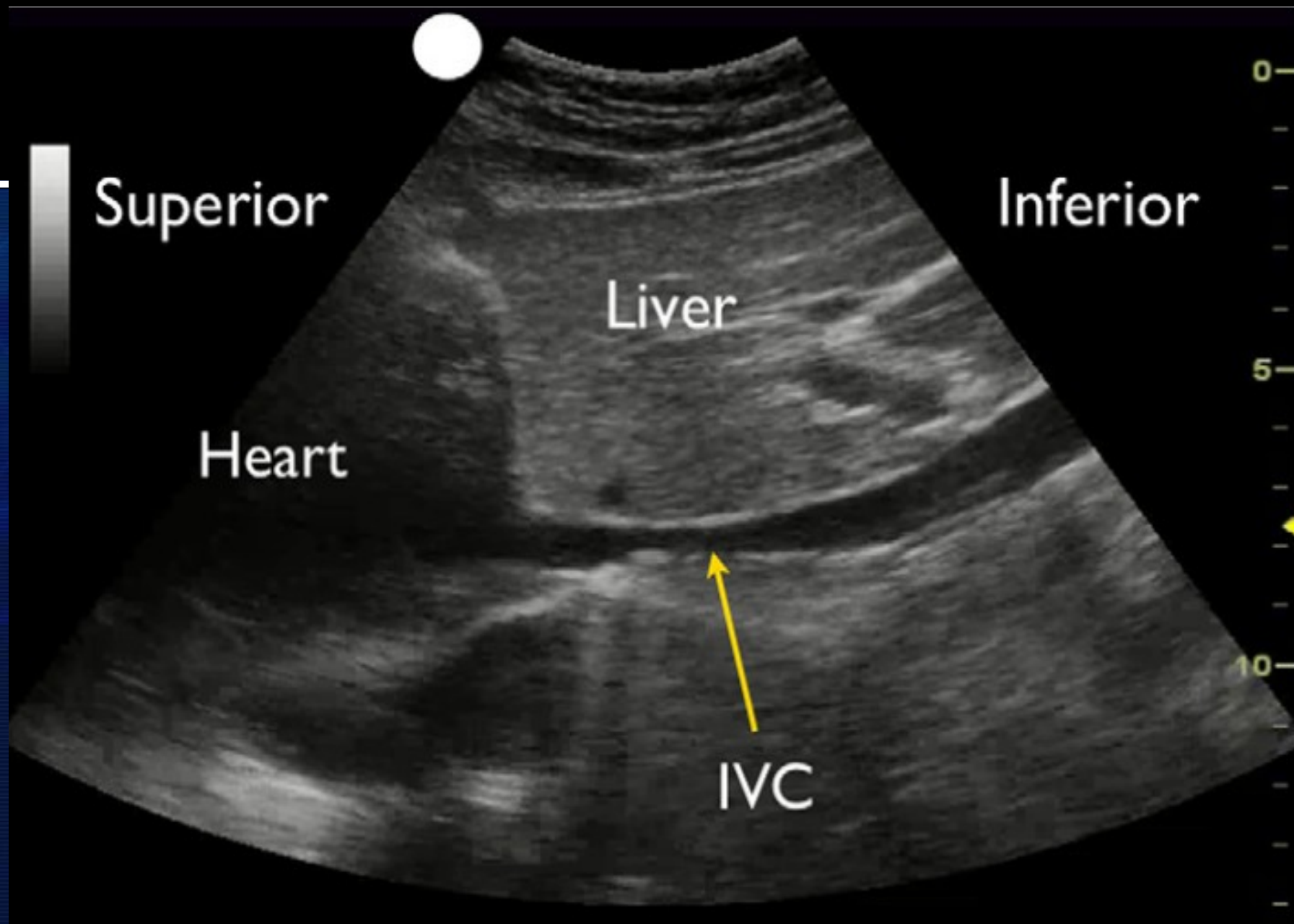
15

Gen THI



Inferior Vena Cava

- IVC çapı <1.5 cm (complete inspiratory)
düşük CVP (<5)
- IVC çapı >2.5 cm (no inspiratory collapse)
yüksek CVP (> 20) ve sıvı yüklenmesi.



Morison's and The FAST Exam

- **FAST**
 - Sağ upper quadrant,
 - Sol upper quadrant,
 - suprapubic area
- ectopic pregnancy,
- massive ascites,
- ruptured viscus,
- spontaneous intraabdominal bleeding,
- intraperitoneal rupture of an AAA, etc.

Aorta

AAA 4 level (Xiphoid to umbilicus)

- Kalp çıkışı
- Suprarenal
- Infrarenal
- İliac bifurcation üzerinde
- Aorta çapı >5 cm (+ hypotension =AAA)

Pneumothorax

Tension pnx düşünülmeli

- Central line
- Pacemaker takılması
- Thoracentesis
- Her iki hemithorax anterior 3. intercostal aralıktan başlanır
- High frequency probe
- M-mode
 - ocean/beach or seashore -- no pneumothorax
 - continuous ocean or stratosphere sign--- pneumothorax



Duchess of Camb



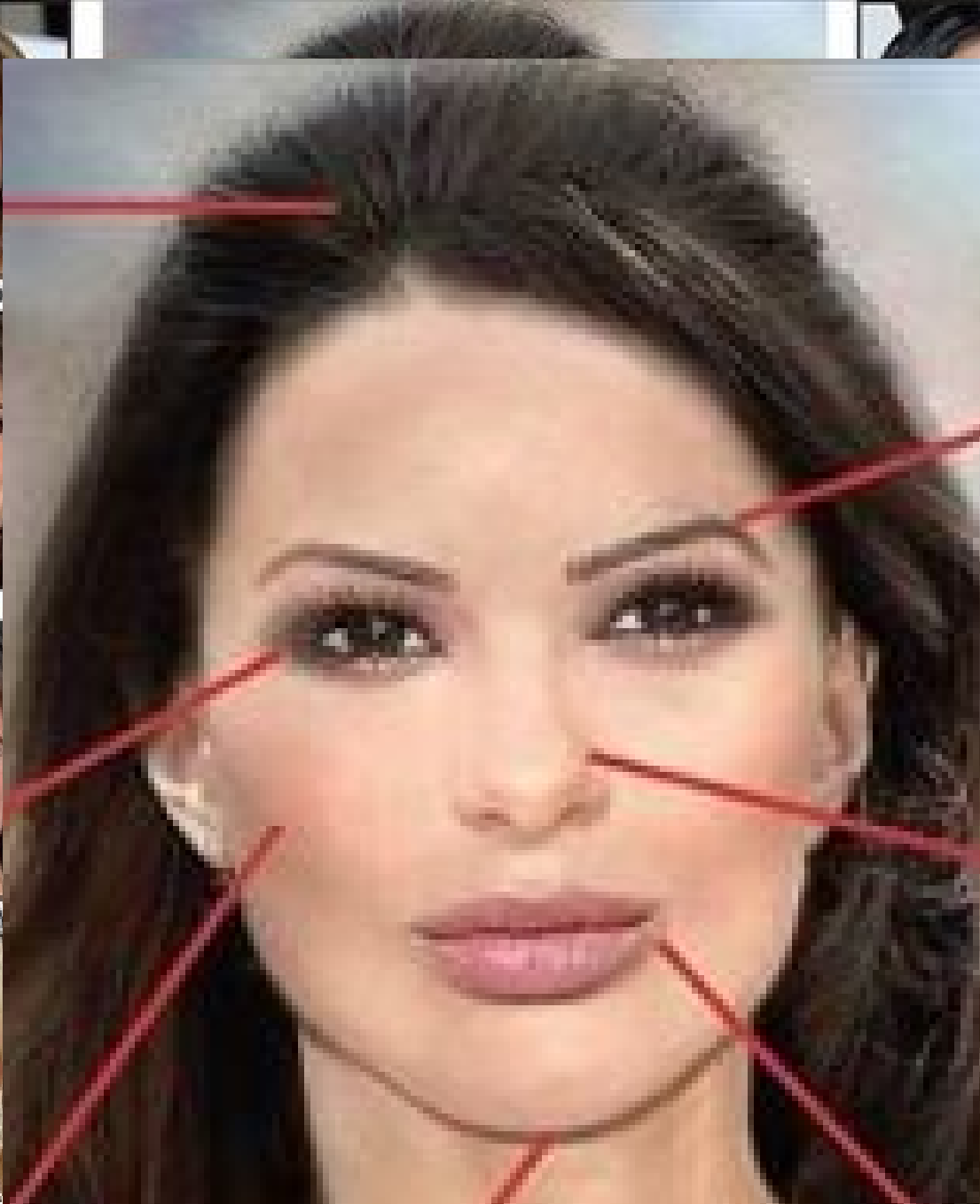
Cheryl Cole



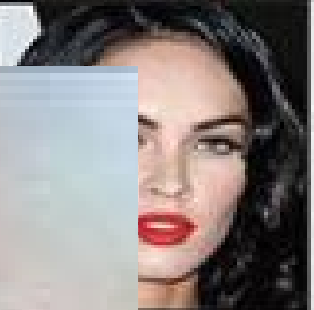
Keira Knightley



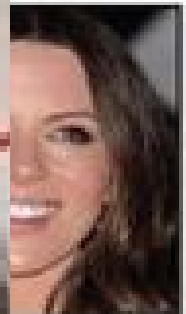
Gwyneth Paltrow



Object of desire? Computer Image of the 'Ideal woman'



xx



insale



Jolie



Kelly Brook

The RUSH Exam: Rapid Ultrasound in SHock in the Evaluation of the Critically Ill

Phillips Perera, MD, RDMS, FACEP^{a,*}, Thomas Mailhot, MD, RDMS^b,
David Riley, MD, MS, RDMS^a, Diku Mandavia, MD, FACEP, FRCPC^{b,c}

BLUE

(Bedside Lung Ultrasound in Emergency)





CXR-Radiology Reading: PTX Negative

1 Ratio 20.0 Zoom 41%



CT-Large Right PTX

PTX



- 
- Pneumothorax directography specificity %53
 - Gold standart is “CT”



- Akciğer USG ile görüntülemeye uygun değildir
- Eğer CT kullan-a-mıyorsanız , USG kullanılabilir
- Thoraks USG pnemothorax sensitivity (CT'ye göre) %92
- USG'nin bazı technical üstünlüğü var
- 4-12 MHz probe

STATIC IMAGES



SLS (Sliding Lung Sign)

- Normal



A line

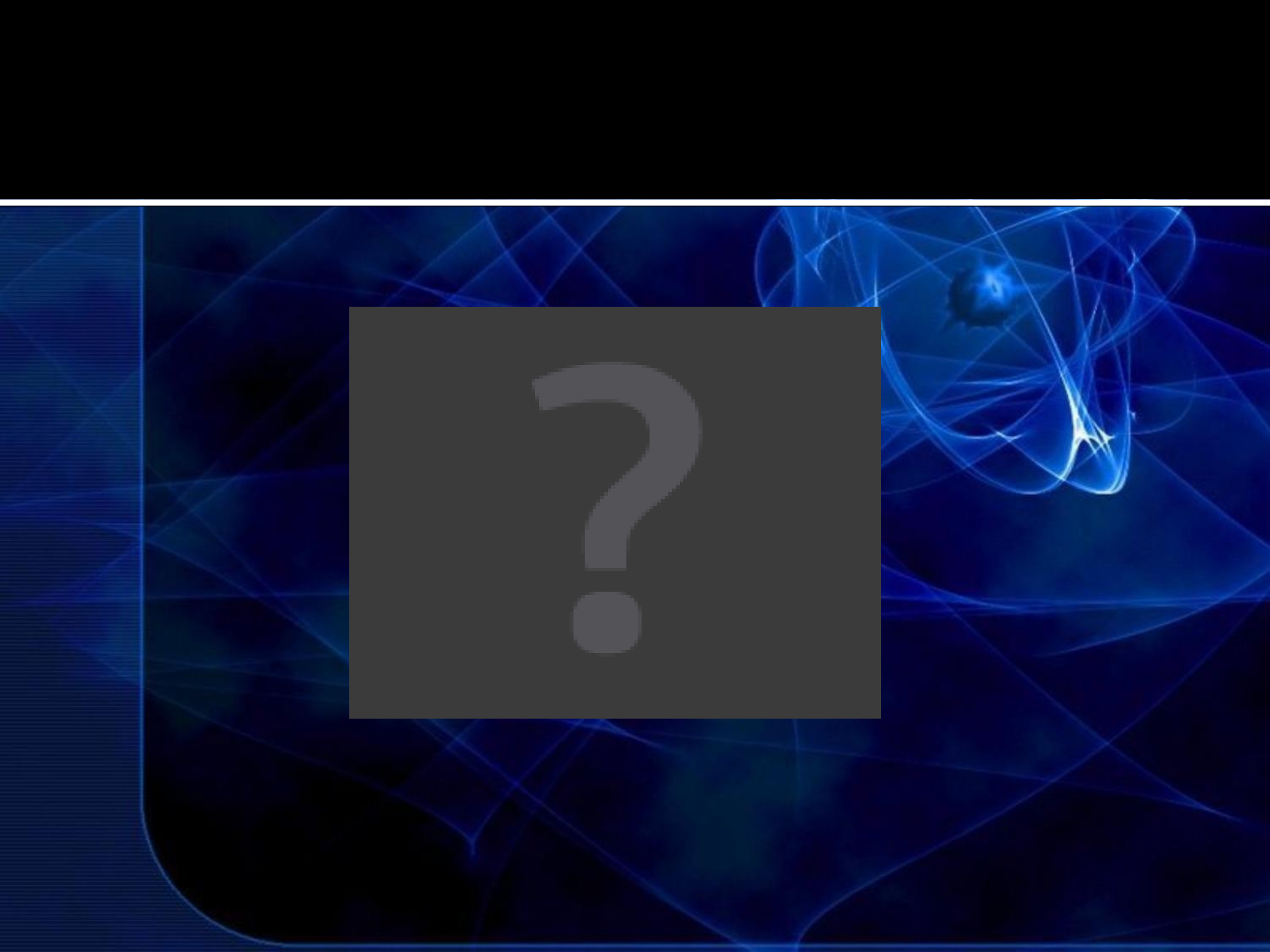
- Pnomothorax



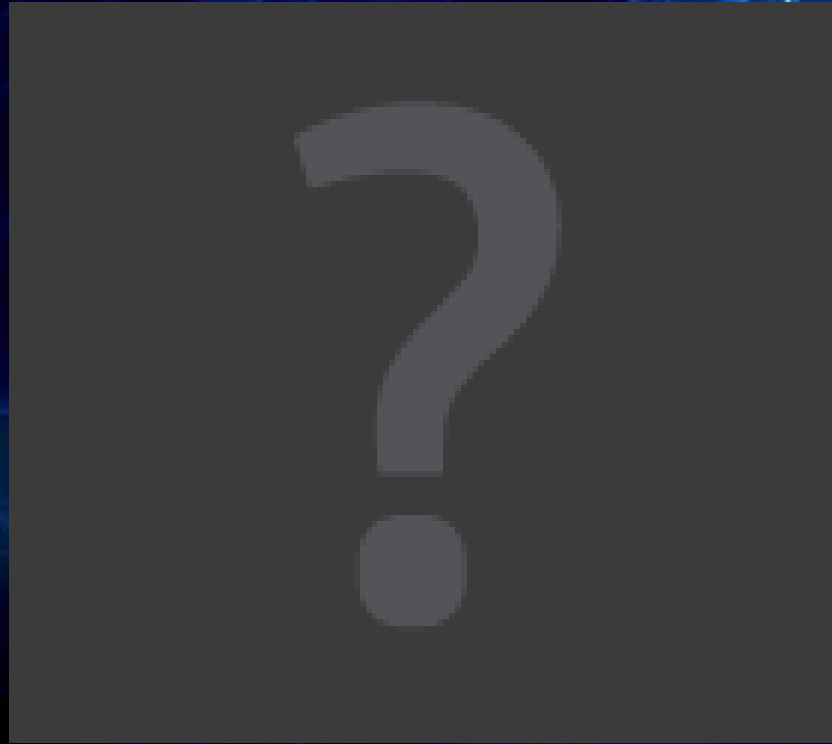
B line

- Norma

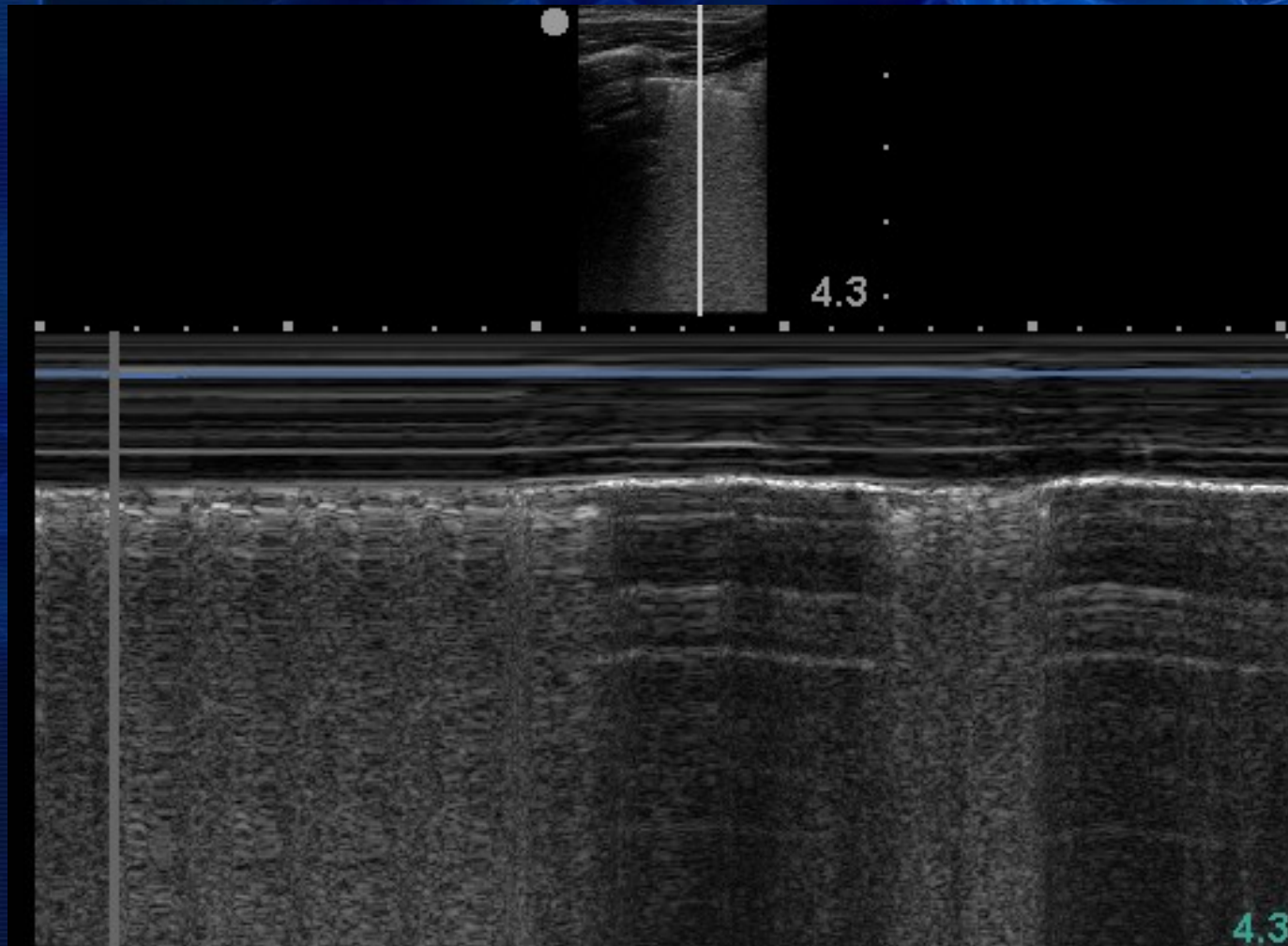




Lung point

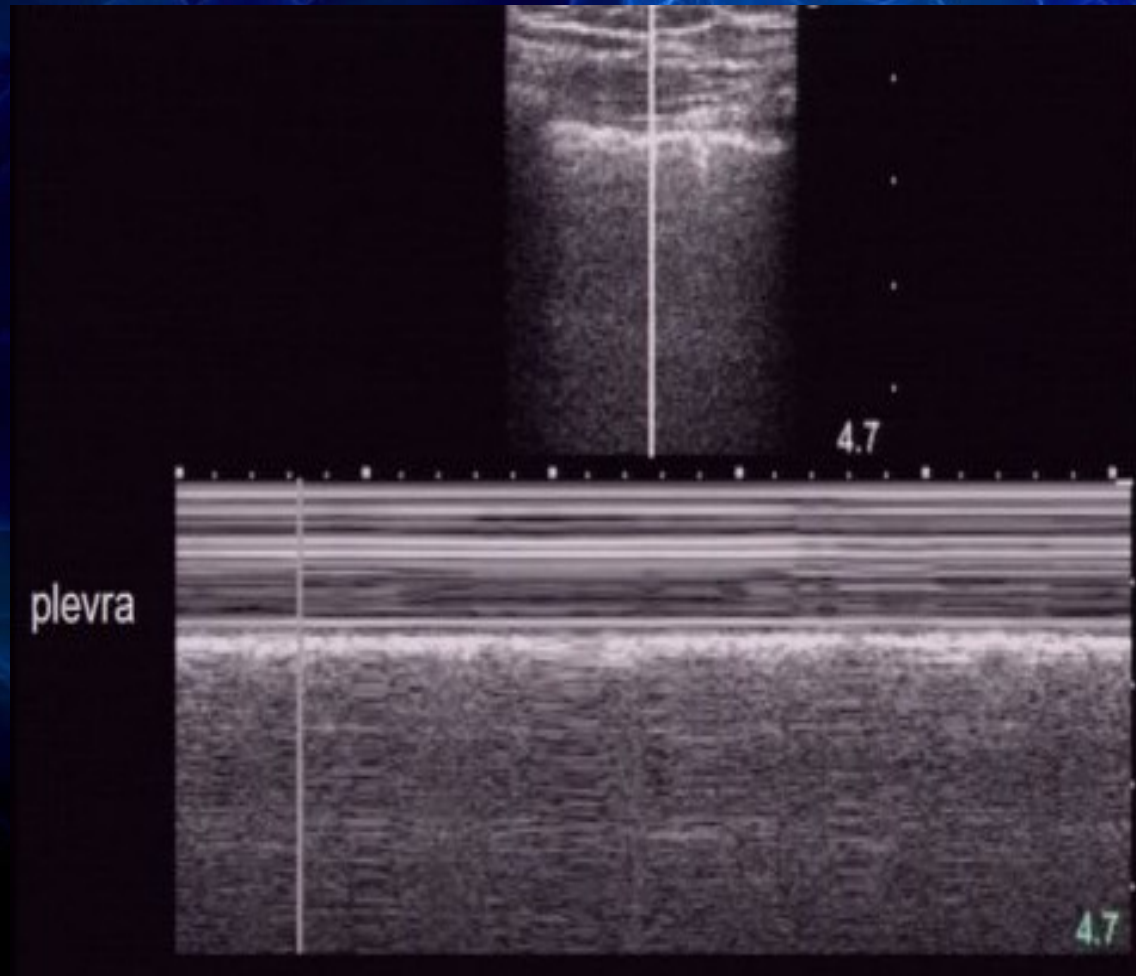


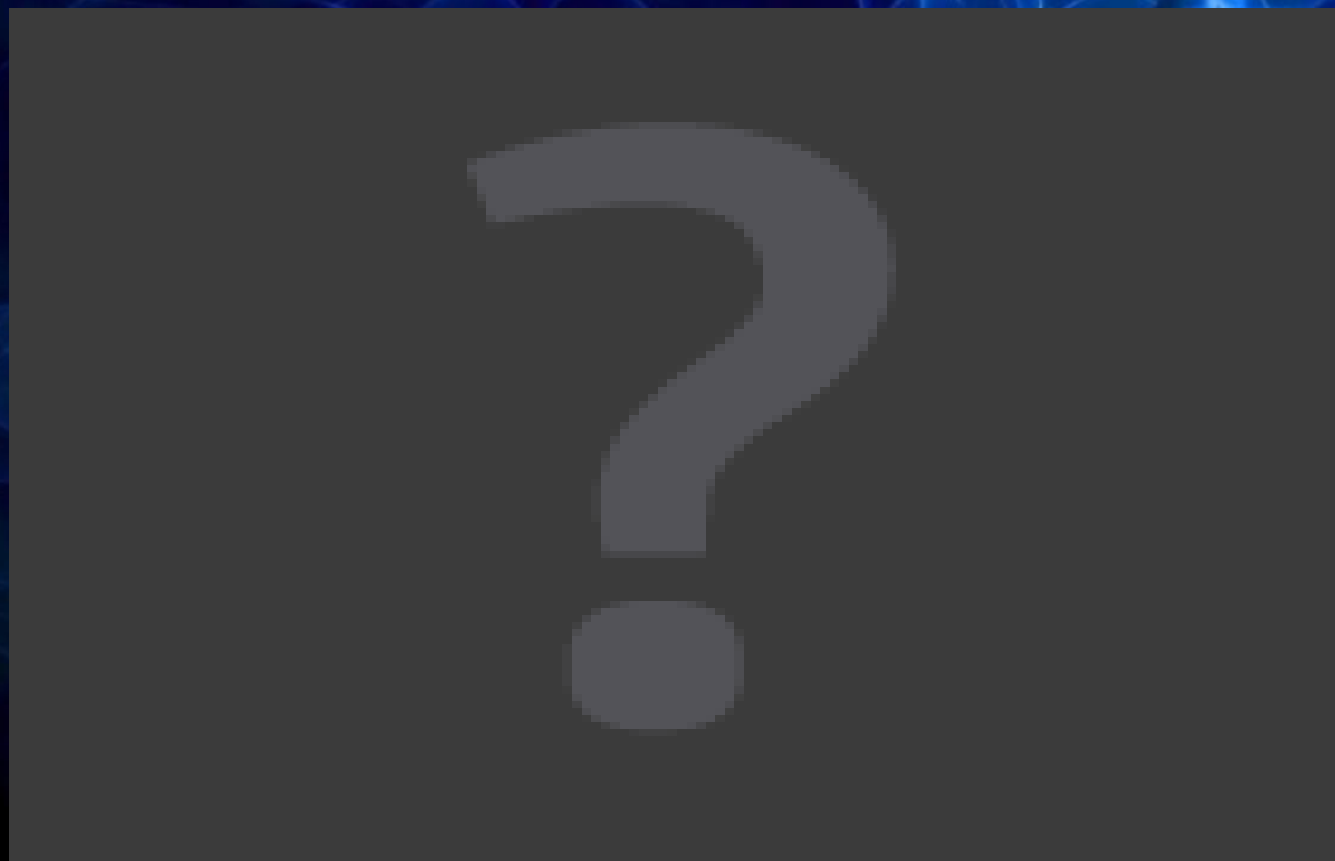
Dynamic changes



Sea shore Sign

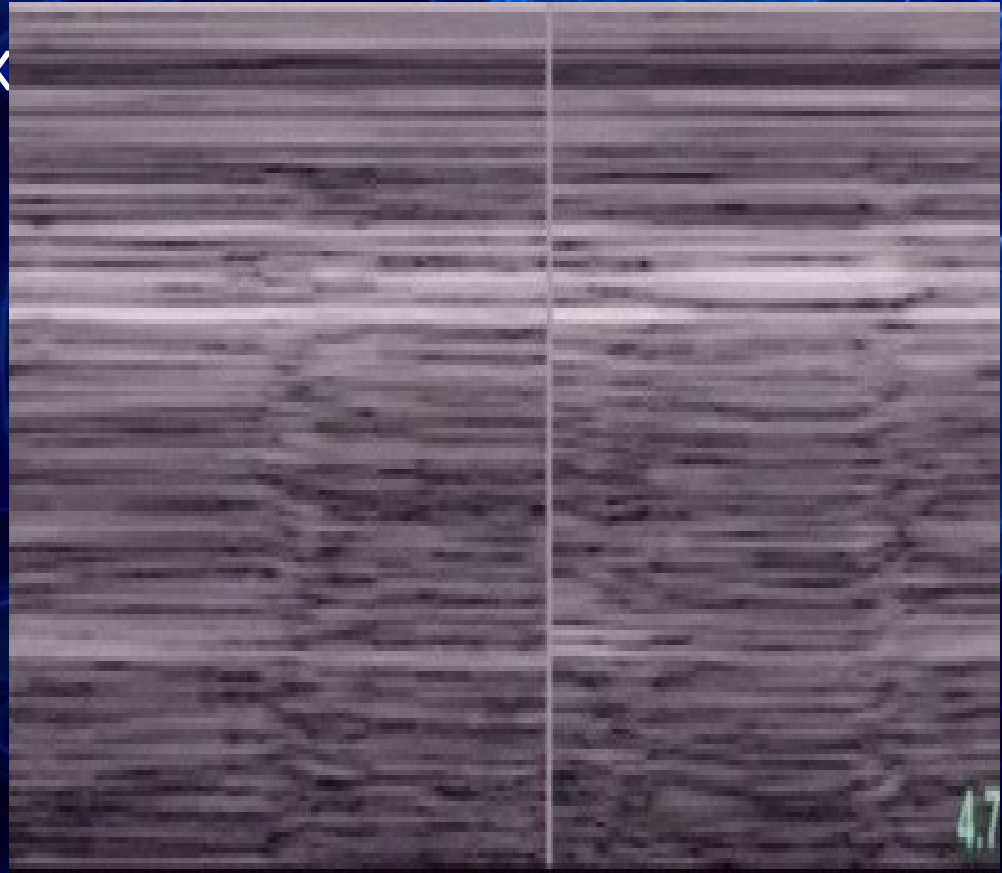
- Normal (M mode)

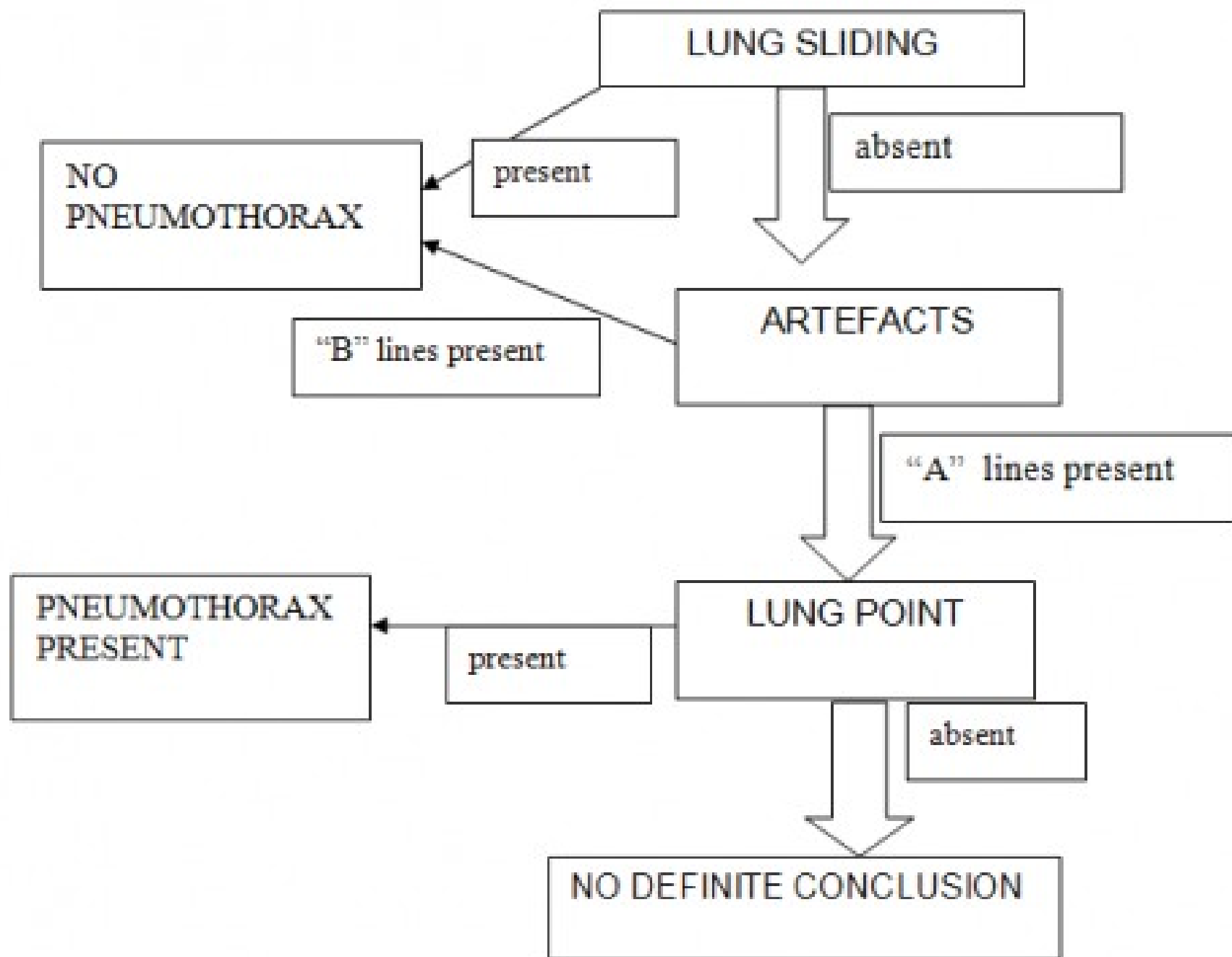


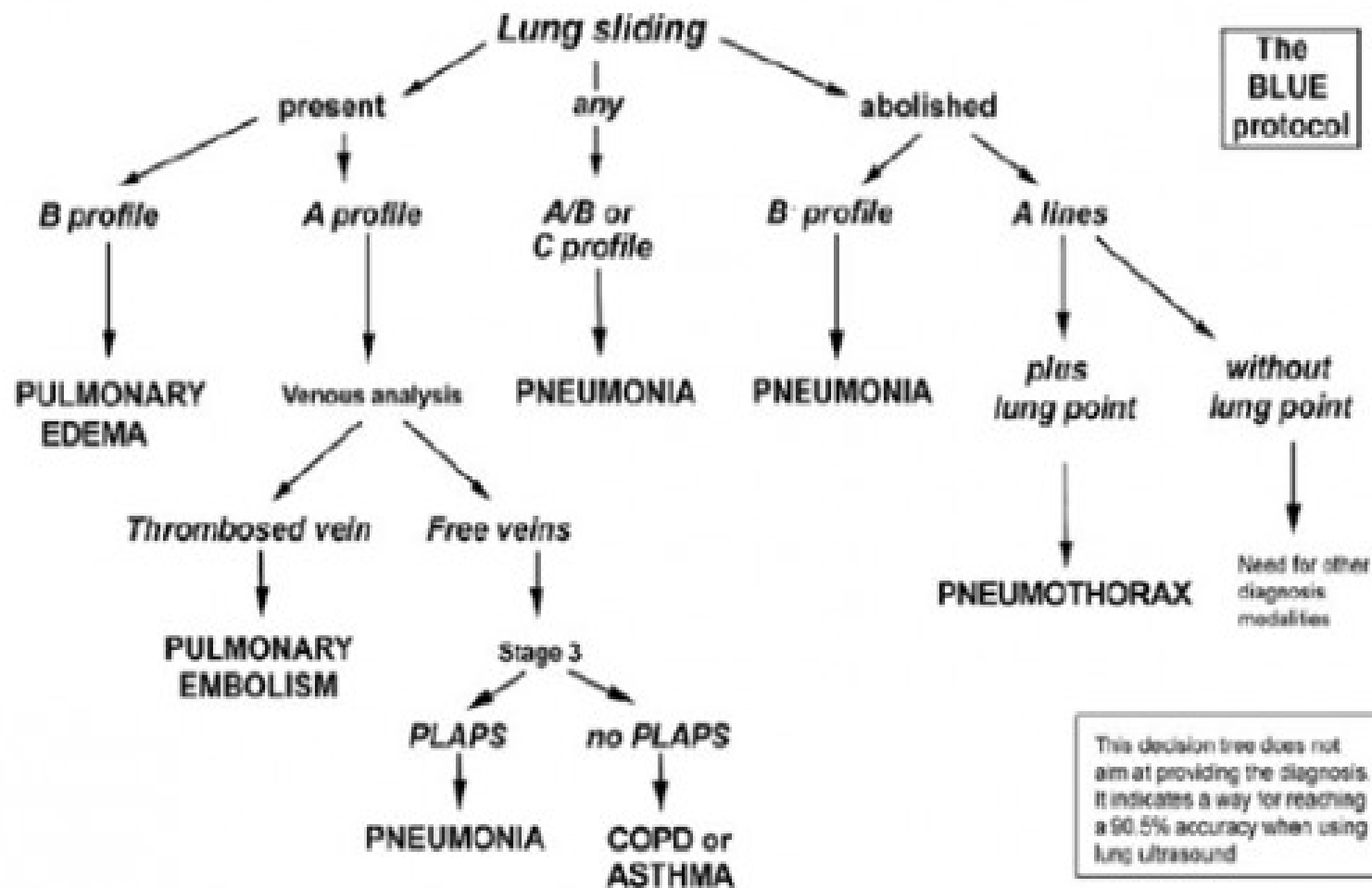


Strotopher Sign

- Pneumothorax







A profile means predominantly A lines

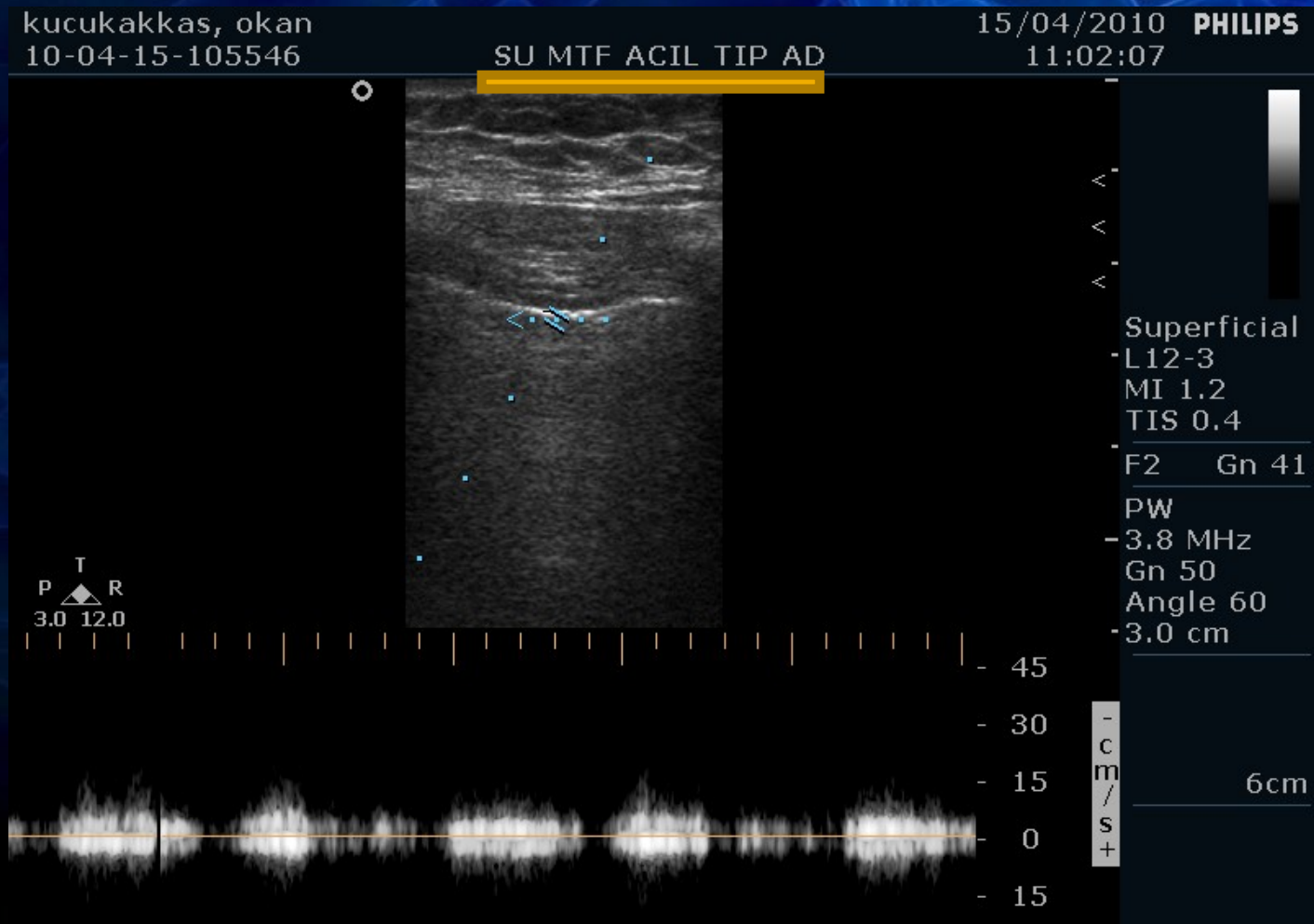
B profile means predominantly multiple anterior diffuse B lines

A / B profile means predominant A lines on one side and predominant B lines on the other side.

C profile means anterior alveolar consolidation(s)

PLAPS means *posterolateral alveolar and/or pleural syndrome* detected on a lateral sub-posterior sonological examination.

Pleural Sliding Sound (PSS)



A new development in emergency department ultrasonography: Pleural Sliding Sound (PSS)

Sadik Abdullah Girisgin, Osman Karaoglan, Goknil Calik, Mehmet Ergin, Sedat Kocak, Basar Cander

Procedural

- Intravenous lines
 - Internal jugular
 - Femoral
 - Deep brachial
- Paracentesis
- Thoracentesis

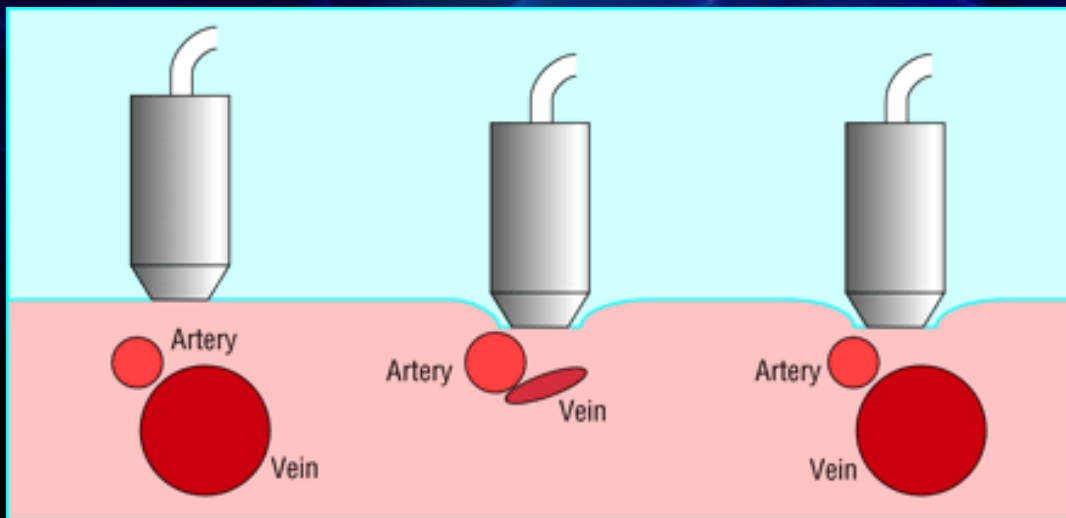
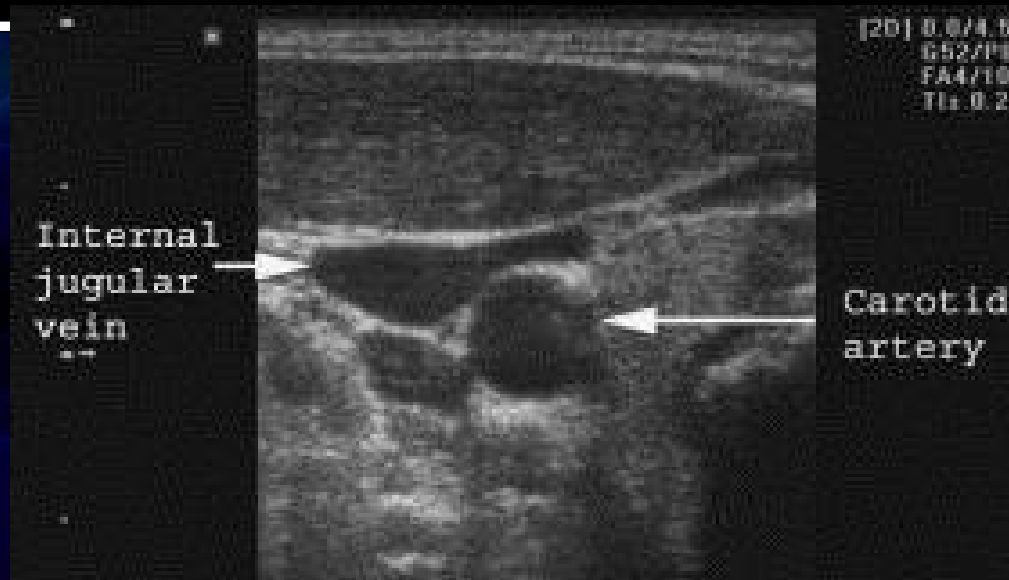


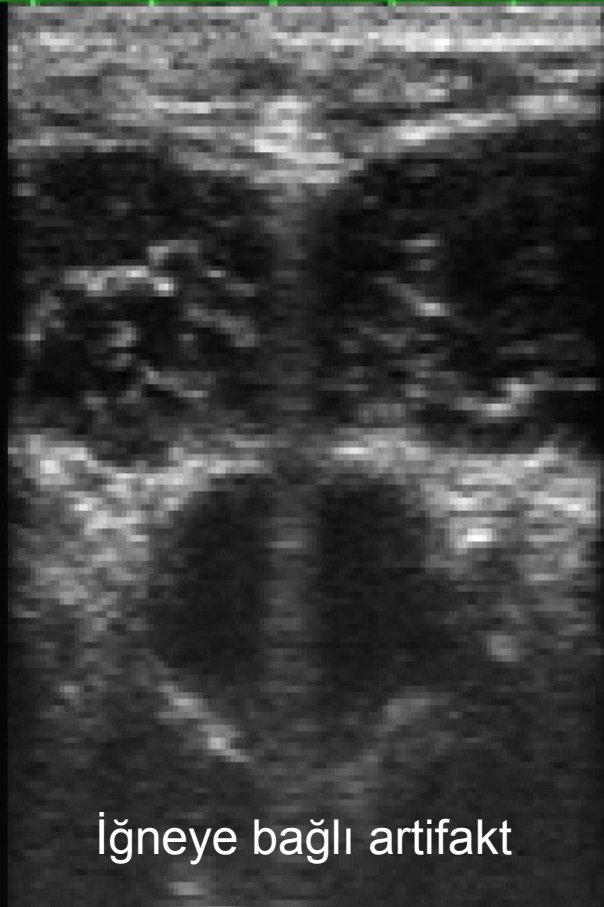
Procedural

- Bladder aspiration
- Fracture reduction
- Transvenous pacemaker
- Abscess drainage
- Foreign body
- Lumbar puncture
- Peritonsillar abscess drainage
- Arthrocentesis



USG Yardımıyla Santral Venöz Kateter

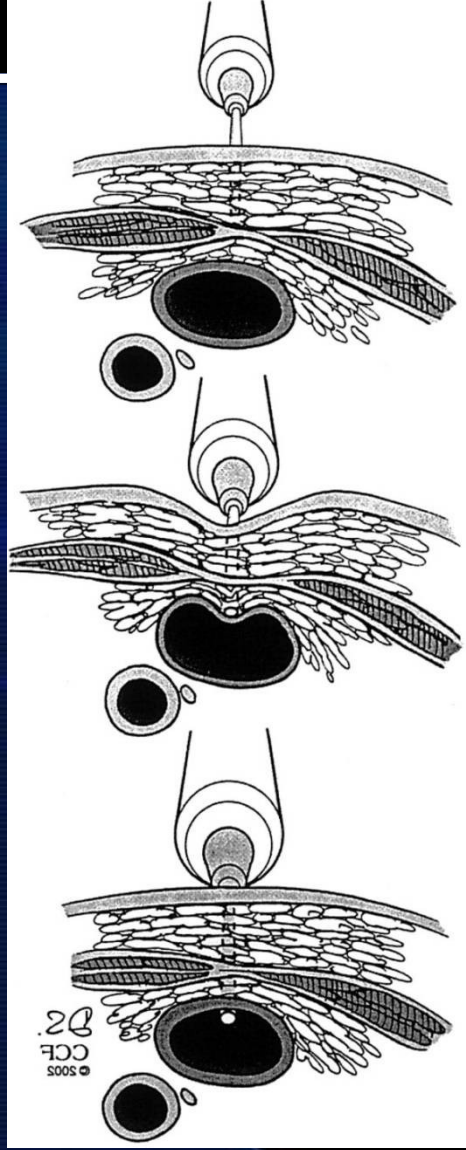




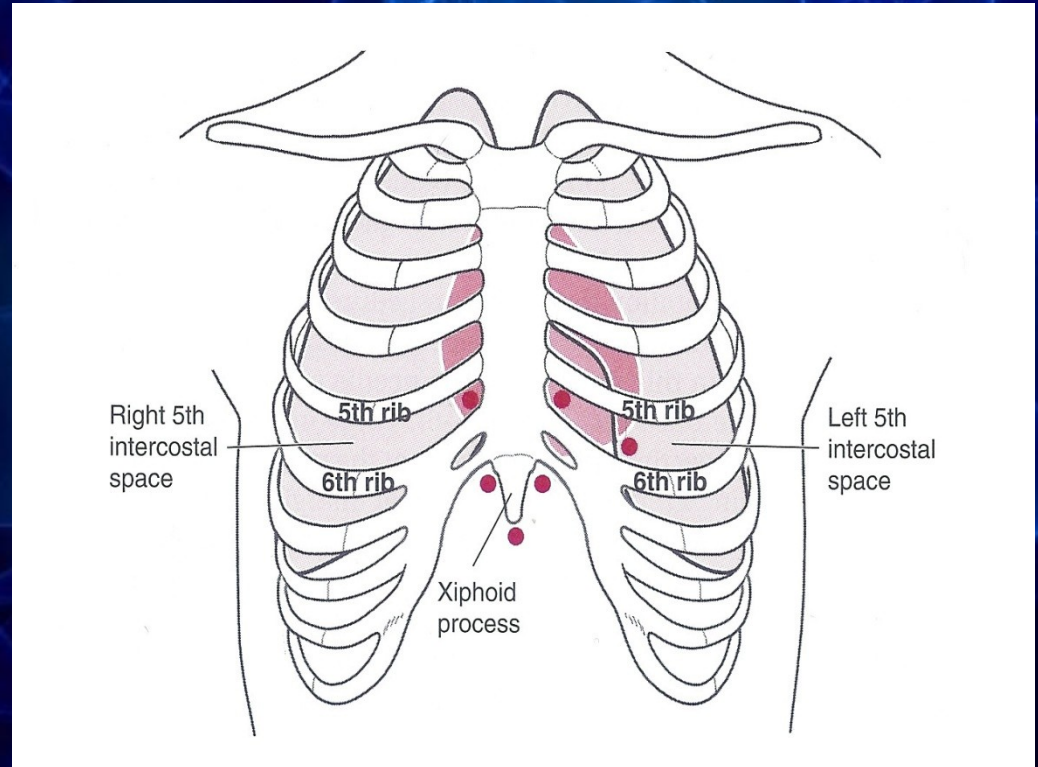
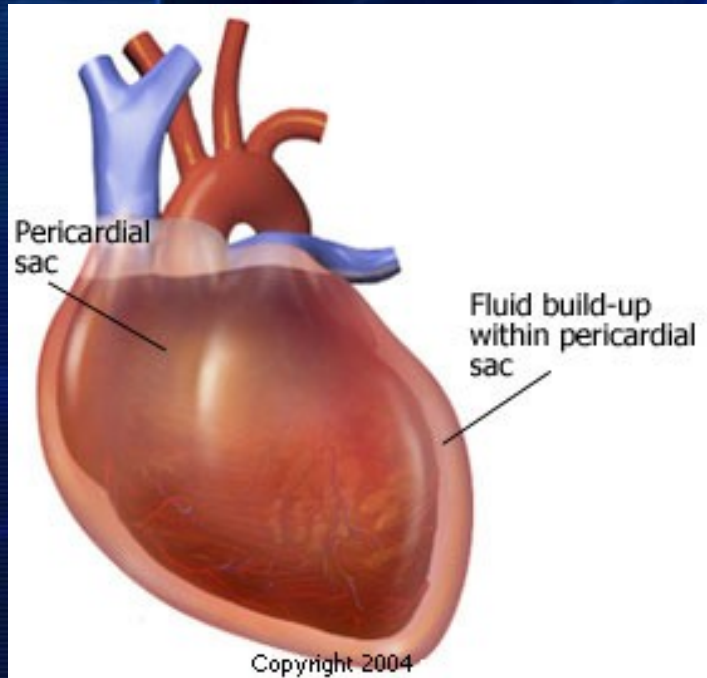
İğneye bağlı artifakt



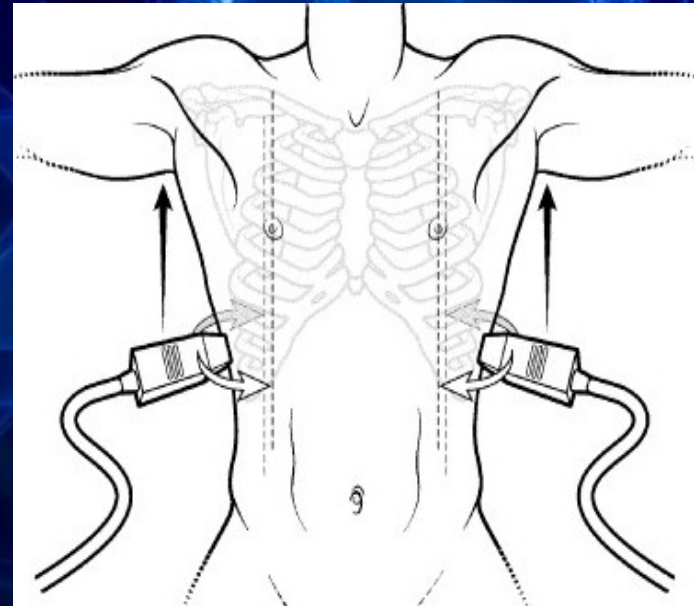
Probu tutan el, hastada sabitleniyor



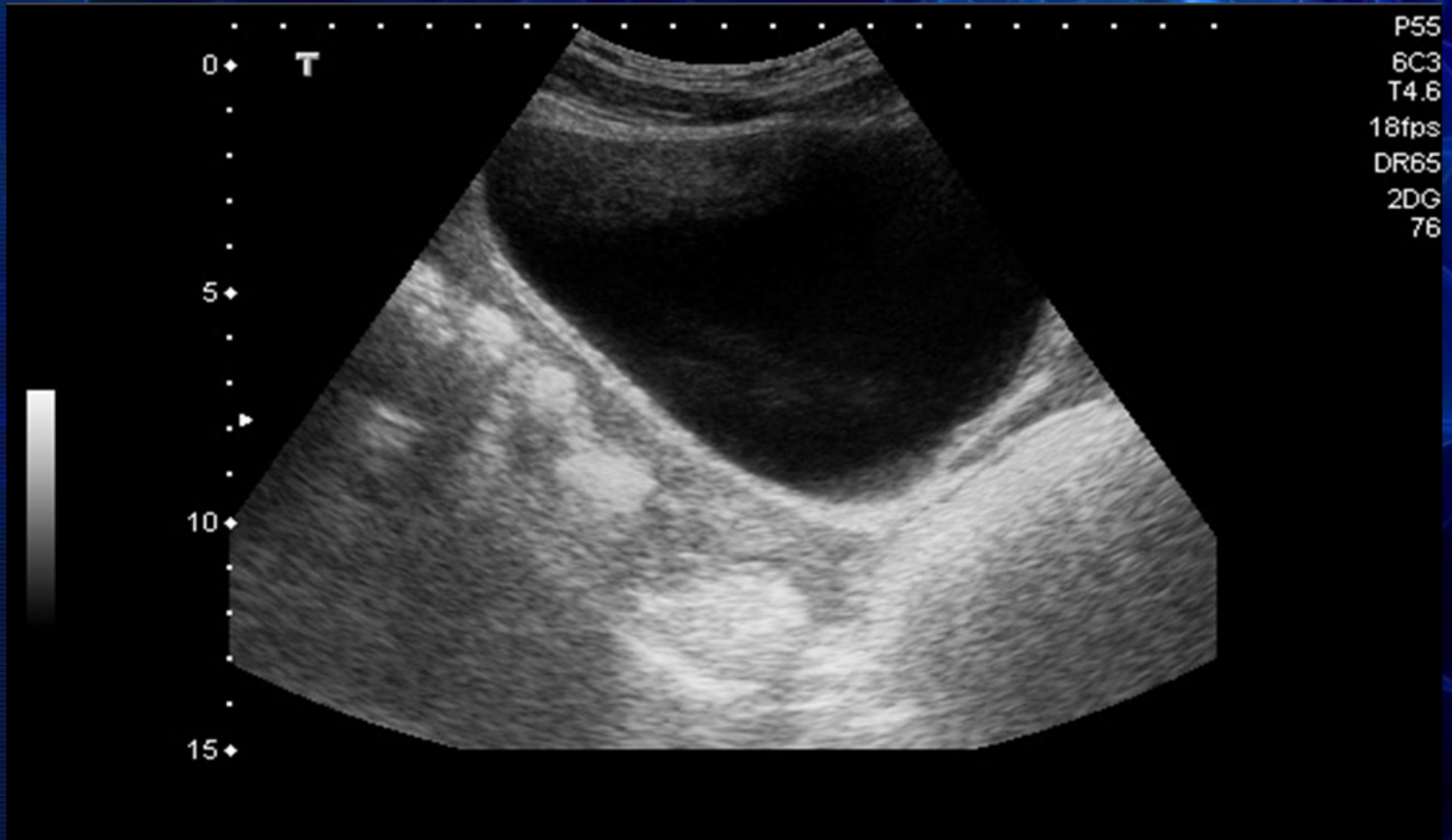
Pericardiosynthesis

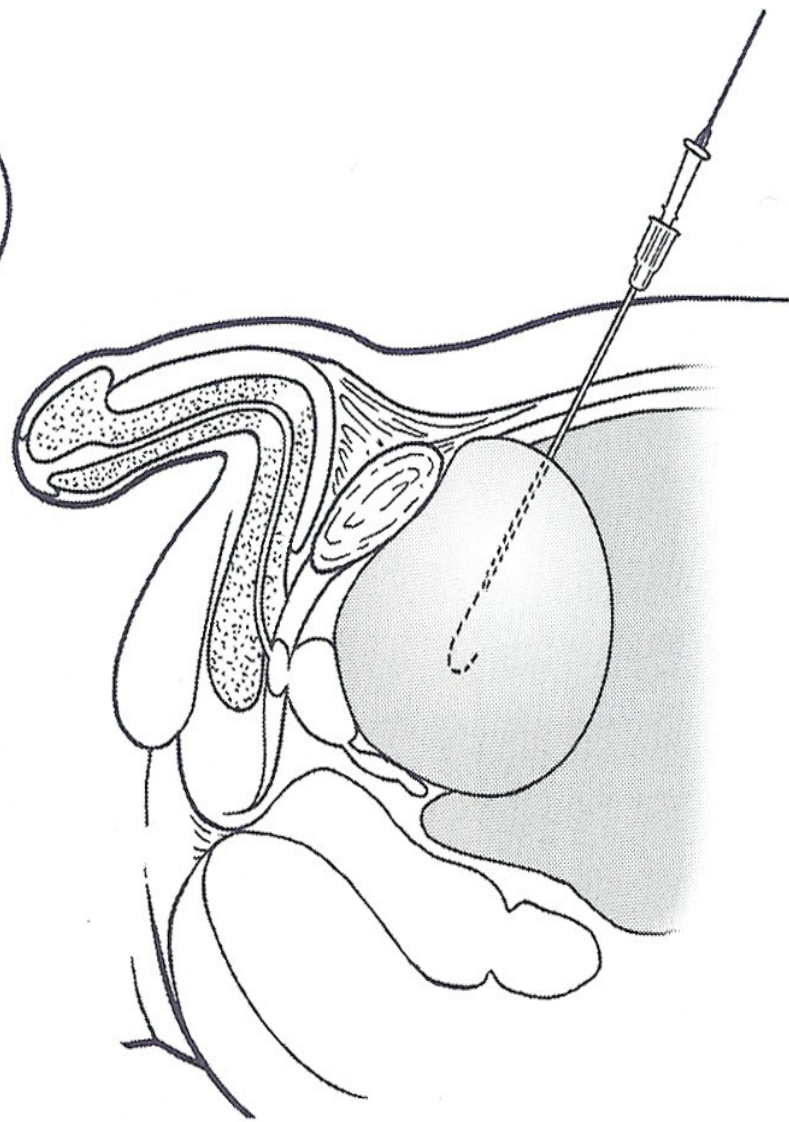
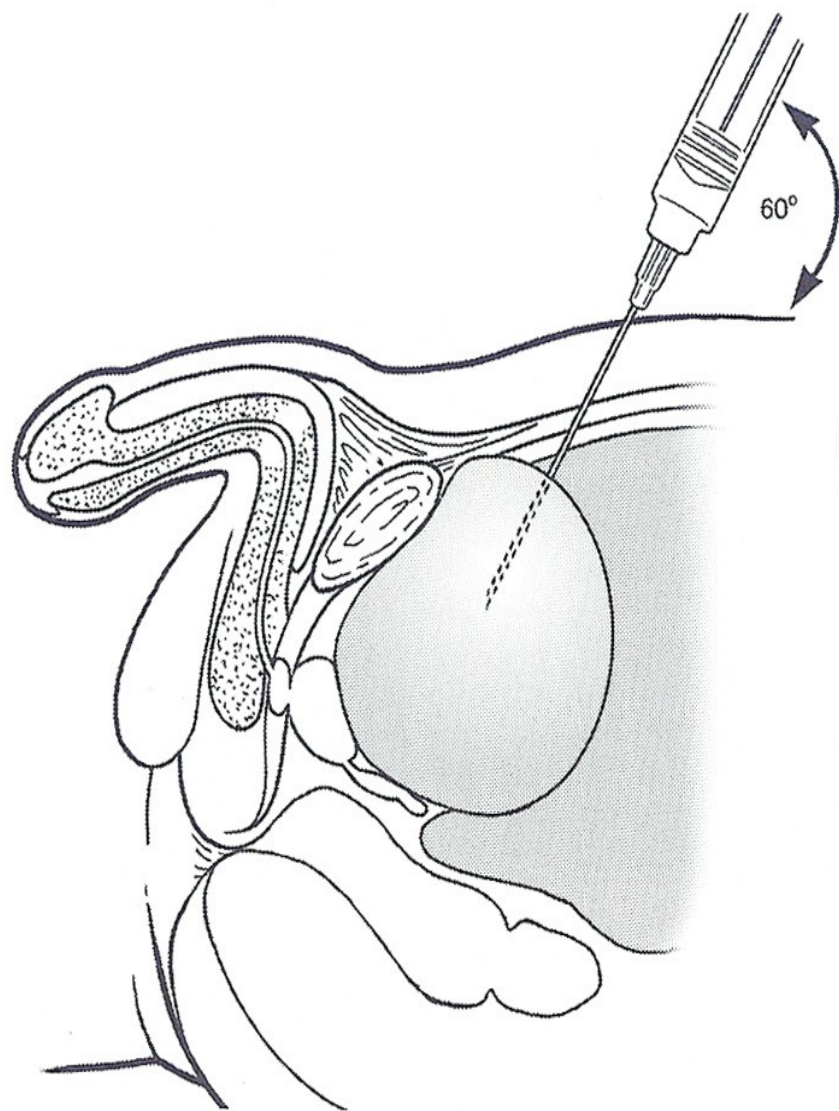


Pleural sıvı ve Thorasynthecis



Suprapubic Aspiration





Yabancı Cisimler

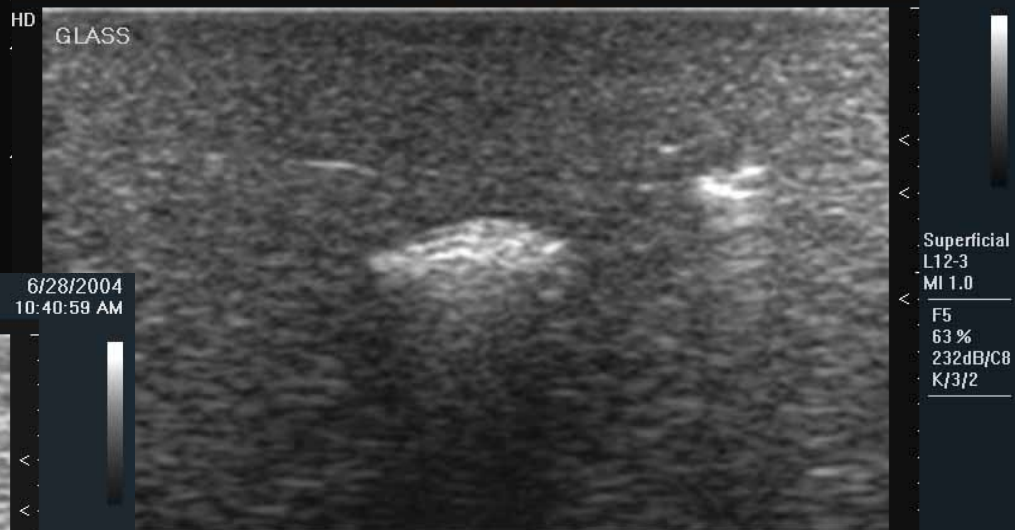
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Philips Medical Systems



Blue Phantom Philips 6/28/2004 10:40:59 AM
Philips Medical Systems



Blue Phantom Philips 6/28/2004 10:23:11 AM
Philips Medical Systems



Superficial
L12-3
MI 1.0
F5
63 %
232dB/C8
K/3/2

Superficial
L12-3
MI 1.0
F5
63 %
232dB/C8
K/3/2

31 Hz
2 cm

31 Hz
2 cm

Yabancı Cisimler



Pilot Study to Evaluate the Accuracy of Ultrasonography in Confirming Endotracheal Tube Placement

Ira L. Werner, MD, RDMS

Les E. Smith, MD

Erica R. Goldstein, MD

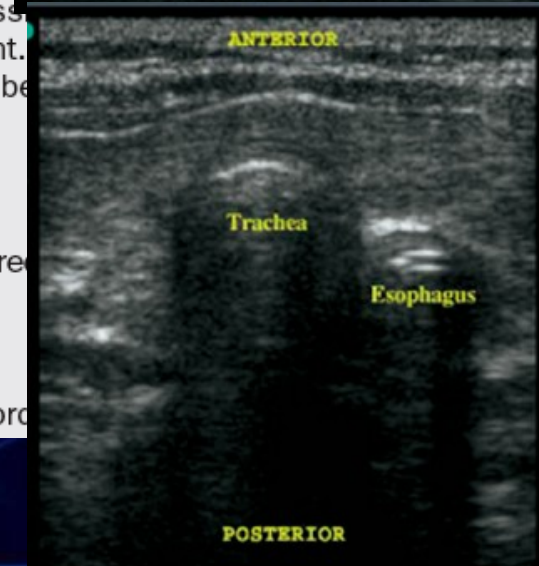
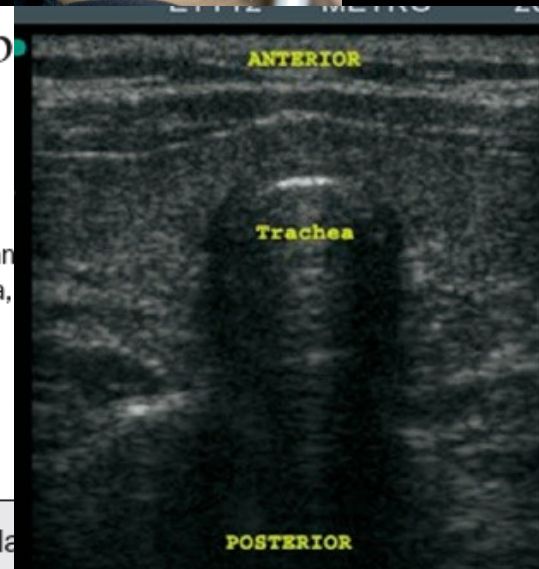
Robert A. Jones, DO, RDMS

Robert K. Cydulka, MD, MS

From the Department of Emergency Medicine, MetroHealth Medical Center/Cleveland Foundation (Werner, Goldstein, Jones, Cydulka), and the Department of Anesthesia, MetroHealth Medical Center (Smith), Cleveland, OH.

Study objective: Visualization of the vocal cords and end-tidal capnography are the usual standards in confirming endotracheal tube placement. Vocal cord visualization is, however, not always possible, and capnography is not 100% reliable and requires ventilation of the lungs to confirm placement. The goal of this study is to determine the accuracy of ultrasonography for detecting endotracheal tube placement into the trachea and esophagus in real time.

Methods: This was a prospective, randomized, controlled study. Eligible patients were adults undergoing elective surgery requiring intubation. Exclusion criteria were a history of difficult intubation, abnormal airway anatomy, aspiration risk factors, and esophageal disease. Thirty-three patients were enrolled. After induction of anesthesia and neuromuscular blockade, the anesthesiologist placed the endotracheal tube in the trachea and esophagus in random order with direct laryngoscopy. During the intubations, a high-frequency, linear transducer was placed transversely on the neck at the suprasternal notch. Two emergency physicians, blinded to the or



Confirmation of Endotracheal Tube Placement after Intubation Using the Ultrasound Sliding Lung Sign

Blake Weaver, DO, Matthew Lyon, MD, RDMS, Michael Blaivas, MD, RDMS

Abstract

Objectives: To evaluate the performance of the ultrasound (US) *sliding lung sign* as a predictor of endotracheal tube (ETT) placement. Many other tools and examination findings have been used to confirm ETT placement; erroneous placement of the ETT has even been confirmed by US.

Methods: This was a laboratory study using fresh, recently dead cadavers. Cadavers were obtained at a medical school anatomy laboratory on the basis of availability during a four-month period. Subjects who died from significant trauma or after thoracic surgery were excluded. A numerical randomization tool was used to direct where the tube would be placed on intubation. Laryngoscopy was performed, and

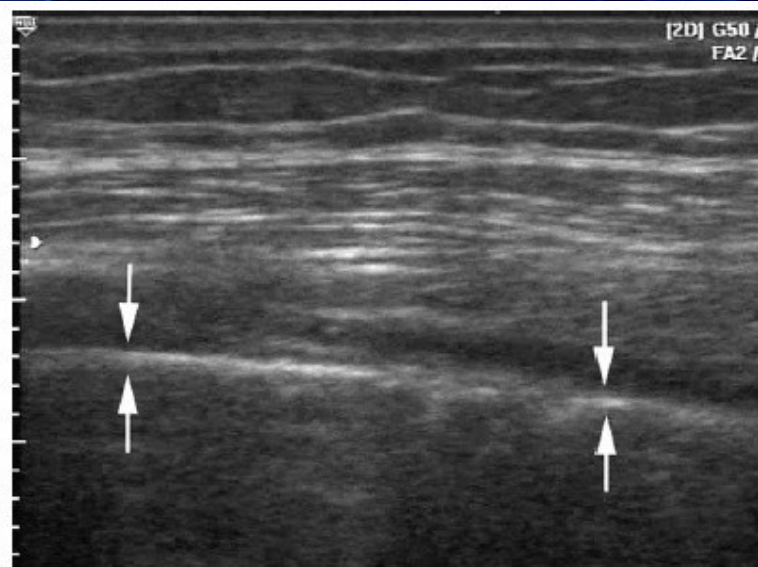
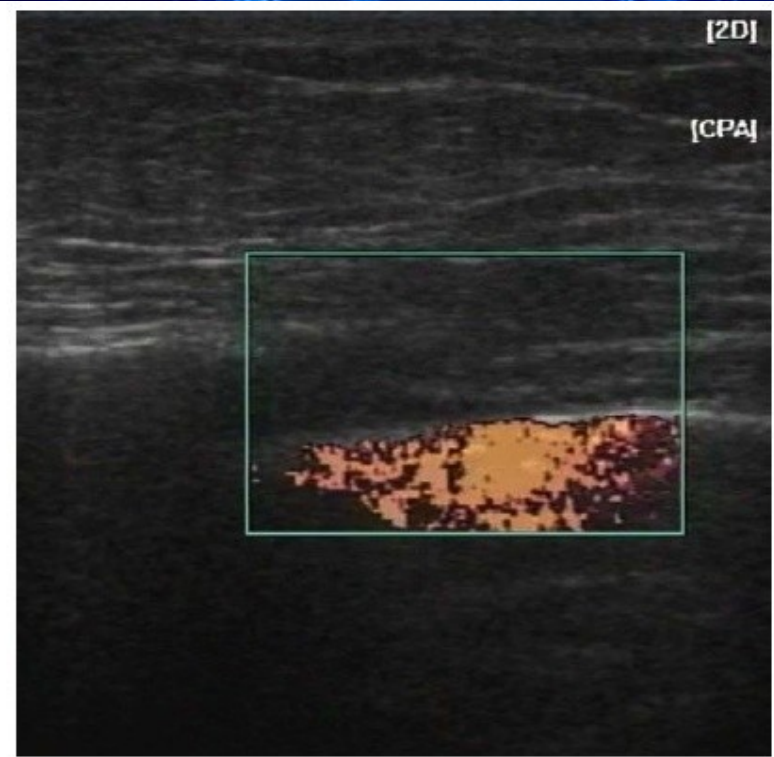
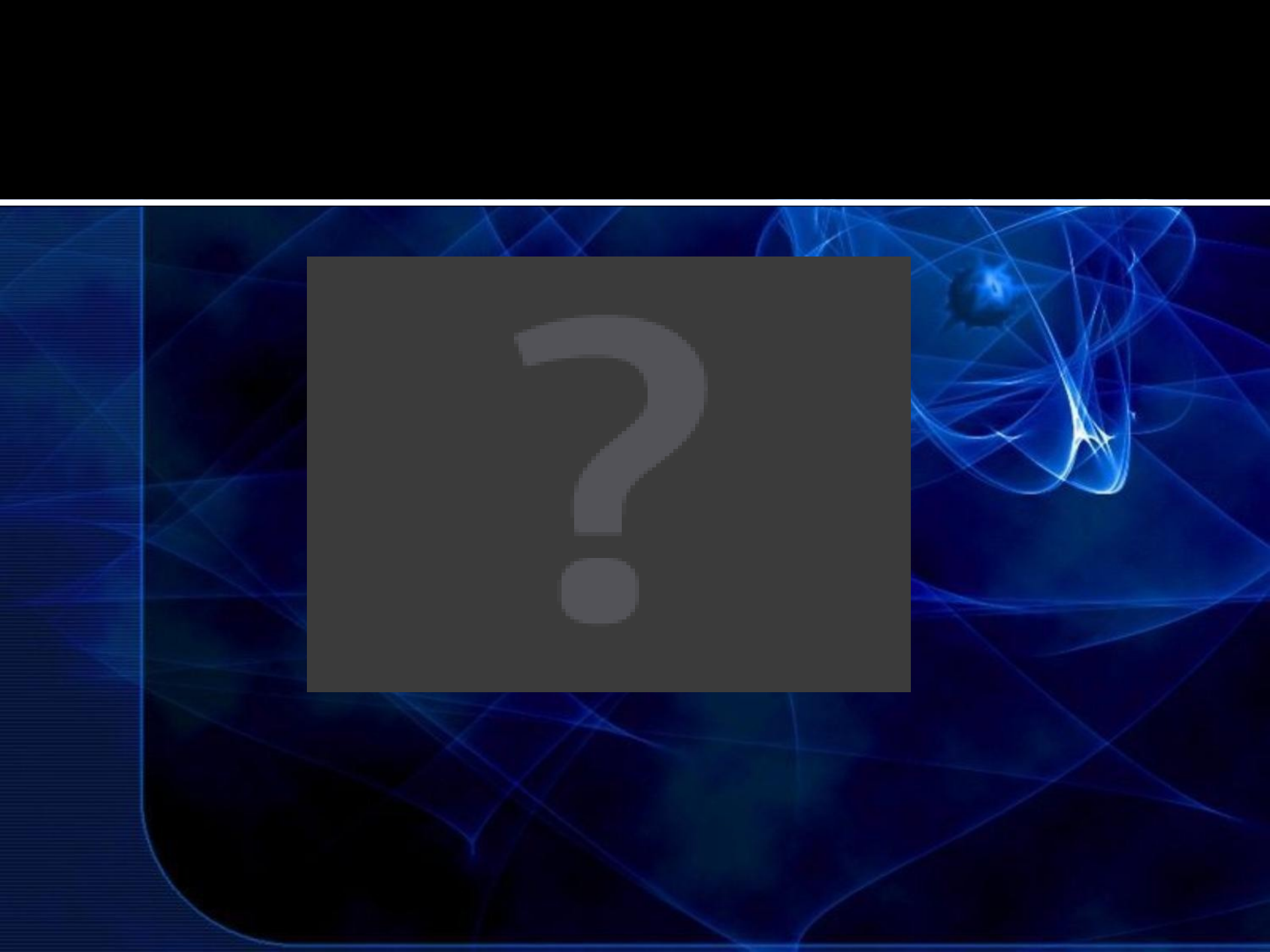


Figure 2. The bright interfaces of the parietal and visceral pleura are seen (arrows).

presence on both sides of the chest was assumed to sig-





DİĞERLERİ



Obstetry/Gynecology

- Abdominal ağrı or vaginal kanama (gebelikte önemli)
- IU gebelik veya pelvik serbest sıvı

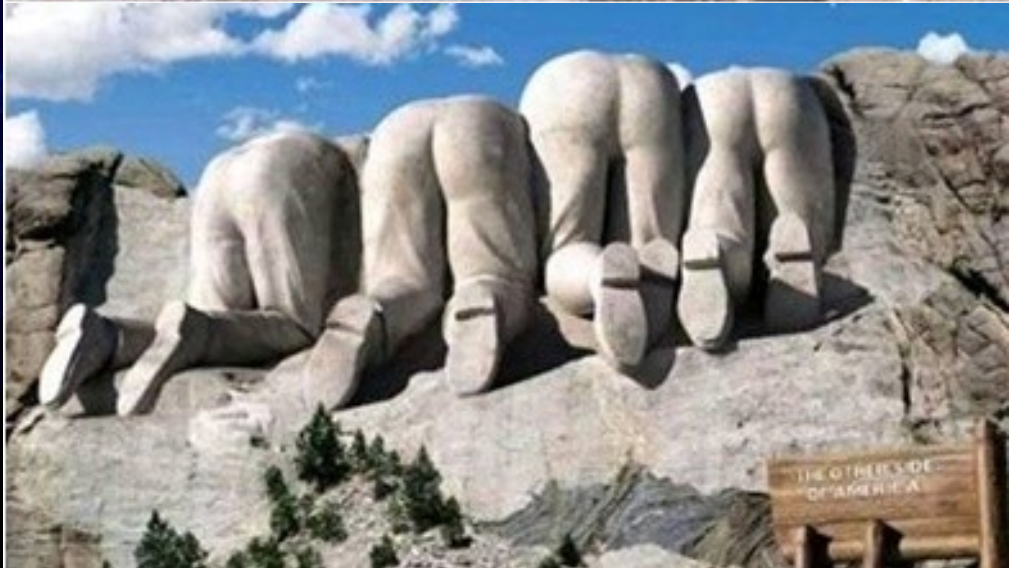


Ophthalmology

- Retinal dekolman
- Vitreous kanaması
- Ocular yabancı cisim
- Globe penetration
- Lens luxation
- Retrobulbar hematoma
- Optik nerve çapının ölçümü

■ May 2009 CPT Assistant (Volume 19 Issue 5)





Ophthalmology

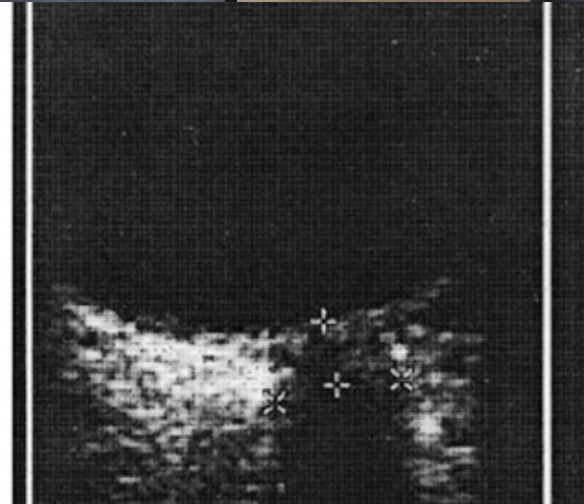
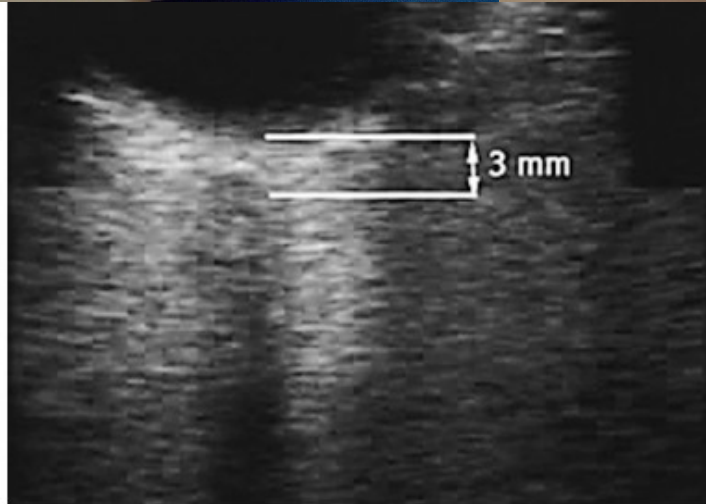




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The role of optic nerve ultrasonography in the diagnosis of elevated intracranial pressure

Abdullah Sadik Girisgin, Erdal Kalkan, Sedat Kocak, Basar Cander, Mehmet Gul, Mustafa Semiz

Emerg Med J 2007;**24**:251-254. doi: 10.1136/emj.2006.040931

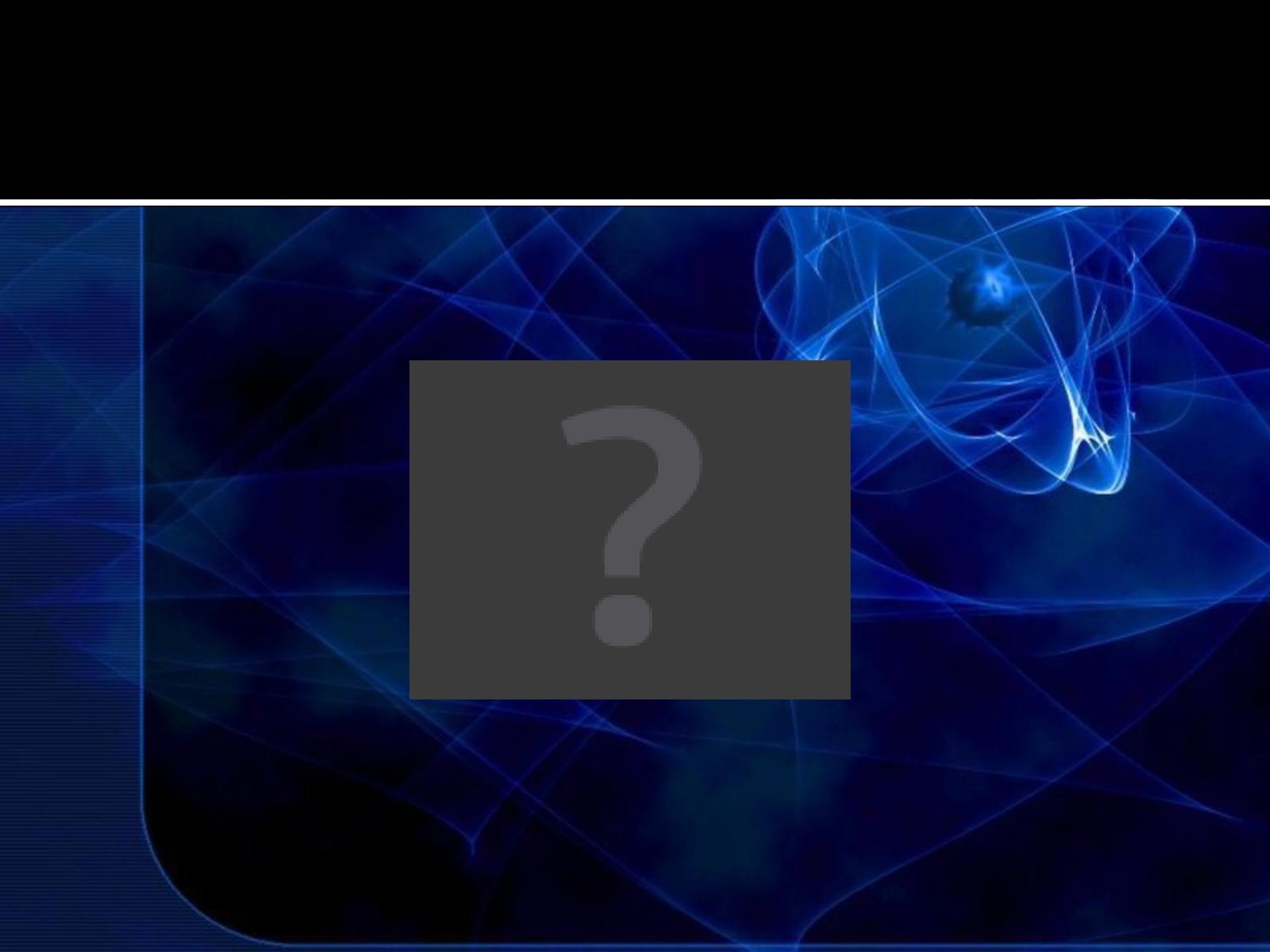
Objective: To evaluate the convenience and utility of optic nerve ultrasonography (ONUS) in the evaluation of emergency patients with elevated intracranial pressure (EICP) due to traumatic or non-traumatic causes.

Methods: This study was conducted between May 2005 and December 2005 in the emergency department of

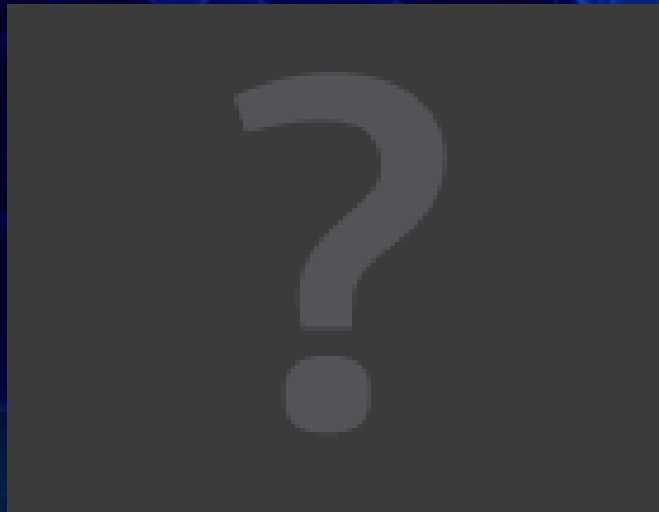


A

B



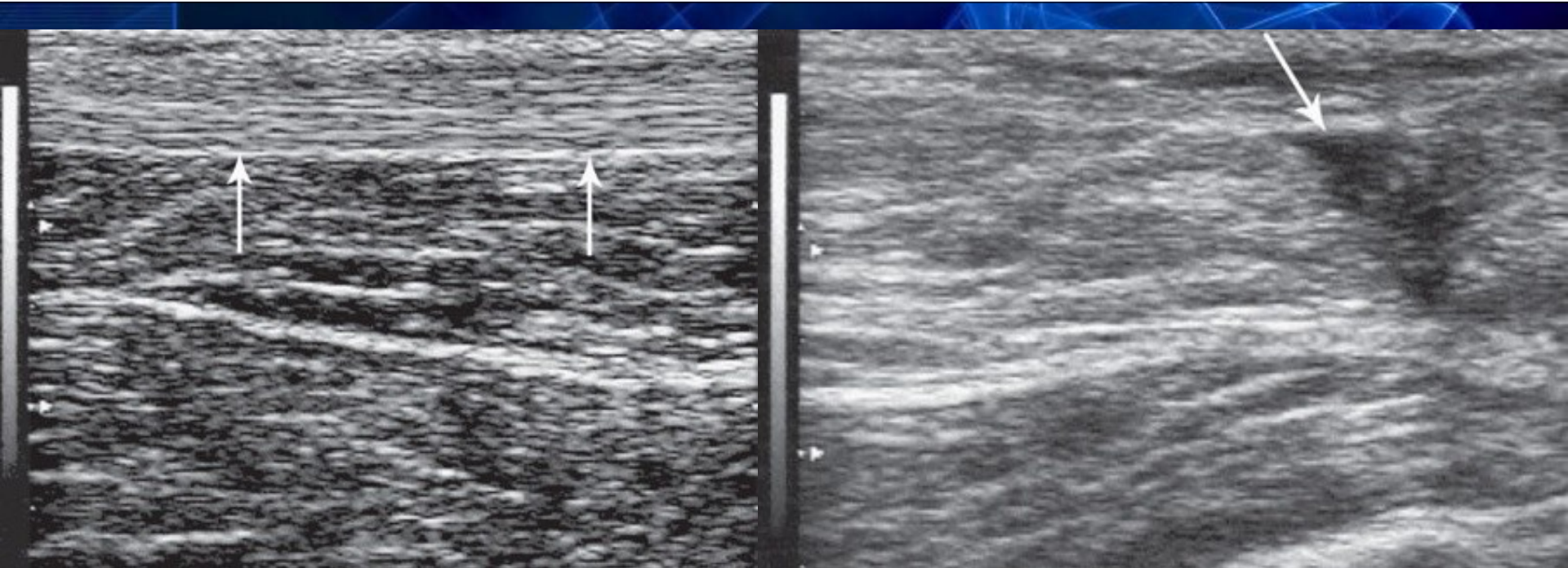
Soft tissue infection



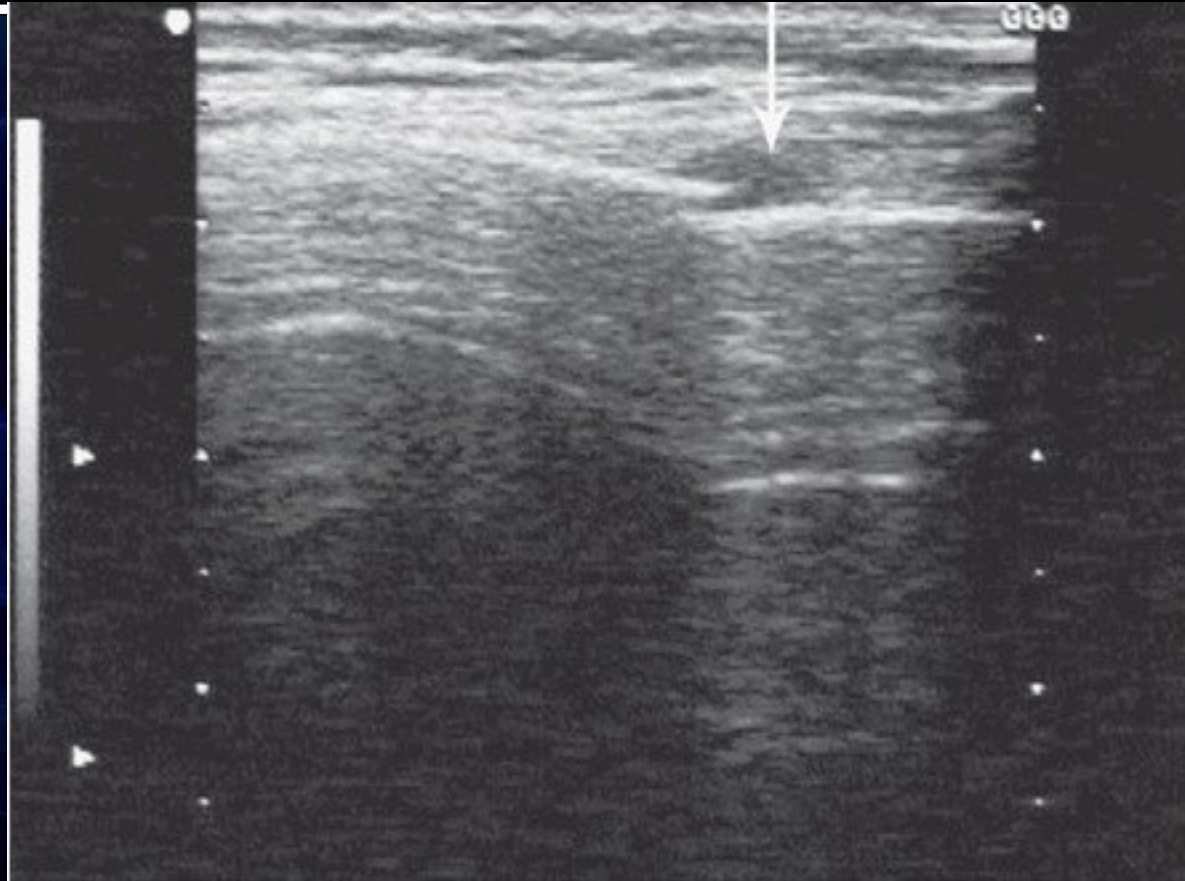
Sinusitis



Tendon Rupture




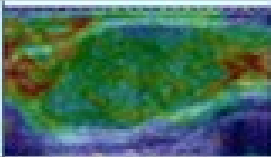

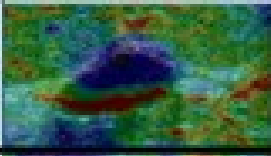
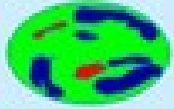
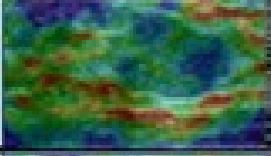
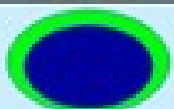
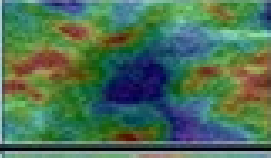

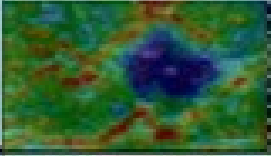

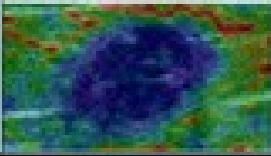
Sternum Fracture





US Elastography



	Classification Standard		Typical Image
1	Strain is seen in the entire hypoechoic area (the entire lesion is shown in green similar to the surrounding tissue)		
1*	BGR (blue-green-red) 3 layer pattern – typical artefact seen in a cystic lesion		
2	Strain is seen within most of the hypoechoic area but some areas show no strain (the lesion is a mixture of green and blue)		
3	Strain appears only in the periphery with no strain in the centre of the lesion (the centre of the lesion is shown as blue with the periphery in green)		
4	No strain is measured within the lesion (the entire lesion is shown in blue)		
5	No strain is measured within the lesion nor in the surrounding tissues (the lesion and the surrounding tissues are blue)		



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☐ [Secondary Malignant Peritoneal Mesothelioma of the Greater Omentum after Therapy for Primary](#)

1. [Pleural Mesothelioma.](#)

Gutzeit A, Reischauer C, Hergan K, Kos S, Roos JE.

Case Rep Oncol. 201

PMID: 23687495 [Pu

☐ [Shear stress and](#)

2. [surgery.](#)

Wiewiora M, Piecu

Clin Hemorheol Micr

PMID: 23686091 [Pu

☐ [Does the Absence](#)

3. [Arrest?](#)

Cohn B.

Ann Emerg Med. 201

of print] No abstract

PMID: 23683545 [Pu



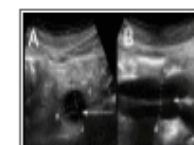
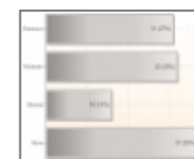
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Unpublished Faculty



Ann Emerg Med. 2013 May 15

Does the Absence of Cardiac Activity on Ultrasonography Predict Failed Resuscitation in Cardiac Arrest?

Cohn B.

Division of Emergency Medicine, Washington University
School of Medicine, St. Louis, MO.

Am J Emerg Med. 2013 Mar 24

Ultrasound guidance for radial arterial puncture: a randomized controlled trial.

Bobbia X, Grandpierre RG, Claret PG, Moreau A, Pommet S, Bonnec JM, Bayard RP, Lefrant JY, Muller L, de La Coussaye JE.

Division Anesthésie Réanimation Douleur Urgences, GHU Carémeau, Place du Professeur Robert Debré, CHU Nîmes, 30 029 Nîmes Cedex 9, France.

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Interest of optic nerve sheath diameter ultrasonography in detecting non- invasively raised intracranial pressure.

Messerer M, [Berhouma M](#), Messerer R, Dubourg J.

Service de neurochirurgie, département des neurosciences cliniques, centre
hospitalier universitaire Vaudois, Lausanne, Suisse.

ÖZET



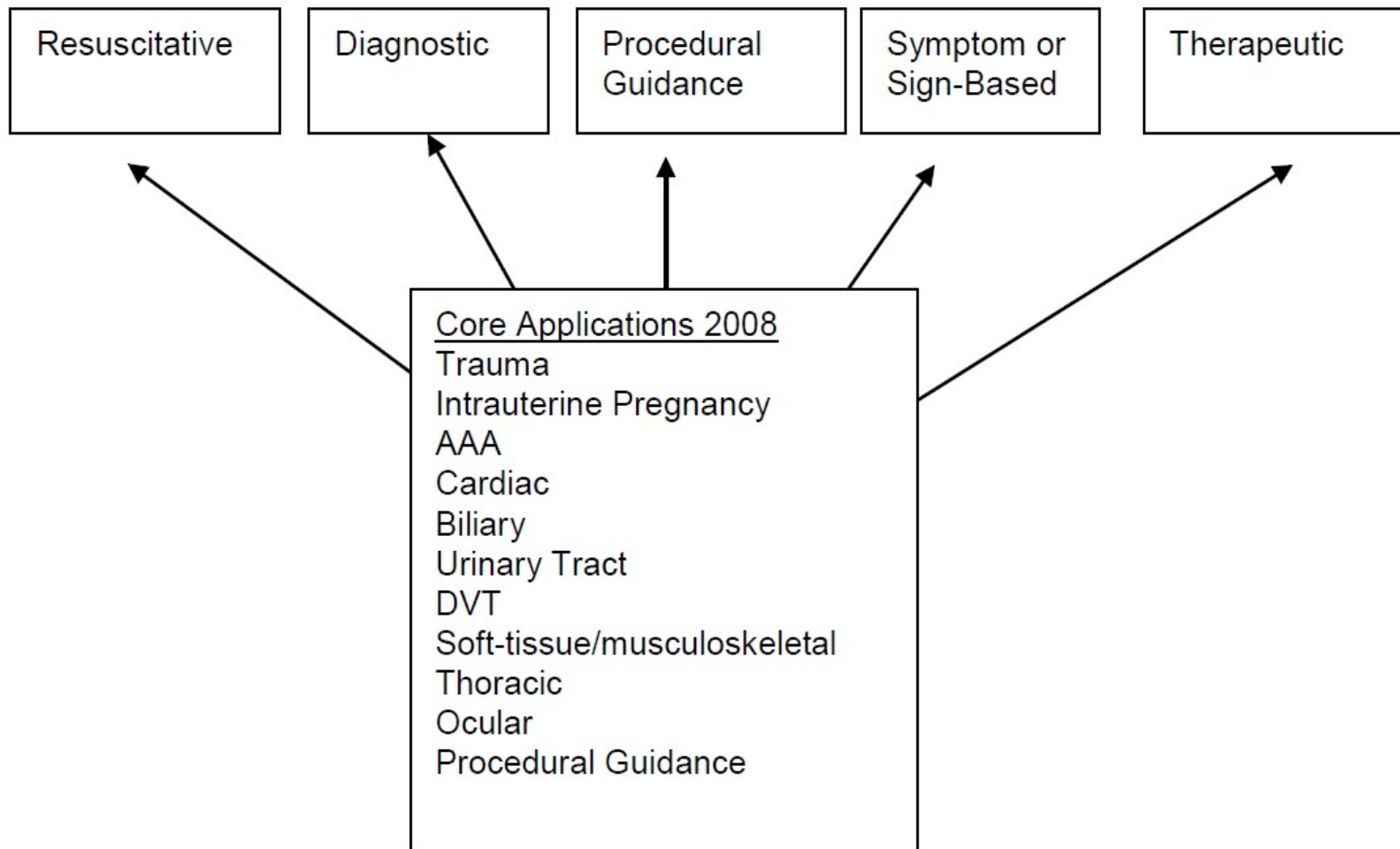
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POLICY STATEMENT

Approved October 2008

Emergency Ultrasound Guidelines



Çalışmaların Yönü?



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Approved October 2008

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1

DIAGNOSTIC ACCURACY

TECHNICAL

Future Research Efforts

Recent & Current
Investigations:
2000-2008

Early Research: 1980-1999





ACİLDE ULTRASONOGRAFİ KULLANIMI NEREYE KADAR ?

DOÇ. DR. SADIK GİRİŞGİN

*Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi
Acil Tıp Anabilim Dalı*



**Ultrasonografi kullanmayı
ÖĞRENMEYİN**

NEDEN?????

Acilde bir řiir gibidir Ultrasonografi

Ne MRI, ne X-ray ne de bilgisayarlı ultrasonografi;
Eęer biliyorsan acilde en iyi seçenektir ultrasonografi
Bunu da nereden çıkardın diyorsan
Gösterir gerçeęi bu yükselen grafi

Hız. Mevlana

Results by year

2012: 719



The background is a dark blue gradient with a complex pattern of glowing, translucent blue lines that intersect and swirl. A bright, multi-colored spot (blue, green, yellow) is visible in the upper right quadrant, emitting a soft glow. The overall effect is ethereal and futuristic.

TEŞEKKÜRLER