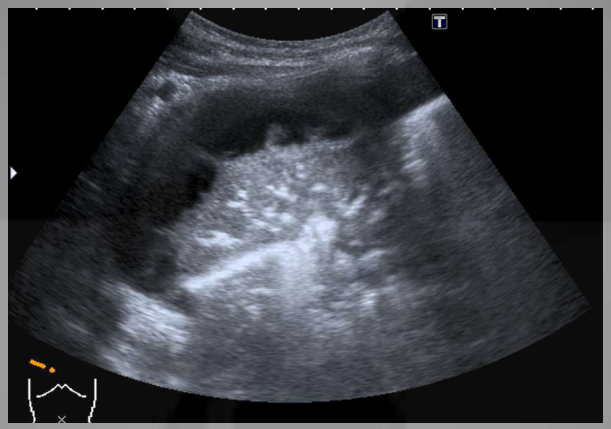
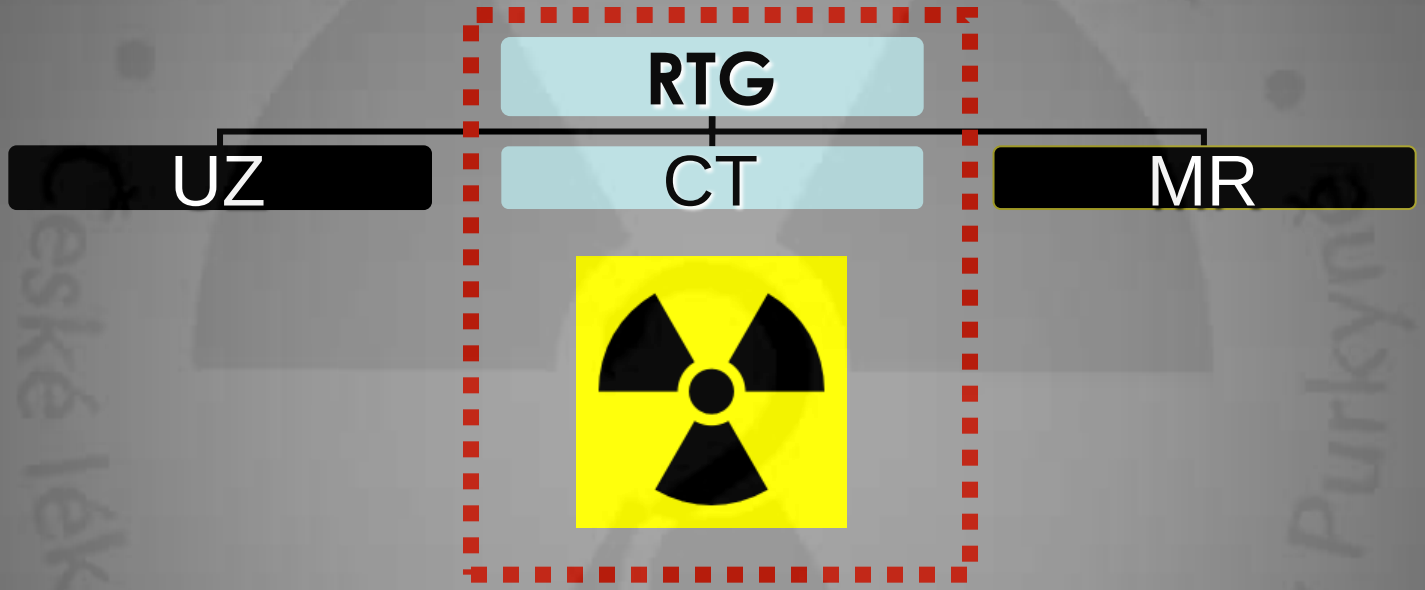
ULTRAZVUKOVÉ VYŠETŘENÍ HRUDNÍKU

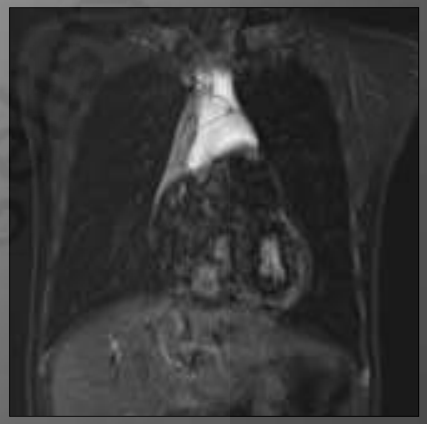


MUDr. Lenka Mrázková, KZM, FN Motol, 2.LF UK, Praha

RADIOLOGICKÁ SPOLEČNOST
České lékařské společnosti J. E. Purkyně
XXXVIX. český radiologický kongres
8. - 10. 10. 2014
Hotel Diplomat, Praha 6

ZOBRAZOVACÍ METODY - ONEMOCNĚNÍ HRUDNÍKU



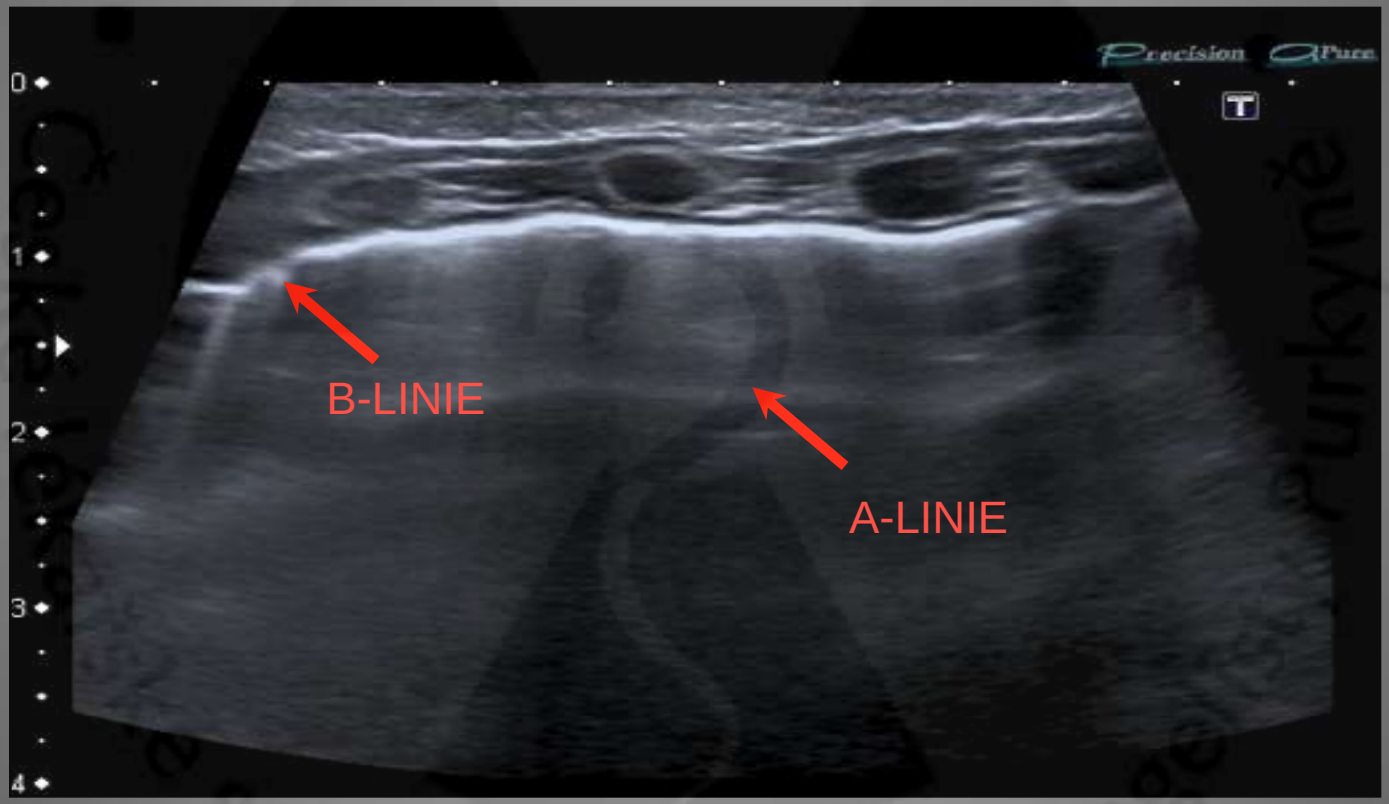


ALE PROČ POUŽÍVAT ULTRAZVUK PRO ZOBRAZENÍ PATOLOGIÍ HRUDNÍKU...

- …KDYŽ SKELET I VZDUCH JSOU VŠEOBECNĚ POVAŽOVÁNY ZA NEPROSTUPNOU BARIERU PRO ULTRAZVUKOVÉ VLNY?

- ZOBRAZENÍ ARTEFAKTŮ – MIRRORING, REVERBERACE
- ZOBRAZENÍ REÁLNÝCH STRUKTUR

NORMÁLNÍ UZ OBRAZ VZDUŠNÉ PLÍCE + PLEURY + HRUDNÍ STĚNY



A-LINIE - HORIZONTÁLNÍ
B-LINIE - VERTIKÁLNÍ “KOMETY”

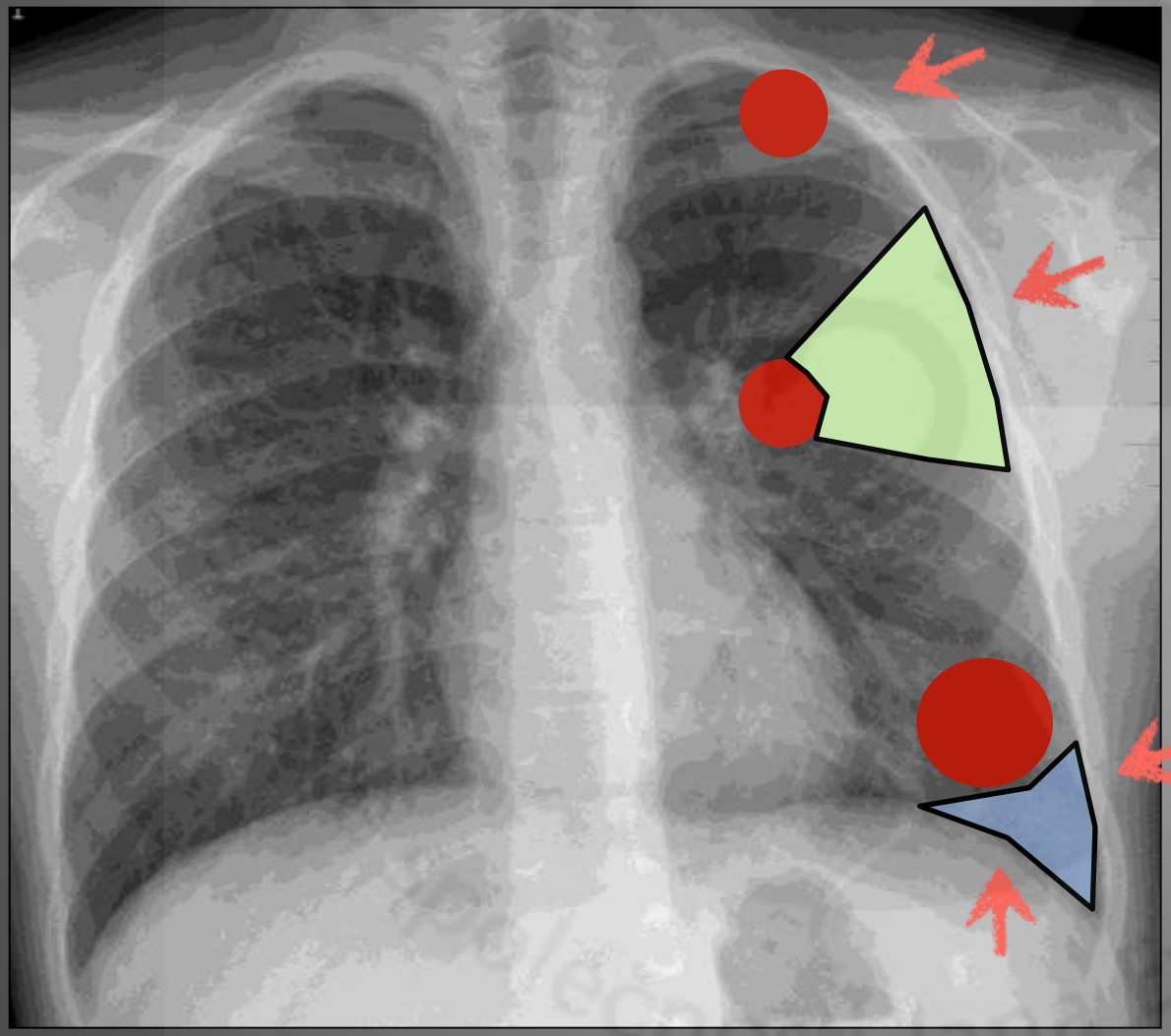
VÝHODY ULTRAZVUKOVÉHO ZOBRAZENÍ HRUDNÍKU

- BEZ RADIAČNÍ EXPOZICE
- ZOBRAZENÍ V REÁLNÉM ČASE
- DYNAMICKÁ ZOBRAZENÍ
- PROVEDITELNÉ U LŮŽKA
- DOKUMENTACE /VIDEO SMYČKY/

INDIKACE ULTRAZVUKOVÉHO VYŠETŘENÍ HRUDNÍKU

- PATOL. NÁLEZ /PALPAČNÍ, POSLECHOVÝ/
- DOPLŇKOVÉ VYŠETŘENÍ PŘI OBTÍŽNÉ SPECIFIKACI PATOLOGIE DETEKOVANÉ NA RTG, CT, MR
- PNEUMOTHORAX
- PATOLOGIE BRÁNICE A MEDIASTINA
- DIFUZNÍ PLICNÍ PROCESY
- INTERVENCE

REÁLNÁ PATOLOGIE – AKUSTICKÉ OKNO

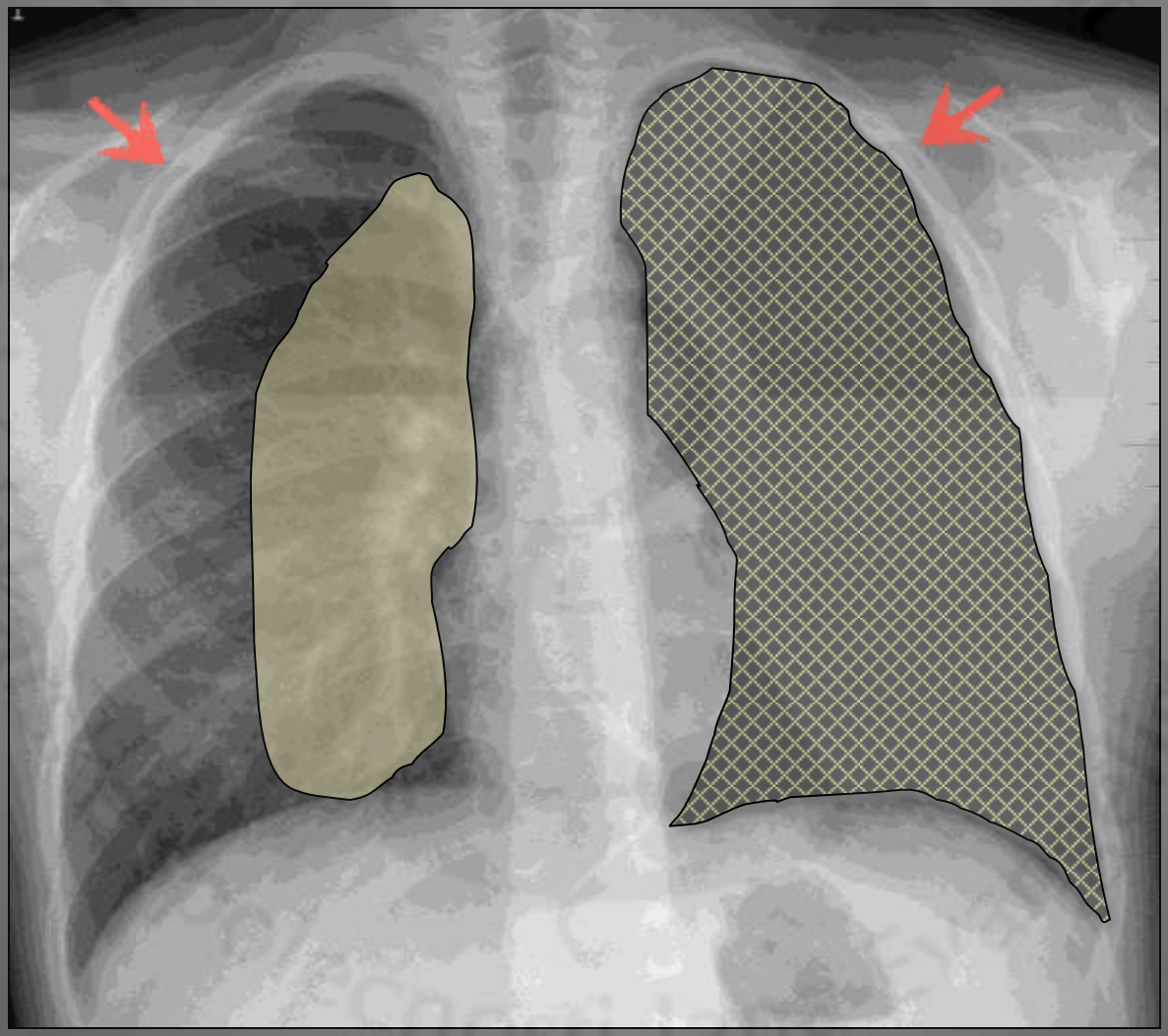


PERIFERNÍ LÉZE

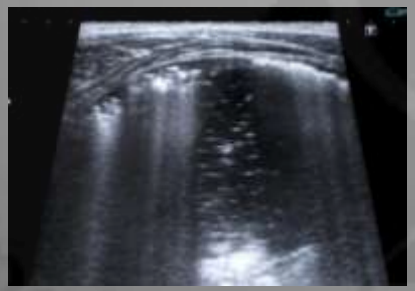
CENTRÁLNÍ LÉZE
KONSOLIDACE

PERIFERNÍ LÉZE
TEKUTINA

DIFUZNÍ LÉZE - ARTEFAKTY

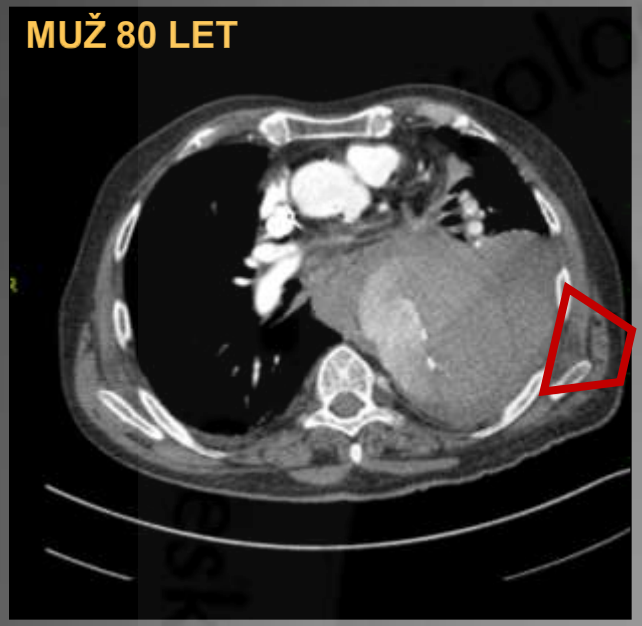


TECHNIKA VYŠETŘENÍ

CONVEX/ABDOMINAL	LINEAR	SECTOR	MICROCONVEX
3 – 6 MHZ	7 – 18 MHZ	2,5 – 3,6 MHZ	5 – 7 MHZ
			

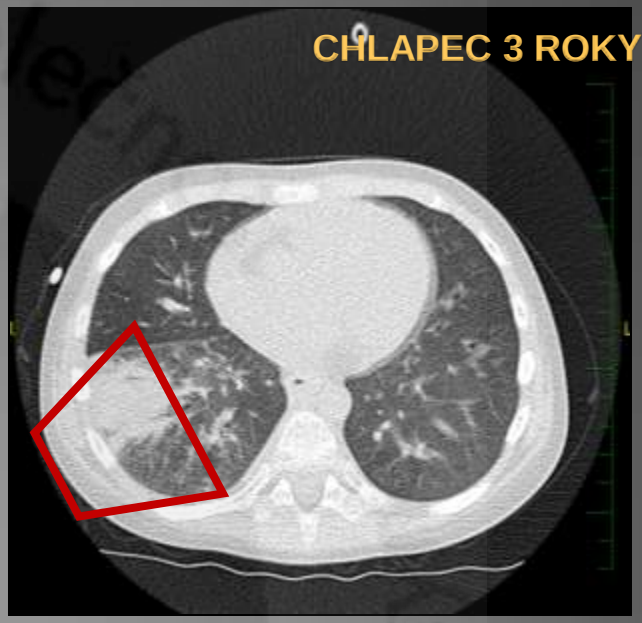
Radiologická společnost
Společnosti Jana Ev

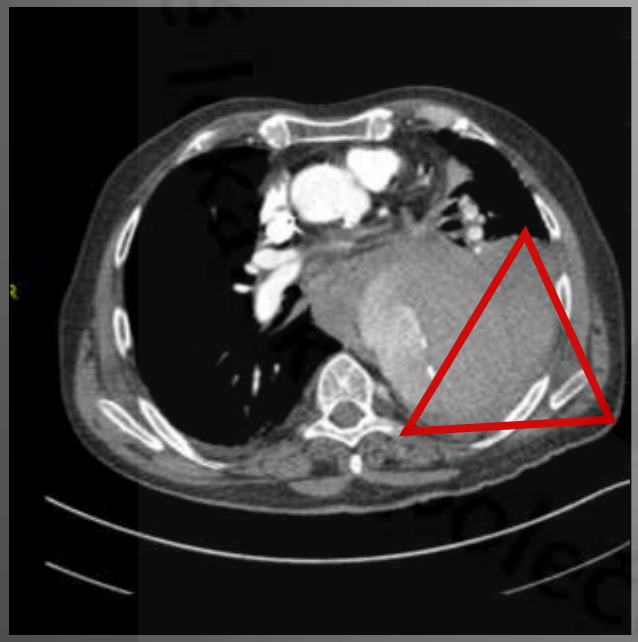
MUŽ 80 LET



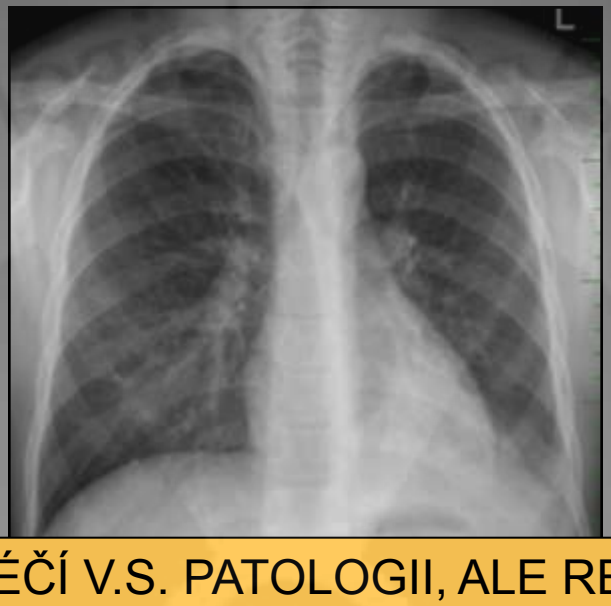
5 CM

CHLAPEC 3 ROKY

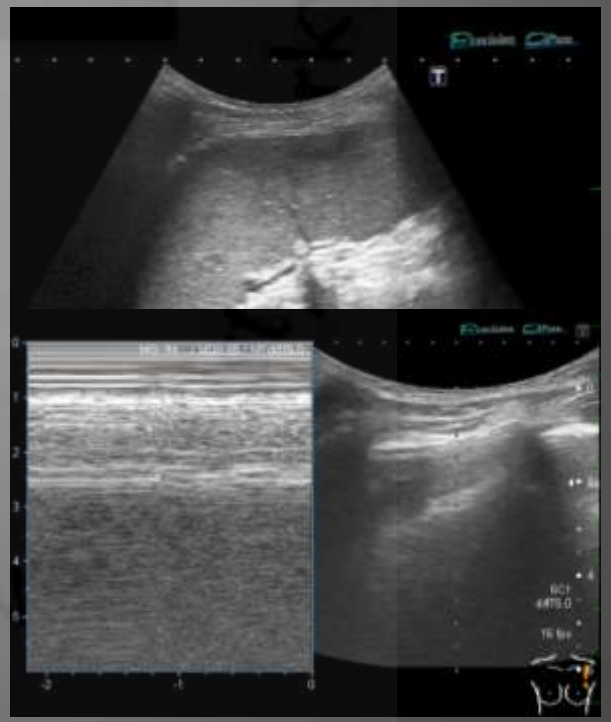


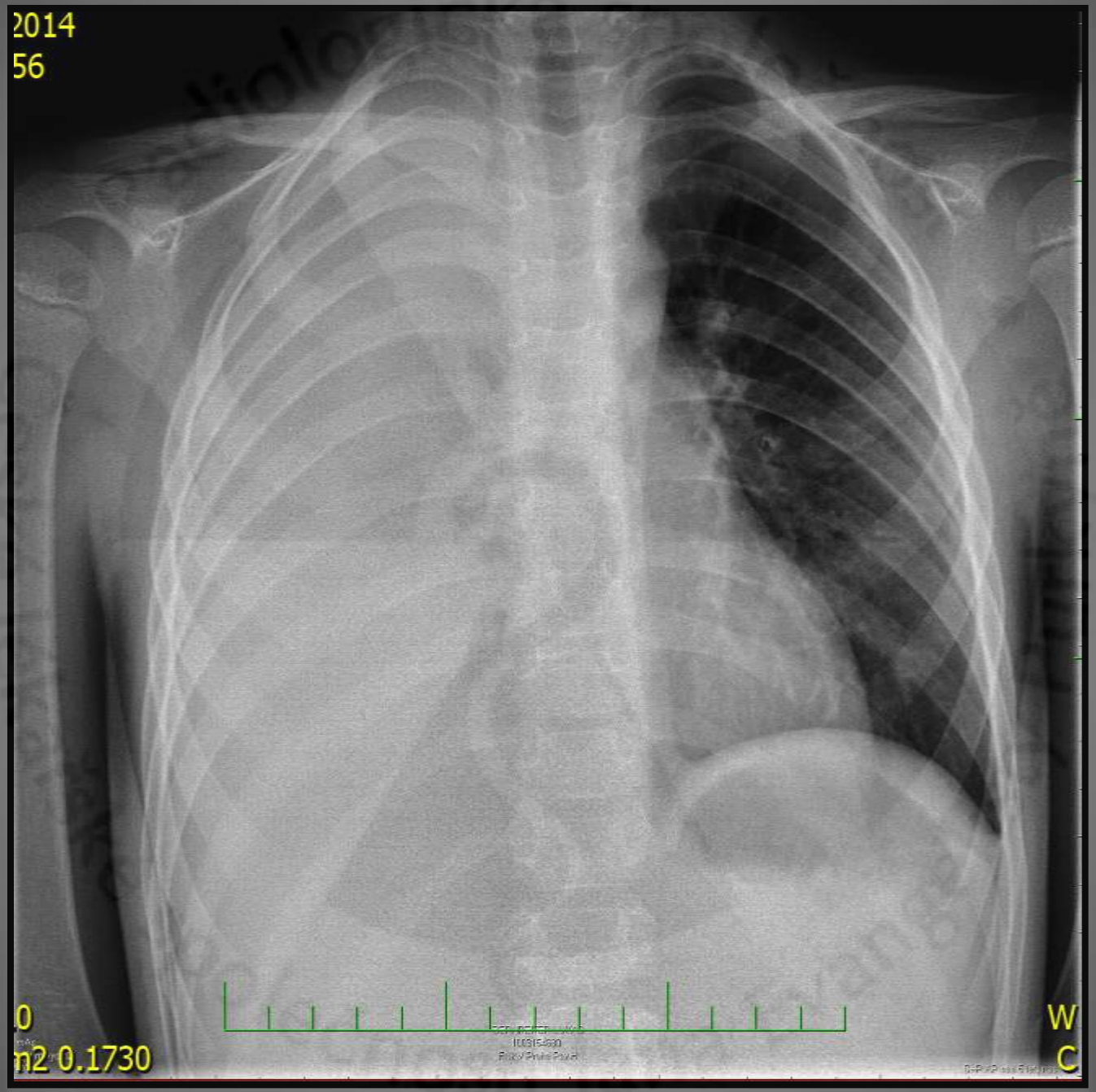


15-20 CM



LÉKAŘ KLINIK NELÉČÍ V.S. PATOLOGII, ALE REÁLNOU PATOLOGII

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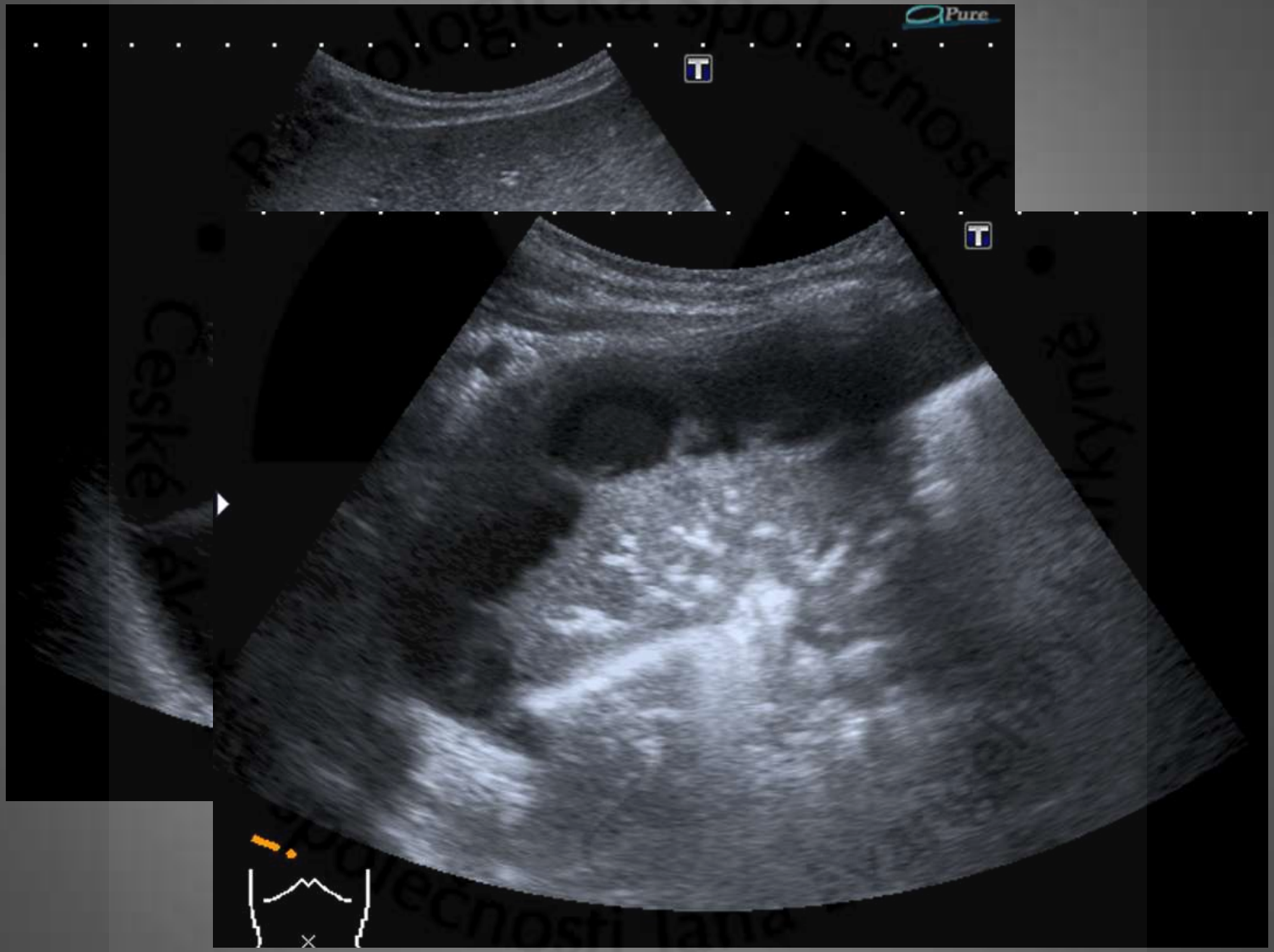
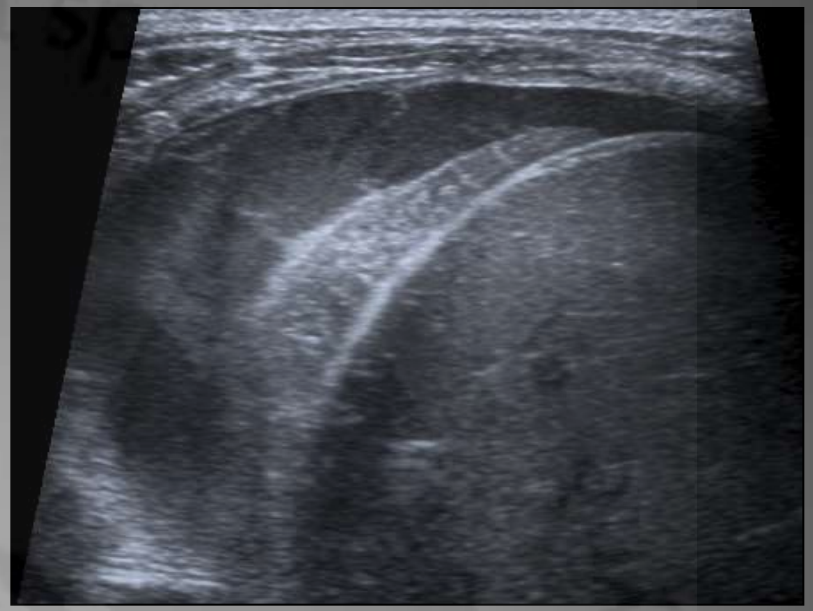
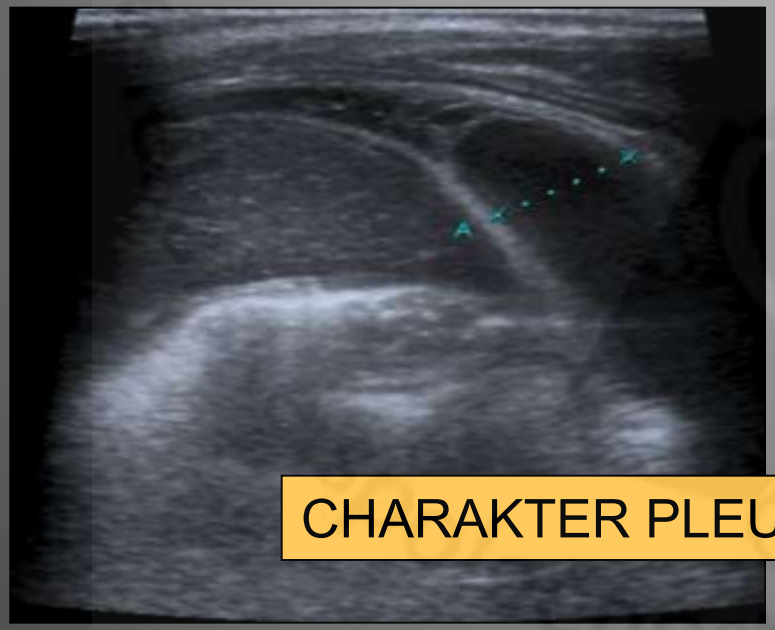
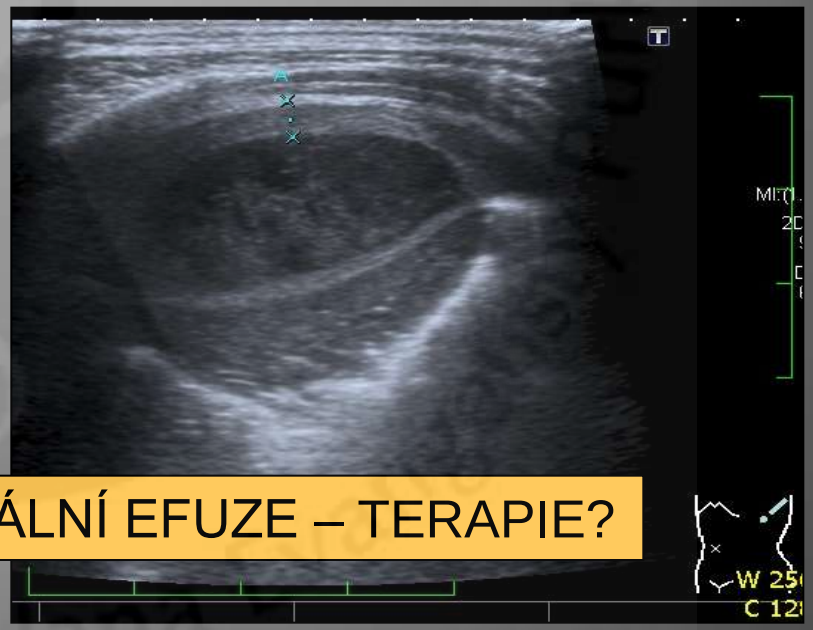

Pure

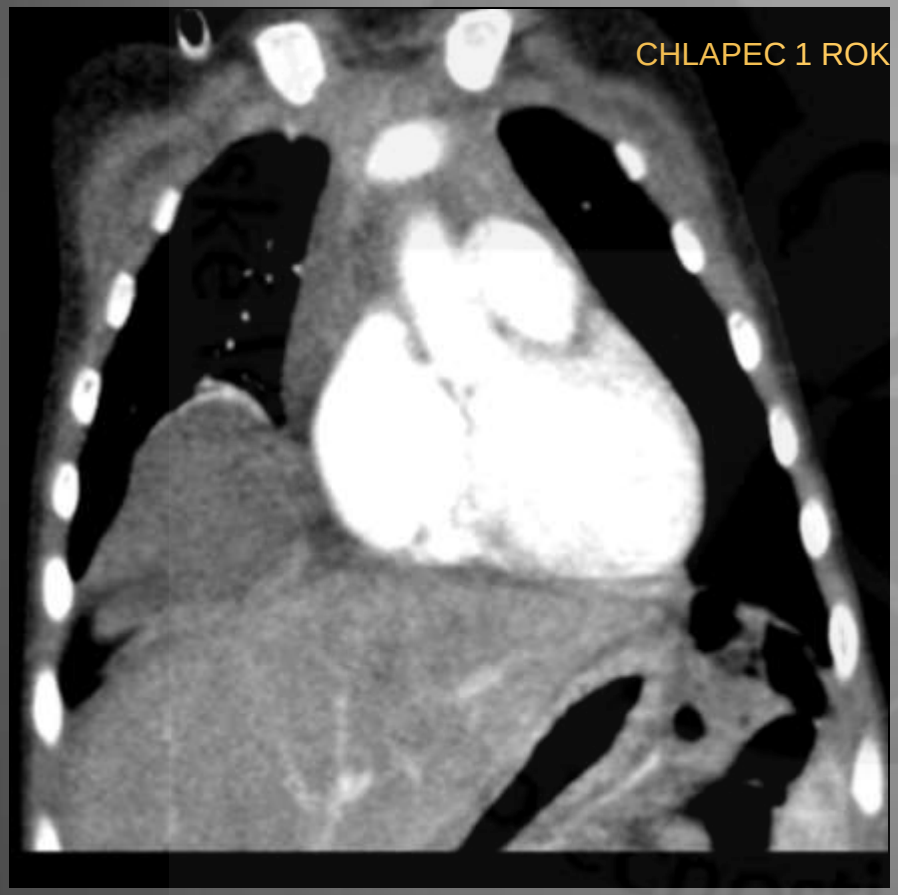


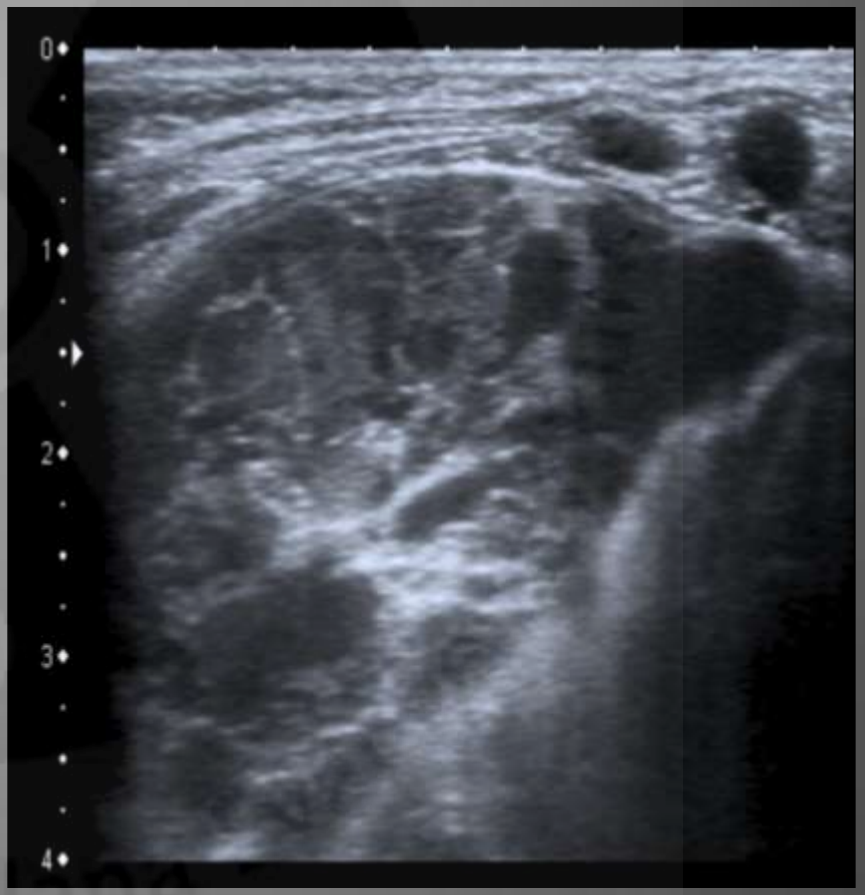


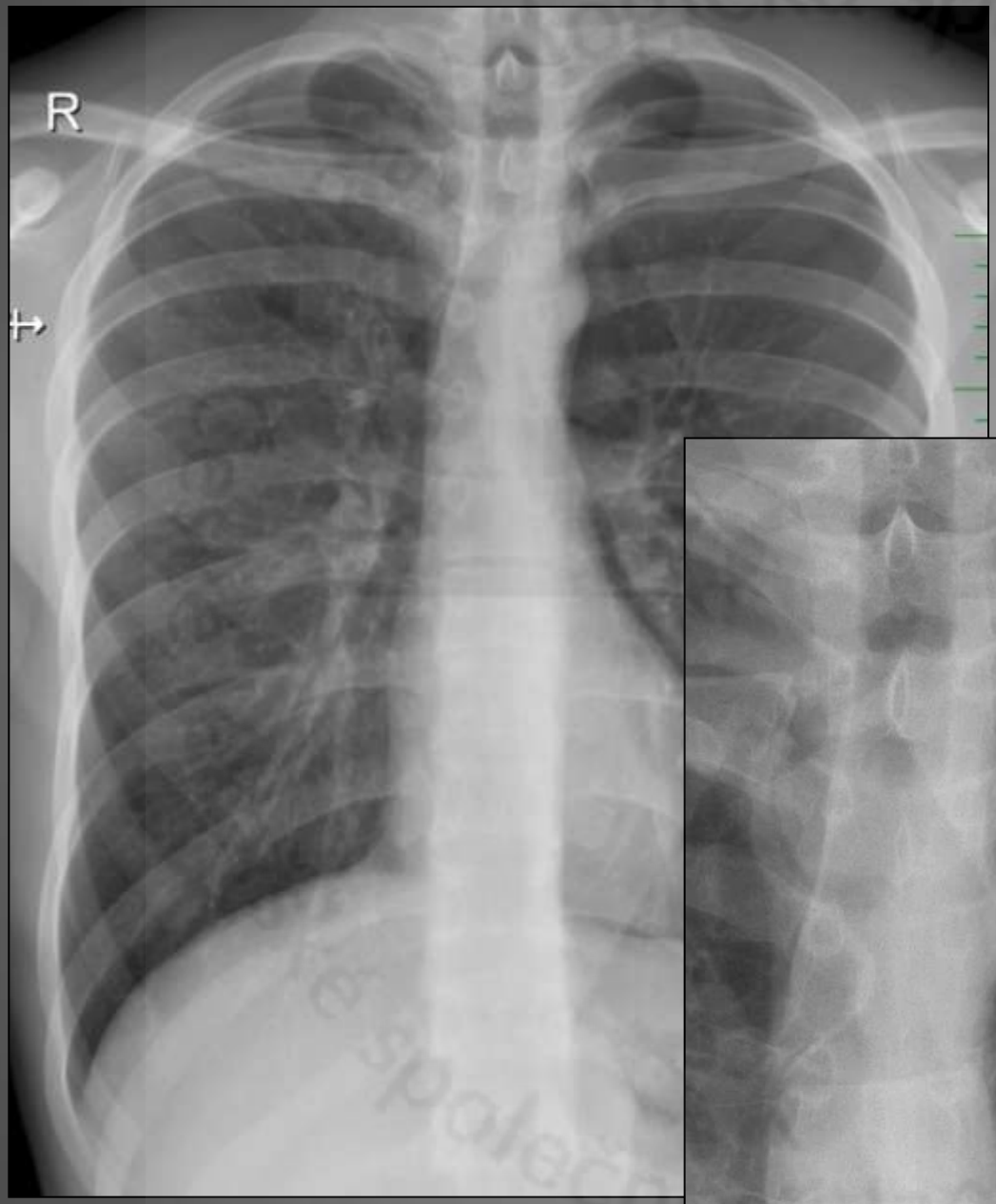


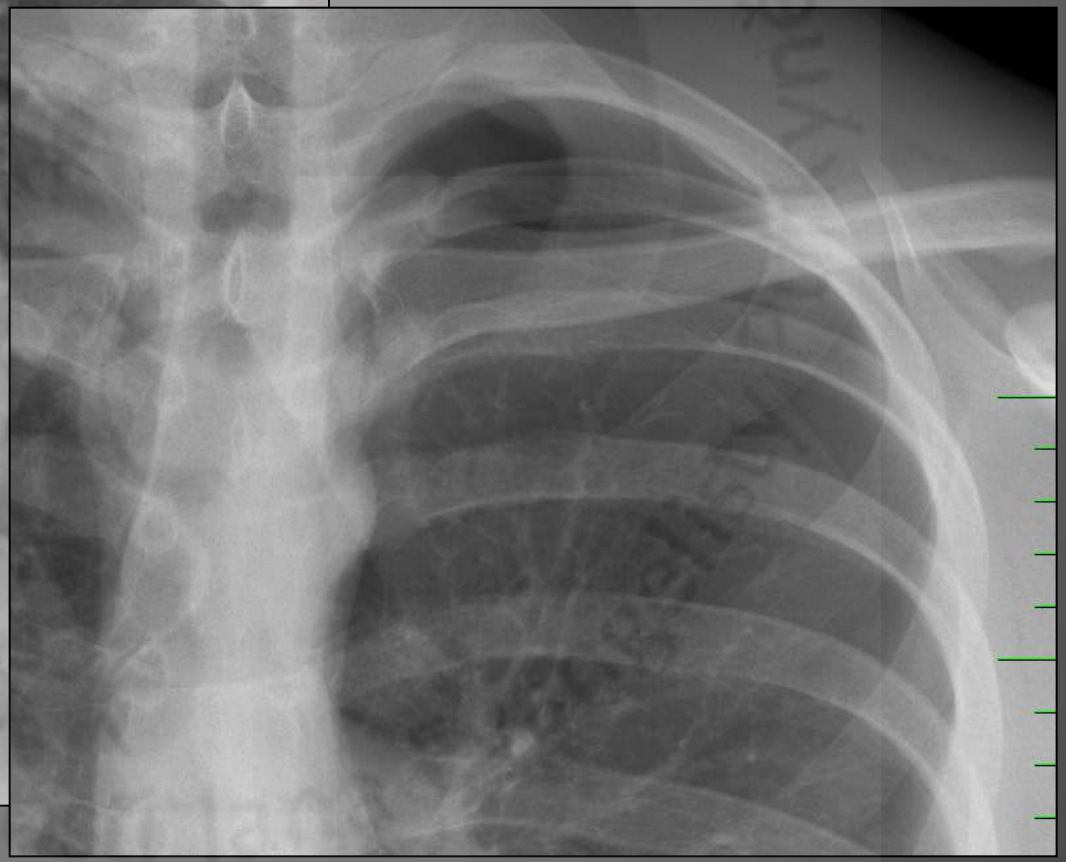
CHARAKTER PLEURÁLNÍ EFUZE – TERAPIE?

KAVERNÓZNÍ LYMFANGIOM







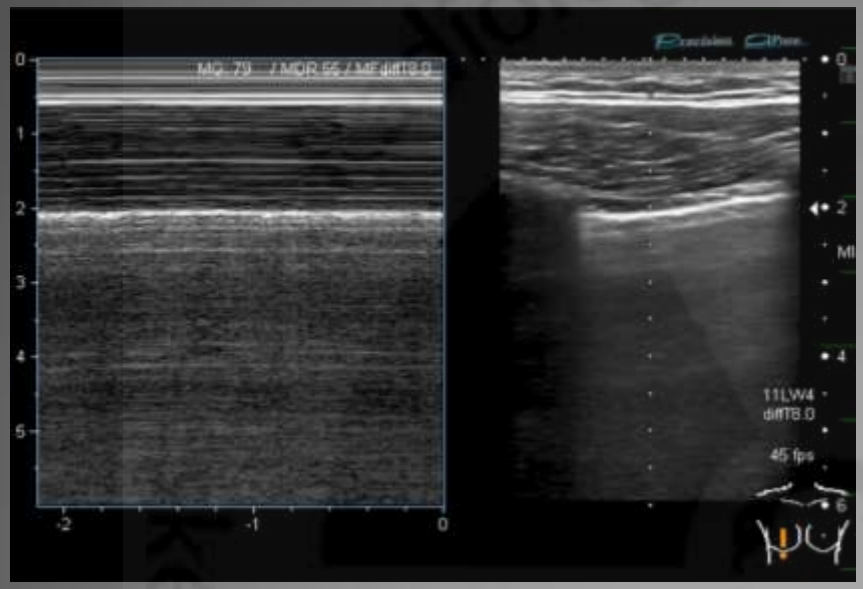


“PANÍ DOKTORKO, JÁ PŘI TOM ECHU NA TO SRDCE U TOHO PACIENTA NĚJAK DIVNĚ VIDÍM…LÉPE ŘEČENO, NEVIDÍM SKORO VŮBEC”

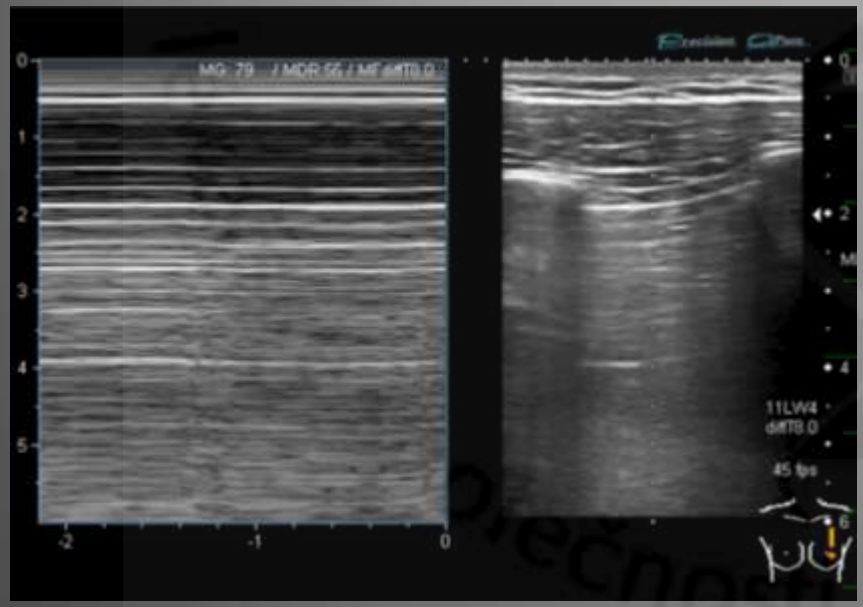
SLIDING B - LINES

NO SLIDING LUNG POINT

M – MODE

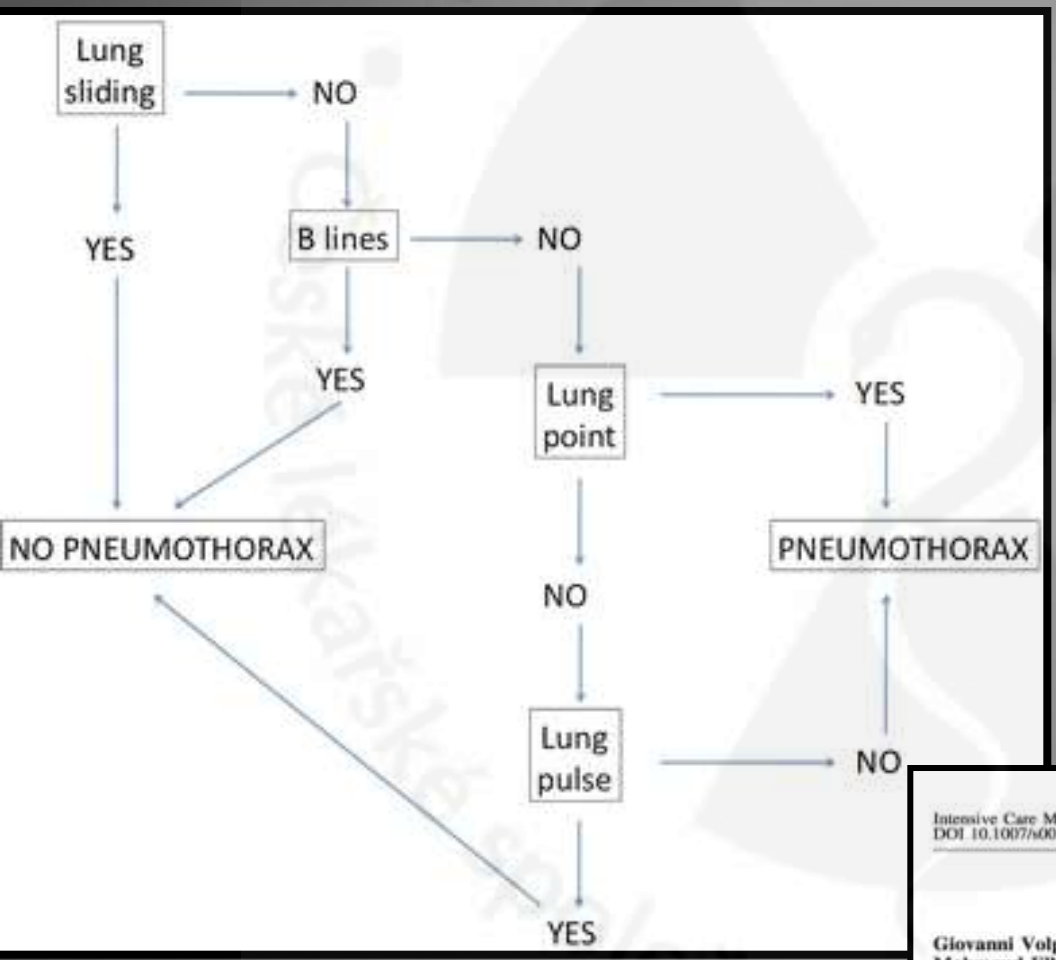


SEASHORE SIGN



STRATOSPHERE SIGN

PNEUMOTHORAX A ULTRASONOGRAFIE



Intensive Care Med (2012) 38:577–591
DOI 10.1007/s00134-012-2513-4

CONFERENCE REPORTS AND EXPERT PANEL

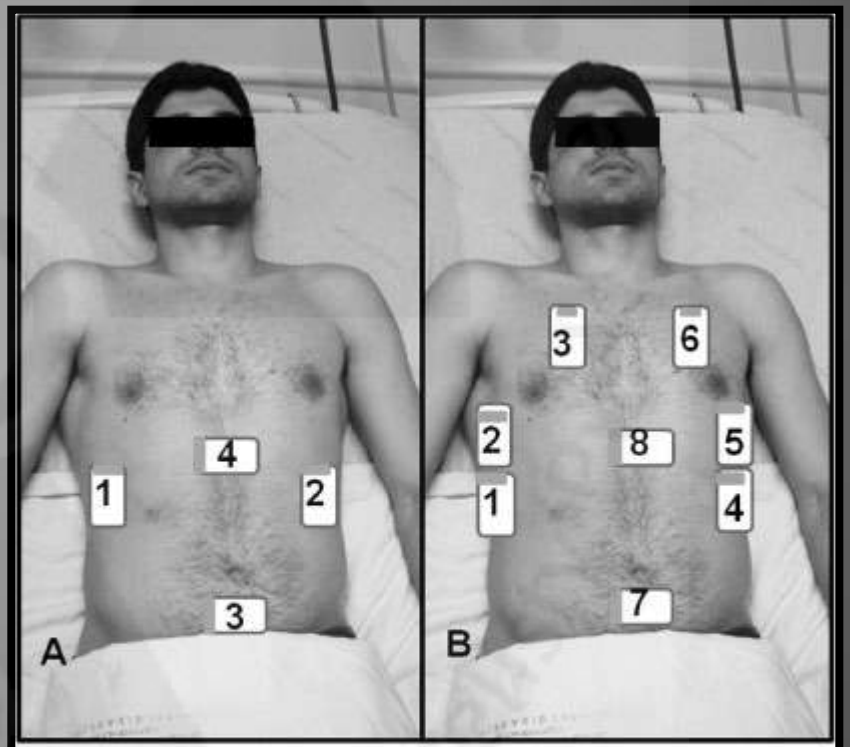
Giovanni Volpicelli
Mahmoud Elbarbary
Michael Blaivas
Daniel A. Lichtenstein
Gebhard Mathis
Andrew W. Kirkpatrick
Lawrence Melniker
Luna Gargani

International evidence-based recommendations for point-of-care lung ultrasound

FOCUSED ASSESSMENT WITH SONOGRAPHY IN TRAUMA + EXTENDED

- **FAST, eFAST**
- HRUDNÍ + BŘIŠNÍ DUTINA
- US + RTG

- HEMOPERITONEUM
- PNEUMOTORAX
- HEMOTORAX
- HEMOPERIKARD
- PLEURÁLNÍ EFUZE
- PERIKARDIÁLNÍ EFUZE

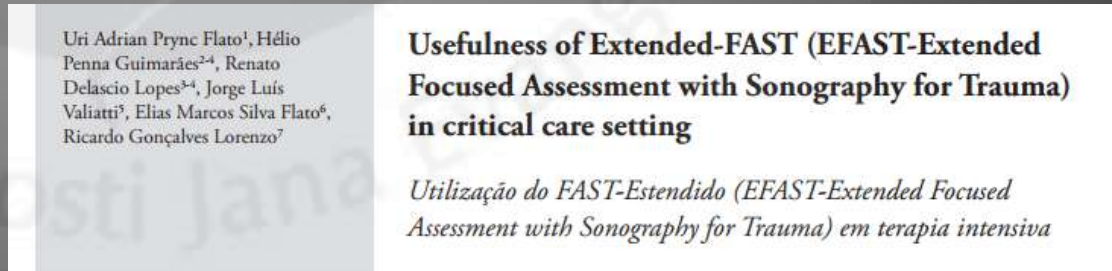


FAST - Focused Assessment with Sonography for Trauma; EFAST – Extended Focused Assessment with Sonography for Trauma.

Figure 2- FAST (A) and EFAST (B) anatomical references.

FAST, eFAST - INDIKACE

- hemodynamically unstable patients, when the cause of hypotension is unclear.
- patients who need an emergent bedside procedure.
- patients at a community hospital who require transfer to a trauma center consider pericardiocentesis if a pericardial effusion is found, consider early blood transfusion for significant hemoperitoneum, and consider a chest tube if a hemothorax or pneumothorax is discovered, especially if aeromedical transport is planned
- intoxicated patients who can be observed and re-examined.
- patients with penetrating trauma with multiple wounds or unclear trajectory, especially with wounds in upper abdomen or lower chest
- patients with a concerning mechanism of injury but no indication for ct consider a period of observation and serial fast exams.

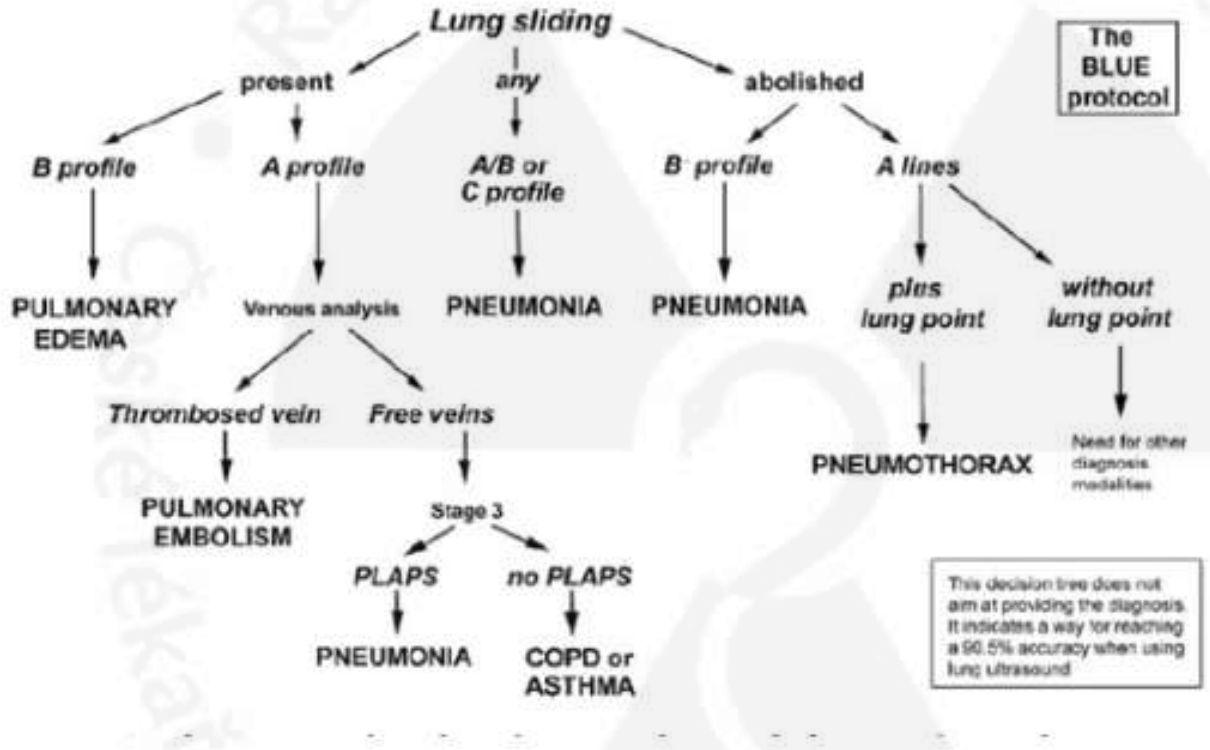


Uri Adrian Prync Flato[1], Hélio Penna Guimarães[2-4], Renato Delascio Lopes[3-4], Jorge Luís Valiatti[5], Elias Marcos Silva Flato[6], Ricardo Gonçalves Lorenzo[7]

Usefulness of Extended-FAST (EFAST-Extended Focused Assessment with Sonography for Trauma) in critical care setting

Utilização do FAST-Estendido (EFAST-Extended Focused Assessment with Sonography for Trauma) em terapia intensiva

BLUE PROTOCOL



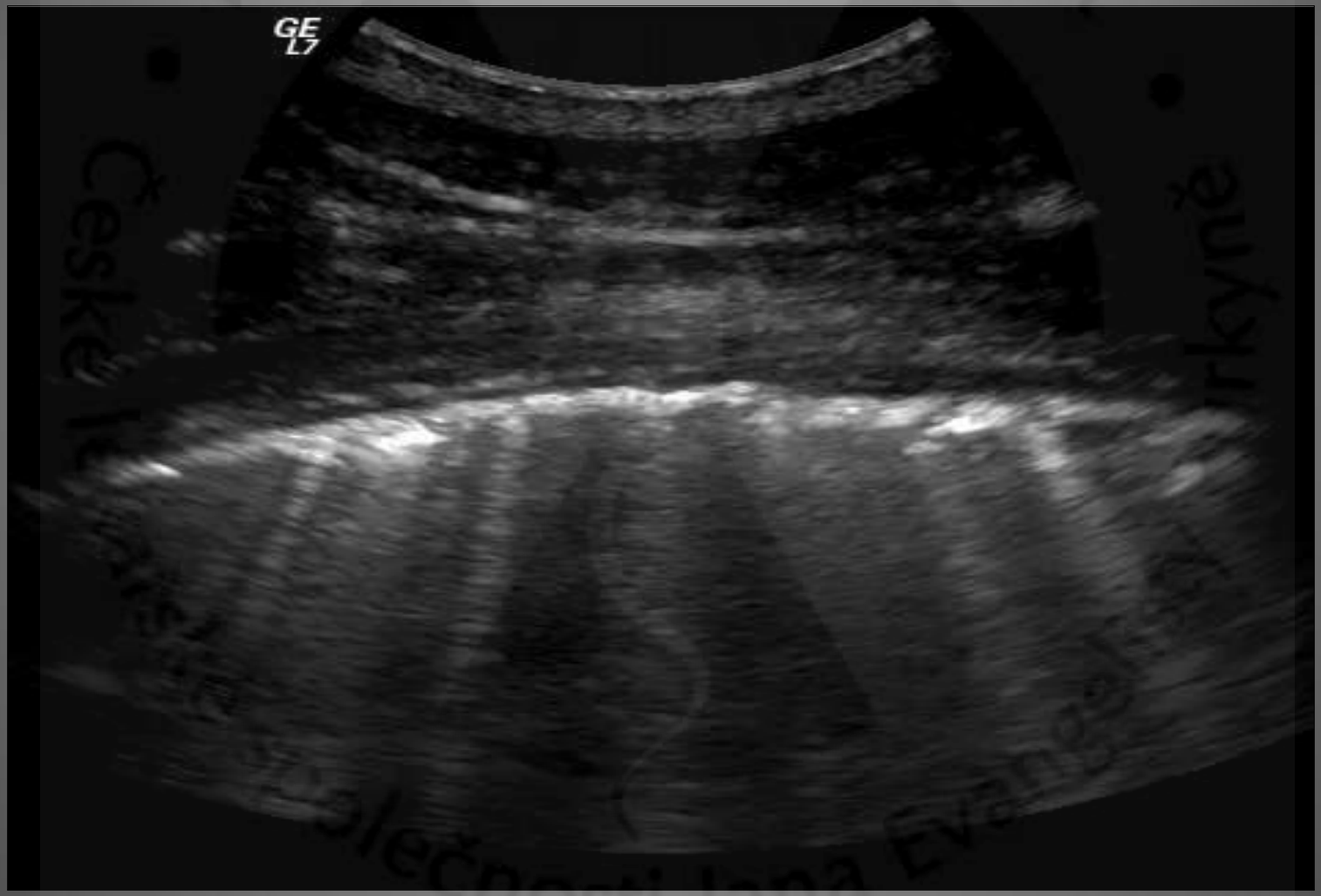
A profile means predominantly A lines
B profile means predominantly multiple anterior diffuse B lines
A / B profile means predominant A lines on one side and predominant B lines on the other side.
C profile means anterior alveolar consolidation(s)
PLAPS means ***posterolateral alveolar and/or pleural syndrome*** detected on a lateral sub-posterior sonological examination.

Original Research
CRITICAL CARE MEDICINE

Relevance of Lung Ultrasound in the Diagnosis of Acute Respiratory Failure*
The BLUE Protocol

Daniel A. Lichtenstein, MD, FCCP, and Gilbert A. Mezière, MD

A- LINES, B - LINES



ZÁVĚR

- ULTRASONOGRAFIE HRUDNÍKU SE STÁVÁ /A STALA/ VÝZNAMNOU SLOŽKOU EMERGENTNÍ A INTEZÍVNÍ DIAGNOSTIKY
- JEJÍ CÍLENÁ CITLIVÁ INDIKACE DOKÁŽE ELIMINOVAT POUŽITÍ ZOBRAZOVACÍCH METOD VYUŽADUJÍCÍ RADIAČNÍ EXPOZICI – DĚTI
- VYŽADUJE ZVLÁDNUTÍ ULTRAZVUKOVÉ TECHNIKY A PRINCIPŮ ULTRAZVUKOVÉ DIAGNOSTIKY
- EDUKAČNÍ PROGRAMY
- DOKUMENTACE!

Radiologická společnost
Lékařské společnosti Jana Evangelisty Purkyně

ULTRASONOGRAFIE NENÍ SUBJEKTIVNÍ METODA.

DŮLEŽITÁ JE SOUHRA PŘÍSTROJE A ČLOVĚKA.