Définition

Importance

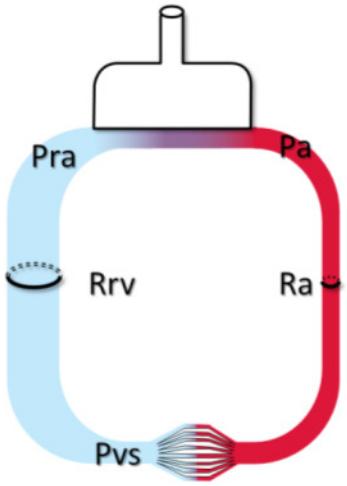
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 29, 2008 VOL. 358 NO. 22

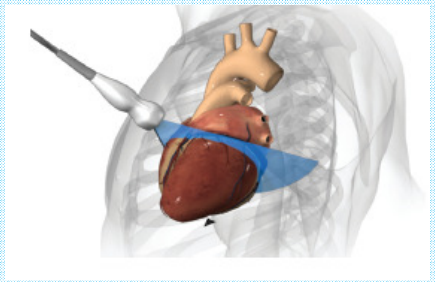
A Comparison of Aprotinin and Lysine Analogues in High-Risk Cardiac Surgery

Dean A. Fergusson, M.H.A., Ph.D., Paul C. Hébert, M.D., M.H.Sc., C. David Mazer, M.D., Stephen Fremes, M.D., Charles MacAdams, M.D., John M. Murkin, M.D., Kevin Teoh, M.D., M.Sc., Peter C. Duke, M.D., Ramiro Arellano, M.D., M.Sc., Morris A. Blajchman, M.D., Jean S. Bussières, M.D., Dany Côté, M.D., Jacek Karski, M.D., Raymond Martineau, M.D.,* James A. Robblee, M.D., M.B.A., Marc Rodger, M.D., M.Sc., George Wells, Ph.D., Jennifer Clinch, M.A., and Roanda Pretorius, M.Sc., for the BART Investigators†

Mécanisme



Approche



Évaluation de la fonction cardiaque et instabilité hémodynamique: Partie III

André Denault MD PhD

Université de Montréal

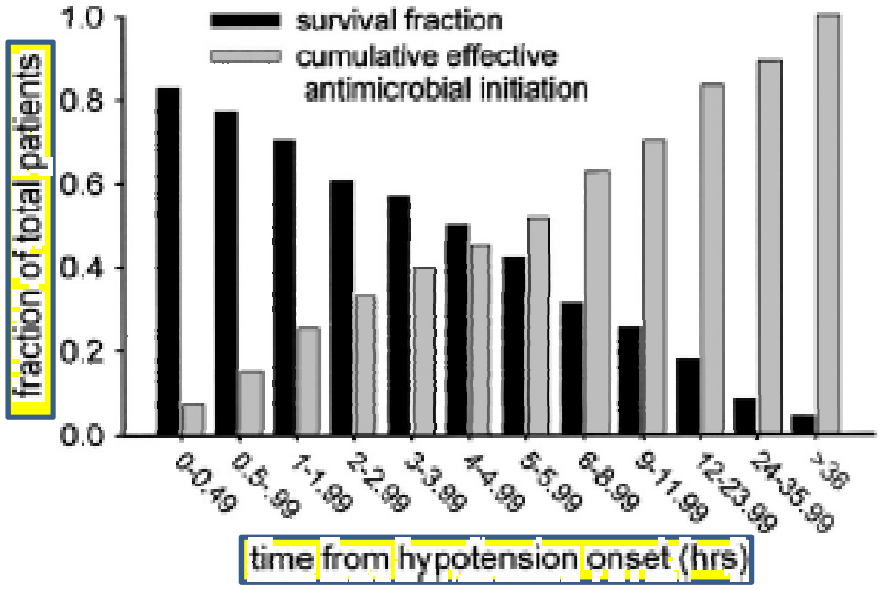
INSTITUT DE CARDIOLOGIE DE MONTRÉAL

CHUM

Montréal, le 20 octobre 2010

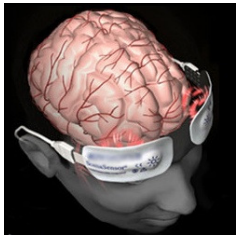
Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock*

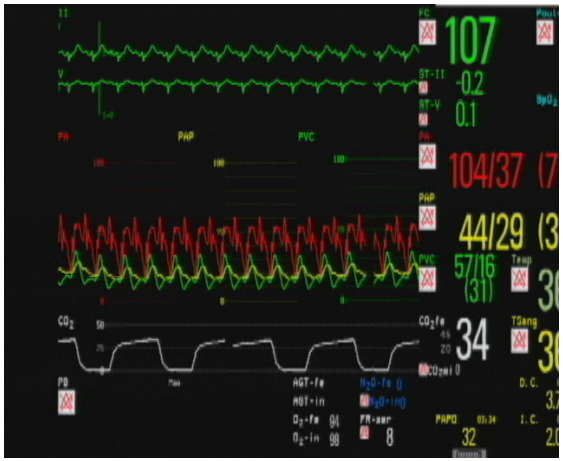
Anand Kumar, MD; Daniel Roberts, MD; Kenneth E. Wood, DO; Bruce Light, MD; Joseph E. Parrillo, MD; Satendra Sharma, MD; Robert Suppes, BSc; Daniel Feinstein, MD; Sergio Zanotti, MD; Leo Taiberg, MD; David Gurka, MD; Aseem Kumar, PhD; Mary Cheang, MSc



(Crit Care Med 2006; 34:1589–1596)


ALARMES DE
II
V
FC
107
ST-II
-0.2
ST-V
0.1
PA
PAP
PVC
100
104/37
PAP
44/29
PVC
5
(16)
(31)
CO_2
50
25
CO_2fe
45
20
34
CO_2mi 0





At the same time


ALARMES DE
II
V
FC
107
ST-II
-0.2
ST-V
0.1
PAP
PVC
PA
104/37
PAP
44/29
PVC
57/16
(31)
Temp
CO2
50
25
CO2fe
45
20
34
CO2mi 0

Our role

Oxygen transport

Oxygen demand

Relation depends on

Oxygen arterial content

X

Cardiac output

Our role

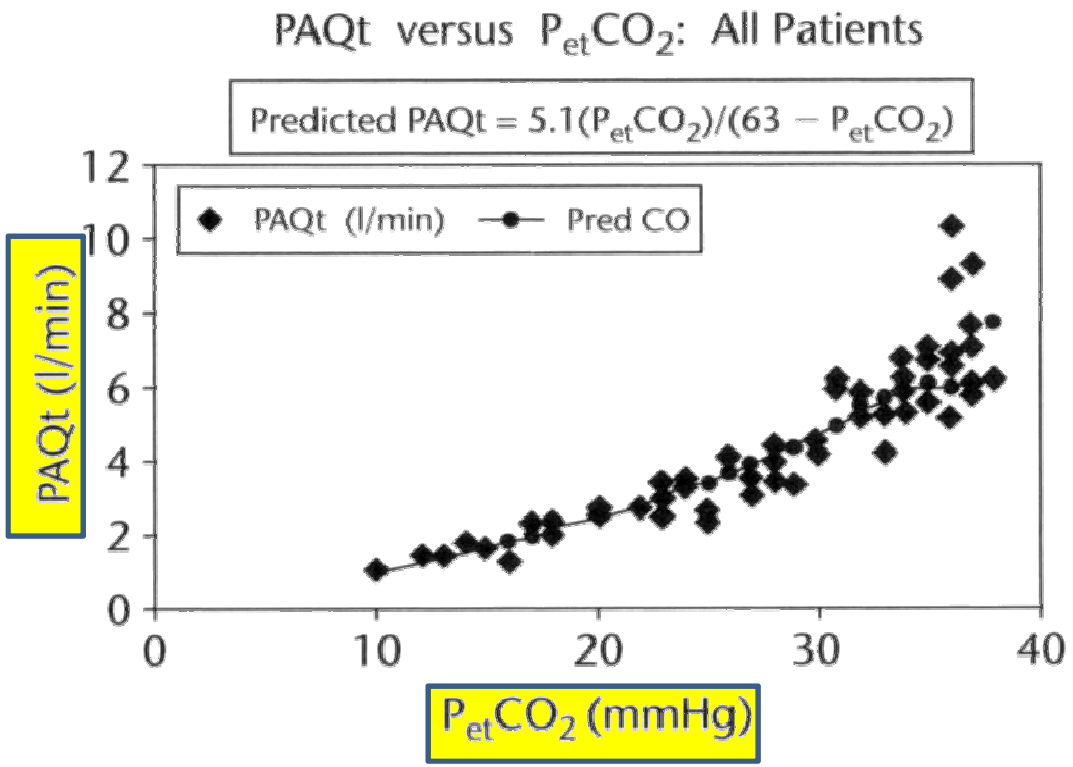
Oxygen transport

Oxygen demand

Relation depends on

Oxygen arterial content

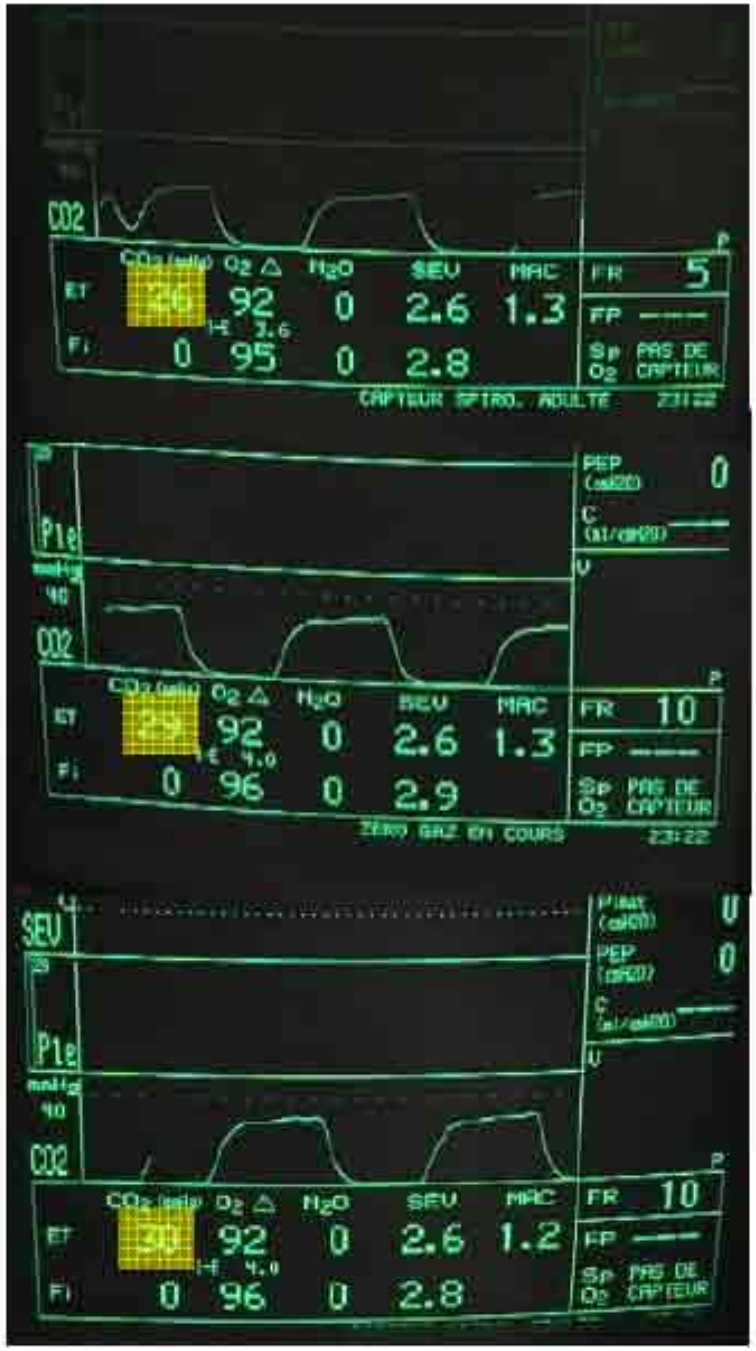
Cardiac output monitor: capnography

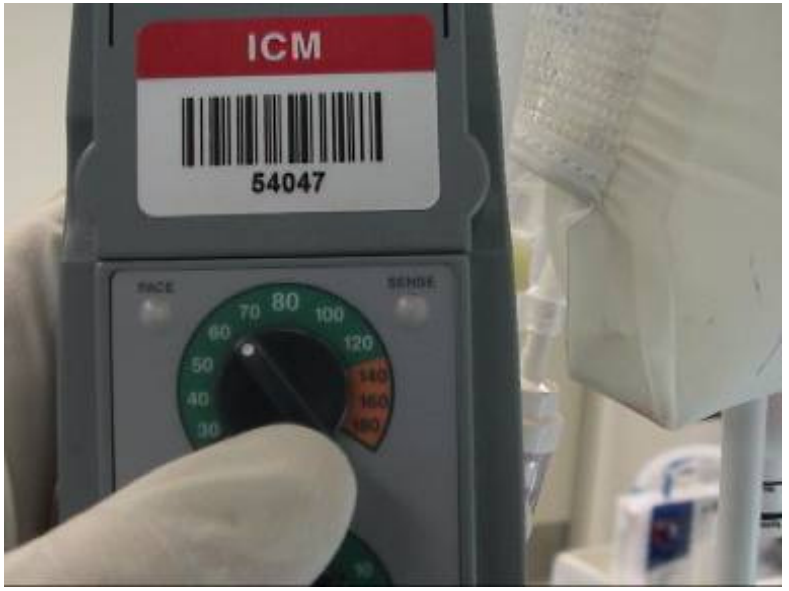


Maslow et al Anesth Analg 2001;92:306-313

Heart rate optimisation


FC 85
FR
PA (88)
122/ 66
AP (32)
91/ 25
PVC(17)
NIP
SaO2 93
PR 77
T1
T2
FC 100
FR
PA (71)
97/ 55
AP (30)
86/ 25
PVC(13)
NIP
SaO2 94
PR 98
T1
T2
CO
FC 80
FR
PA (89)
121/ 59
AP (30)
91/ 25
PVC(10)
NIP
SaO2 ***
PR ***
T1
T2
CO
YE


CO2
ET
92
0
2.6
1.3
FR 5
FP
Sp O2 PAS DE CAPTEUR
F
0
95
0
2.8
CAPTEUR SPIRO. ADULTE
PEP 0
P1e
CO2
ET
92
0
2.6
1.3
FR 10
FP
Sp O2 PAS DE CAPTEUR
F
0
96
0
2.9
ZERO GAZ EN COURS
23:22
SEV
P1e
CO2
ET
92
0
2.6
1.2
FR 10
FP
Sp O2 PAS DE CAPTEUR
F
0
96
0
2.8



Noradrenalin 4µg/min

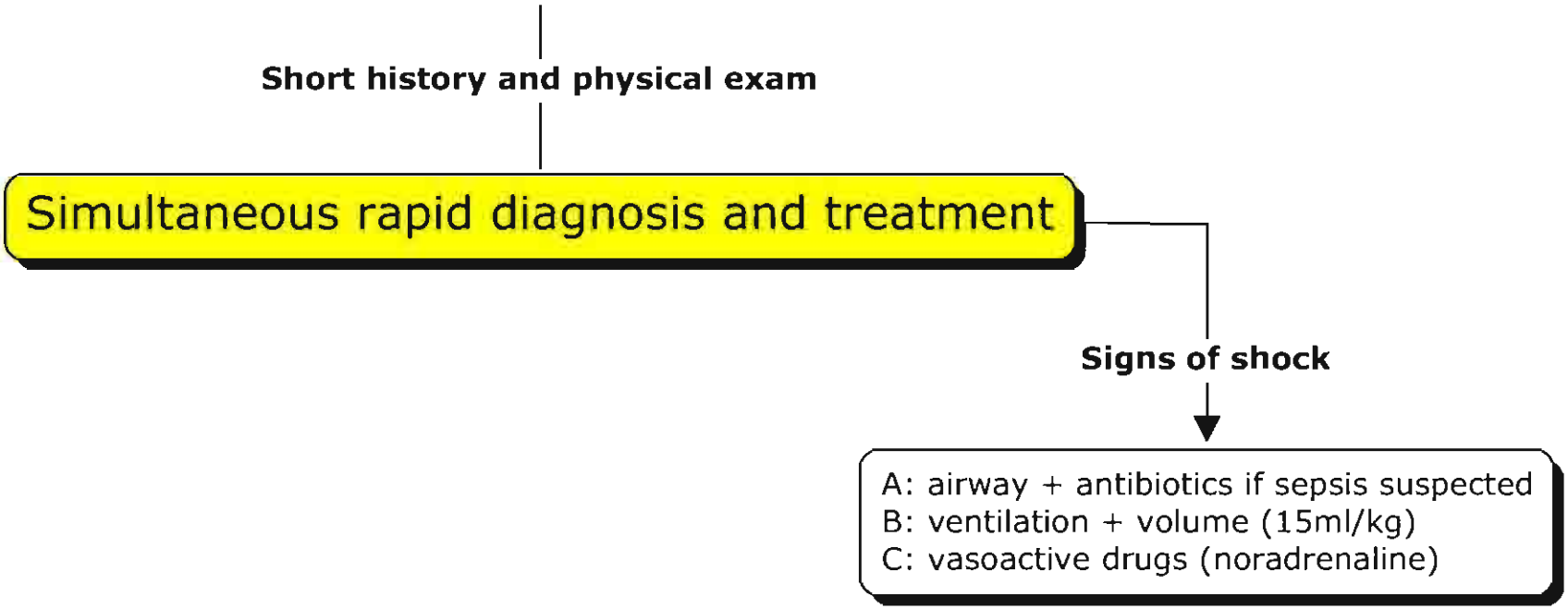
Noradrenaline 0.5 µg/min

Hemodynamic instability

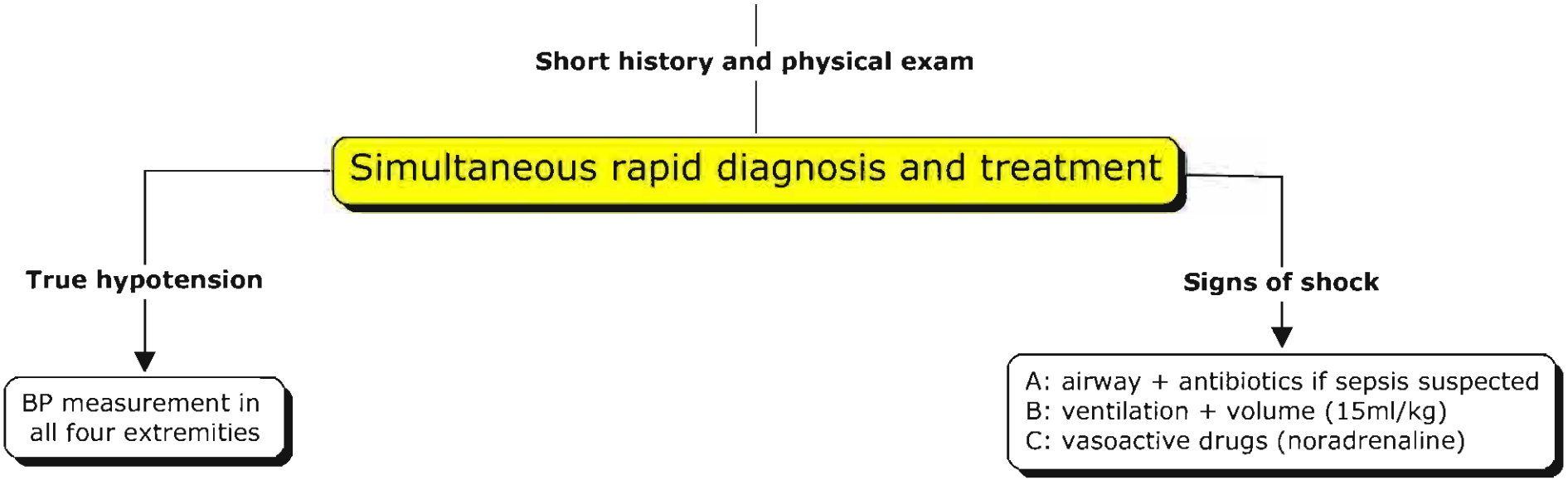
Short history and physical exam

Simultaneous rapid diagnosis and treatment

Hemodynamic instability



Hemodynamic instability

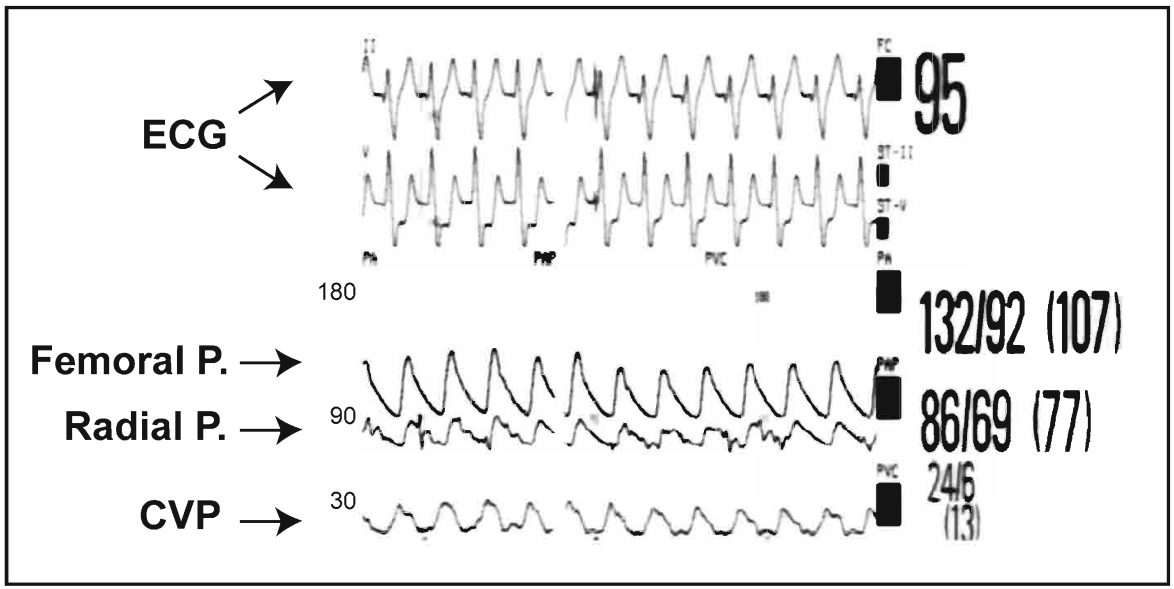


Can J Anesth/J Can Anesth (2009) 56:534–536
DOI 10.1007/s12630-009-9088-8

PERIOPERATIVE CARDIOVASCULAR ROUNDS

Abnormal aortic-to-radial arterial pressure gradients resulting in misdiagnosis of hemodynamic instability

André Denault, MD · Alain Deschamps, MD, PhD



Quand suspecter une pseudo-hypotension?

- Discordance entre la pression artérielle et l'état clinique
- Patient de petite taille ou petite radiale
- Dosage élevé d'amines

Per-CEC ♂ de 64 ans

Per-CEC


ADULT rSO2 INDEX
08/19/09
12:01:48
SYSTEM SIGNAL OK
L 64
BASELINE
rSO2 ↓ 15%
75
SYSTEM SIGNAL OK
R 60
BASELINE
rSO2 ↓ 8%
65
08:01
4 HOURS
1/MIN
12:01
BASELINE MENU
EVENT MARK
ALARM SUSPEND
OPTIONS MENU

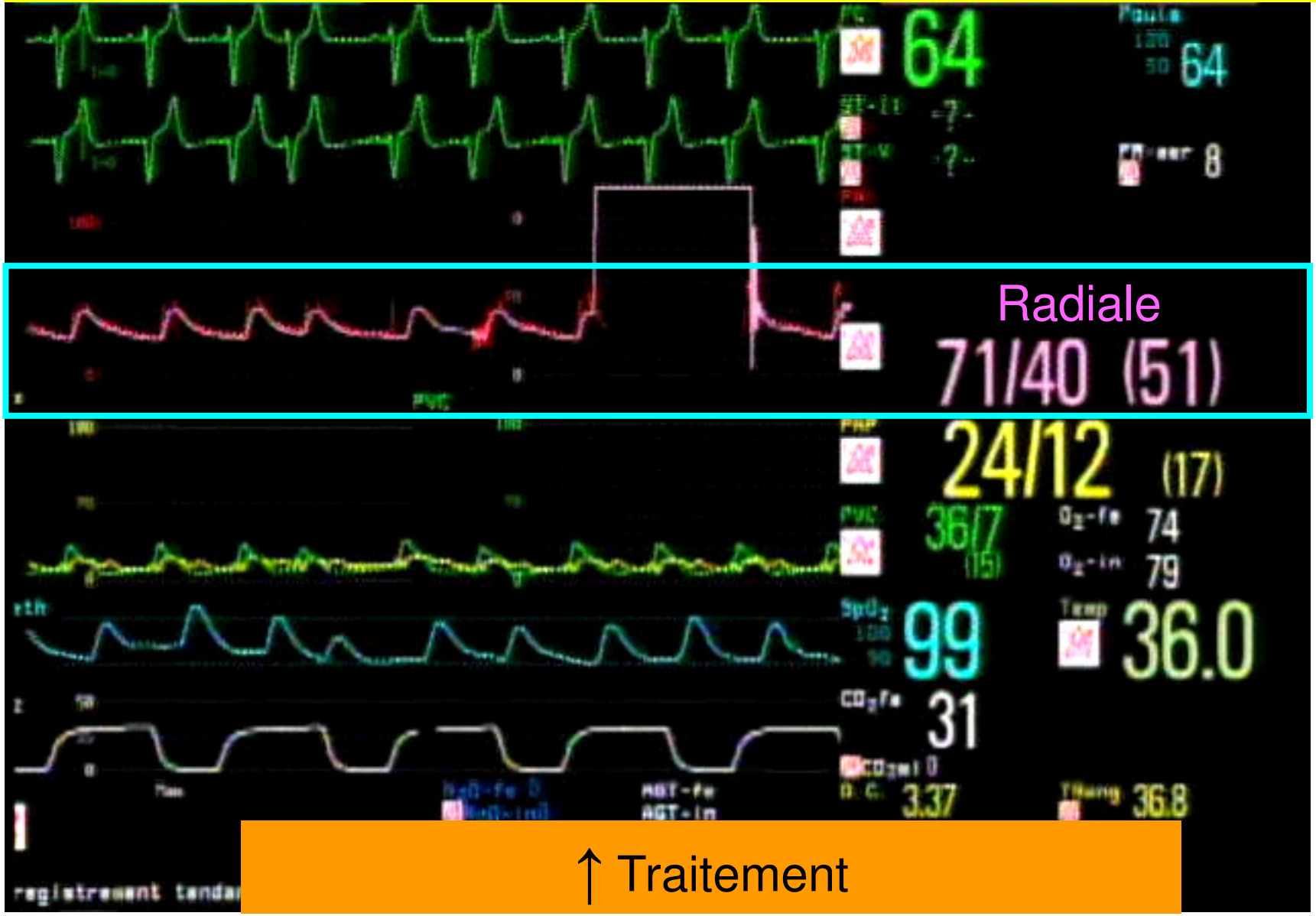
Gradient fémoral-radial en chirurgie cardiaque

31 mai 2007

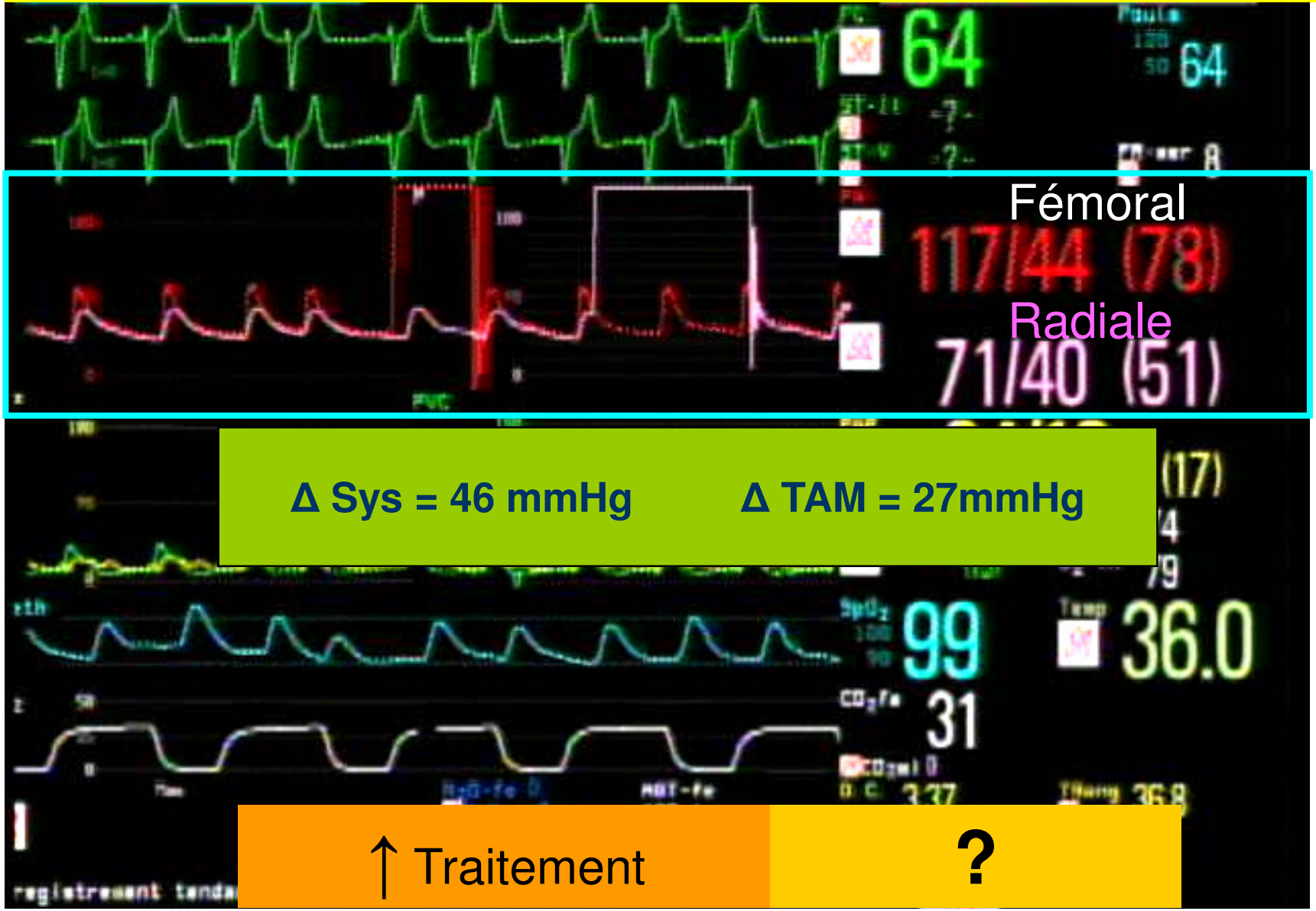
Antonio Juan Su
Résident en anesthésiologie,
Université de Montréal

Directeur de recherche	Dr André Denault
Co-chercheurs	Dr Giuseppe Fuda
Collaborateurs	Dr Alain Deschamps Dr Pierre Bouchard Dr Jean Lambert

Post-CEC


64
64
Radiale
71/40 (51)
24/12 (17)
36/7 (15)
74
79
99
36.0
31
3.37
36.8
↑ Traitement

Post-CEC


64
64
Fémoral
117/44 (78)
Radiale
71/40 (51)
Δ Sys = 46 mmHg
Δ TAM = 27mmHg
99
36.0
31
↑ Traitement
?

Conséquences potentielles

- Besoin supplémentaire d'amines
  - Morbidité/mortalité
  - Sortie de CEC difficile
- Mesure de contrôle avec pression aortique et installation de canule fémorale post CEC
  - Conditions sous optimales

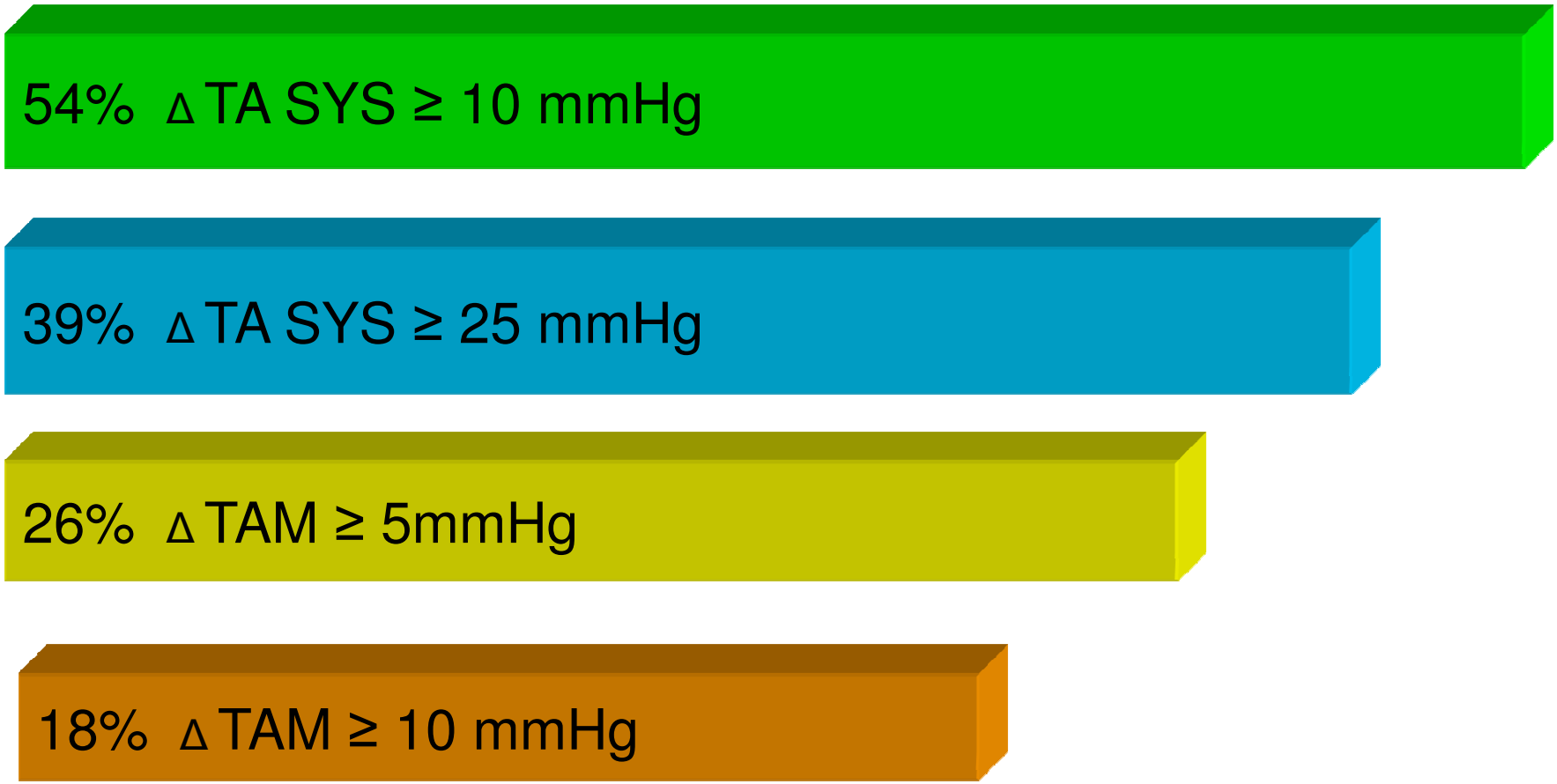
Objectif principal

– Évaluer les facteurs de risque influençant l'apparition d'un gradient artériel fémoral radial en chirurgie cardiaque

- N = 129
- 81♂ vs 48♀

- Pontages coronariens simples (n=26, 20%)
- Chirurgies valvulaires seules (n=33, 26%)
- Chirurgies complexes (n=64, 50%)
- Autres procédures variées (n=5, 4%)

Chirurgies cardiaques avec gradient artériel central - périphérique

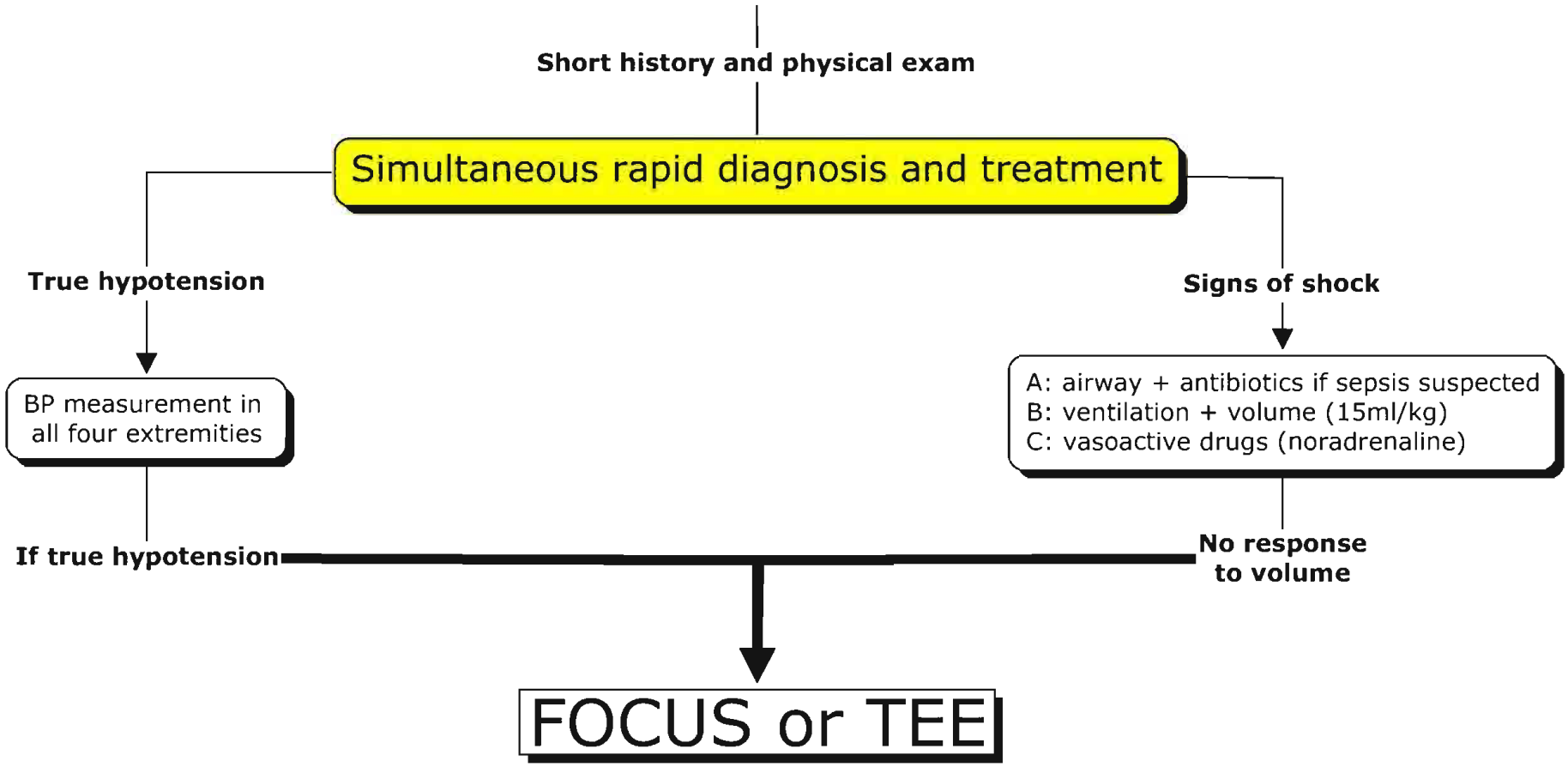


Facteurs de risque

- Poids
- Taille
- Diabète
- FAC VG post CEC normale
- CVP pré CEC

Variable	N	Absence de gradient		Présence de gradient		p
Poids (kg)	129	80.30	±14.428	71.27	±15.954	0.0011
Taille (cm)	129	168.85	±9.6057	163.23	±9.601	0.0012
Diabète	30	22		8		0.0005
FAC VG post CEC	122					0.0418
CVP PRE		16.52	±6.19	13.36	±6.15	0.0099

Hemodynamic instability



Intensive Care Med (2008) 34:243–249
DOI 10.1007/s00134-007-0923-5

CLINICAL COMMENTARY

Antoine Vieillard-Baron
Michel Slama
Bernard Cholley
Gérard Janvier
Philippe Vignon

Echocardiography in the intensive care unit: from evolution to revolution?

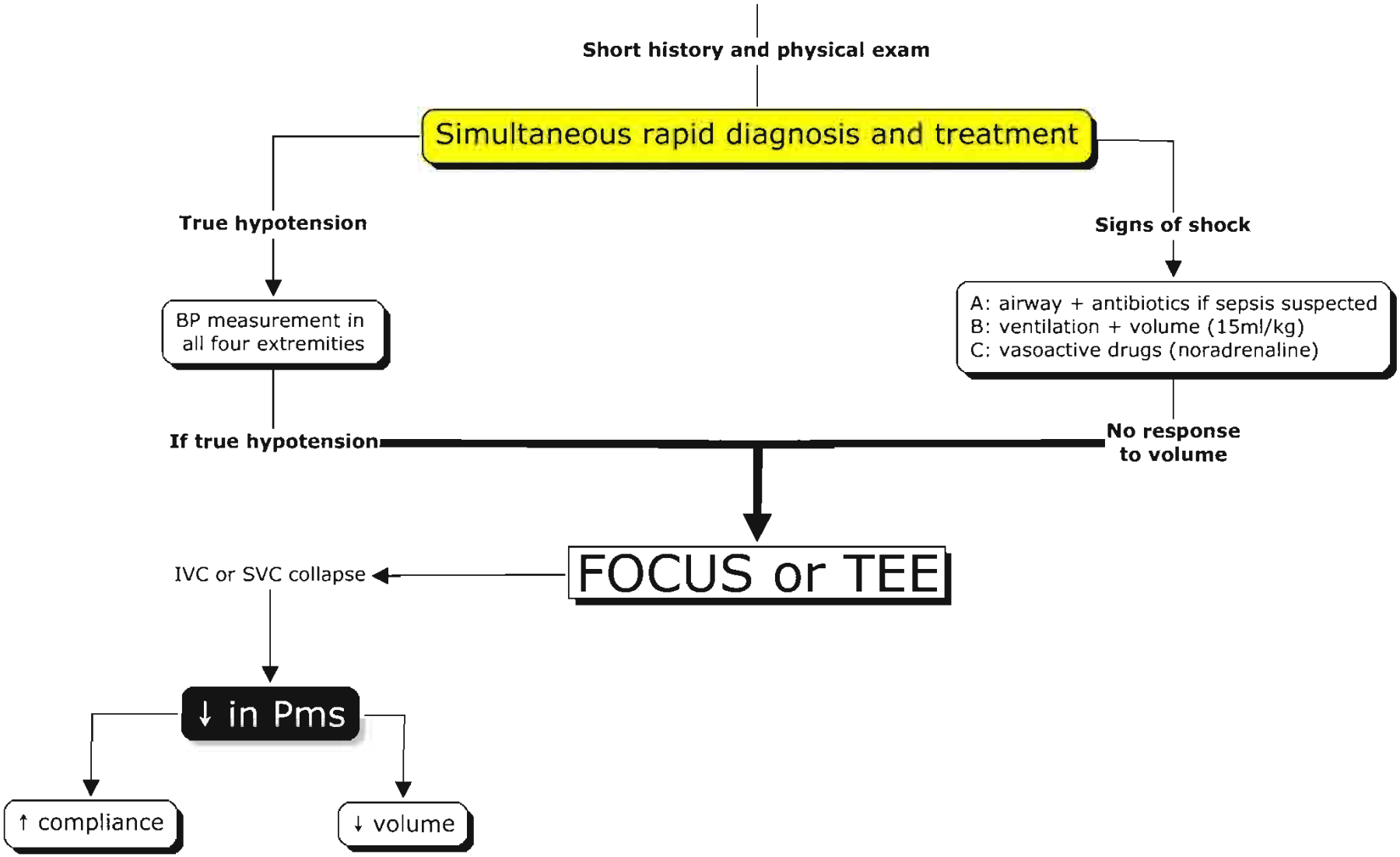
CHEST Consensus Statement

American College of Chest Physicians/ La Société de Réanimation de Langue Française Statement on Competence in Critical Care Ultrasonography*

Paul H. Mayo, MD; Yannick Beaulieu, MD; Peter Doelken, MD; David Feller-Kopman, MD; Christopher Harrod, MS; Adolfo Kaplan, MD; John Oropello, MD; Antoine Vieillard-Baron, MD; Olivier Axler, MD; Daniel Lichtenstein, MD; Eric Maury, MD; Michel Slama, MD; and Philippe Vignon, MD

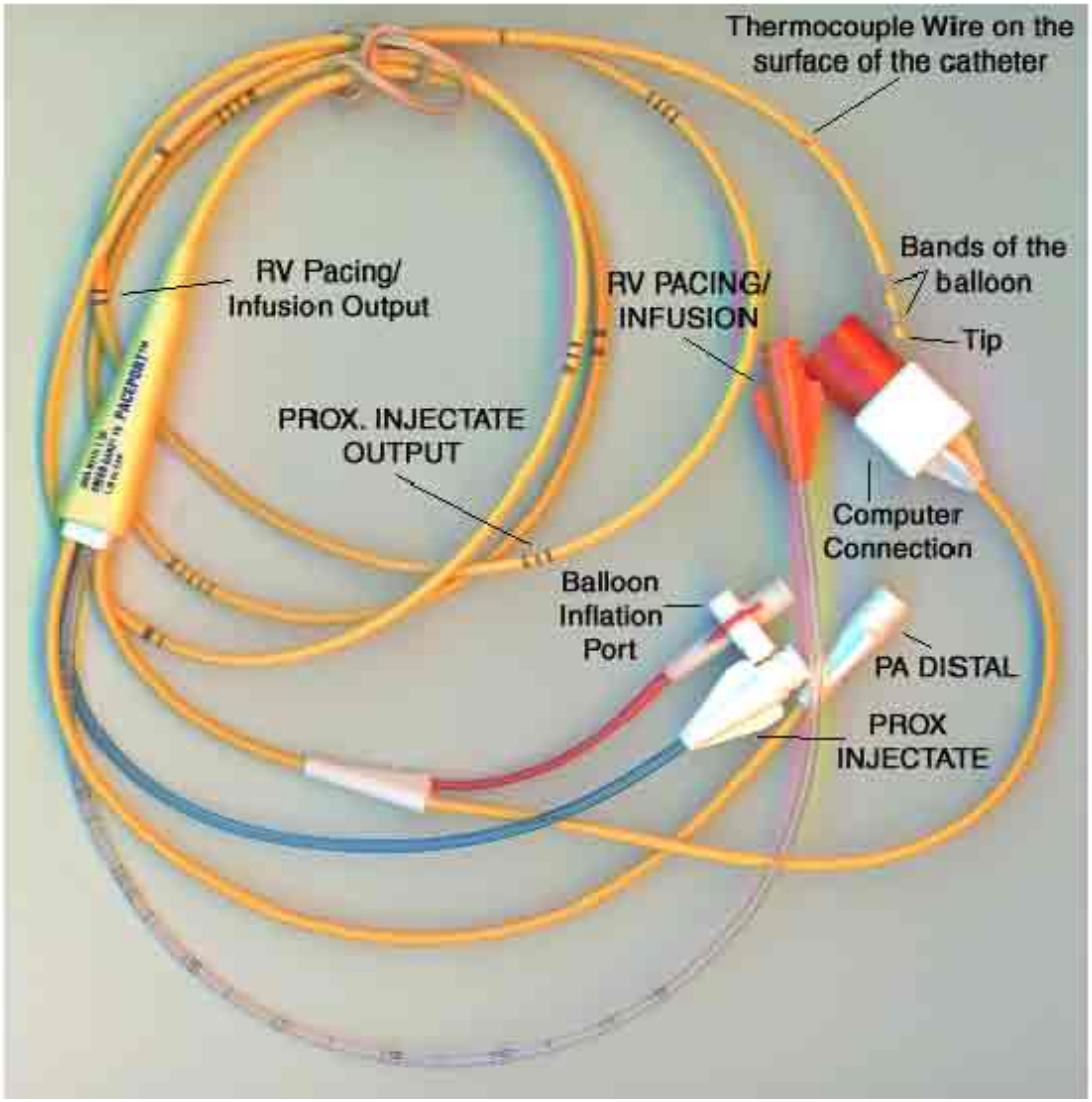
(CHEST 2009; 135:1050–1060)

Hemodynamic instability



Prédiction de la réponse au volume par l'analyse des courbes de TVC, de PCPB et de pression diastolique du ventricule droit chez des patients de chirurgie cardiaque

Sébastien Roy RIV
Université de Montréal
Mars 2004


Thermocouple Wire on the surface of the catheter
RV Pacing/ Infusion Output
RV PACING/ INFUSION
Bands of the balloon
Tip
PROX. INJECTATE OUTPUT
Computer Connection
Balloon Inflation Port
PA DISTAL
PROX INJECTATE

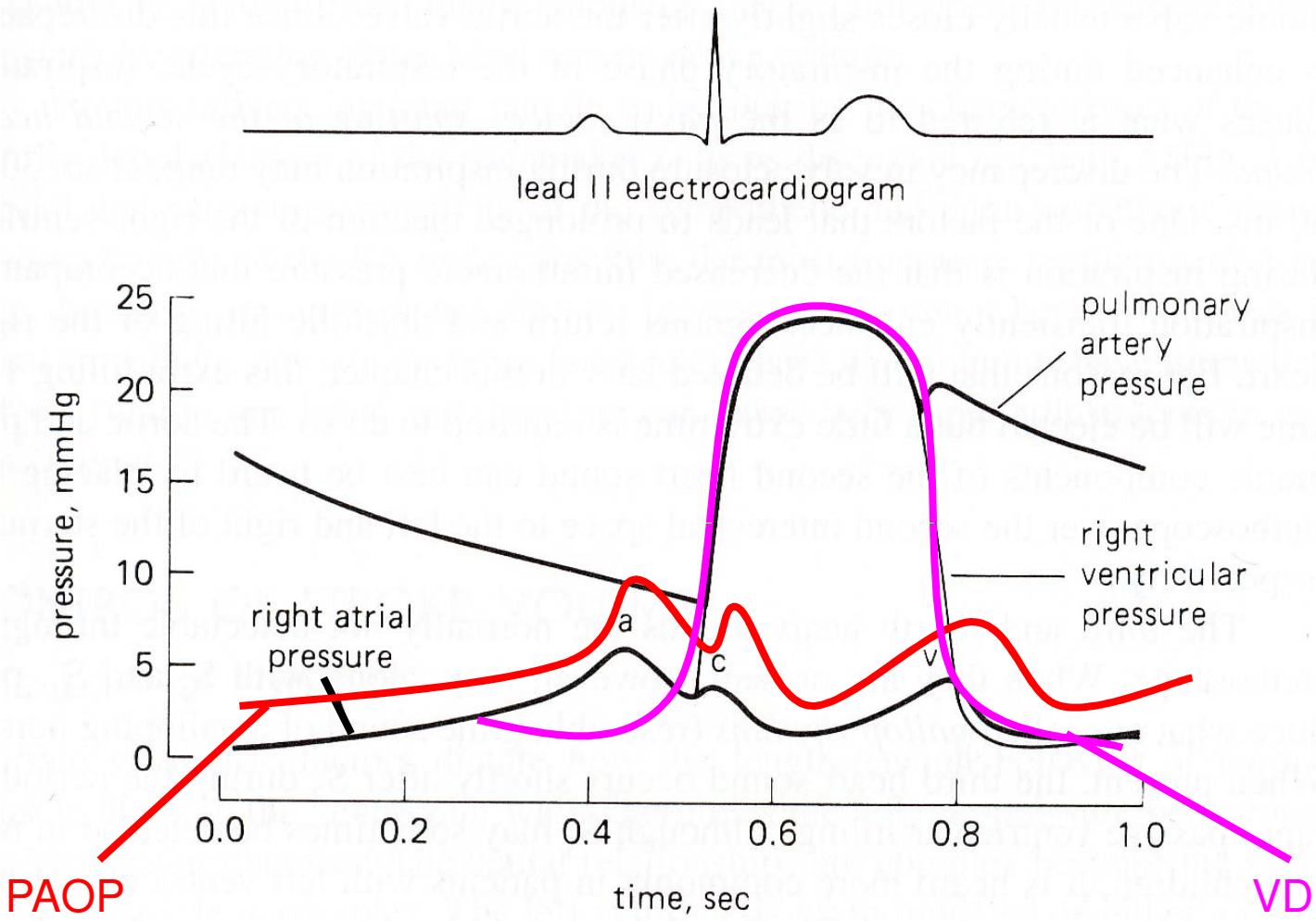
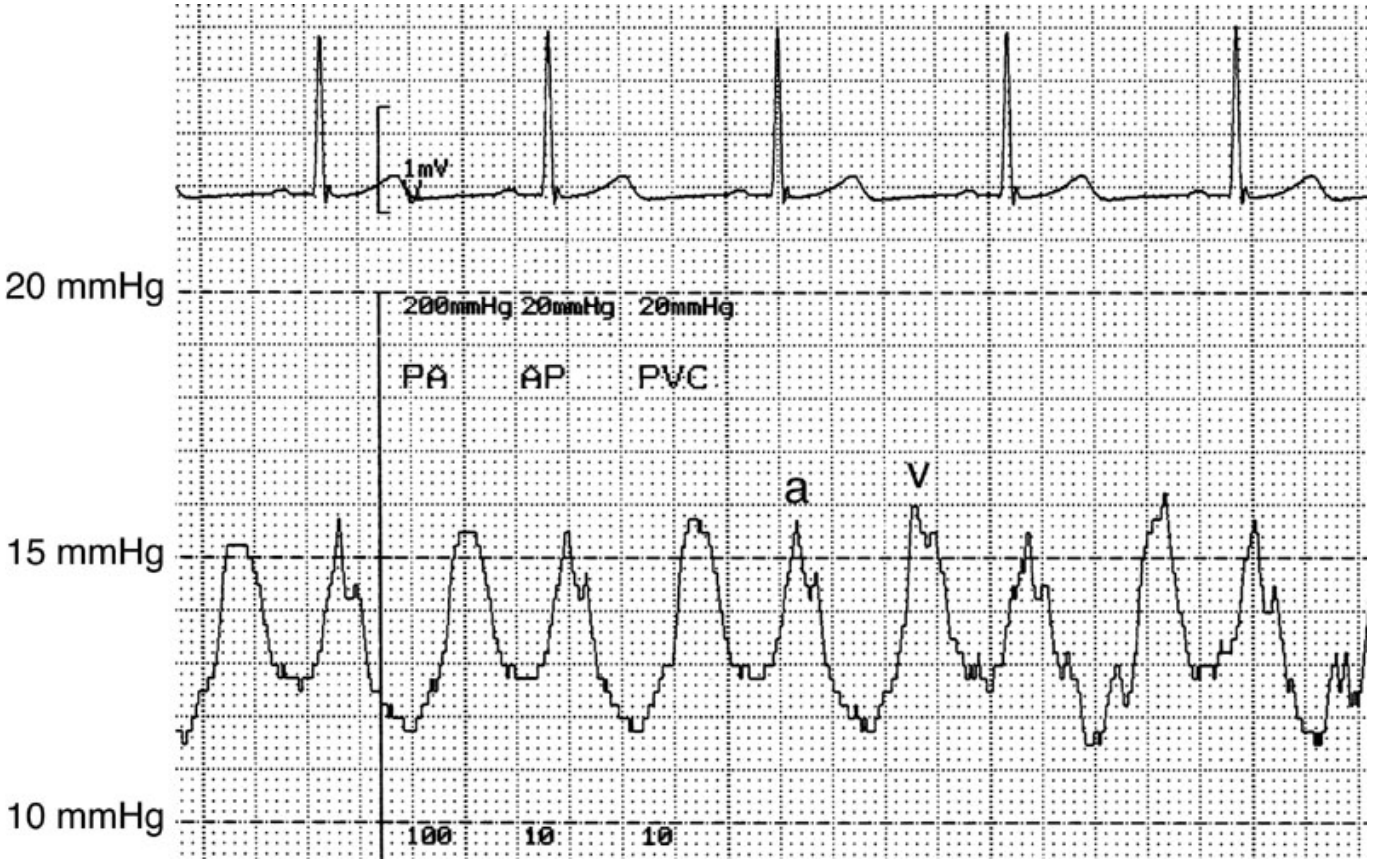


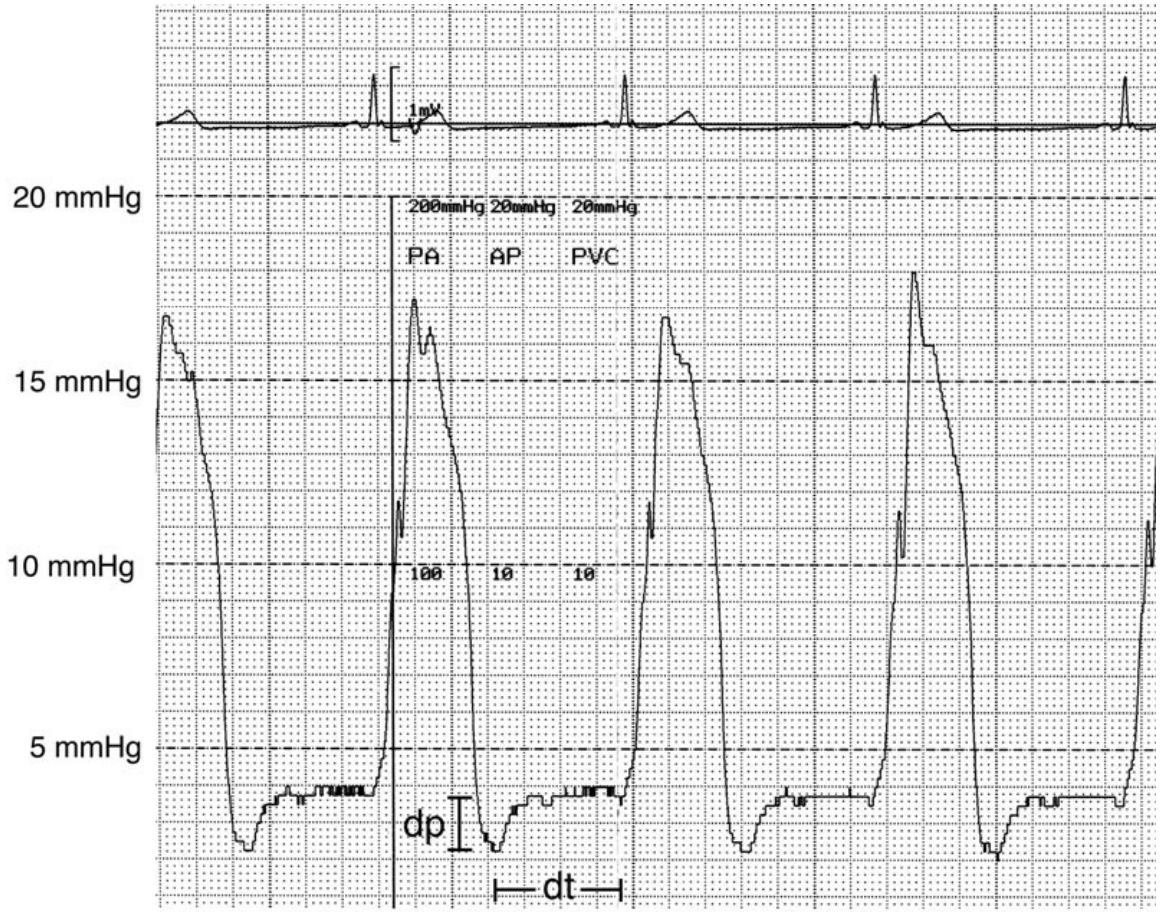
Figure 4-2 Cardiac cycle—right heart.

Courbe de PCPB : exemple d'un répondeur

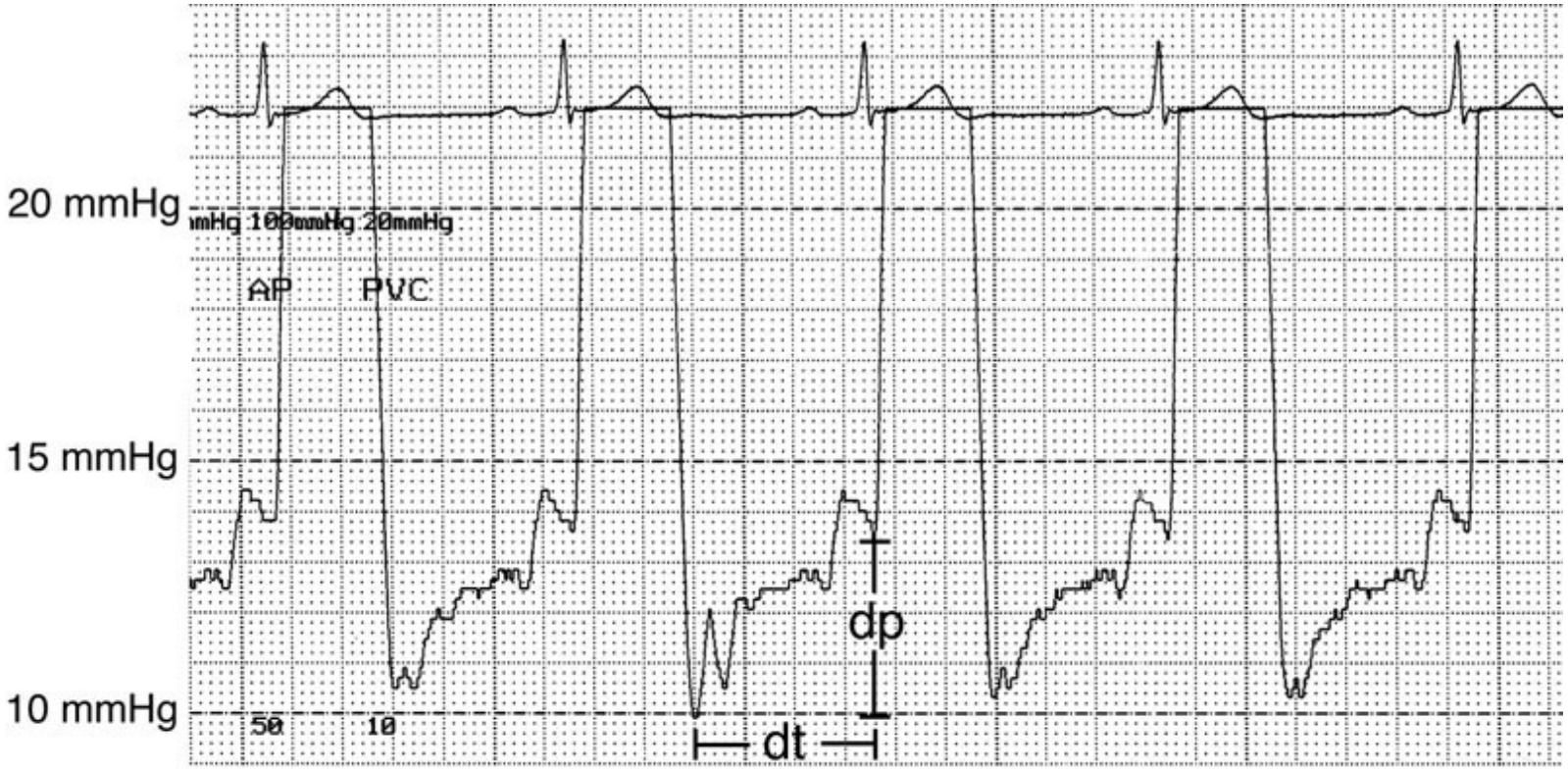
Courbe de PCPB : exemple d'un non répondeur



Courbe du VD : exemple d'un répondeur



Courbe du VD : exemple d'un non répondeur



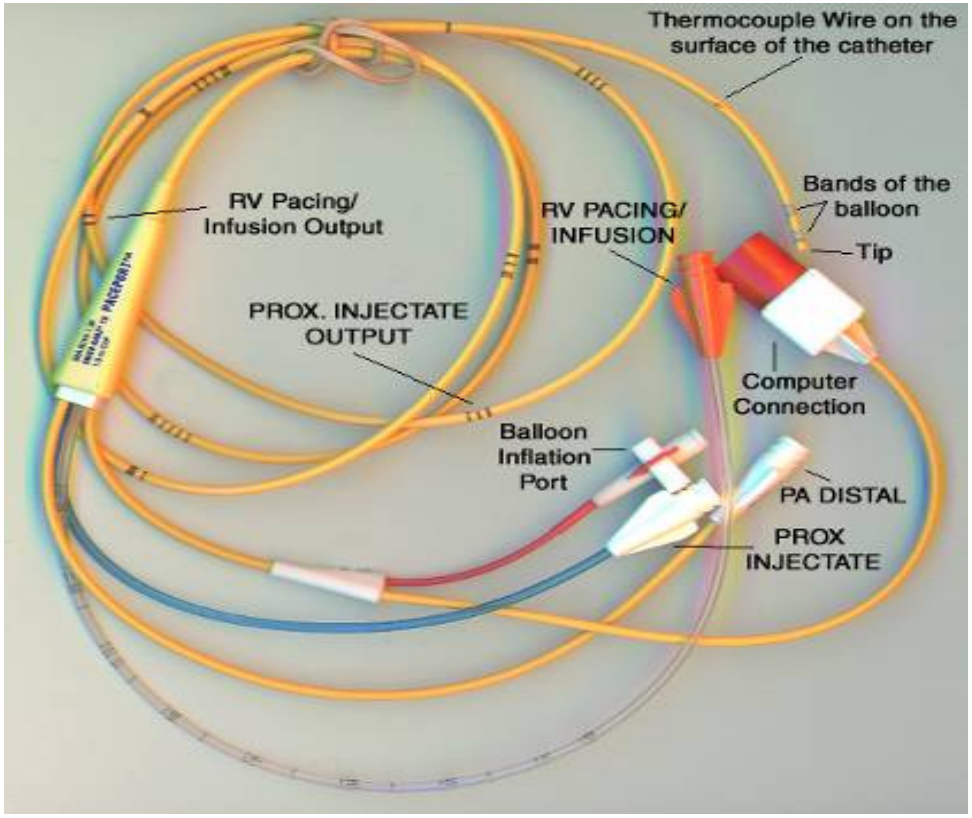
Résultats pour les courbes de TVC et PCPB

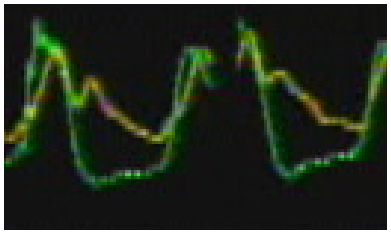
Paramètres	Répondeurs (N = 24)	Non répondeurs (N = 14)	p
Δ VE post bolus (%)	33 ± 16	8 ± 6	< 0,0001
TVC (mm Hg)	9 ± 3	9 ± 3	0,6
PCPB (mm Hg)	11 ± 3	12 ± 3	0,57
Ratio a/v de TVC	1,16 ± 0,14	1,18 ± 0,09	0,67
Ratio a/v de PCPB	1,07 ± 0,07	0,96 ± 0,1	0,0001
dp VD/RR (mm Hg/s)	1,96 ± 0,83	2,68 ± 1,06	0,03

Prédiction de la réponse au volume si le ratio a/v de la courbe de PCPB est > 1 avant bolus	
Sensibilité	83 %
Spécificité	79 %
Valeur prédictive positive	87 %
Valeur prédictive négative	73 %

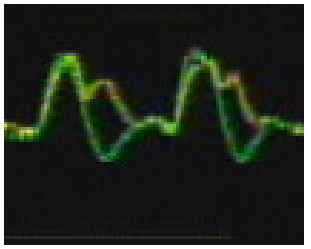
Conclusions

- Ces résultats soulignent l'importance d'analyser les tendances et les courbes obtenues avec un catheter de Swan-Ganz et non seulement d'utiliser les valeurs absolues des pressions dans la détermination de la réponse au volume

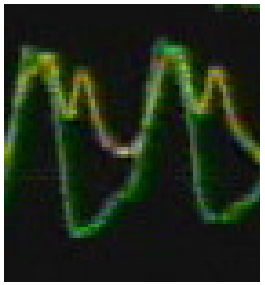


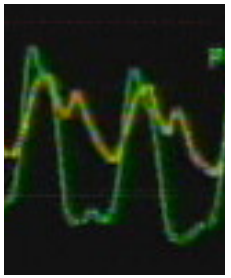


Post-CPB



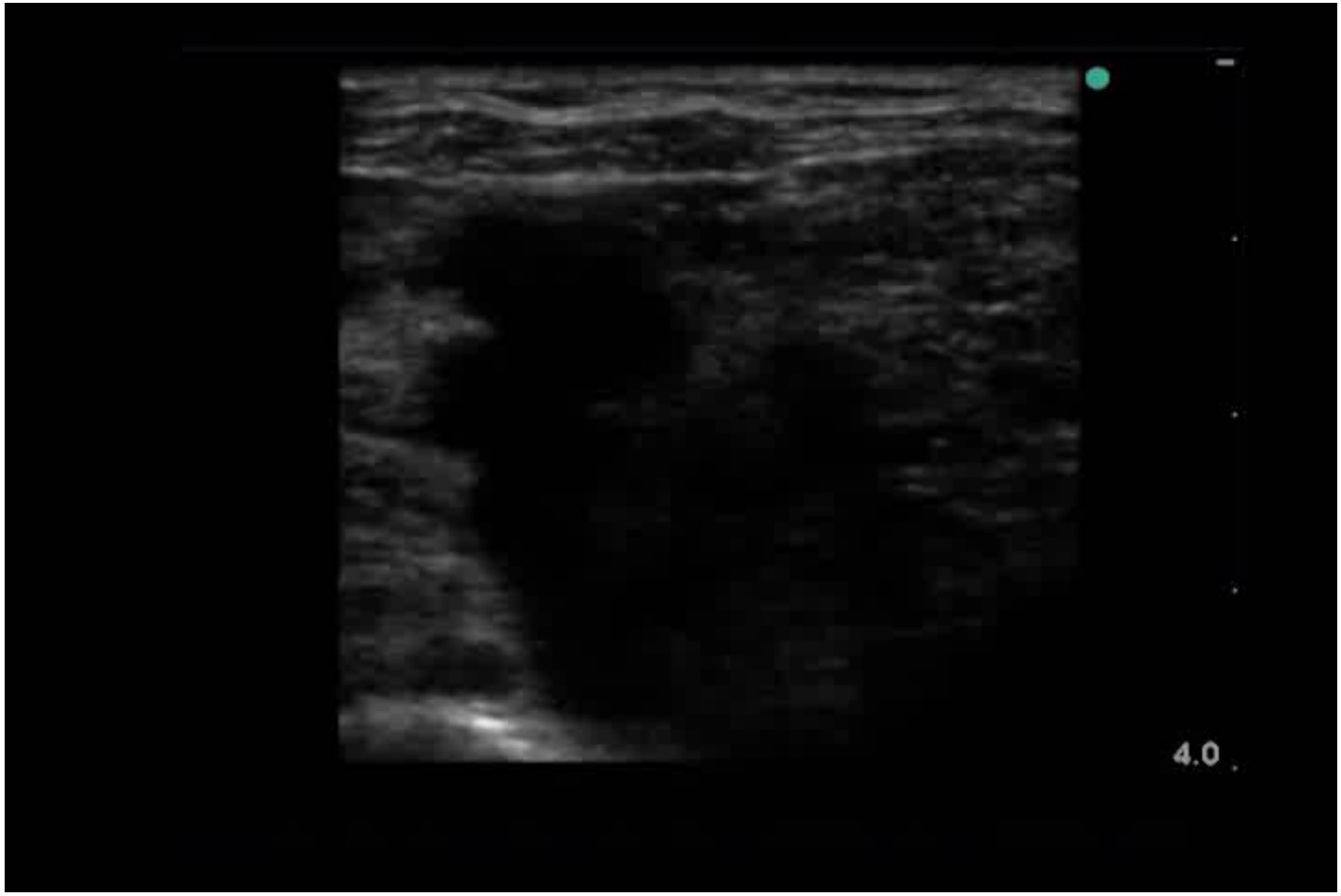
Unstable



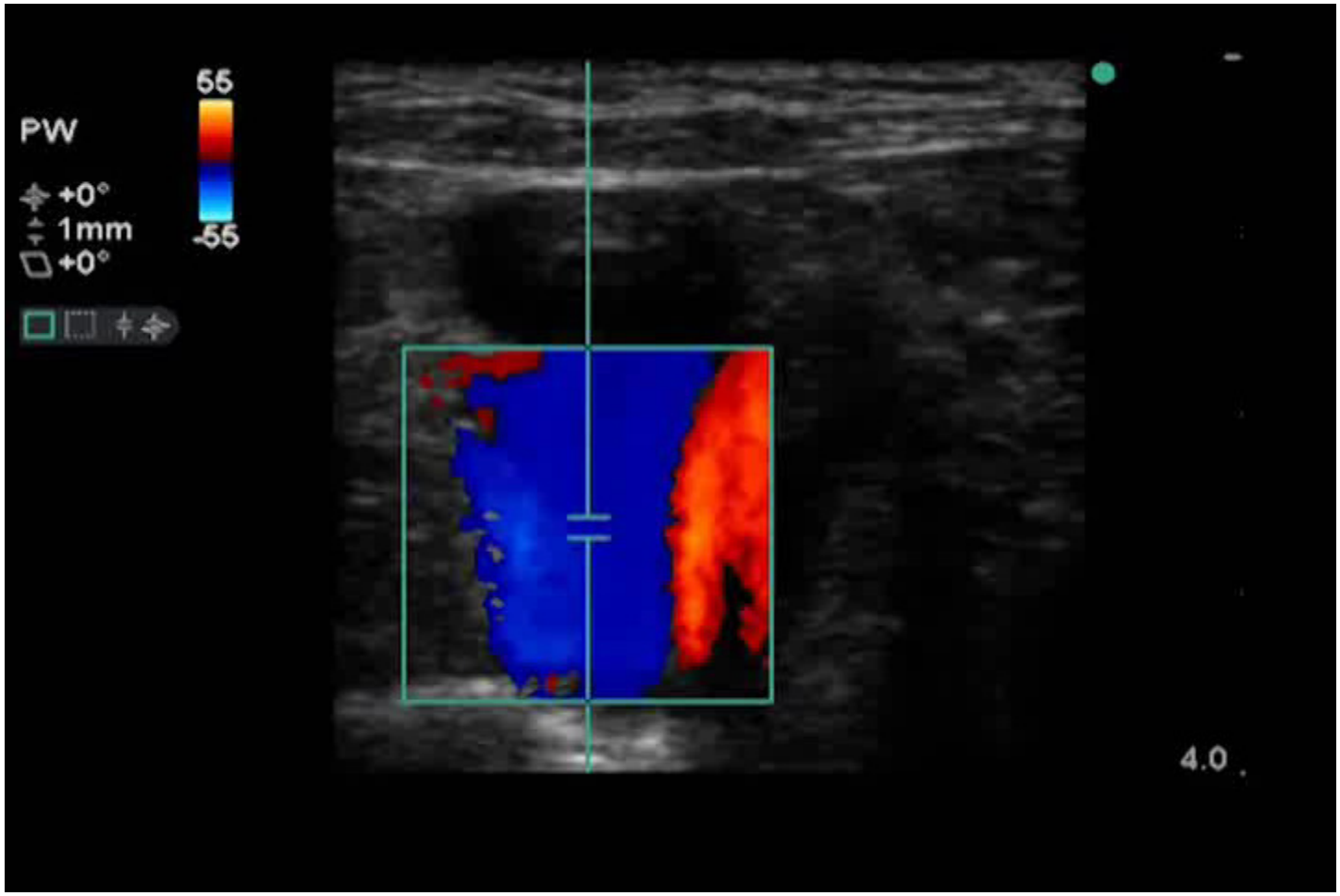


Inhaled milrinone

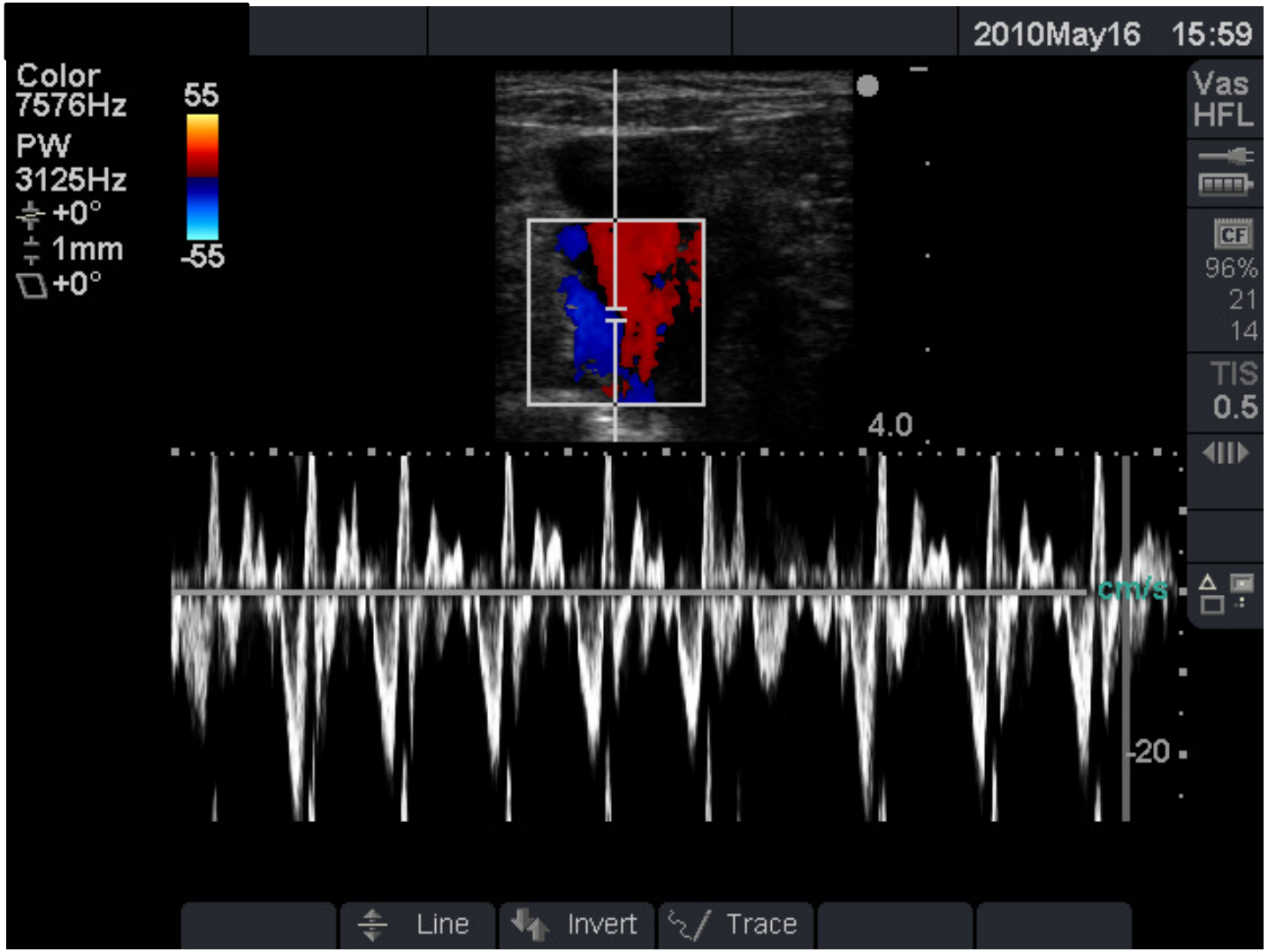
Examen jugulaire interne



Examen jugulaire interne: Doppler couleur

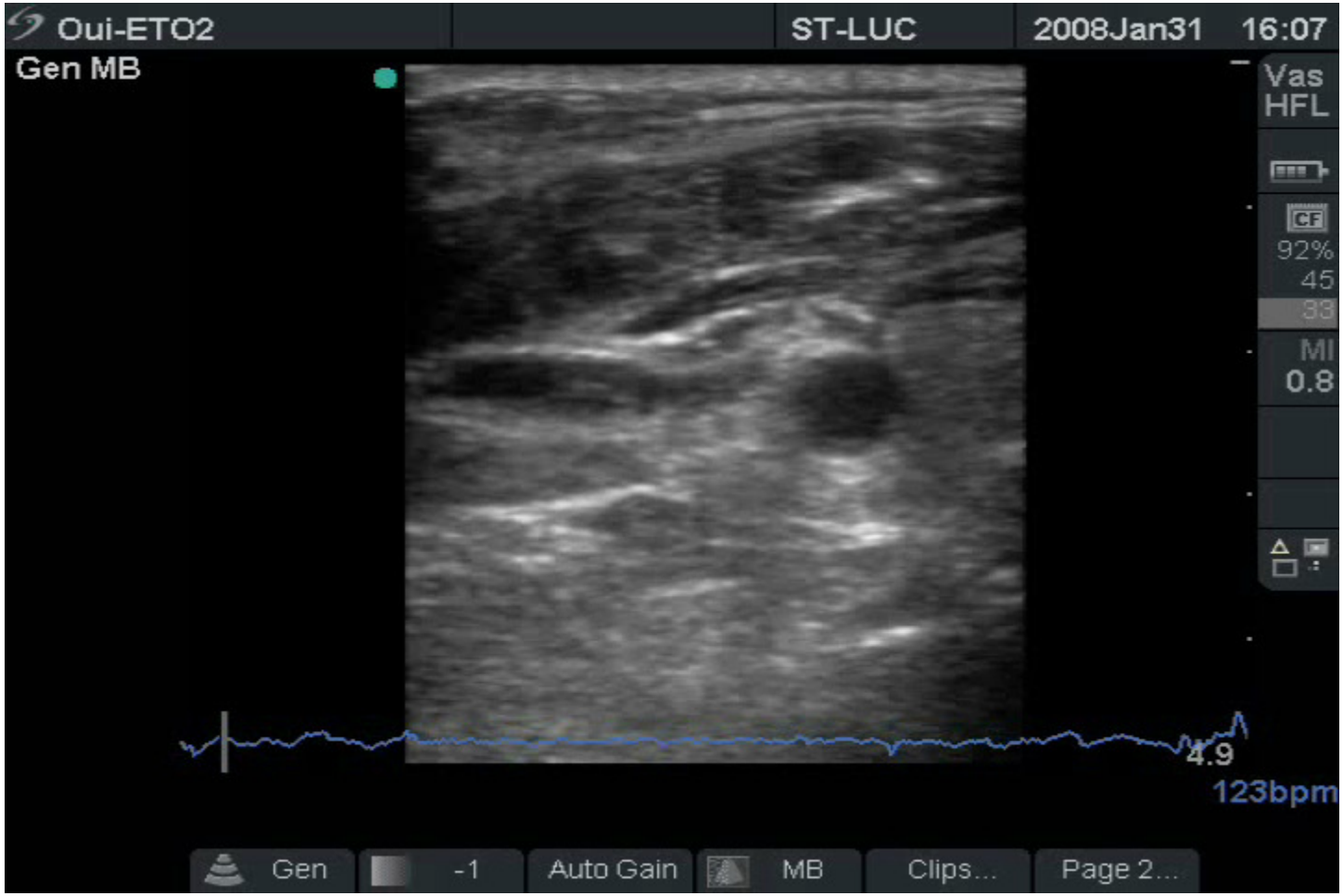


Examen jugulaire interne: Doppler pulsé

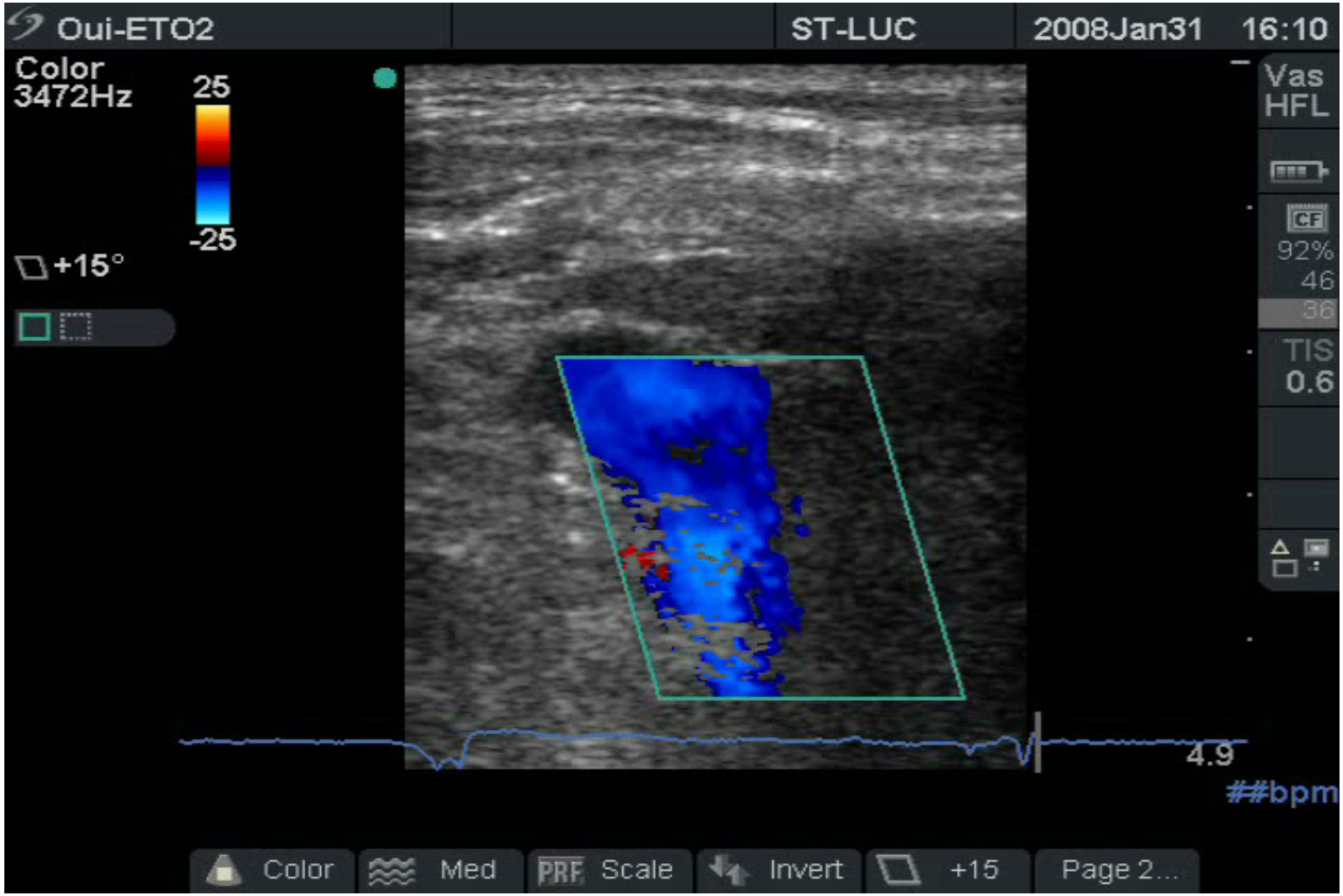


7 jours plus tard: redevient instable et fébrile: candidémie

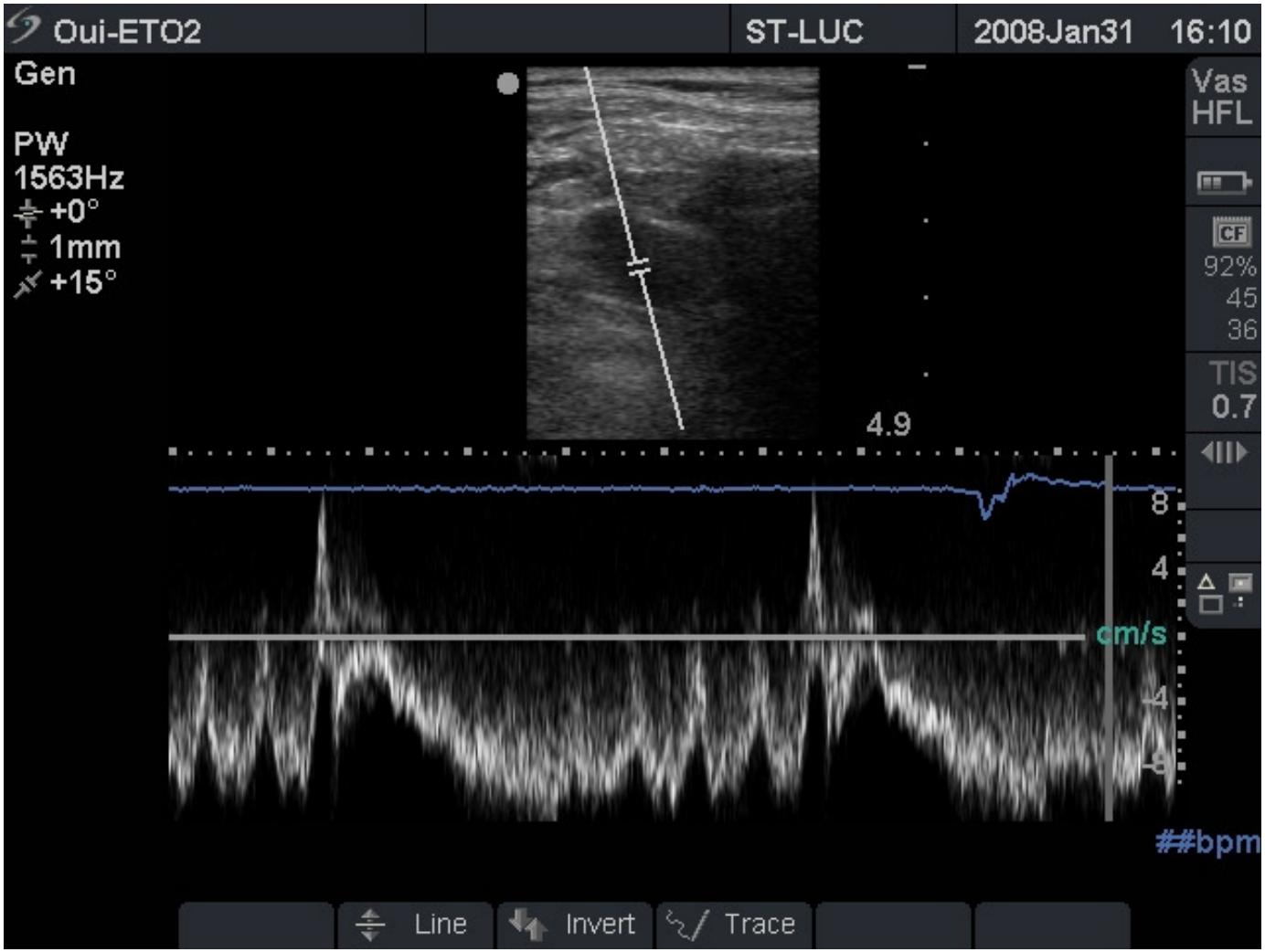
Jugulaire interne droite



Doppler couleur

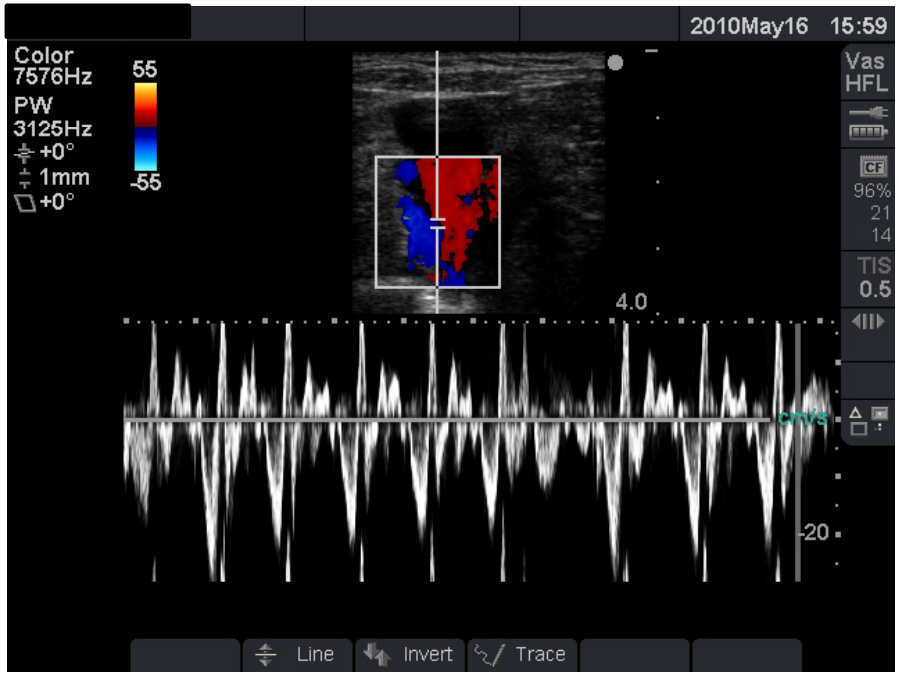


Mode M

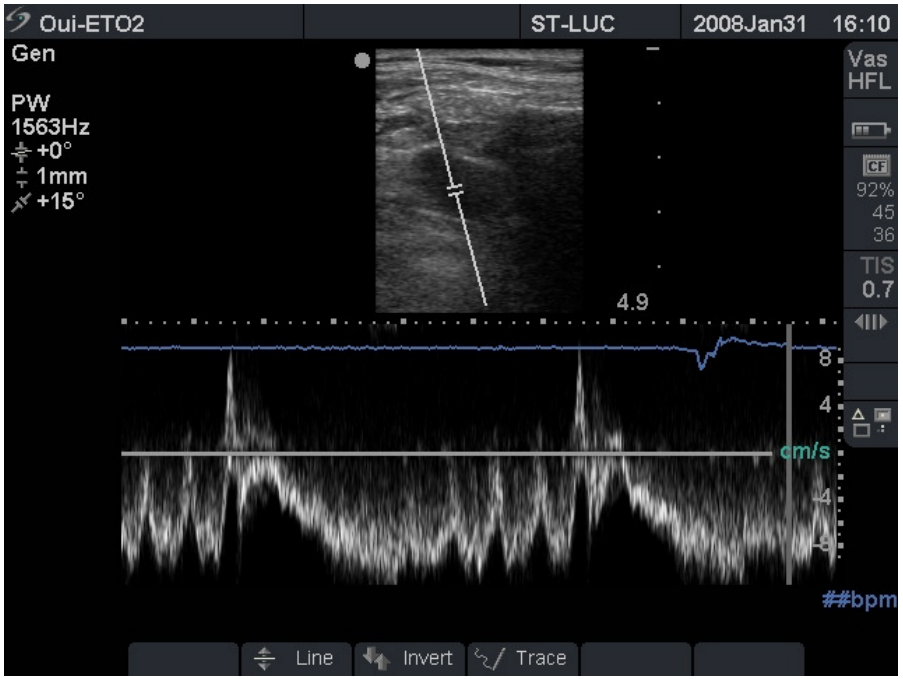

Oui-ETO2
ST-LUC
2008Jan31 16:10
Gen
PW
1563Hz
+0°
1mm
+15°
Vas
HFL
CF
92%
45
36
TIS
0.7
4.9
8
4
cm/s
-4
-8
##bpm
Line
Invert
Trace

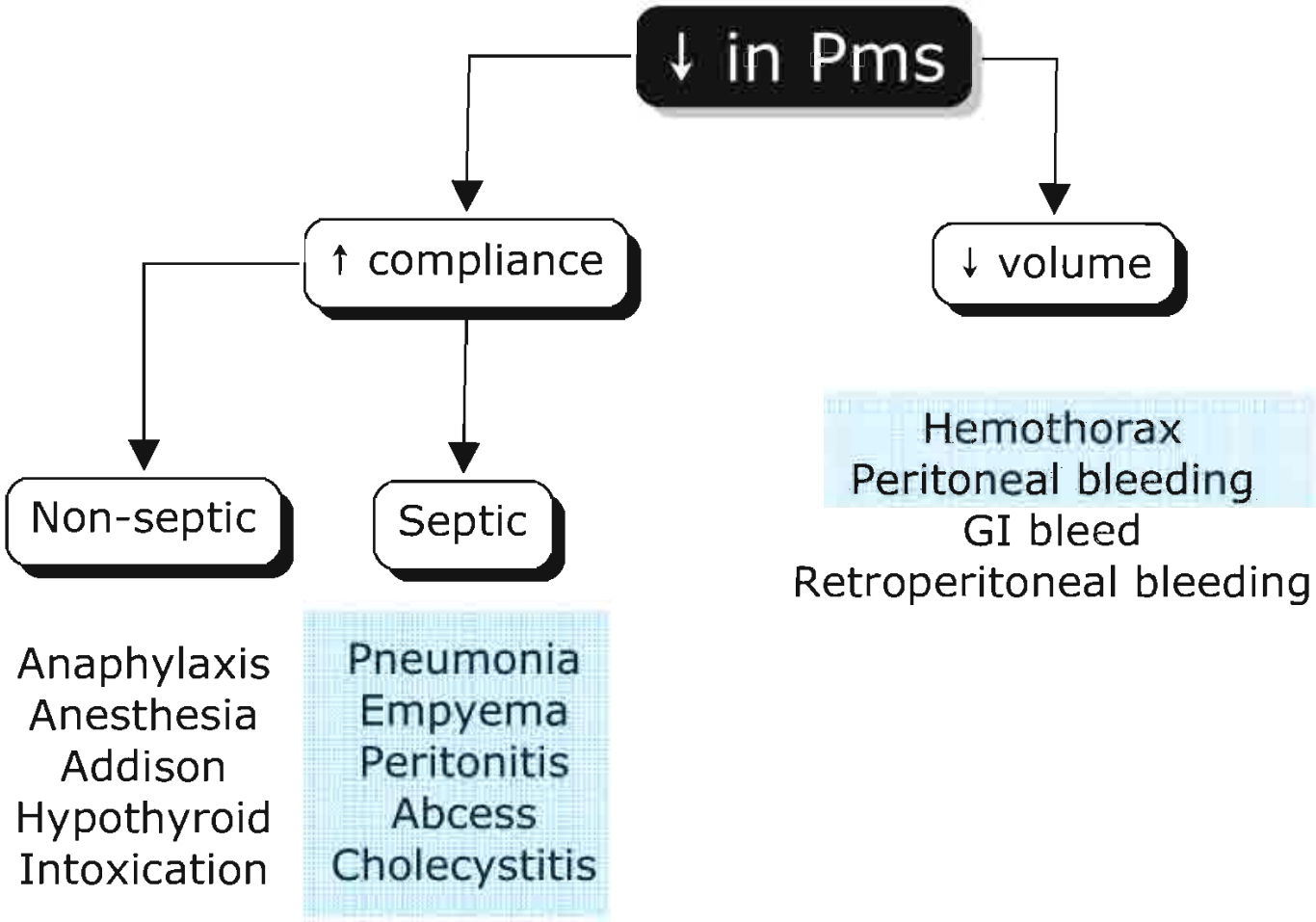
Réponse au volume

Moins importante

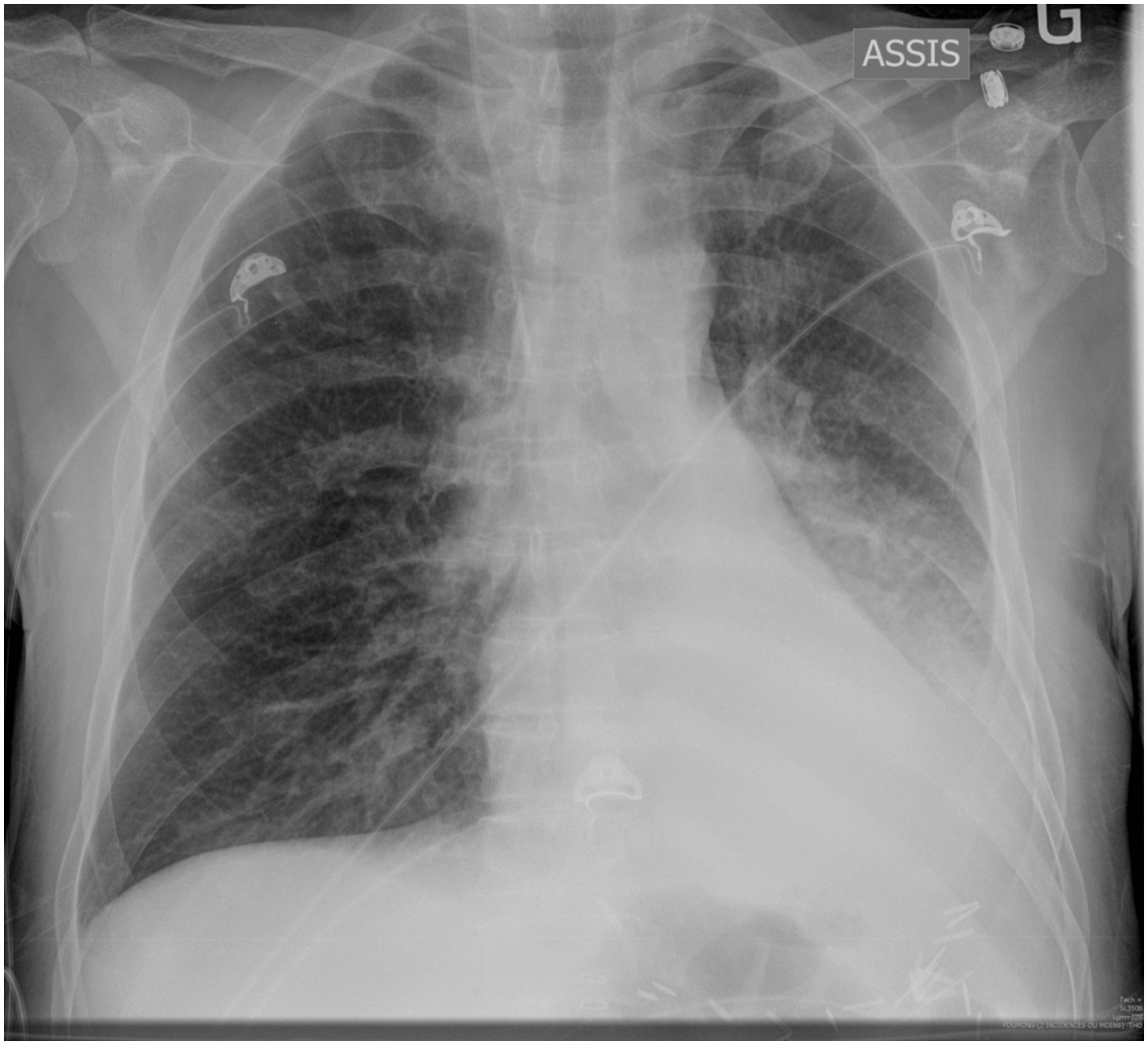


Plus importante

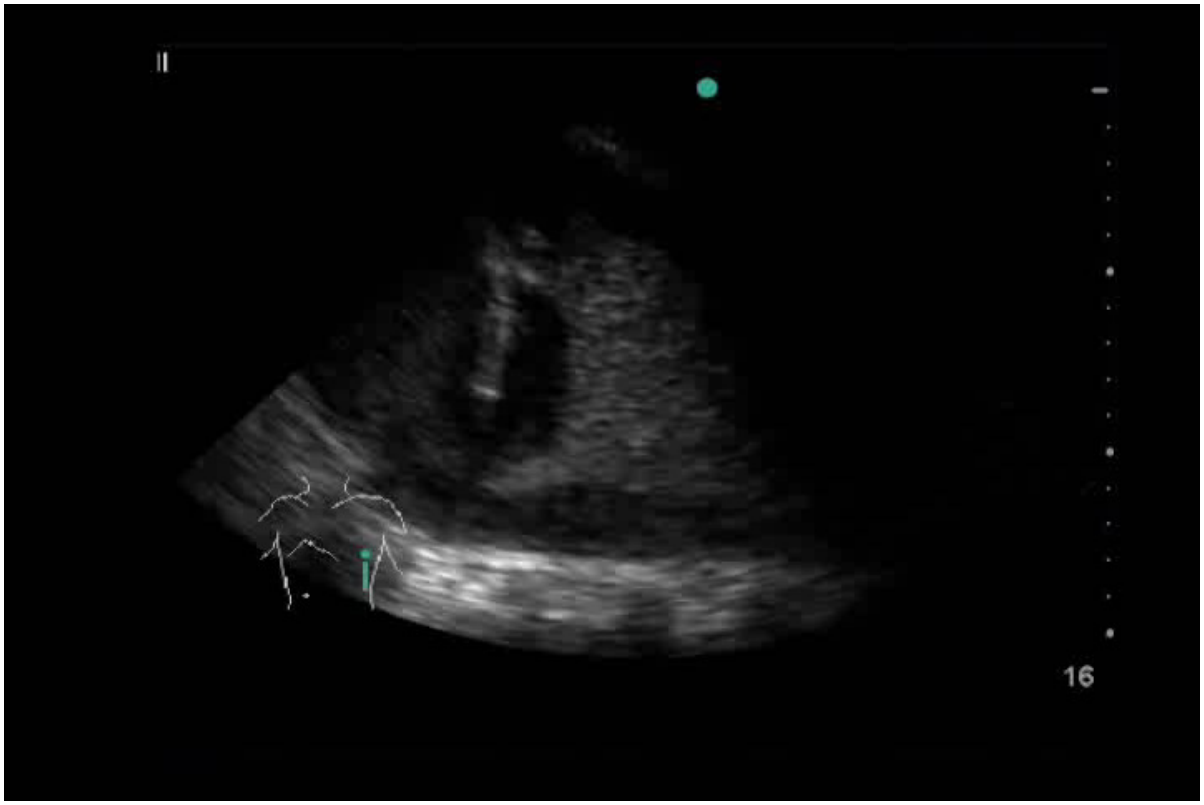



↓ in Pms
↑ compliance
↓ volume
Non-septic
Septic
Hemothorax
Peritoneal bleeding
GI bleed
Retroperitoneal bleeding
Anaphylaxis
Anesthesia
Addison
Hypothyroid
Intoxication
Pneumonia
Empyema
Peritonitis
Abcess
Cholecystitis

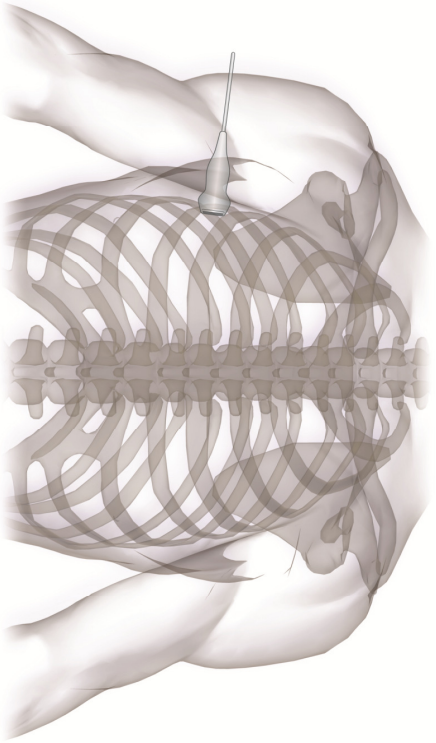
Atélectasie ou pneumonie?



Atélectasie ou pneumonie?

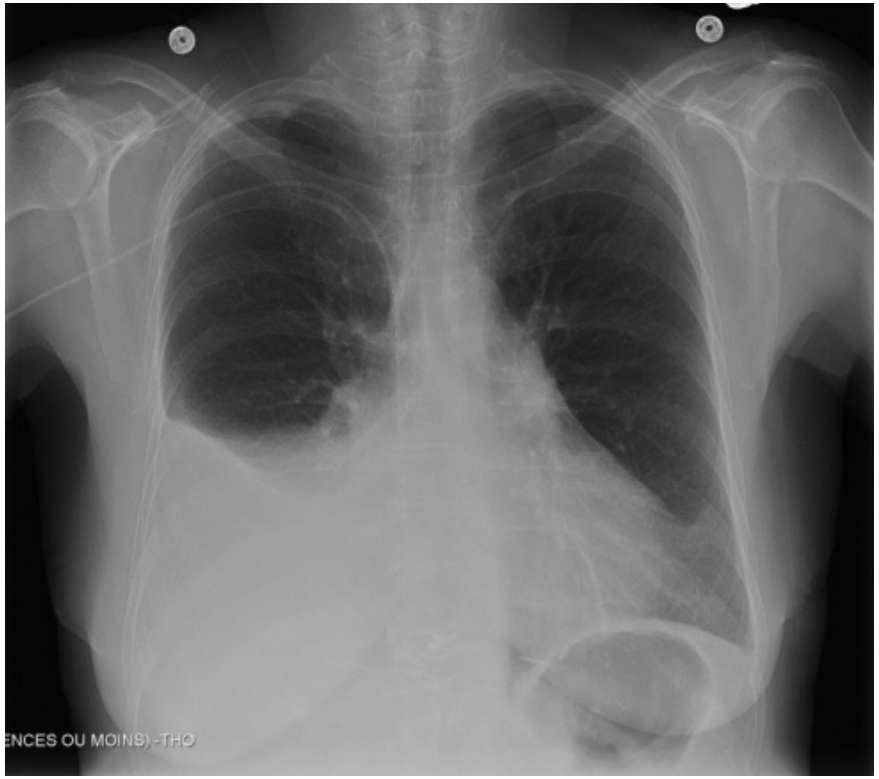


Thorax droit

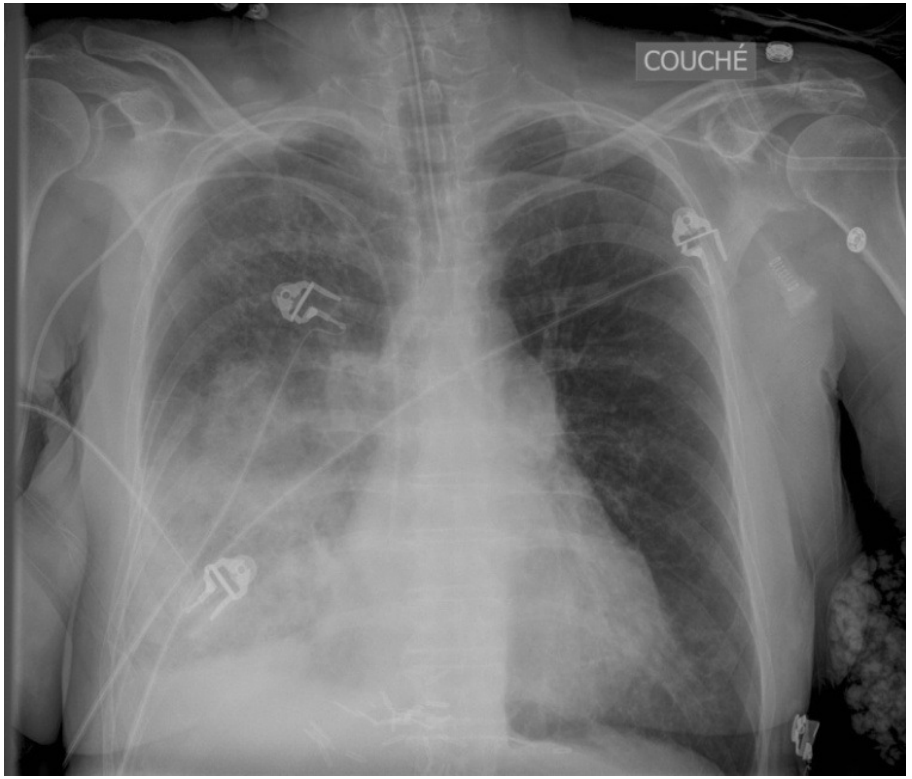


♀ de 58 ans instable après greffe hépatique

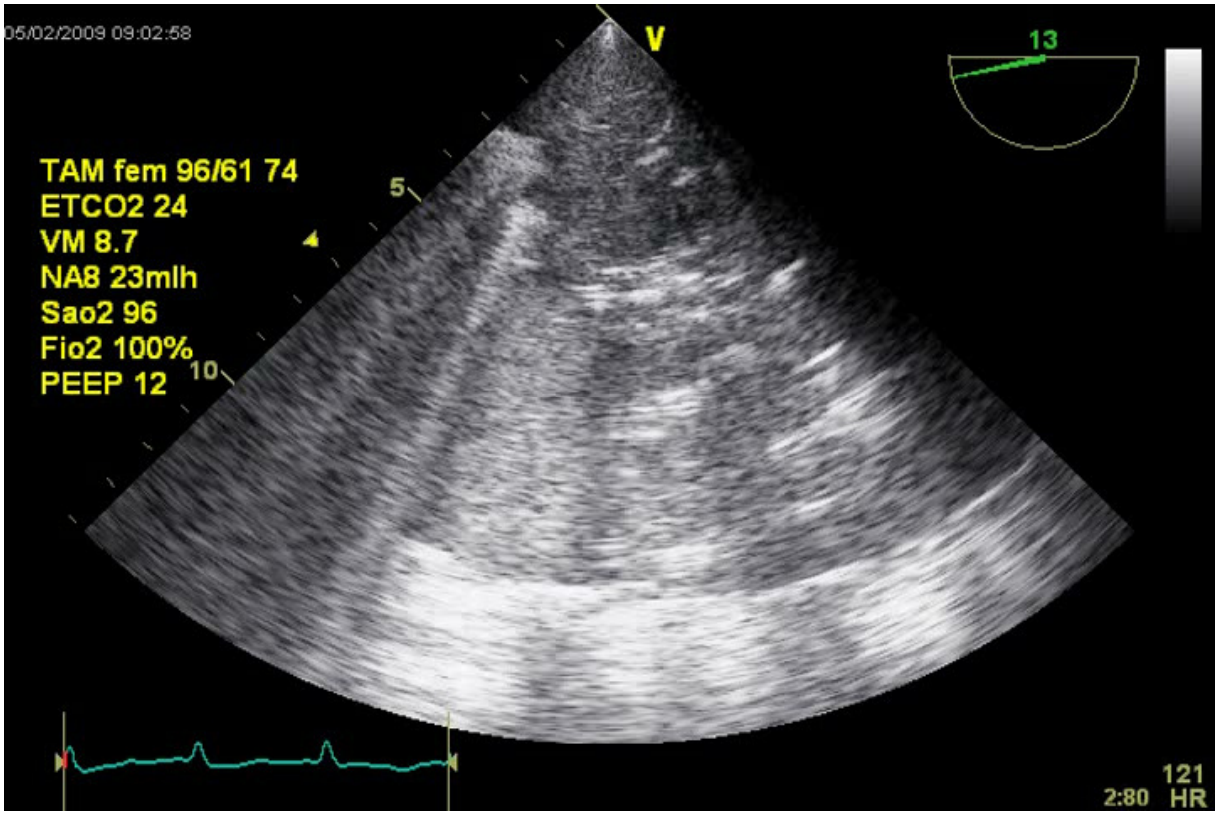
Avant l'épisode

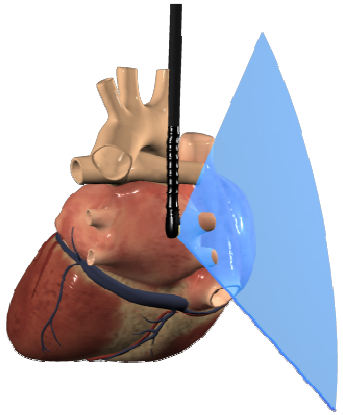


Pendant l'épisode

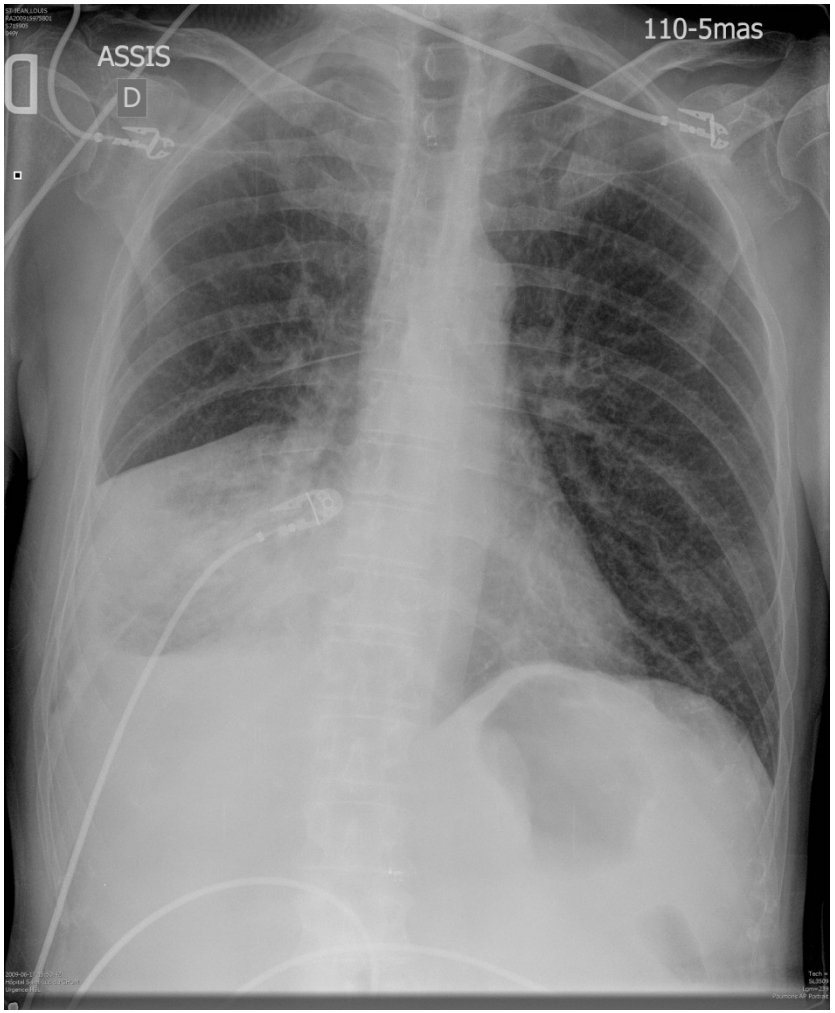


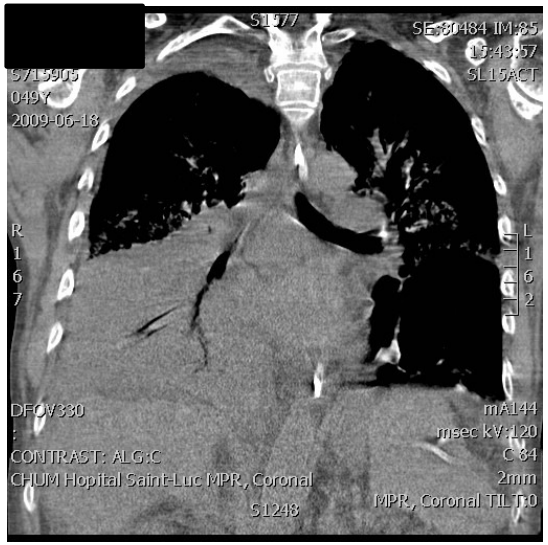
♀ de 58 ans instable après greffe hépatique

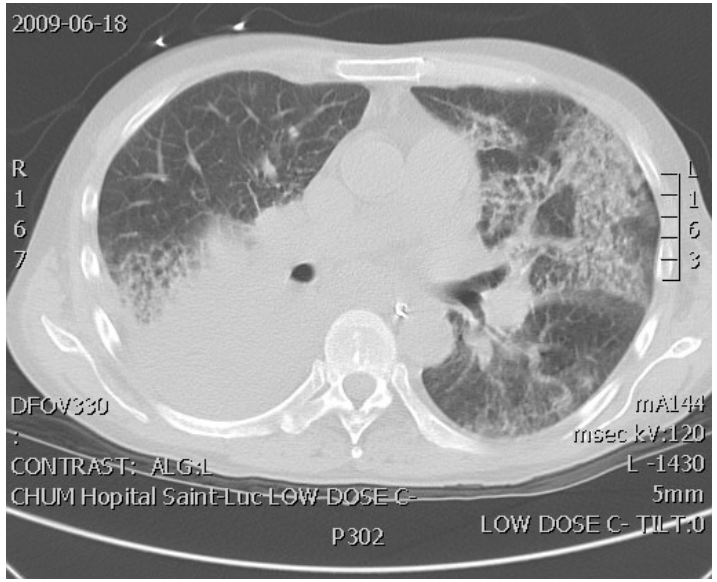




♂ 49 ans fièvre à l'urgence

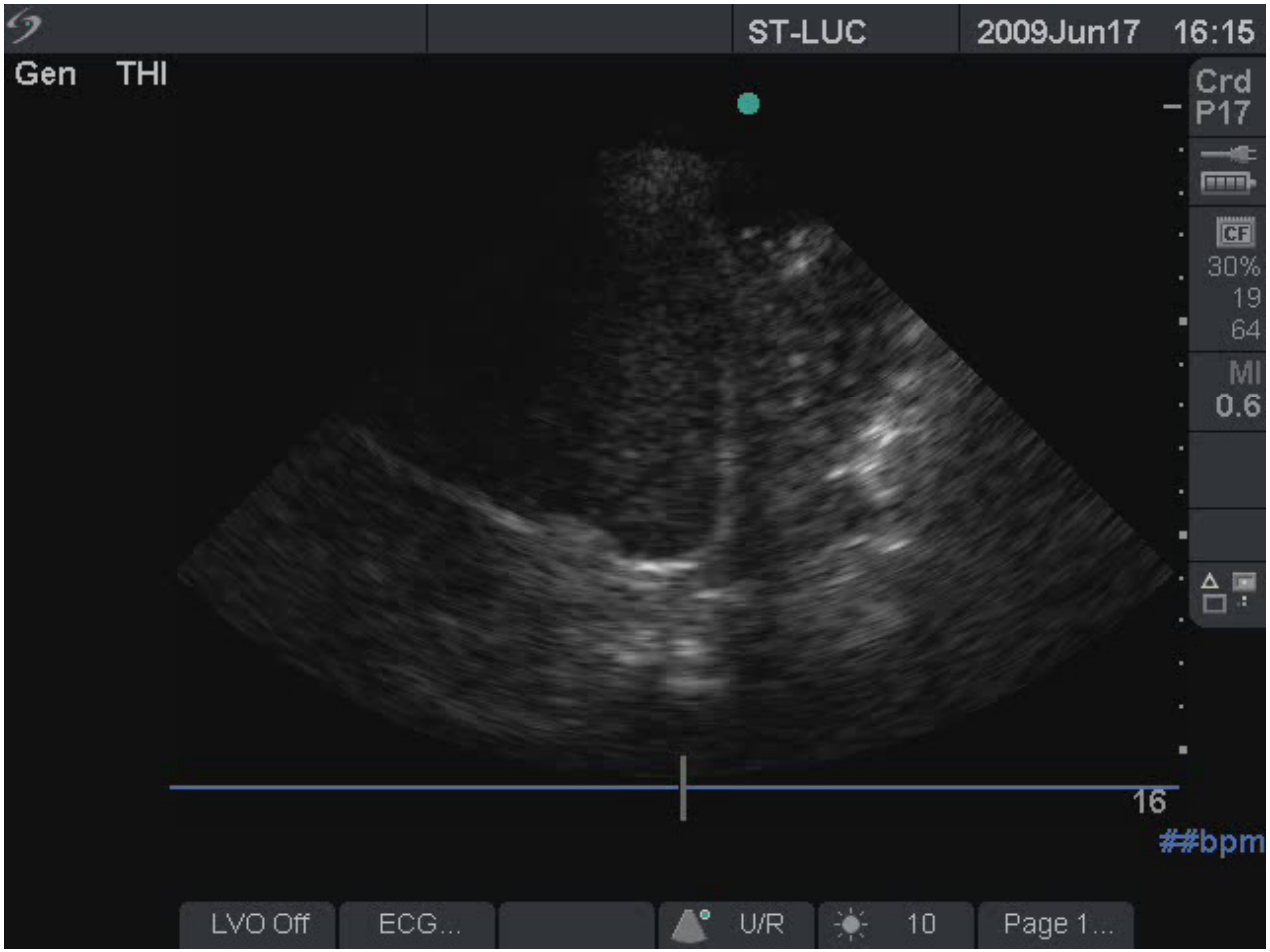




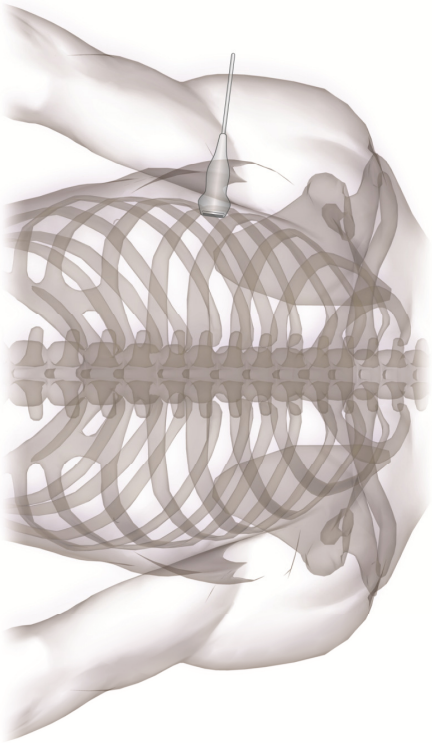


♂ 49 ans fièvre à l'urgence:

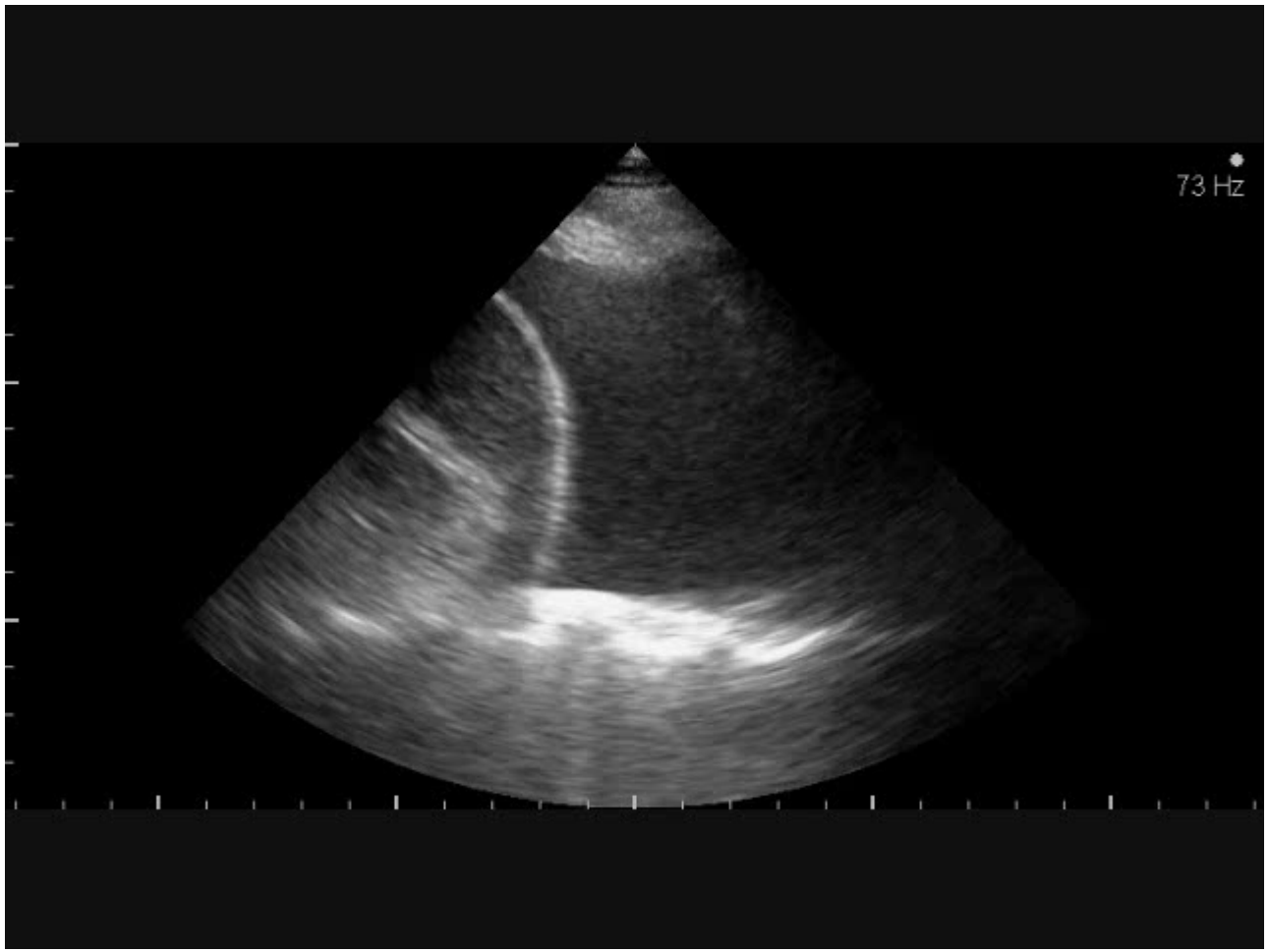
culture positive de sang: pneumococcus pneumonia



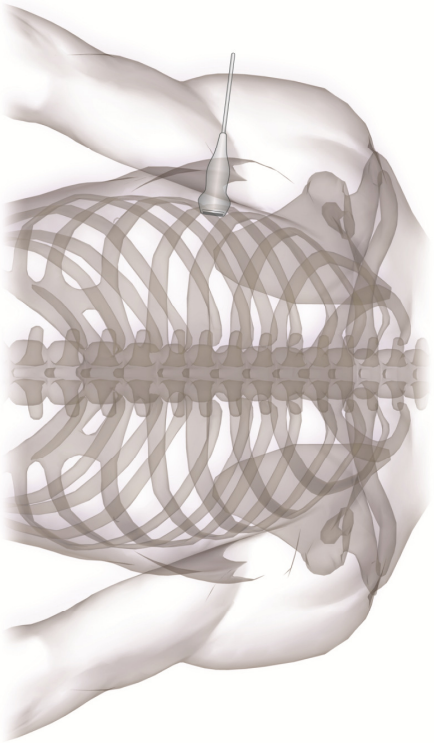
Thorax droit



Aspect de l'épanchement pleural

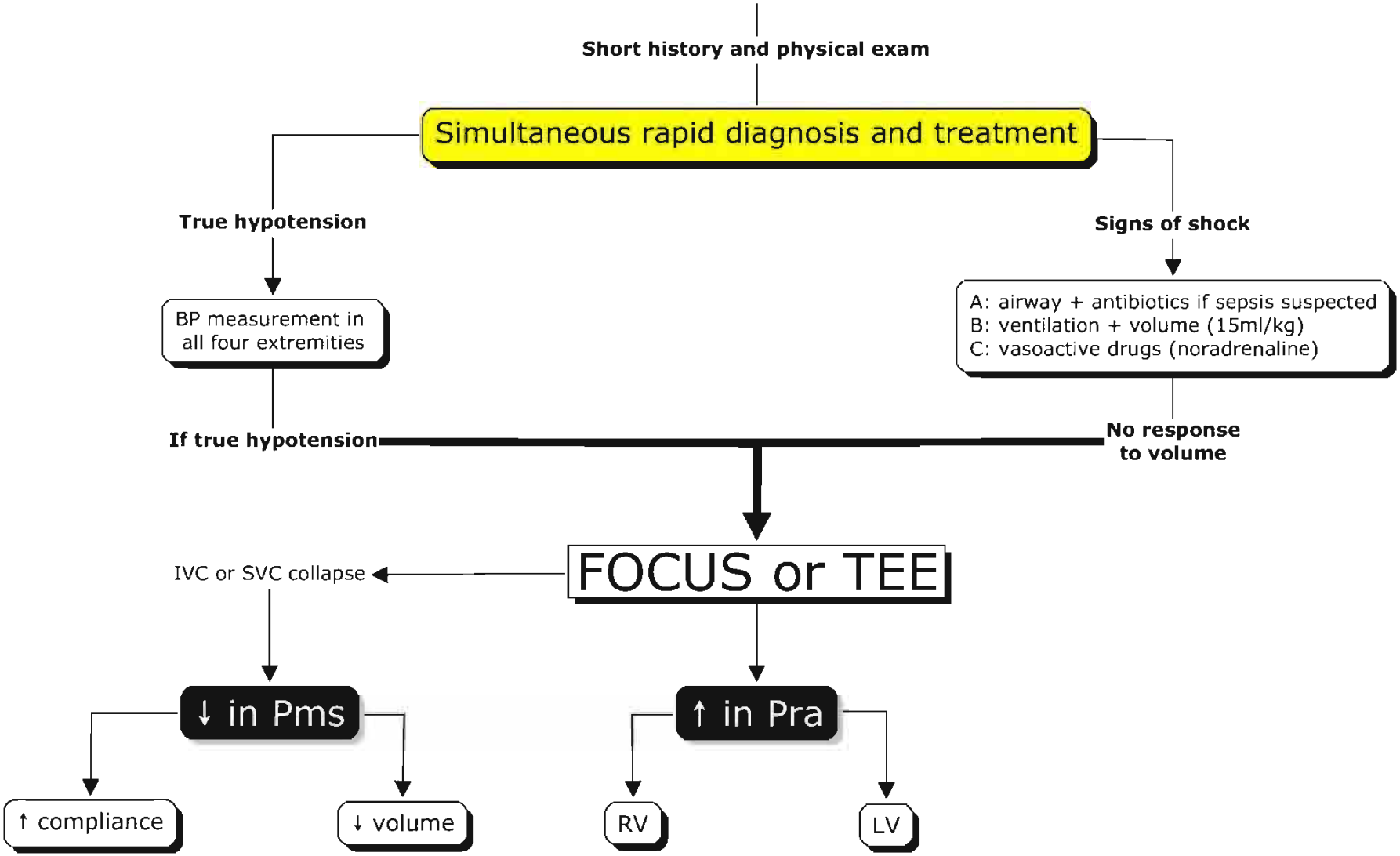


Thorax droit



Courtoisie de Philippe Rola

Hemodynamic instability

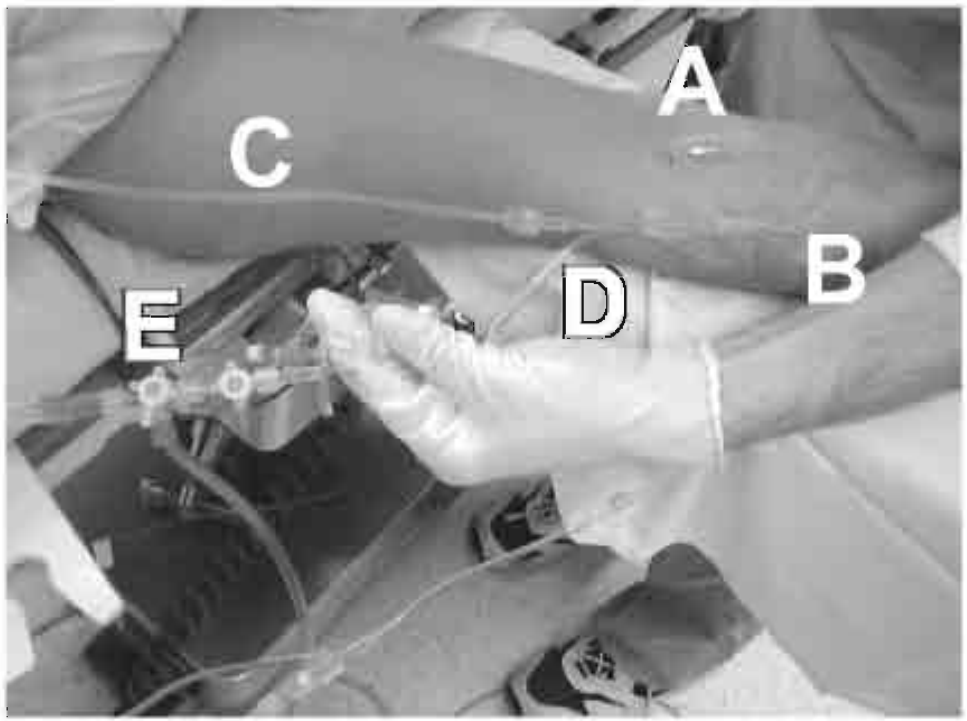


Intensive Care Med (2004) 30:627–632
DOI 10.1007/s00134-003-2052-0

ORIGINAL

Roger Desjardins
André Y. Denault
Sylvain Bélisle
Michel Carrier
Denis Babin
Sylvie Lévesque
Raymond Martineau

Can peripheral venous pressure be interchangeable with central venous pressure in patients undergoing cardiac surgery?



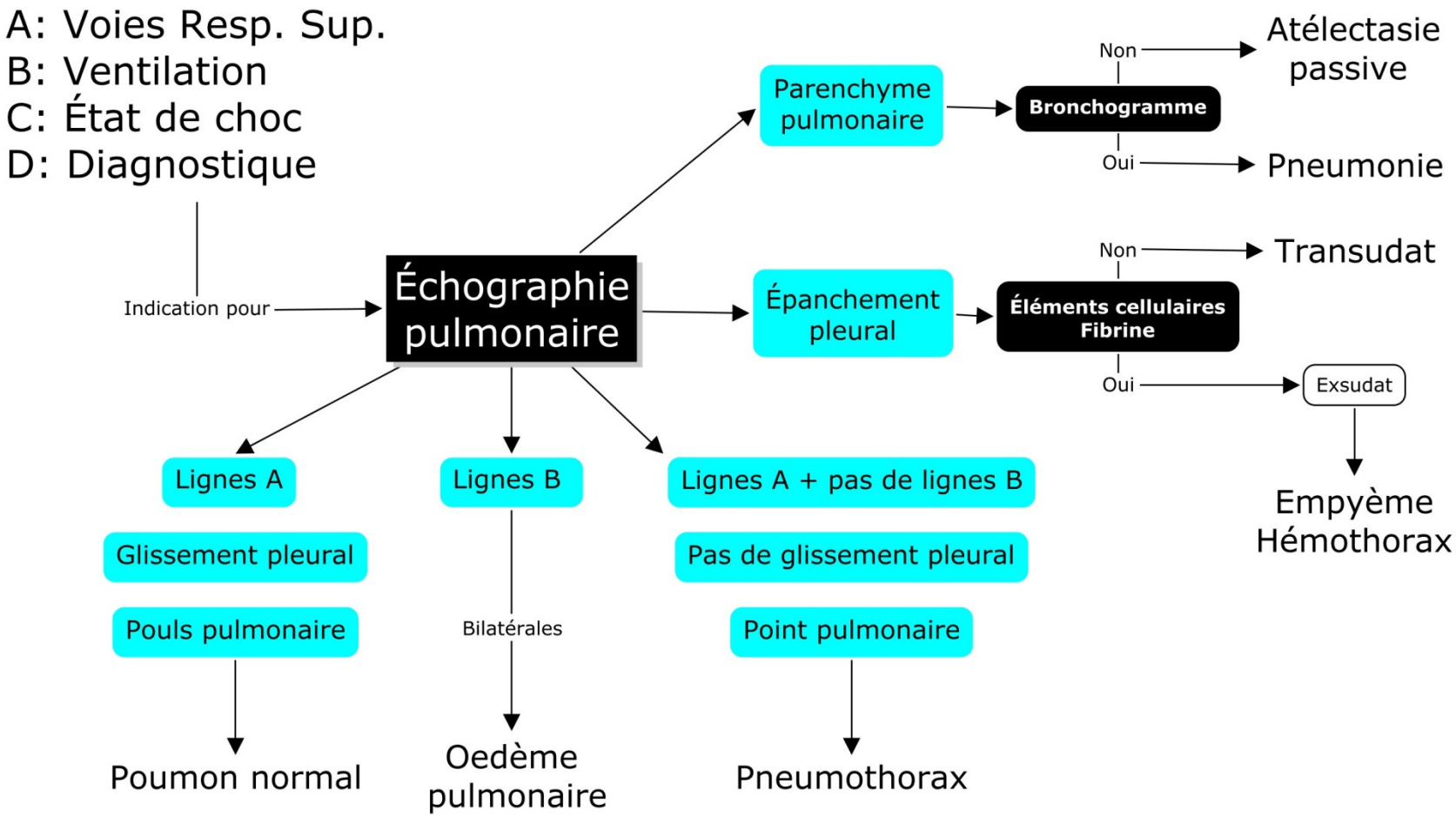
Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

Notre approche



Comment ai-je appris?

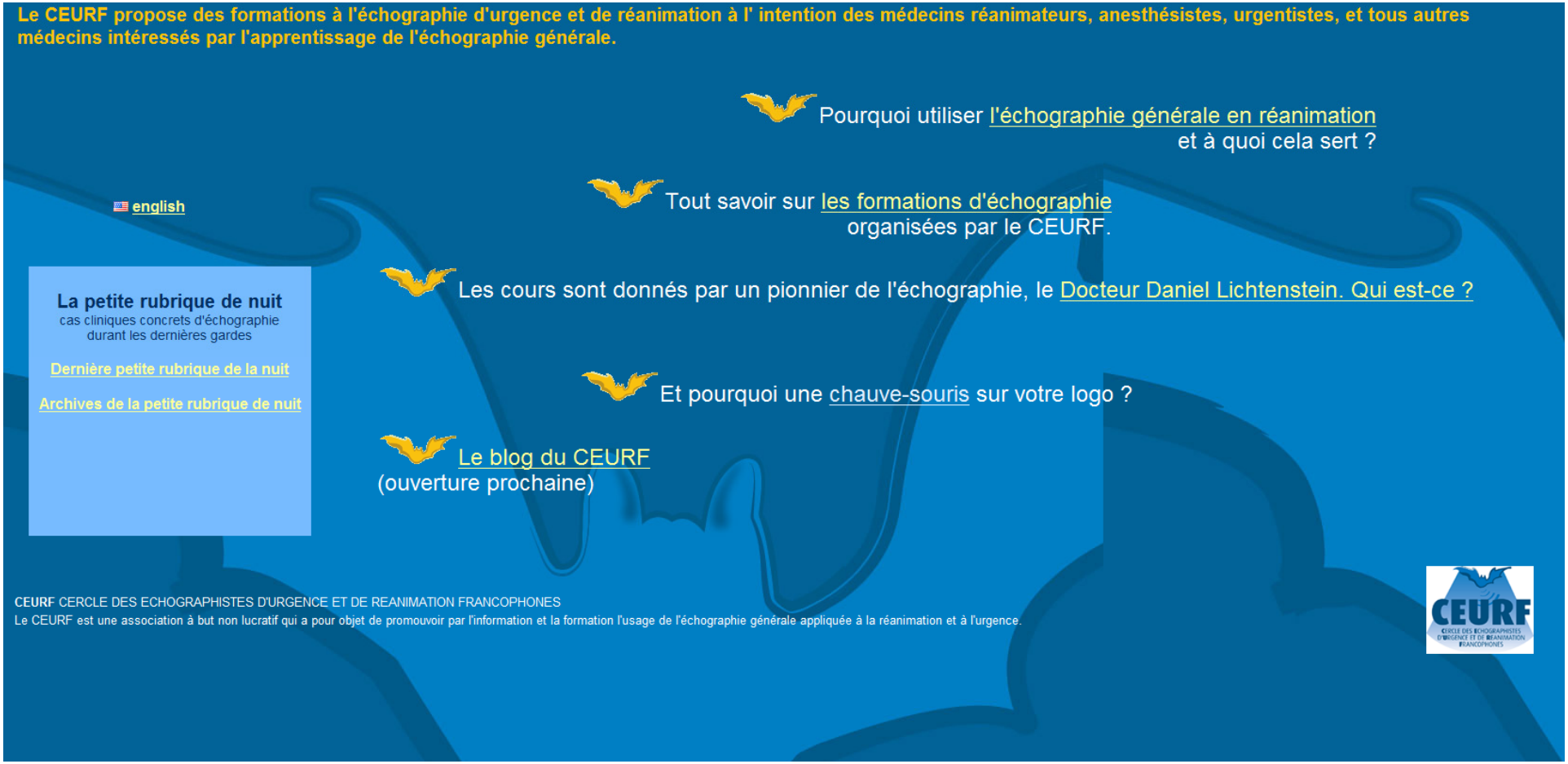
Dr. Daniel Lichenstein

Dr. Sylvain Bélisle

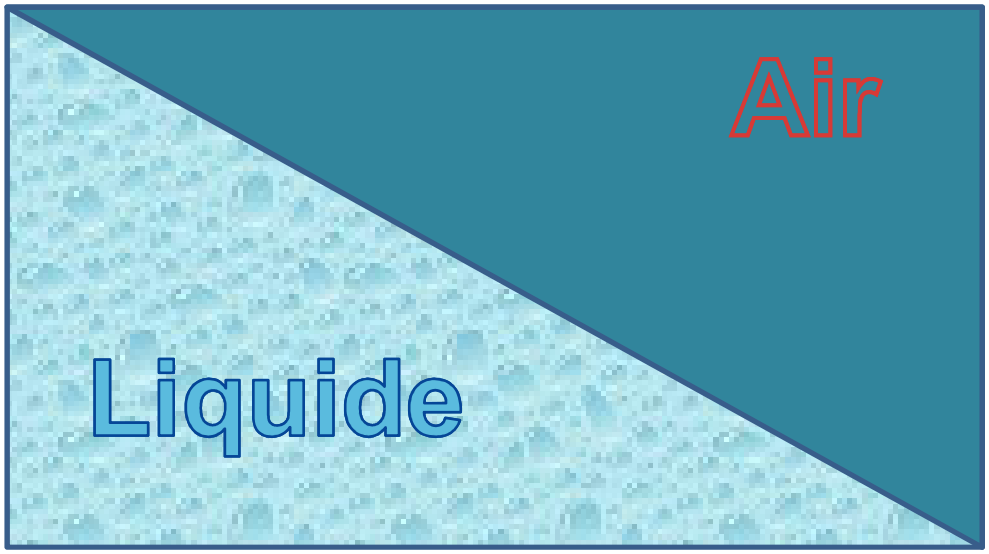
CEURF
CERCLE DES ECHOGRAPHISTES D'URGENCE ET DE REANIMATION FRANCOPHONES

http://www.ceurf.net

Ressources

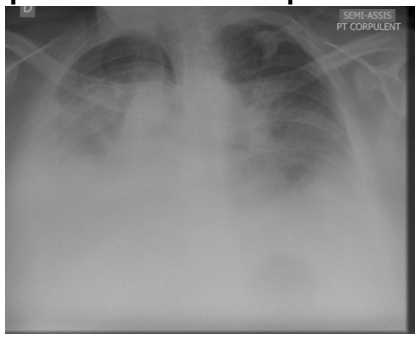

Le CEURF propose des formations à l'échographie d'urgence et de réanimation à l' intention des médecins réanimateurs, anesthésistes, urgentistes, et tous autres médecins intéressés par l'apprentissage de l'échographie générale.
Pourquoi utiliser l'échographie générale en réanimation et à quoi cela sert ?
english
Tout savoir sur les formations d'échographie organisées par le CEURF.
La petite rubrique de nuit
cas cliniques concrets d'échographie durant les dernières gardes
Dernière petite rubrique de la nuit
Archives de la petite rubrique de nuit
Les cours sont donnés par un pionnier de l'échographie, le Docteur Daniel Lichtenstein. Qui est-ce ?
Et pourquoi une chauve-souris sur votre logo ?
Le blog du CEURF
(ouverture prochaine)
CEURF CERCLE DES ECHOGRAPHISTES D'URGENCE ET DE REANIMATION FRANCOPHONES
Le CEURF est une association à but non lucratif qui a pour objet de promouvoir par l'information et la formation l'usage de l'échographie générale appliquée à la réanimation et à l'urgence.
CEURF

Contenu pulmonaire

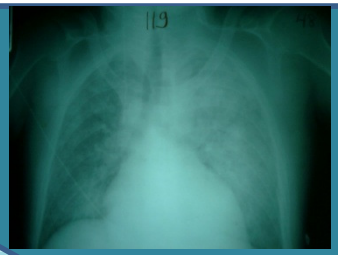


Contenu pulmonaire

Épanchement pleural

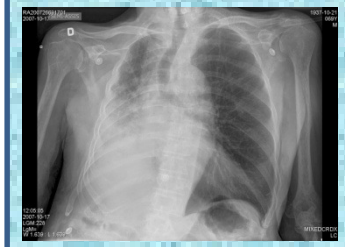


Syndrome interstitiel



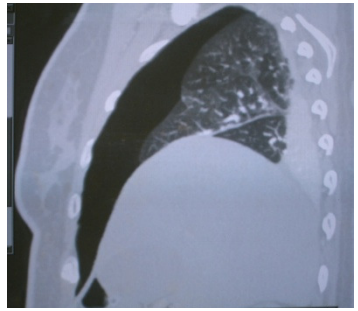
Air

Pneumonie



Liquide

Pneumothorax



Échographie pulmonaire: approch

1- Sonde linéaire + phasique (3.5-10 MHz)

2- Gain bas-modéré

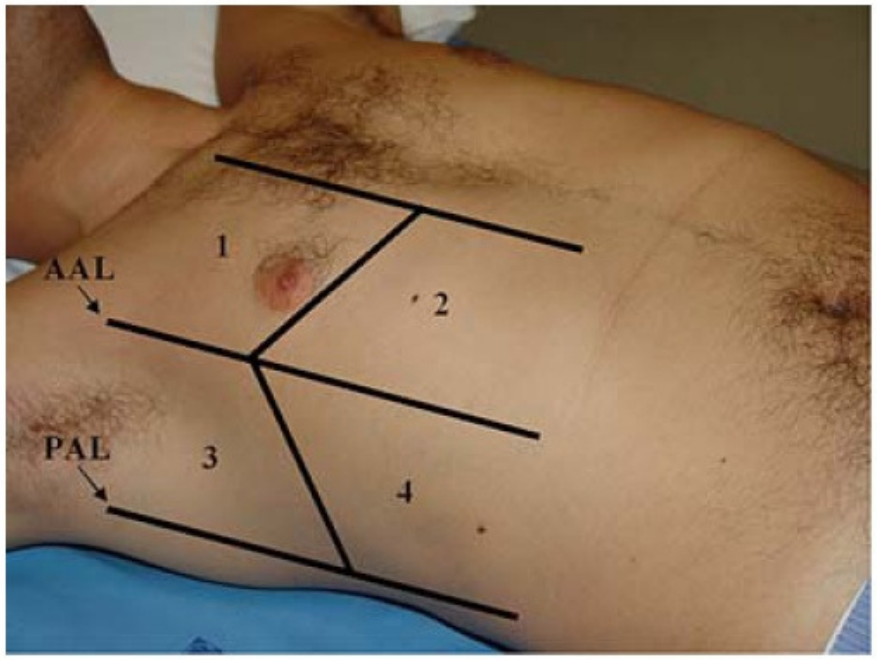
3- 5-8 cm de profondeur

4- Scan longitudinal du poumon
(4 à 6 regions/poumon)

5- Examen complémentaire
(analyse veineuse,cardiaque etc)

Échographie pulmonaire: approch

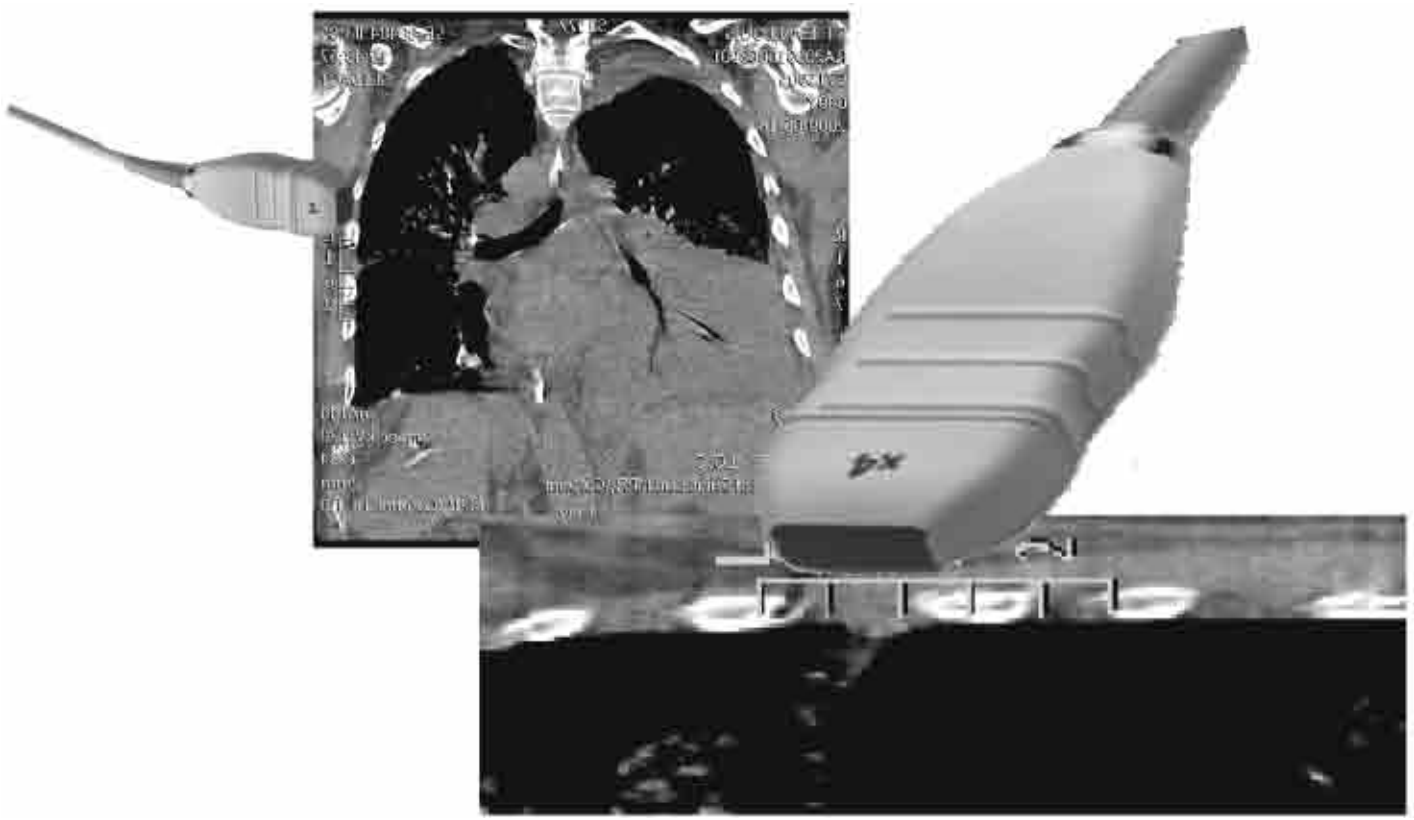
Régions antérieures (1-2): pneumothorax (98%)
syndrome interstitiel

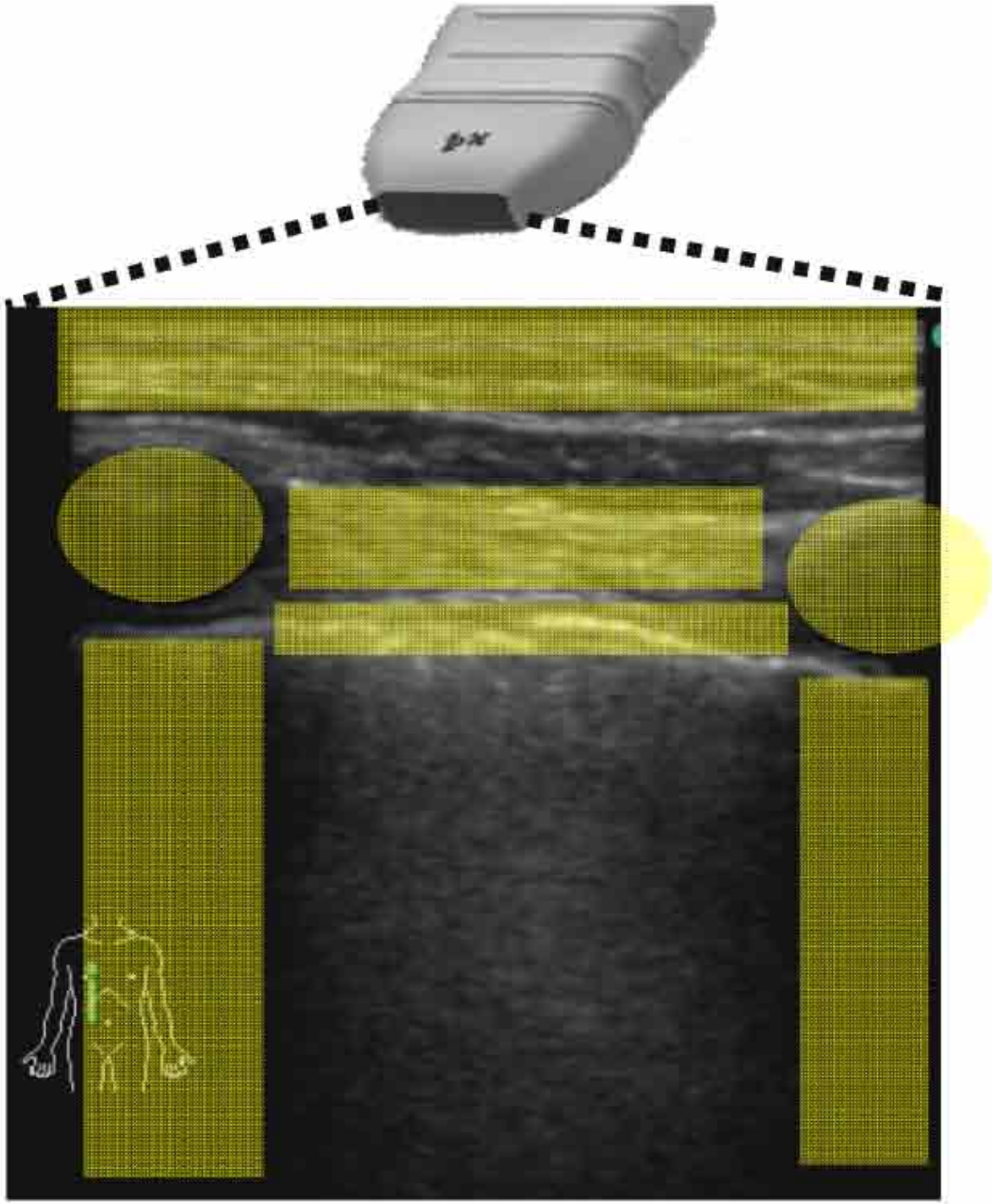


Régions latérales (3-4): épanchements pleuraux
consolidations: atélectasie ou pneumonie
fonction diaghragmatique (nerf phrénique)

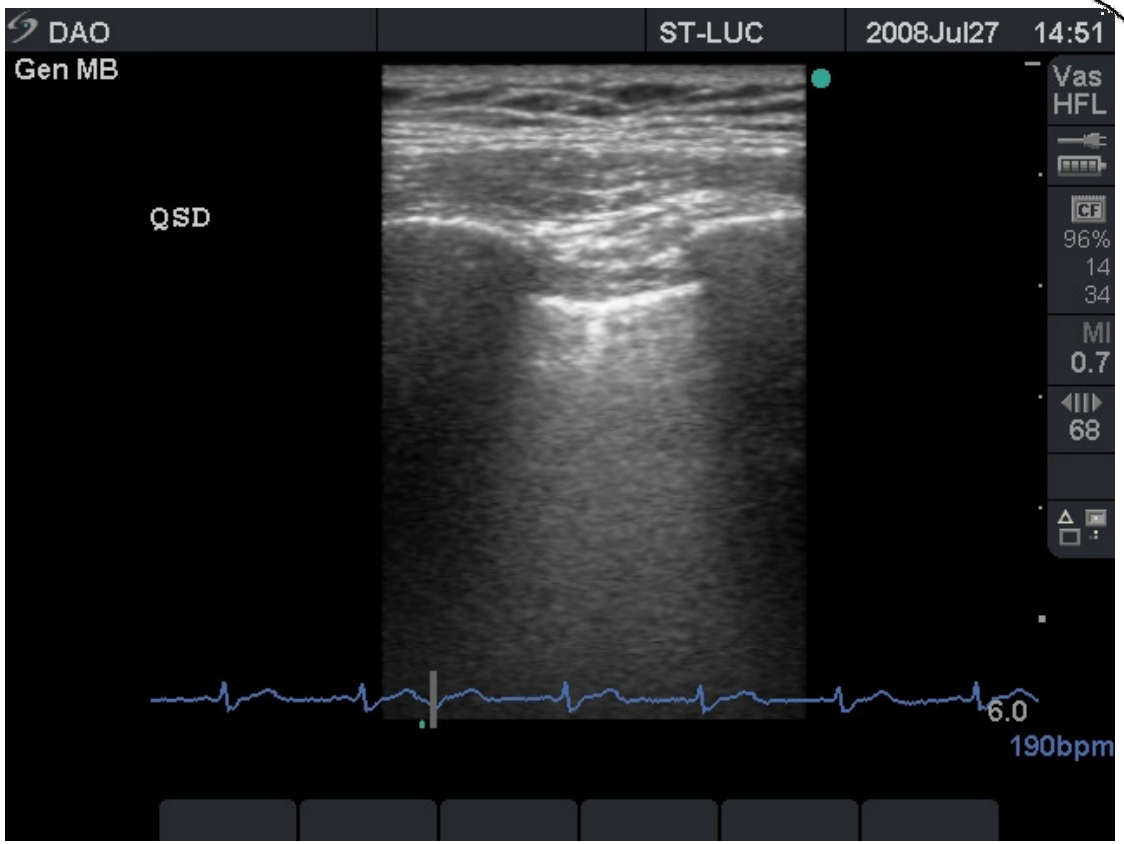
Nomenclature: “sliding lung” ou glissement pleural

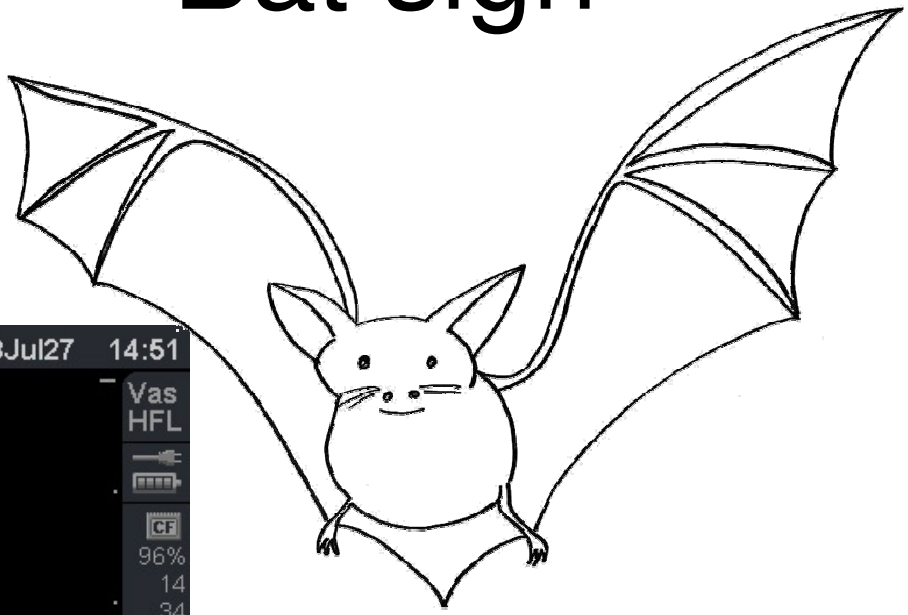
- Mouvement horizontal de la ligne pleurale
- 5 mm sous la partie inférieure des côtes
- Hyperéchoïque (blanc)
- Bouge avec la respiration
- Amplitude maximale à la base pulmonaire
- Corresponds au mouvement de la plèvre viscérale sur la plèvre pariétale

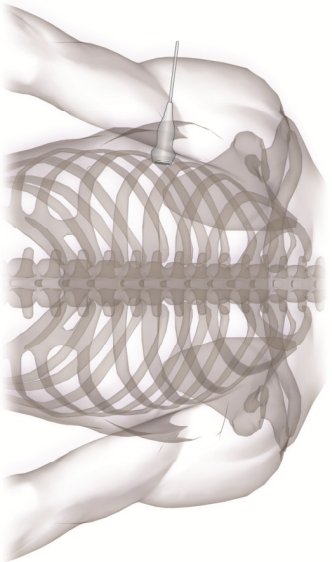


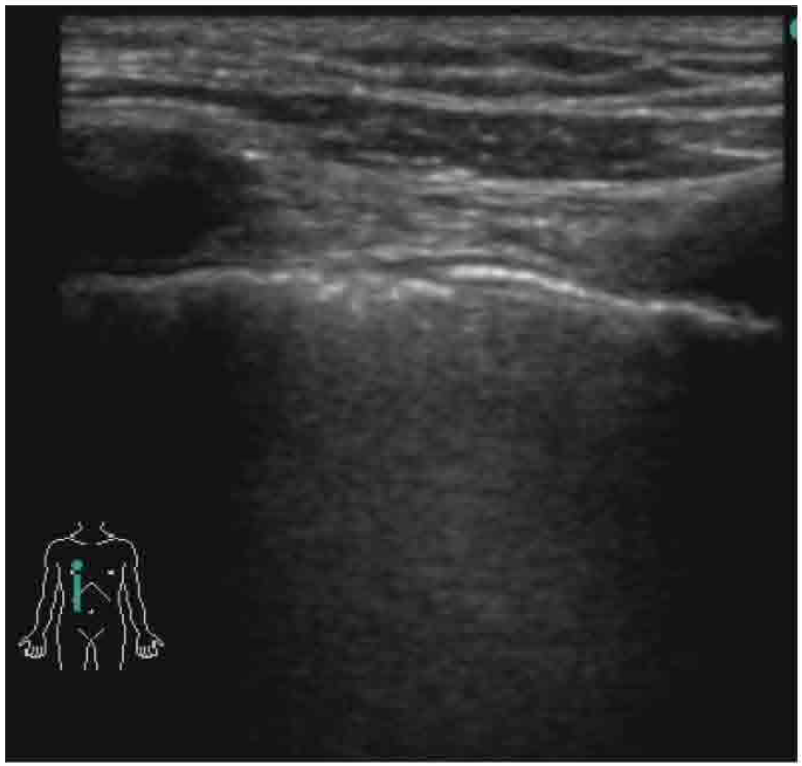


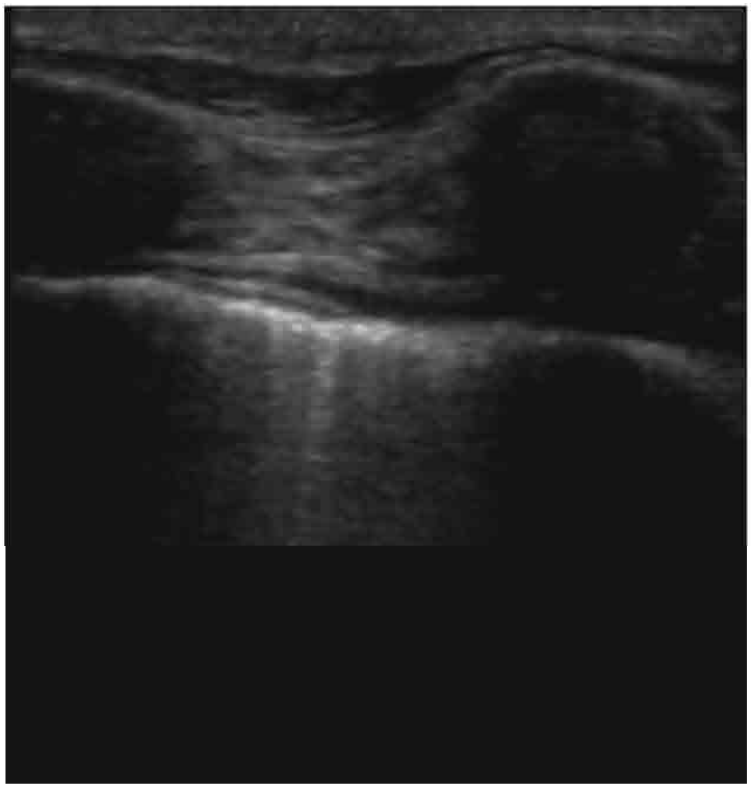
Ligne pleurale = “Bat sign”





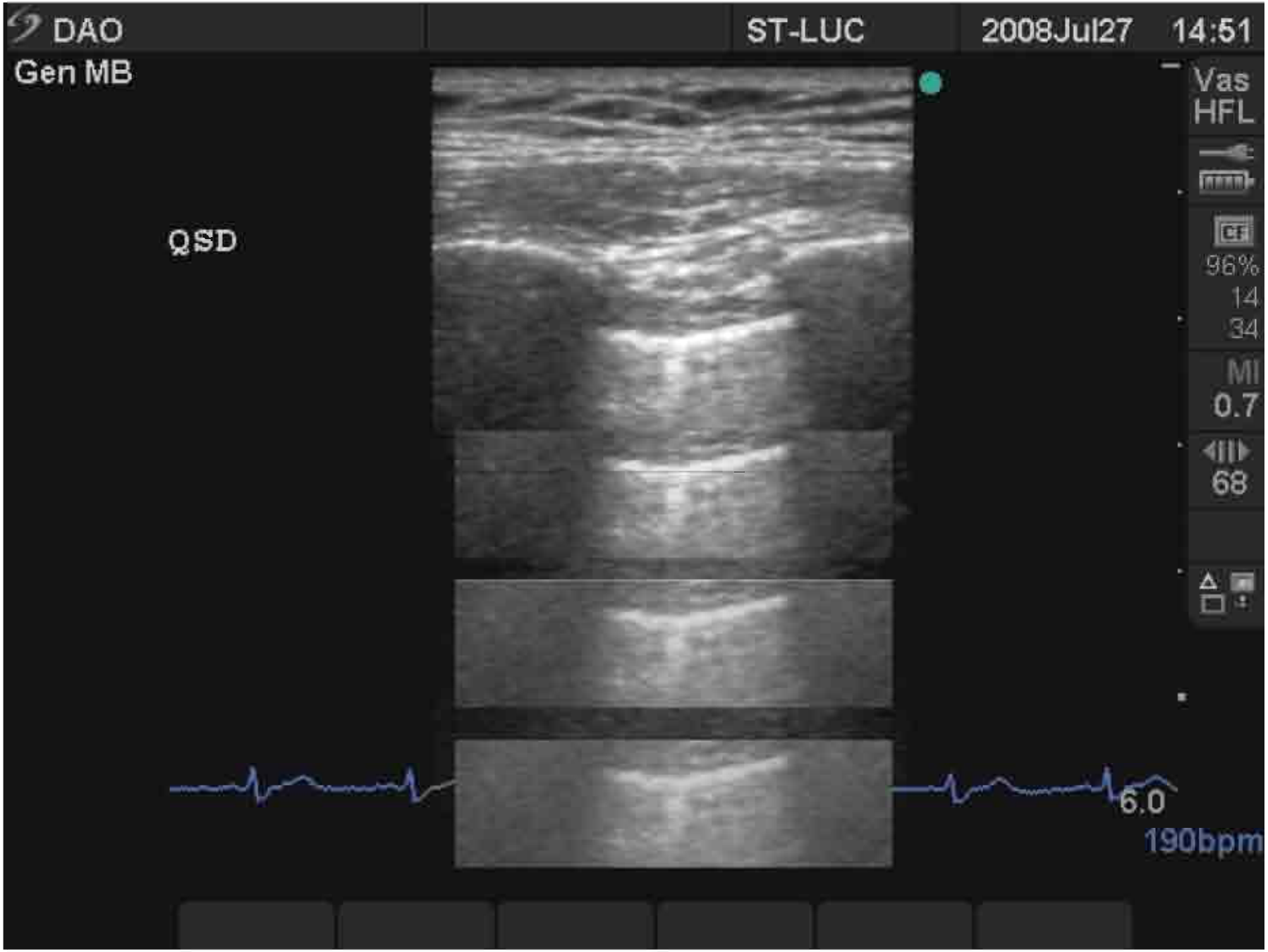




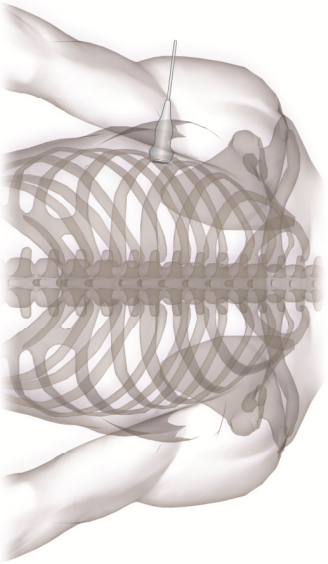


Nomenclature: lignes A

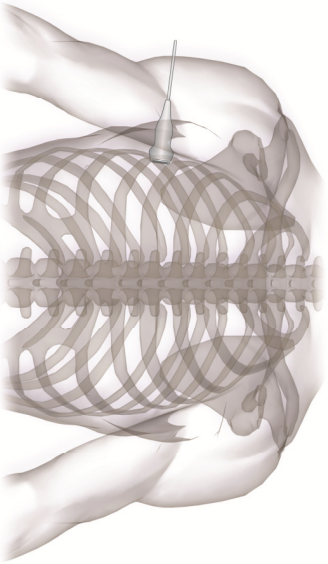
- Lignes horizontales
- Lignes hyperéchoïque qui originent de la ligne pleurale
- Les lignes sont parallèles et à une distance identique à la distance entre la sonde d'écho et la ligne pleurale
- Les lignes se répètent plusieurs fois = réverbérations de la ligne pleurale


DAO
ST-LUC
2008Jul27
14:51
Gen MB
QSD
Vas
HFL
96%
14
34
MI
0.7
68
6.0
190bpm

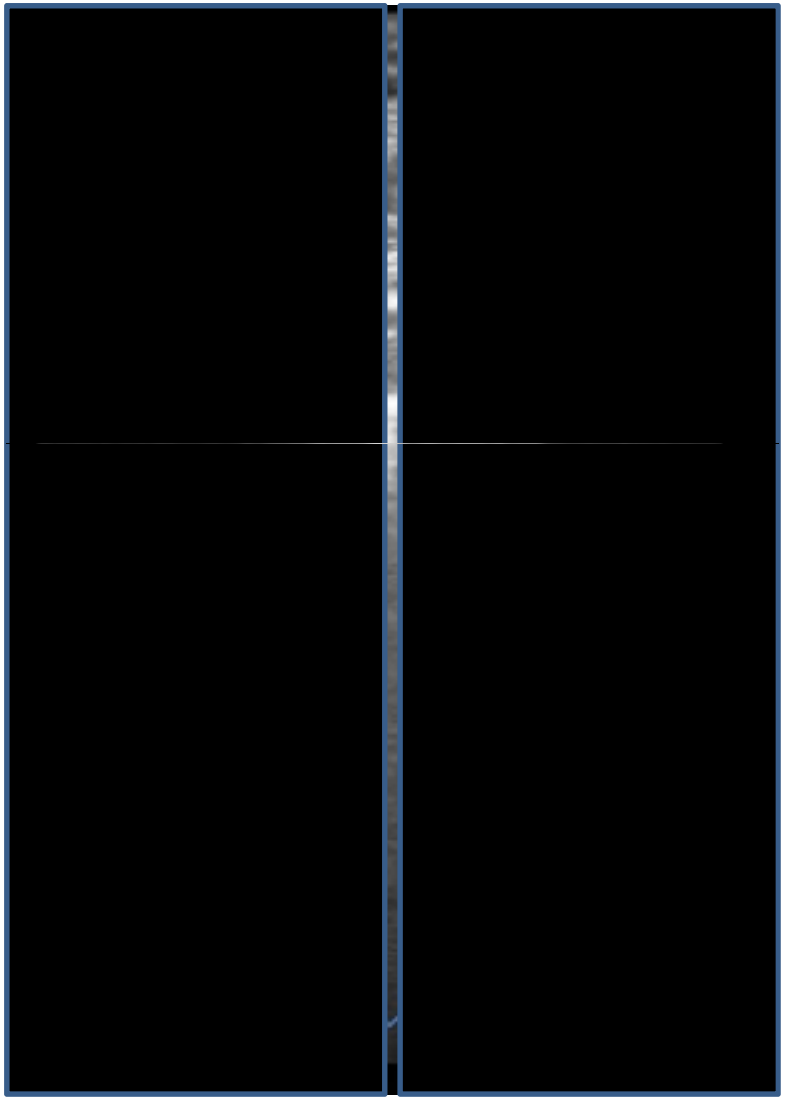
Glissement pleural ou sliding lur

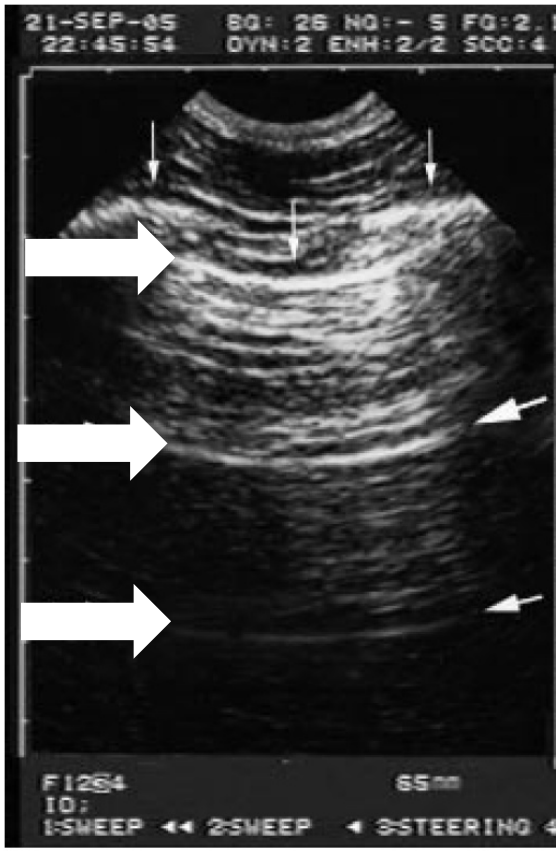


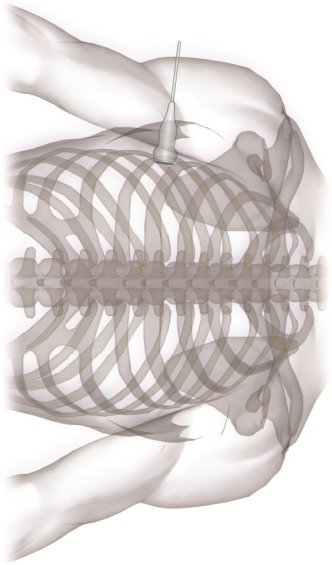
Glissement pleural ou sliding lur



Mode 2D et mode M

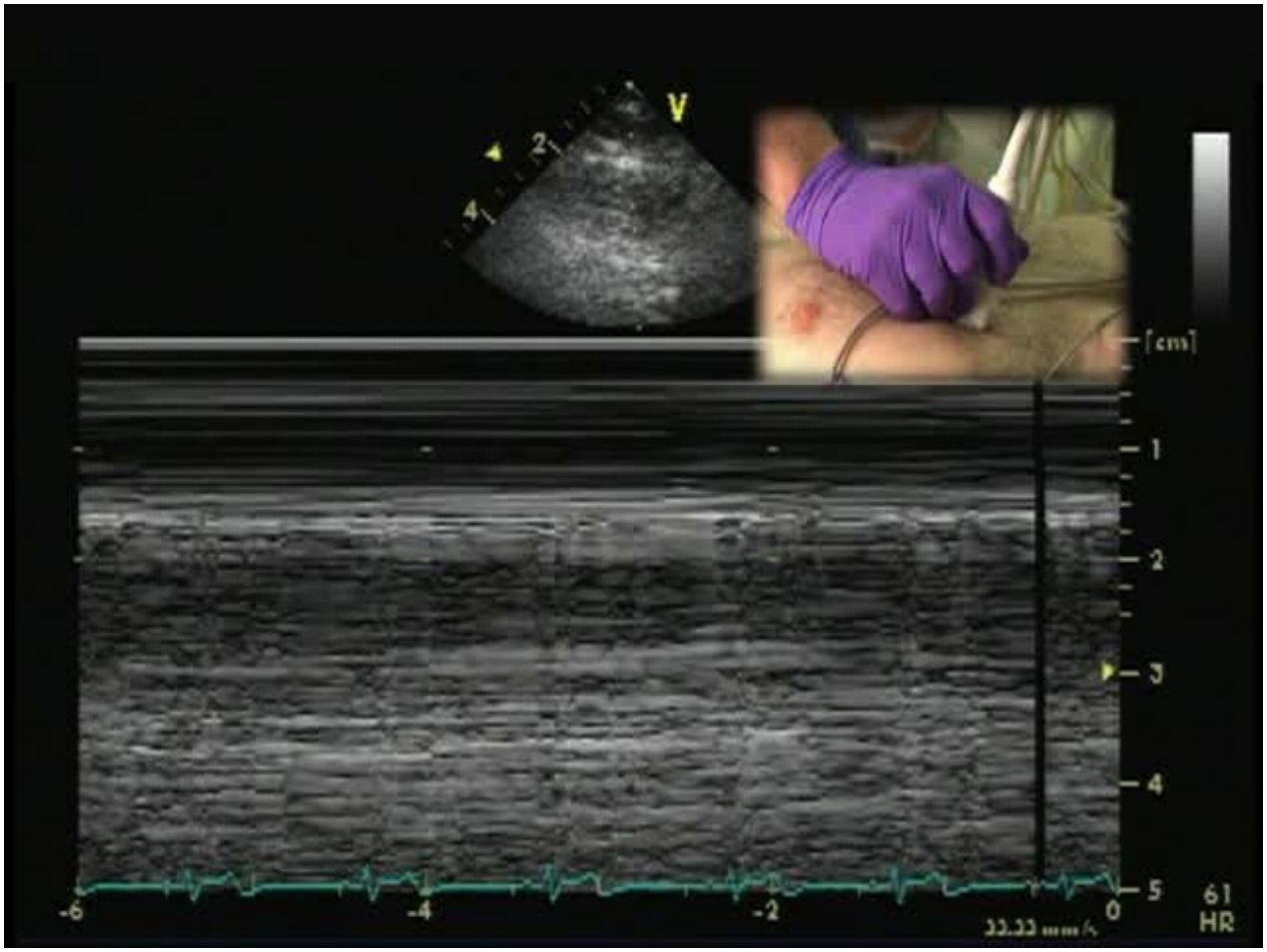




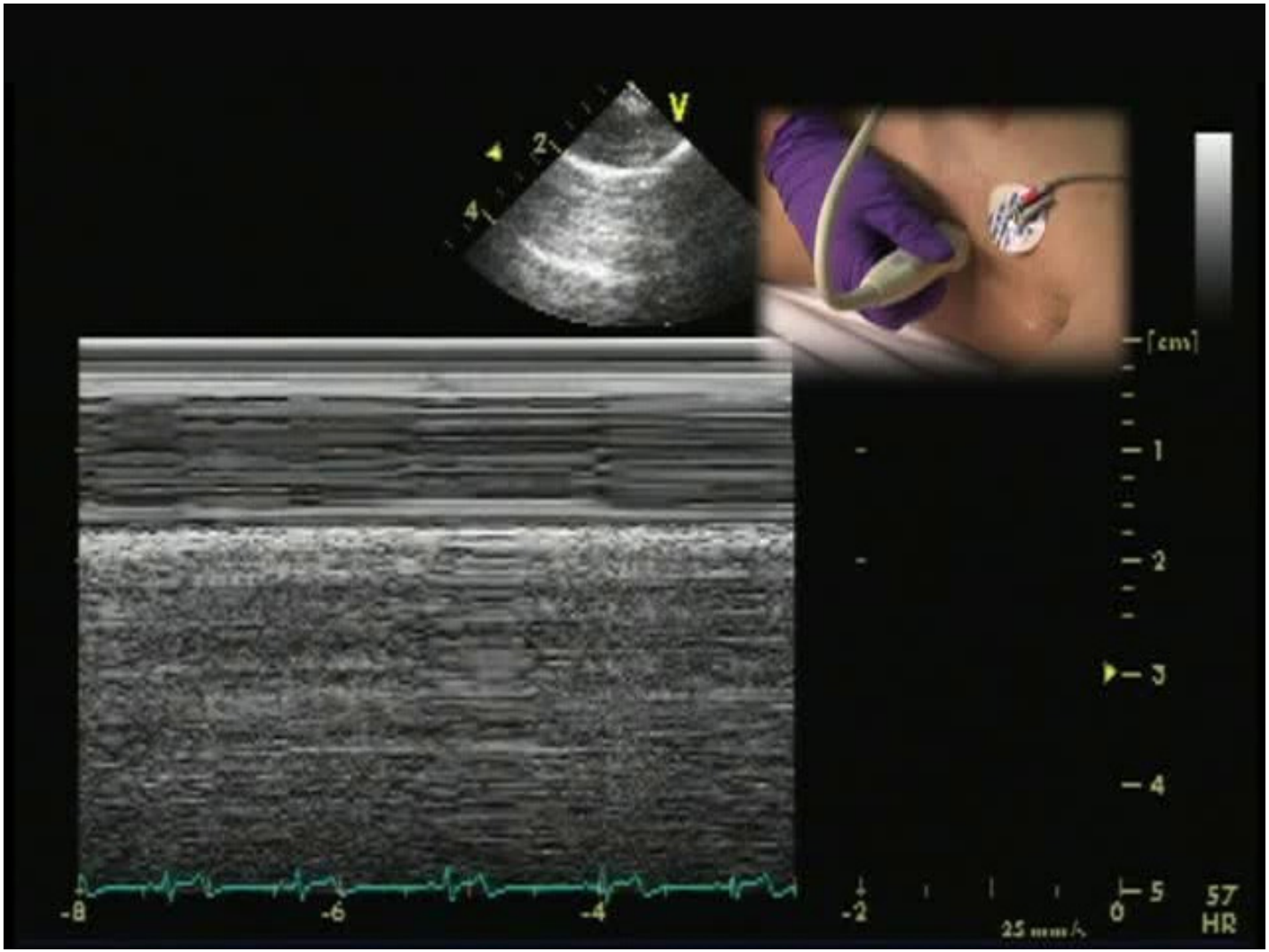


Lignes A = artéfacts horizontaux répétitifs
qui originent de la ligne pleurale
En mode M cet artéfact génère un aspect sablonneux.
Ceci se nomme le “*seashore sign”* ou la plage de sable

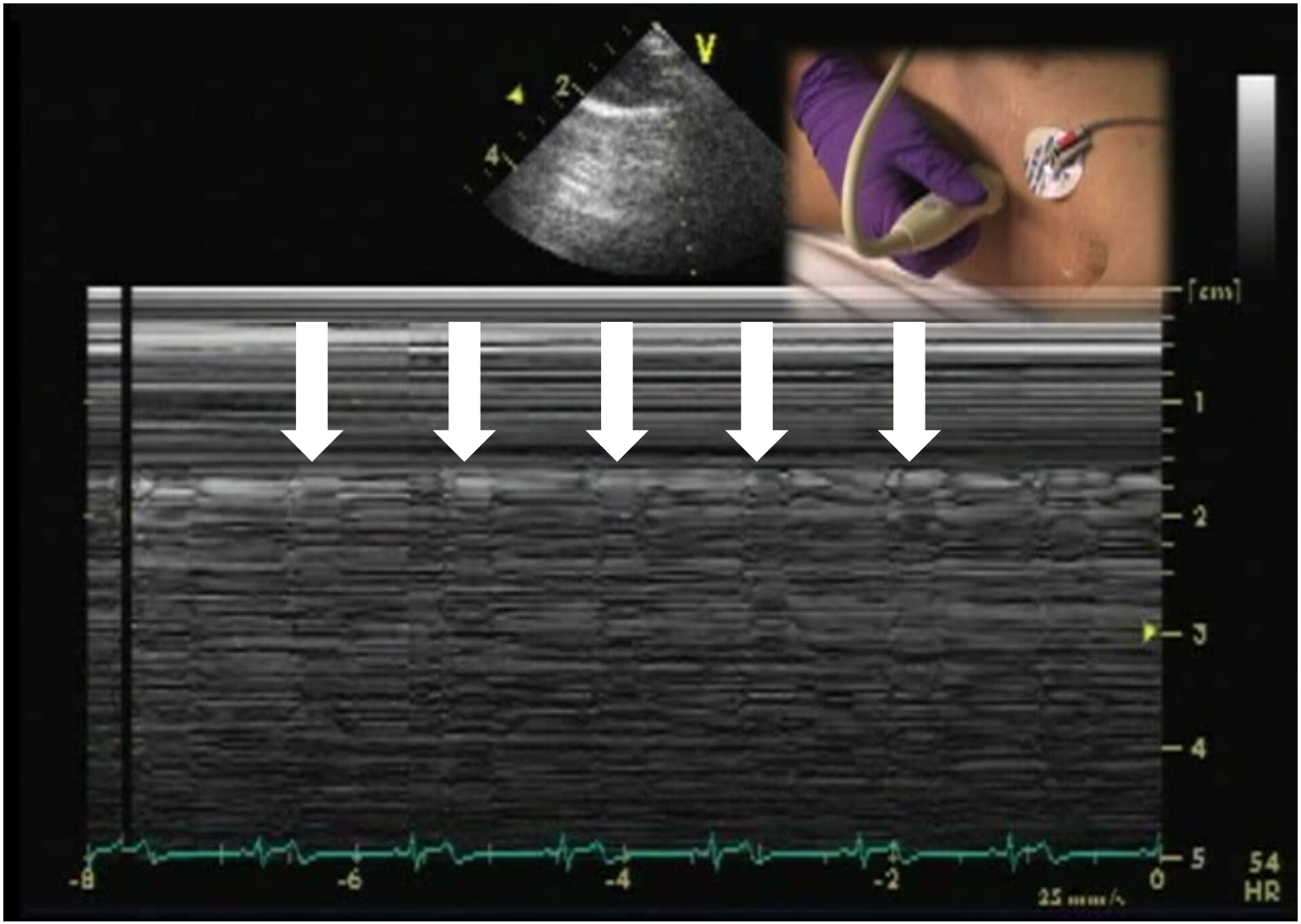
Mode M



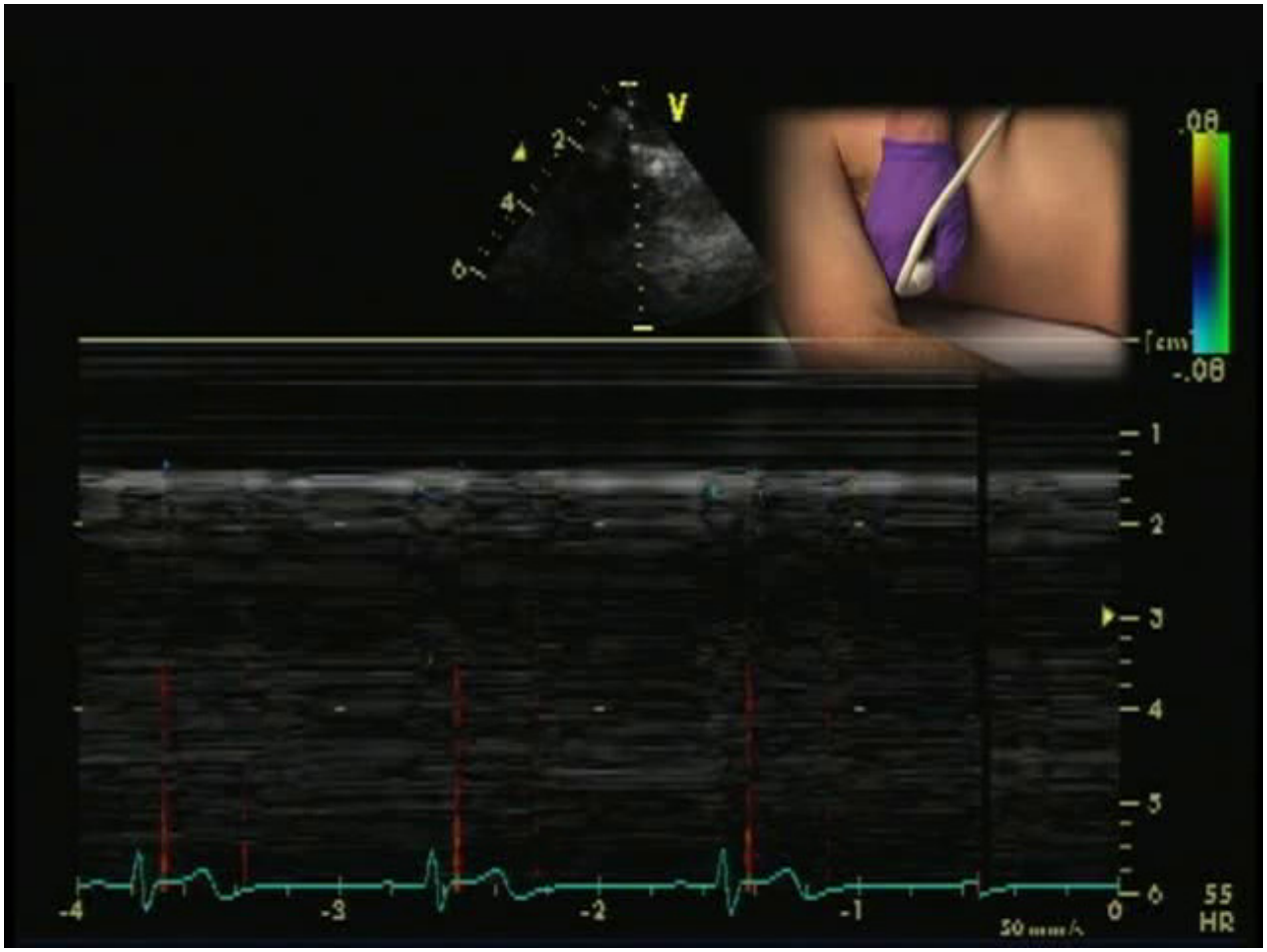
En apnée: pulsations cardiaques = “lung pulse” ou pouls pulmonaire



Mode M: battements cardiaques



Mode M et + Doppler couleur: pouls pulmonaire

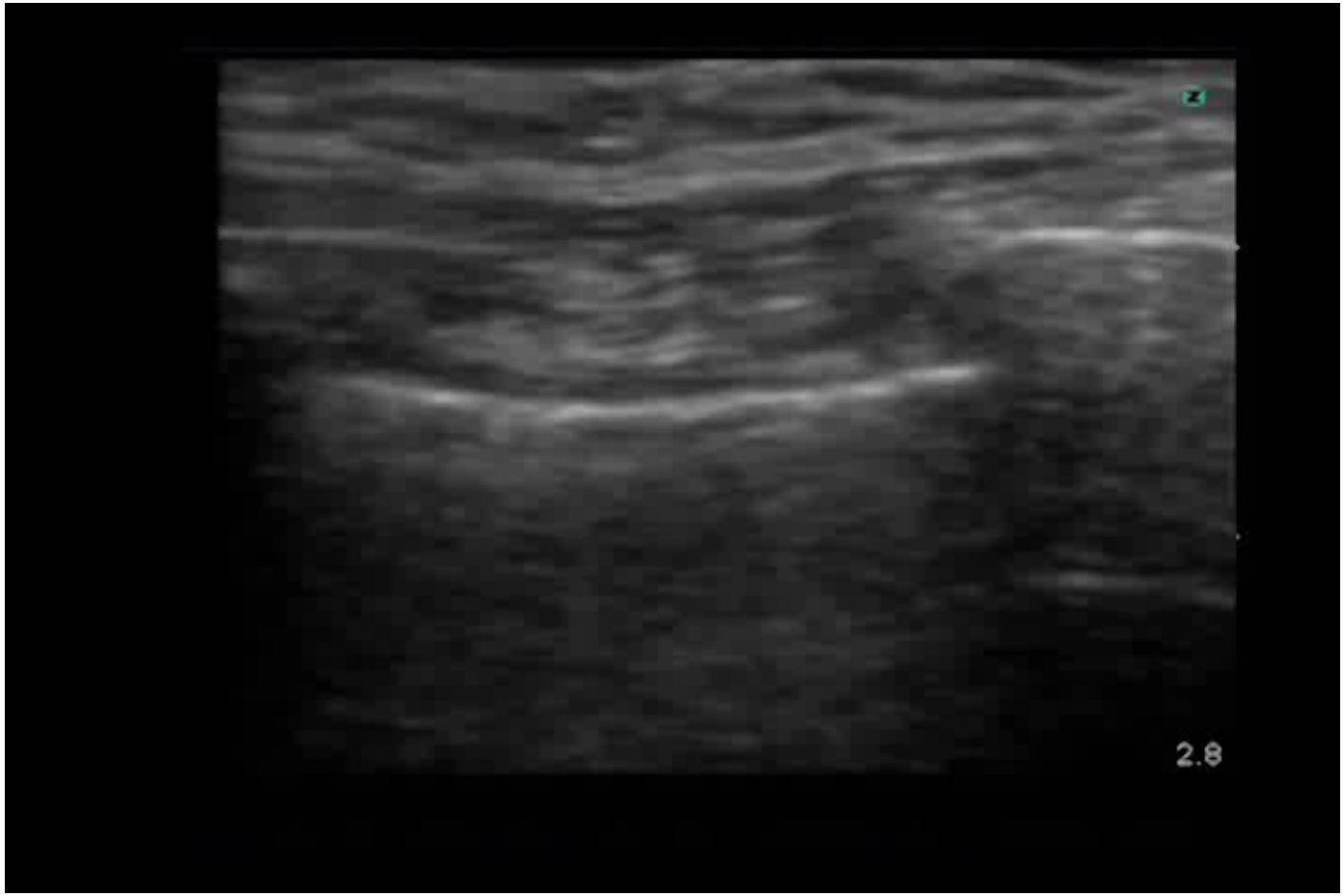


♀ de 68 ans: désaturation et hypotension post-intubation

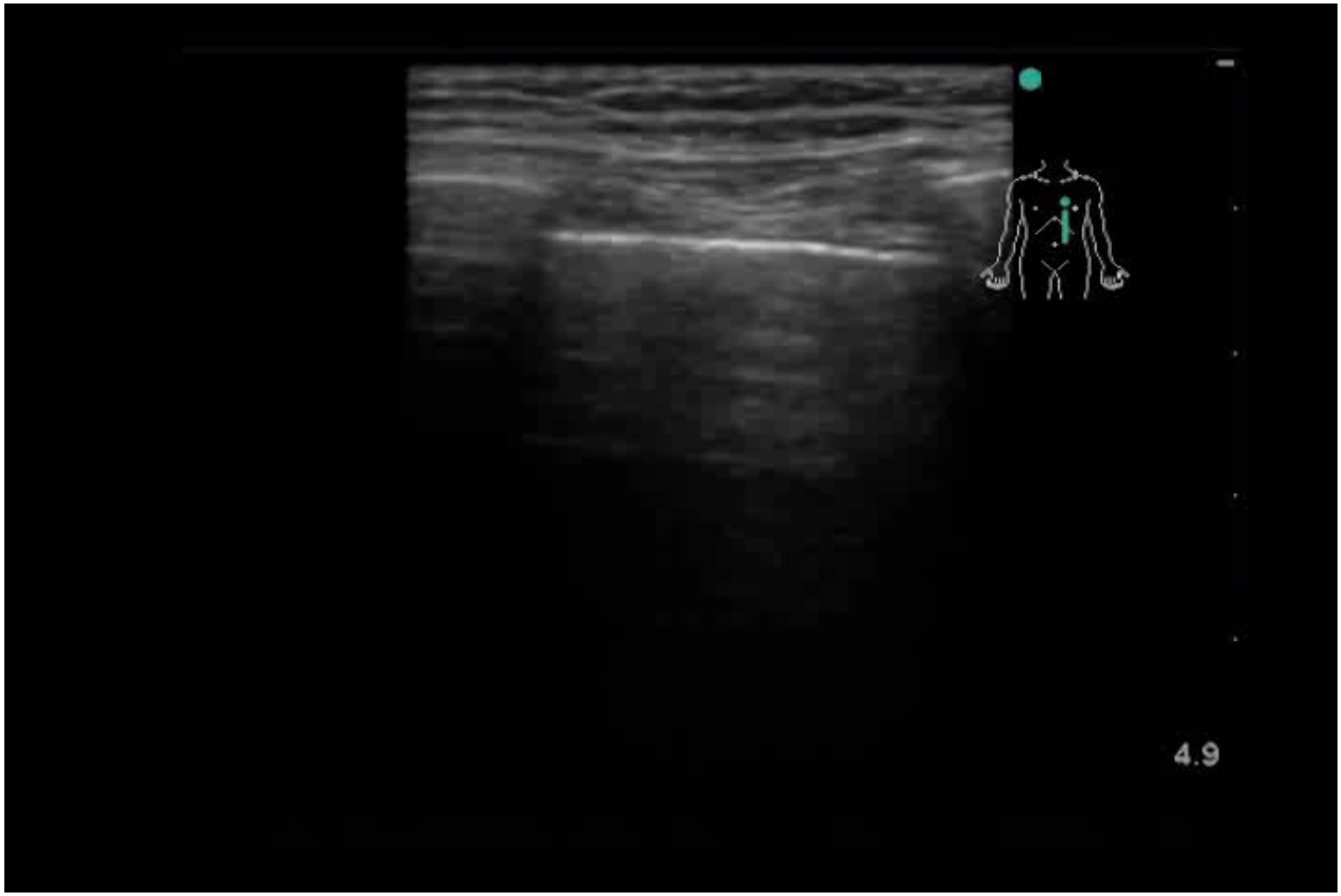
- Absence ou faible murmure vésiculaire à droite.
- Diagnostique différentiel?

Désaturation soudaine post-intubation: poumon droit

Désaturation soudaine post-intubation: poumon droit ZOOM

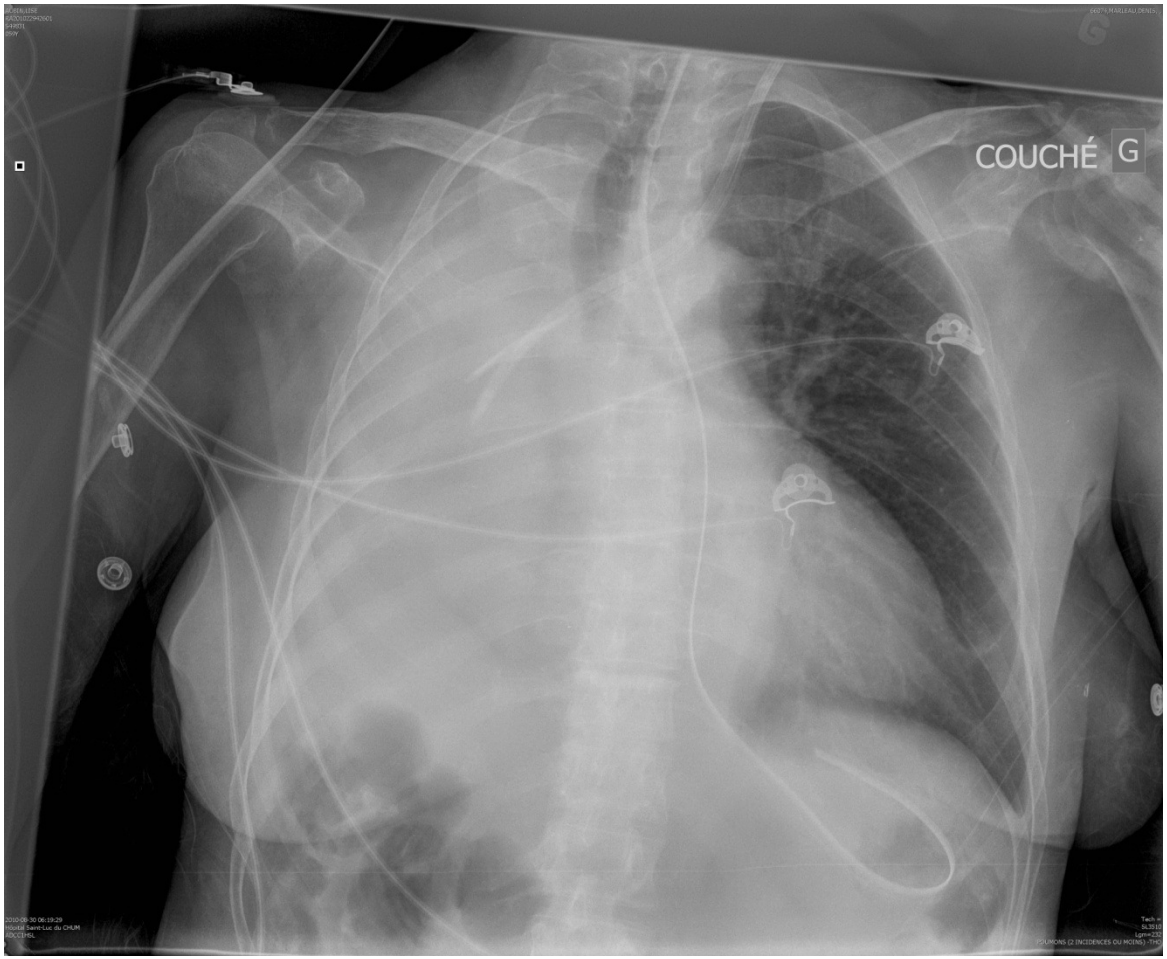


Désaturation soudaine post-intubation: poumon gauche

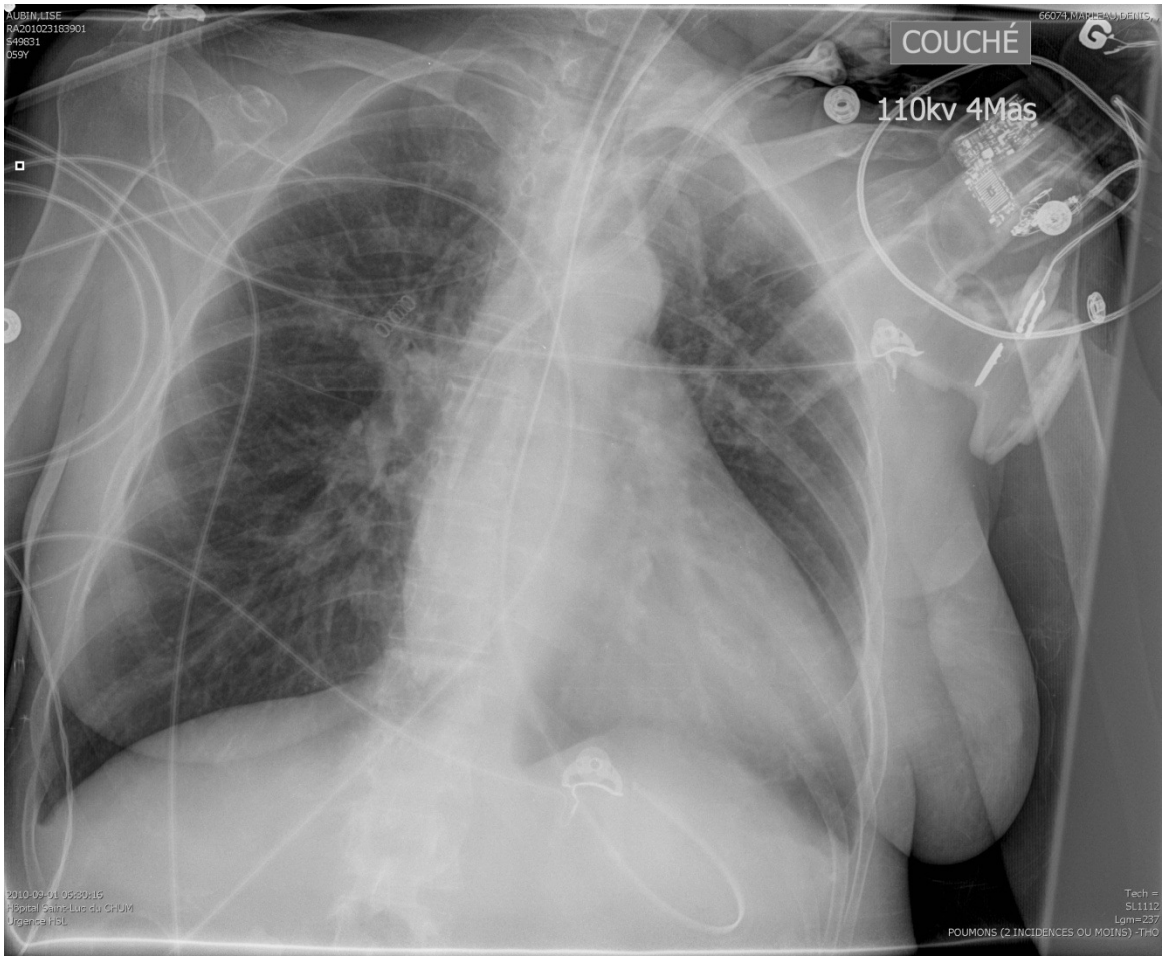


Désaturation soudaine post-intubation: poumon gauche ZOOM

Pré-bronchoscopie



Post-bronchoscopie



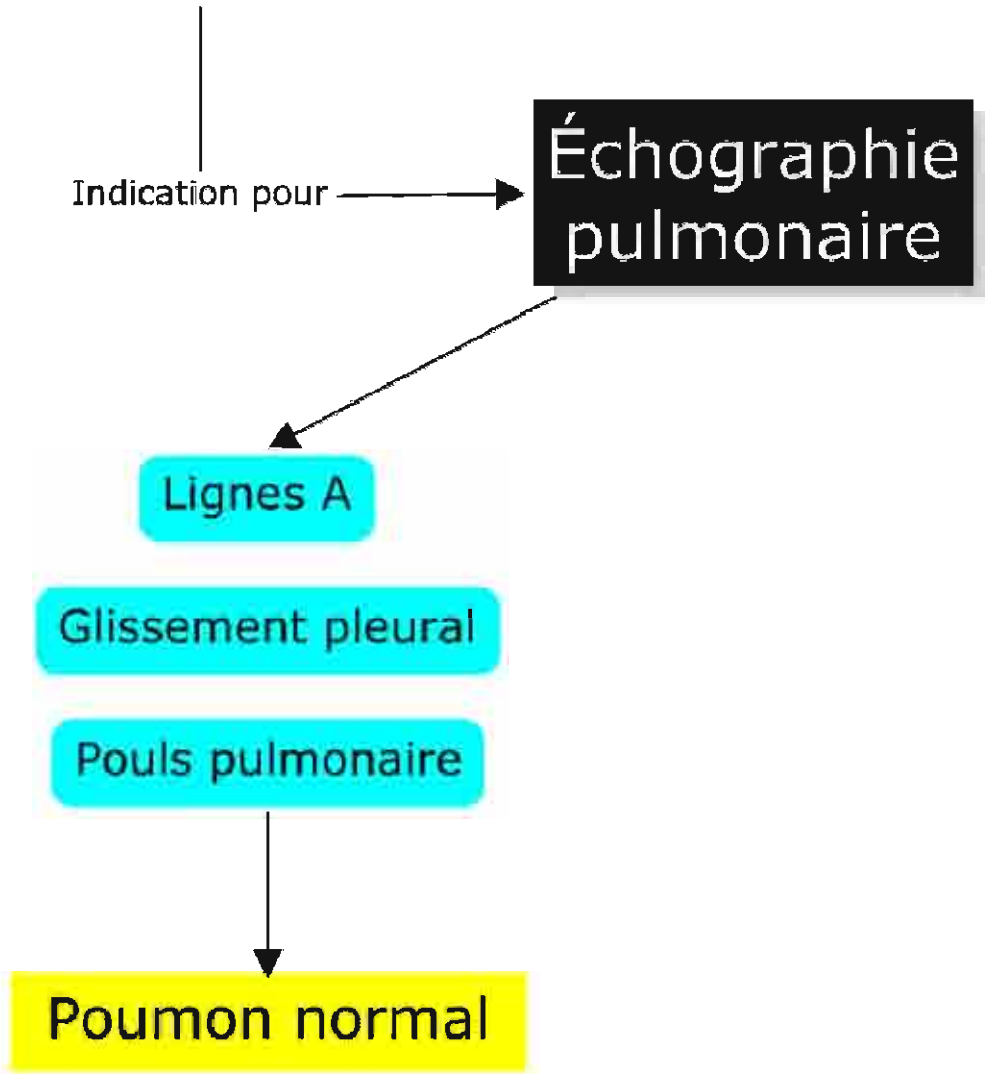
A: prise en charge des VRS

- Intubation endobronchique droite:
  - Glissement pleural à droite seulement
  - Pas de glissement pleural à gauche
  - Pulsation pulmonaire cardiaques à gauche en qq secondes
  - Mouvement diaphragmatique exaggéré à droite

  Pouls pulmonaire a une sensibilité de 90% pour le diagnostique de l'intubation endobronchique

Intensive Care Medecine 2003

A: Voies Resp. Sup.
B: Ventilation
C: État de choc
D: Diagnostique



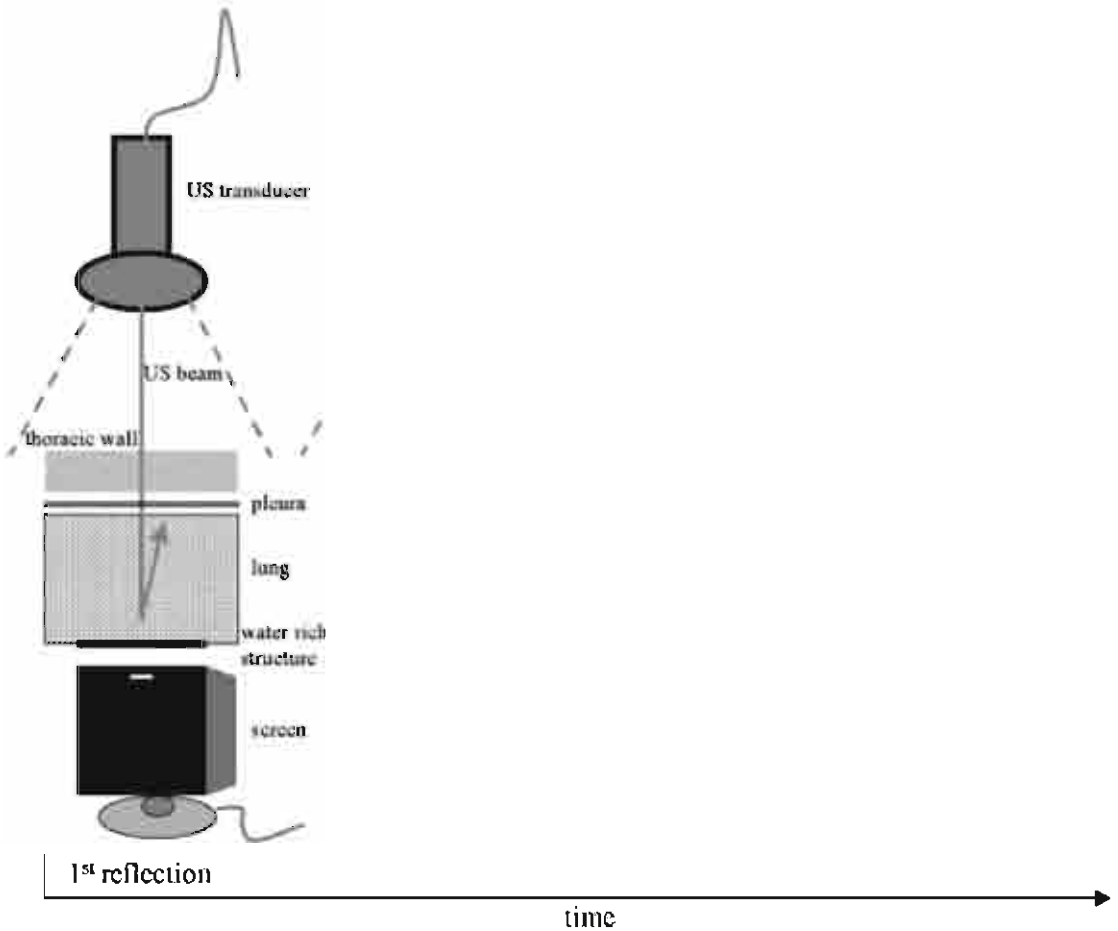
Nomenclature: lignes B ou queues de comètes

- Lignes verticales
- Lignes hyperéchoïque qui originent de la ligne pleurale
- Les lignes sont perpendiculaires à la ligne pleurale
- Les lignes effacent les lignes A
- Normal d'en avoir 1 en région antérieure et 33% de patients en ont dans les régions dépendantes = réverbérations de l'oedème alvéolaire ou interstitiel (lignes de Kerley B)

Emerg Radiol
DOI 10.1007/s10140-008-0701-x

Usefulness of lung ultrasound in the bedside distinction between pulmonary edema and exacerbation of COPD

Giovanni Volpicelli · Luciano Cardinale · Giorgio Garofalo · Andrea Veltri



Early detection of acute lung injury uncoupled to hypoxemia in pigs using ultrasound lung comets*

Luna Gargani, MD; Vincenzo Lionetti, MD; Claudio Di Cristofano, MD; Generoso Bevilacqua, MD, PhD; Fabio A. Recchia, MD, PhD; Eugenio Picano, MD, PhD, FESC

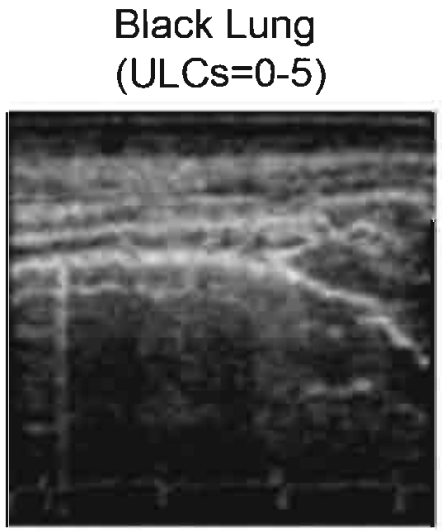
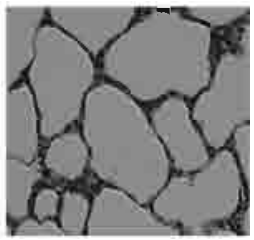
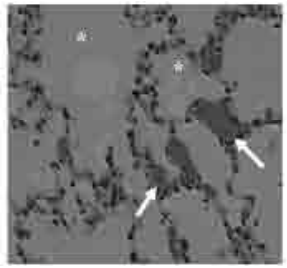


Figure 3. Different chest sonography patterns. *ULCs*, ultrasound lung comets.





(Crit Care Med 2007; 35:2769–2774)

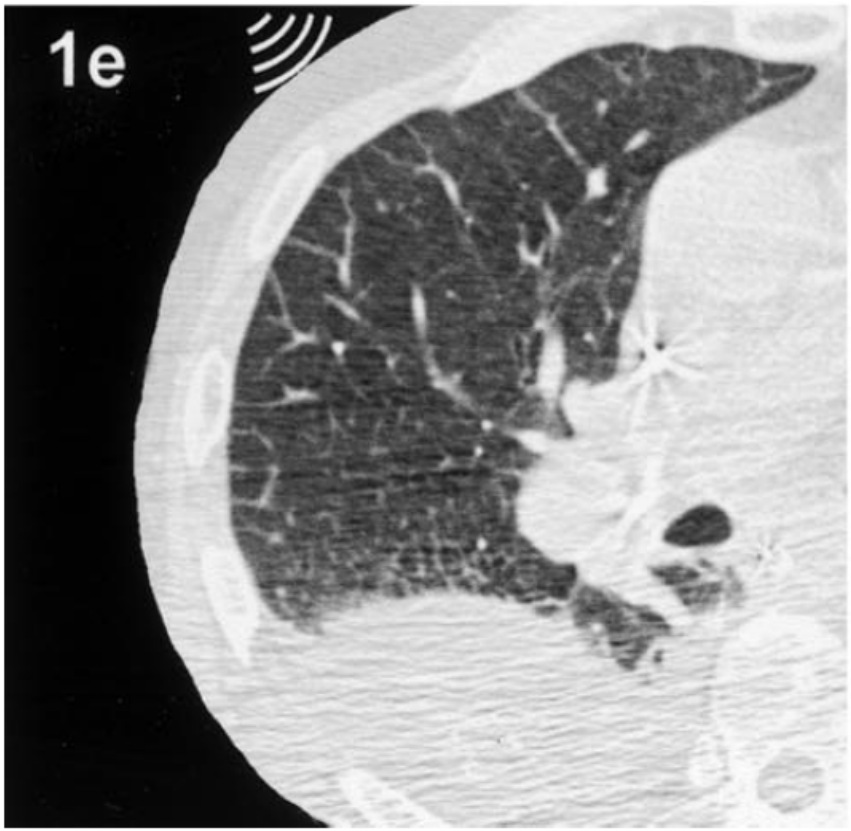
Syndrome alvéolo-interstitiel (OAP, ARDS, maladie interstitielle)

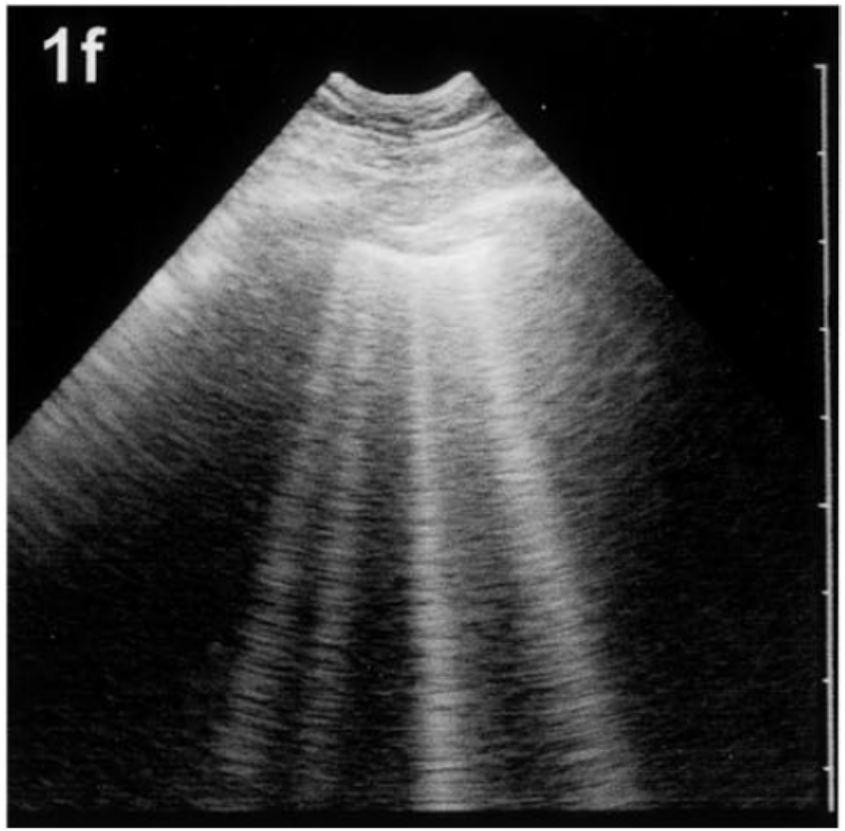
- Présence de > 2 lignes B dans une région
- Équivalent aux lignes B de Kerley
- Types:

  7±1 mm entre les lignes: oedème interstitiel

  < 3 mm entre les lignes: oedème alvéolaire

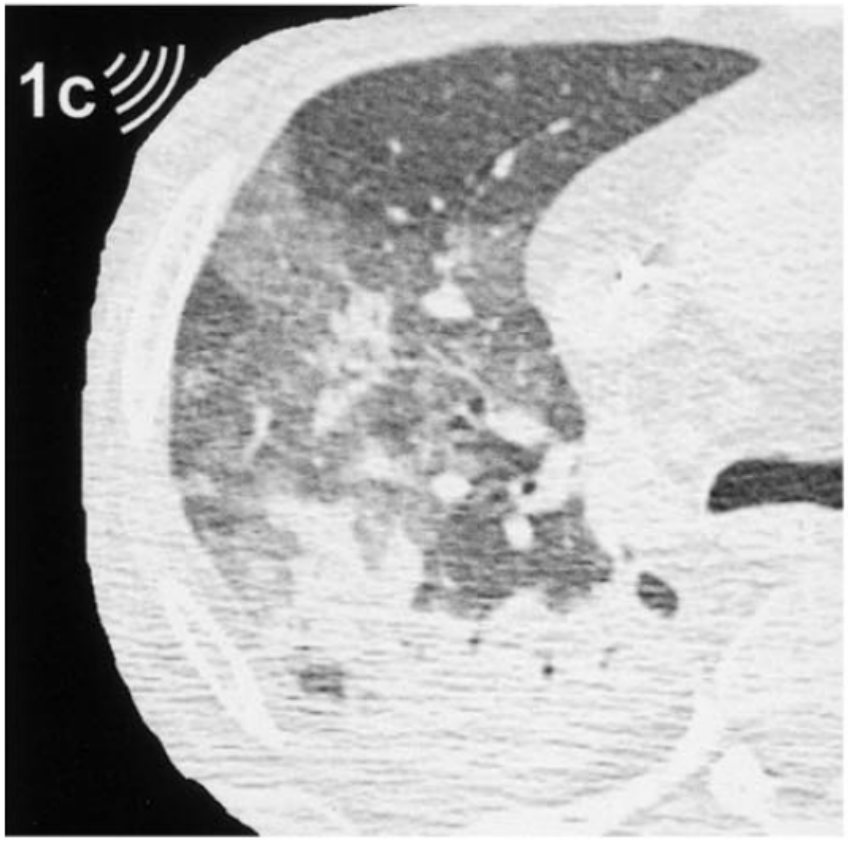
Oedème pulmonaire:
7±1 mm entre les lignes B

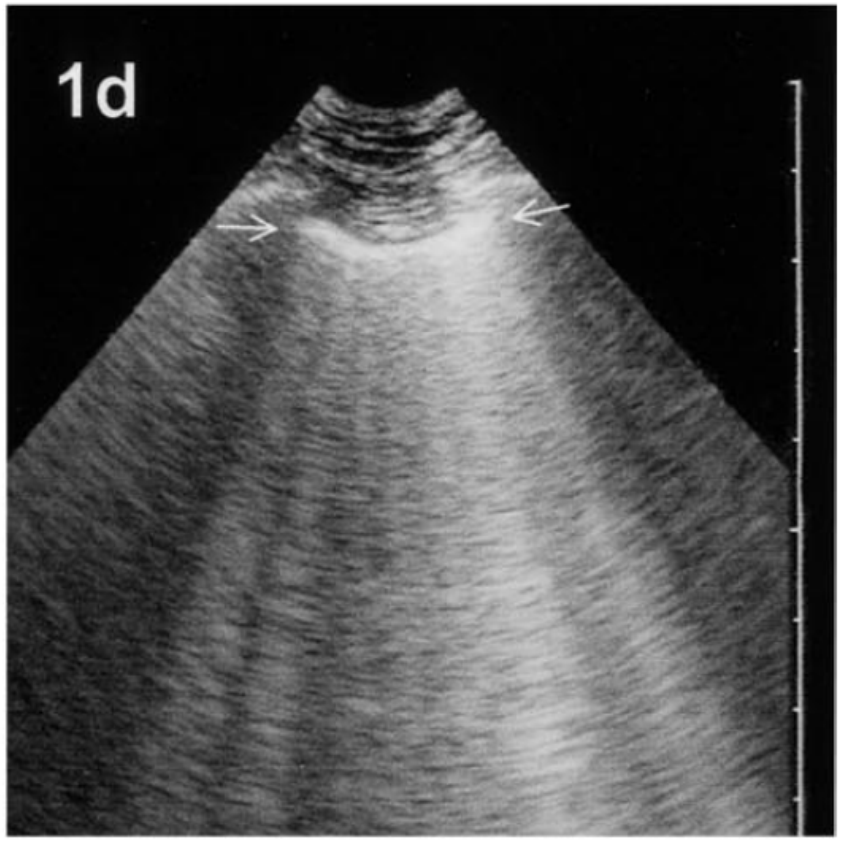




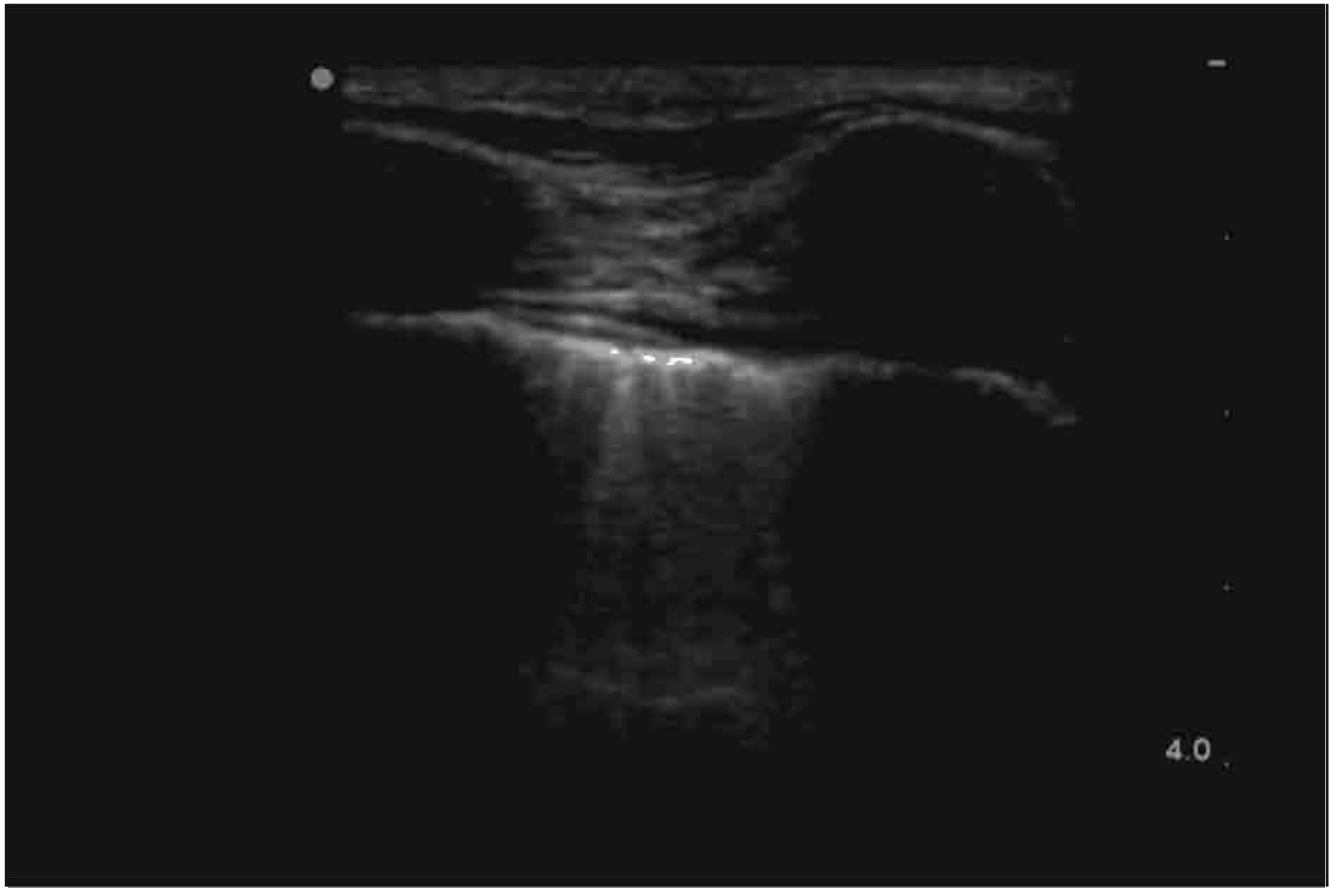
Anesthesiology, V 100, No 1, Jan 2004

Oedème pulmonaire:
3 mm entre les lignes B





Anesthesiology, V 100, No 1, Jan 2004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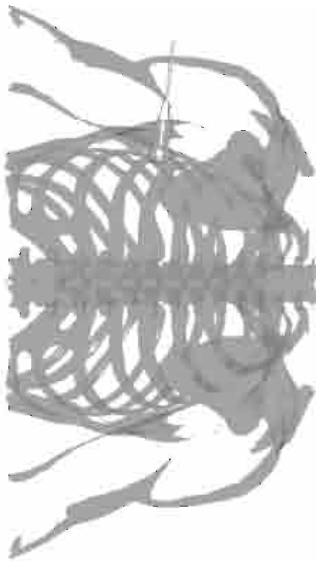
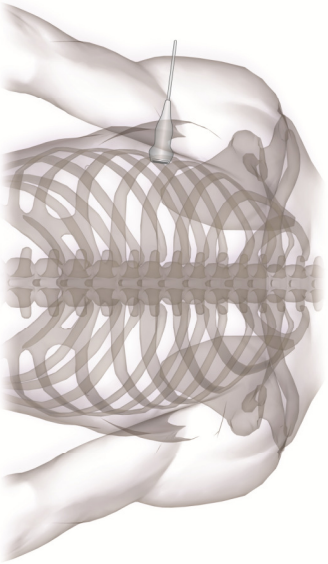
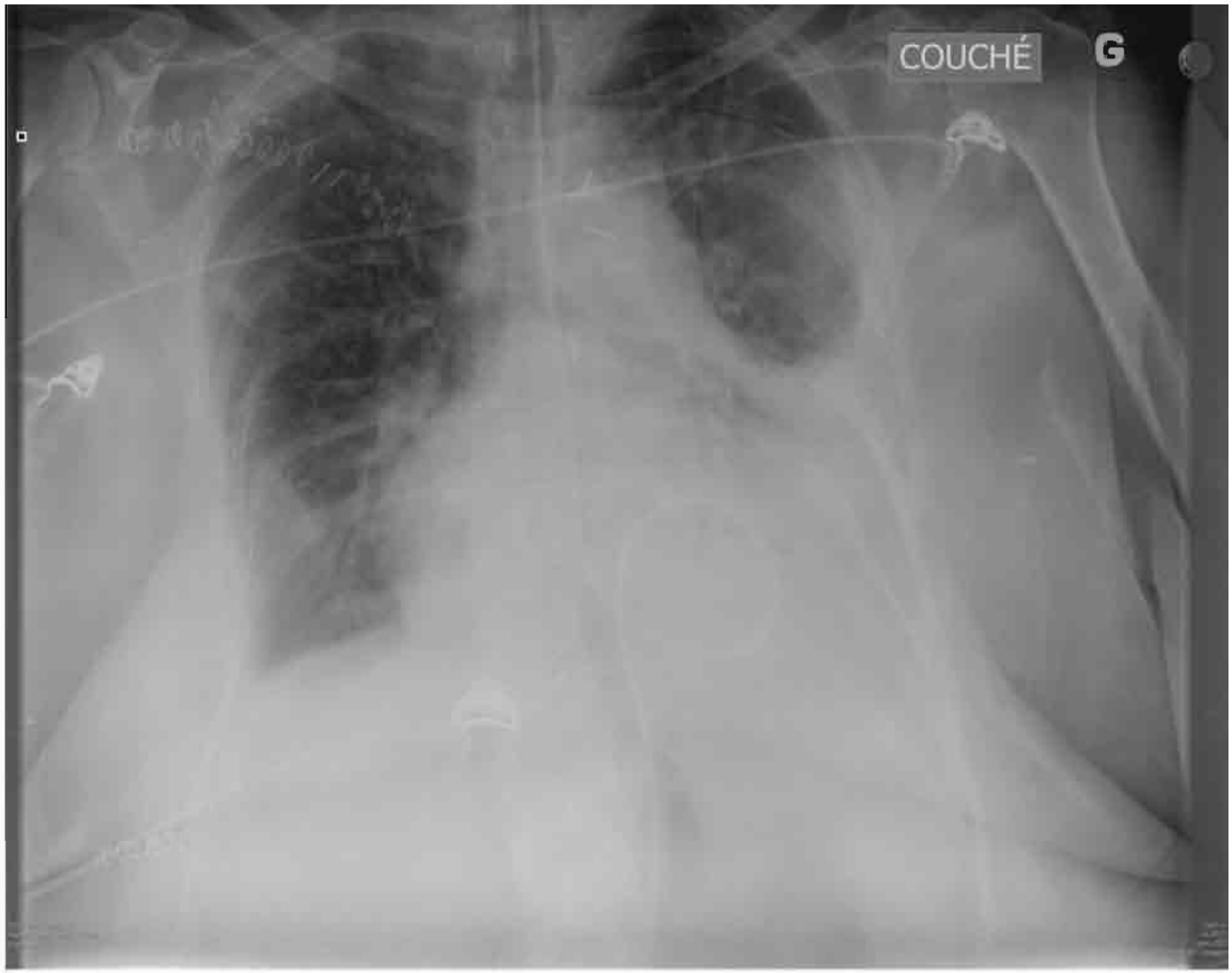


Oedème pulmonaire: lignes B bilatérales
Thorax antérieure: RX poumons?




COUCHÉ
G

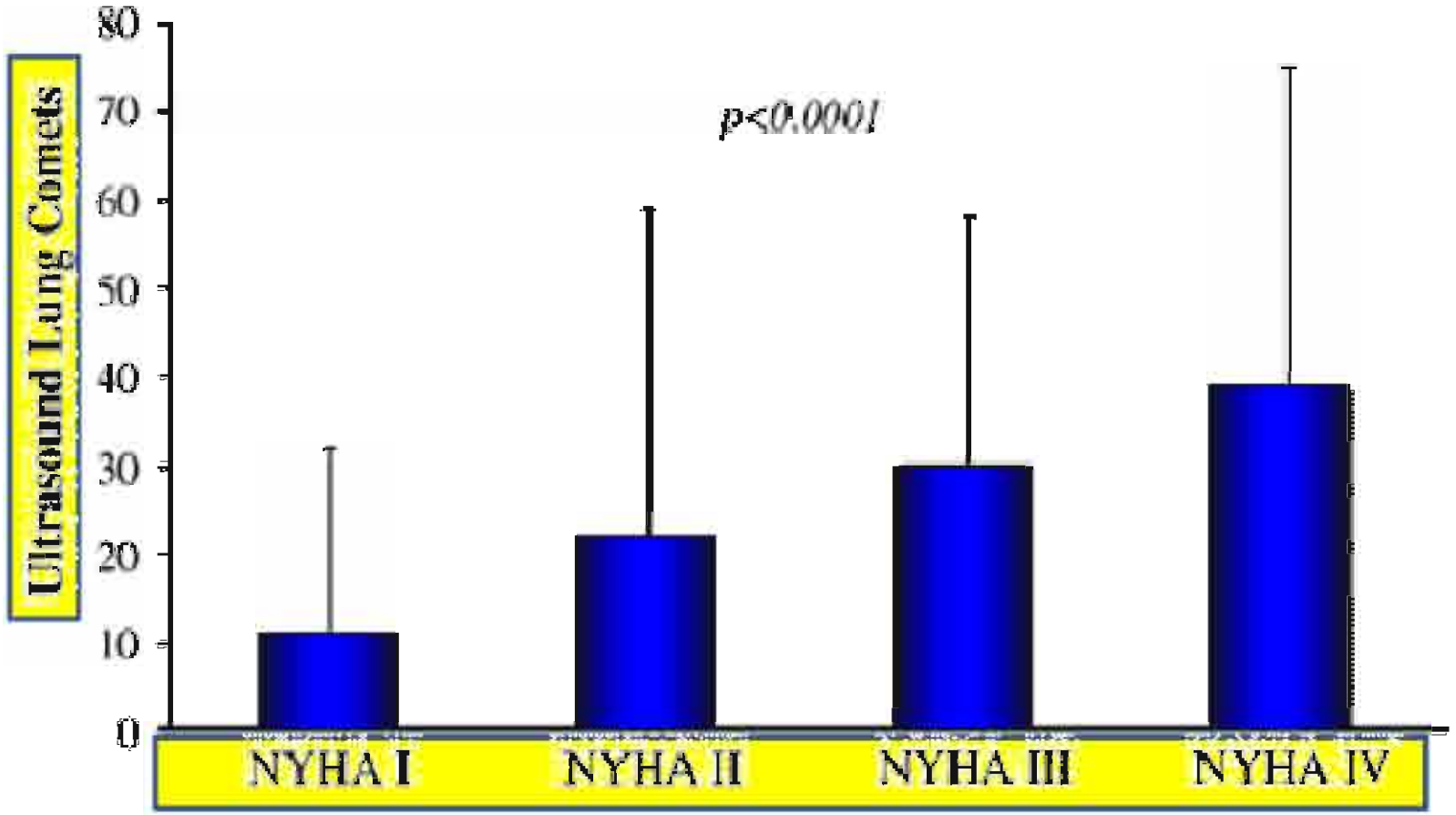
Utilités des lignes B

- Diagnostique de l'oedème pulmonaire
  - Thérapie: lasix ou dialyse
- Corrélation avec le NYHA et la fonction cardiaque systolique et diastolique
- Corrélation avec le BNP et le "wedge"
- Valeur pronostique en survie
- Diminuent après la dialyse

Clinical and echocardiographic determinants of ultrasound lung comets☆

Eur J Echocardiography (2007) 8, 474–479

Francesca Frassi [a,c], Luna Gargani [a,c], Suzana Gligorova [b,c,d], Quirino Ciampi [a,c,e], Gaetano Mottola [b,c], Eugenio Picano [a,*,c]



Clinical and echocardiographic determinants of ultrasound lung comets☆

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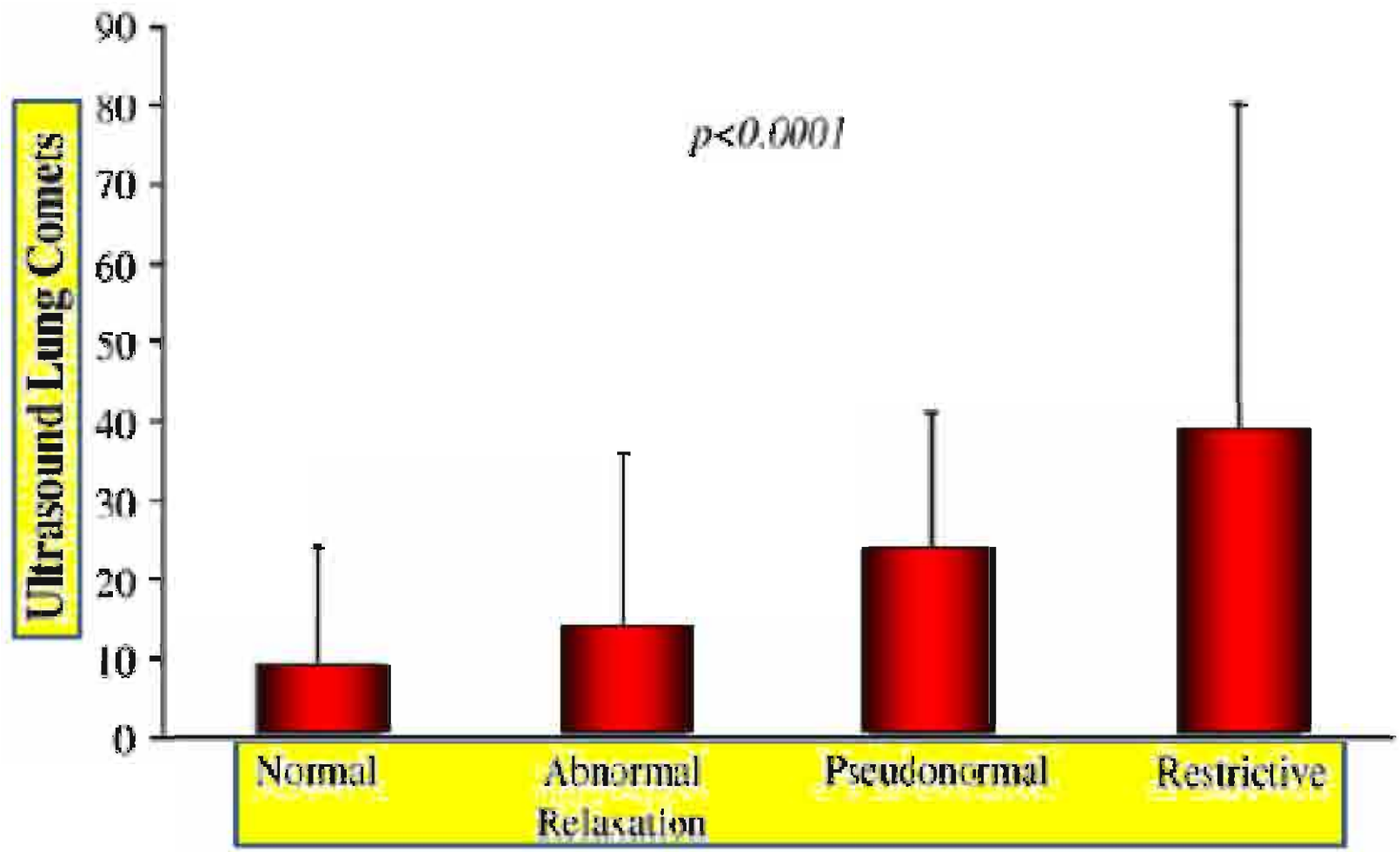
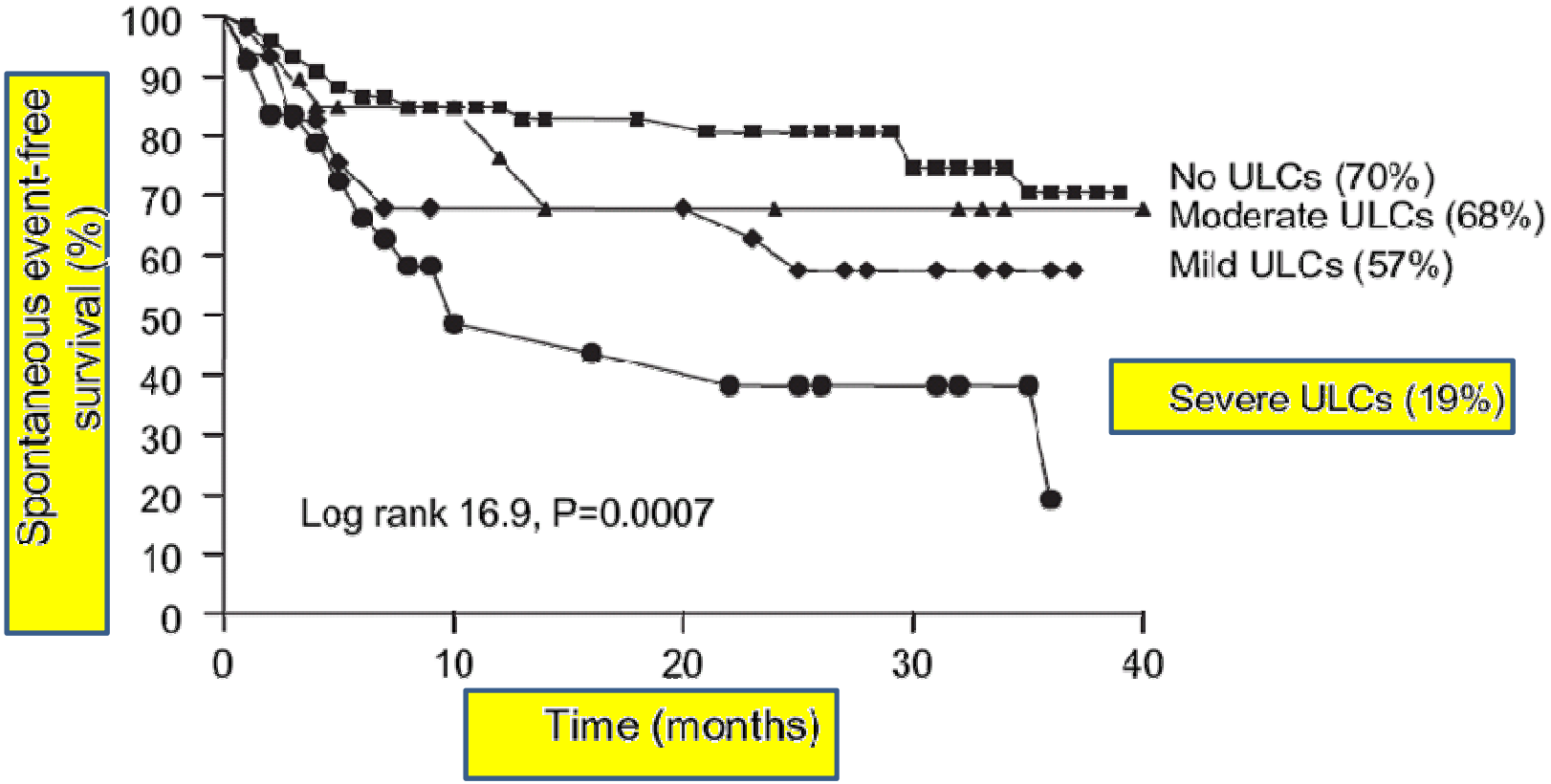


Prognostic Value of Extravascular Lung Water Assessed With Ultrasound Lung Comets by Chest Sonography in Patients With Dyspnea and/or Chest Pain

Journal of Cardiac Failure Vol. 13 No. 10 2007

FRANCESCA FRASSI, MD,[1] LUNA GARGANI, MD,[1] PAOLA TESORIO, MD,[2] MAURO RACITI, BSc,[1]
GAETANO MOTTOLA, MD,[2] AND EUGENIO PICANO, MD, PhD[1]



N=290

Ultrasound lung comets for the differential diagnosis of acute cardiogenic dyspnoea: A comparison with natriuretic peptides ☆

European Journal of Heart Failure 10 (2008) 70–77

L. Gargani [a,*], F. Frassi [a], G. Soldati [b], P. Tesorio [c], M. Gheorghiade [d], E. Picano [a]

Diagnostic accuracy of a cardiac etiology

	Sensitivity	Specificity
NT-proBNP 298 ng/L	**97%**	**92.6%**
ULCs ≥ 9 (total)	**73%**	**100%**
ULCs ≥ 20 (total)	**84%**	**100%**

- Intraobserver variability: 5.1%
- Interobserver variability: 7.4%

n=149

CHEST

Original Research

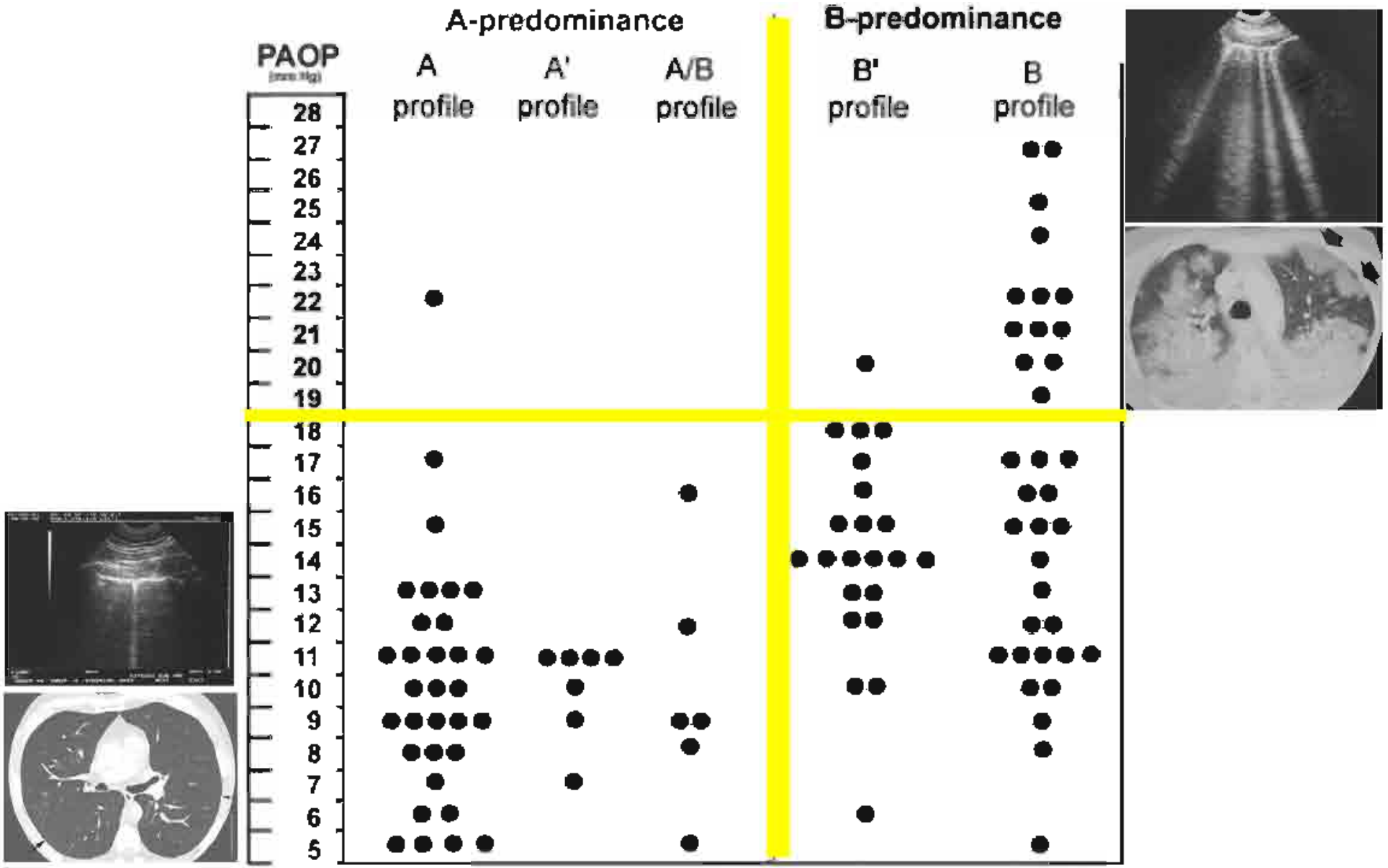
CRITICAL CARE MEDICINE

A-Lines and B-Lines

Lung Ultrasound as a Bedside Tool for Predicting Pulmonary Artery Occlusion Pressure in the Critically Ill

Daniel A. Lichtenstein, MD, FCCP; Gilbert A. Mezière, MD; Jean-François Lagoueyte, MD; Philippe Biderman, MD; Ivan Goldstein, MD; and Agnès Gepner, MD

CHEST 2009; 136:1014–1020


A-predominance
B-predominance
PAOP
A profile
A' profile
A/B profile
B' profile
B profile
28
27
26
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Detection of Pulmonary Congestion by Chest Ultrasound in Dialysis Patients

Francesca Mallamaci, MD,*† Francesco A. Benedetto, MD,‡ Rocco Tripepi,†
Stefania Rastelli, MD,§ Pietro Castellino, MD PROF.,§ Giovanni Tripepi, STAT. DR.,†
Eugenio Picano, MD PROF.,‖ Carmine Zoccali, MD PROF.*†

Reggio Calabria, Catania, and Pisa, Italy

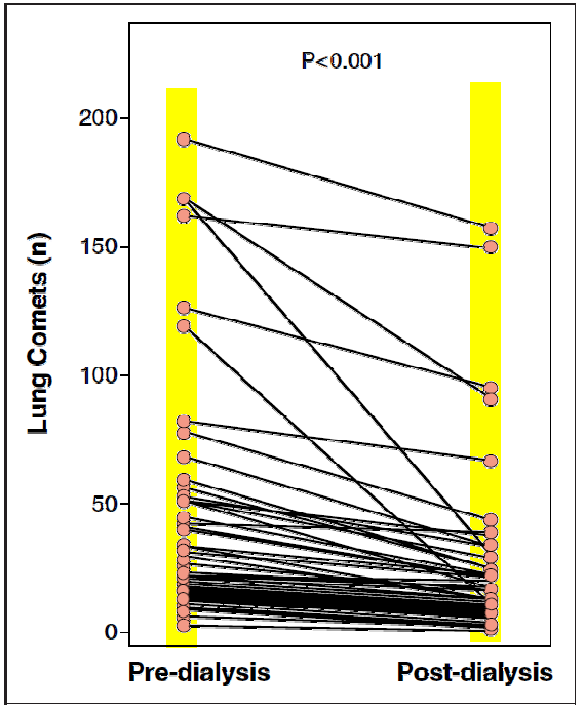
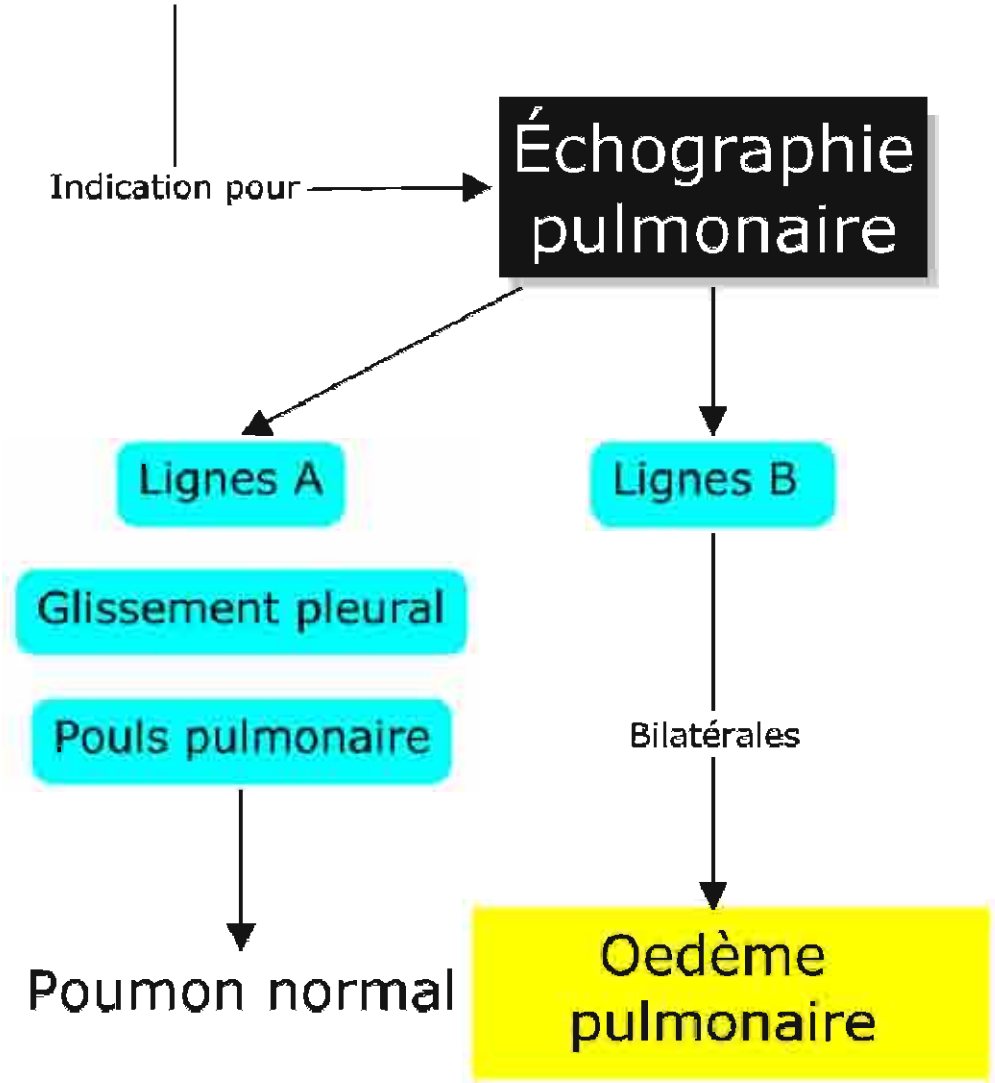


Figure 2. Individuals Pre- and Post-Dialysis Lung Comets Score

Among patients, comparison was made by using the Wilcoxon signed ranks test (see the Statistical Analysis section for details).

Mallamaci JACC Imaging 2010

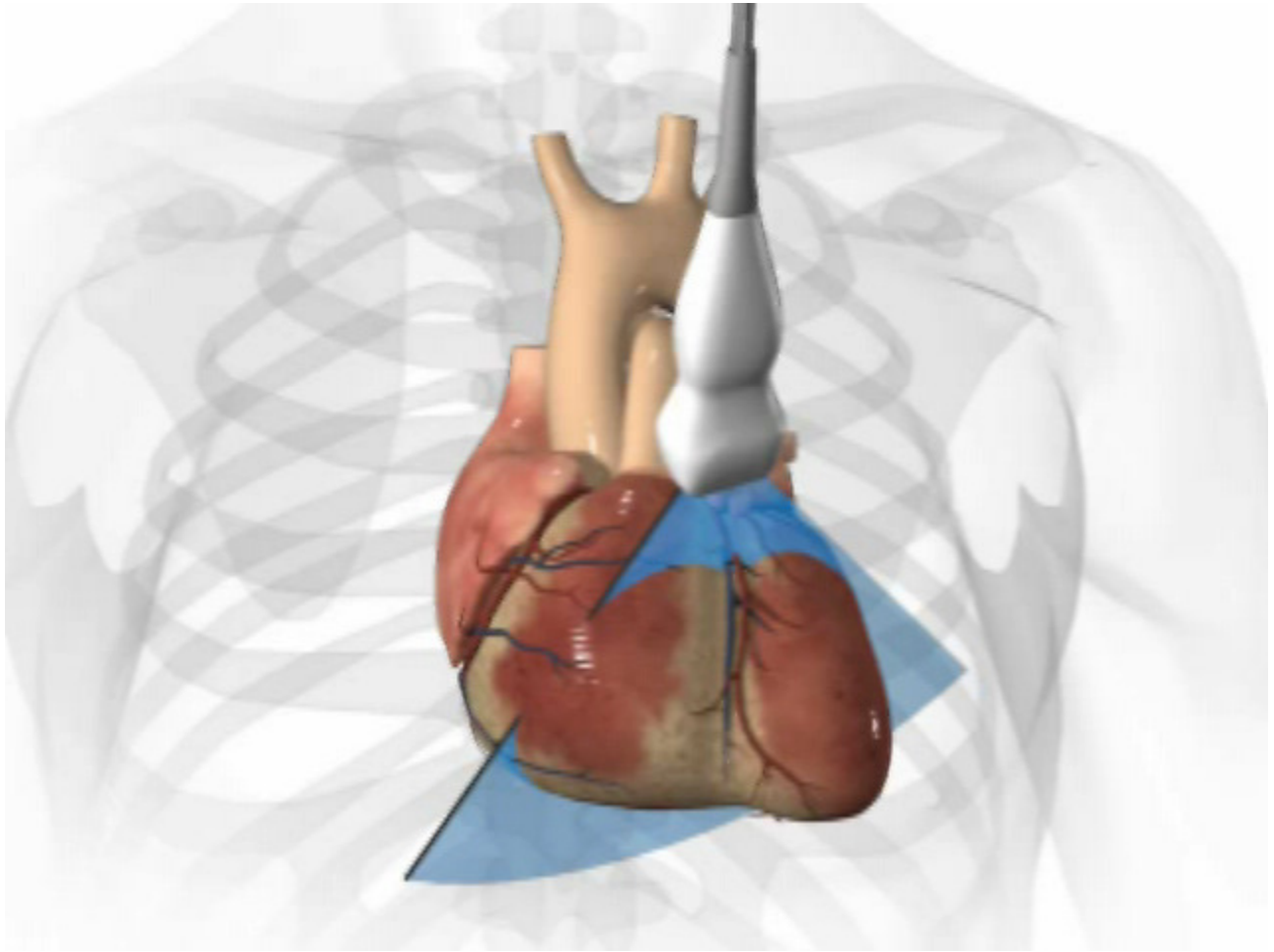
A: Voies Resp. Sup.
B: Ventilation
C: État de choc
D: Diagnostique



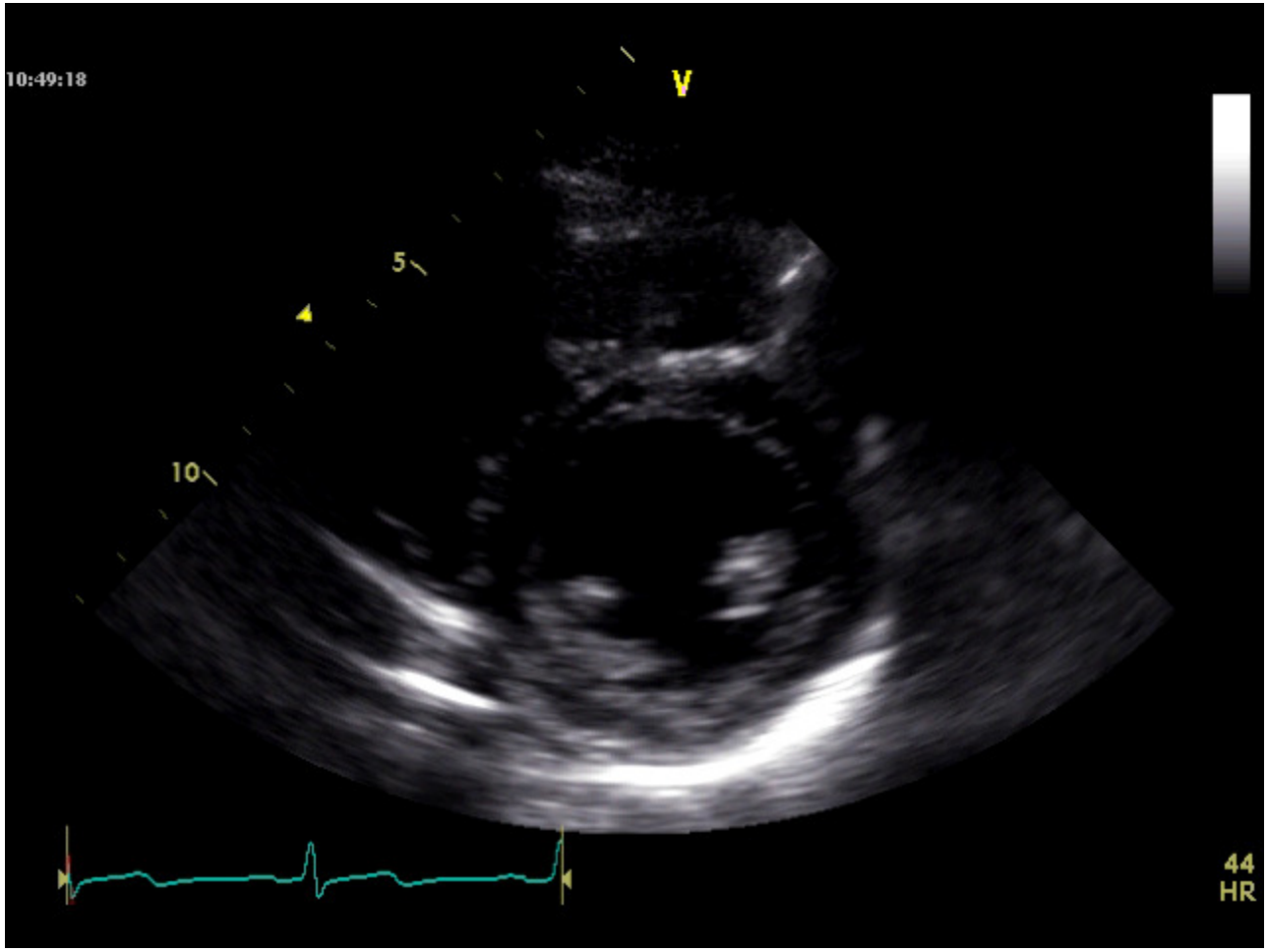
Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

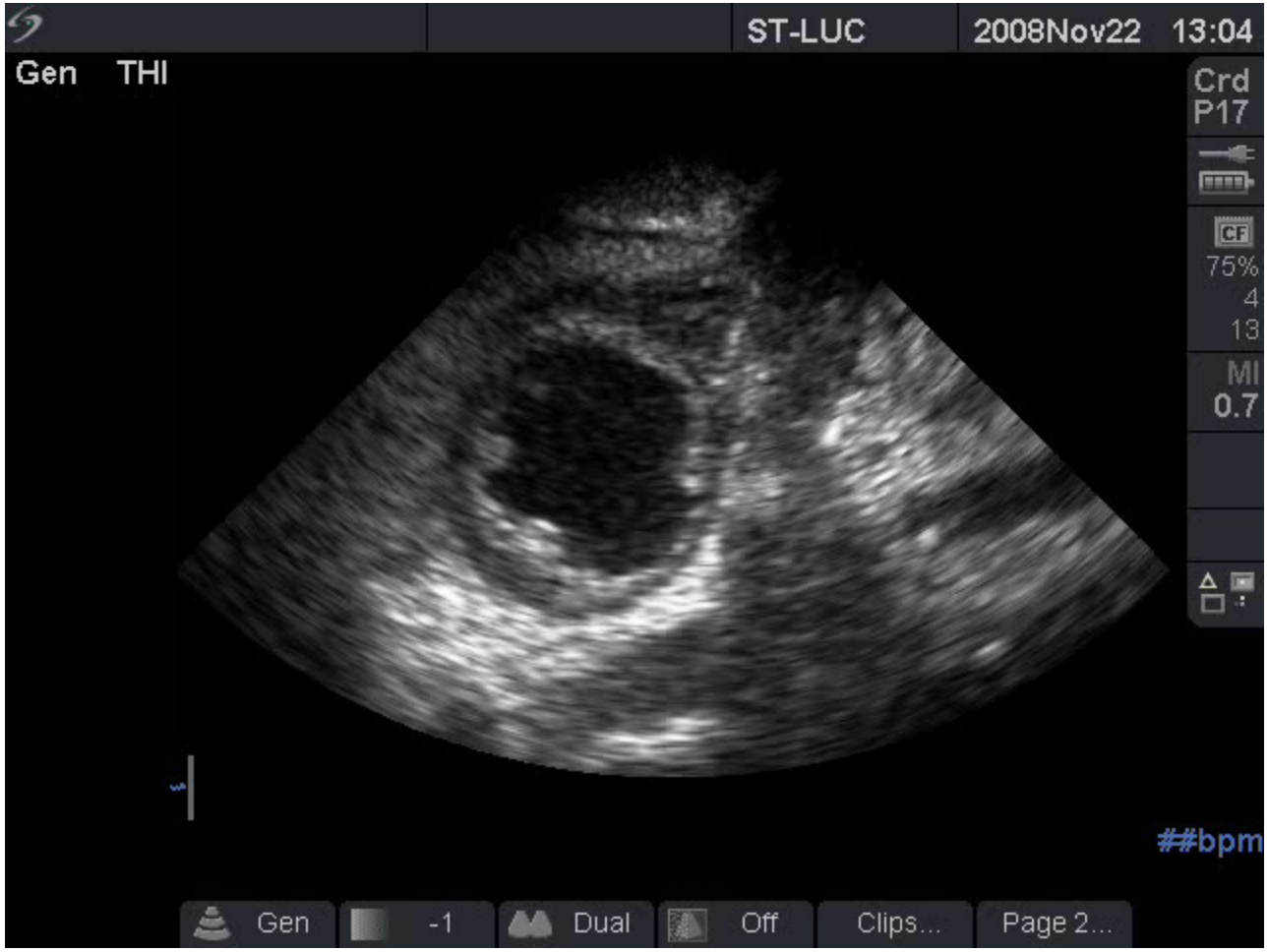
Parasternal SAX



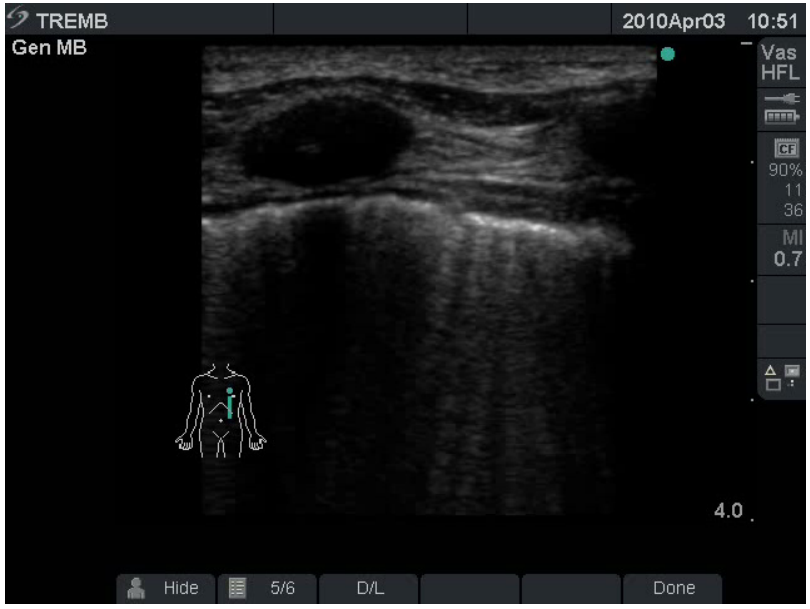
Parasternal SAX

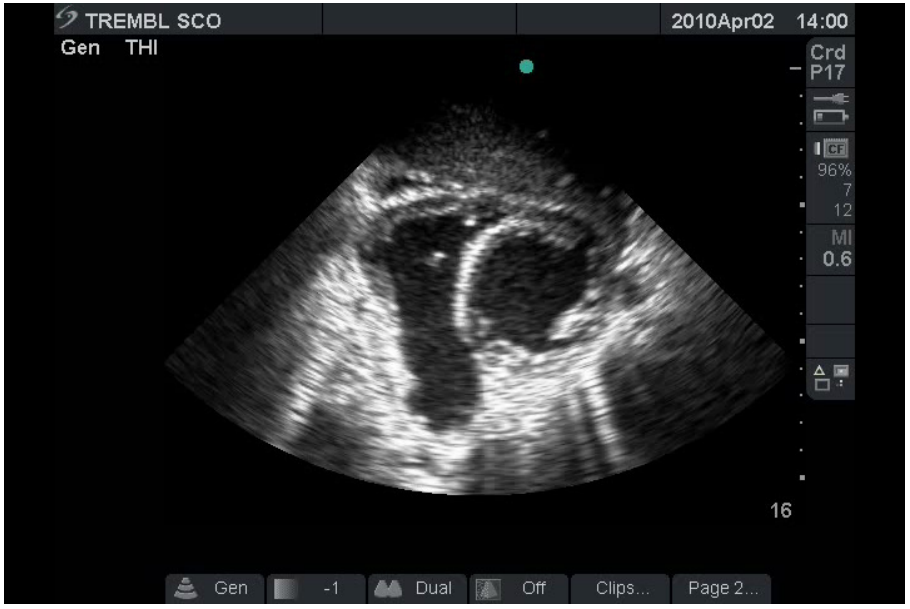


Unstable patient after urgent laparotomy

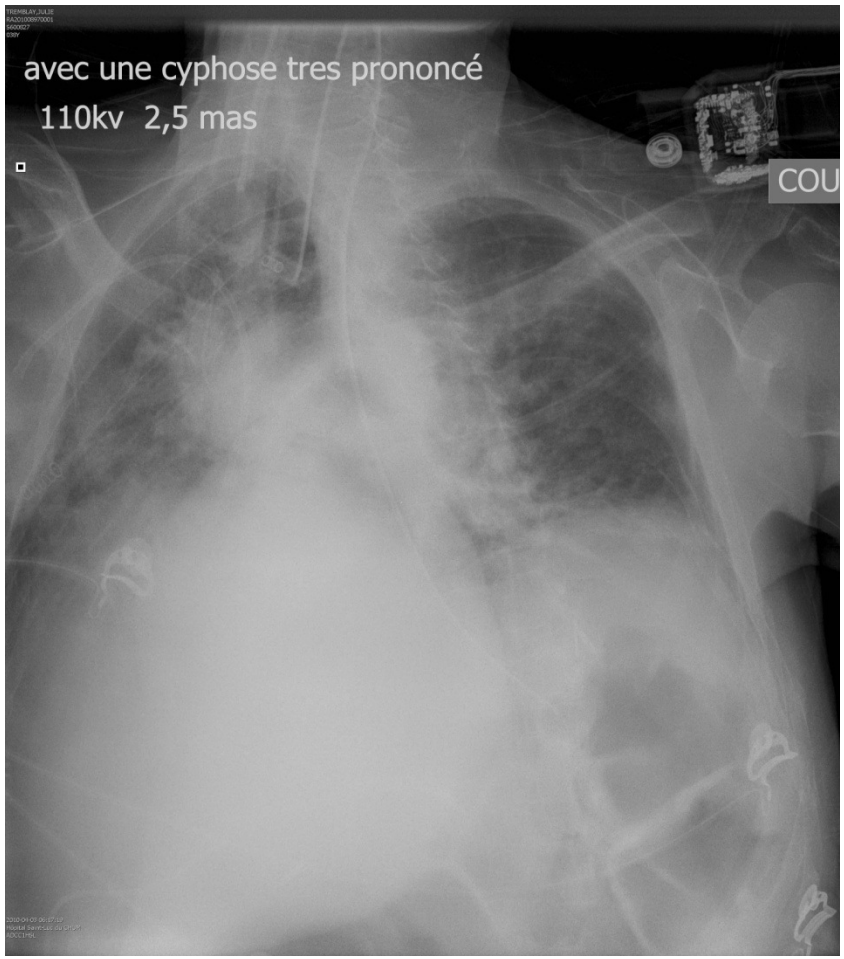


Case last week: 43 yo woman acute SOB on the ward: diagnosis pulmonary emboli?

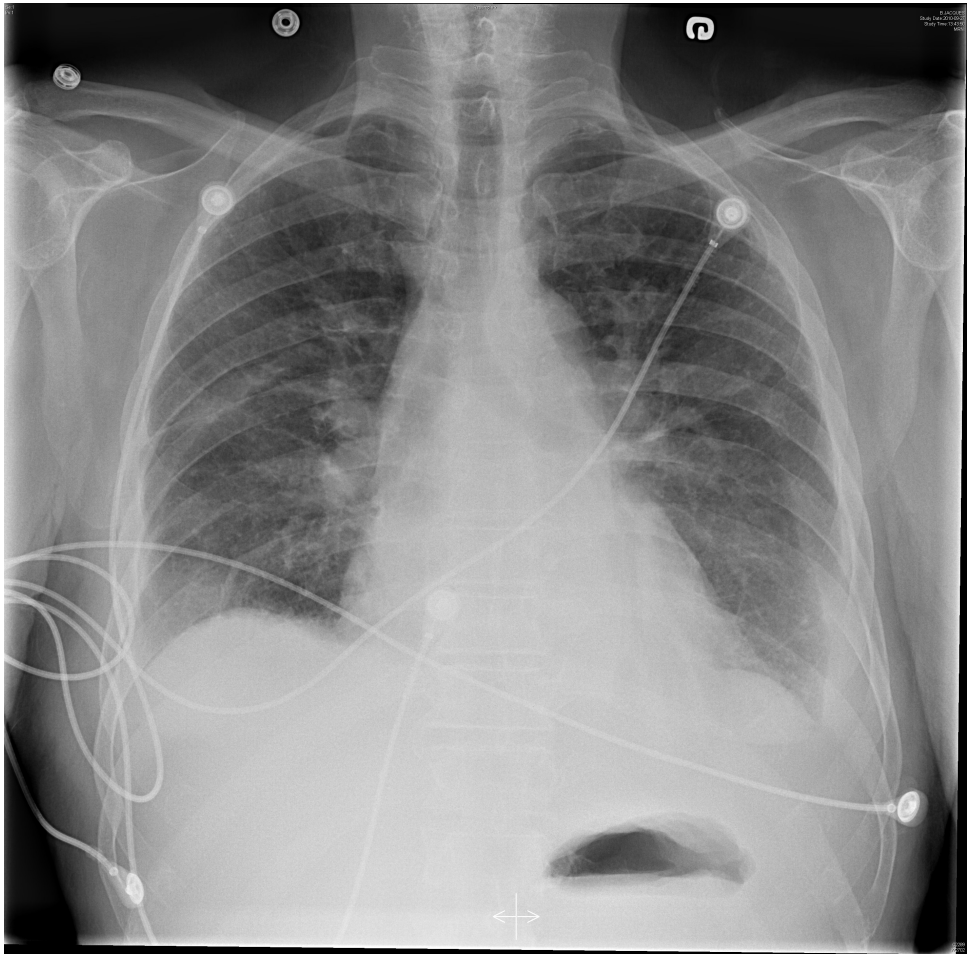


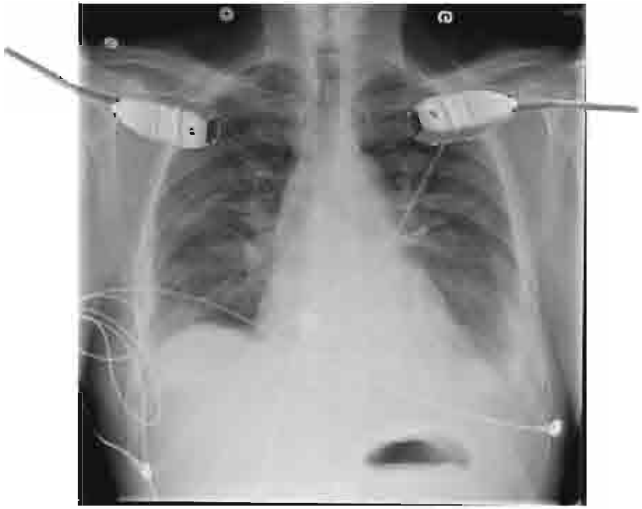


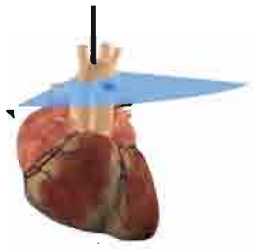
Case last week: 43 yo woman acute SOB on the ward



♂ de 86 ans pré-opératoire

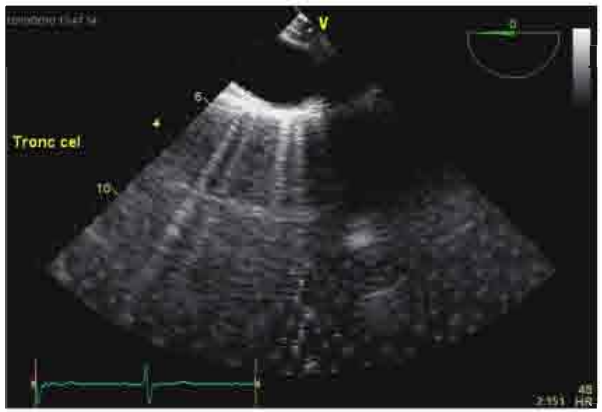


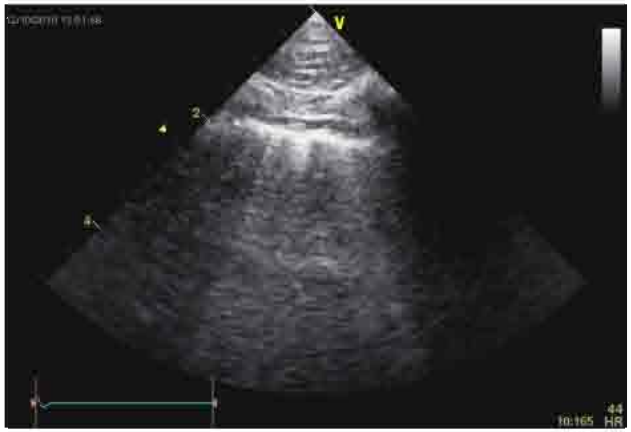


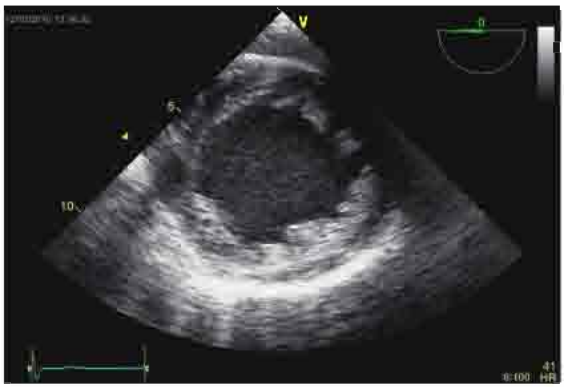


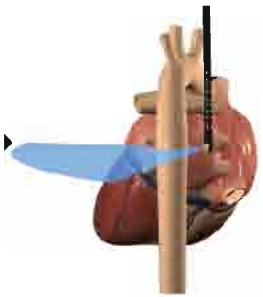
A

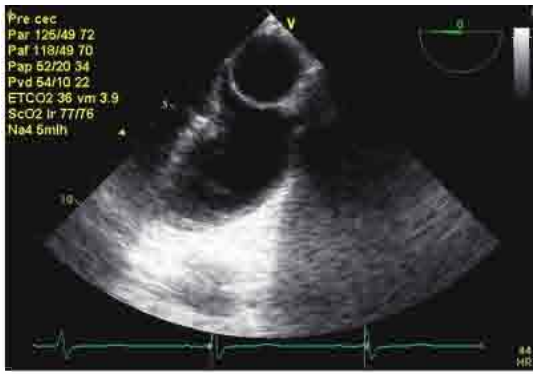
B



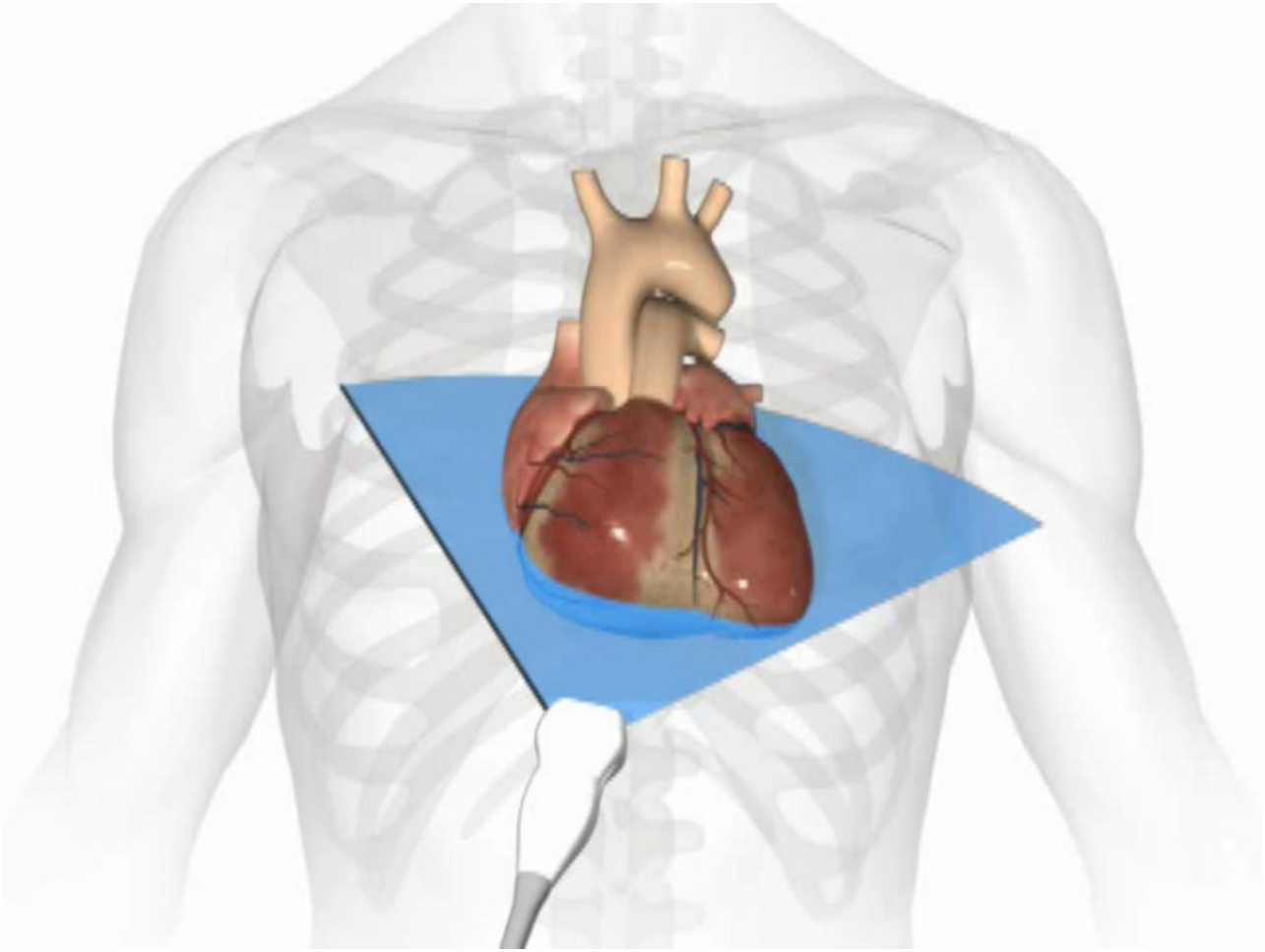




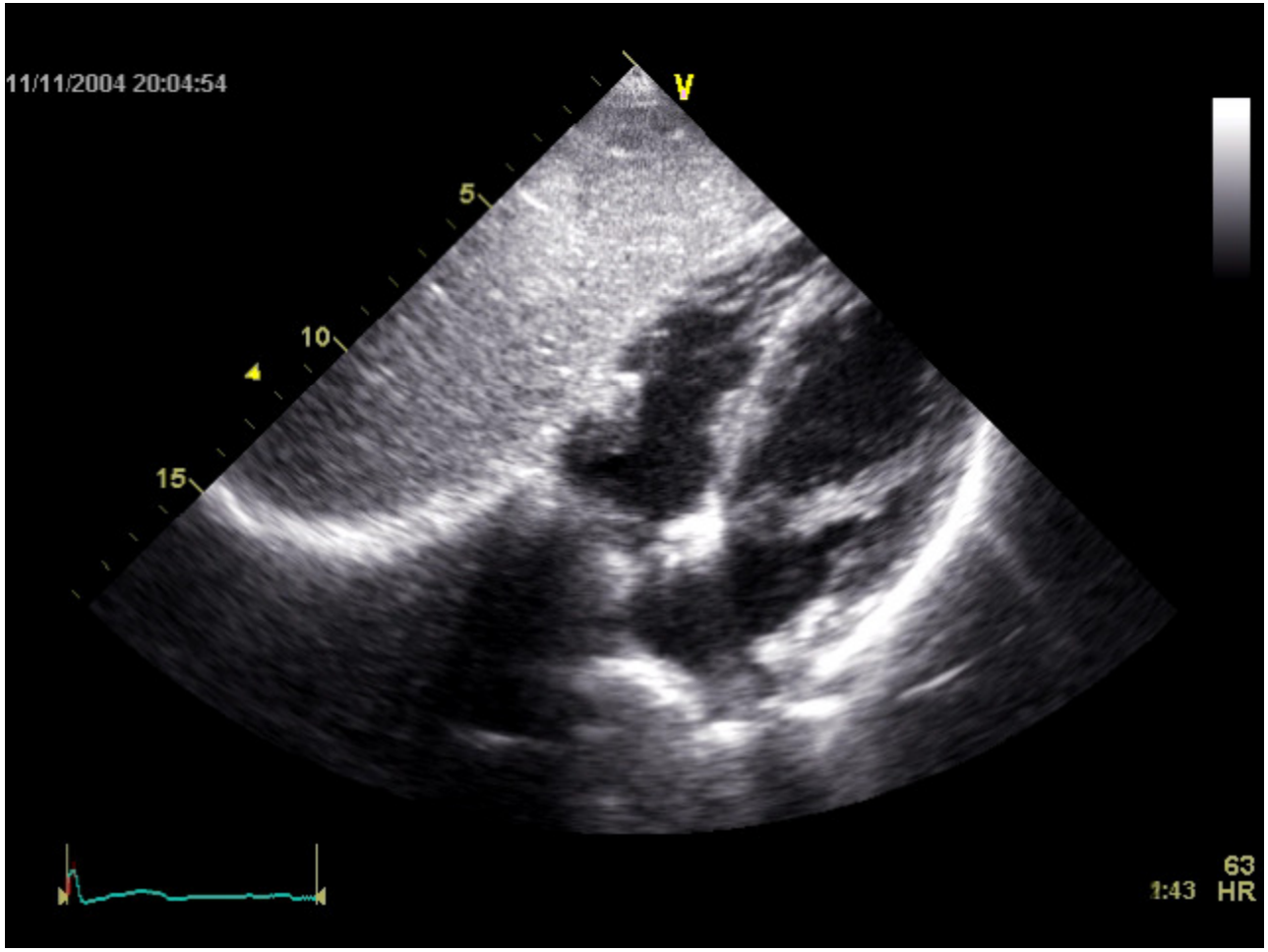



Pre cec
Par 125/49 72
Paf 118/49 70
Pap 52/20 34
Pvd 54/10 22
ETCO2 36 vm 3.9
ScO2 Ir 77/76
Na4 5mlh

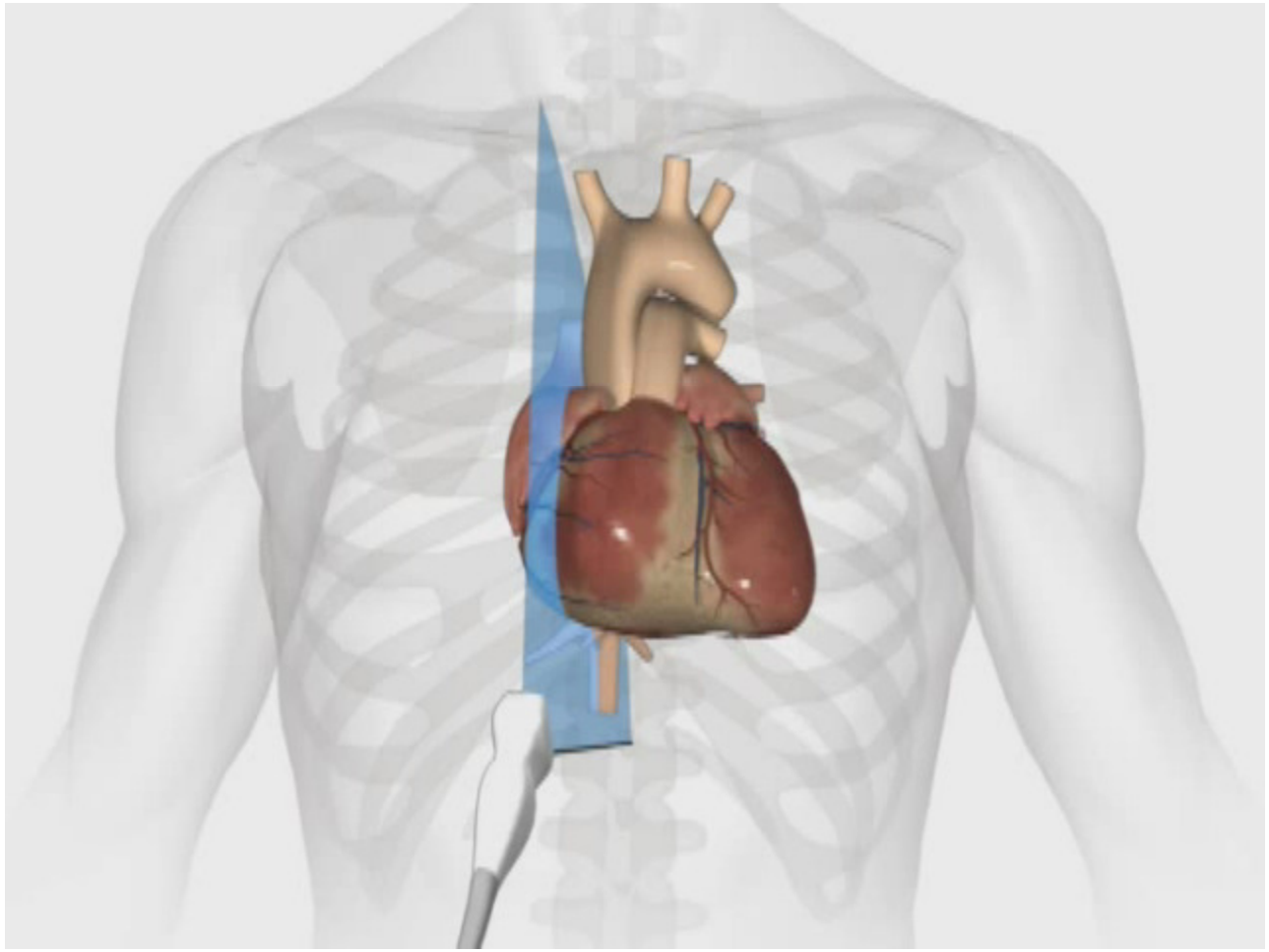
Sub-costal view 0°



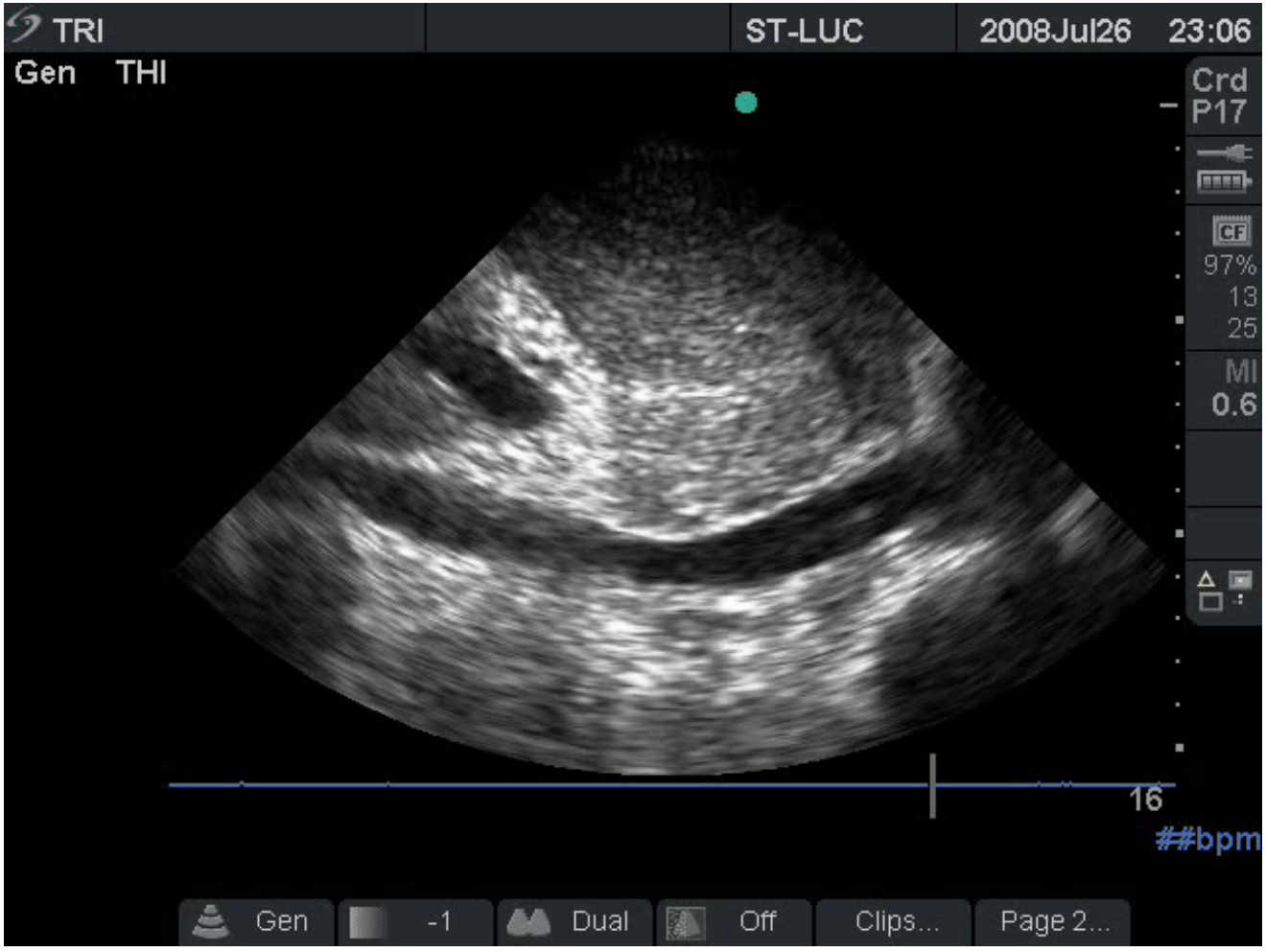
Sub-costal view 0°

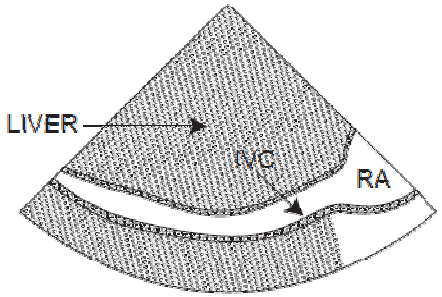


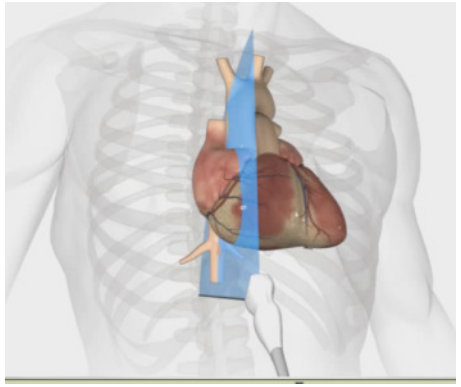
The 90°subcostal view



Normal or ↓ Pms

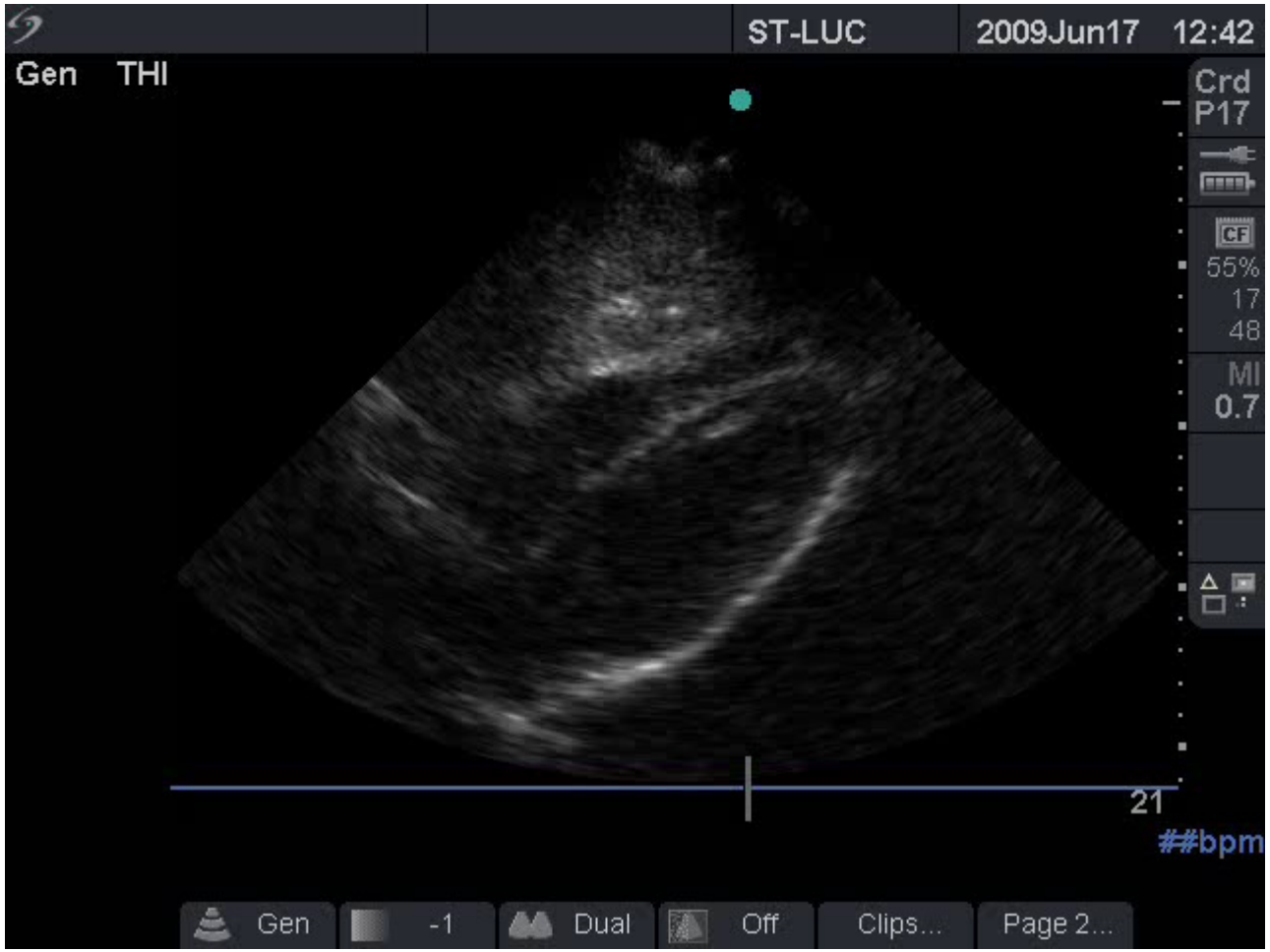


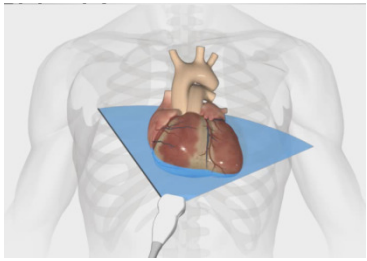


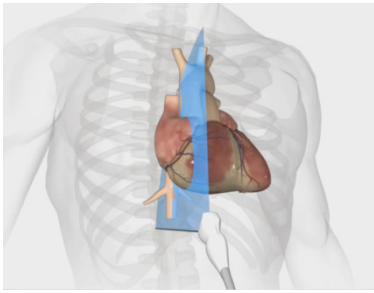


25 yo ♂ post-op laparotomy for abdominal perforation.

On noradrenalin 0.17 ug/kg/m (50ml/h)

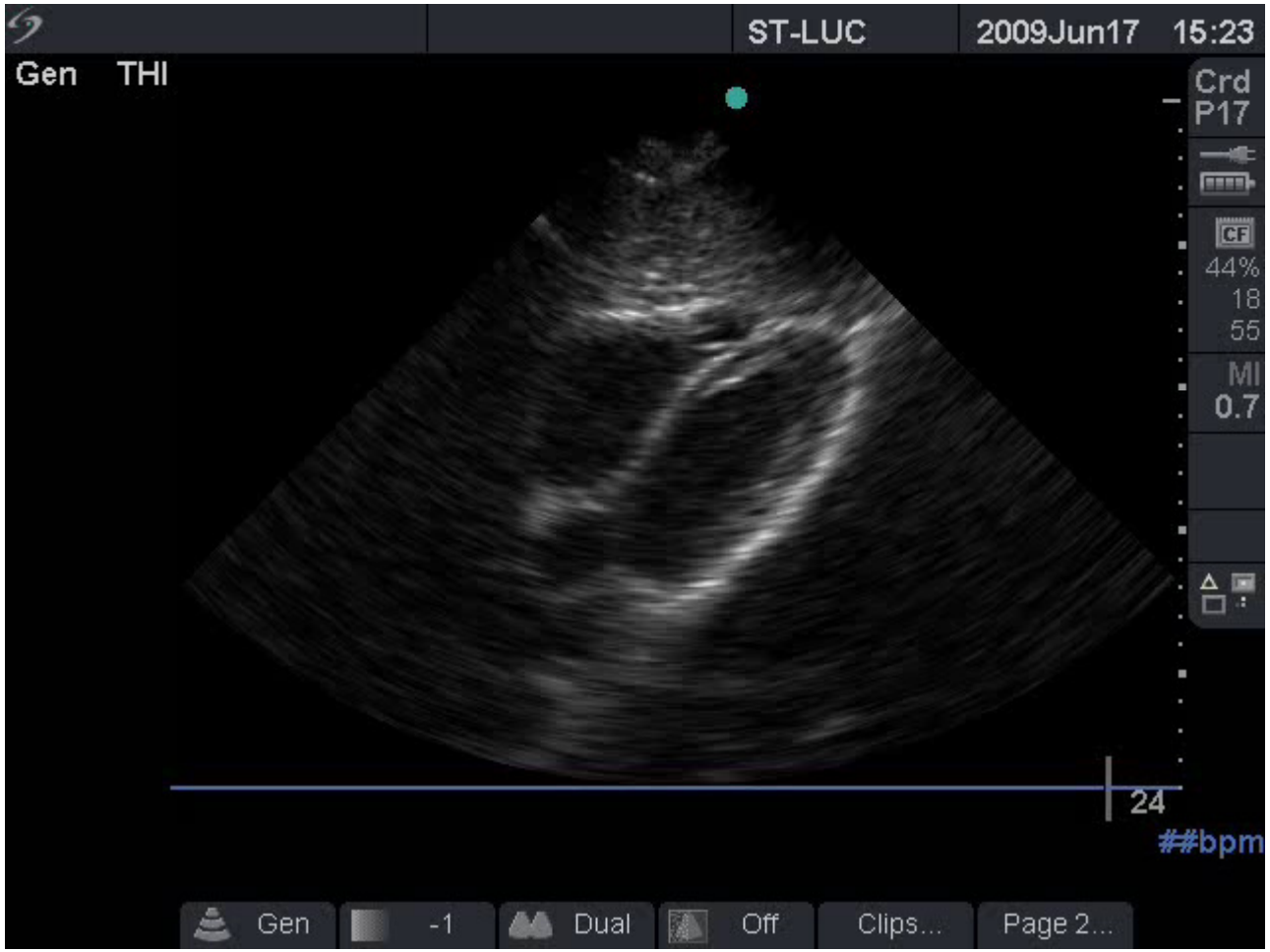


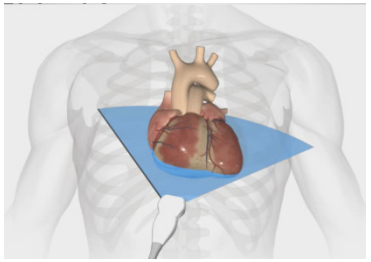


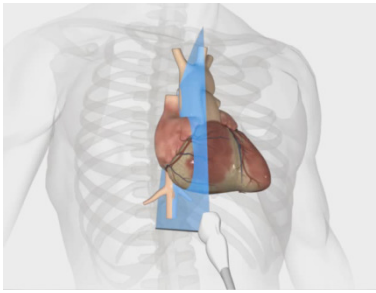


25 yo ♂ post-op laparotomy for abdominal perforation

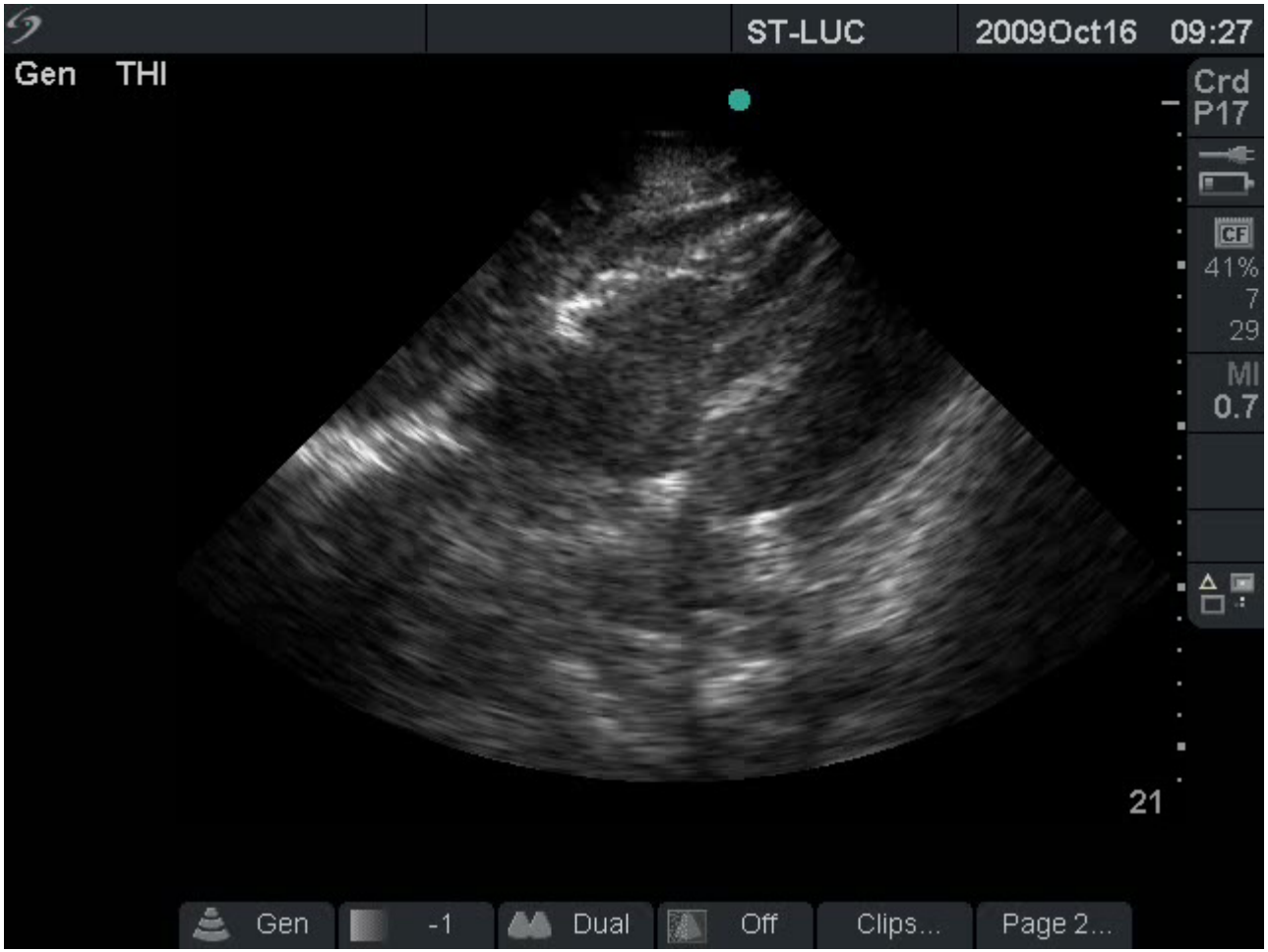
Noradrenalin stopped after 2h of dobutamine

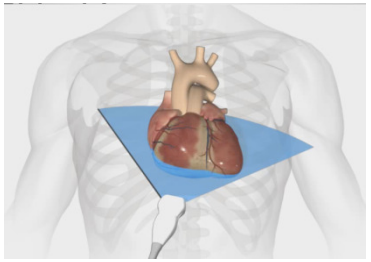




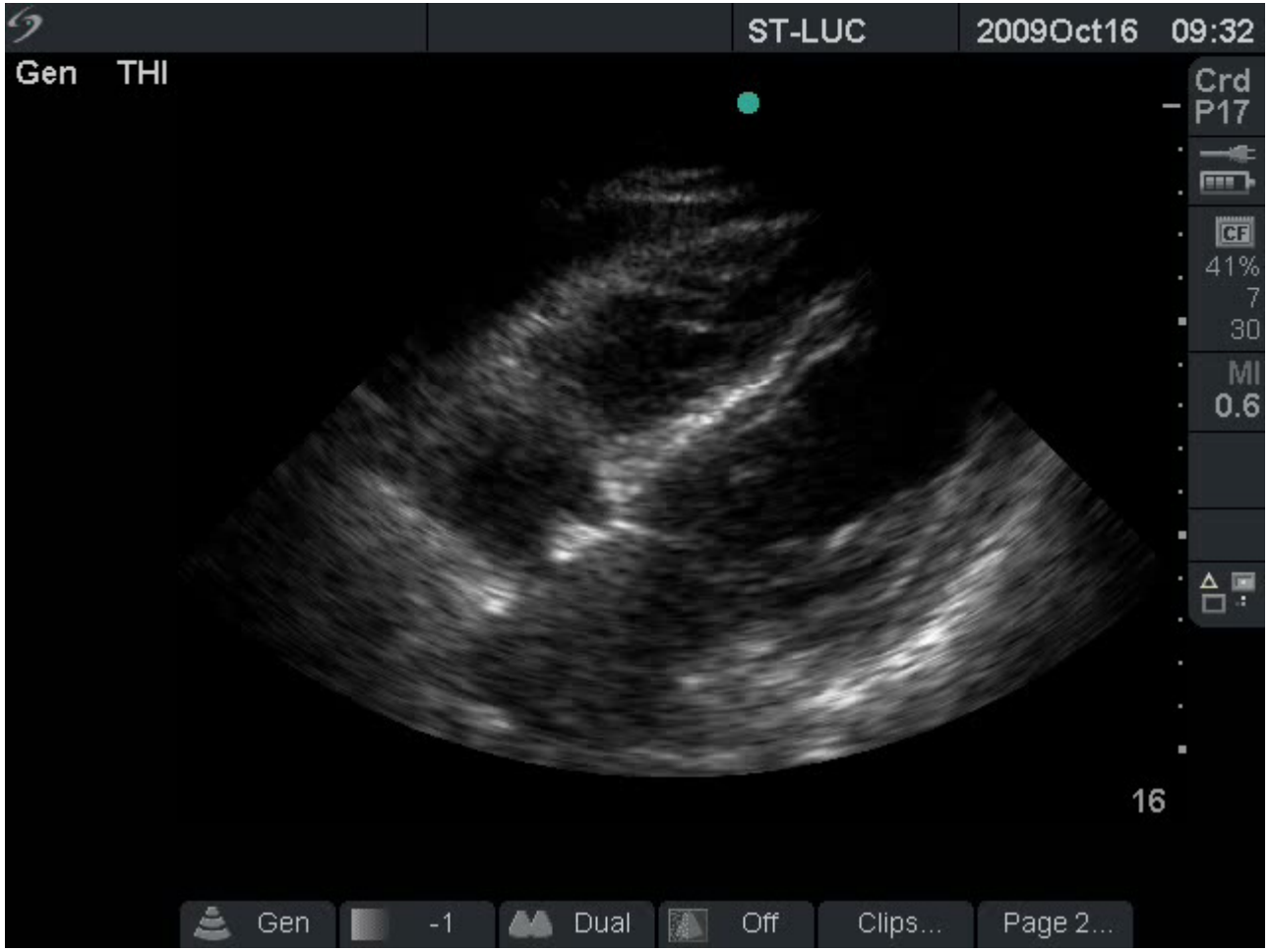


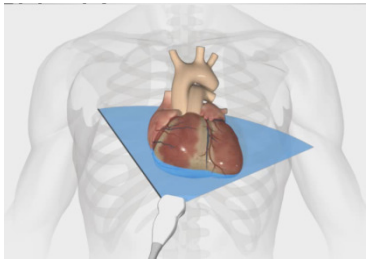
Blue code :arrival. What do you do?



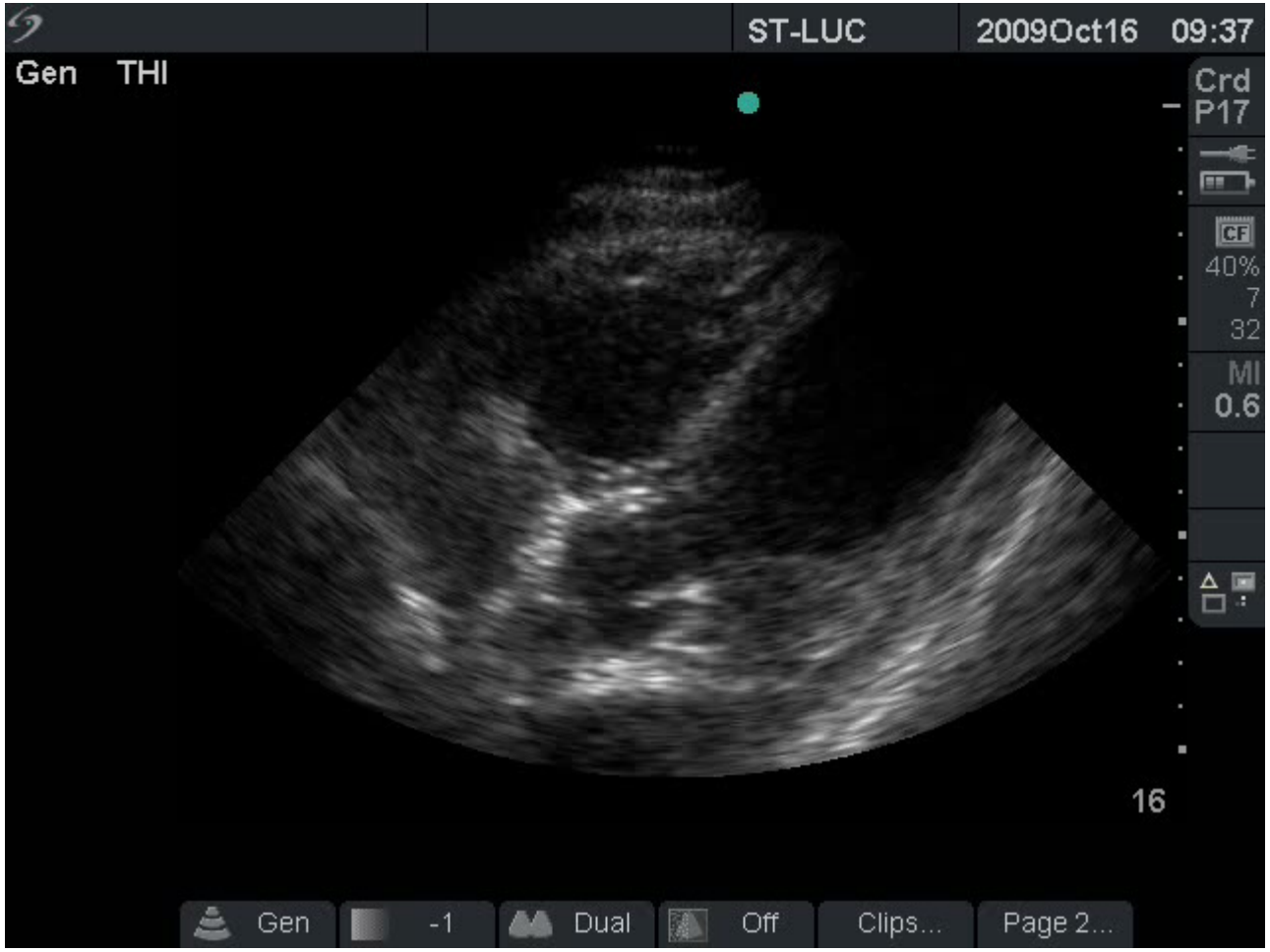


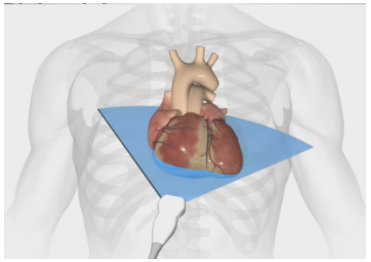
Blue code : 5 minutes





Blue code : 8 minutes



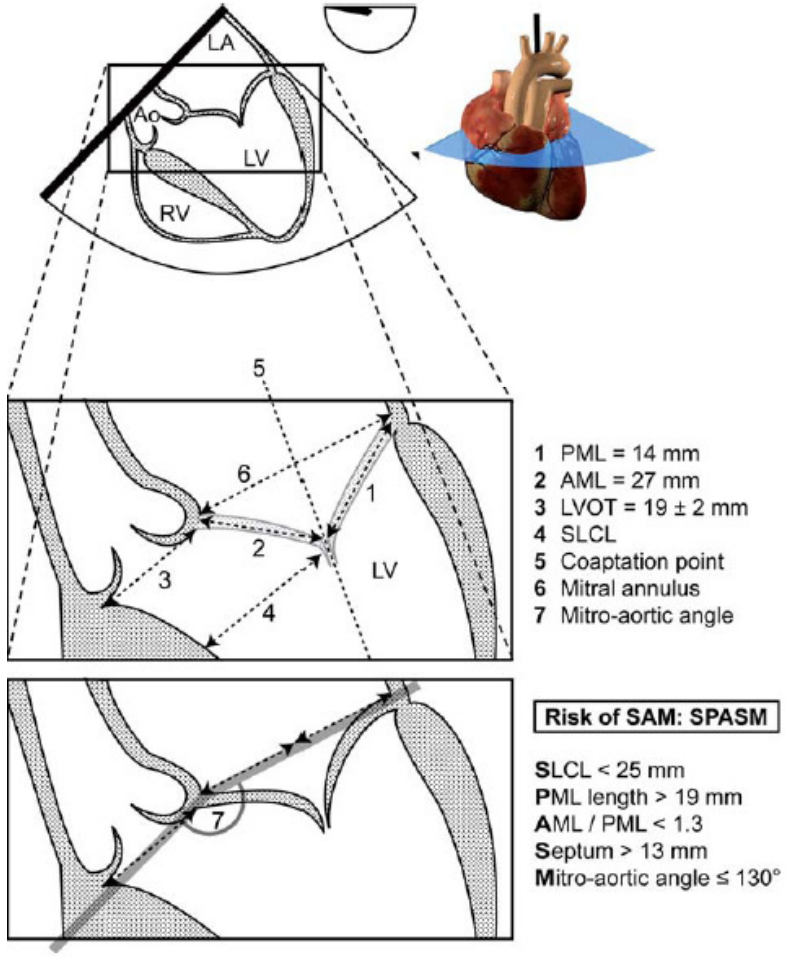


Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

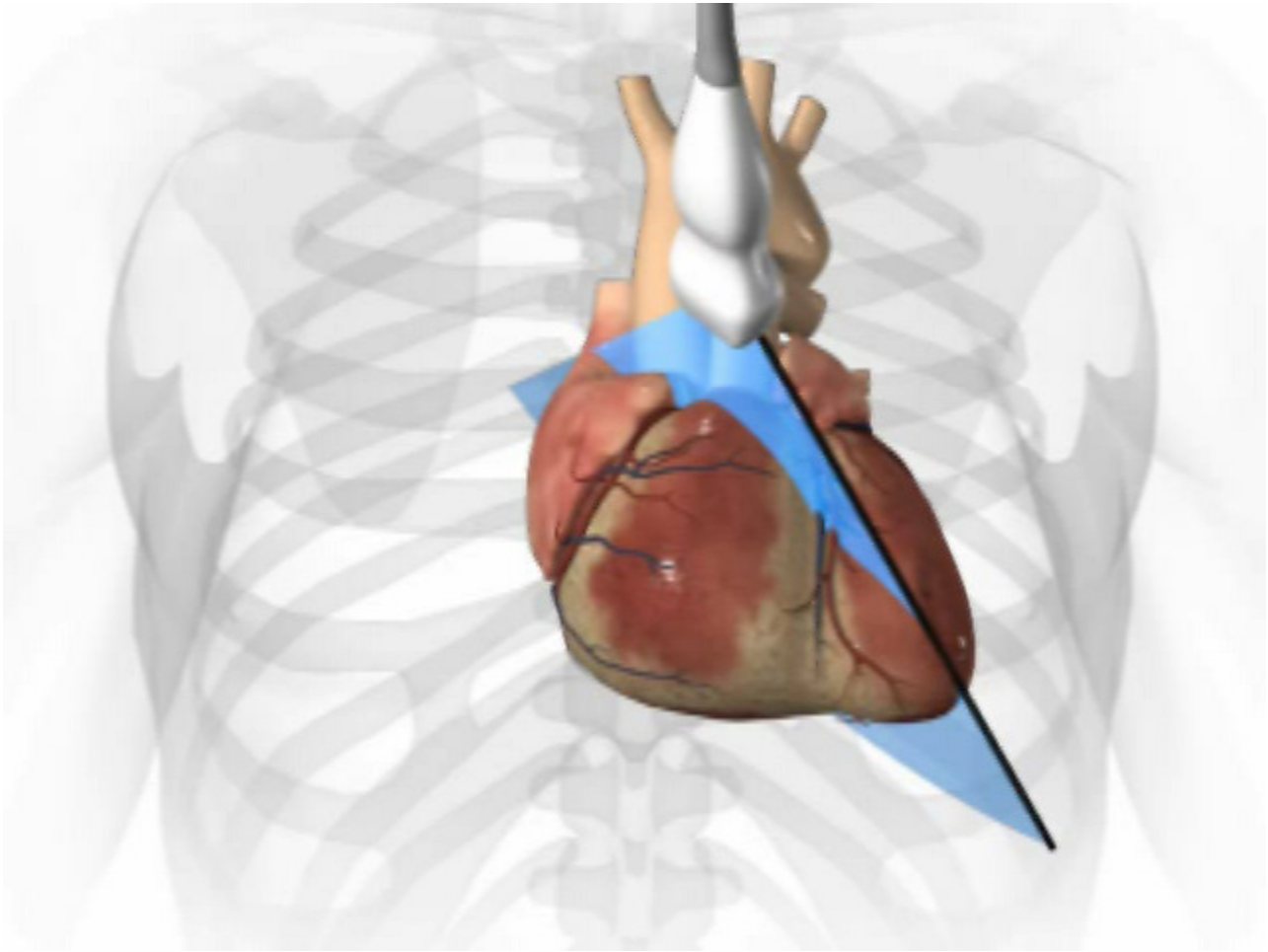
Always consider left ventricular outflow tract obstruction in hemodynamically unstable patients

Antoine G. Rochon, MD · Philippe L. L'Allier, MD · André Y. Denault, MD

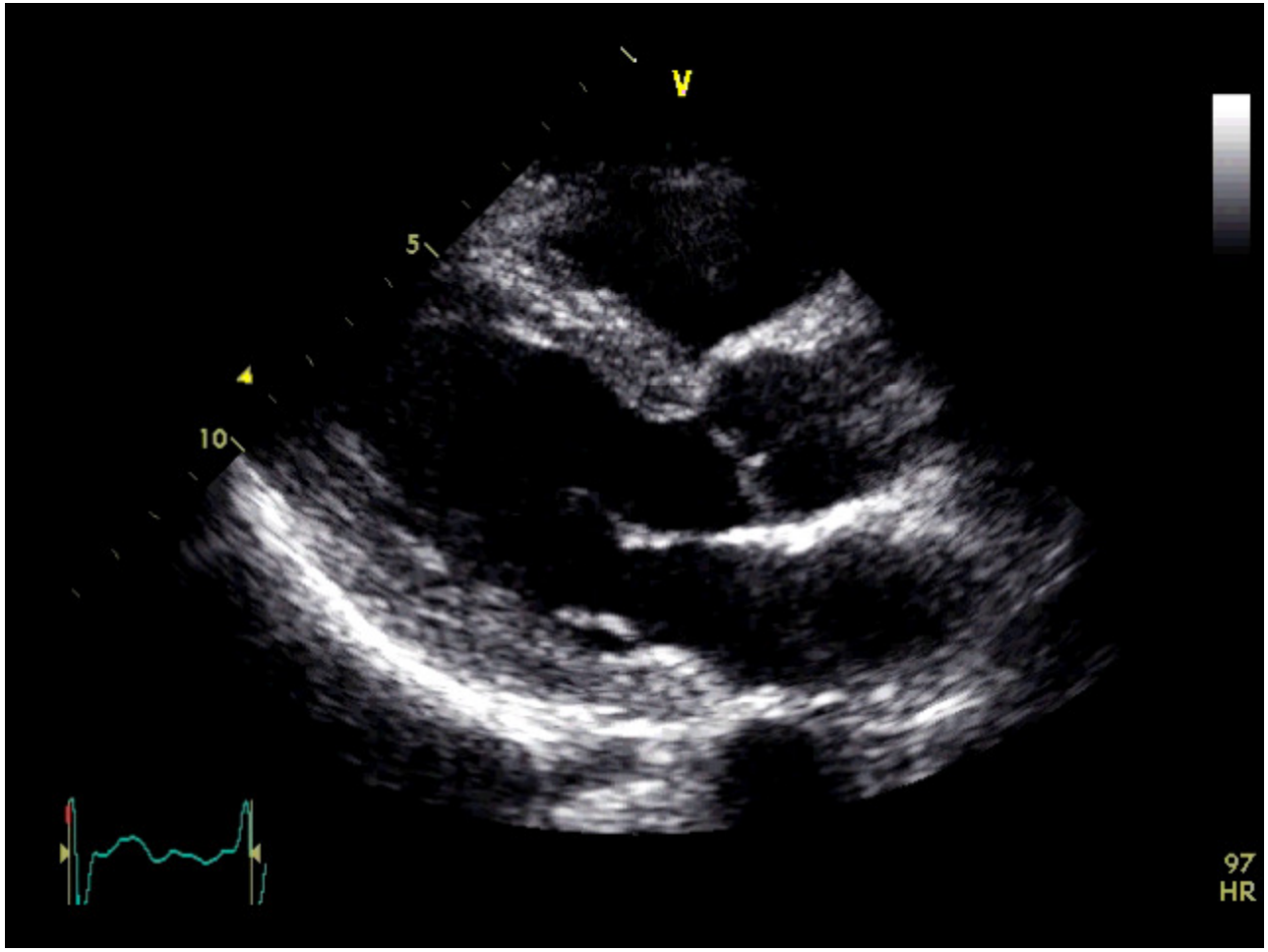


Can J Anesth/J Can Anesth (2009) 56:962–968

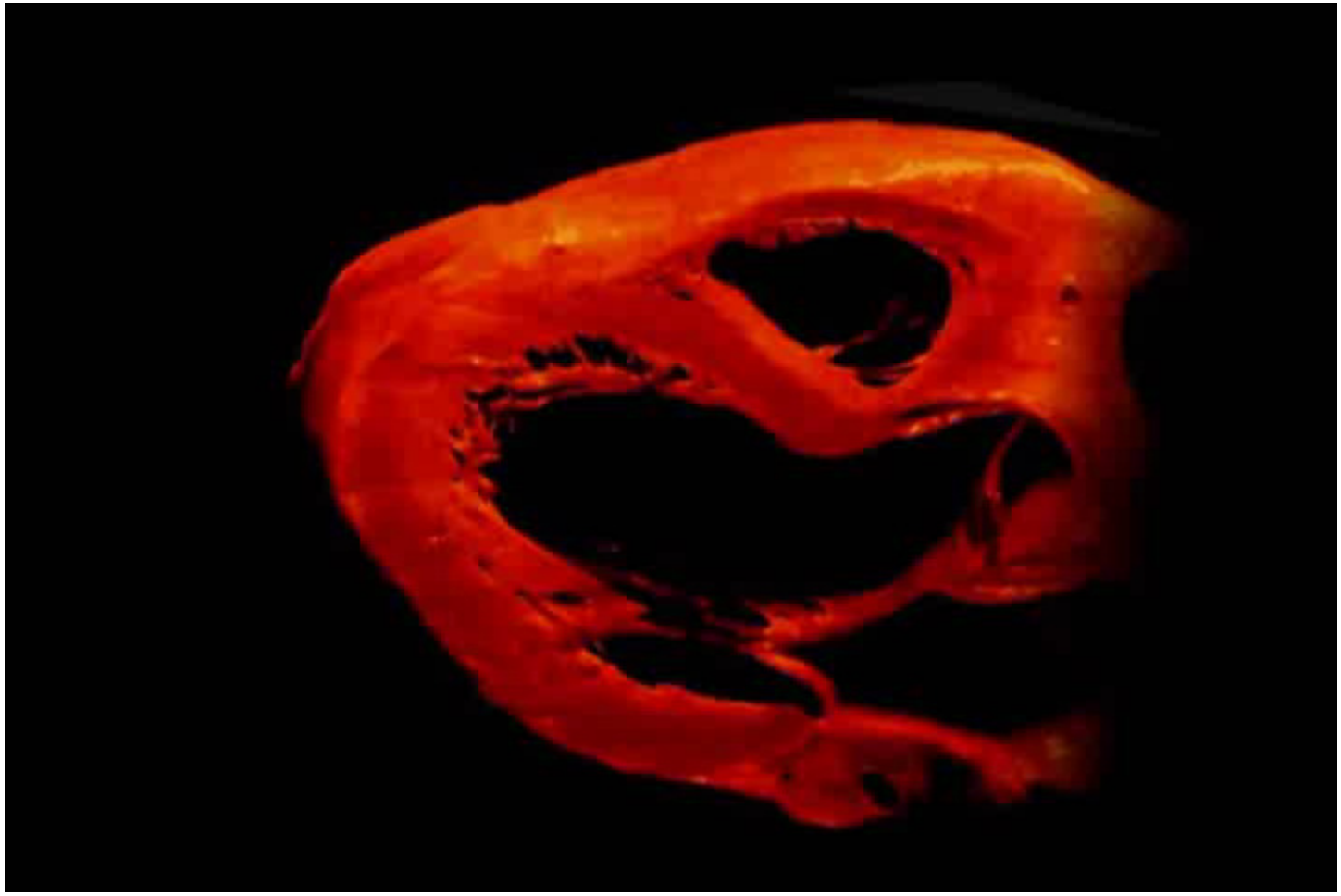
Parasternal LAX view



Para-sternal LAX view

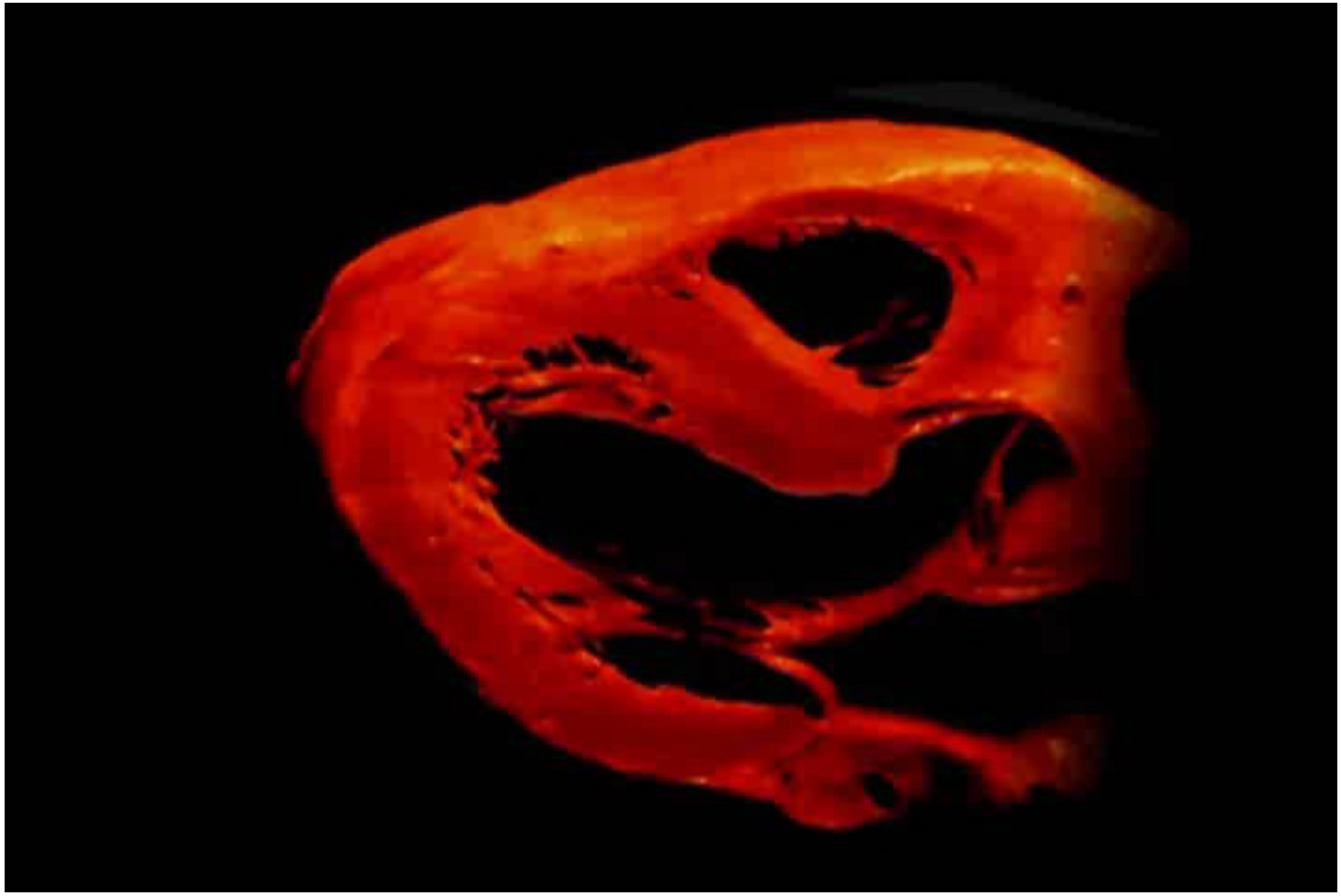


LV outflow tract obstruction



Curtesy of Gaudani

LV outflow tract obstruction

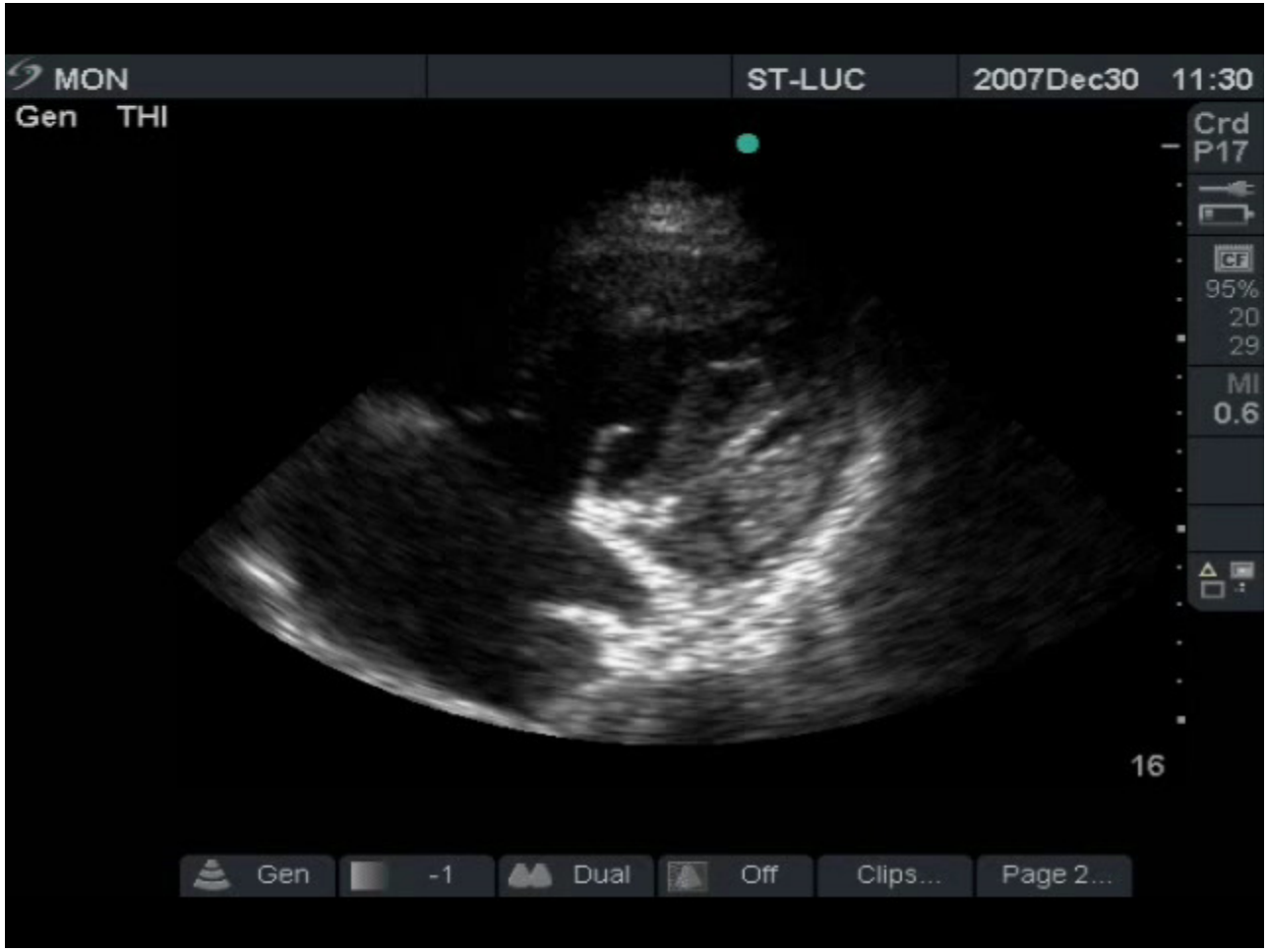


Curtesy of Gaudani

Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

RV systolic dysfunction



Hypoxia and hypercapnia
Systolic dysfunction
Diastolic dysfunction
Outflow tract obstruction
Pulmonary emboli

Others:
congenital, tumor, CMP, arythmias

An email from Bangkok.....

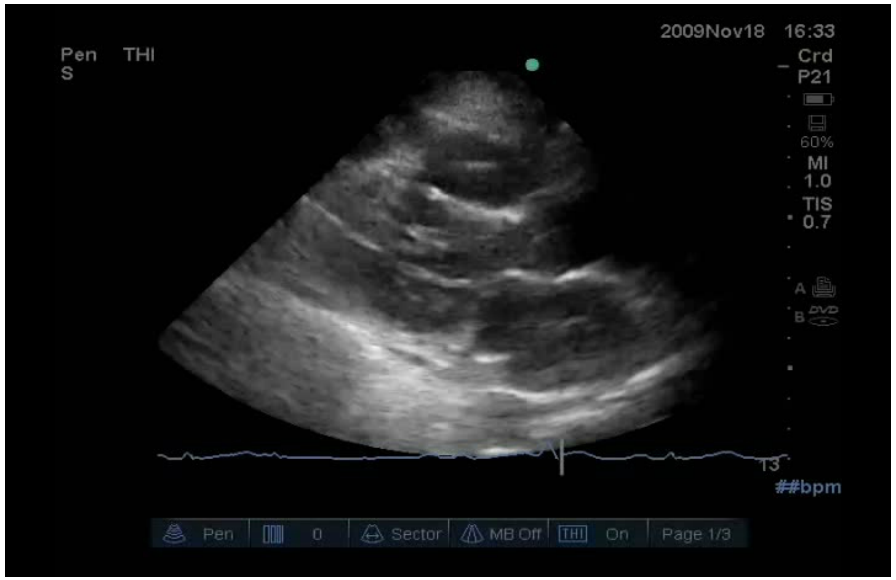
De: Pongdhep Theerawit [pongdhep@yahoo.com]
Envoyé: 7 avril 2010 21:49
À: André Denault
Objet: Fw: Apply for short course TEE
Pièces jointes: 16.15.01 hrs __[0000542].mp4; 16.15.01 hrs __[0000543].mp4; 16.15.01 hrs __[0000546].mp4

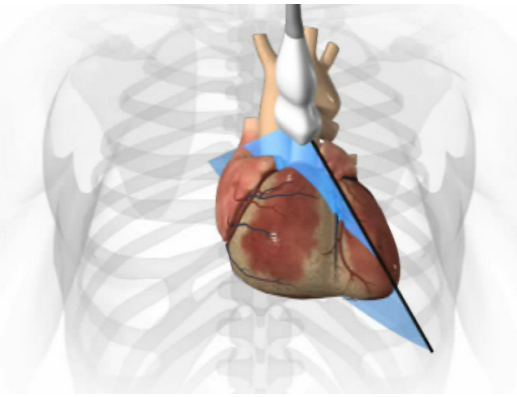
Dear Dr.Denault,

I would like to apply for short course TEE for hemodynamic monitoring at your institute.
How to apply.

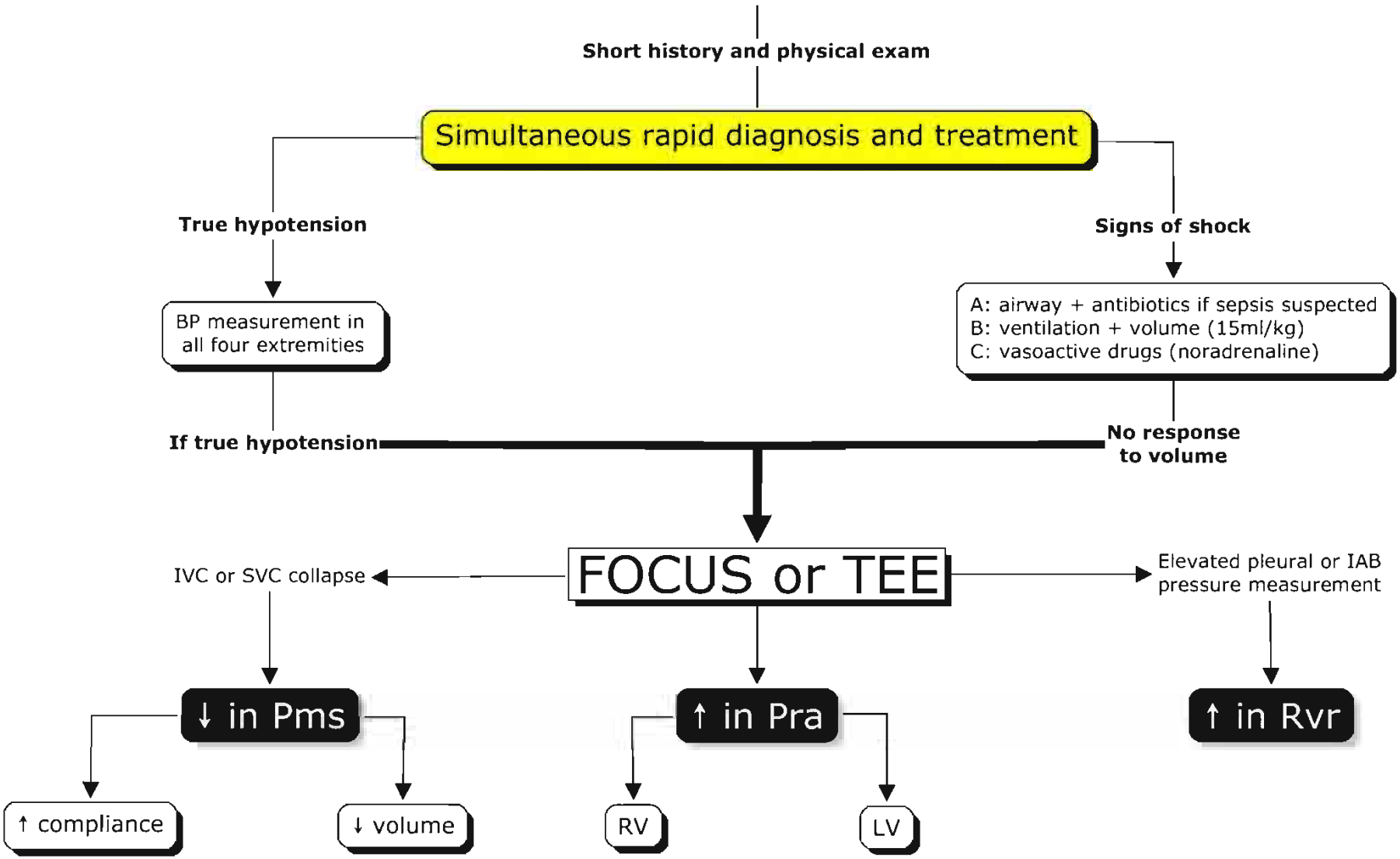
I also sent you an interesting echo finding in a 40 year-old female patient presenting with septic shock. I'm not sure if this finding could contribute to her hypotension and how do we know whether it would be a big problem for hemodynamic management. Can portable echo be helpful in this scenario?.

echo finding in a 40 year-old female patient presenting with septic shock.
nt. Can portable echo be helpful in this scenario?.

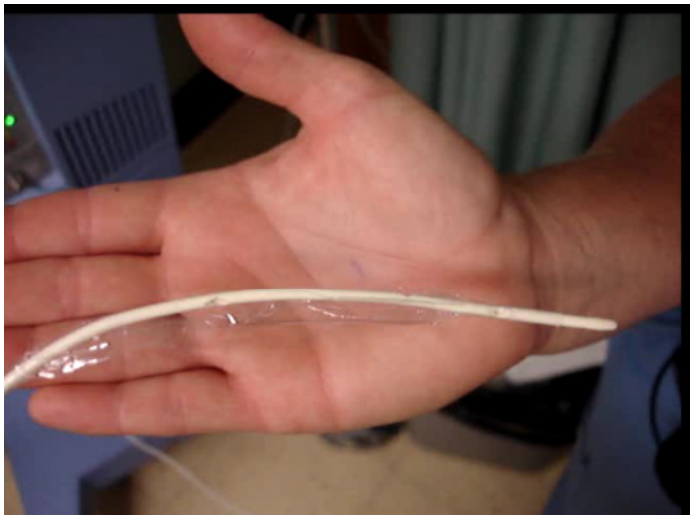




Hemodynamic instability



Monitoring of abdominal and transmural pressure

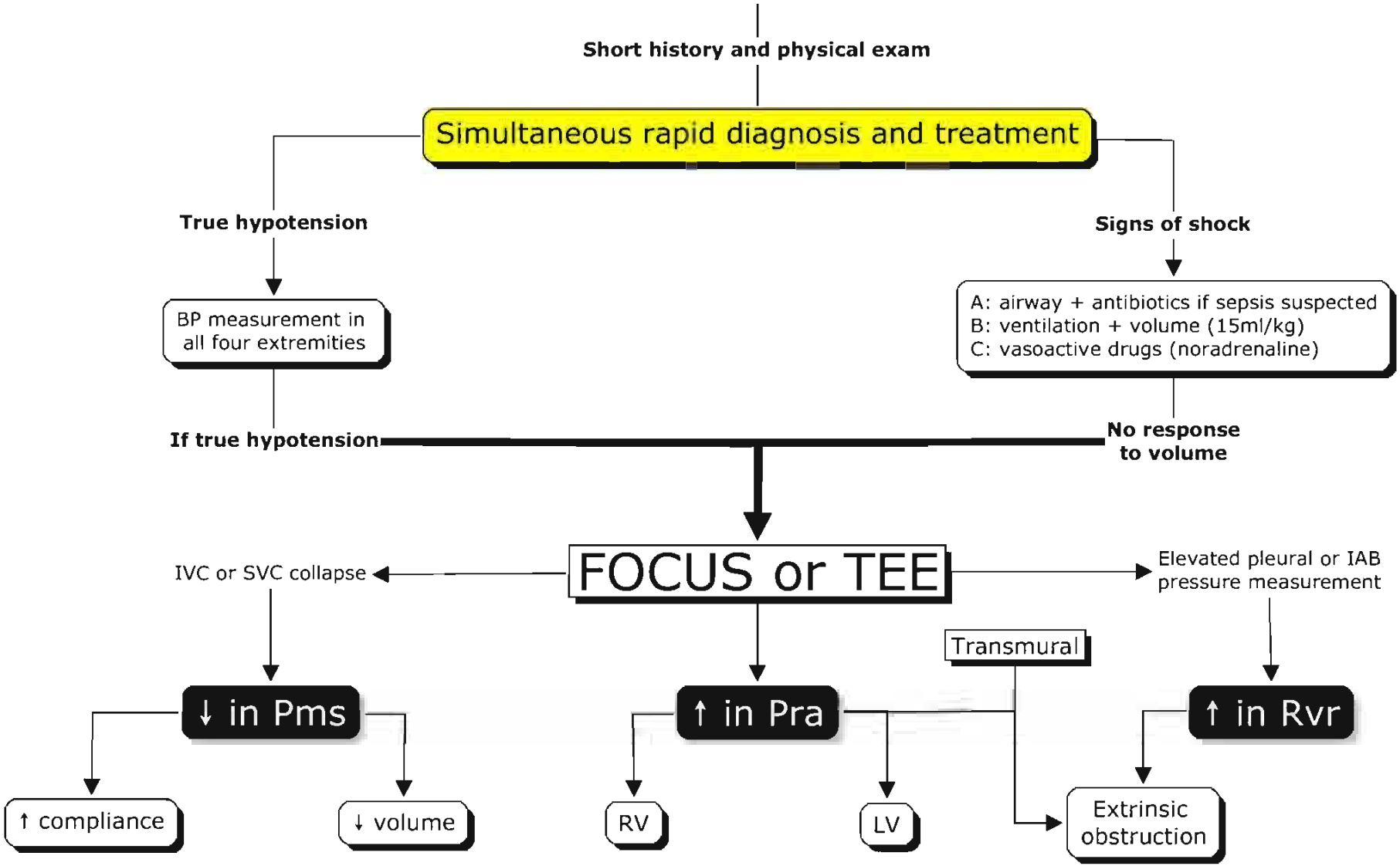


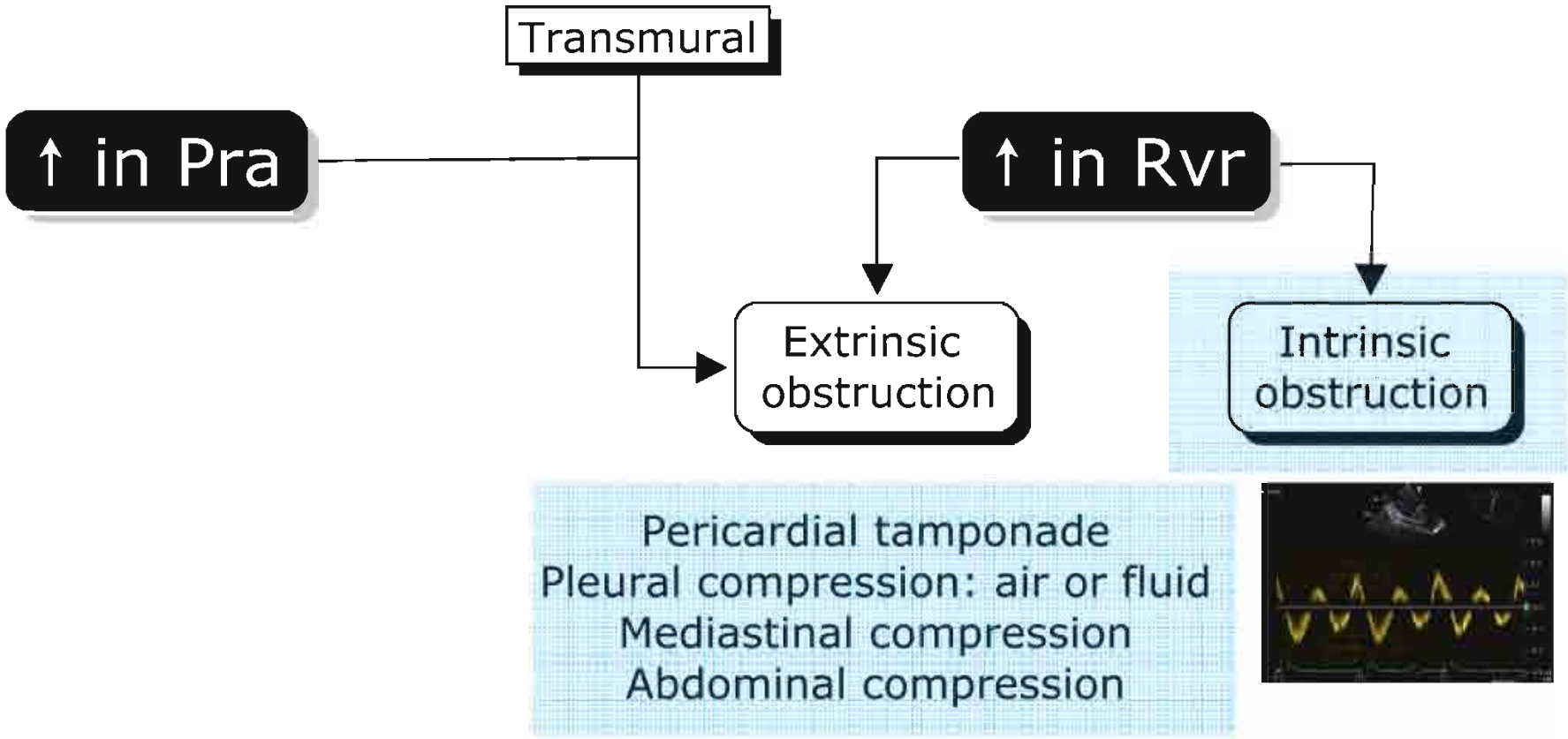
World Society of the Abdominal Compartment Syndrome

WORLD SOCIETY OF THE
ABDOMINAL COMPARTMENT SYNDROME

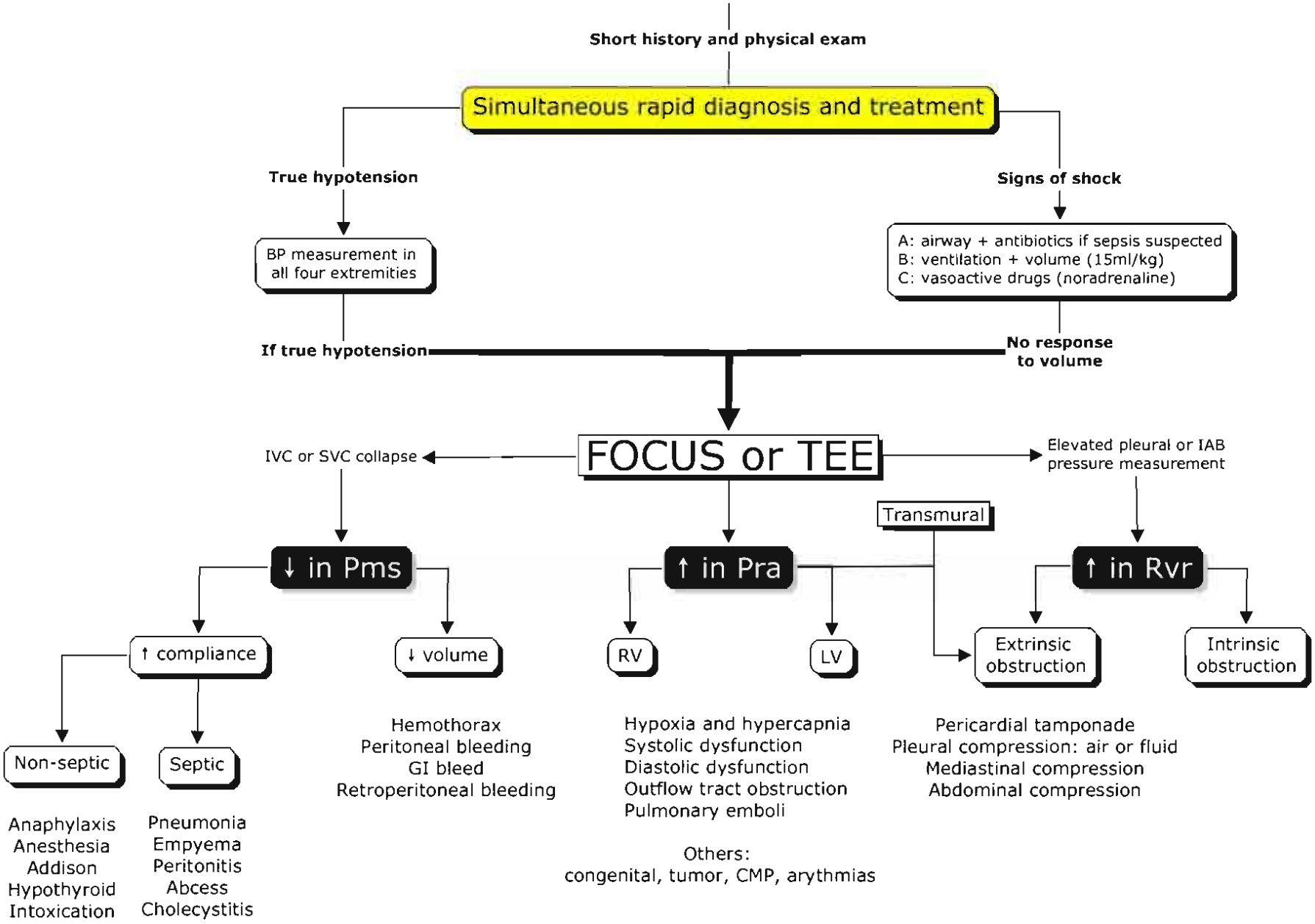
Home | Education | Join WSACS | Discussion | Research | For Patients | Me

Hemodynamic instability

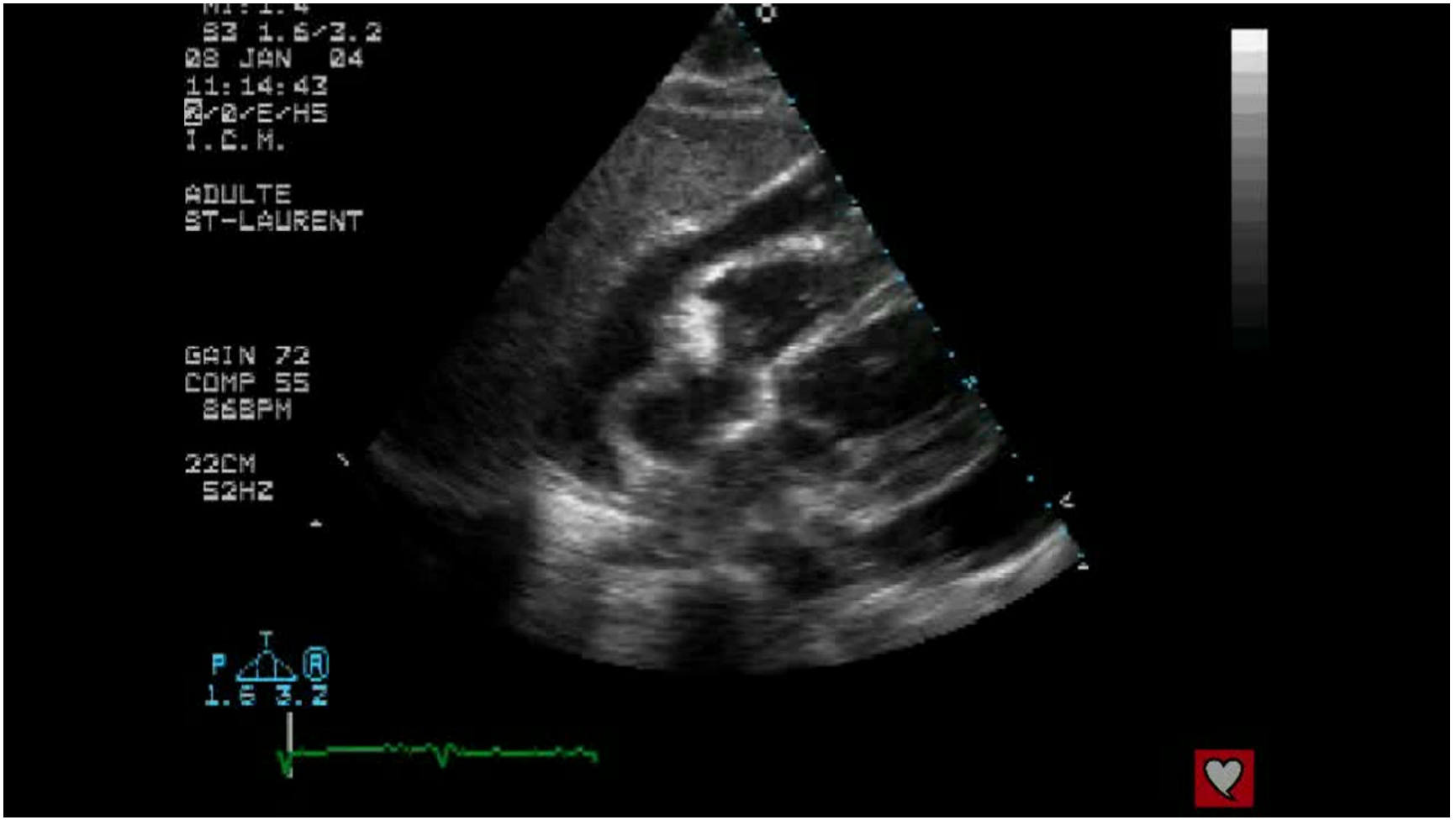



Transmural
↑ in Pra
↑ in Rvr
Extrinsic obstruction
Intrinsic obstruction
Pericardial tamponade
Pleural compression: air or fluid
Mediastinal compression
Abdominal compression

Hemodynamic instability



Tamponade classique

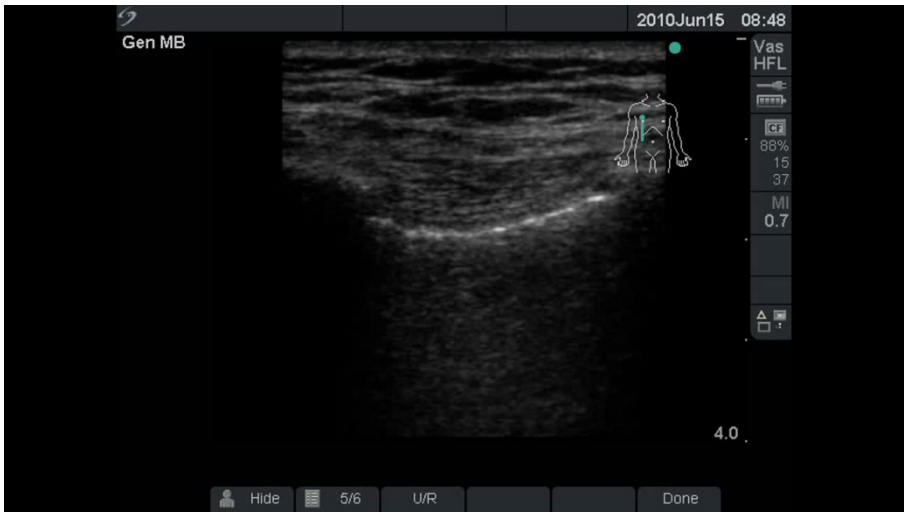


Pneumothorax

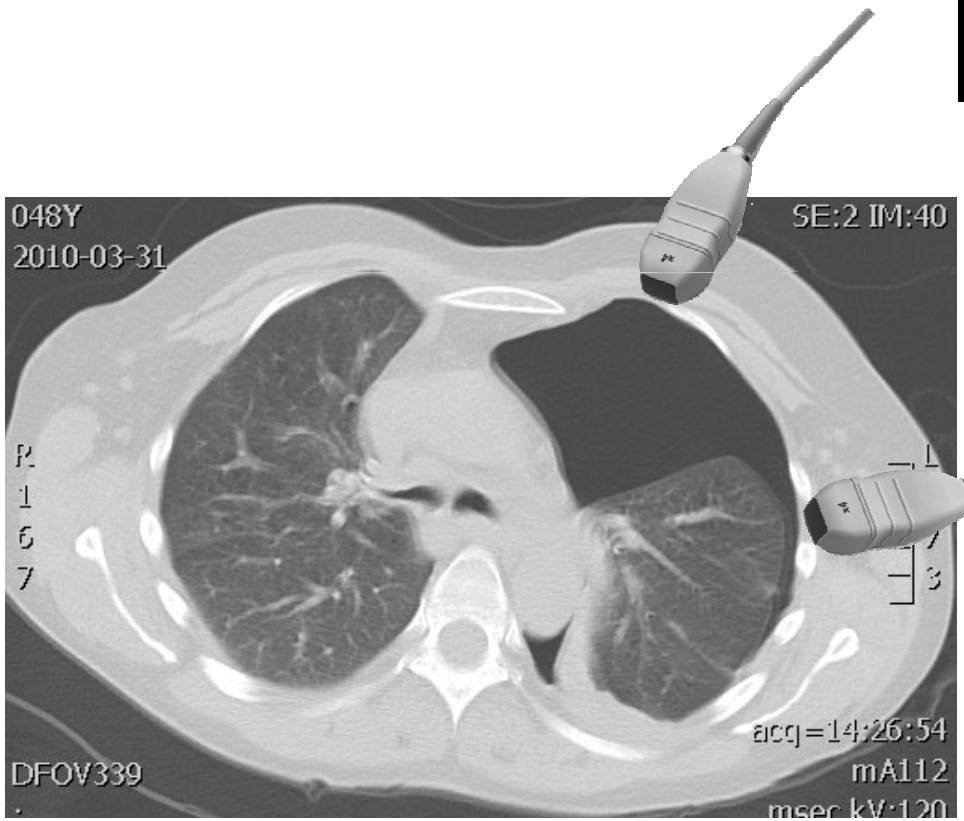
- Critères
  - Lignes A seulement
  - Point pulmonaire

- Exclusion: (*** au site de l'examen)
  - Présence d'un glissement pleural
  - Présence d'un pouls pulmonaire
  - Présence de lignes B

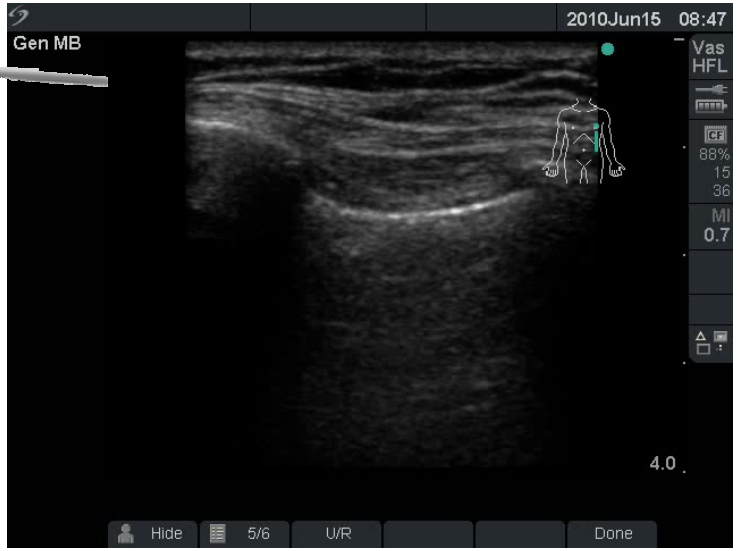
Point pulmonaire



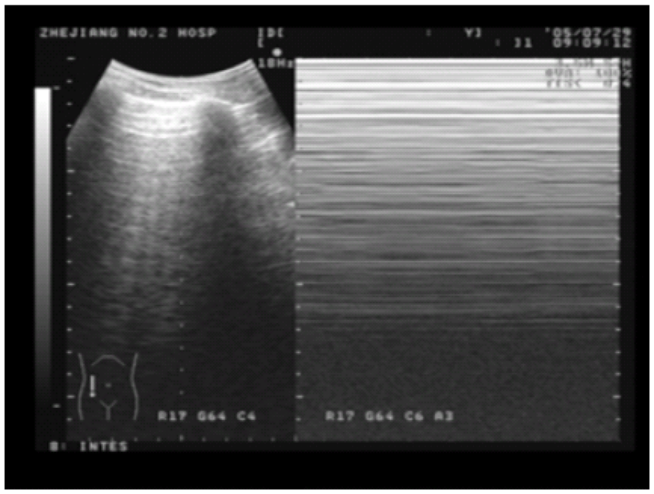
Pas de glissement pleural



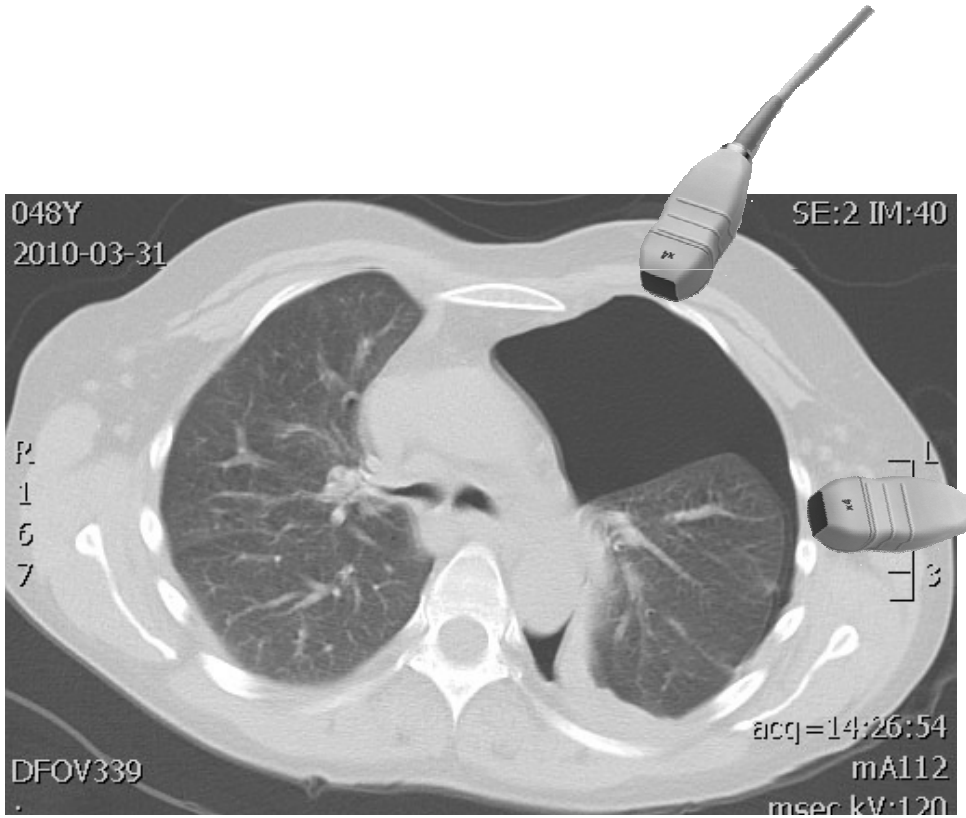
Glissement pleural



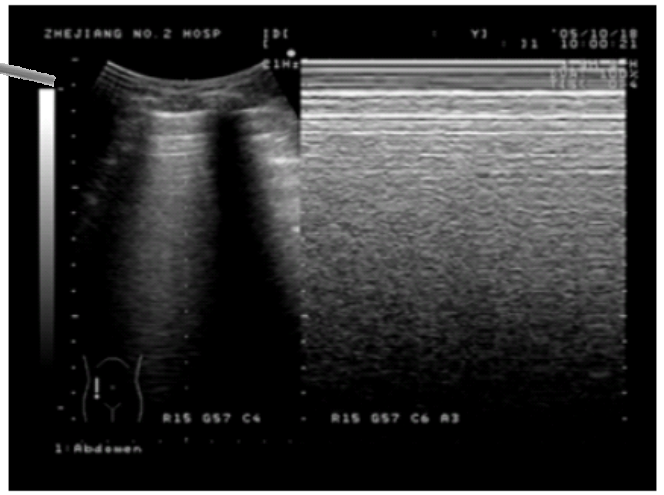
Point pulmo



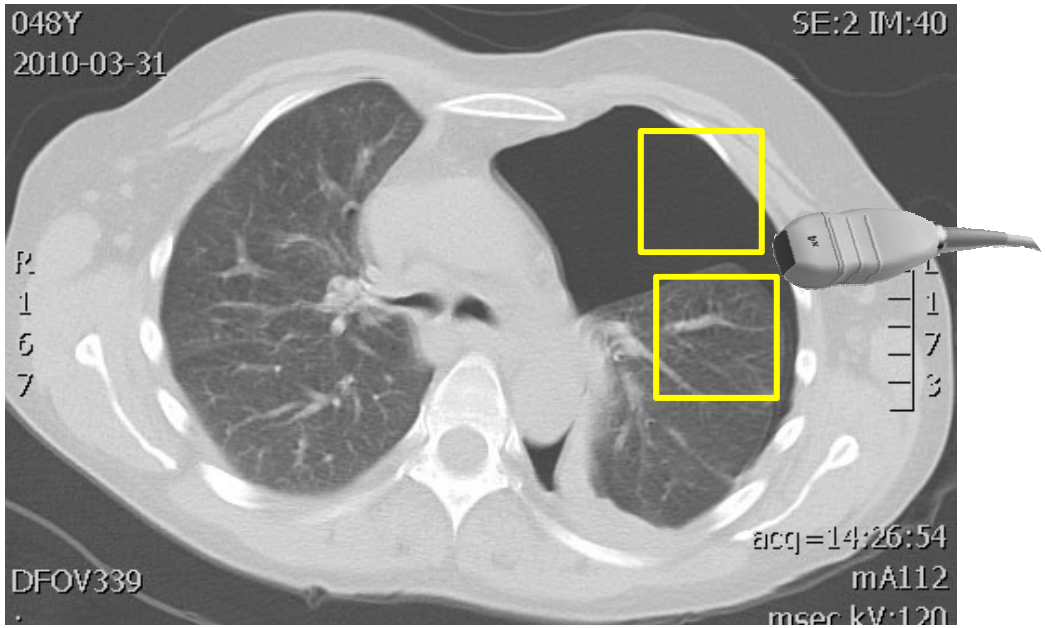
Pas de glissement pleural



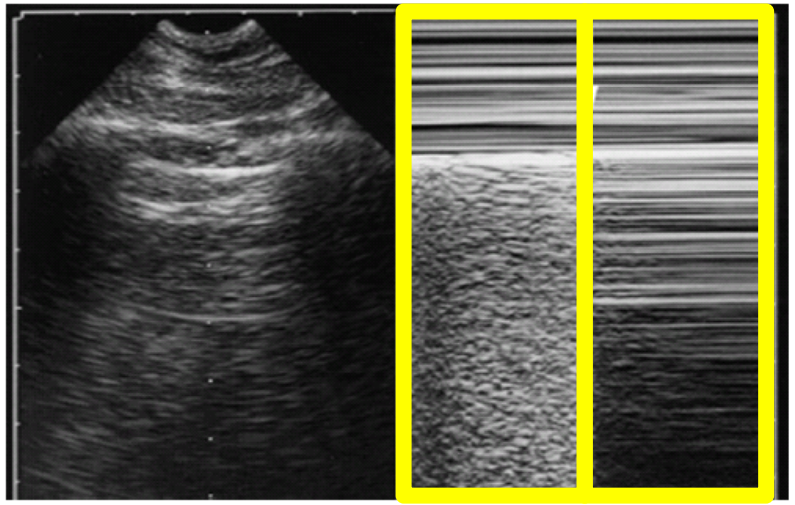
Glissement pleural



Point pulmonaire

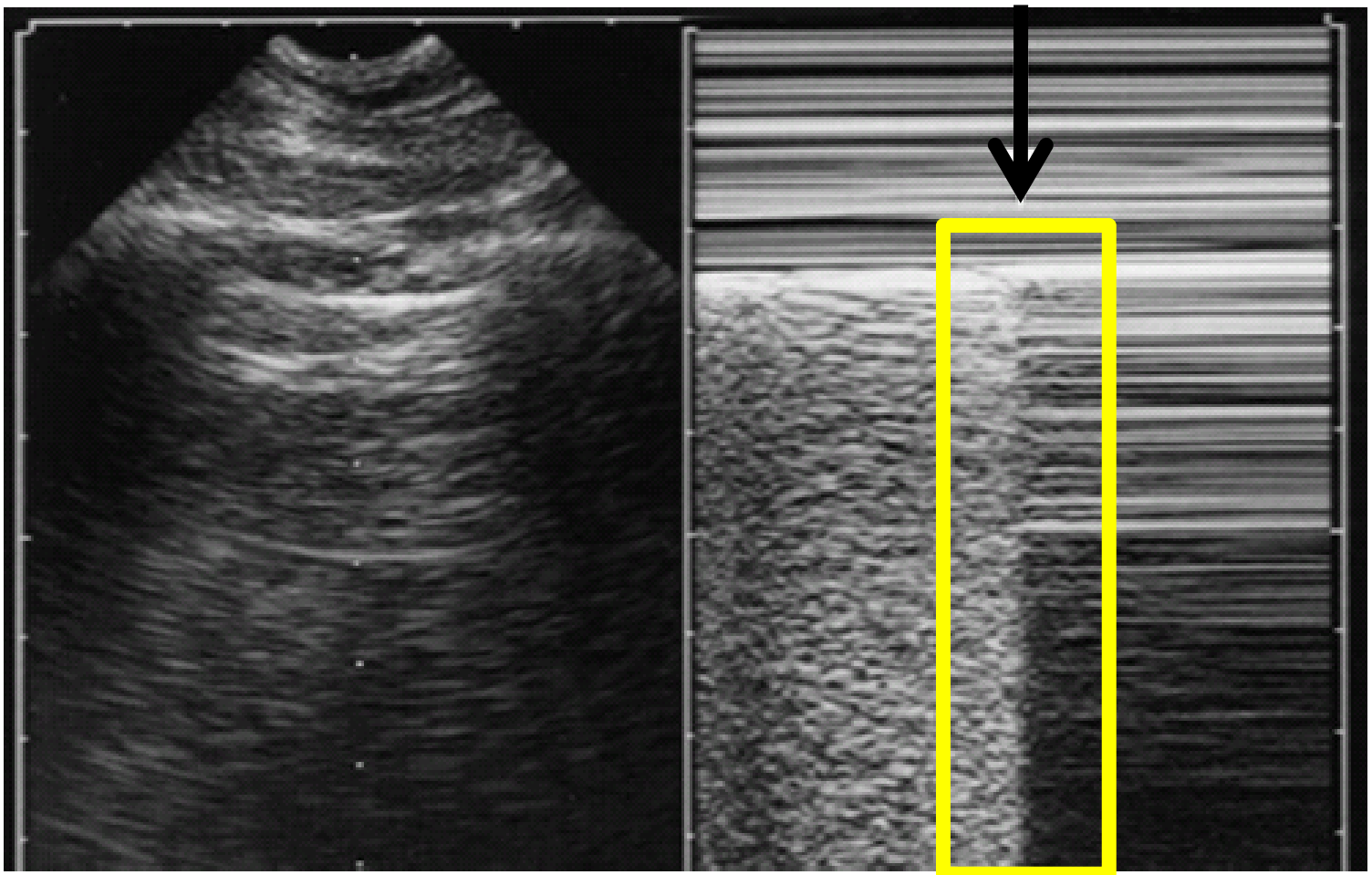


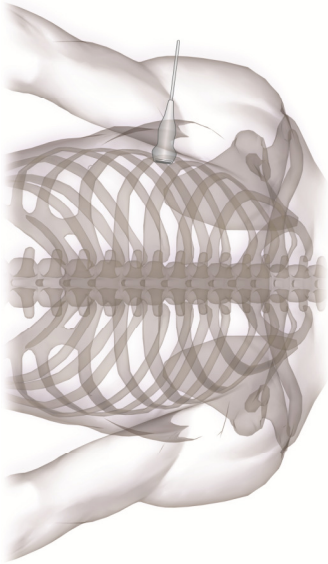
Pas de glissement pleural



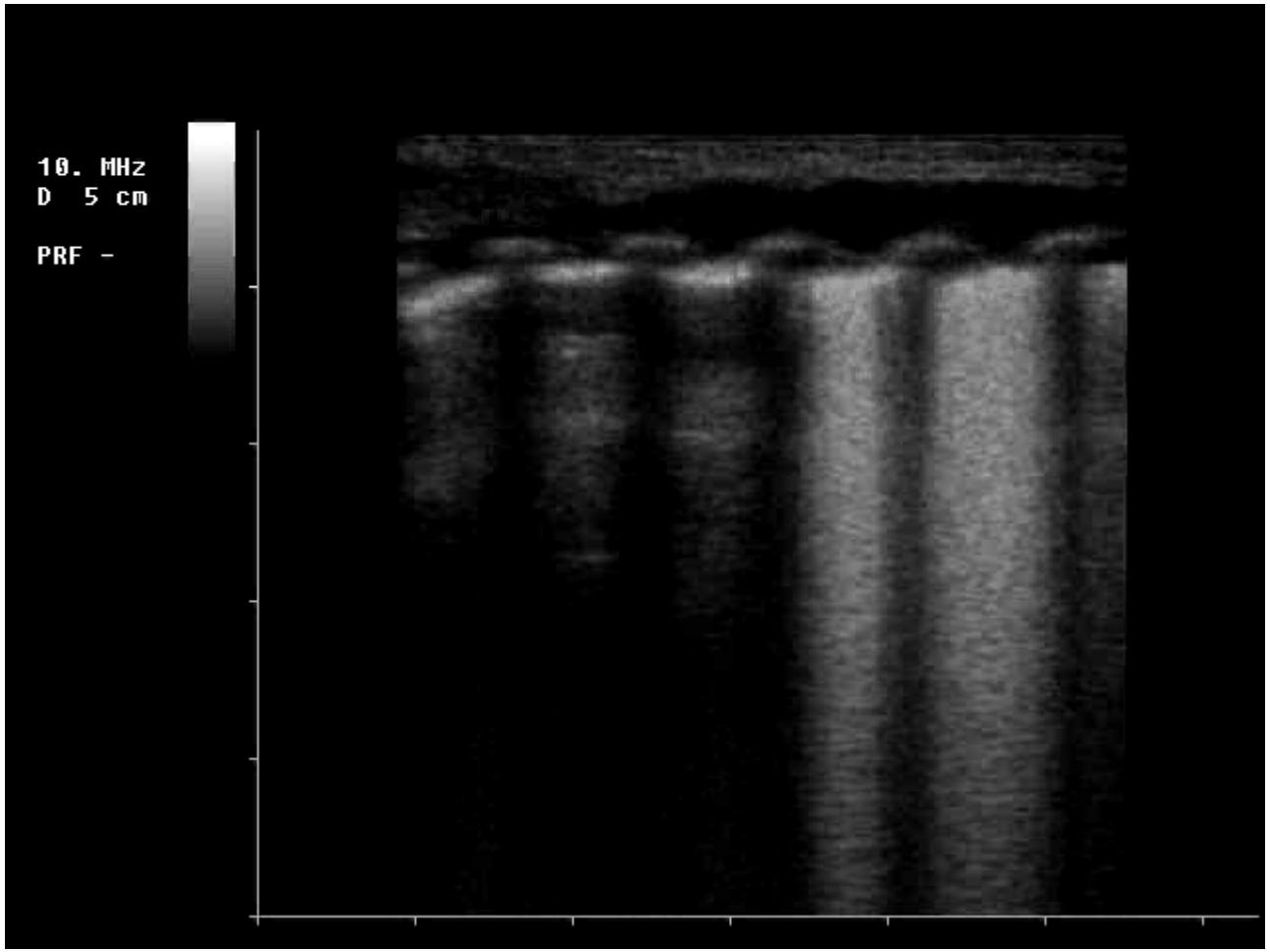
Glissement pleural

Point pulmonaire

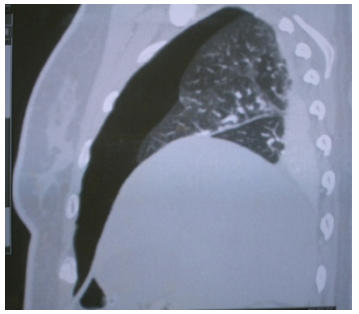




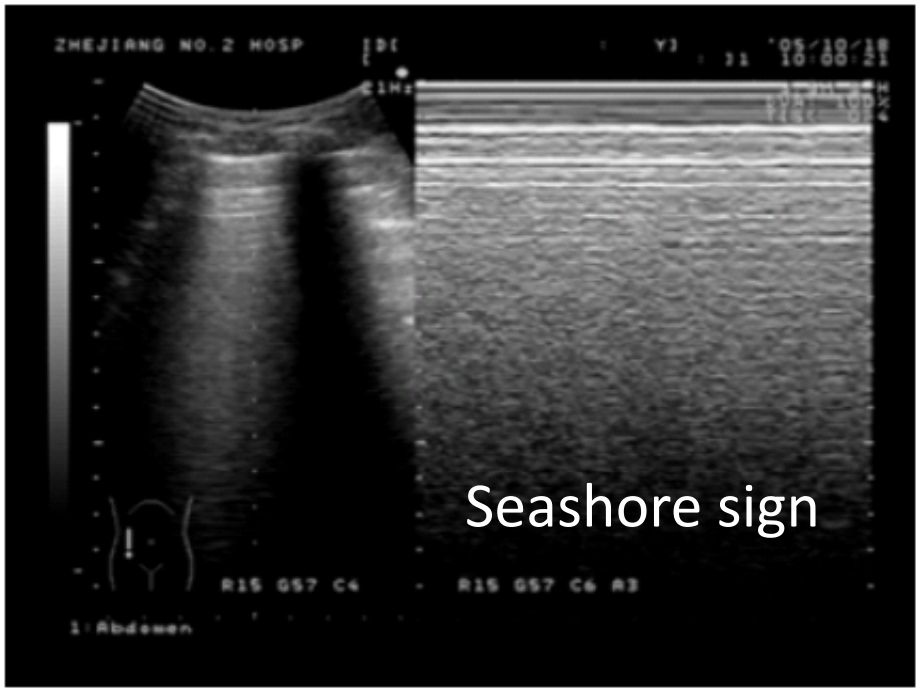
Point pulmonaire

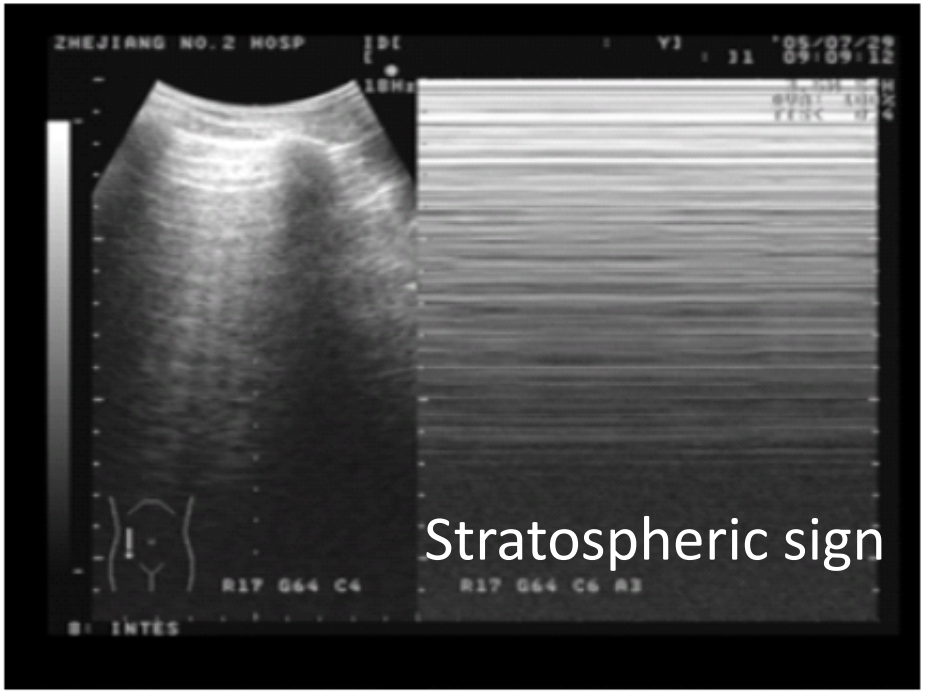


Pneumothorax



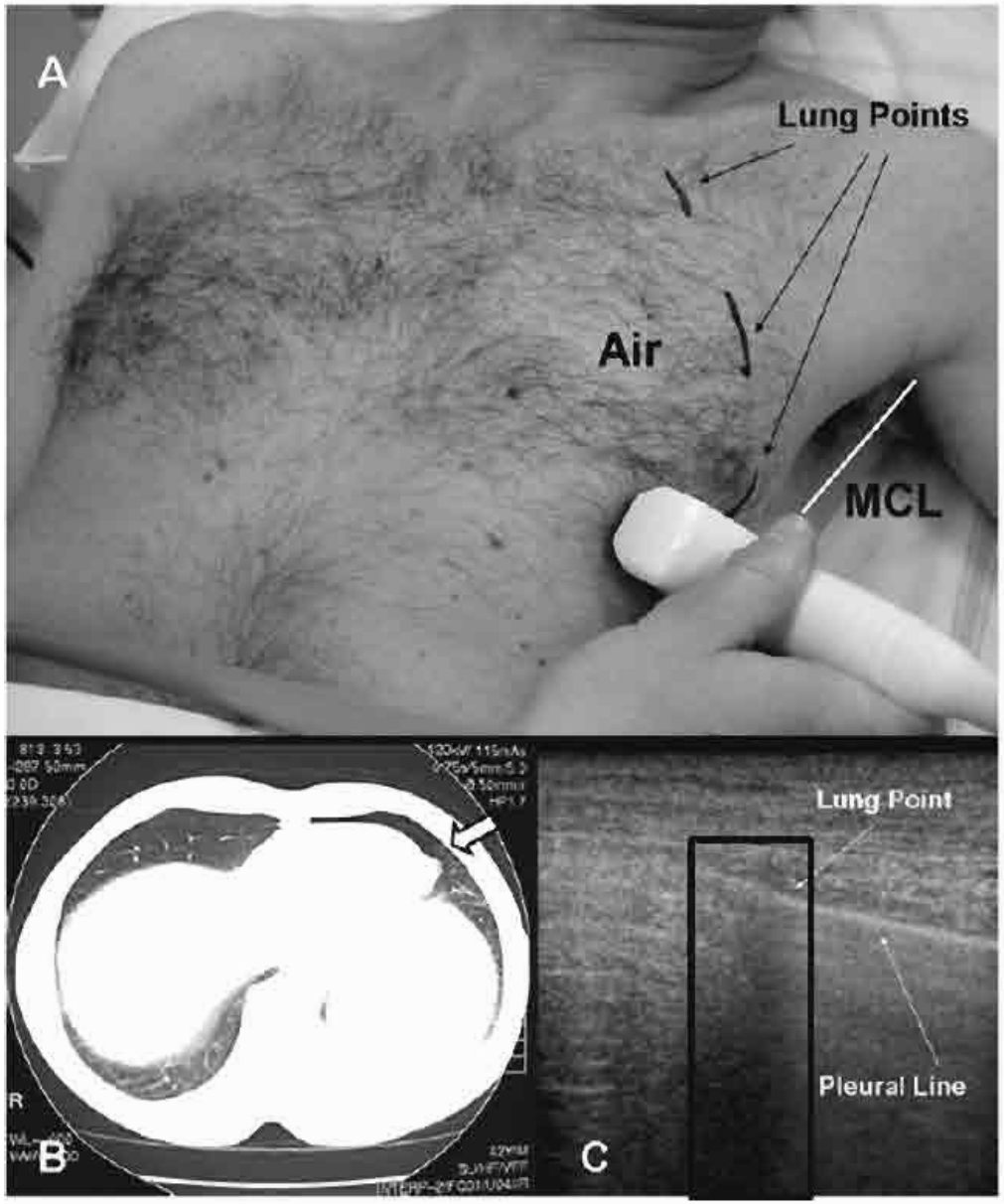
Rapid detection of pneumothorax by ultrasonography in patients with multiple trauma

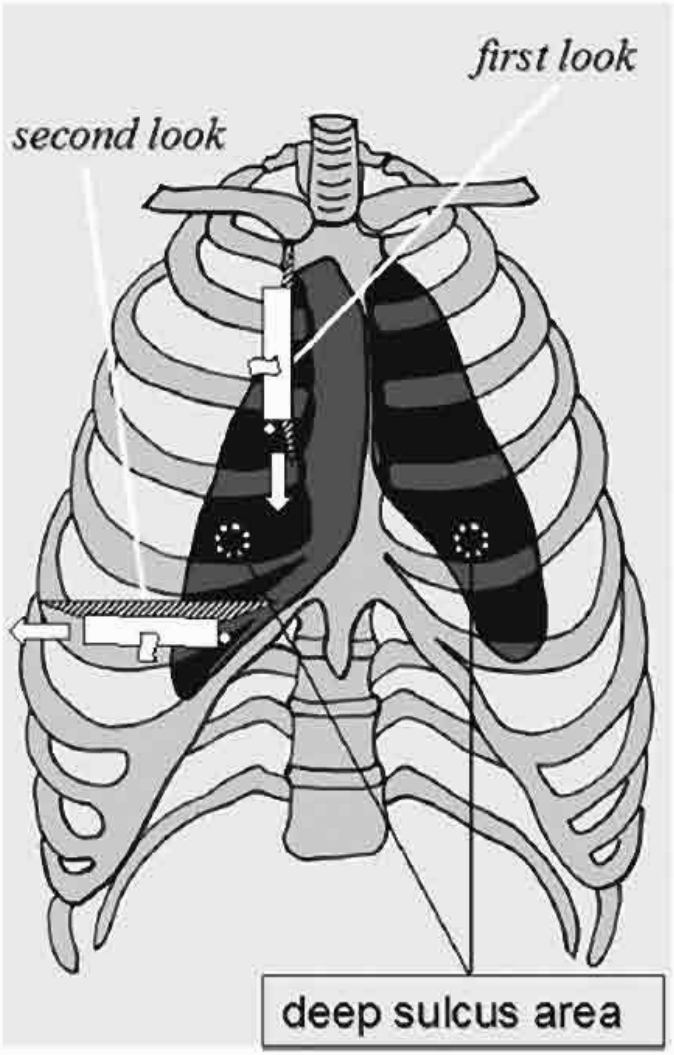




CRITICAL CARE

Critical Care 2006, **10**:R112 doi:10.1186/cc5004





Gino Soldati, CHEST / 133 / 1 / JANUARY, 2008

The Journal of TRAUMA® Injury, Infection, and Critical Care

Surgeon-Performed Ultrasound for Pneumothorax in the Trauma Suite

Jason L. Knudtson, MD, Jonathan M. Dort, MD, FACS, Stephen D. Helmer, PhD, and R. Stephen Smith, MD, RDMS, FACS

Background: Surgeon-performed ultrasound has become ubiquitous in the trauma suite. Initial reports suggest that sonography may be used for the detection of pneumothorax. The purpose of this study was to evaluate the efficacy of sonography to rule out the presence of a pneumothorax in the trauma population.

Methods: A prospective analysis of 328 consecutive trauma patients at an American College of Surgeons-verified Level I trauma center was undertaken. Thoracic ultrasound was performed before chest radiography. The presence or absence of a "sliding-lung" sign or "comet-tail" artifact was recorded.

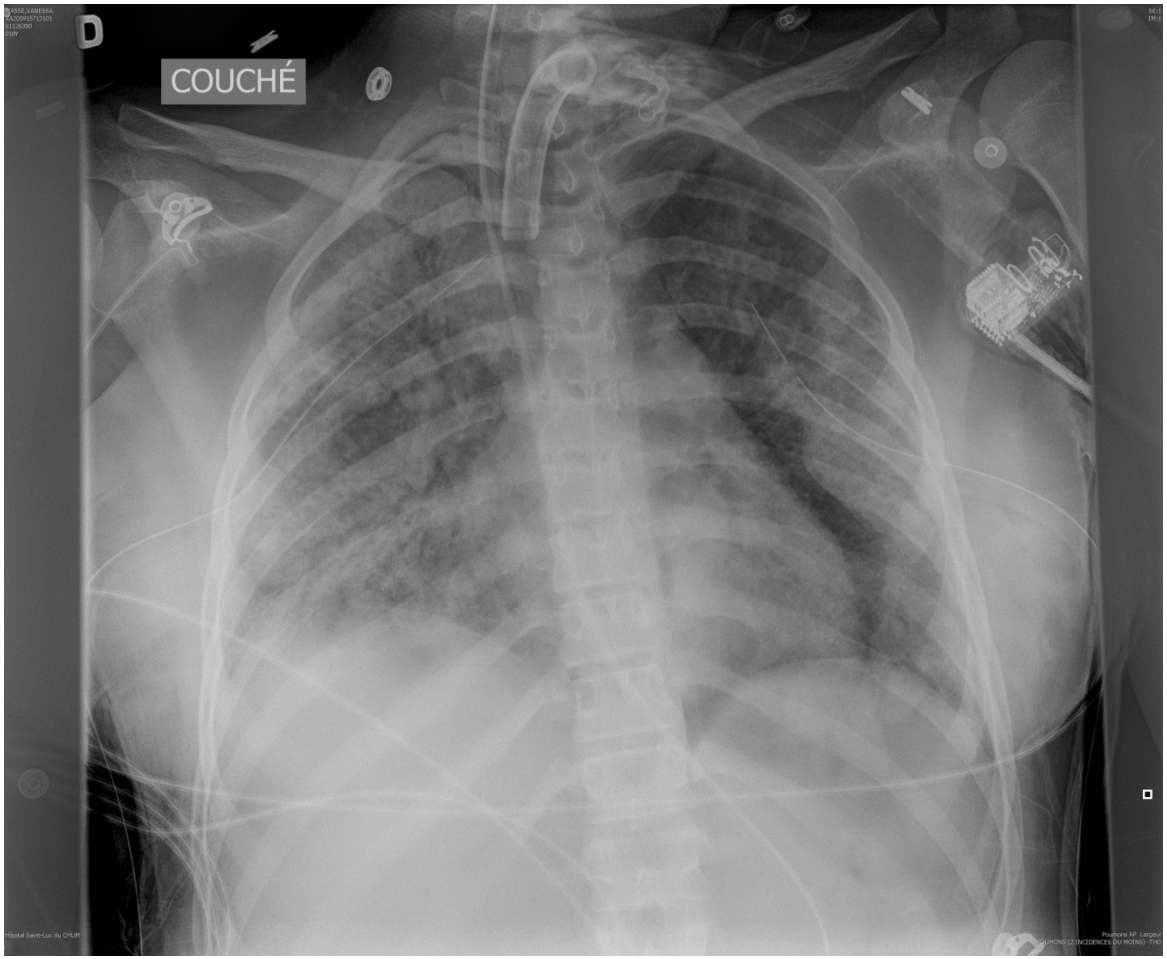
Results: Of 328 evaluations, there were 312 true negatives, 12 true positives, 1 false-negative, 1 false-positive, and 2 exclusions. Specificity, negative predictive value, and accuracy were 99.7%, 99.7%, and 99.4%, respectively.

Conclusion: Ultrasound is a reliable modality for the diagnosis of pneumothorax in the injured patient. This modality may serve as an adjunct or precursor to routine chest radiography in the evaluation of injured patients.

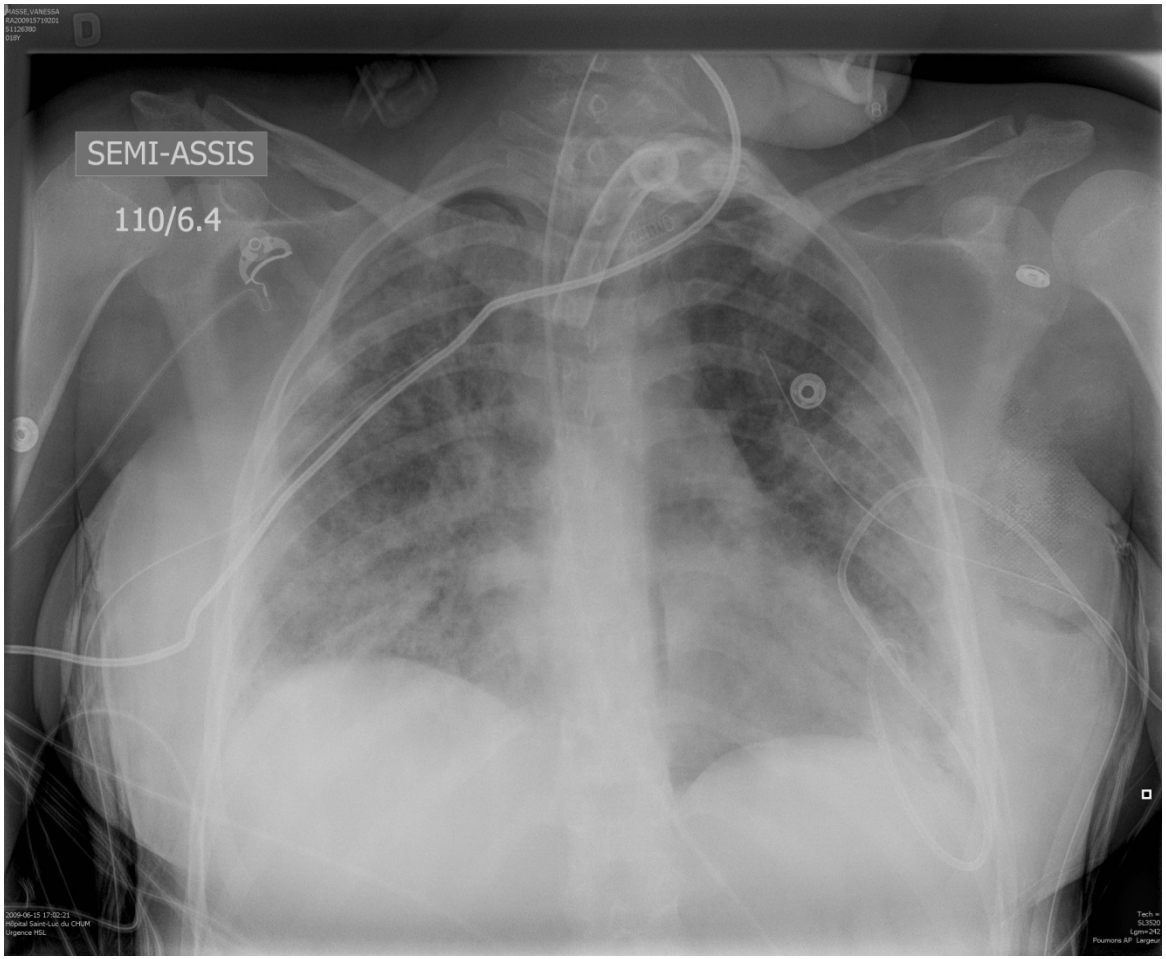
Key Words: Ultrasound, Trauma, Pneumothorax, Lung-sliding, Comet-tail.

J Trauma. 2004;56:527–530.

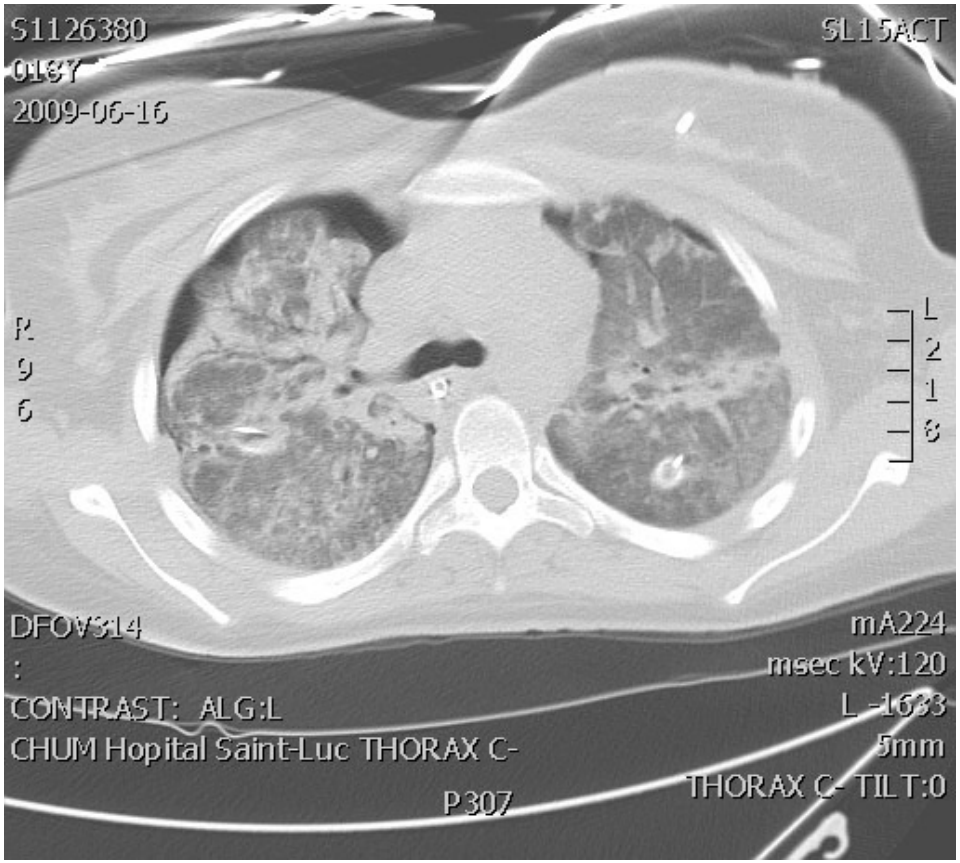
♀ de 28 ans ARDS: désaturation post-trachéostomie



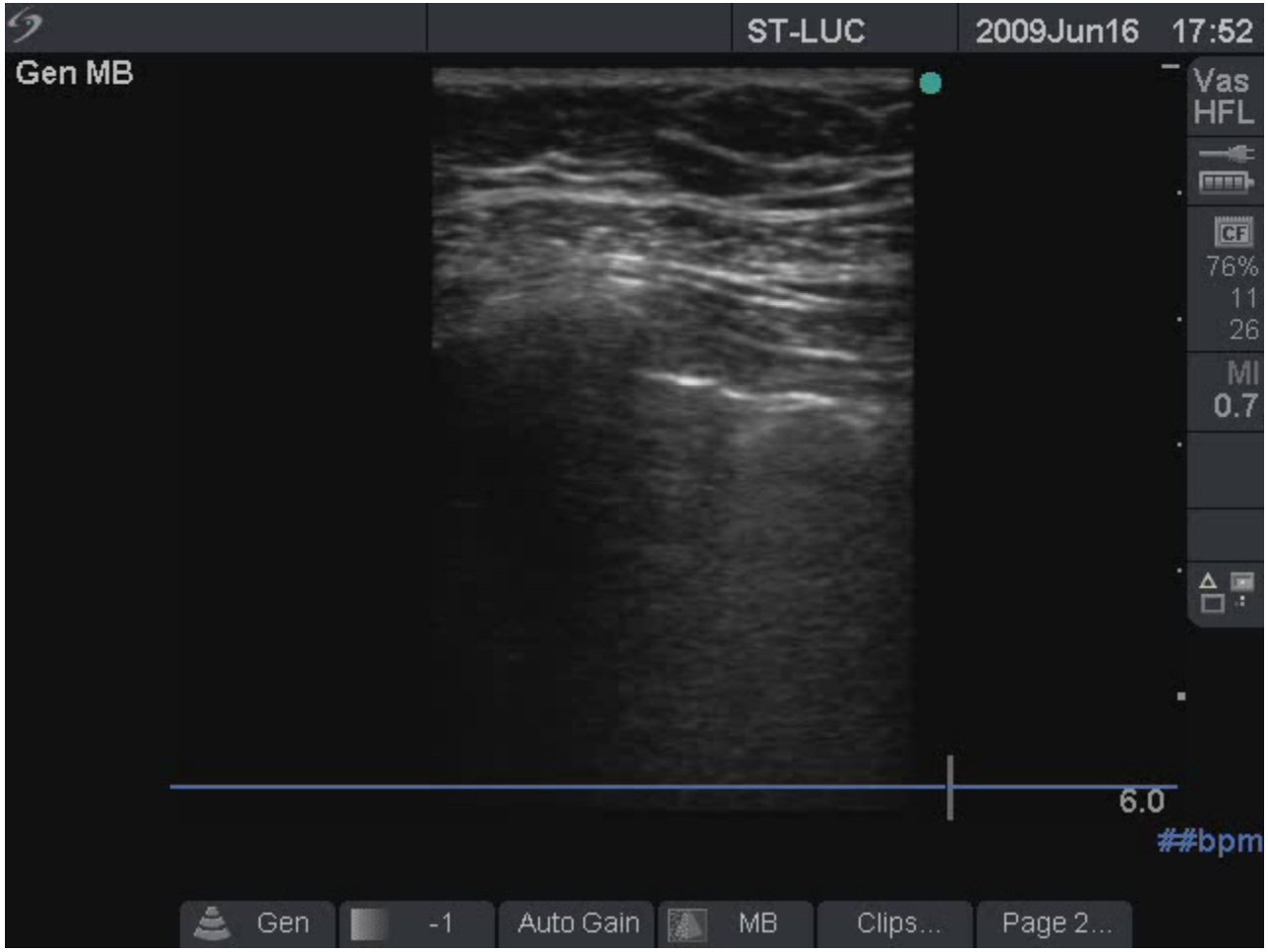
♀ de 28 ans ARDS: désaturation post-trachéostomie



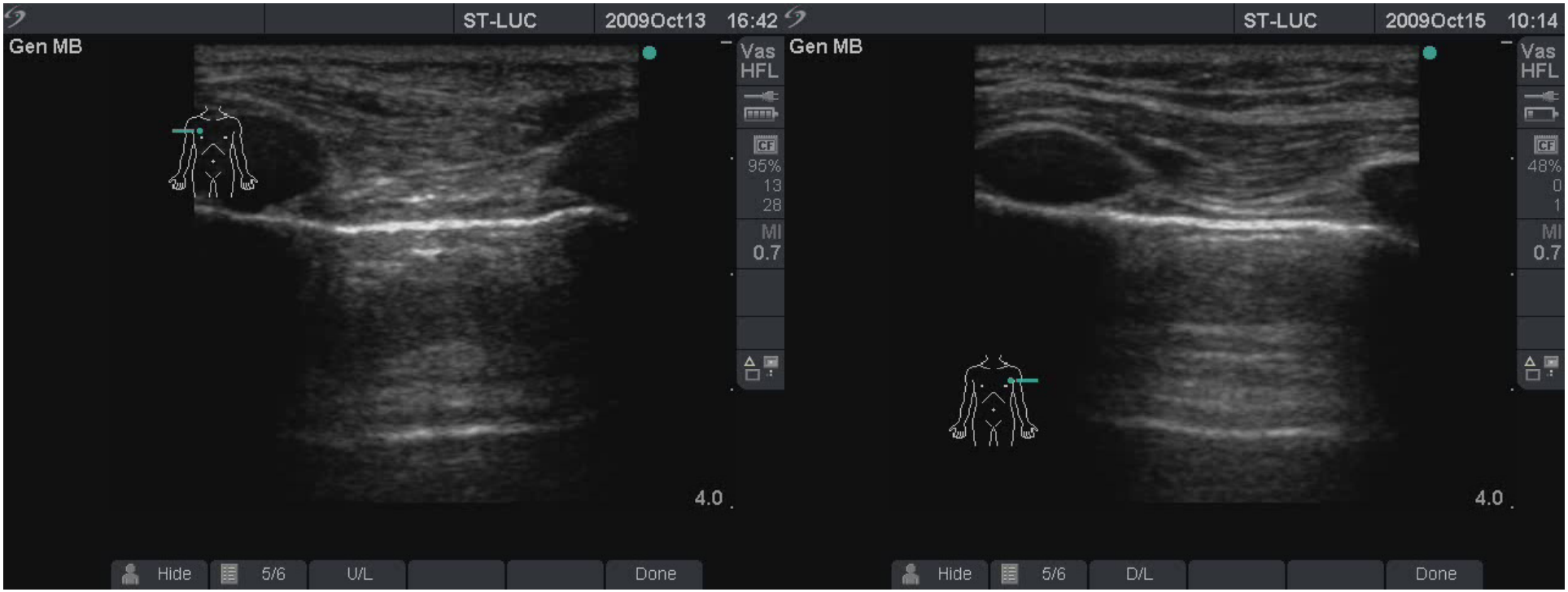
CTSCAN le lendemain

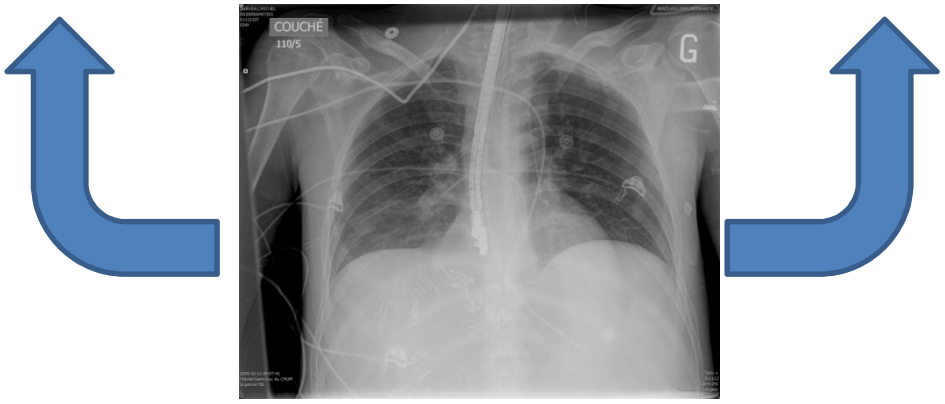


Échographie pulmonaire

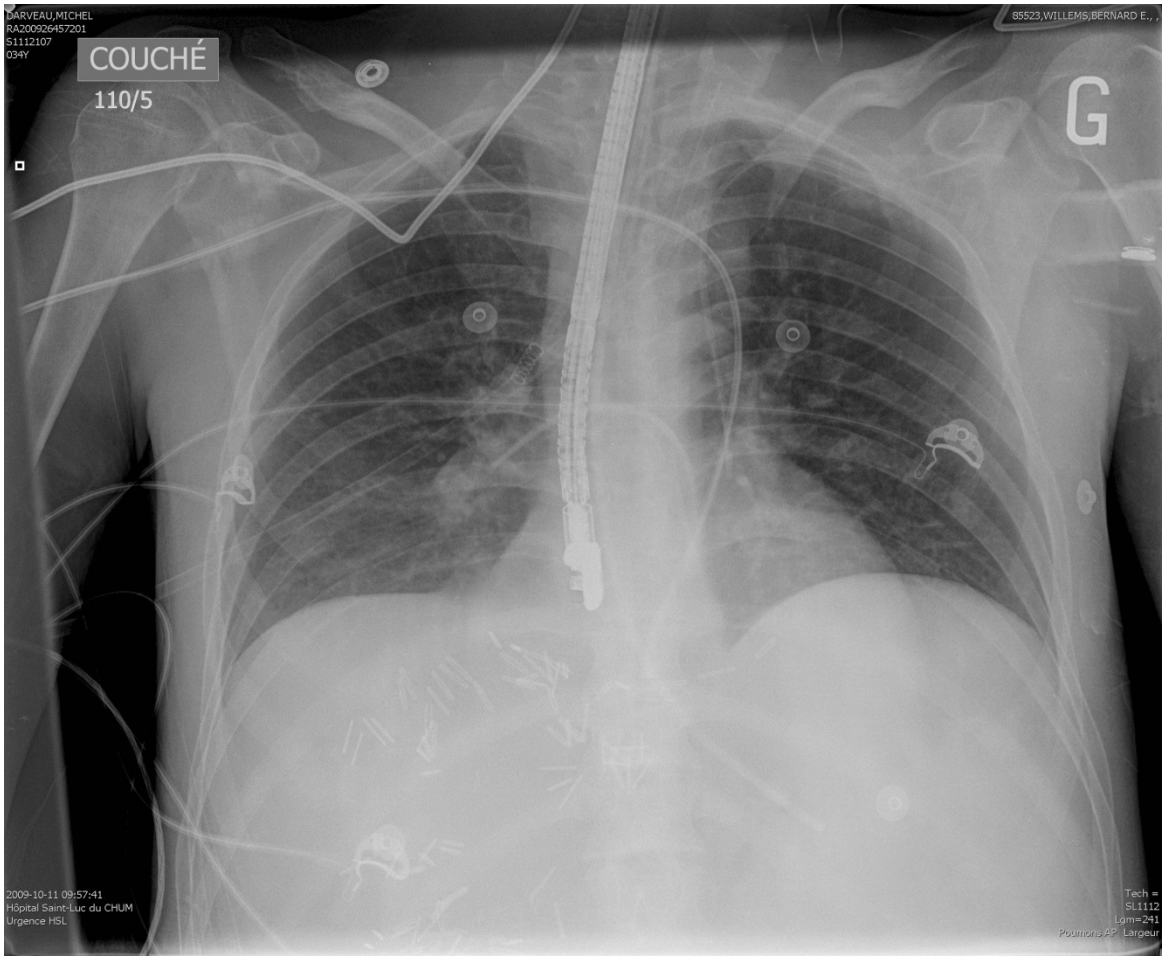


♂ de 42 ans post-greffe de foie: désaturation





♂ de 42 ans post-greffe de foie

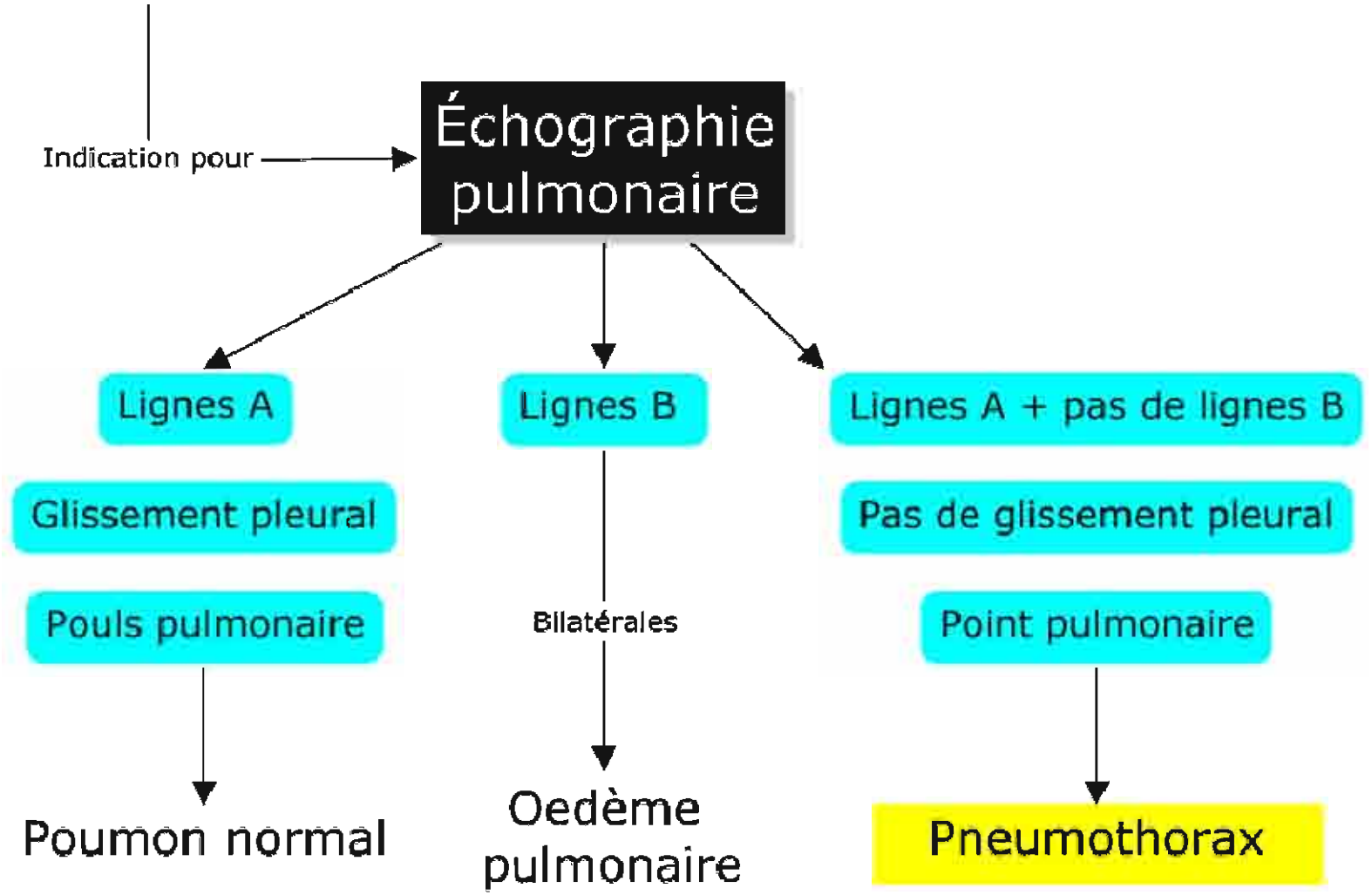


Poumon droit:

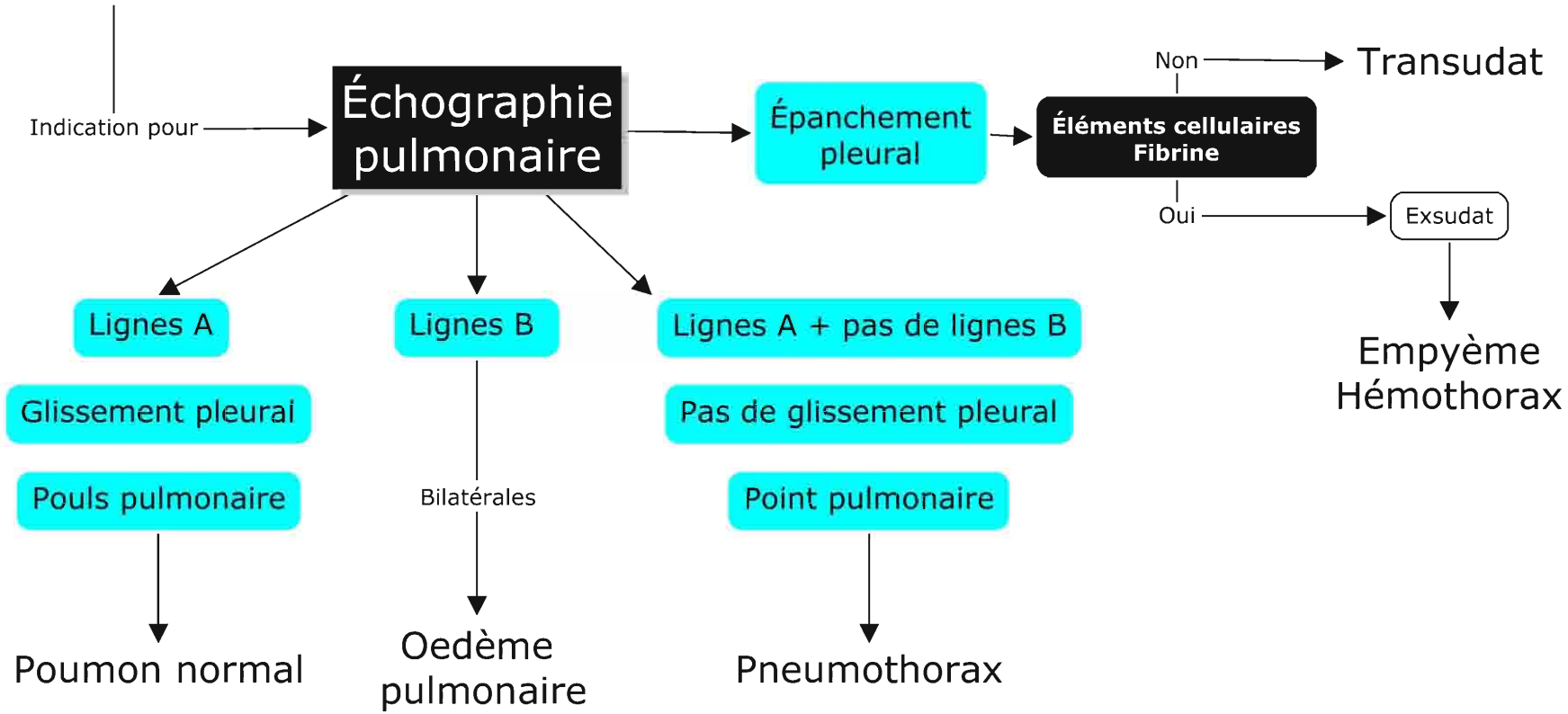
Absence de glissement pleural ≠ pneumothorax

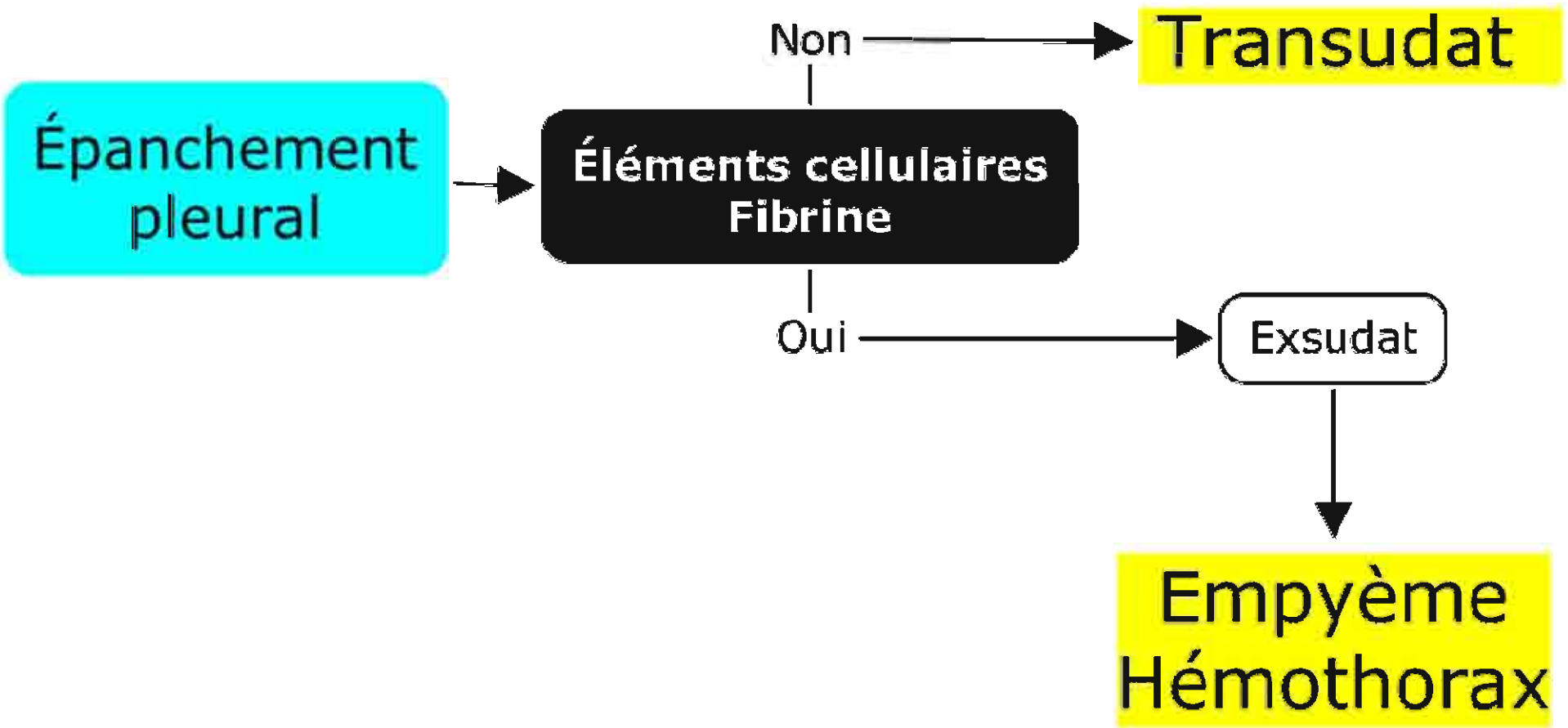
- Poumon immobilisé
  - Intubation endobronchique
  - ARDS sévère
  - Adhésion pleurale
  - Hyperinflation sévère, emphysème bulleux
- Plèvres sont séparées
  - Drain thoracique
  - Atélectasie significative
  - Épanchement

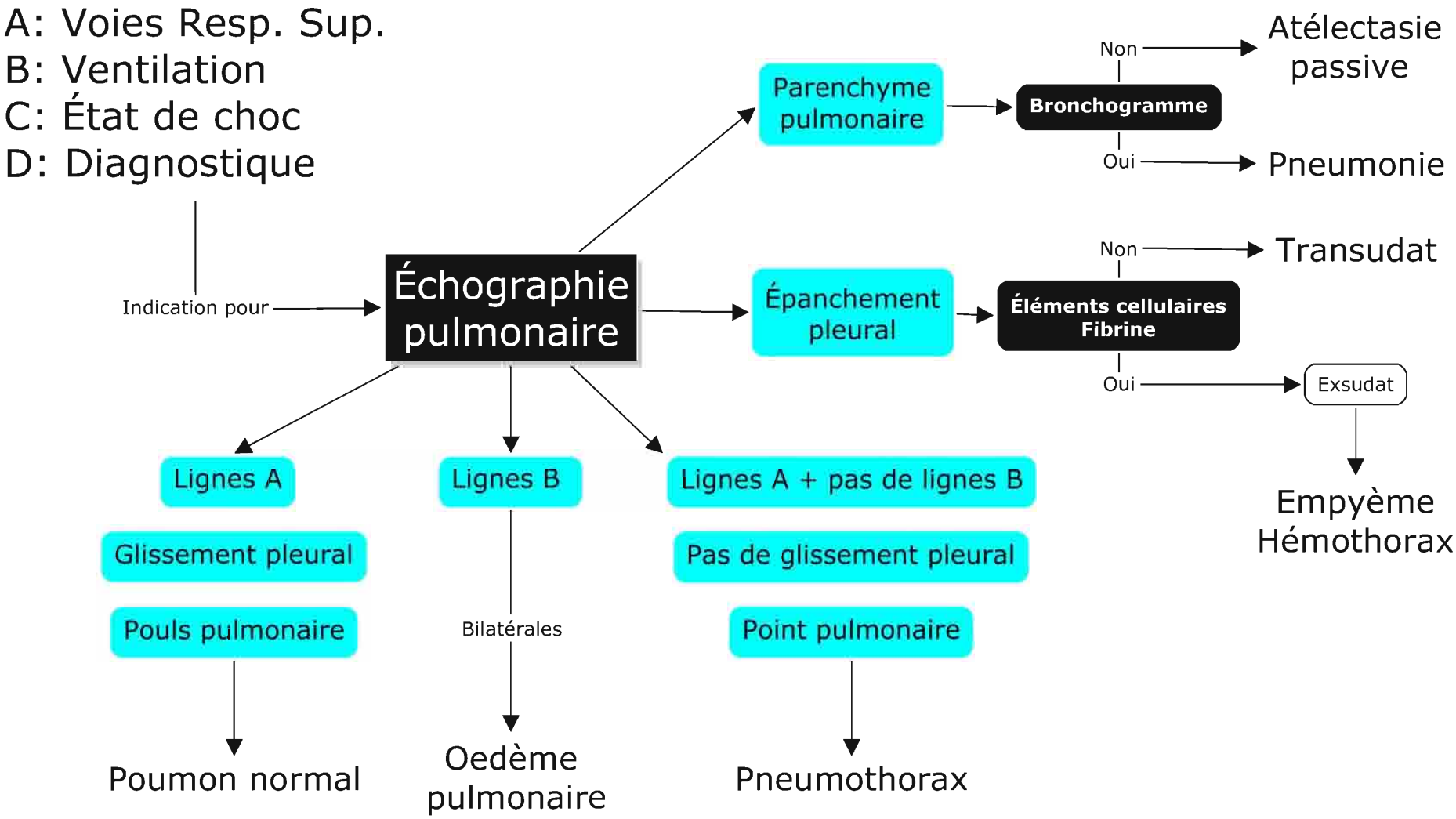
A: Voies Resp. Sup.
B: Ventilation
C: État de choc
D: Diagnostique

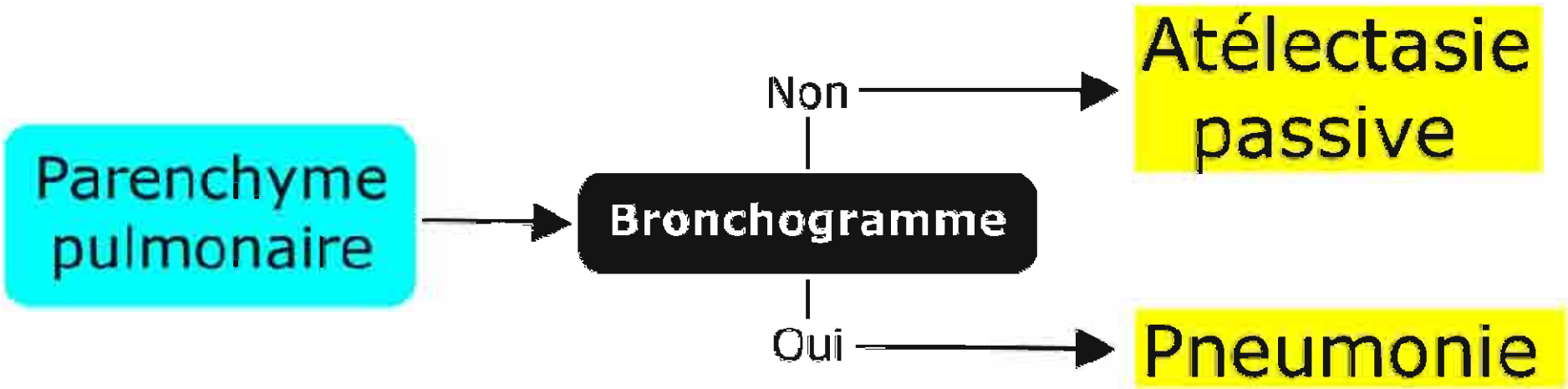


A: Voies Resp. Sup.
B: Ventilation
C: État de choc
D: Diagnostique




Épanchement pleural
Éléments cellulaires
Fibrine
Non
Transudat
Oui
Exsudat
Empyème
Hémothorax


A: Voies Resp. Sup.
B: Ventilation
C: État de choc
D: Diagnostique
Indication pour
Échographie pulmonaire
Parenchyme pulmonaire
Bronchogramme
Non
Atélectasie passive
Oui
Pneumonie
Épanchement pleural
Éléments cellulaires Fibrine
Non
Transudat
Oui
Exsudat
Empyème Hémothorax
Lignes A
Glissement pleural
Pouls pulmonaire
Poumon normal
Lignes B
Bilatérales
Oedème pulmonaire
Lignes A + pas de lignes B
Pas de glissement pleural
Point pulmonaire
Pneumothorax


Parenchyme pulmonaire
Bronchogramme
Non
Atélectasie passive
Oui
Pneumonie

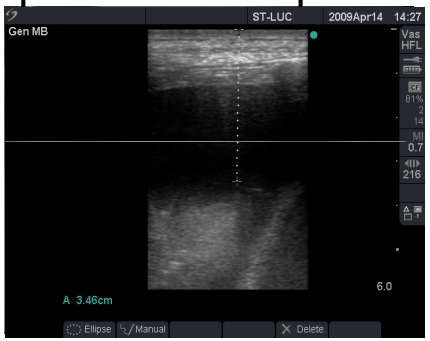
Limitations de l’échographie pulmonaire

- Nécessite équipement d’ultrason
- Nécessite une fenêtre sur le thorax
  - Pansements
  - Obésité morbide
  - Emphysème sous-cutané
- Structures thoraciques centrales non visualisées
- Examen dépendant de l’opérateur
- Formation nécessaire

Limitations de l’échographie pulmonaire

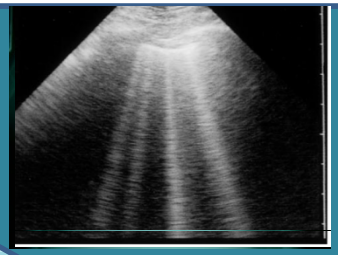
Contenu pulmonaire

Épanchement pleural



Sen/Spe: 97% 94%

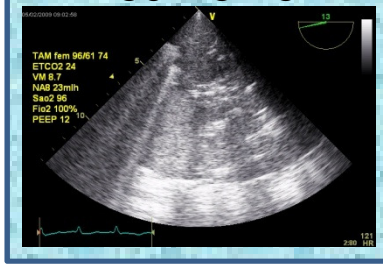
Syndrome interstitiel



Sen/Spe: 100% 100%

Air

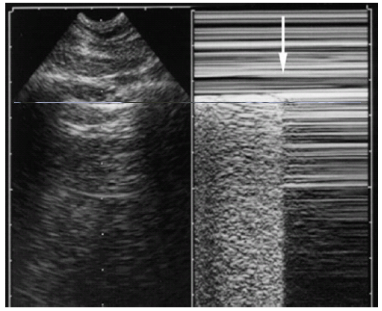
Pneumonie



Liquide

Sen/Spe: 90% 98%

Pneumothorax



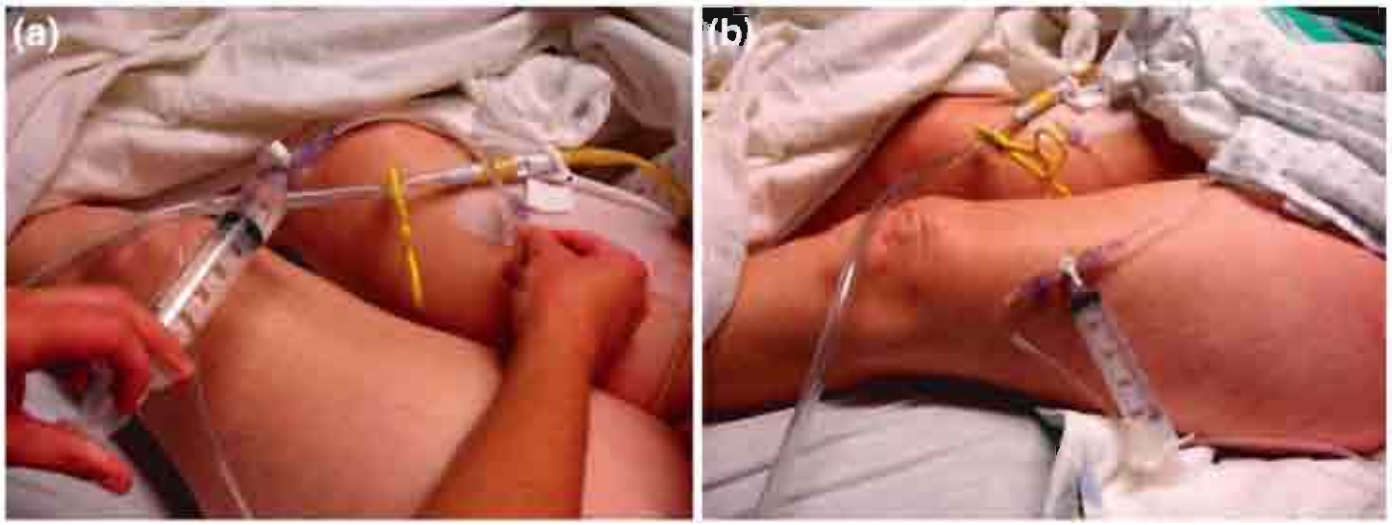
Sen/Spe: 79% 100%

Can J Anesth/J Can Anesth (2009) 56:678–682
DOI 10.1007/s12630-009-9140-8

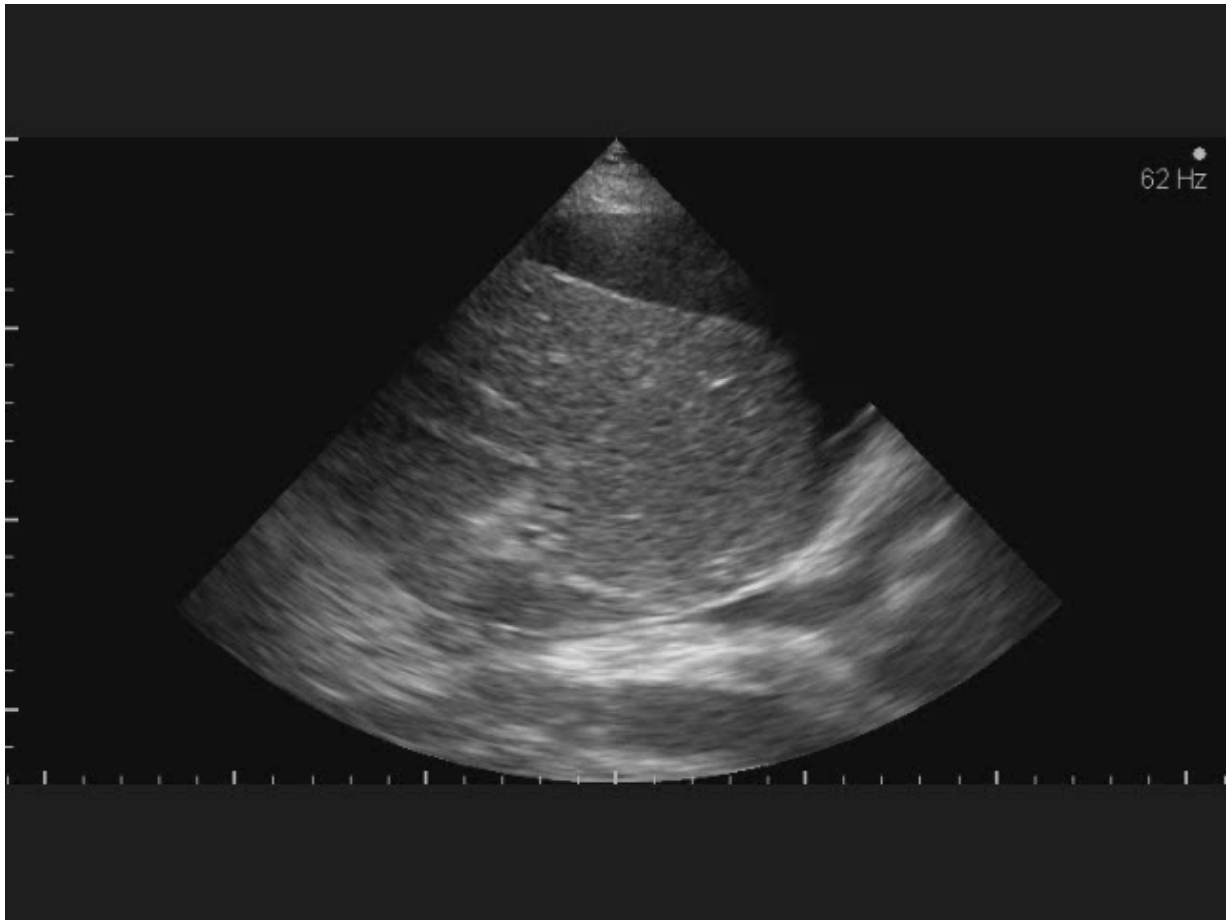
PERIOPERATIVE CARDIOVASCULAR ROUNDS

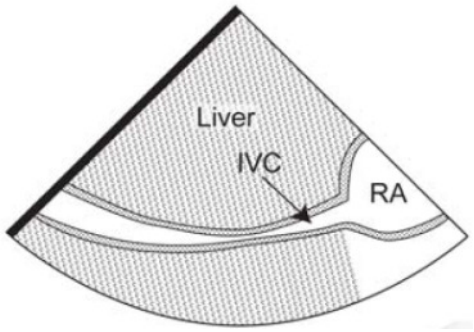
Acute abdominal compartment syndrome

Nancy Deslauriers, MD · Renée Déry, MD · André Denault, MD



Mécanismes mixtes

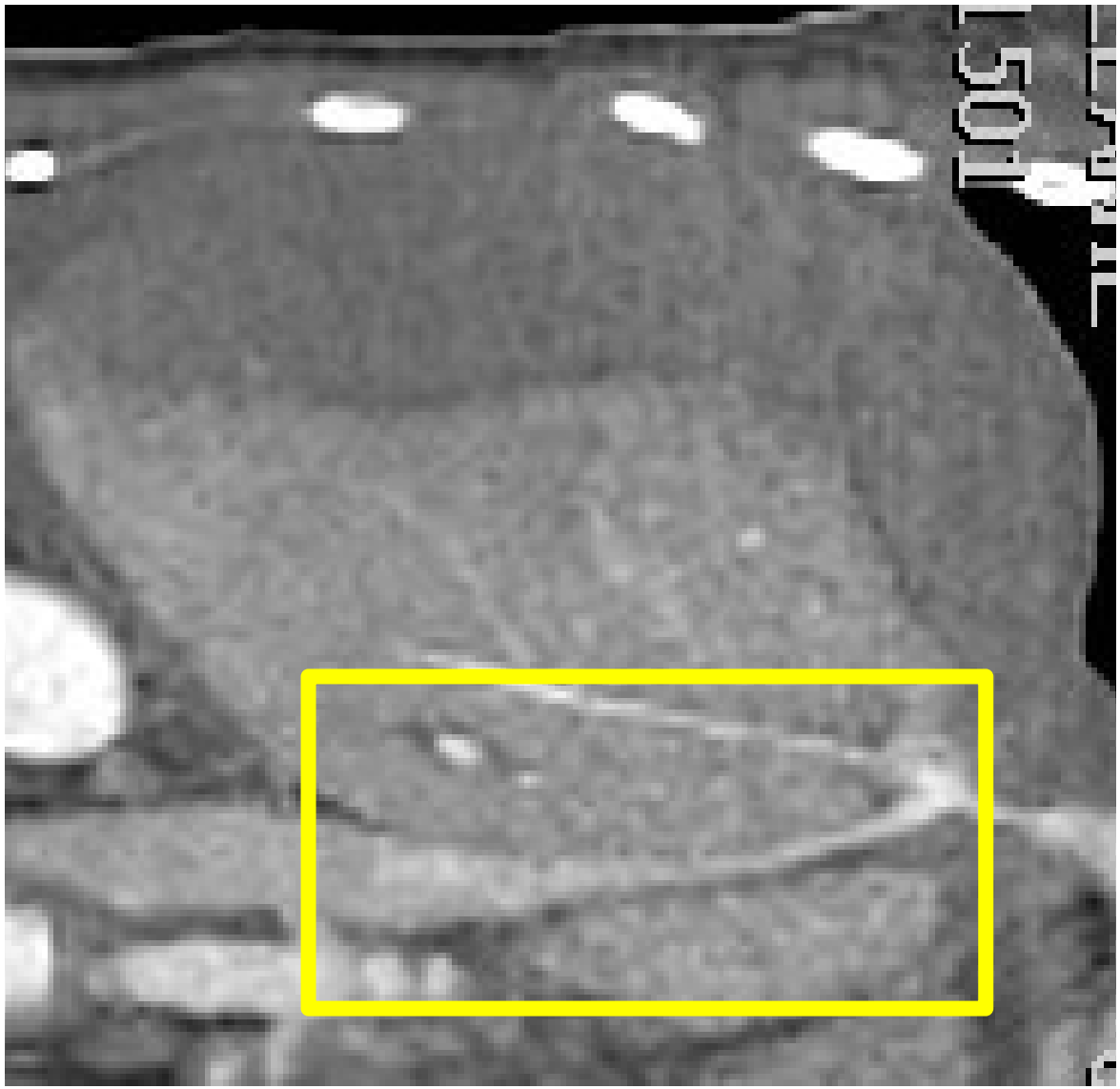


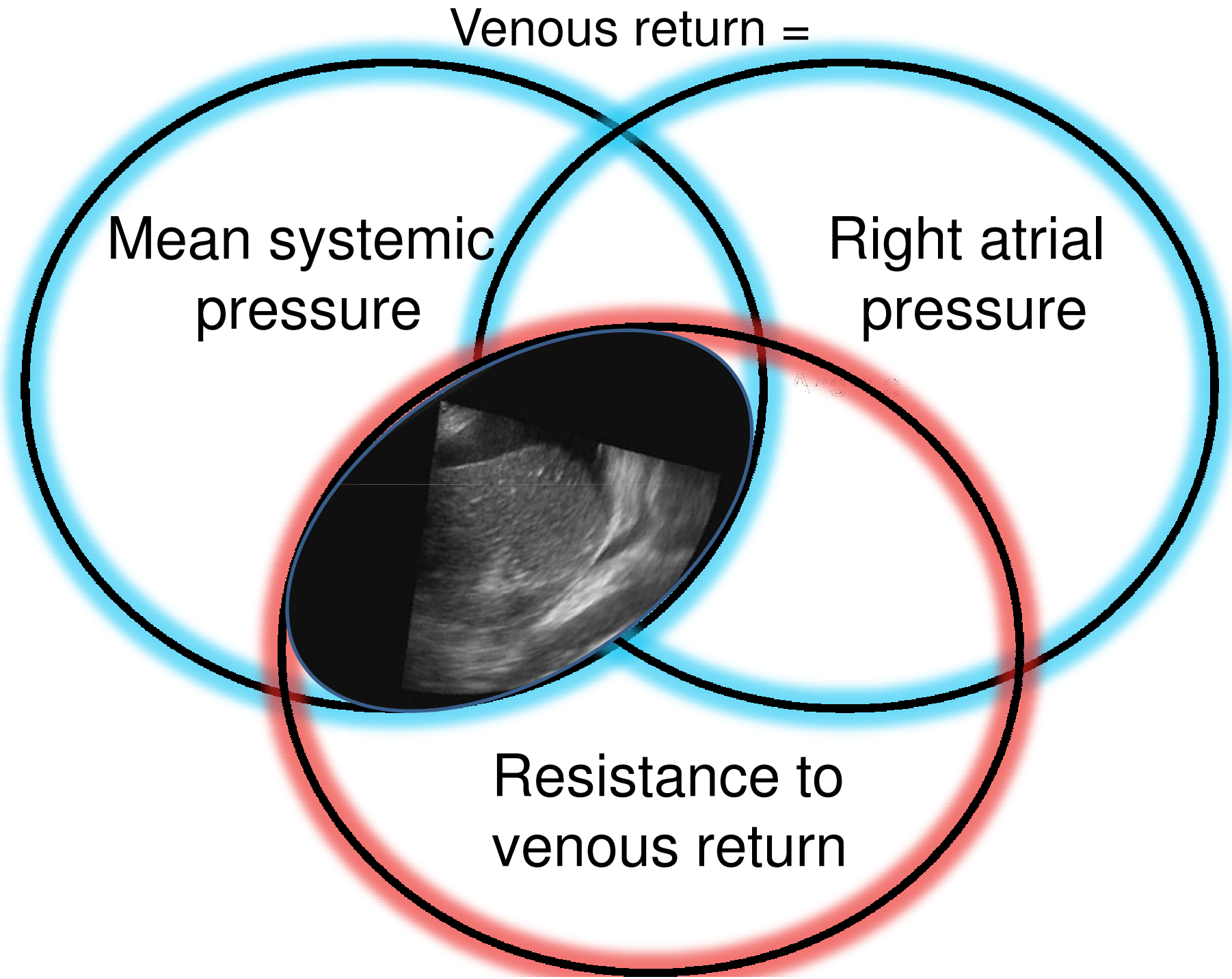


Courtoisie Dr Philippe Rola

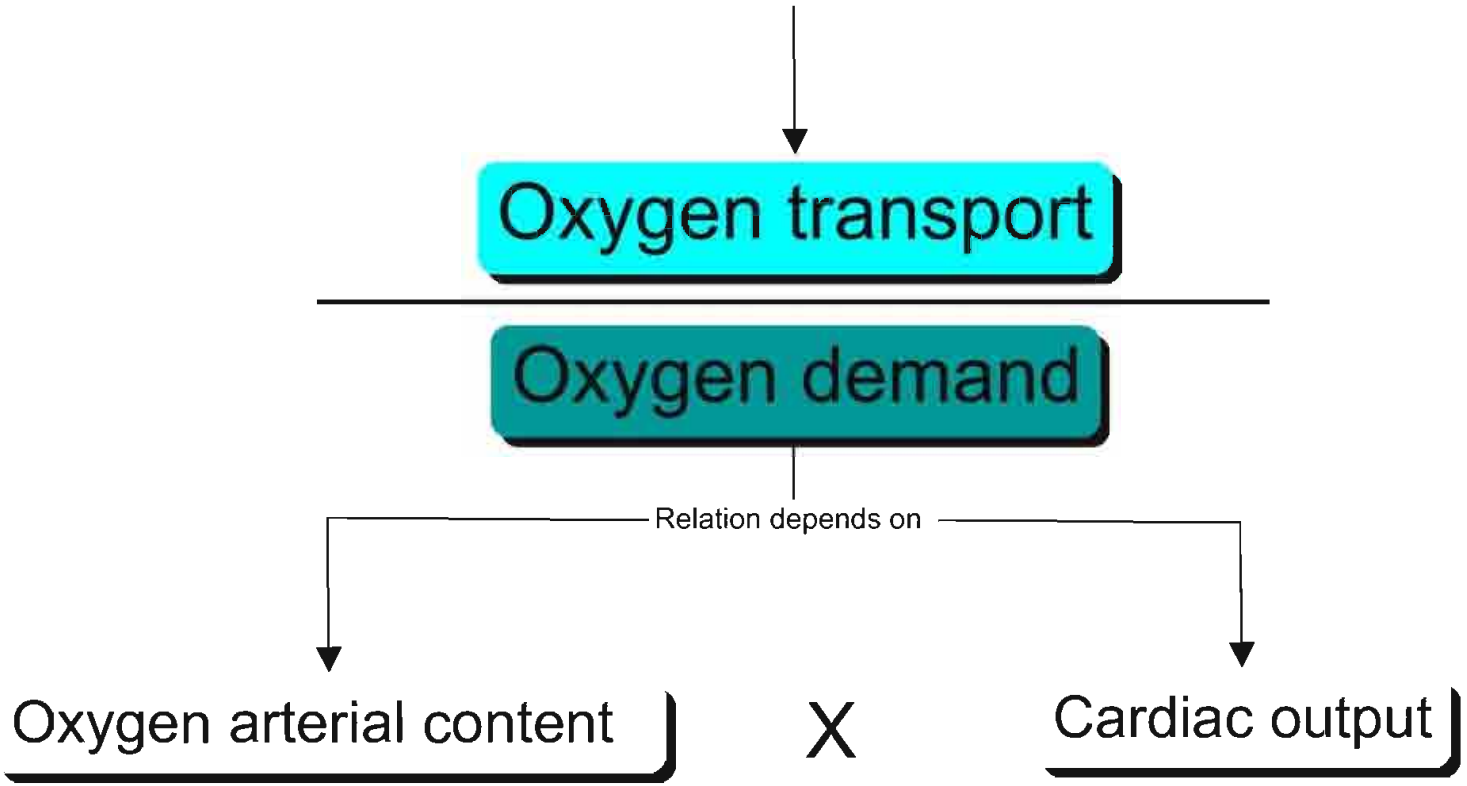
Femme de 20 ans: HELLP

Femme de 20 ans: HELLP




Venous return =
Mean systemic pressure
Right atrial pressure
Resistance to venous return

Hemodynamic instability



En résumé


107
-0.2
0.1
PAP
PVC
104/37
44/29
57/16
34
AGT-fe
AGT-in
8
32

=


PEDIATRIC %SO2
25.09.05
05:07:20
ALARM LOW
L 36
SYSTEM SIGNAL OK
R 43
4 HOURS
2/MIN
LEFT
RIGHT
MAIN MENU

Hemodynamic instability

sure

Depends on