

BRIGADE DE SAPEURS-POMPIERS DE PARIS  
DIVISION SANTÉ

**CONFÉRENCES**  
**MÉDECINE D'URGENCE PRÉHOSPITALIÈRE**  
2025 - 2026

# Échographie

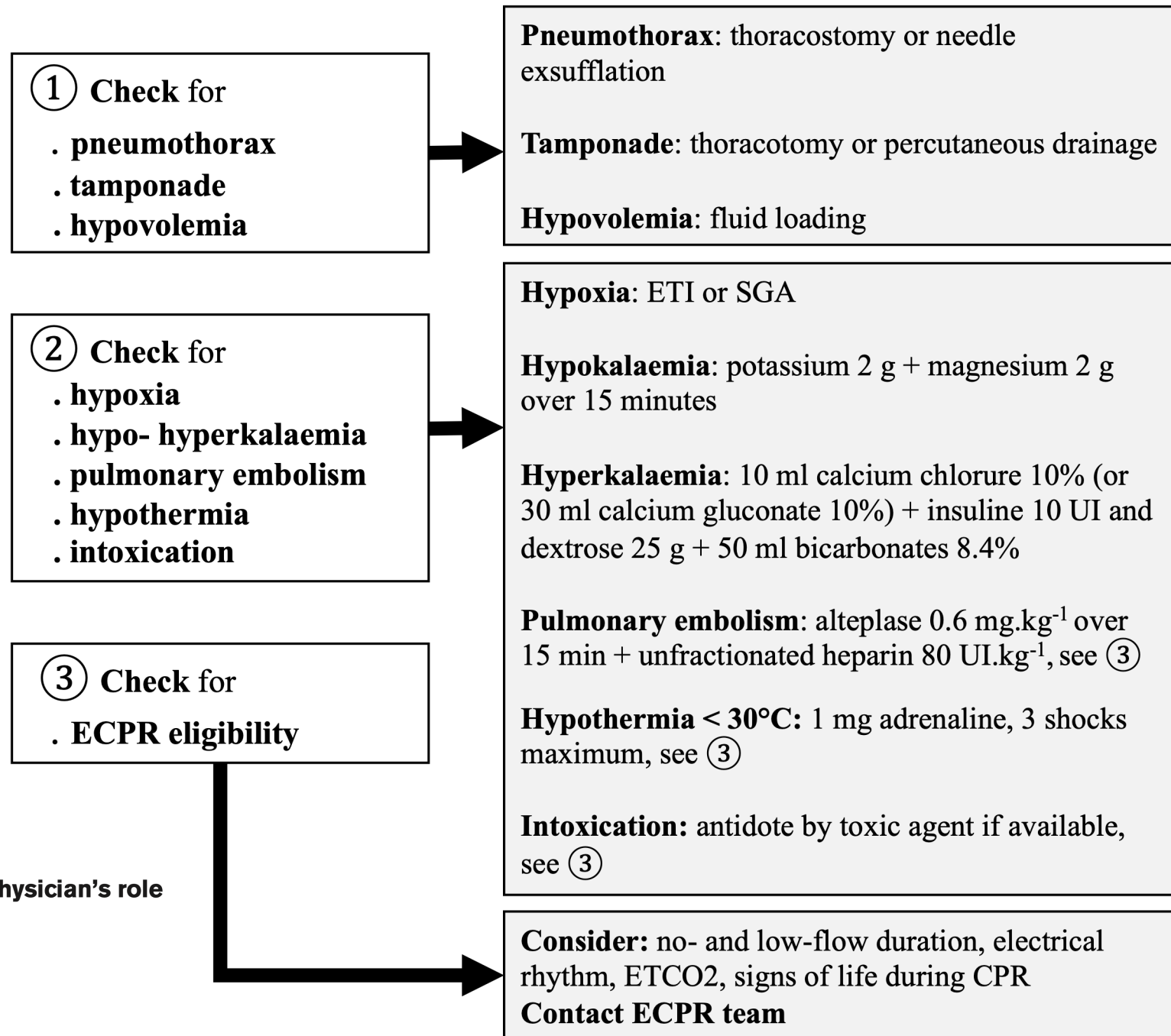
**DANS L'ARRÊT CARDIAQUE**

François Javaudin



# Conflits d'intérêts





**Out-of-hospital cardiac arrest: prehospital physician's role during CPR should be clarified**  
SFMU Cardiac Arrest Board\*



**Out-of-hospital cardiac arrest: prehospital physician's role during CPR should be clarified**  
SFMU Cardiac Arrest Board\*

① Check for

- . pneumothorax
- . tamponade
- . hypovolemia

**Pneumothorax:** thoracostomy or needle exsufflation

**Tamponade:** thoracotomy or percutaneous drainage

**Hypovolemia:** fluid loading

② Check for

- . hypoxia
- . hypo- hyperkalaemia
- . pulmonary embolism
- . hypothermia
- . intoxication

**Hypoxia:** ETI or SGA

**Hypokalaemia:** potassium 2 g + magnesium 2 g over 15 minutes

**Hyperkalaemia:** 10 ml calcium chlorure 10% (or 30 ml calcium gluconate 10%) + insuline 10 UI and dextrose 25 g + 50 ml bicarbonates 8.4%

**Pulmonary embolism:** alteplase 0.6 mg.kg<sup>-1</sup> over 15 min + unfractionated heparin 80 UI.kg<sup>-1</sup>, see ③

**Hypothermia < 30°C:** 1 mg adrenaline, 3 shocks maximum, see ③

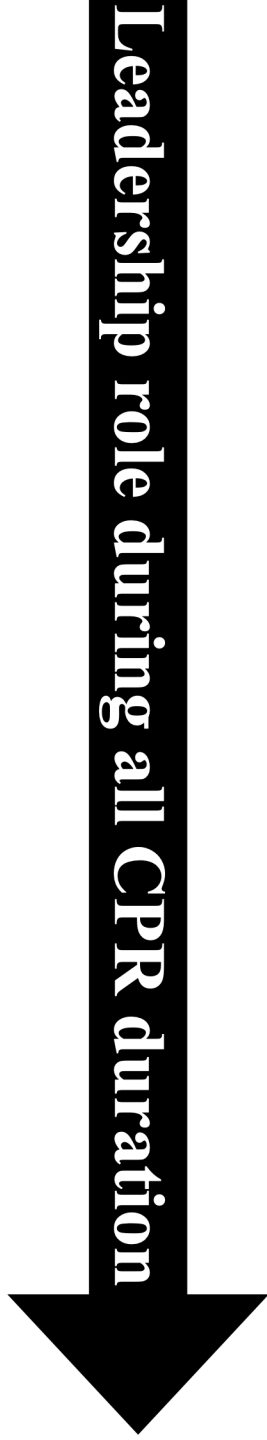
**Intoxication:** antidote by toxic agent if available, see ③

③ Check for

- . ECPR eligibility

**Consider:** no- and low-flow duration, electrical rhythm, ETCO<sub>2</sub>, signs of life during CPR

**Contact ECPR team**

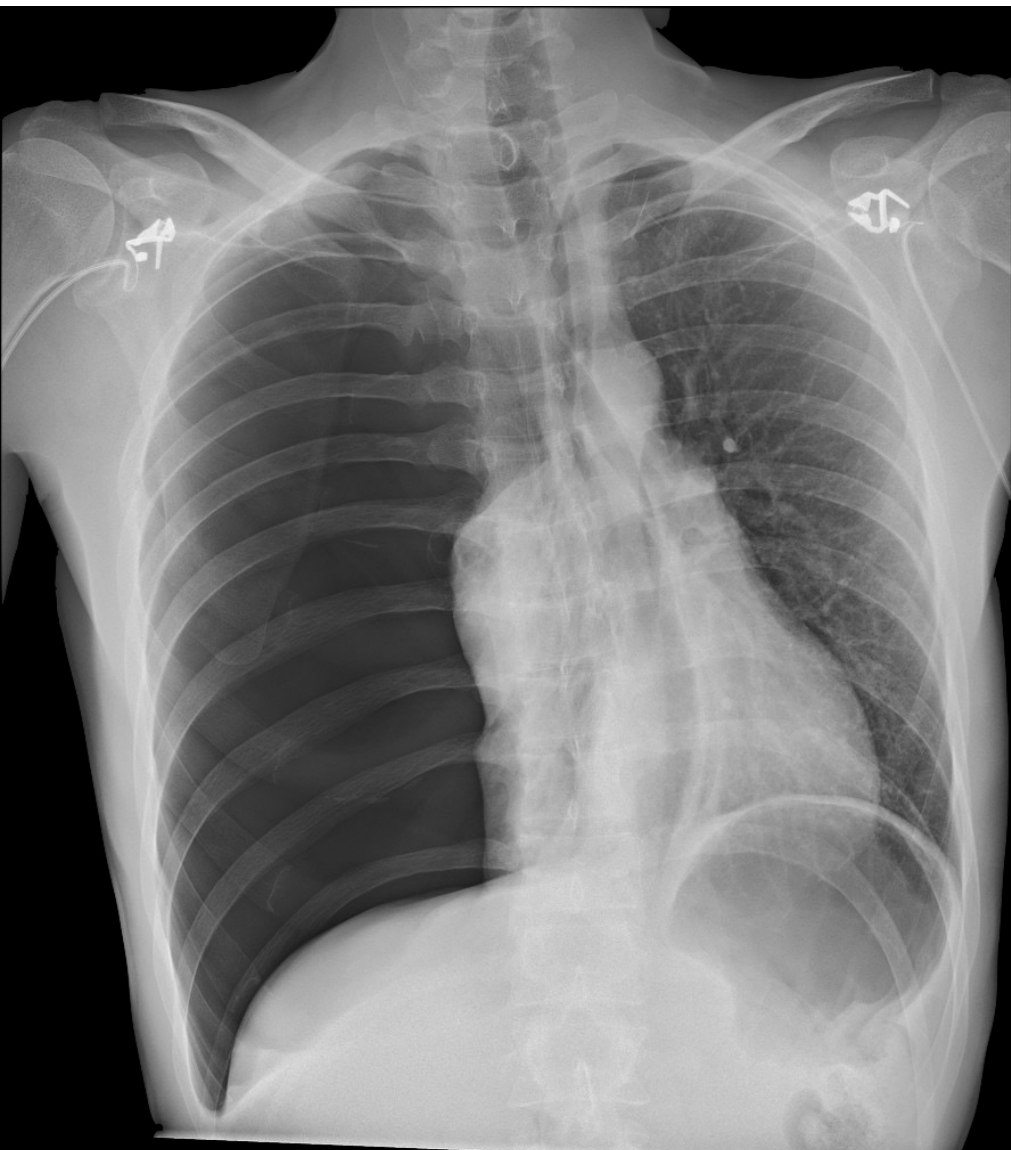




**EUROPEAN  
RESUSCITATION  
COUNCIL**

**2025**

**POCUS may help identify treatable causes of cardiac arrest  
such as cardiac tamponade and tension pneumothorax.**



# **Pneumothorax**

## **compressif**

## Chest ultrasonography versus supine chest radiography for diagnosis of pneumothorax in trauma patients in the emergency department (Review)

	<b>Sensibilité</b>	<b>Spécificité</b>
<b>ECMU</b>	<b>91%</b>	<b>99%</b>
<b>Auscultation</b>	<b>70%</b>	<b>99%</b>



Poumon  
L12-3  
50Hz  
5cm

2D  
Rés  
Gn 57  
C 47  
3 / 1 / 0

P



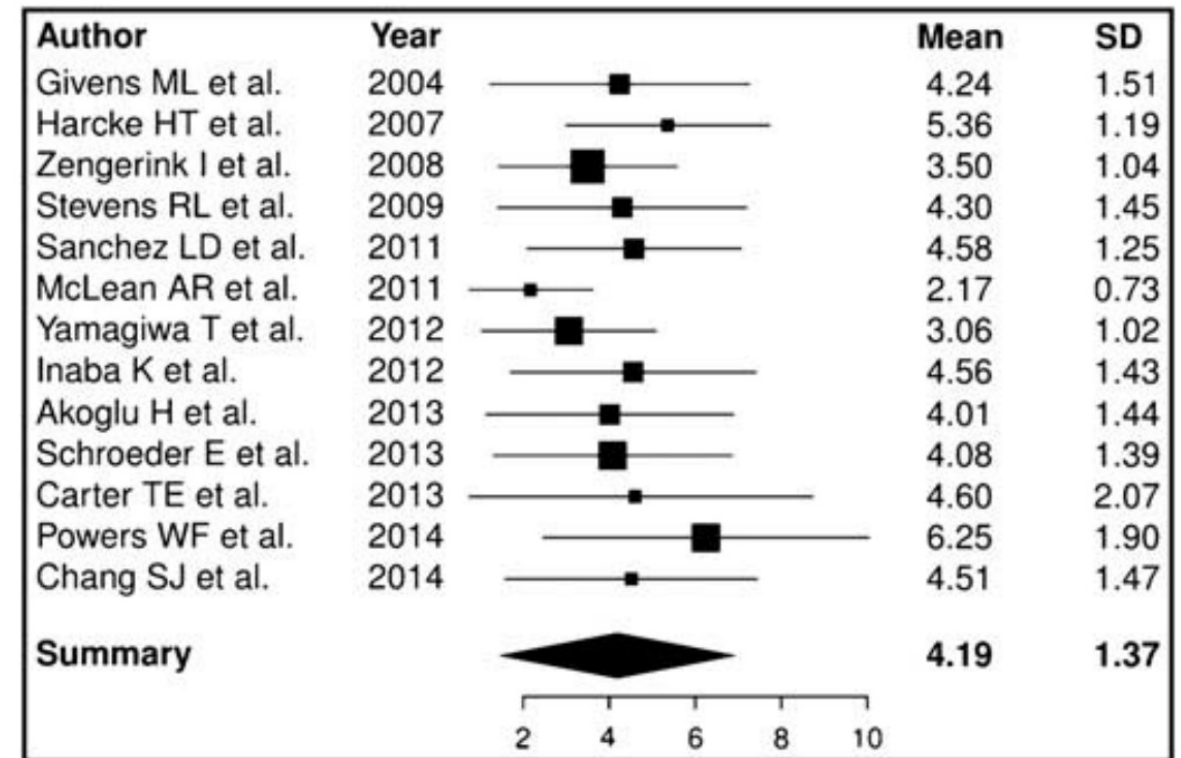
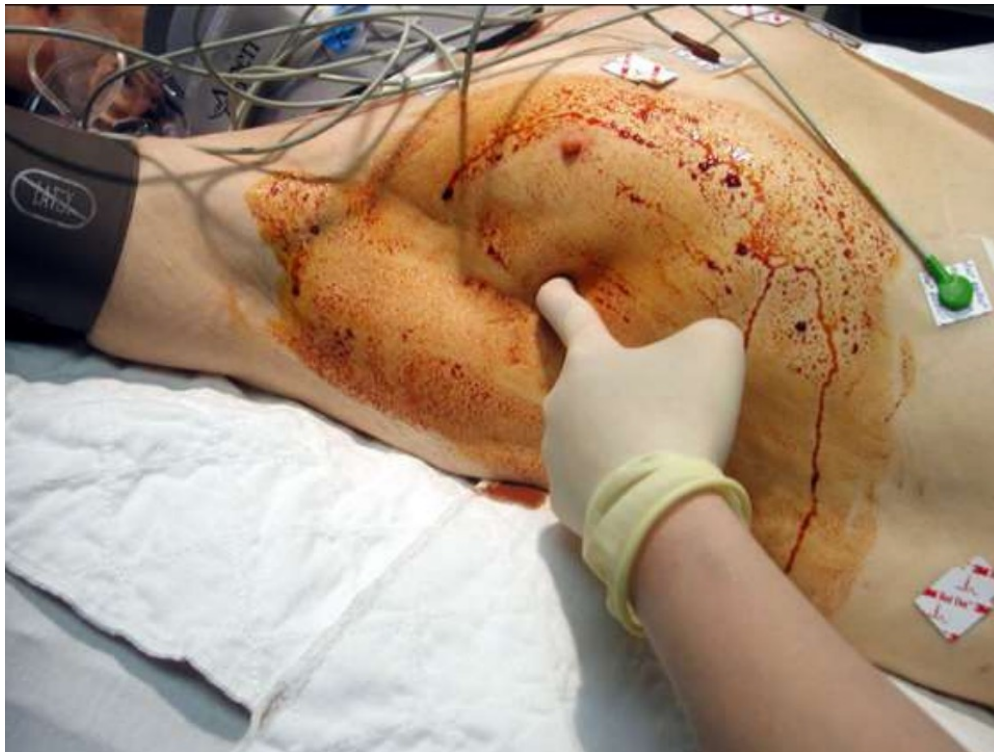
# Thoracostomie au 4<sup>e</sup> espace intercostal > exsufflation à l'aiguille



## Sufficient Catheter Length for Pneumothorax Needle Decompression: A Meta-Analysis

Brian M. Clemency, DO;<sup>1</sup> Christopher T. Tanski, MD, MSEd;<sup>2</sup> Michael Rosenberg, EMT-P;<sup>3</sup> Paul R. May, MA;<sup>1</sup> Joseph D. Consiglio, PhD;<sup>4</sup> Heather A. Lindstrom, PhD<sup>1</sup>

2015





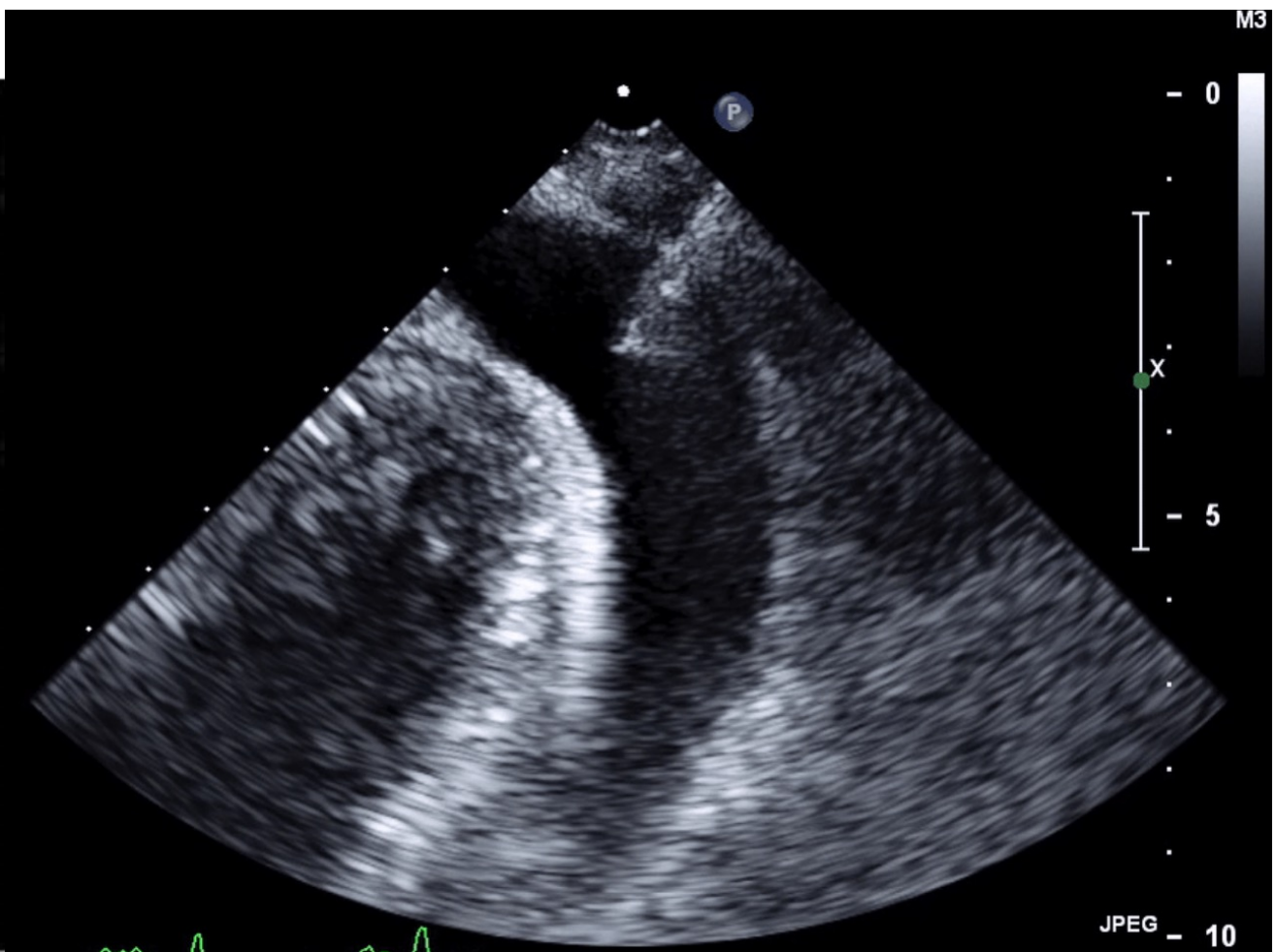
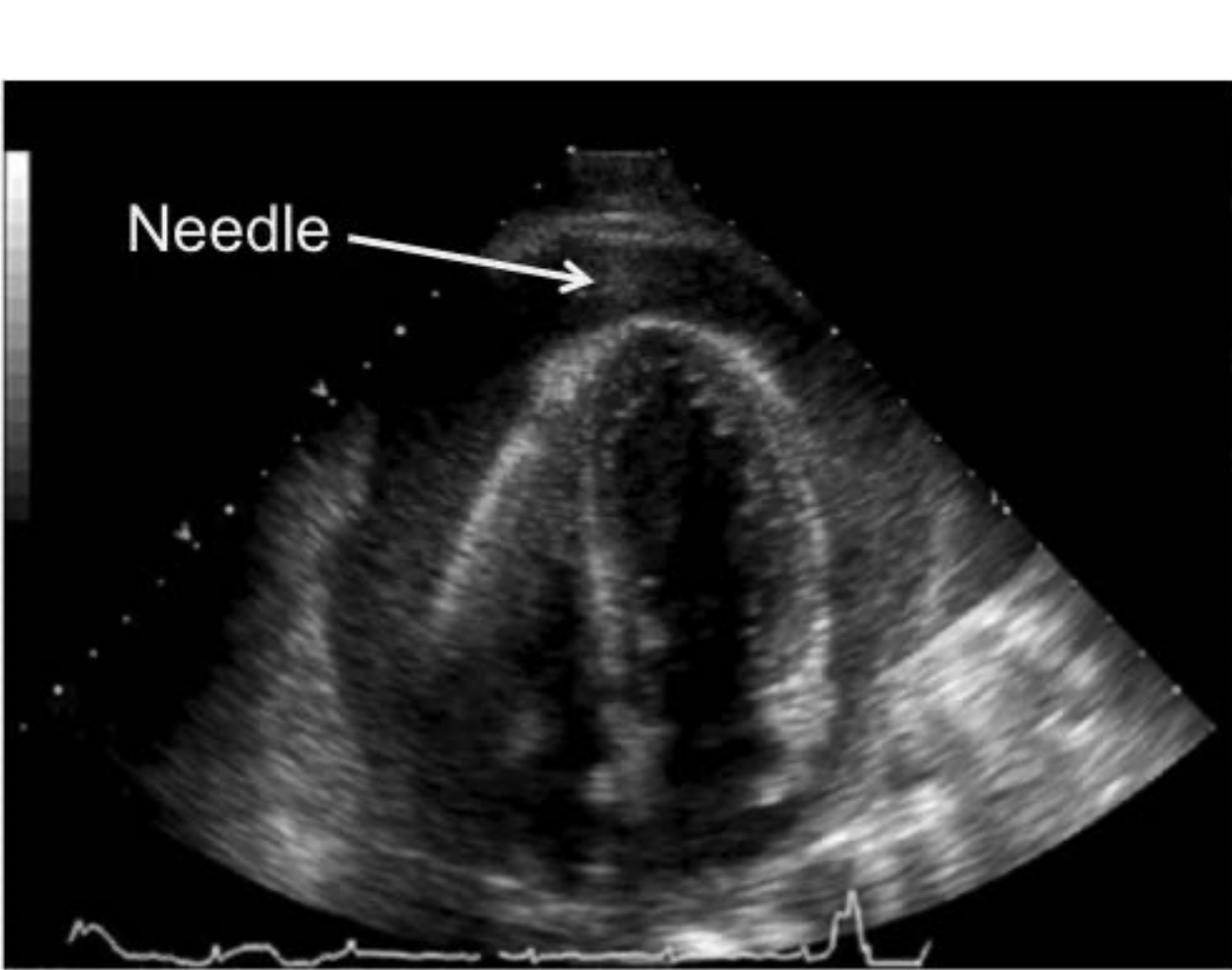
**tamponnade**



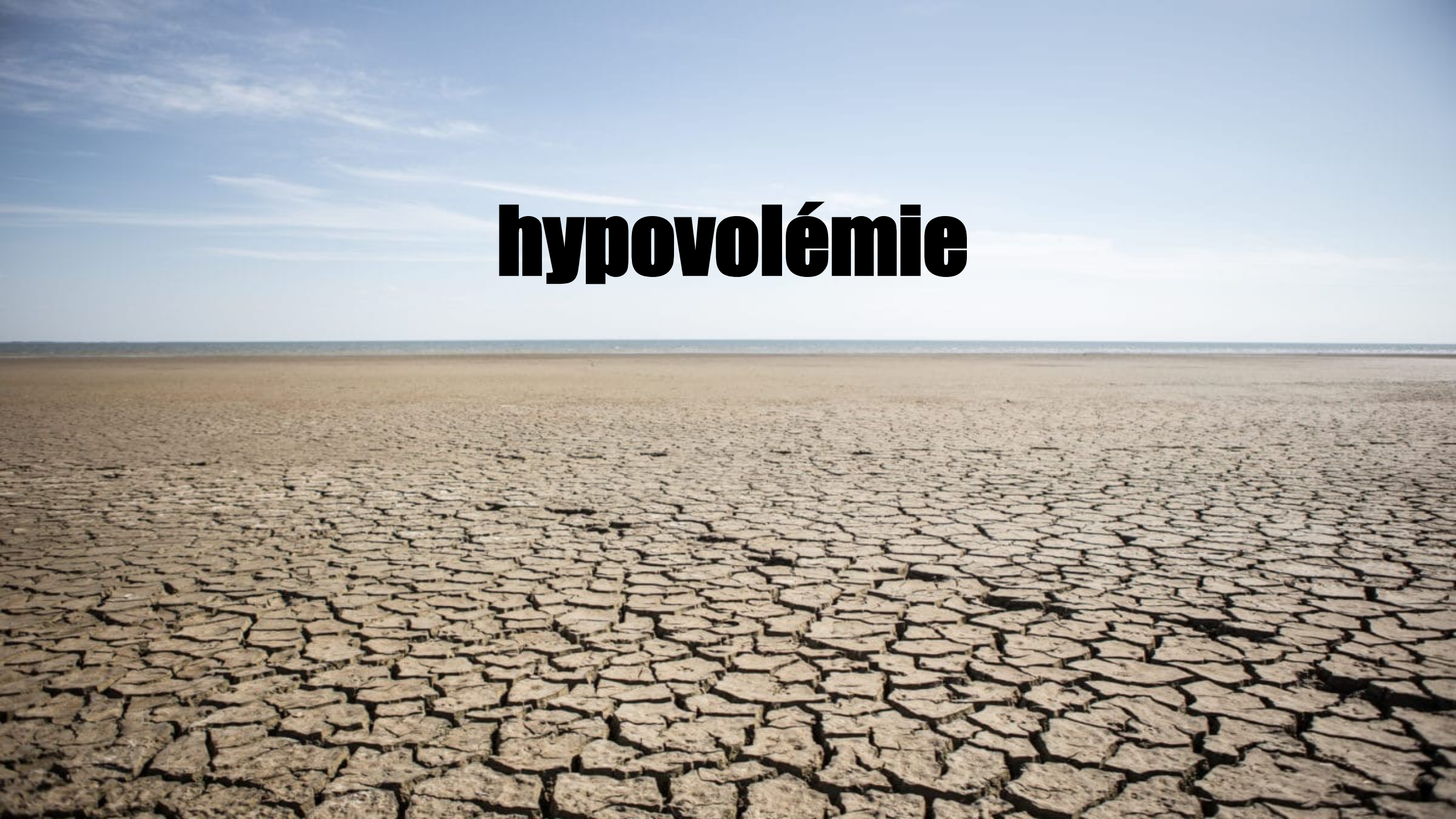
# Drainage échoguidé à l'aiguille

apical, latéro-sternal gauche ou sous xiphoïdien

+ remplissage IV



**hypovolémie**



ADI

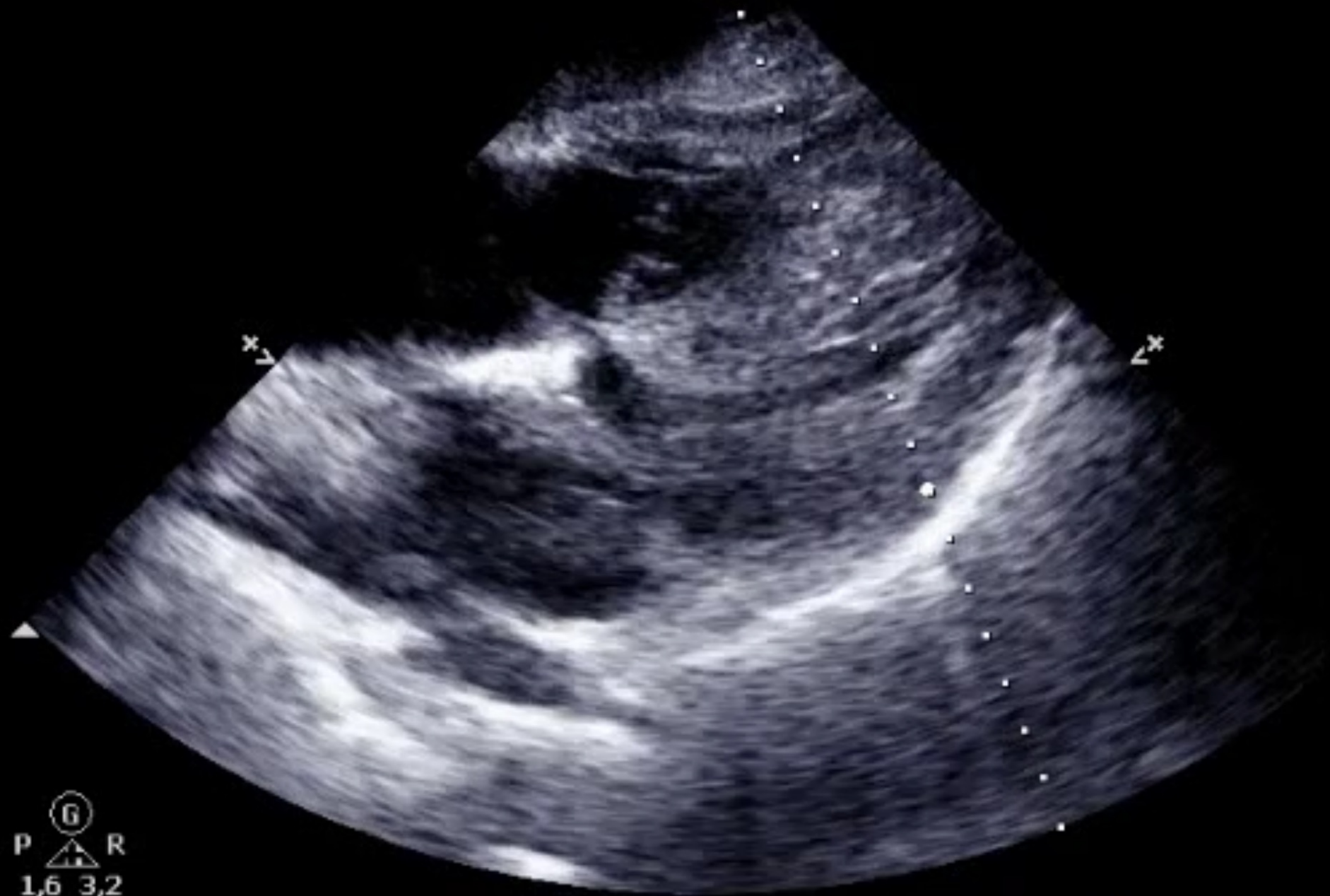
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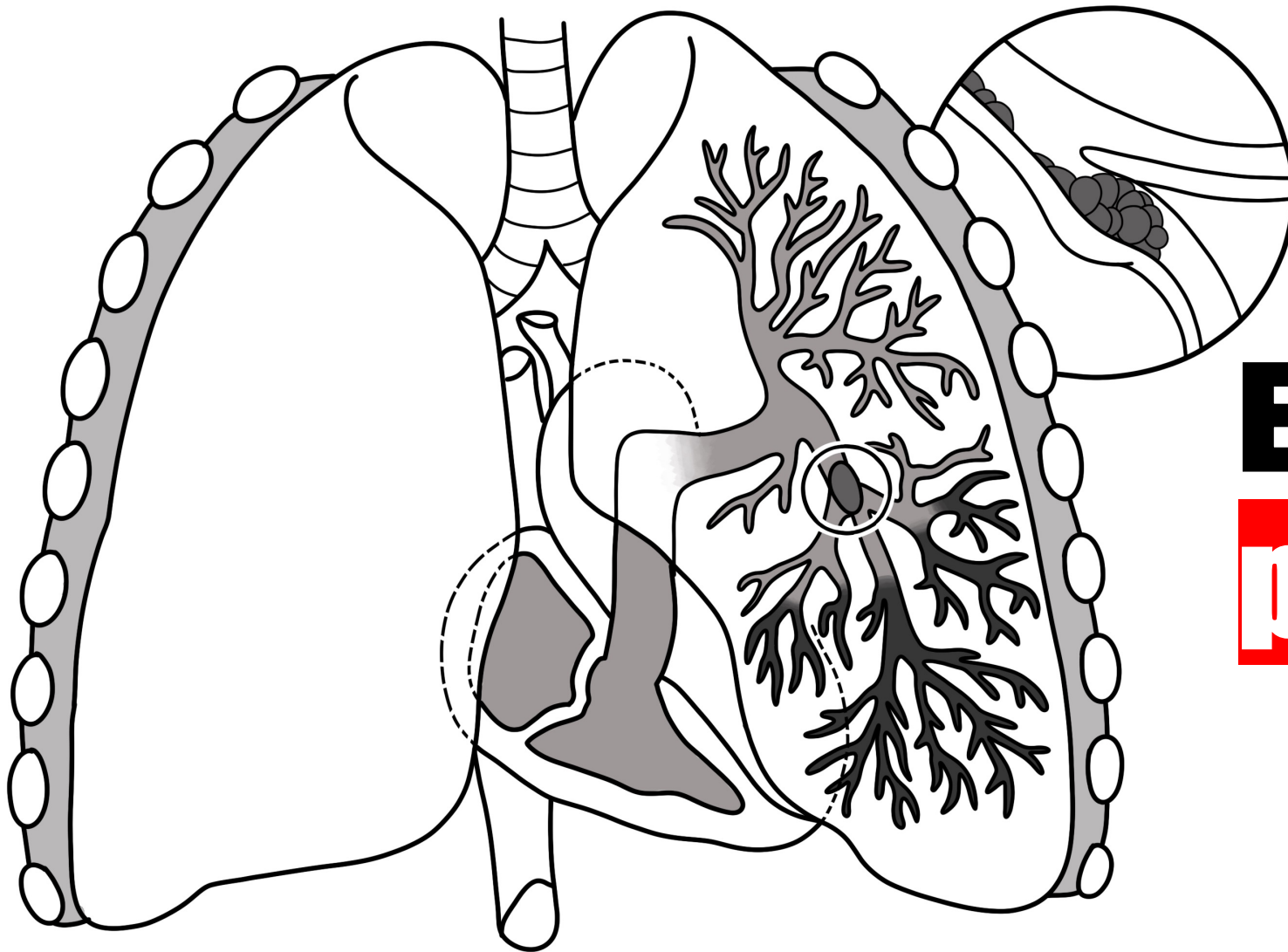
S

\*->

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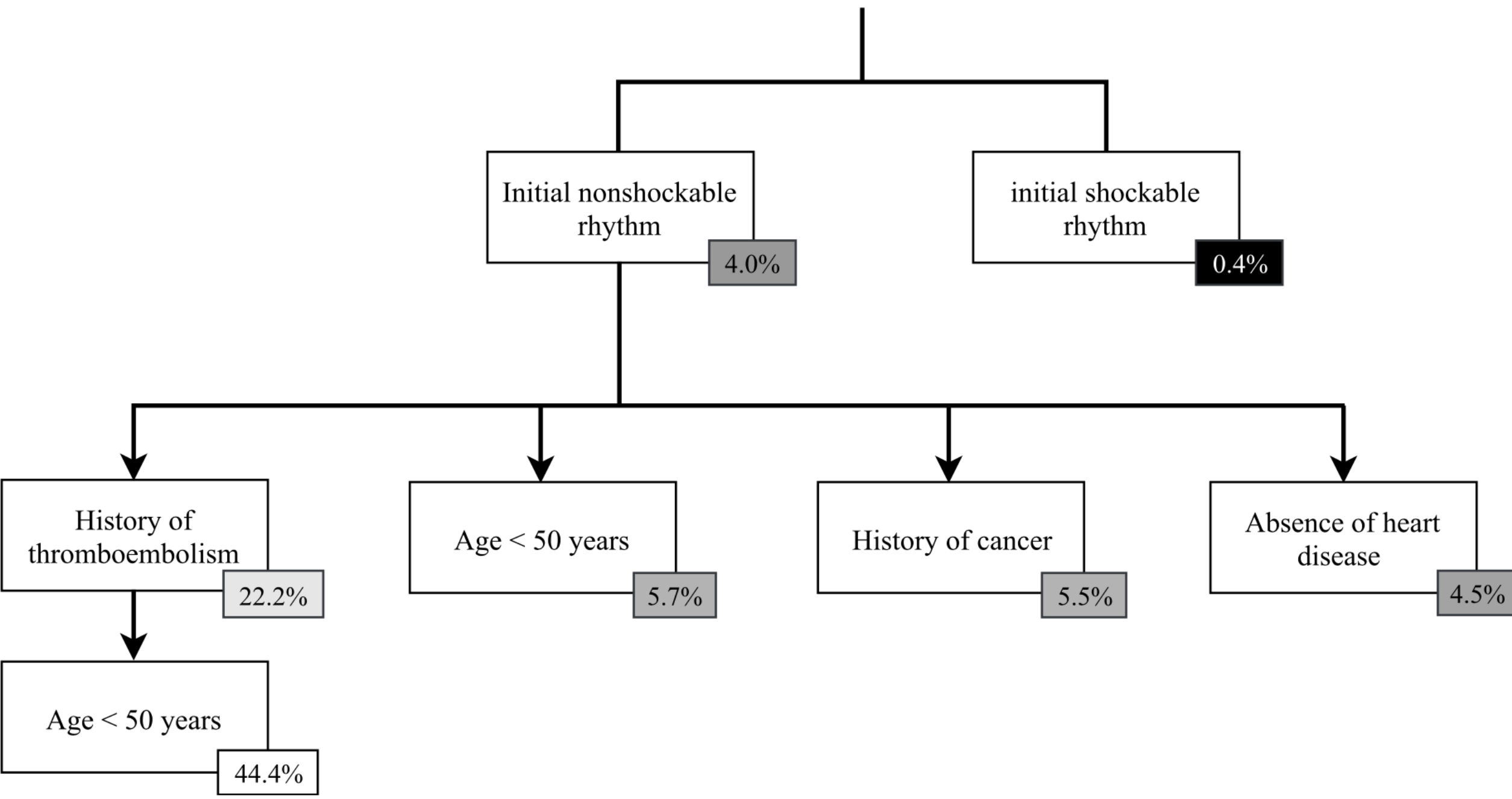
Ⓞ  
P     R  
1,6 3,2





**Embolie**

**pulmonaire**





Gén  
S MB

fe gl



- Vei  
HFL  
93%  
IM  
0,7  
ITM  
0,1

A   
B

4,0

ANTERIOR



M  
E  
D

**Normal**



**$STDVD/STDVG < 0,6$**

**Dilatation modérée**



**$0,6 < STDVD/STDVG < 1$**

**Dilatation majeure**



**$STDVD/STDVG > 1$**

**Dans l'arrêt cardiaque  
 $VD/VG = 1$**



88%

IM

0,7

ITO

0,1





Gén THI  
S

2020Fév21 09:42

— Crd

. P21



. 99%

■ IM

. 0,8

■ ITM

. 0,7

· A

21



Gén



0



Secteur



MB Non



THI Actif

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**ACE**

**Asystolie Cardiaque Echographique**



# RÉSULTATS **ACE**

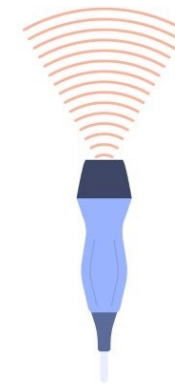
INCLUSIONS

**293 inclusions**



**8 centres**

**67 ans**



**8 min**

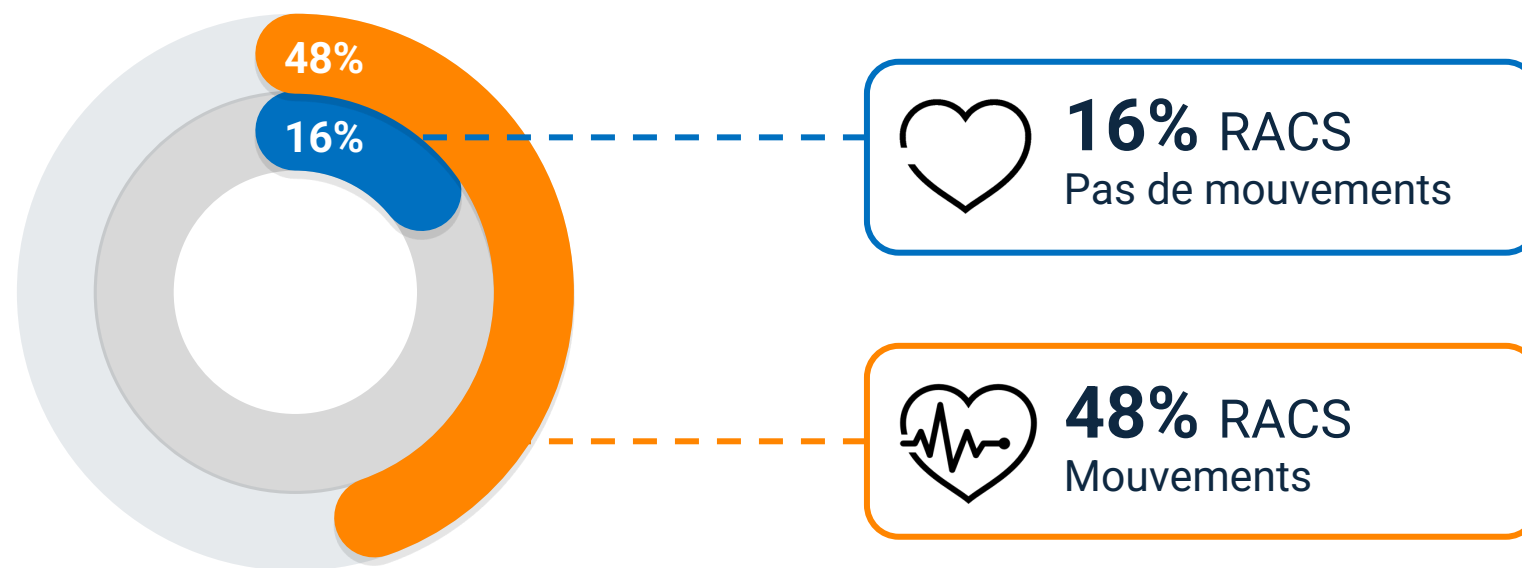
**Pas de mouvements : n = 212 (72%)**

**Mouvements : n = 81 (28%)**



# RÉSULTATS ACE

## RACS





# RÉSULTATS ACE

CAUSES RÉVERSIBLES

**n = 14 (5%)**

**Tamponnade cardiaque : n = 5**

**Hypovolémie : n = 4**

**Embolie pulmonaire : n = 4**

# CONCLUSIONS ACE

**Asystolie  
échographique précoce  
associée à  
l'absence de RACS**

**Ne peut pas être utilisé comme seul élément pour  
décider d'un arrêt de la RCP**





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**2025**

**Do not use POCUS for assessing contractility of the myocardium as a sole indicator for terminating CPR.**

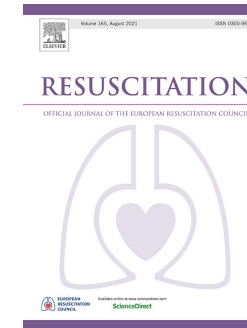
# Reprise d'une Activité Circulatoire Spontanée



# Femoral artery Doppler ultrasound is more accurate than manual palpation for pulse detection in cardiac arrest



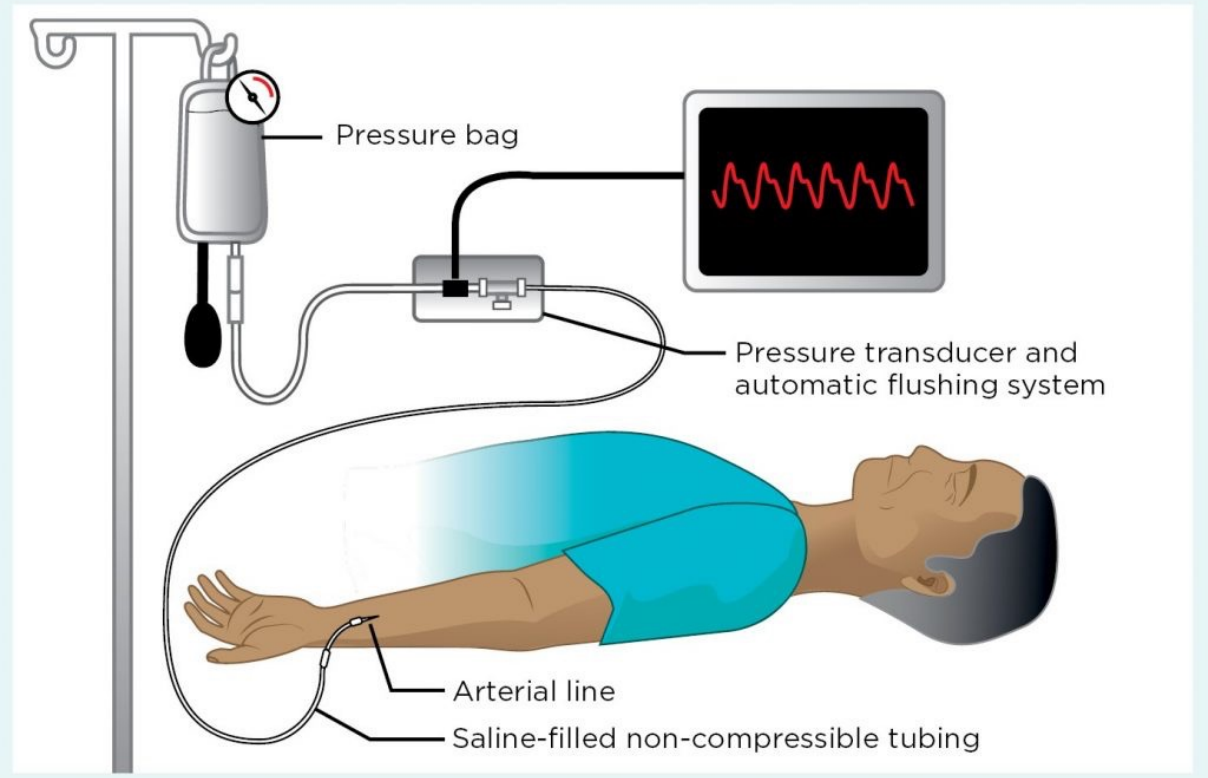
Allison L. Cohen<sup>a,b</sup>, Timmy Li<sup>a,b</sup>, Lance B. Becker<sup>a,b,c</sup>, Casey Owens<sup>b,c</sup>, Neha Singh<sup>c</sup>, Allen Gold<sup>d</sup>, Mathew J. Nelson<sup>a,b</sup>, Daniel Jafari<sup>a,b</sup>, Ghania Haddad<sup>b</sup>, Alexander V. Nello<sup>a,b</sup>, Daniel M. Rolston<sup>a,b,\*</sup>, Northwell Health Biostatistics Unit<sup>1</sup>

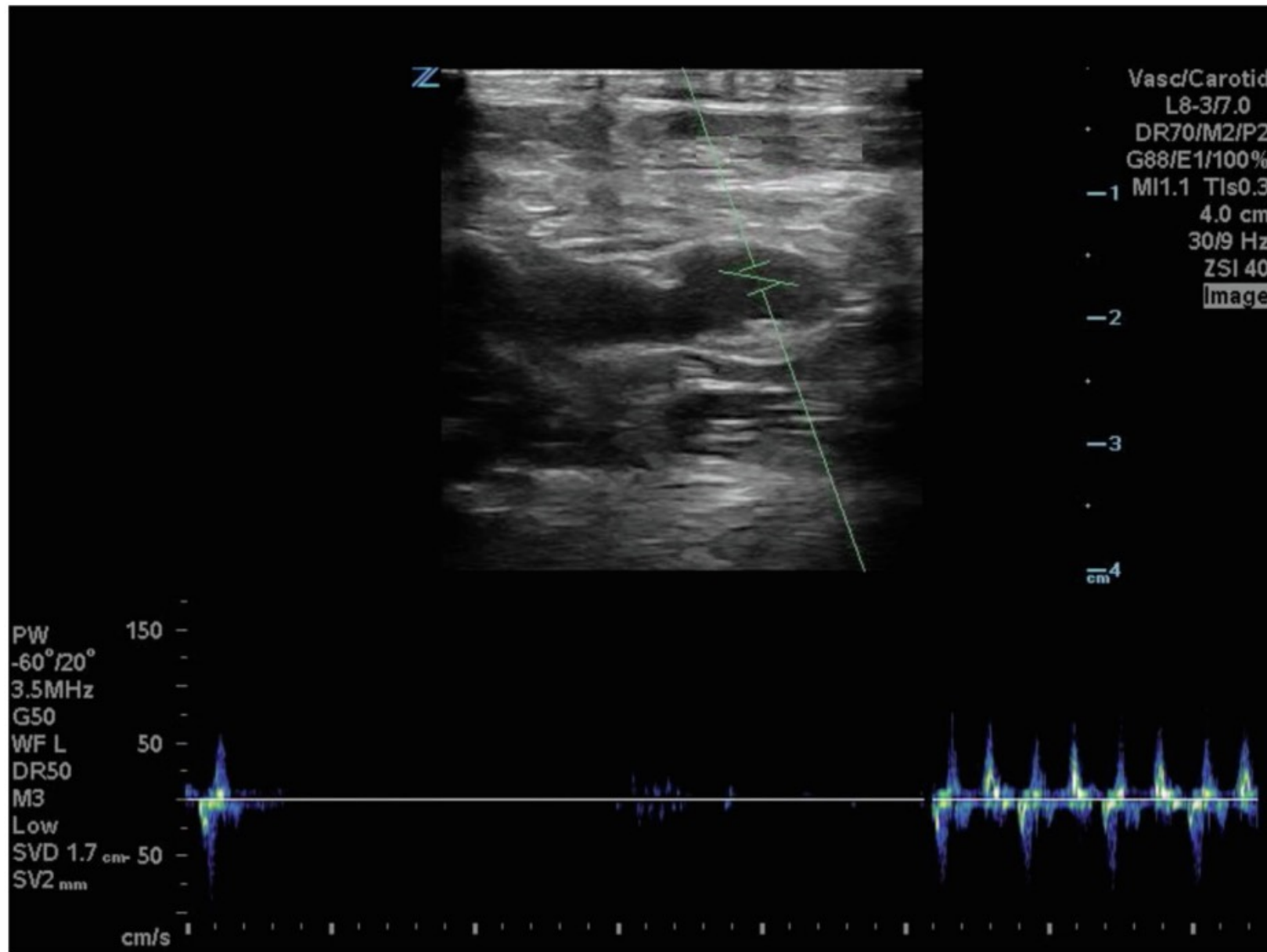


2022

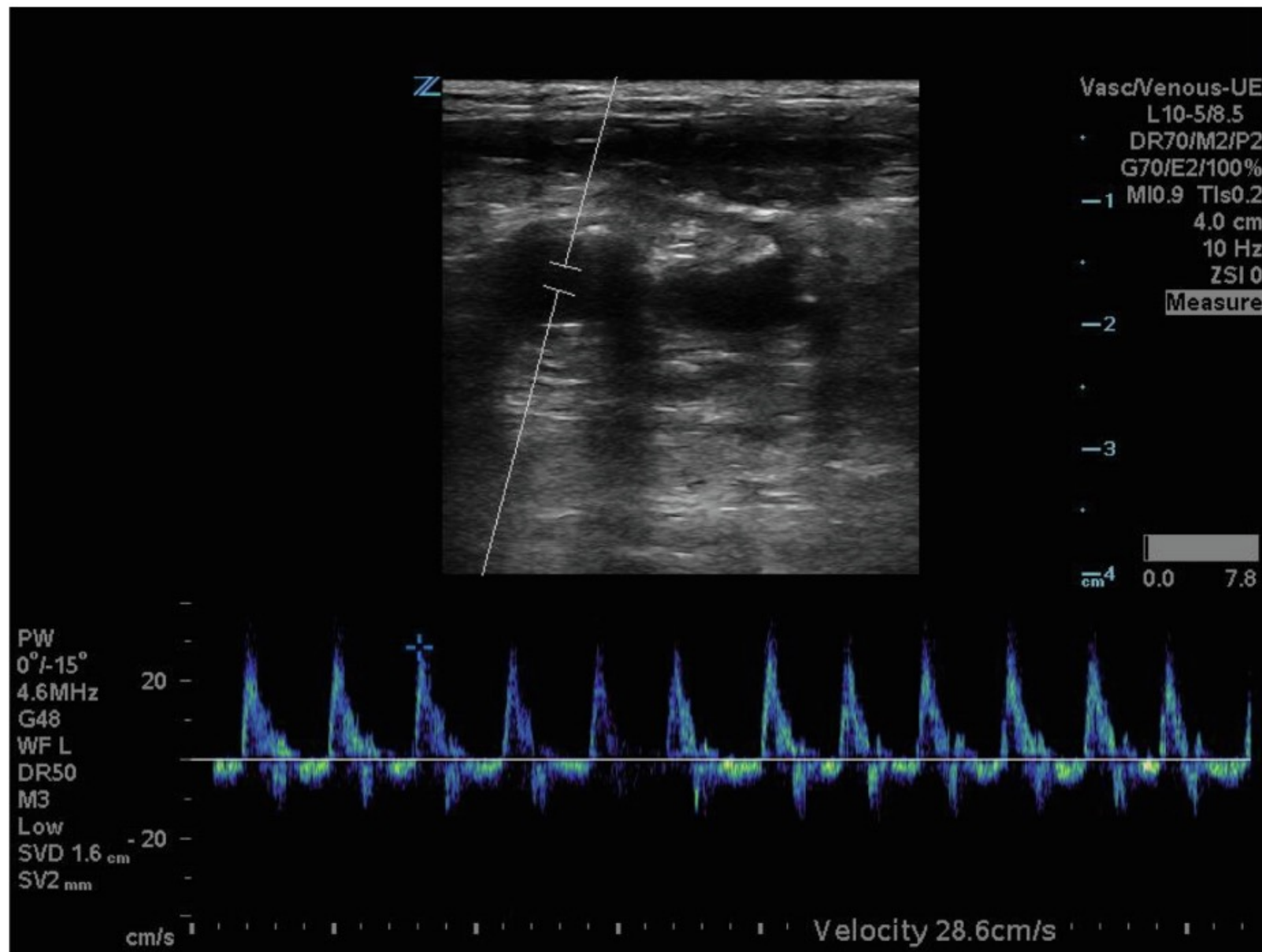
54 patients analysés avec  
213 prises de pouls

Fig 2. Arterial line connection

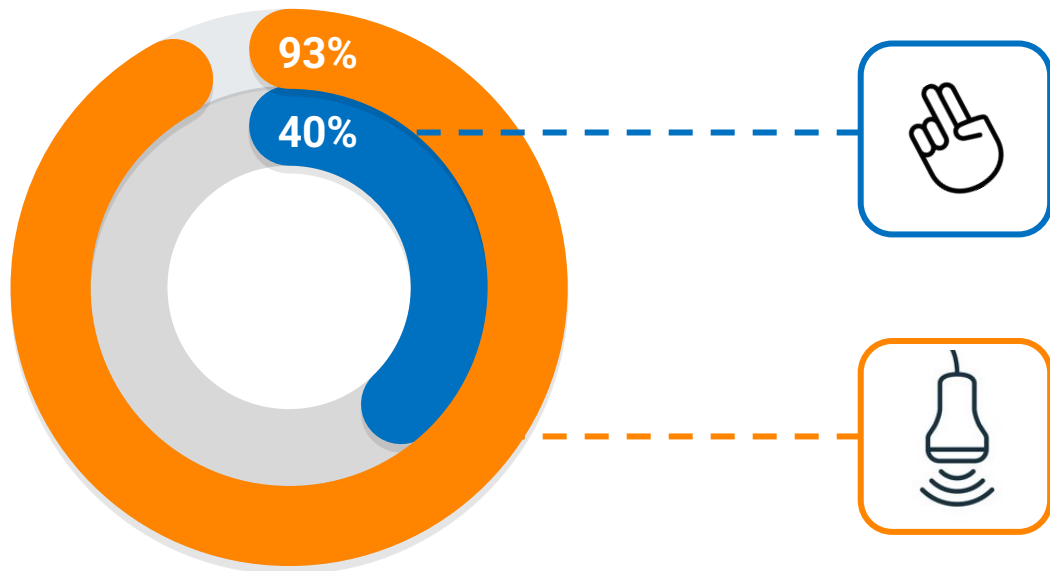




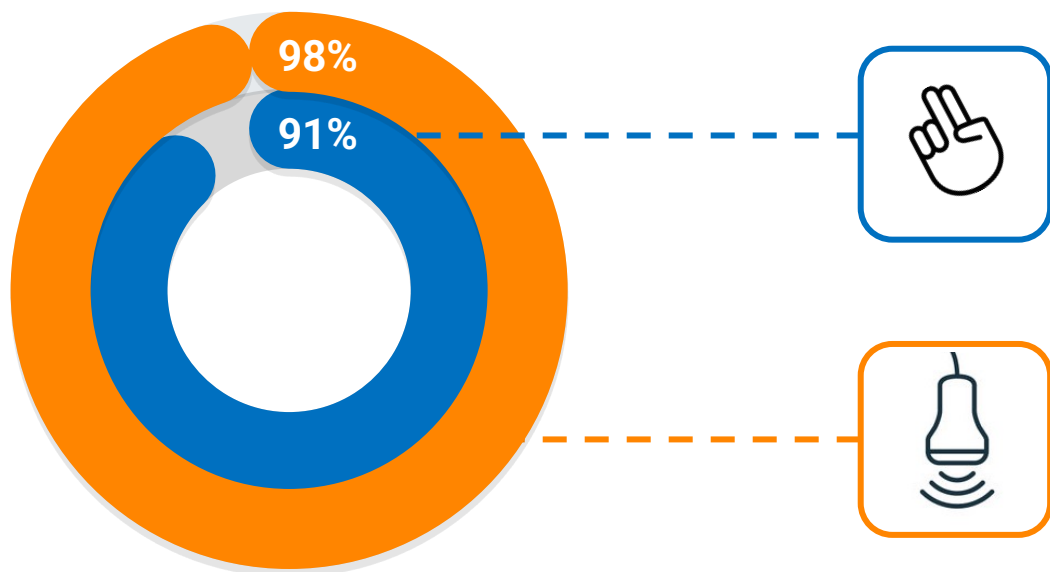
**Fig. 1a - Femoral artery Doppler ultrasound waveforms with chest compressions and no Doppler ultrasound blood flow visible at a pulse check.**



**Fig. 1c – Femoral artery Doppler ultrasound waveform visible with high blood flow (peak systolic velocity of 28.6 cm/s) at a pulse check.**



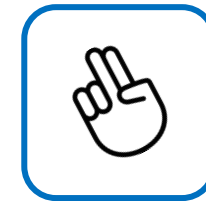
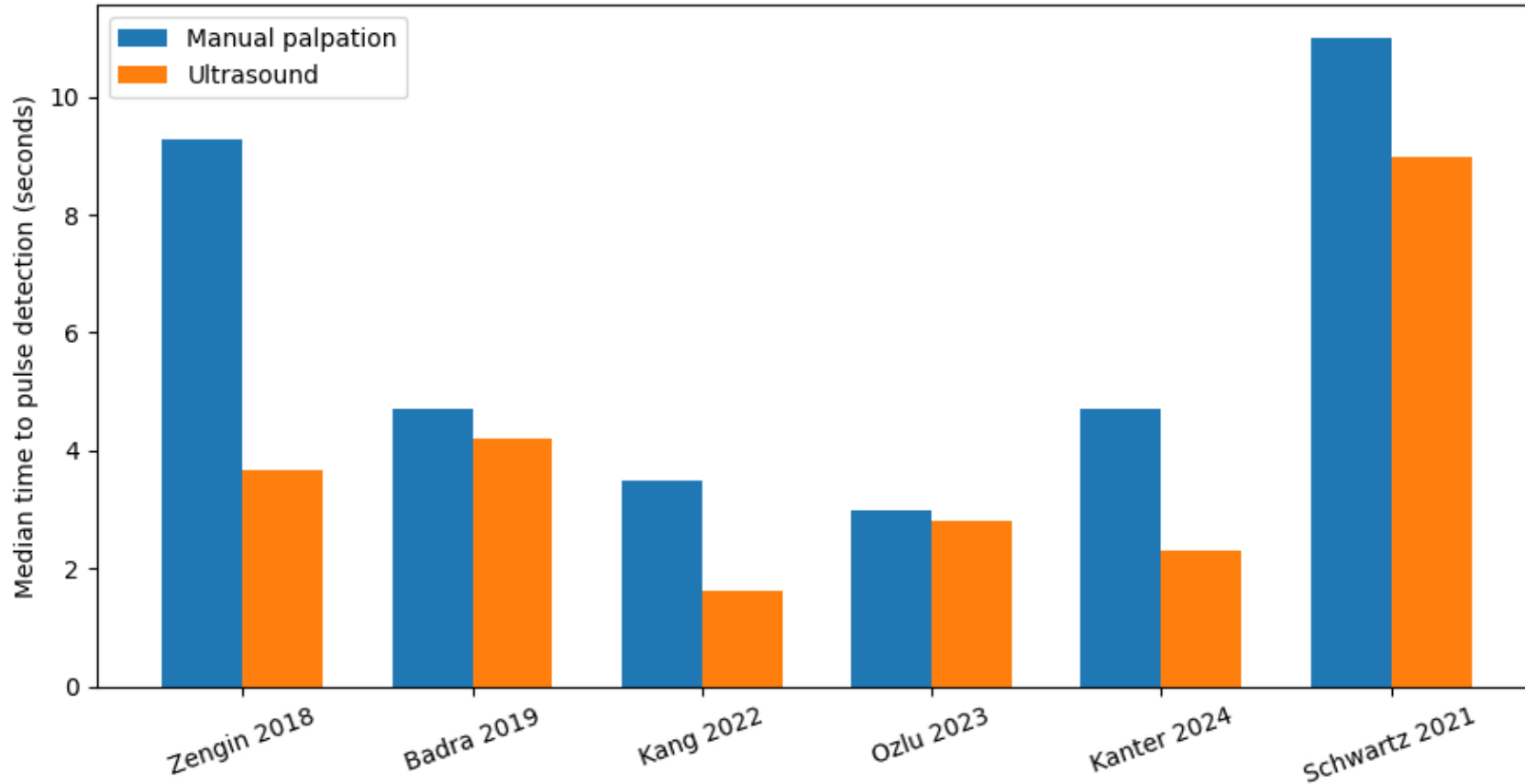
**Sensibilité**



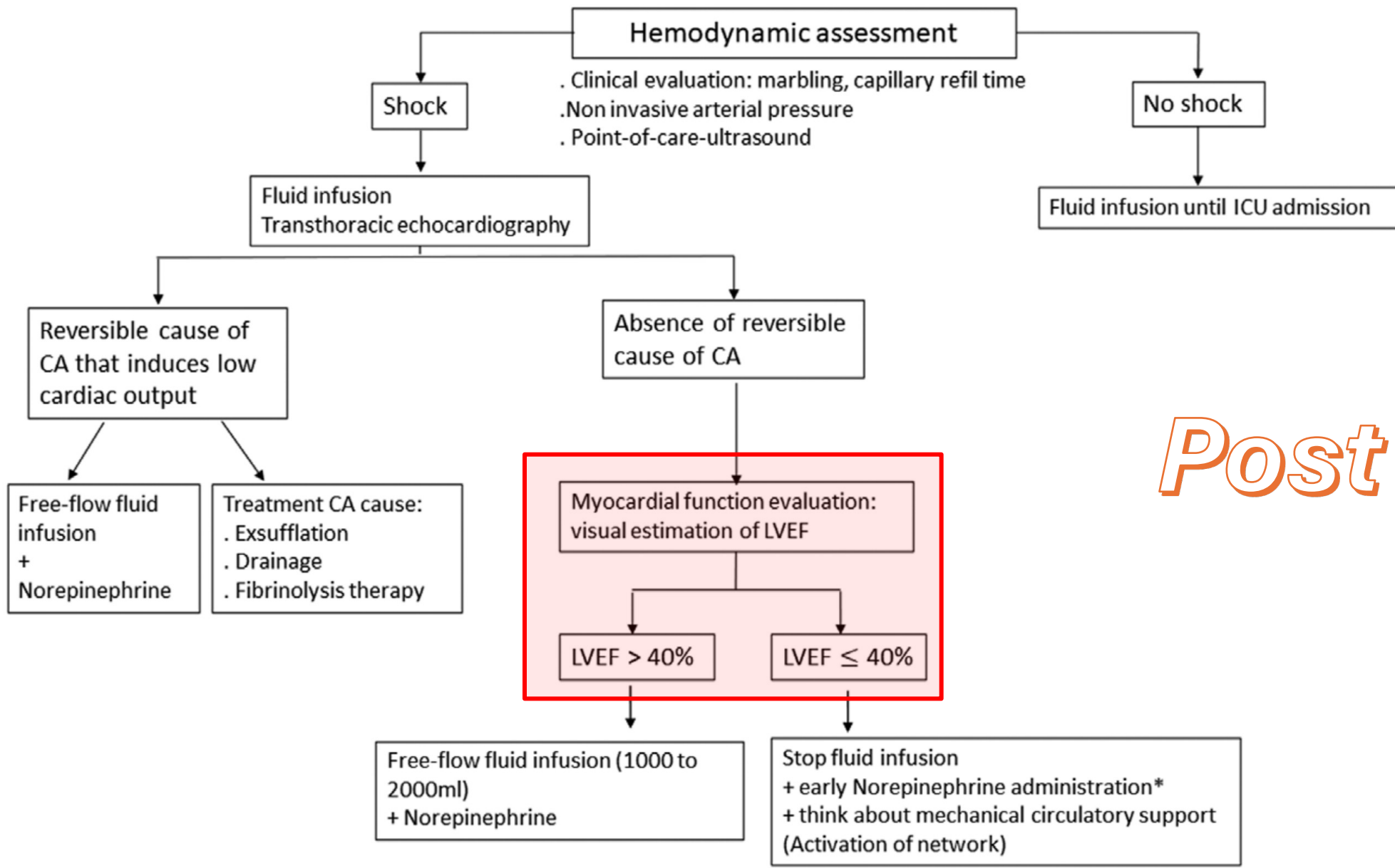
**Spécificité**

**ULTRASOUND VS MANUAL PALPATION FOR PULSE DETECTION DURING CARDIOPULMONARY RESUSCITATION: A SYSTEMATIC REVIEW**

Manual Pulse Palpation vs Ultrasound Detection Time by Study



**CONCLUSIONS:** **Ultrasound techniques outperform Manual Palpation** in pulse detection during CPR, offering **faster detection**, **greater accuracy**, and improved ROSC identification.



# Post RACS

\*Discuss dobutamine if severe LVEF



# SYNTHÈSE

## ÉCHOGRAPHIE ET ARRÊT CARDIAQUE

### CAUSES



Recommandé

Si expertise suffisante

### Pronostic



Oui

Mais pas le seul indicateur

### RACS



Oui

Plus rapide et sensible

### Post RACS



Recommandé

Évaluation hémodynamique  
Causes réversibles



Interruption minimale des compressions thoraciques (<10sec)