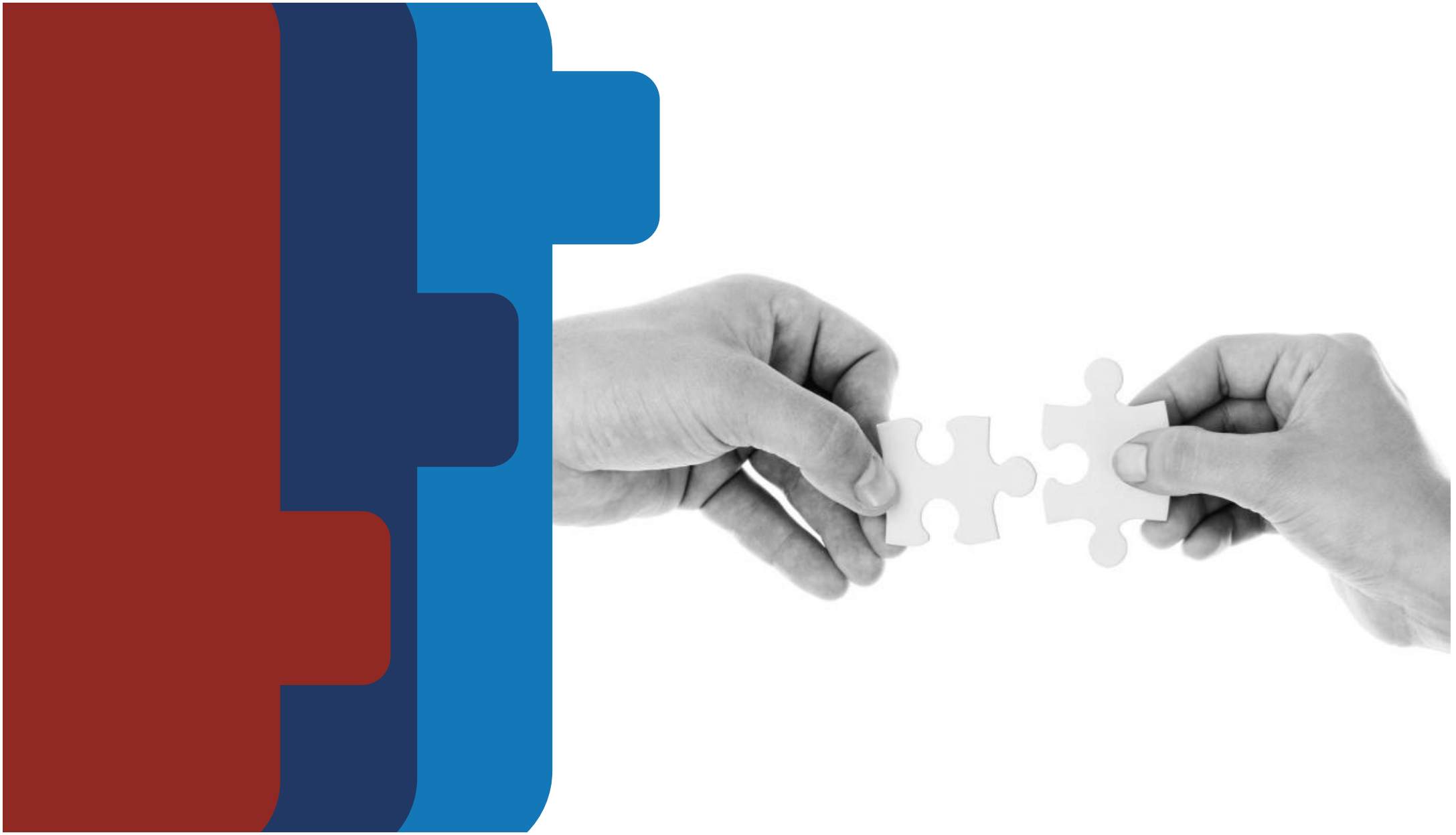
GAVePed
Gruppo Accessi Venosi Pediatrici

V Convegno Nazionale
GAVePed
2023 RIMINI
15-16 Maggio

INTEGRAZIONE TRA ECHOTIP ED ECG INTRACAVITARIO

Geremia Zito Marinosci

Azienda Ospedaliera di Rilievo Nazionale
SANTOBONO PAUSILIPON

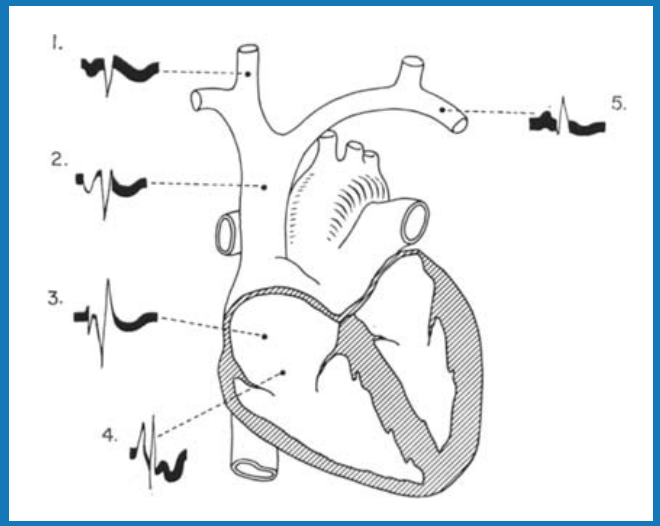


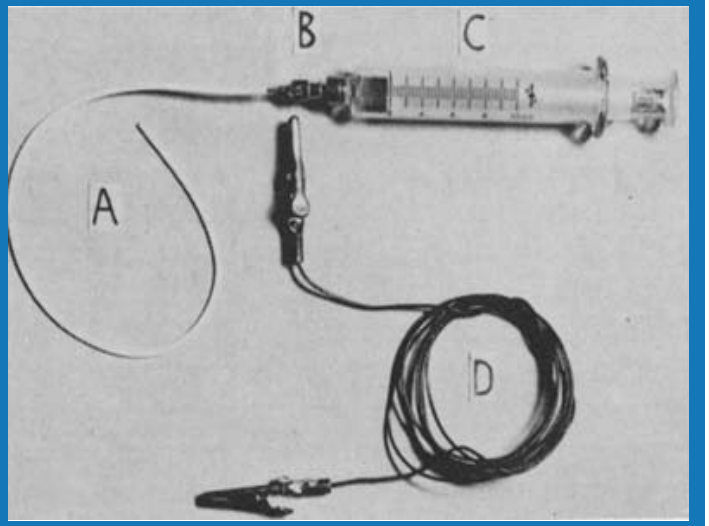
(Received for publication March 3, 1960)

ACCURATE PLACEMENT OF VENTRICULO-ATRIAL SHUNT FOR HYDROCEPHALUS UNDER ELECTROCARDIOGRAPHIC CONTROL*

CAPTAIN JAMES T. ROBERTSON, MC, USAF,† ROBERT W. SCHICK, M.D., FRED MORGAN, M.D., AND DONALD D. MATSON, M.D.

Neurosurgical Service, The Children's Hospital Medical Center, and Department of Surgery, Harvard Medical School, Boston, Massachusetts

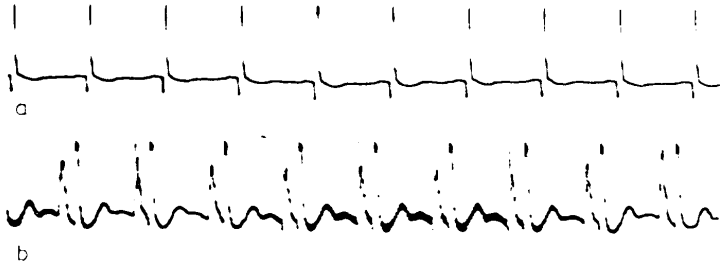




Non-radiological recognition of misplacement of central venous catheter

SIR,—We suggest that the technique described by Mr J D B Miller and Dr J Broom (9 July, p 95) may be suitable only for the type of catheter they use, and we describe the technique that we have been using in patients in our operating room and intensive care unit for the past two years.

All the patients have routine electrocardiographic monitoring with the limb leads placed as follows: the right arm lead is positioned over the right shoulder; the left arm lead over the left shoulder; and the left leg lead over the upper half of the sternum. When the subclavian or internal jugular vein is punctured and catheterised the limb leads are arranged as follows: the left leg lead is placed over the left shoulder and the left arm lead is clipped on to the distal end of the guide wire.



Electrocardiographic tracing A before B after entering the right atrium.

1984

ANESTH ANALG
1984;63:953–6

ECG-Guided Placement of Sorenson CVP Catheters via Arm Veins

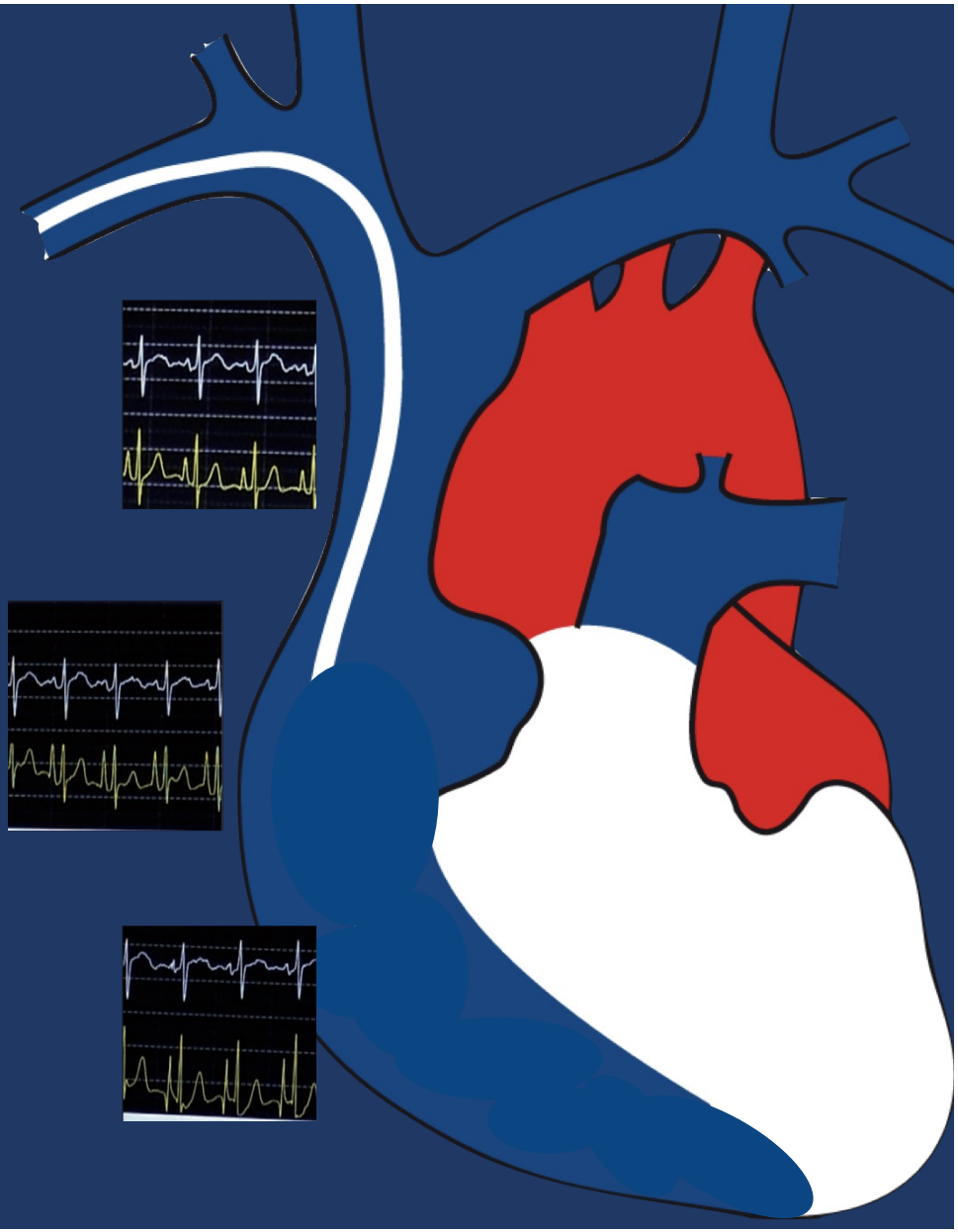
Peter S. Colley, MD, and Alan A. Artru, MD

2011

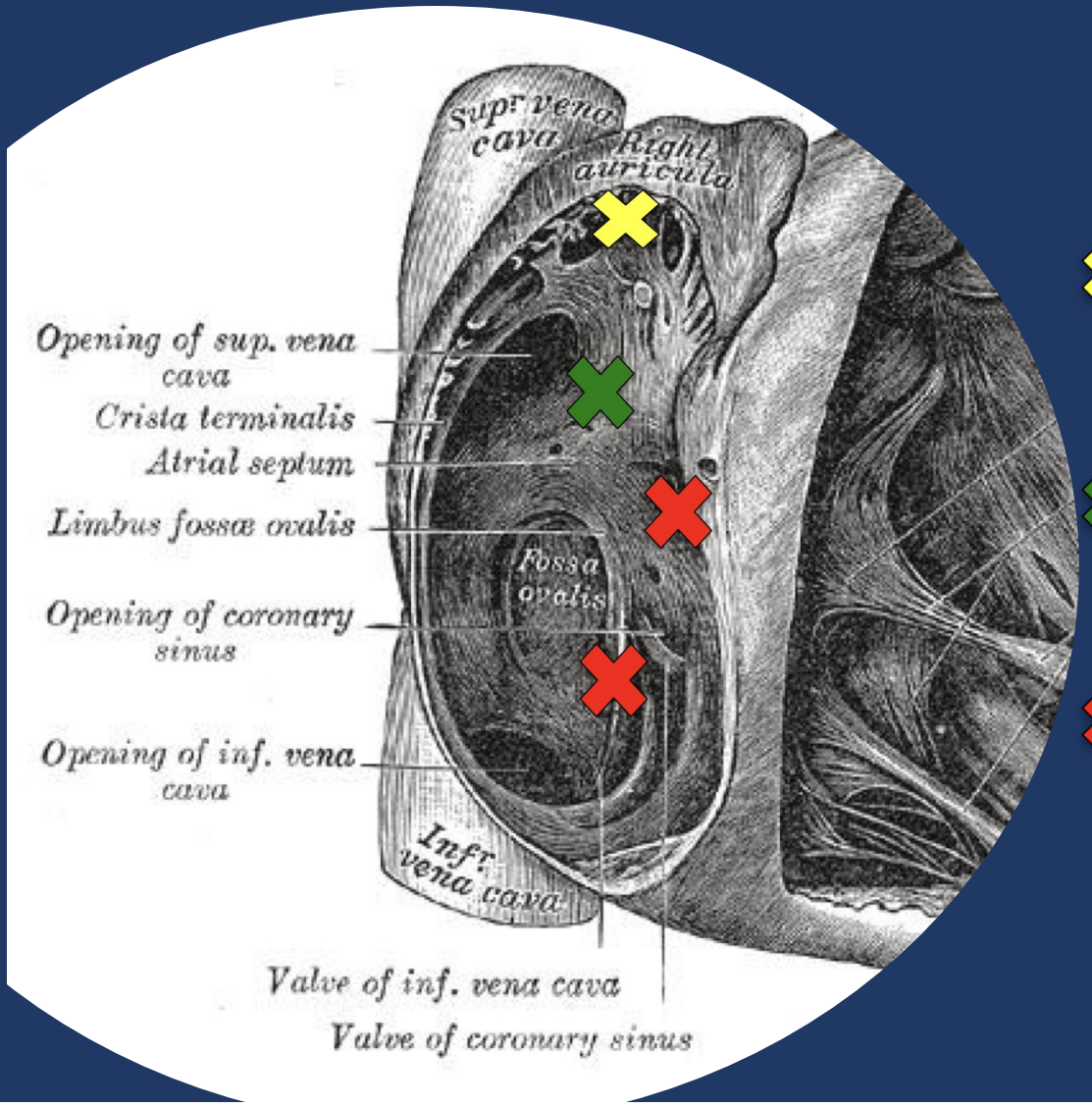
J Vasc Access 2011; 12 (4): 280-291
DOI: 10.5301/JVA.2011.8381

The electrocardiographic method for positioning the tip of central venous catheters

Mauro Pittiruti[1], Antonio La Greca[1], Giancarlo Scoppettuolo[2]



Un po' di Anatomia

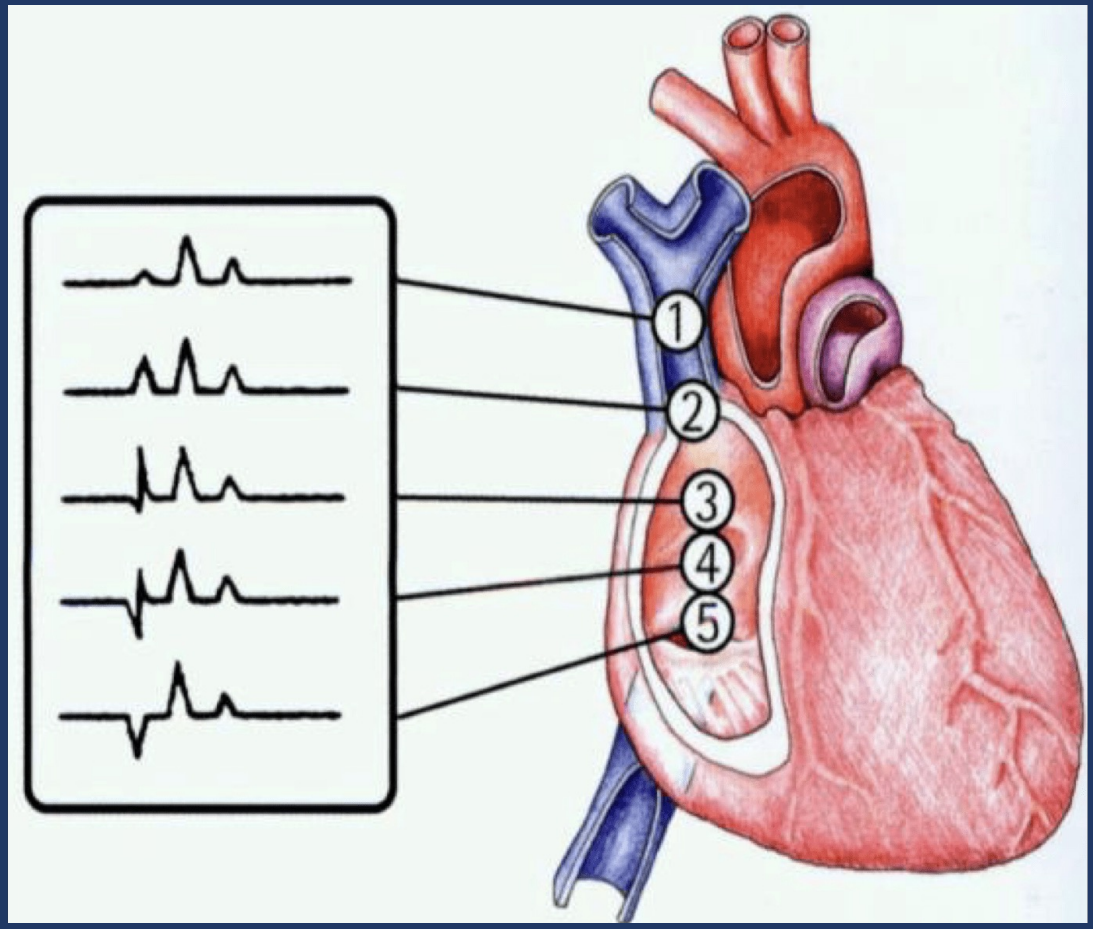


Onda P di ampiezza crescente

Onda P massimale

Onda P di ampiezza decrescente o difasica

Un po' di Anatomia e di Elettrofisiologia



- L'elettrodo intracavitario è costituito dalla punta del catetere
- Si basa sui cambiamenti dell'onda P durante la progressione del catetere sino alle vene centrali
- Variazioni dell'onda P in DII (parallela all'asse di depolarizzazione atriale, si vede meglio l'onda P)
- GIUNZIONE CAVO-ATRIALE: picco massimo dell'onda P (Stas, Yeon, Schummer, Pittiruti/La Greca, etc,)
  (= CRISTA TERMINALIS)

2015

JVA
ISSN 1129-7298

J Vasc Access 2015; 16 (2): 137-143
DOI: 10.5301/jva.5000281

ORIGINAL ARTICLE

The intracavitary ECG method for positioning the tip of central venous access devices in pediatric patients: results of an Italian multicenter study

CRITICITA':

- I cambiamenti dell'onda P sono più rapidi ed avvengono in spazi più piccoli

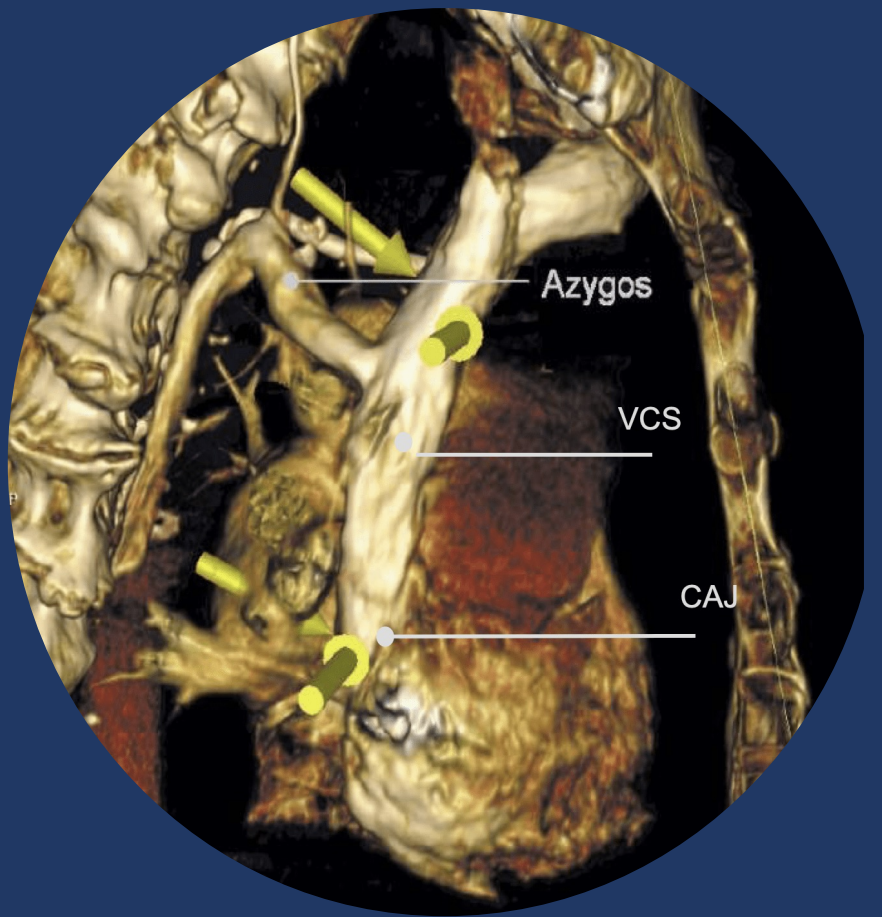
Un po' di Anatomia 2.0

A Study of the Relationship of the Superior Vena Cava to the Bony Landmarks of the Sternum in the Supine Adult: Implications for Magnetic Guidance Systems

Antonia A. Claasz, BSc (Hons), PhD, and Don P. Chorley

La vena cava superiore si impianta **dorsalmente** e non cranialmente sull'atrio destro, **tra terzo medio e terzo prox.** dell'atrio stesso e **tangenzialmente** ad esso (Testut, Gray, Aslamy)

L'estremità distale dei cateteri con punta ben posizionata all'imbocco in sede giunzionale appare sul radiogramma proiettata all'interno dell'ombra cardiaca.



Un po' di Anatomia 2.0

INCROCIO TRA SILHOUETTE CARDIACA DESTRA E LINEA MEDIASTINICA

MRI of central venous anatomy: implications for central venous catheter insertion

Z Aslamy, CL Dewald and JE Heffner

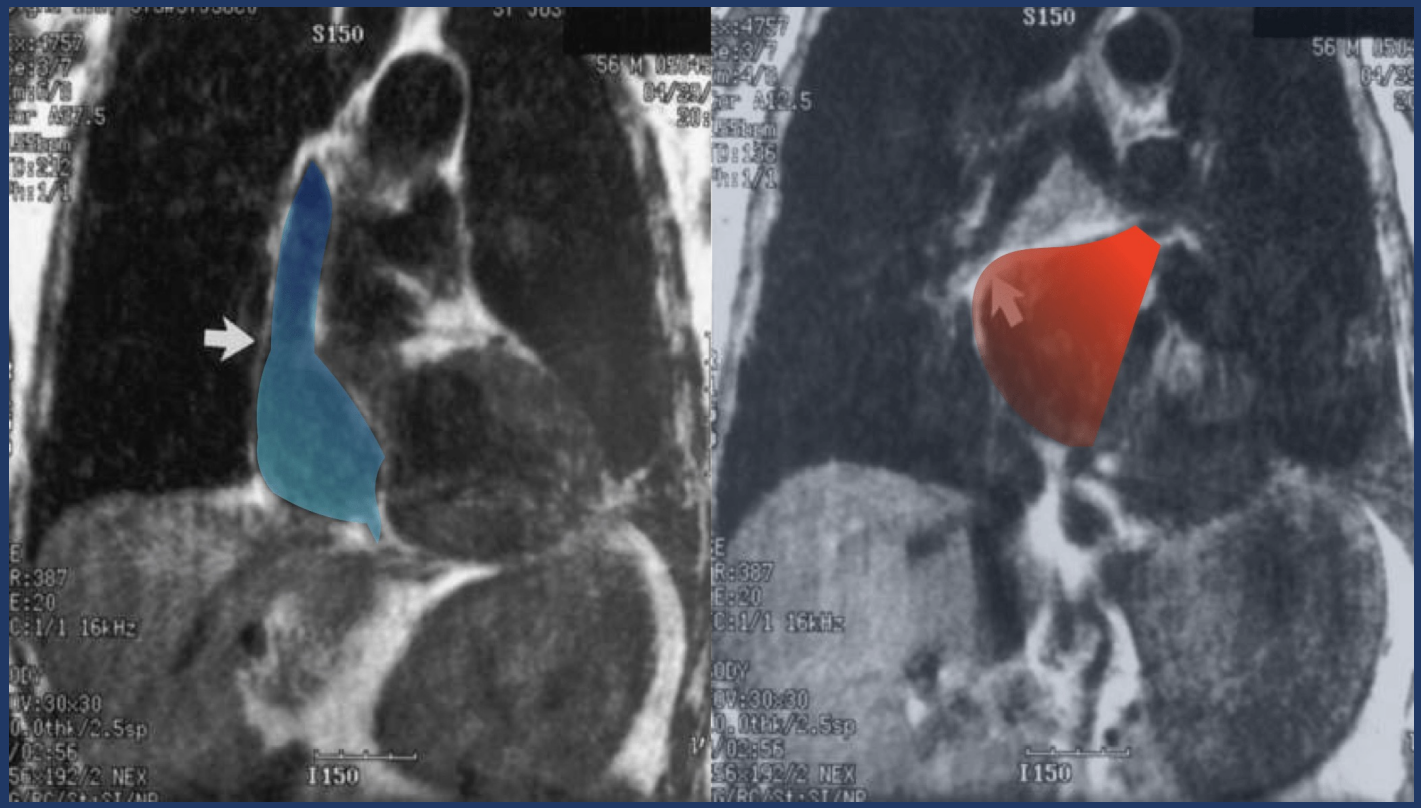
Chest 1998;114;820-826

Un po' di Anatomia 2.0

MRI of central venous anatomy: implications for central venous catheter insertion

Z Aslamy, CL Dewald and JE Heffner

Chest 1998;114;820-826



Nel 38% dei pazienti il profilo cardiaco destro radiologico è composto dalla opacità dell'atrio sinistro che deborda sull'immagine del destro nella sua porzione cranio-laterale, con il risultato che la punta di cateteri ben posizionati appare sul radiogramma proiettata all'interno dell'ombra cardiaca

International evidence-based recommendations on ultrasound-guided vascular access

Table 3 Recommendations on ultrasound vascular access in neonates and children

Ultrasound vascular access in neonates and children

Domain code	Suggested definition	Level of evidence	Degree of consensus	Strength of recommendation
D4.SD1.S1–2	Ultrasound guidance should be routinely used for short- and long-term central venous access in children and neonates	A	Very good	Strong
D4.SD1.S3	Ultrasound vessel imaging with ultrasound assistance as "a minimum" should be routinely performed before internal jugular vein puncture in neonates	A	Very good	Strong
D4.SD1.S4	In neonates, ultrasound screening should be used before subclavian vein puncture. Ultrasound-guided puncture should be considered for catheterization using the supra-clavicular route, but this technique requires experienced operators	C	Some	Weak
D4.SD1.S5	Ultrasound vessel screening should be routinely used before femoral vein puncture. Ultrasound-guided femoral puncture is recommended to decrease inadvertent arterial puncture	B	Very good	Strong
D4.SD1.S6	Ultrasound guidance can be considered when difficult peripheral venous access is required in areas such as the antecubital fossa and ankle. Blind deep antecubital fossa puncture should disappear	C	Very good	Strong
D4.SD1.S7	Ultrasound-guided arterial catheterization improves first-pass success and should be used routinely in children and neonates	A	Very good	Strong
D4.SD1.S8	After central venous catheter placement in paediatric patients including neonates, the ultrasound equipment should remain easily accessible at the patient's bedside to detect early life-threatening catheter-related complications such as pneumothorax, cardiac tamponade and hemothorax	B	Very good	Strong
D4.SD1.S9	There is no ideal site for cannulation in children; the best site should be determined after ultrasound examination	A	Very good	Strong

Intensive Care Med (2012) 38:1105–1117
DOI 10.1007/s00134-012-2597-x

The Journal of Vascular Access
Volume 24, Issue 1, January 2023, Pages 5-13

https://doi.org/10.1177/11297298211031391

Editorial

ECHOTIP-Ped: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in pediatric patients

ECHOTIP-Ped

- TIP NAVIGATION
- TIP LOCATION

Evidence have shown that ultrasound-based tip navigation coupled together with an intra-procedural tip location may virtually cancel the occurrence of primary malposition

ECHOTIP-Ped

CVC	Protocol	Probe	Windows
CICC	Tip navigation	Linear "hockey stick" probe, 10–14 MHz	Same acoustic windows as RaCeVA
	Tip location	Micro-convex probe, 4–8 MHz, or small sectorial probe, 3–7 MHz	Subcostal bi-caval view (recommended) or four-chambers apical view (as alternative option)
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	Tip location	Micro-convex probe, 4–8 MHz, or small sectorial probe, 3–7 MHz	Subcostal bi-caval view (recommended) or four-chambers apical view (as alternative option)
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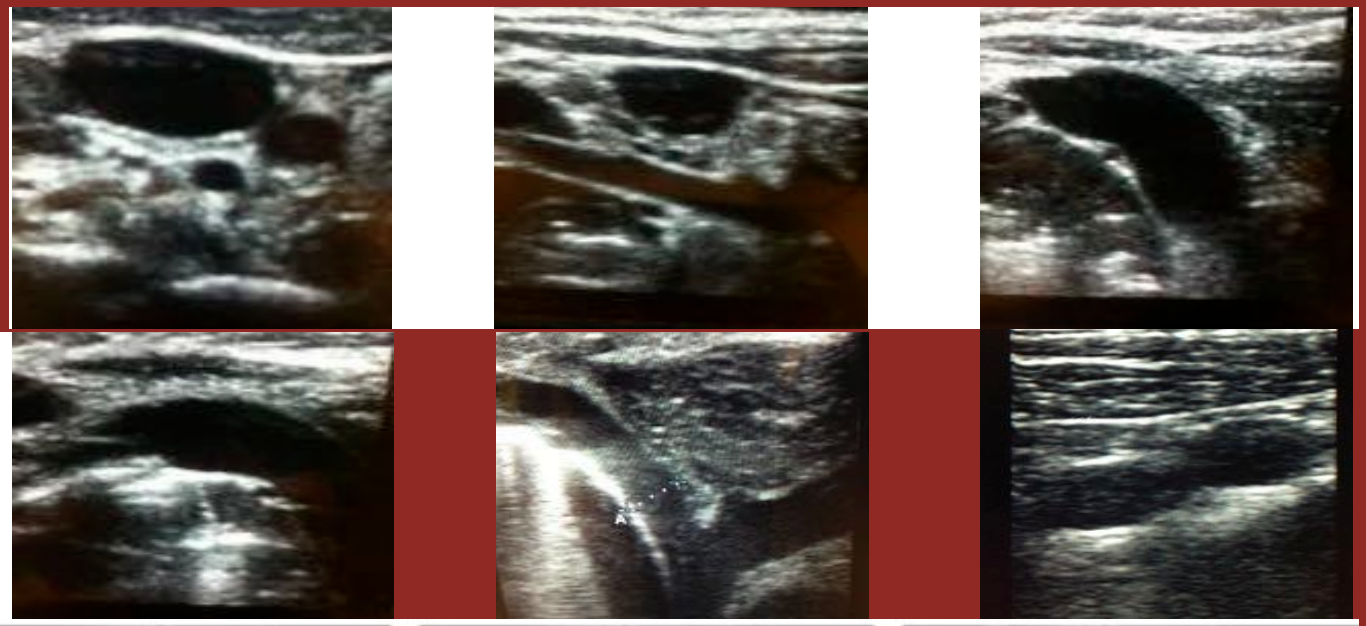
ECHOTIP-Ped

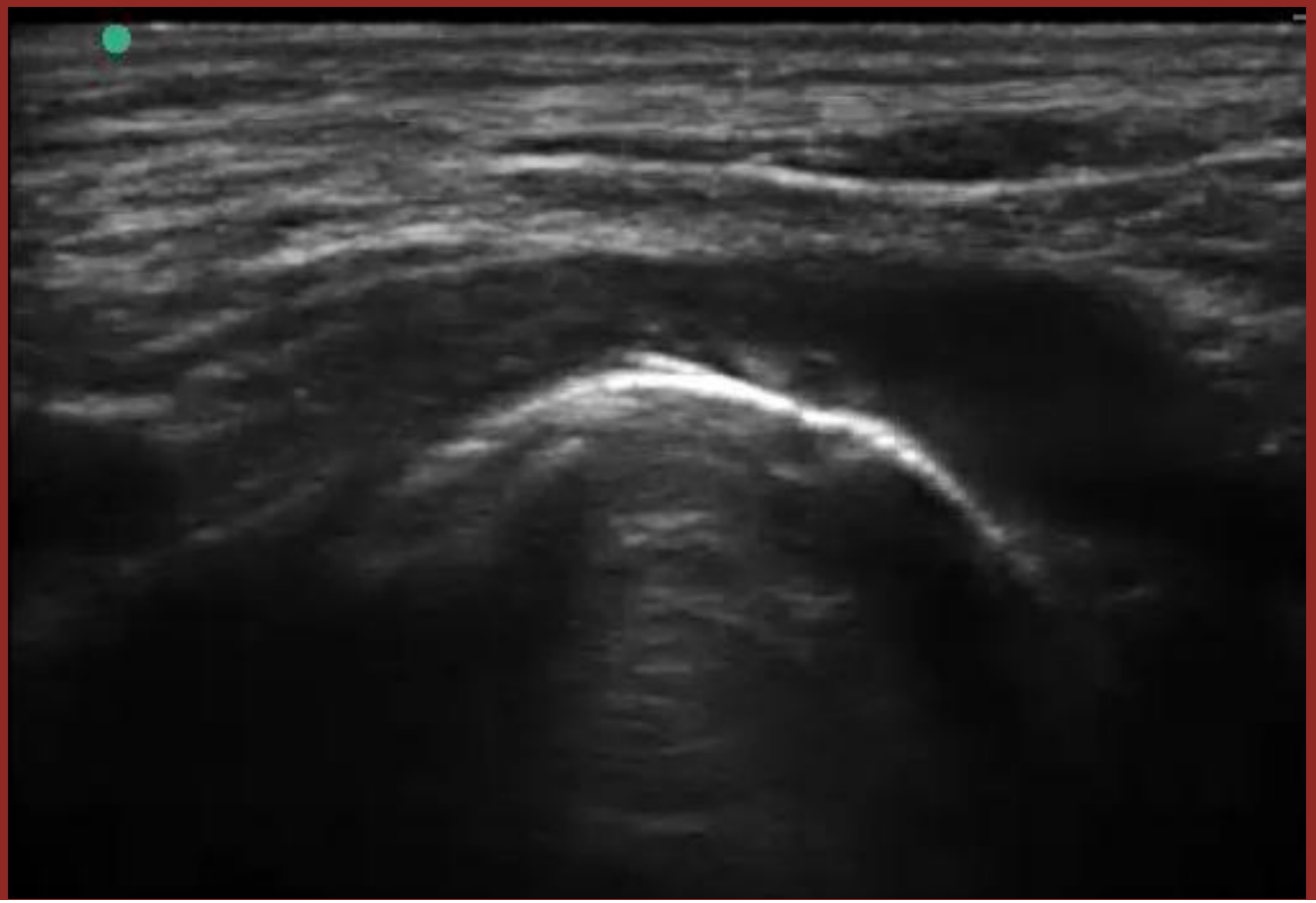


Modified form
Rhondali et al., DOI doi:10.1111/j.1460-9592.2011.03614.x

ECHOTIP-Ped

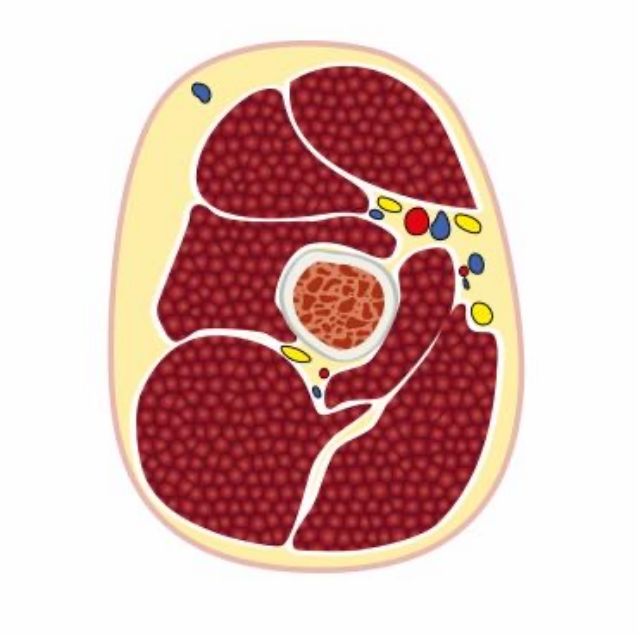
ECHOTIP-Ped

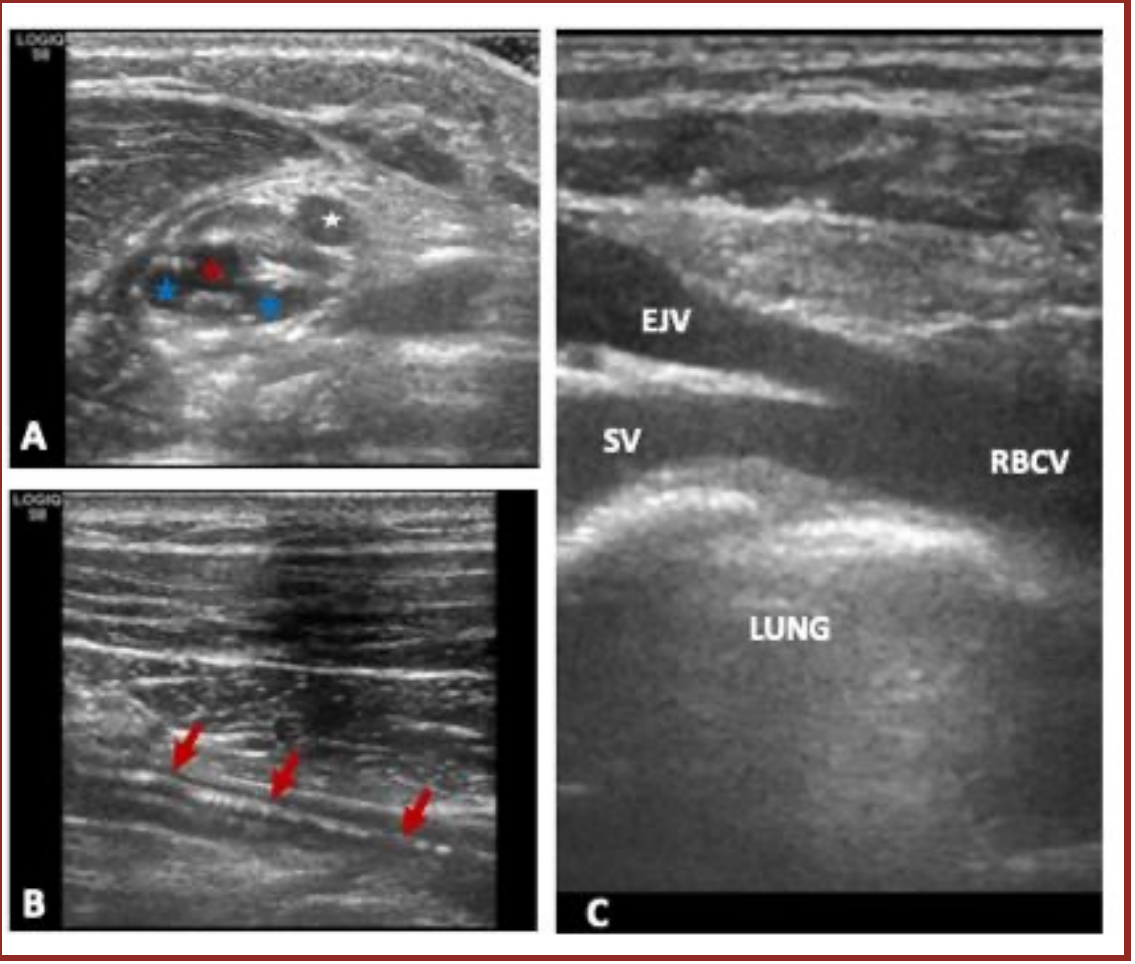
ECHOTIP-Ped



ECHOTIP-Ped

RAPEVA





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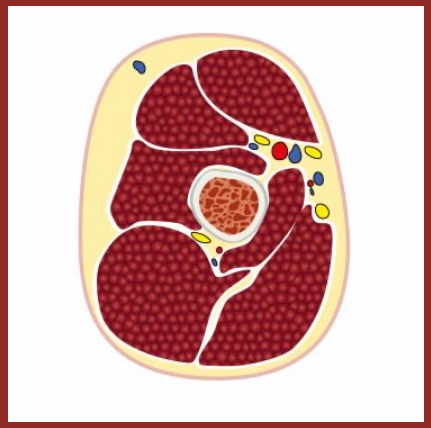
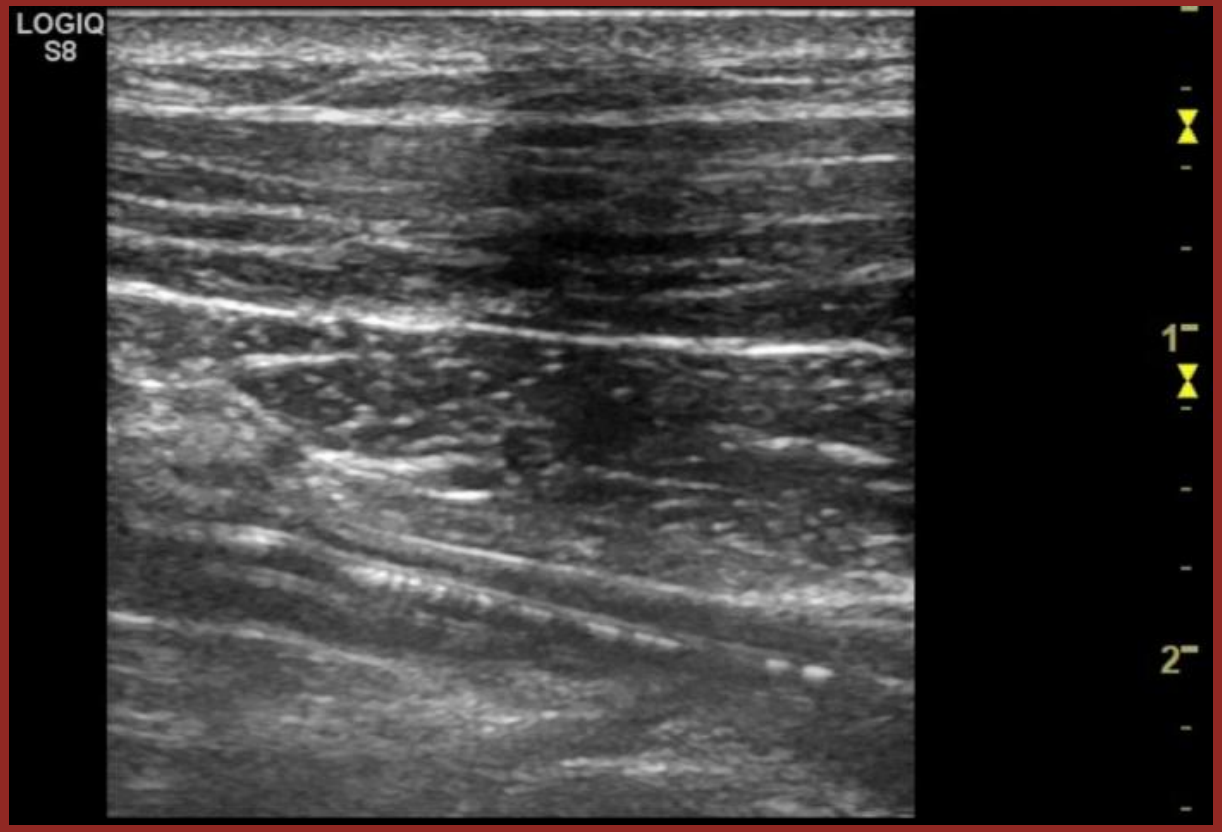
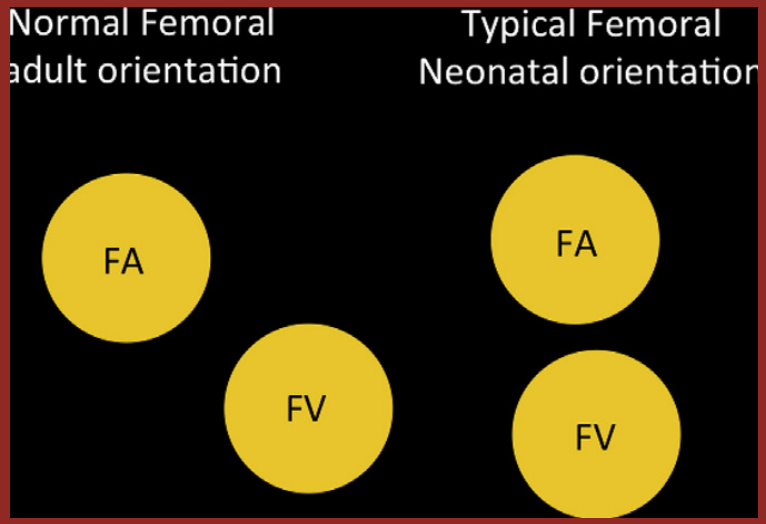
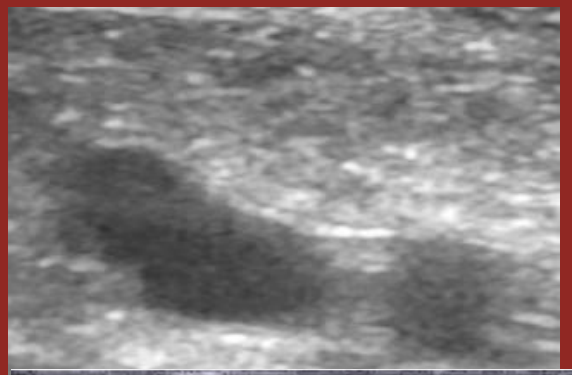


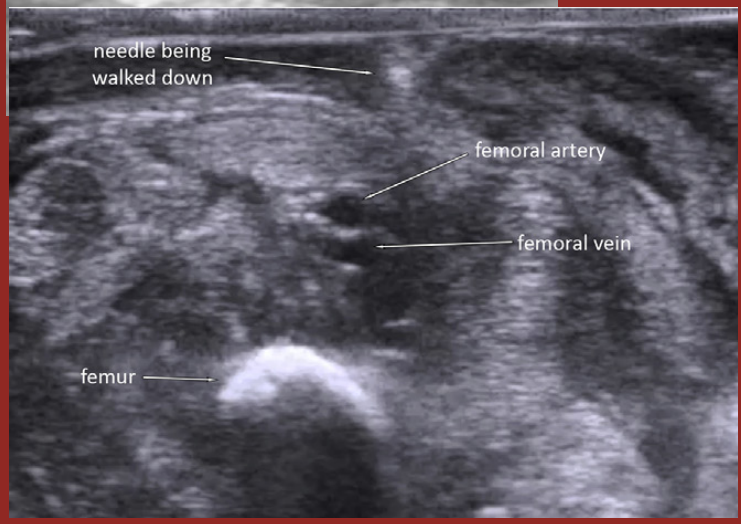


ECHOTIP-Ped

RAFEVA







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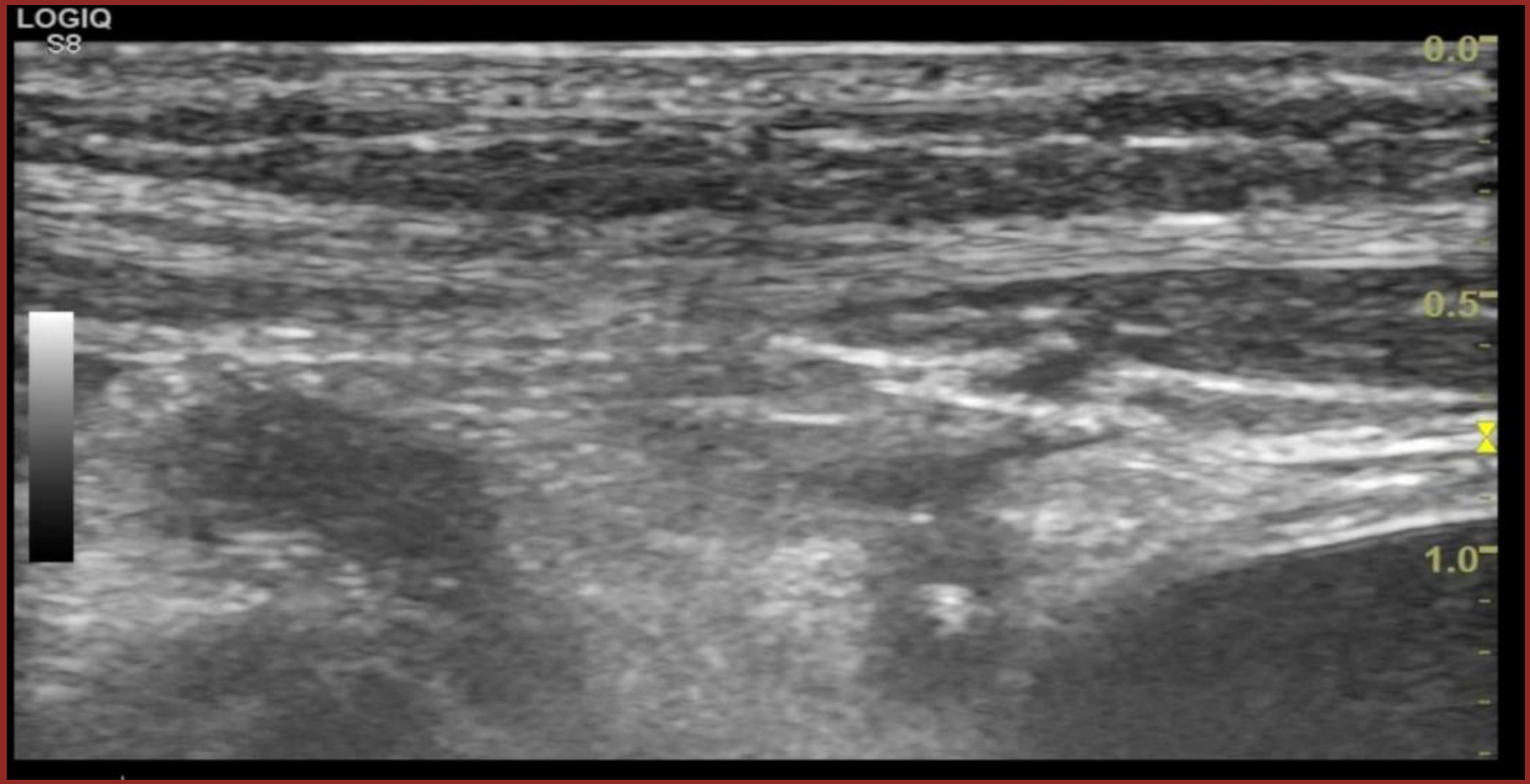
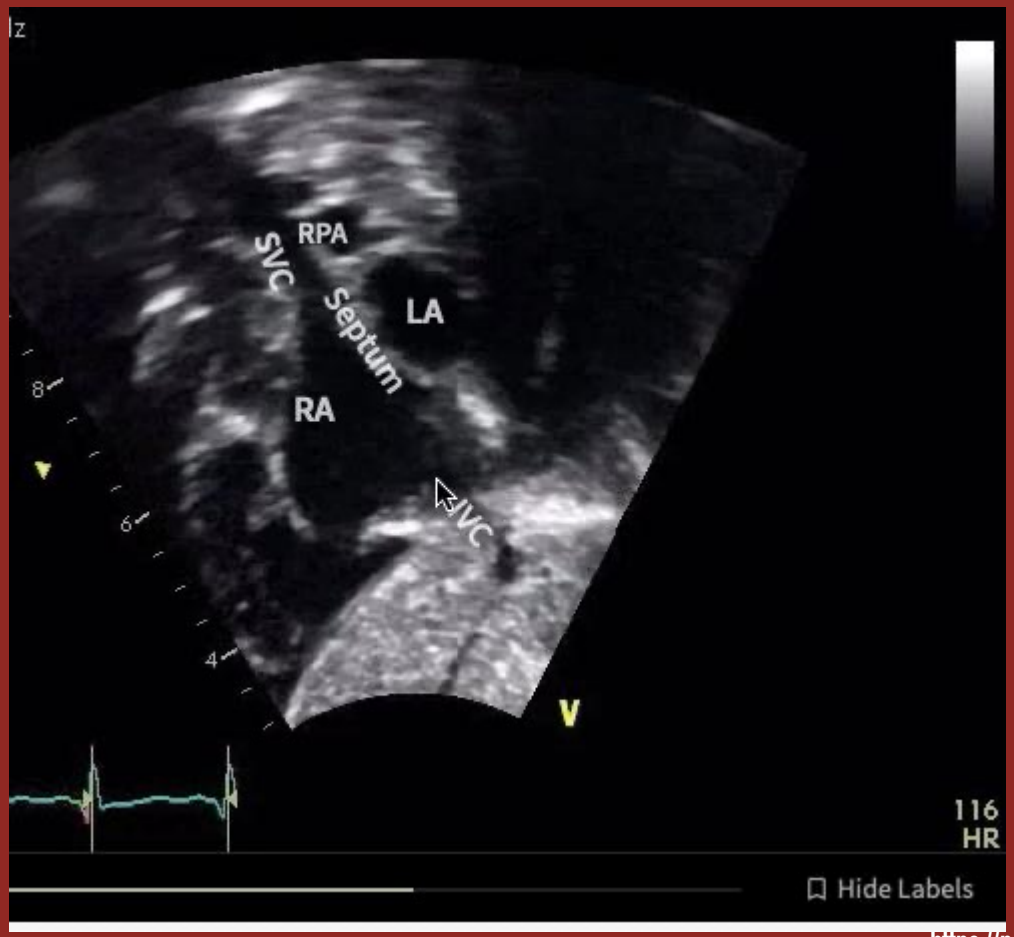


ECHOTIP-Ped Subcostal BiCaval



- Transducer on abdomen just below xyphoid process
- Notch at 6 o'clock
- Probe tilted towards patient's right shoulder

https://pedecho.org/library/normal/echocardiogram/sub-short-svc-and-ivc-p4d

ECHOTIP-Ped Apical 4 C

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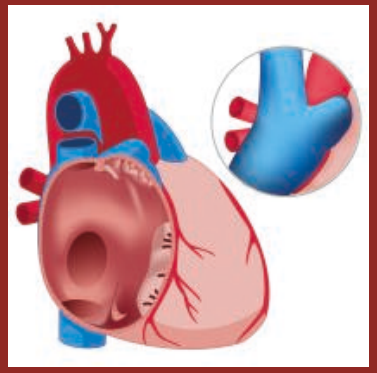
https://pedecho.org/library/normal/echocardiogram/sub-short-svc-and-ivc-p4d

ECHOTIP-Ped



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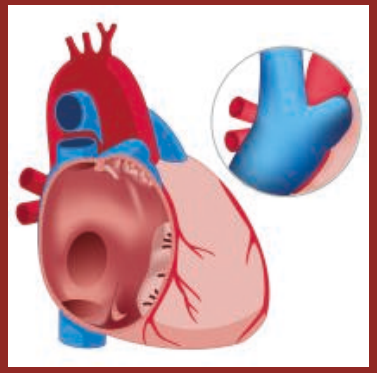
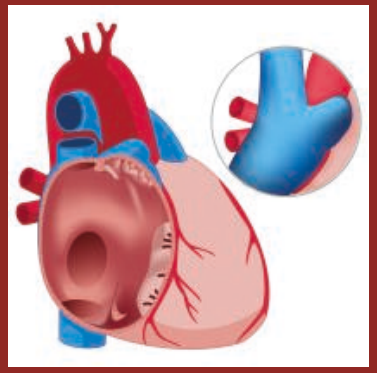



Gen-M
116 mm
PRC 8/3/2/6
G
XV/M +6/–
PRS 1
P 100%
FC –
MI
TIS
TIB 0.3
TIC 0.6
ardio Pediatrica
2-9 CARDIO PED
5
10

ECHOTIP-Ped



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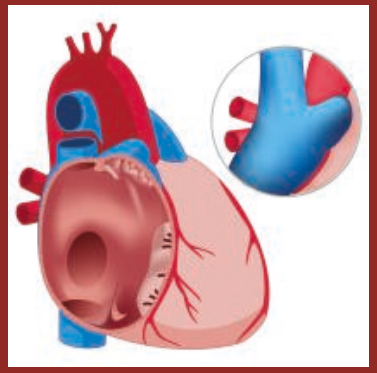

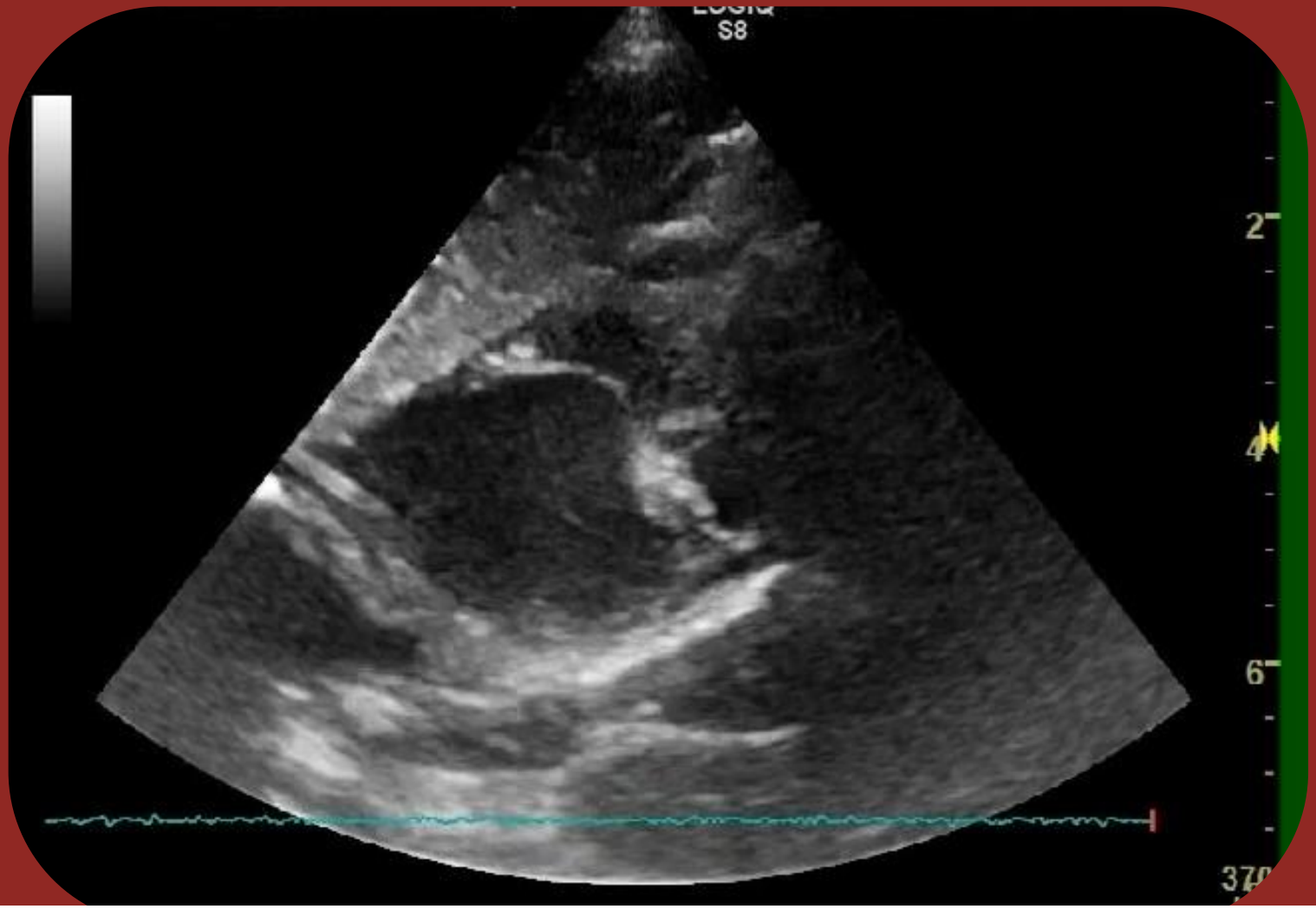

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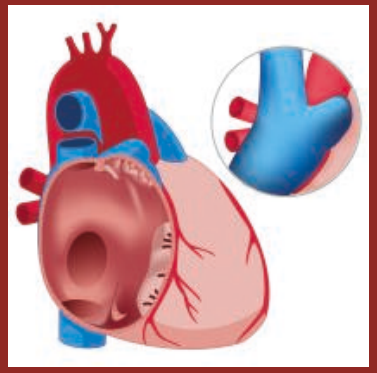
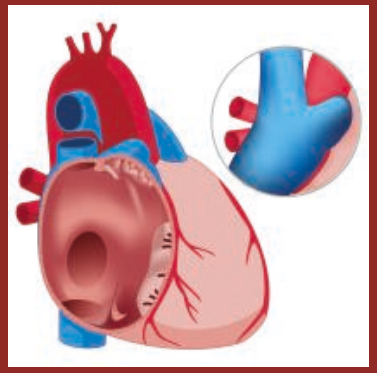
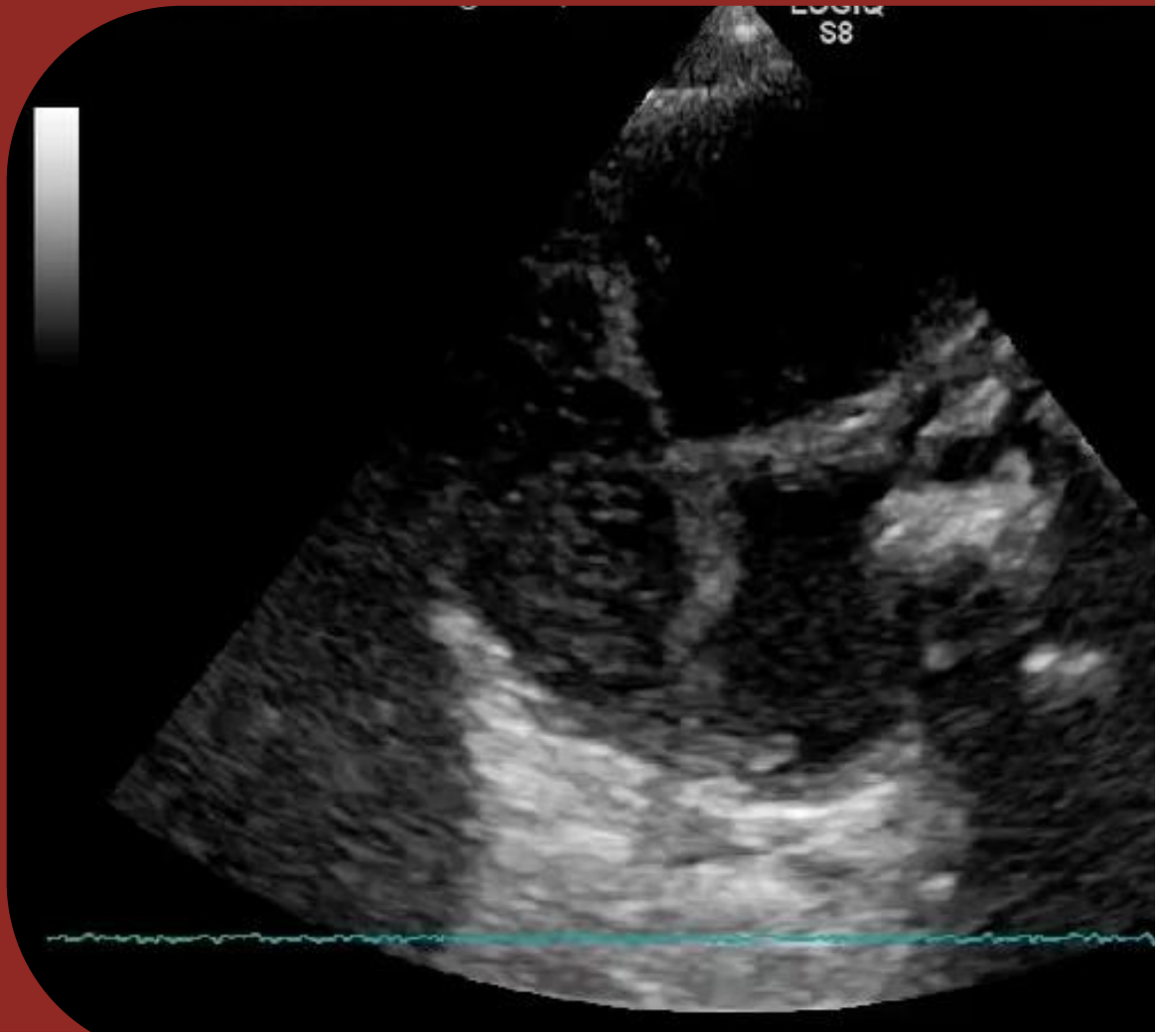



RA
LA
Septum
SVC
RPA


ADM Cardillo, Lorenzo
6S cardio MI 1.3 TIs 0.7
LOGIQ
S8

ECHOTIP-Ped





ECHOTIP-Ped

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SAGE journals

Editorial

ECHOTIP-Ped: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in pediatric patients

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SAGE journals

Editorial

ECHOTIP-Ped: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in pediatric patients

«Some of these maneuvers are easy and require only a minimal training, while some others imply a well-trained operator with more than basic knowledge in the field of vascular ultrasound and echocardiography.

Thus, training is the main open question, and we suggest that more evidence should be published about the proper training required for achieving appropriate skills of real-time ultrasound for CVAD insertion in children.»