



Un nuovo protocollo per l'esame delle vene superficiali del neonato: RaSuVA

Mauro Pittiruti

Quali accessi venosi nel neonato?

- AGOCANNULE **NIR**
 - Vene superficiali arto superiore, arto inferiore, scalpo
- CATETERI VENOSI OMBELICALI
 - Vena ombelicale
- CATETERI EPICUTANEO-CAVALI **NIR**
 - Vene superficiali arto superiore, arto inferiore, scalpo
- CATETERI VENOSI CENTRALI – CICC **ECO**
 - Vena profonde dell'inguine (v.femorale)
 - Vene profonde dell'area sopra/sottoclaveare
 - V.anonima, v.giugulare int.

Tecnologia NIR nel neonato

ACCESSO A VENE SUPERFICIALI.

- **Agocannule**
- **Cateteri epicutaneo-cavali (ECC)**

NIR TECHNOLOGY



NIR TECHNOLOGY

Ideal for detection – puncture – cannulation
of **superficial veins (< 7mm of depth)**

British Journal of Anaesthesia **110** (6): 888–91 (2013)
doi:10.1093/bja/aet078

EDITORIAL II

Difficult peripheral veins: turn on the lights

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ULTRASOUND

Ideal (mandatory !) for detection – puncture – cannulation of **deep veins (> 7mm of depth)**

Intensive Care Med
DOI 10.1007/s00134-012-2597-x

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**International evidence-based
recommendations on ultrasound-guided
vascular access**

Protocolli GAVeCeLT per la venipuntura delle vene profonde

- RaPeVA

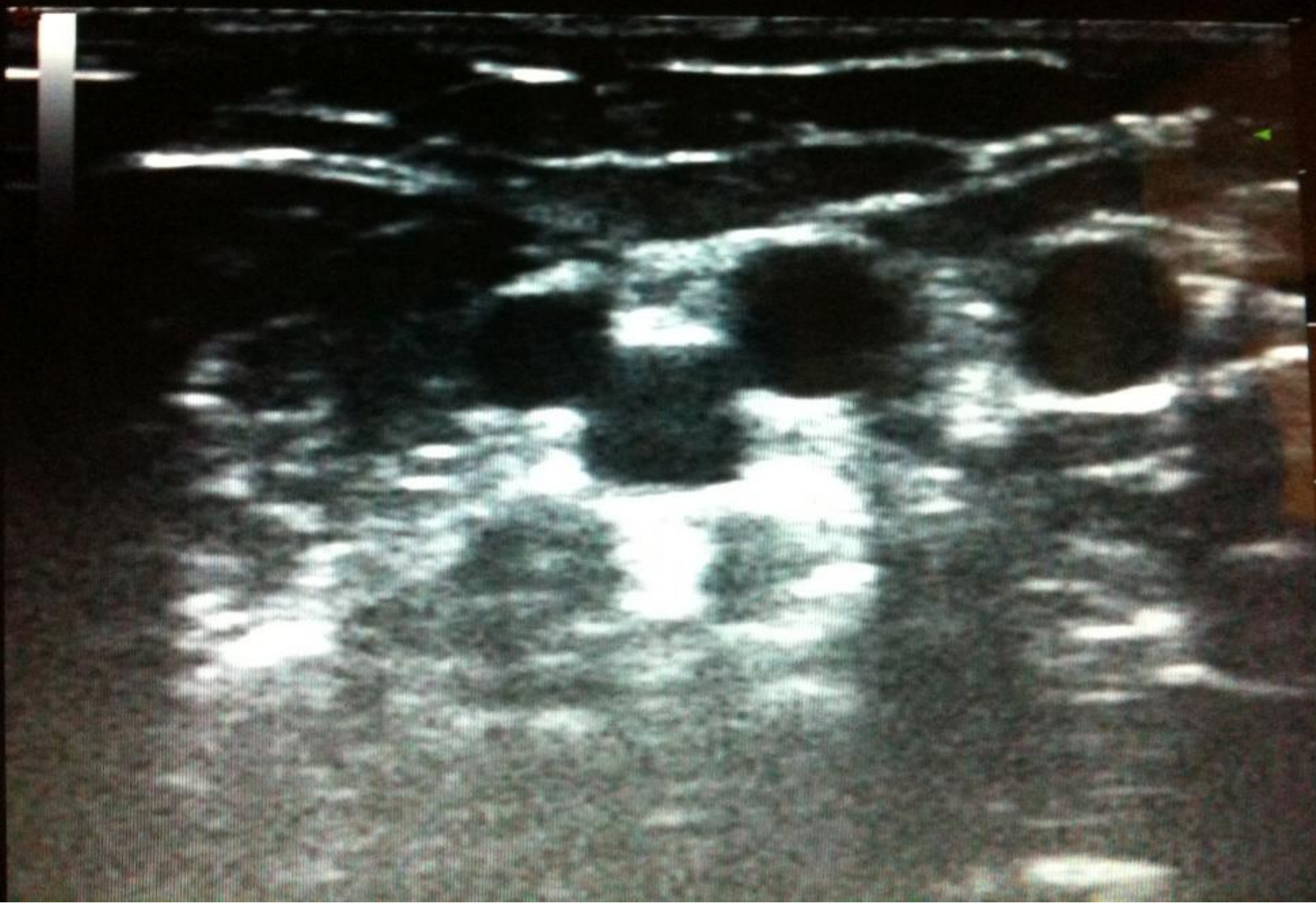
- RaCeVA

RaPeVA

**Rapid Peripheral Vein
Assessment**



P 3 CM XV C
PRC 7-3-B PRS 5
PST 4







ne

A 0,83cm

B 0,56cm

2,0

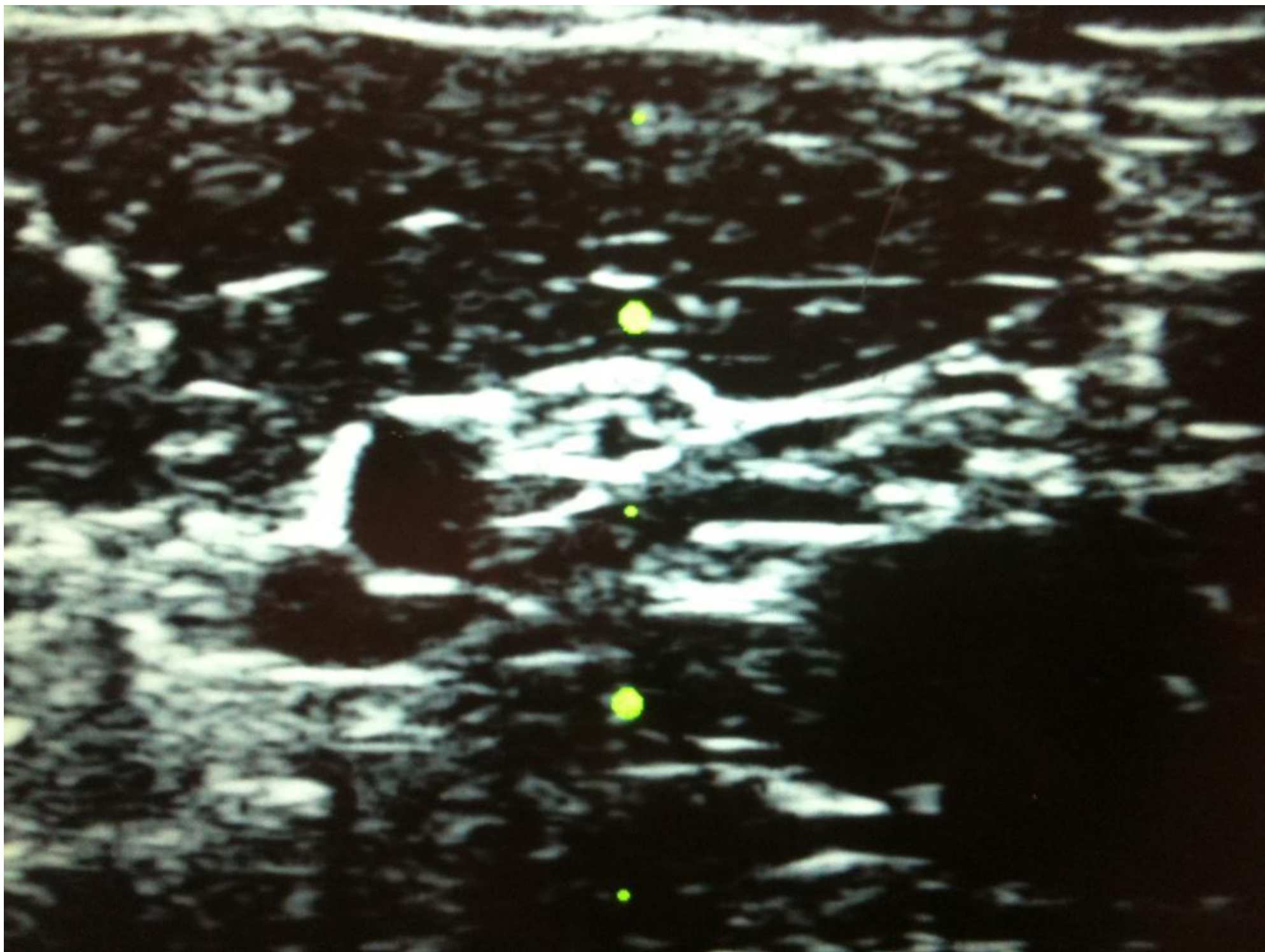
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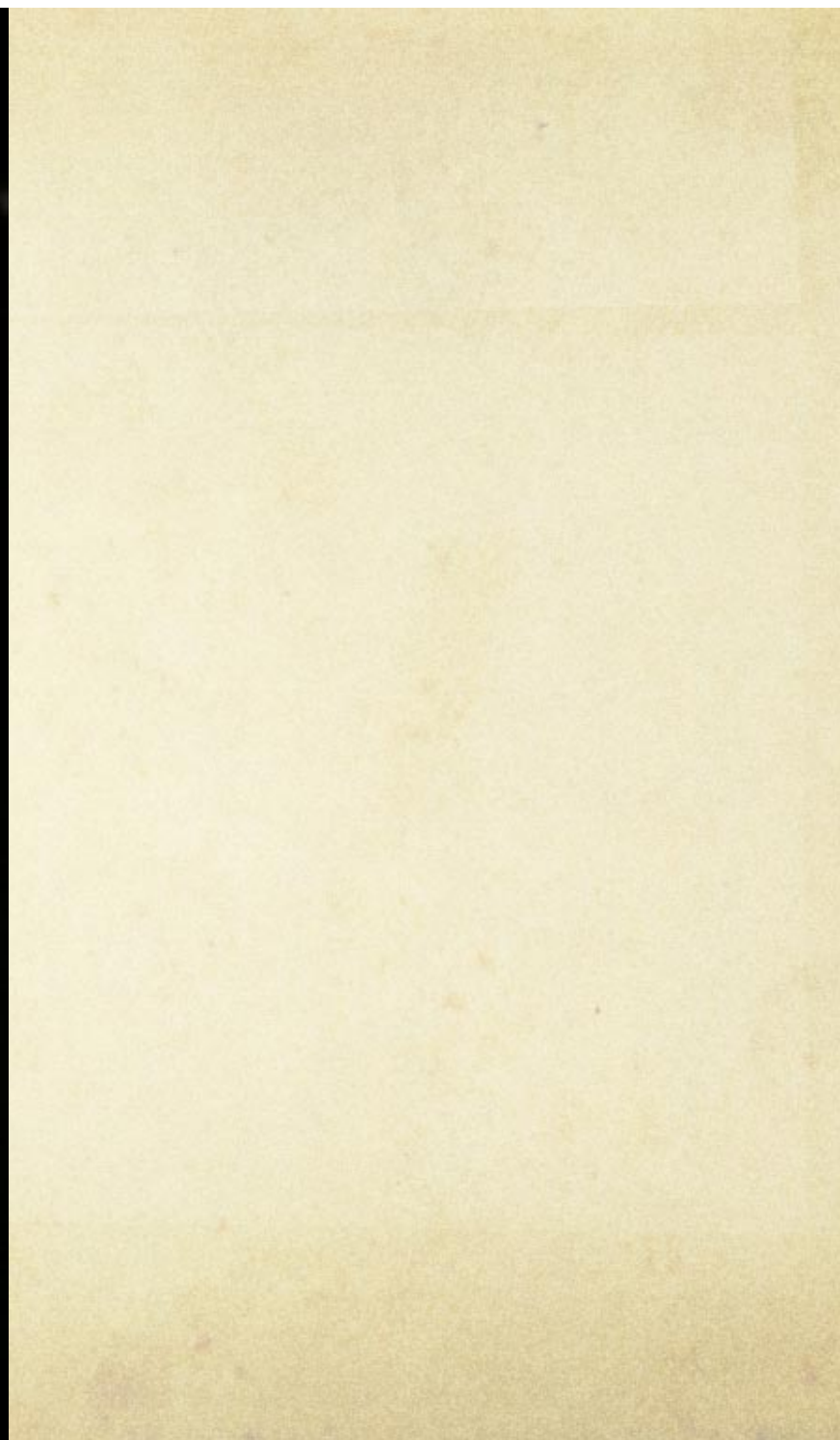
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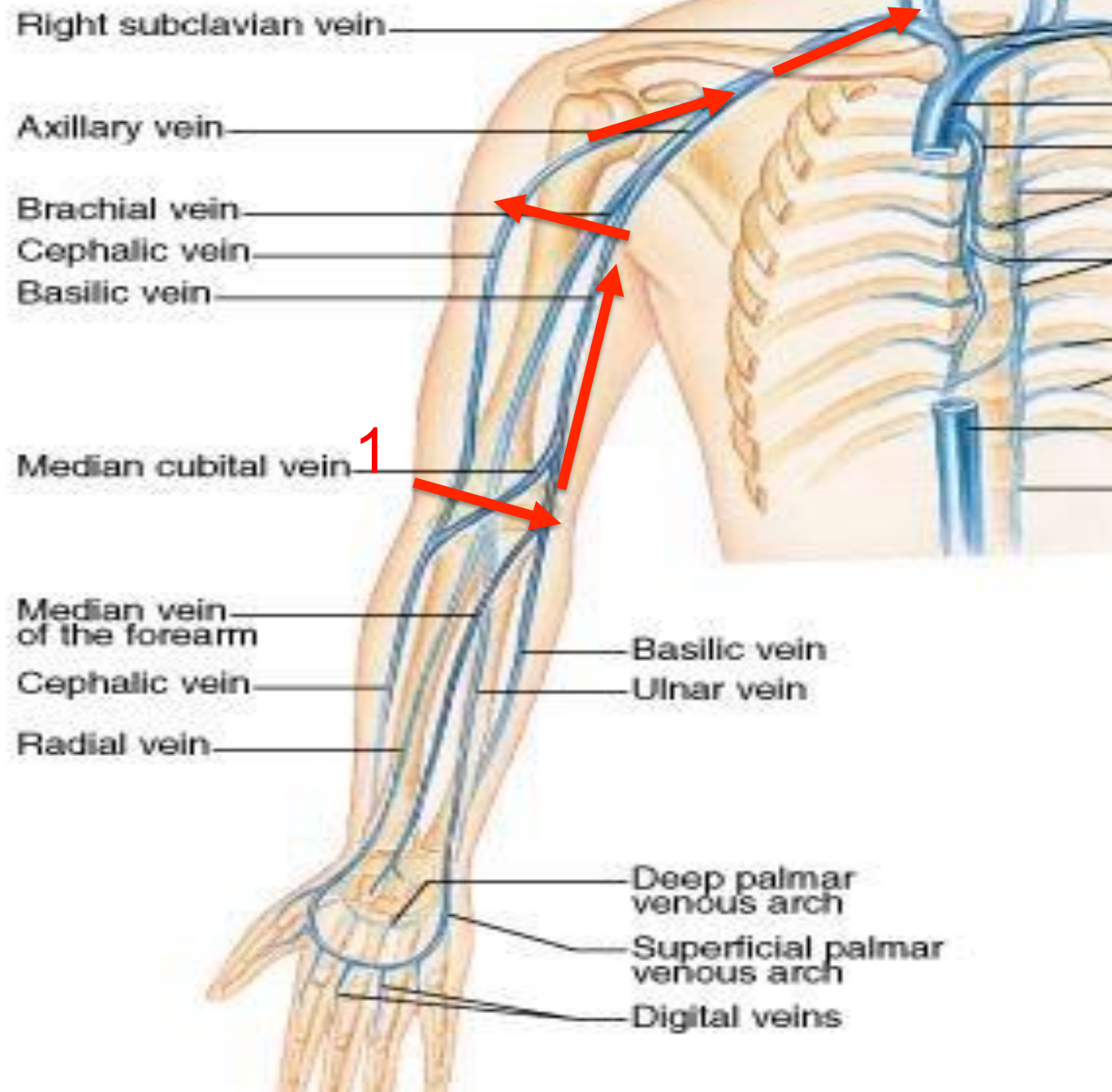


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205

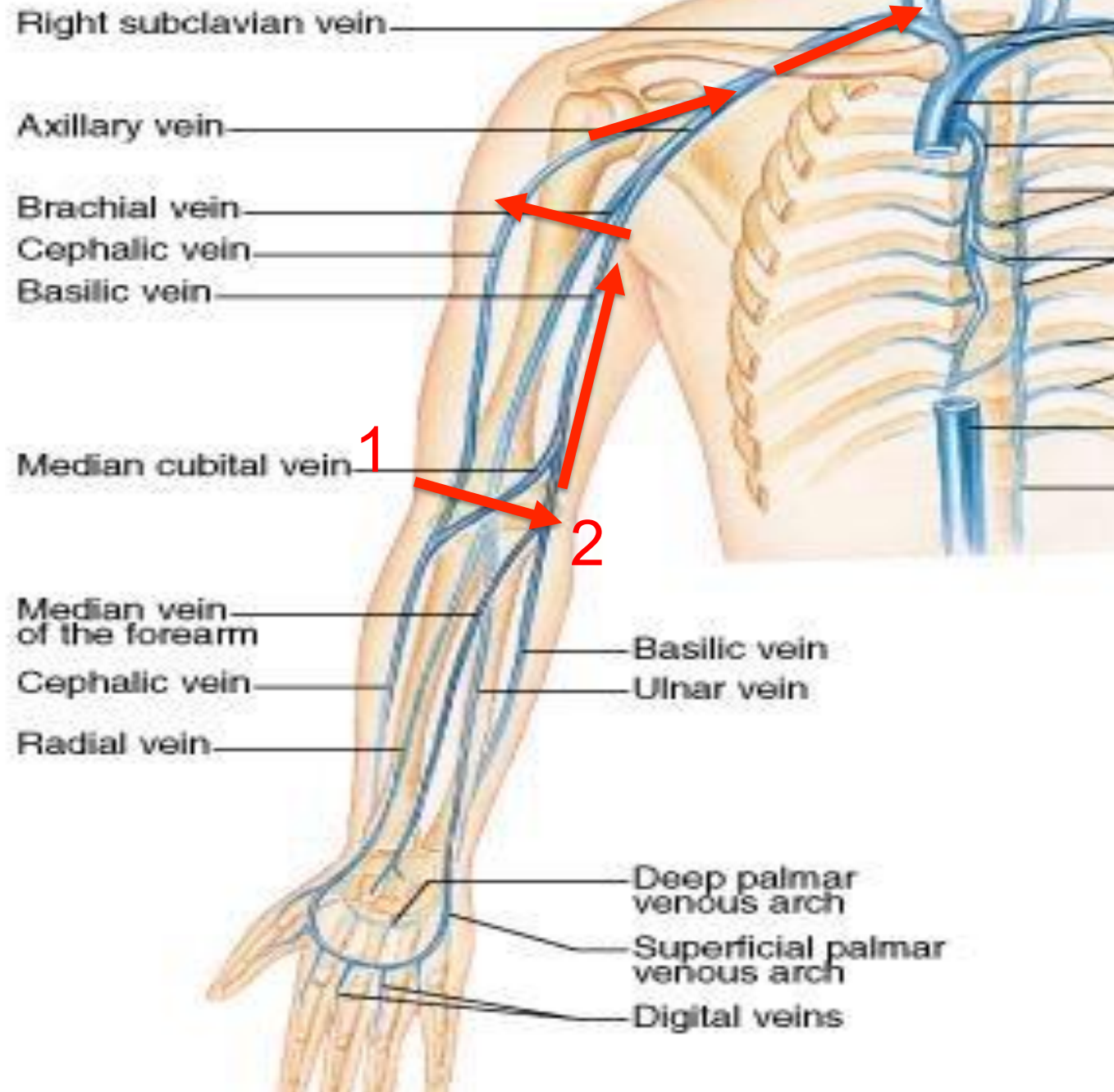
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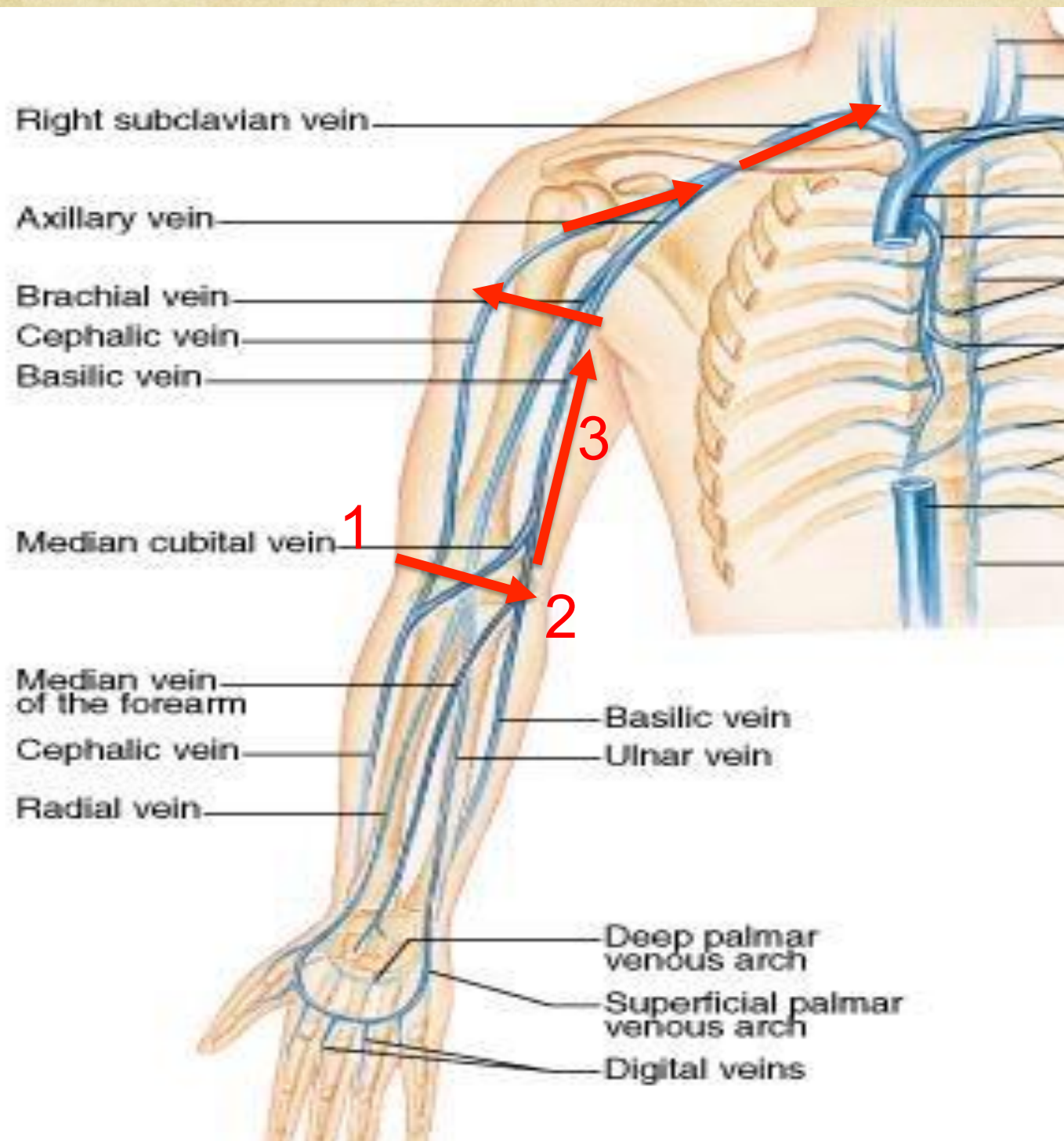
1

v.cefalica
al gomito



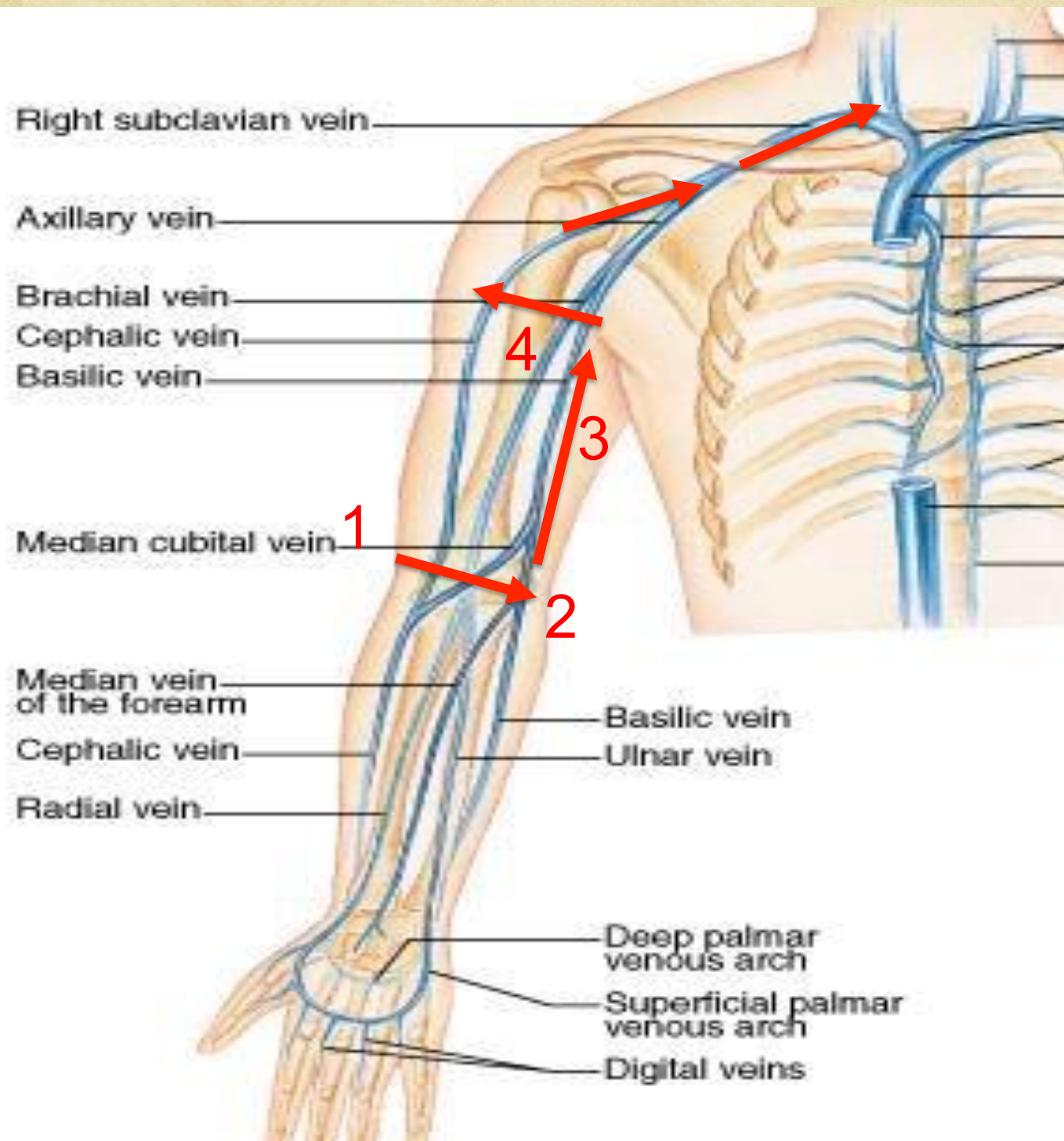
2

a. e vv.
brachiali
al gomito



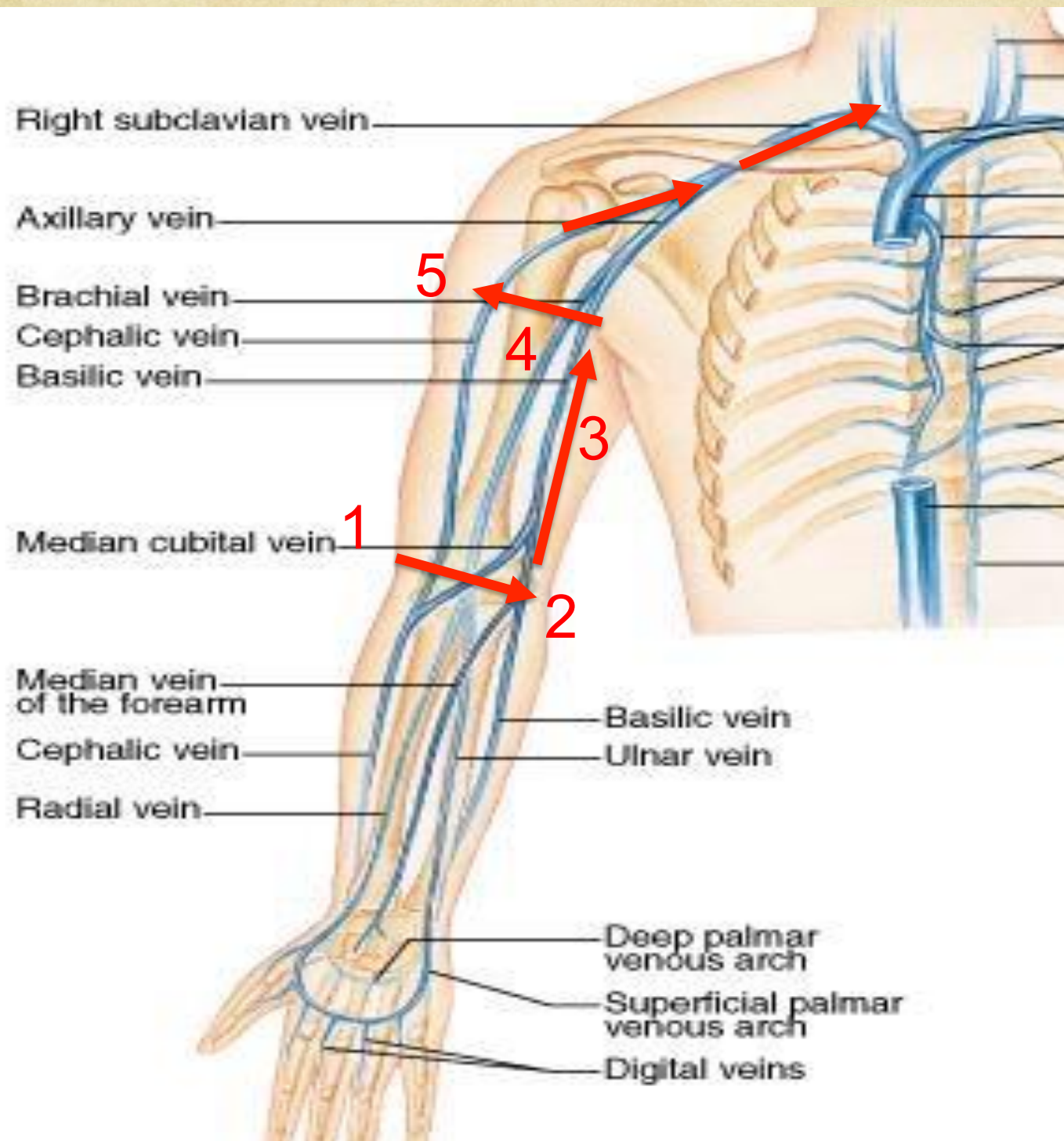
3

v.basilica
nel suo
decorso
verso l'alto



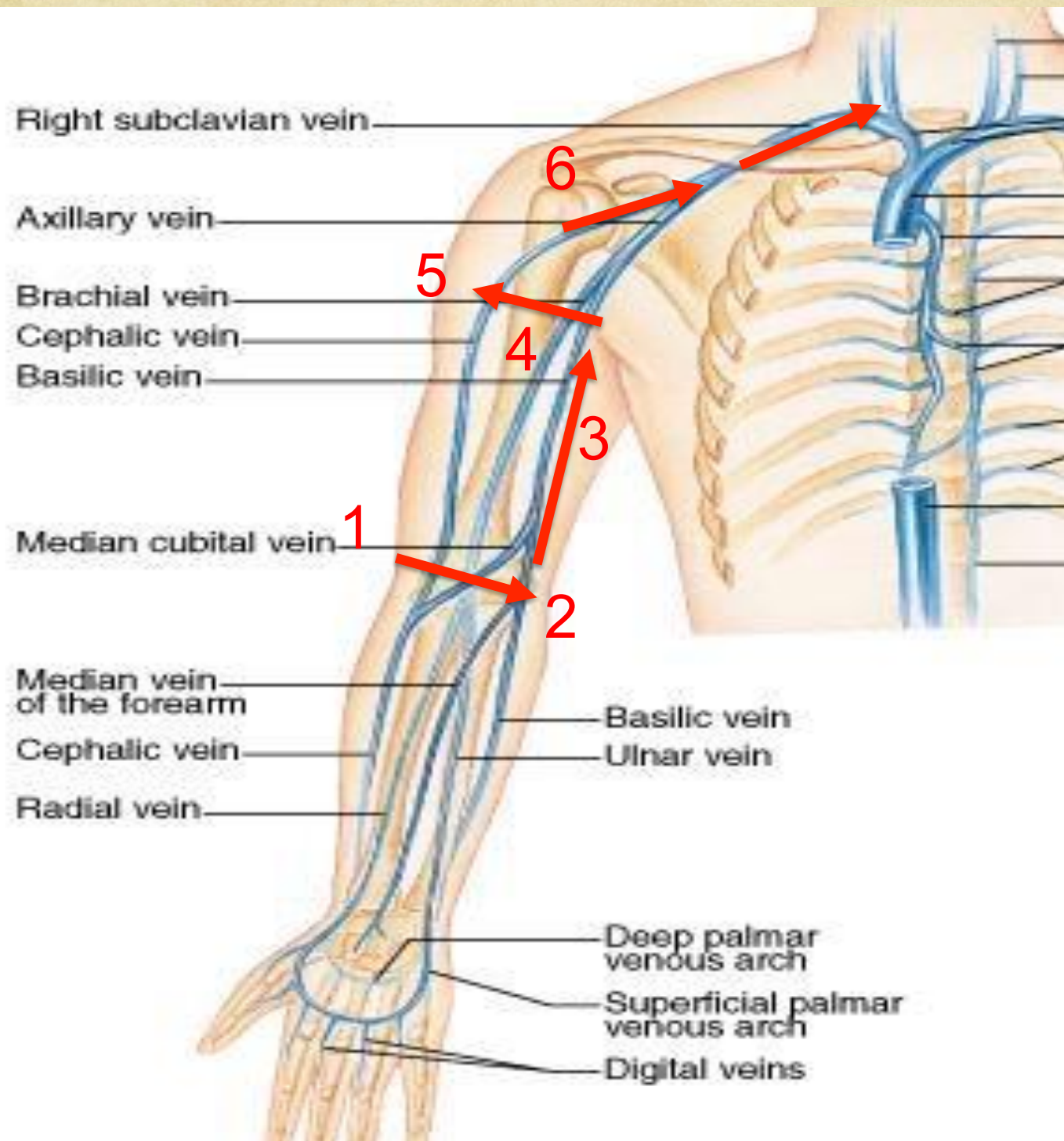
4

fascio nervo
vascolare
(a.+vv.
brachiali
+ n.mediano)



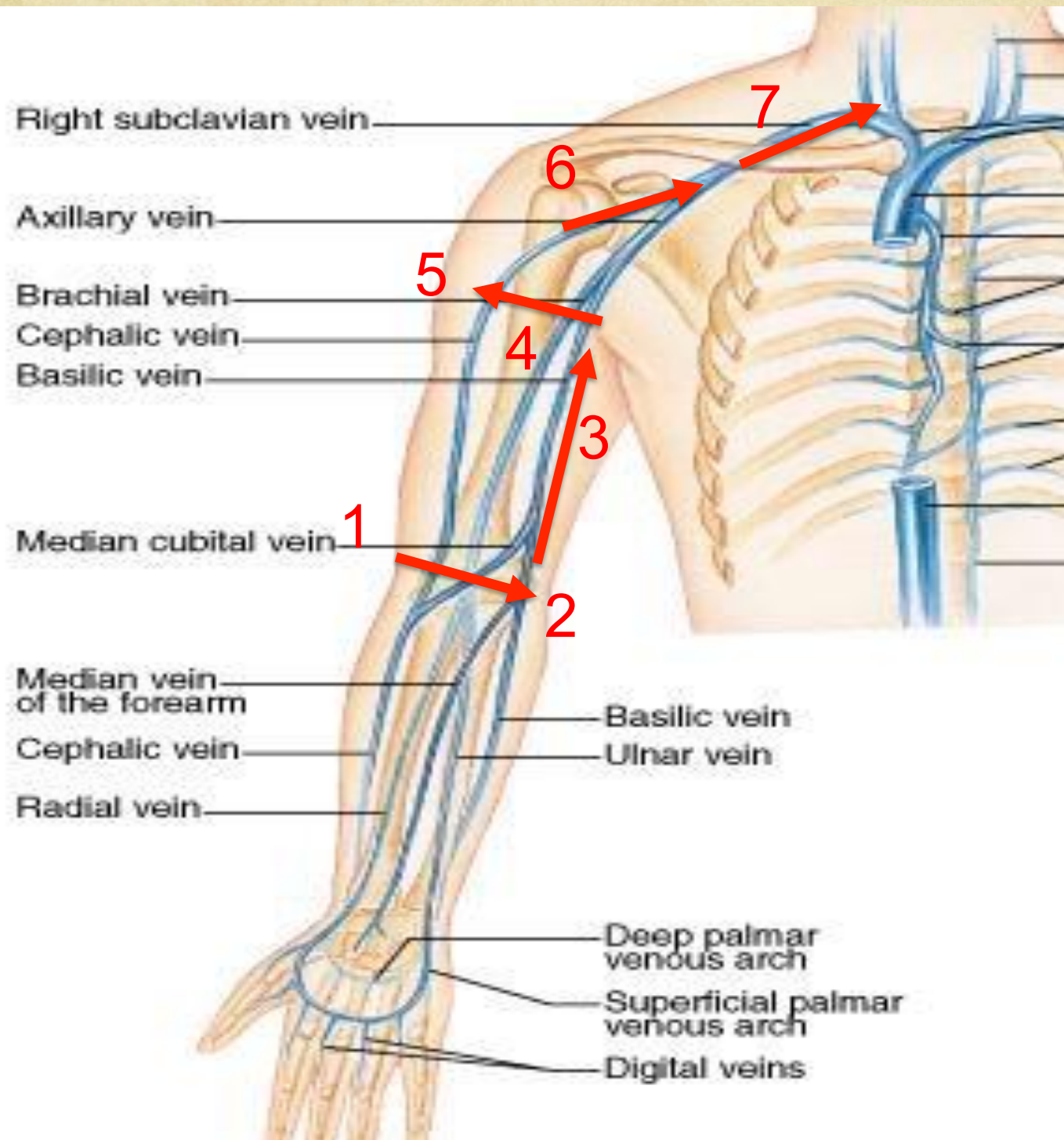
5

v.cefalica



6

v.ascellare
in sede sotto
claveare



7

v.succlavia
in sede sopra
claveare
+ v.giug.int.
+ v.anonima

Protocollo RaPeVa

Presentato a congressi
internazionali

Integrato nei corsi educazionali
GAVeCeLT

Diffuso tramite il Manuale
GAVeCeLT



Protocollo RaCeVA

Protocollo per l'esame ecografico sistematico delle vene della zona sopraclaveare-sottoclaveare prima del posizionamento di CICC:

- Negli adulti
- Nei bambini
- Nei neonati

RaCeVA nell'adulto

12

How to Choose the Most Appropriate Ultrasound-Guided Approach for Central Line Insertion: Introducing the Rapid Central Venous Assessment Protocol

MAURO PITTIRUTI | ANTONIO LAGRECA

Overview

Standard central venous access performed with the “blind” technique was historically based on the puncture of two central veins (the subclavian vein and the internal jugular vein),¹ but ultrasound (US) guidance has expanded the spectrum to at least four sites: the internal jugular vein, the brachiocephalic (or “innominate”) vein, the subclavian vein, and the axillary vein. In many patients, two additional, centrally located venous segments can be cannulated: the external jugular vein (in its final tract close to the junction of the subclavian vein) and the cephalic vein (in its final, infraclavicular tract close to the junction of the axillary vein).

The list just presented is limited to the veins available for placement of central venous catheters (CVCs) *in the neck/*

vein puncture, and (6) transthoracic echocardiography for verification of the position of the tip of the catheter at the end of the procedure.

Of particular relevance is the application of US for rapid assessment of the central veins in an effort not only to exclude veins that appear morphologically abnormal (thrombosis, external compression, anatomic variations) but also to evaluate the possible options and choose the best approach. This can easily be performed by following the rapid central vein assessment (RaCeVA) protocol, which has been standardized by our group and is currently taught in our GAVeCeLT courses on US-guided central venous access.

This six-step protocol suggests the following preprocedural complete venous scan (before deciding on the most appropriate approach):

RaCeVA nel bambino

Ultrasound Guided Central Vascular Access in Neonates, Infants and Children

Mauro Pittiruti*

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Table 2. Ultrasound-Guided Venipuncture

• At neck
— Internal jugular vein (<i>out of plane</i>)
• In the supra-clavicular area
— Internal and external jugular, subclavian, brachio-cephalic vein (<i>in plane</i>)
• In the infraclavicular area
— Axillary, cephalic vein (<i>out of plane/in plane</i>)
• At mid-arm
— Basilic vein, brachial veins (<i>out of plane</i>)
• At the groin
— Femoral, saphenous vein (<i>out of plane</i>)

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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

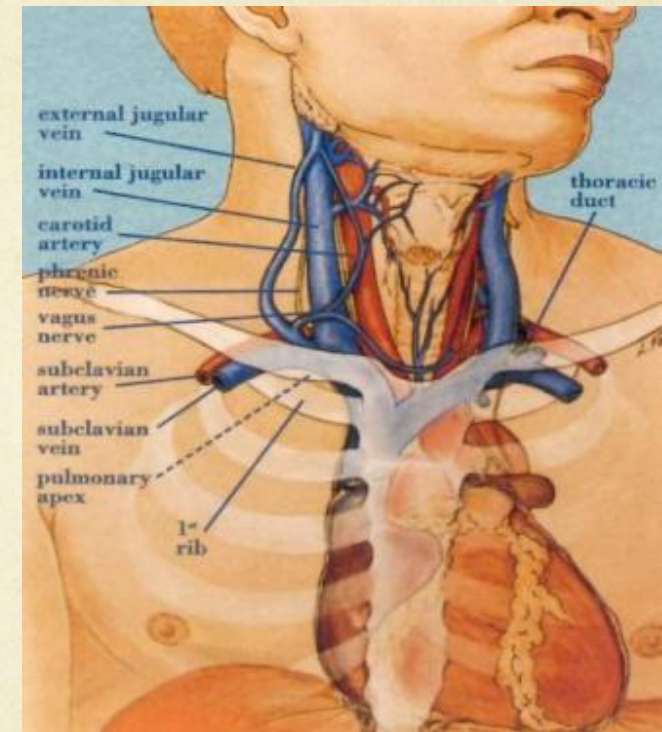
Domain code	Suggested definition	Level of evidence
D4.SD1.S1–2	Ultrasound guidance should be routinely used for short- and long-term central venous access in children and neonates	A
D4.SD1.S3	Ultrasound vessel imaging with ultrasound assistance as “a minimum” should be routinely performed before internal jugular vein puncture in neonates	A
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
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
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
D4.SD1.S7	Ultrasound-guided arterial catheterization improves first-pass success and should be used routinely in children and neonates	A
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
D4.SD1.S9	There is no ideal site for cannulation in children; the best site should be determined after ultrasound examination	A

D4.SD1.S9

There is no ideal site for cannulation in children; the best site should be determined after ultrasound examination

A

- Though much of the initial experience in this field has been carried out with **internal jugular vein** and **subclavian vein**, in neonates and in small children the largest and easiest vein to access is the **brachiocephalic vein**.



The vein to puncture is chosen after careful ultrasound evaluation of central veins.

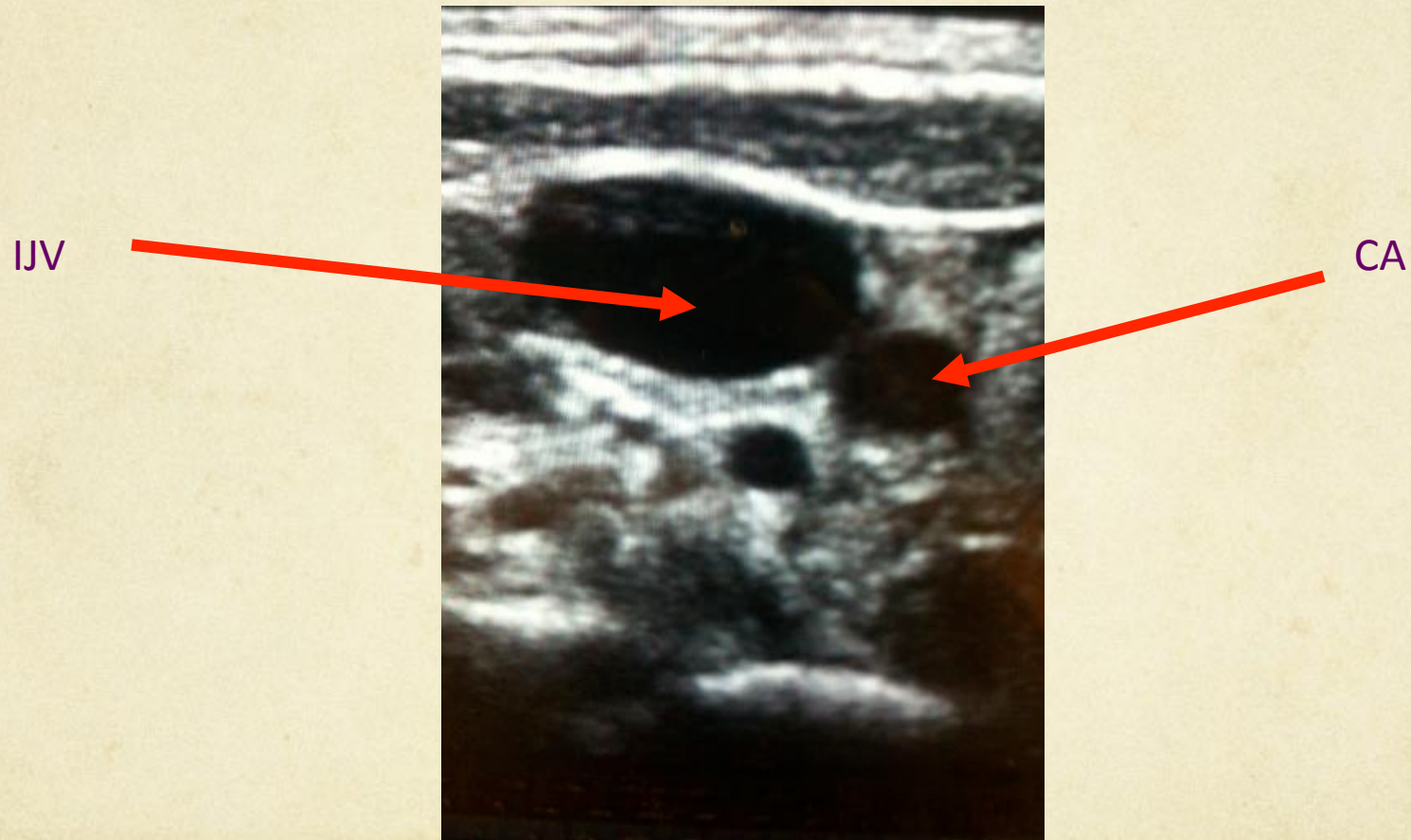
RaCeVa = Rapid Central Vein Assessment



Linear probe
10-14 Mhz
'hockey stick'



RaCeVA in 4 mo. old in PICU



IJV



SA



BCV



SV



BCV

EJV

SV



Pleura

AA

VA



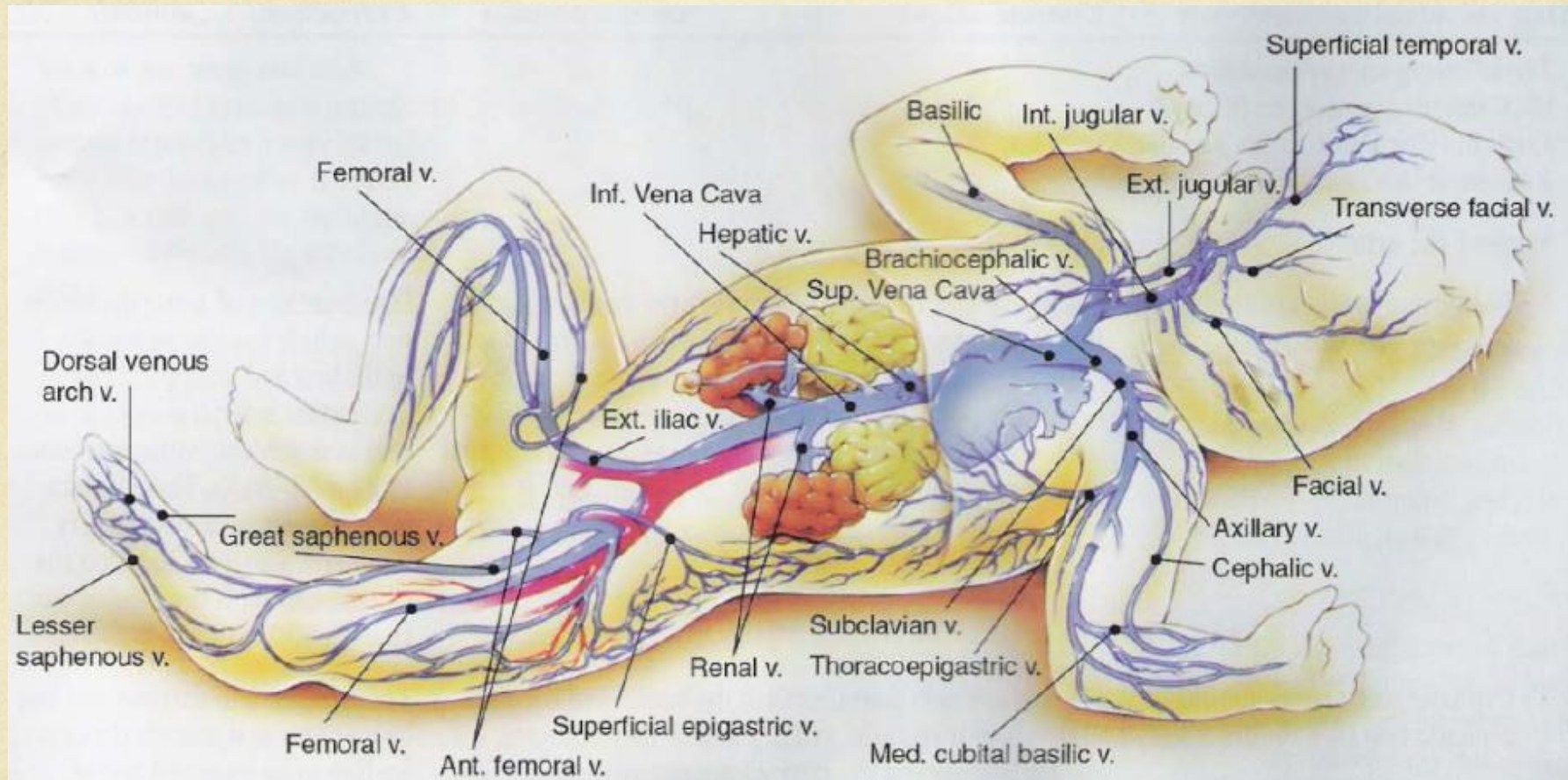
The choice: BCV



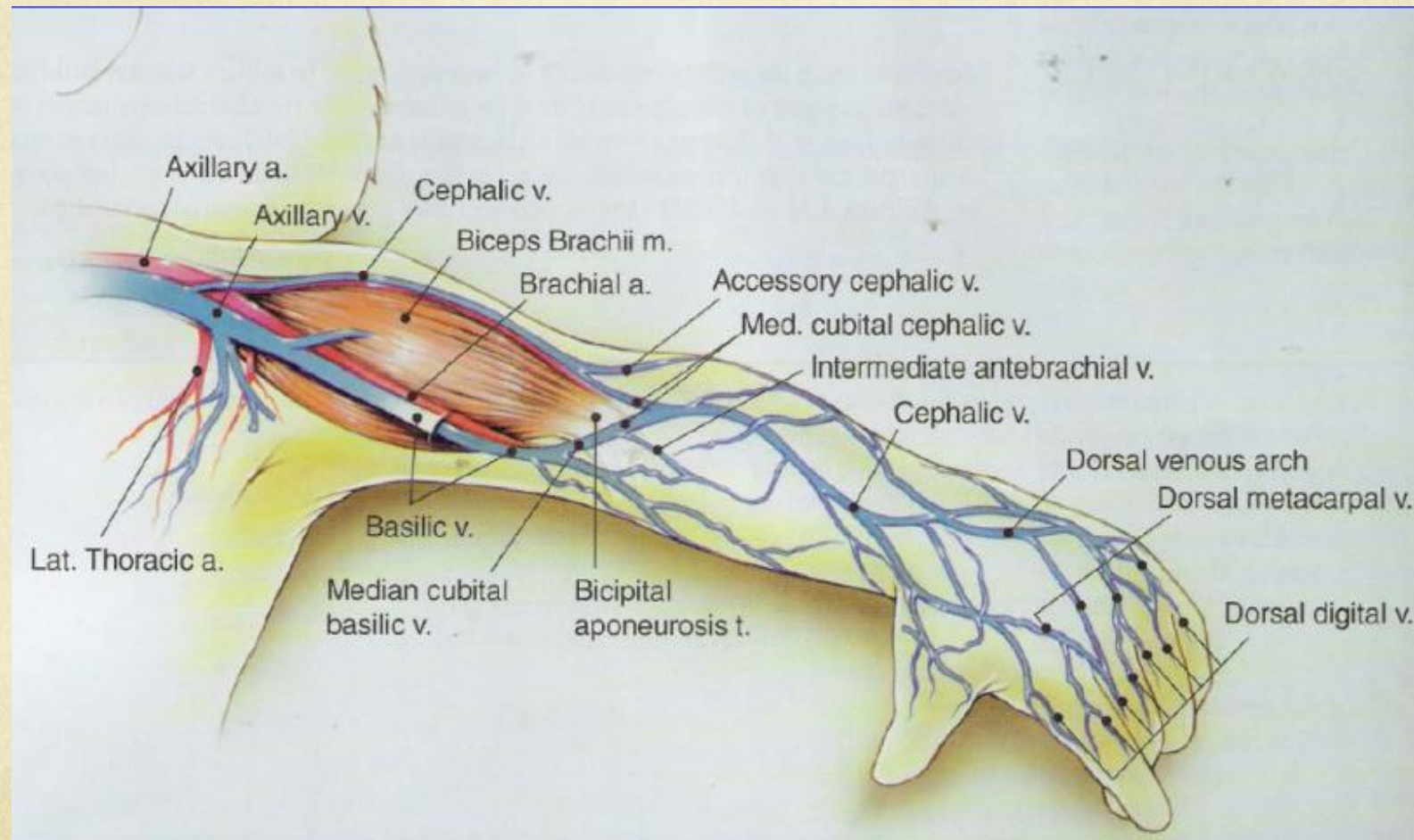
Nel neonato

- Vene profonde (ecoguida)
 - Femorale
 - Anonima
 - Giugulare interna
 - Succlavia
 - Giugulare esterna
- Vene superficiali (NIR o inserzione diretta)

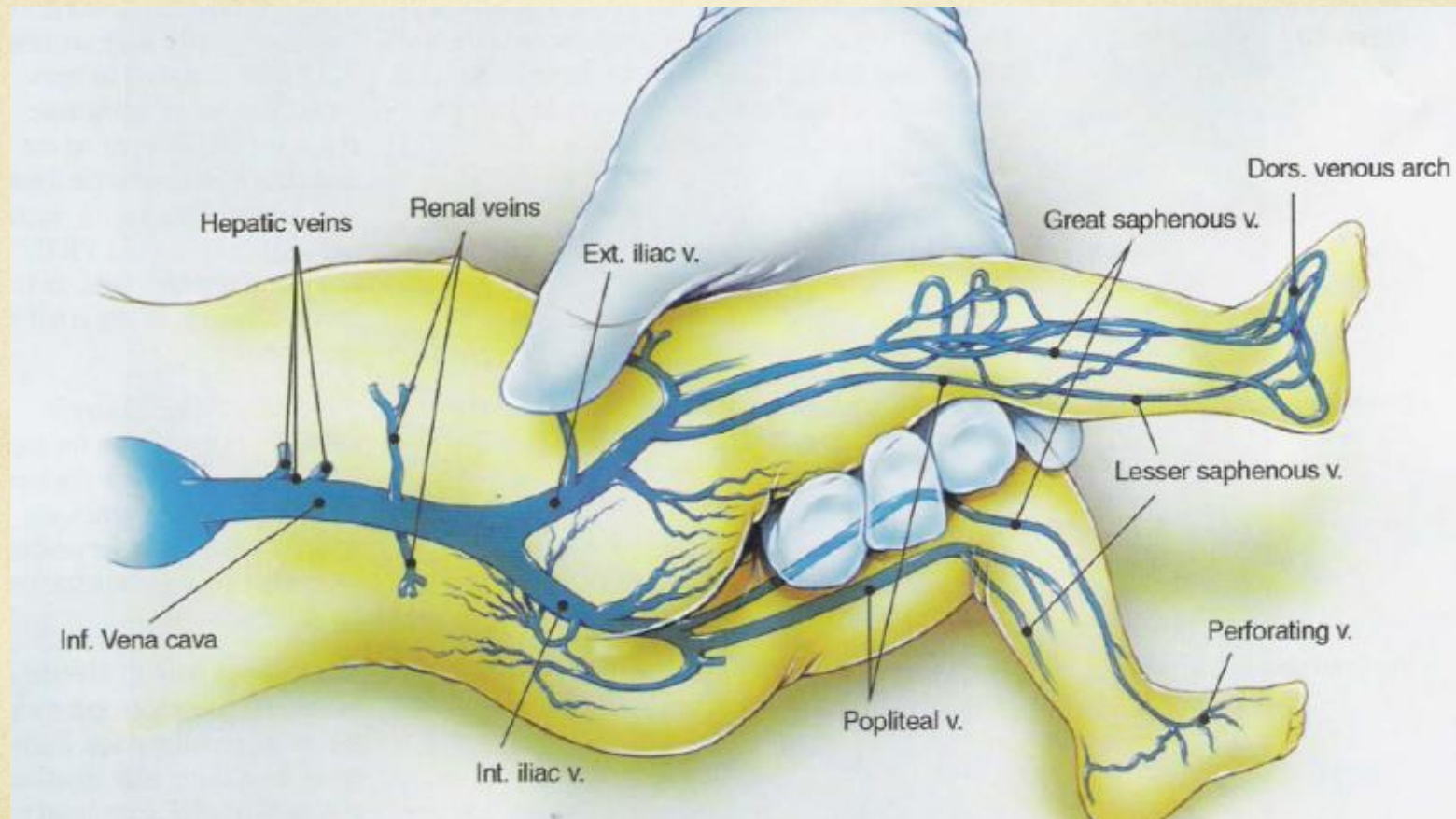
Neonato



Neonato



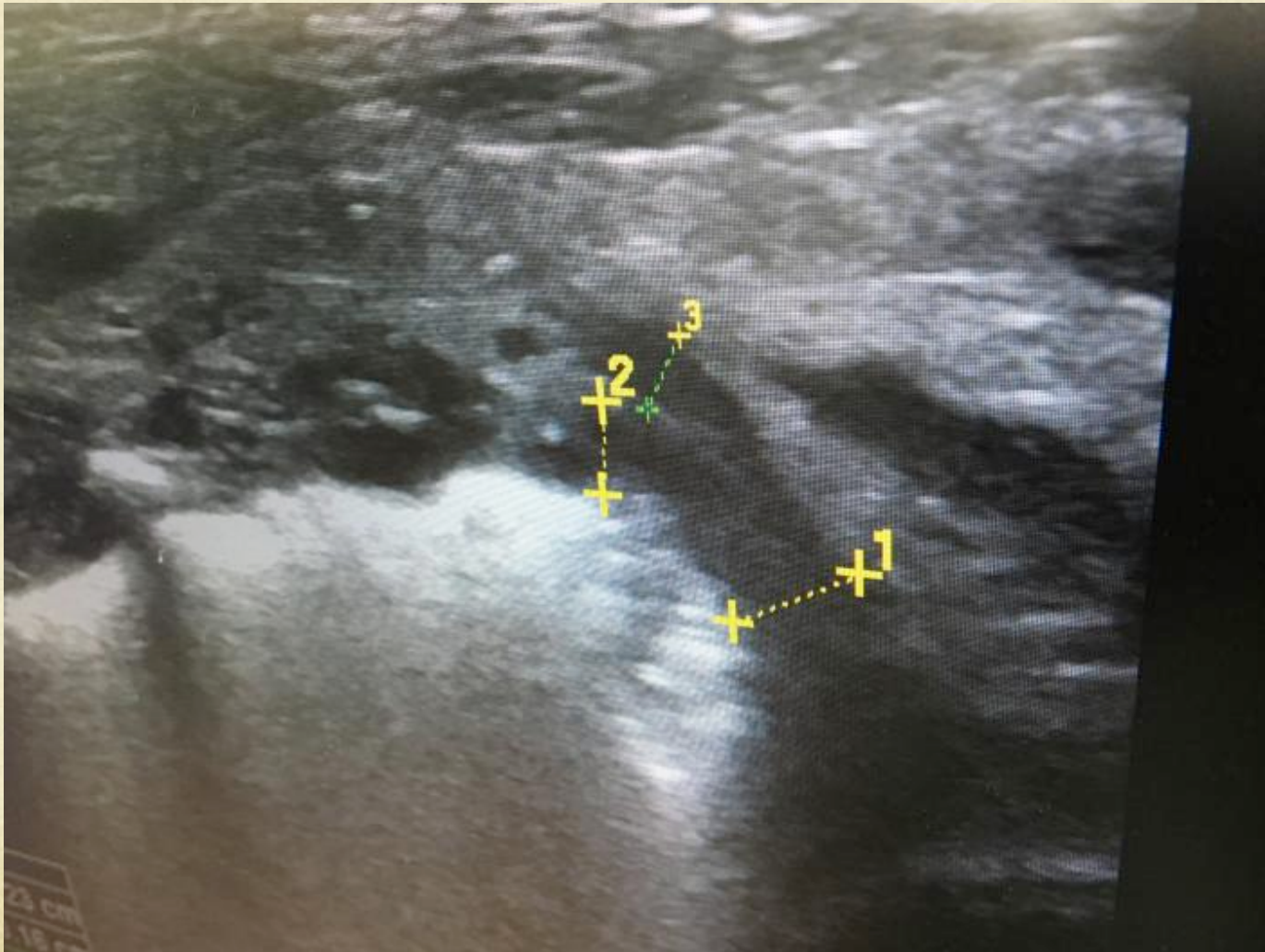
Neonato



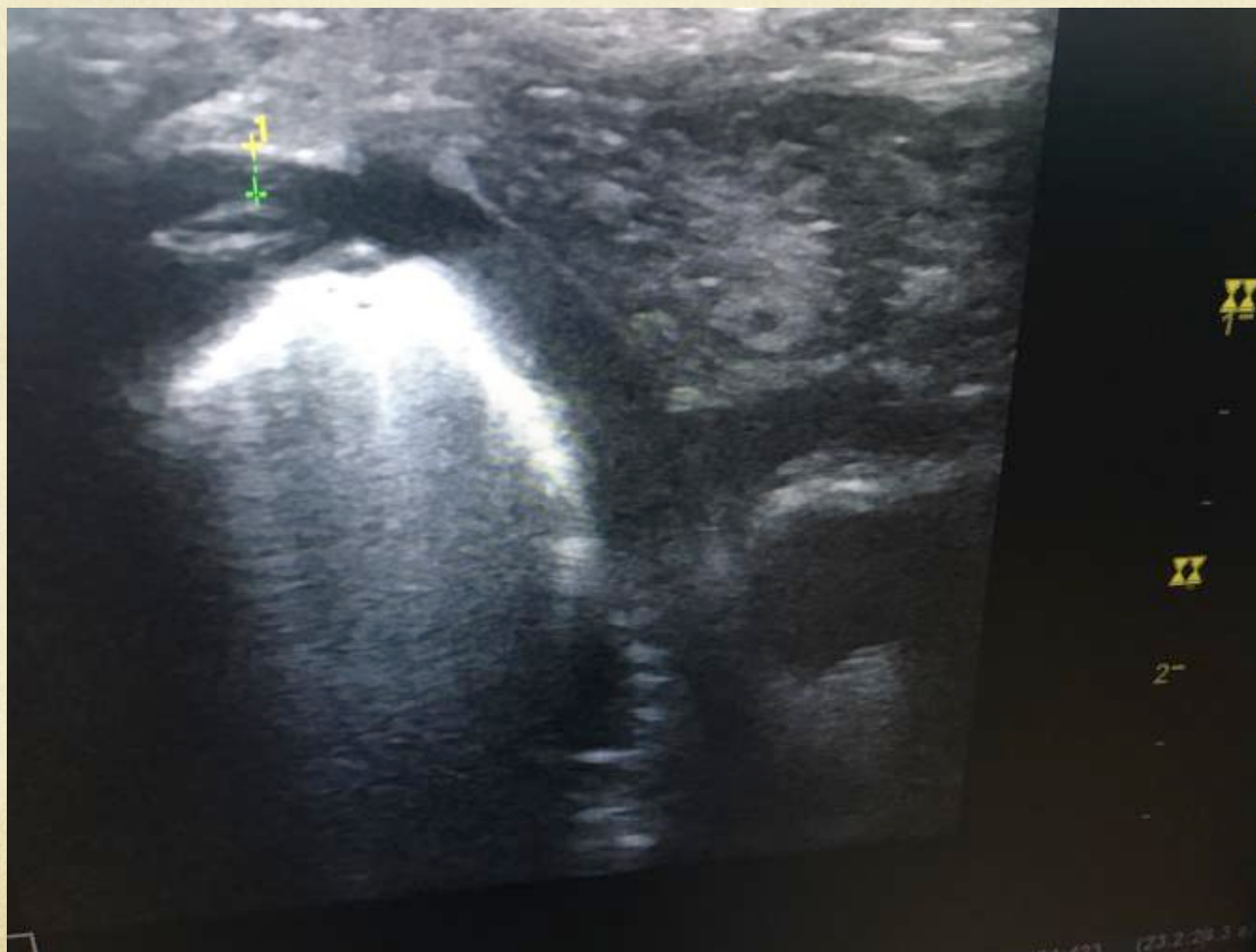
RaCeVA nel neonato



RaCeVA nel neonato



RaCeVA nel neonato



RaCeVA e RaPeVA

- Esame sistematico delle vene profonde
- Non utili per le vene superficiali del neonato in cui si inseriscono agocannule e cateteri epicutaneo-cavali

Vene del neonato

Vene profonde → RaCeVA

Vene superficiali → RaSuVA

Una novità

Un protocollo per scegliere la vena superficiale in cui inserire una AGOCANNULA o un EPICUTANEO-CAVALE:

Il protocollo RaSuVA

- diretto
- utilizzando la tecnologia NIR

RaSuVA

Esame sistematico delle vene superficiali
del neonato (con e senza tecnologia NIR,
con e senza laccio)



Malleolo mediale (MM)	Vd
	Fd
	Vs
	Fs
Malleolo laterale (ML)	Vd
	Fd
	Vs
	Fs
Retropoplitea (RP)	Vd
	Fd
	Vs
	Fs
Mano e polso (MP)	Vd
	Fd
	Vs
	Fs
Antecubitale (AC)	Vd
	Fd
	Vs
	Fs
Preauricolare (PR)	Vd
	Fd
	Vs
	Fs
Postauricolare (PO)	Vd
	Fd
	Vs
	Fs



Malleolo
mediale



Malleolo mediale
(con laccio)



Malleolo laterale



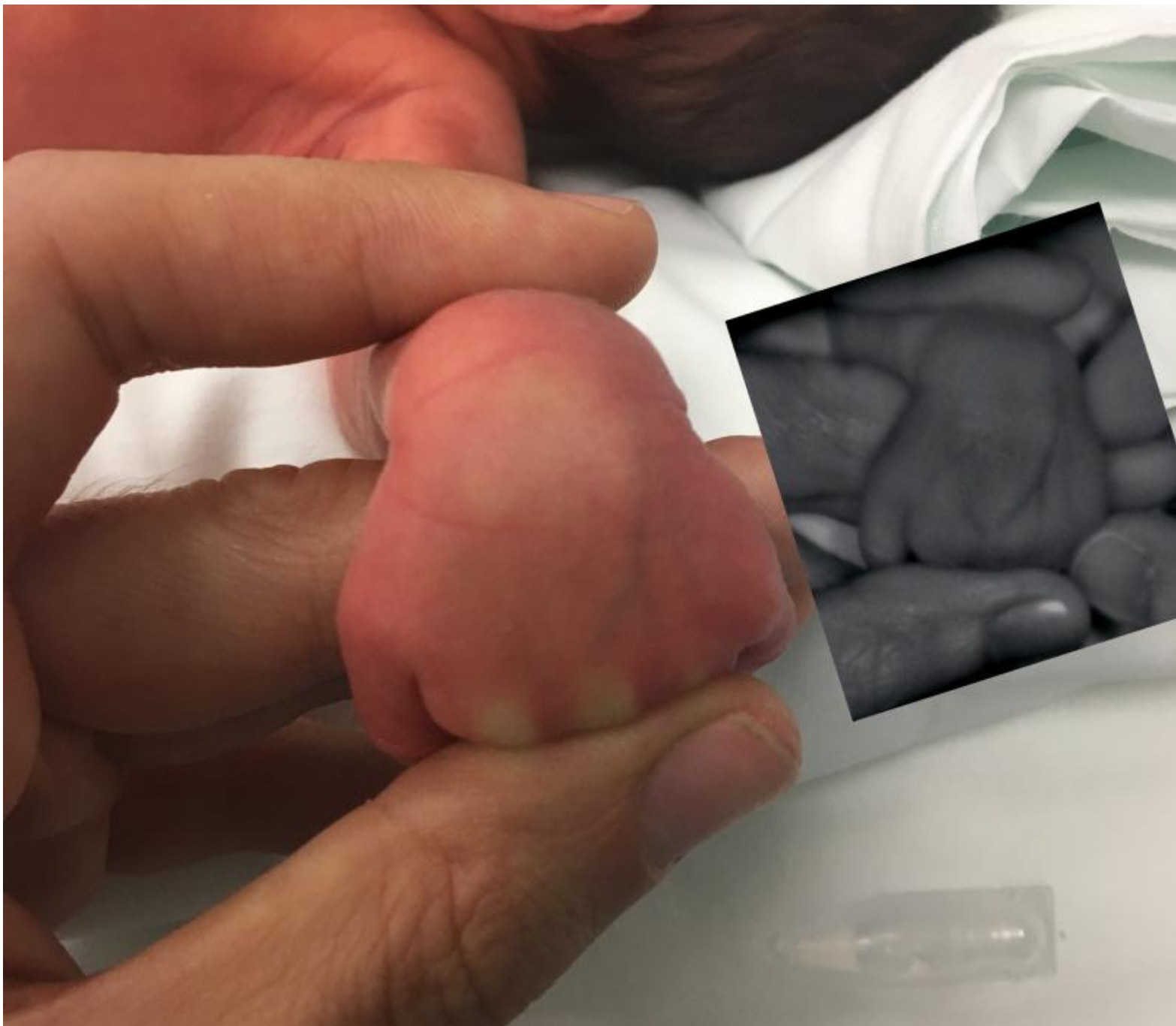
Malleolo laterale
(con laccio)



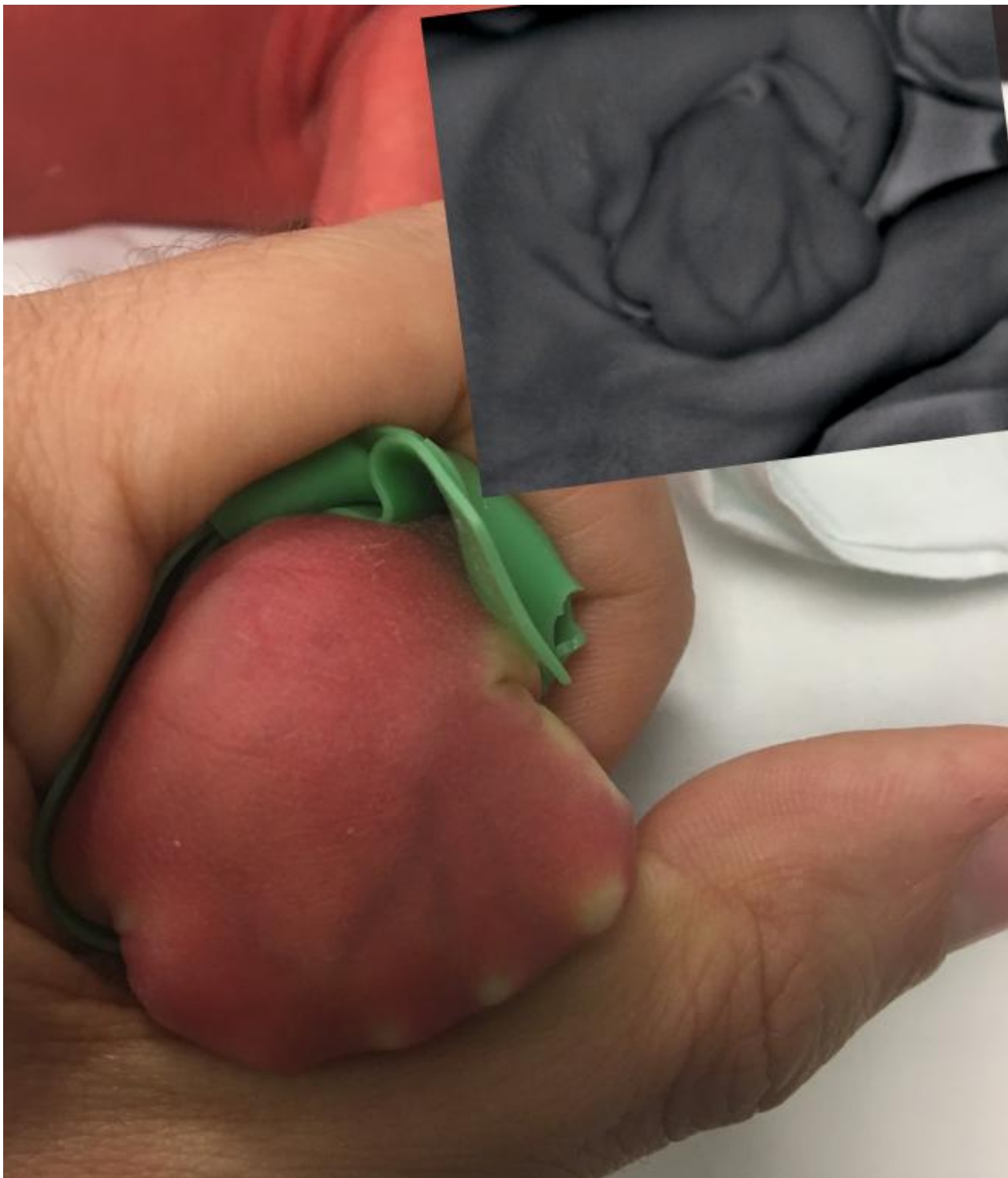
Retroplitea



Retropoplitea
(con laccio)



Mano e
polso



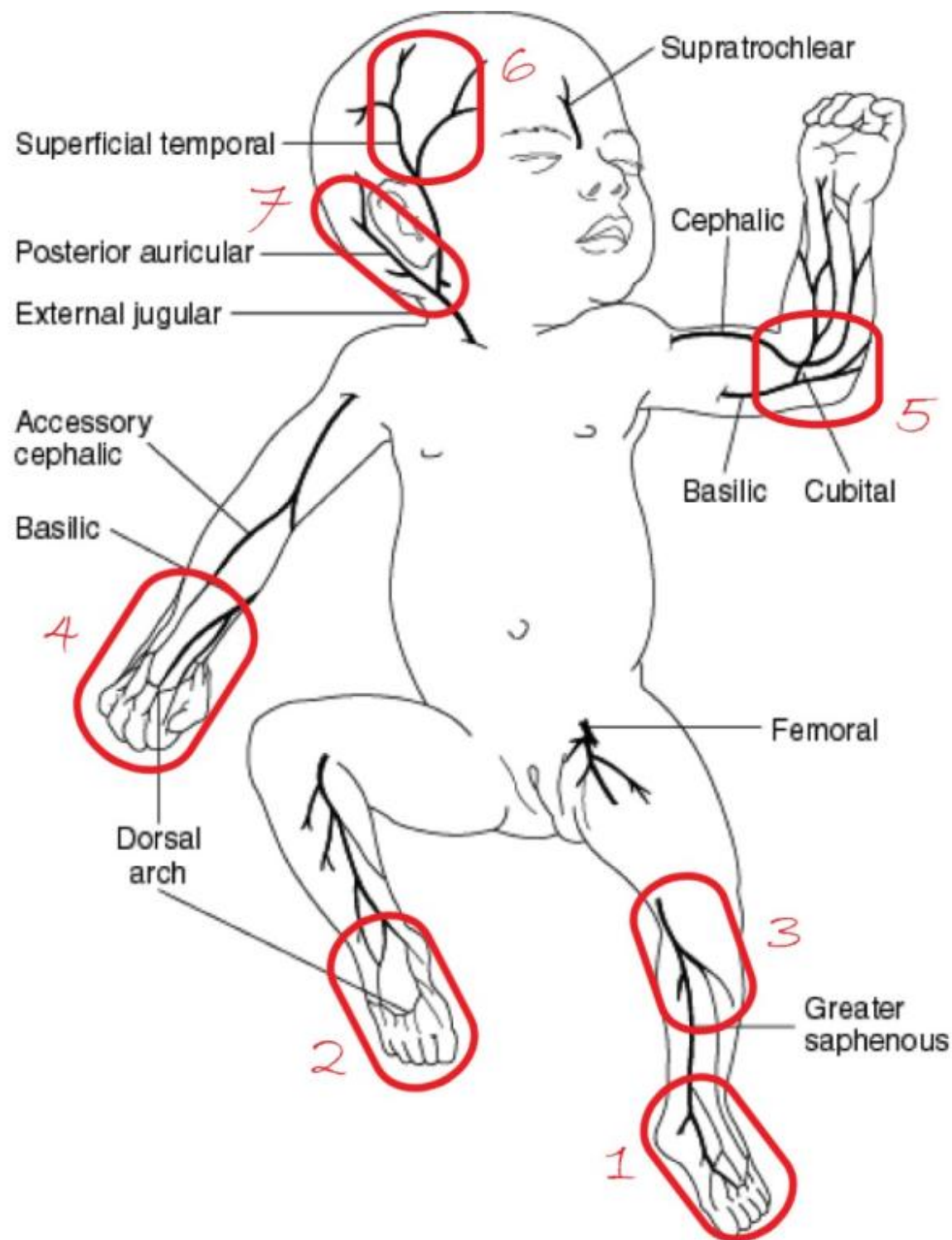
Mano e polso
(con laccio)



Antecubitale



Antecubitale
(con laccio)



- 1 - malleolo mediale
- 2 - malleolo laterale
- 3 - retropoplitea
- 4 - mano e polso
- 5 - antecubitale
- 6 - preauricolare
- 7 - retroauricolare

RaSuVA

Un approccio sistematico allo studio delle vene superficiali del neonato, come base razionale per la scelta della vena più appropriata per il posizionamento di una agocannula o di un catetere epicutaneo-cavale.

RaSuVA

Ordine di preferenza:

Per posizionamento agocannula

- 1) *Arti inferiori (safena esclusa)*
- 2) *Mani e polso*
- 3) *Scalpo*

Per posizionamento ECC

- 1) *Antecubitale*
- 2) *Safena al malleolo mediale*
- 3) *Scalpo*



Protocollo RaSuVA

Presentato al congresso ESPNIC 2017

Presentato al congresso AVA 2017

Prossimamente inserito nel Manuale dell'Accesso Vascolare nel Bambino e nel Neonato in preparazione presso Springer (editors: N.Disma, D.G.Biasucci e Mauro Pittiruti)

Inserito nei corsi educazionali del GAVePed (il gruppo accessi venosi pediatrici del GAVeCeLT)



RaSuVA (Rapid Superficial Veins Assessment): a new protocol for a systematic evaluation of the peripheral veins of the neonate before insertion of peripheral cannulas or peripherally inserted central catheters.

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Association for Vascular Access
ANNUAL SCIENTIFIC MEETING
September 16-19 • Phoenix Convention Center • Phoenix, AZ

RaSuVA (Rapid Superficial Veins Assessment): a new protocol for a systematic evaluation of the peripheral veins of the neonate before insertion of peripheral cannulas or peripherally inserted central catheters.

Mauro Pittiruti – Giovanni Barone – Vito D'Andrea

CE Code (Attendee Use Only):



GAVePed
Gruppo Accessi Venosi Pediatrici



GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

**Grazie
dell'attenzione**

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