I PROTOCOLLI PER I CATETERI CENTRALI ESTERNI :

SIC - ISP-2 - SIF

Maria Giuseppina Annetta

GAVeCeLT 2022
Roma, 5-6-7 dicembre

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Insertion bundle - definizione

- Poche e chiare raccomandazioni basate su evidenze scientifiche, capaci di agire sinergicamente per fornire massima sicurezza, efficacia ed economicità di una determinata procedura

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Insertion bundle - obiettivo

- **Ridurre al minimo le complicanze correlate al posizionamento di un catetere venoso centrale:**
  - **PICC - CICC - FICC**

  - Complicanze legate alla venipuntura: fallimento della puntura, punture ripetute, danno nervoso, puntura arteriosa
  - Malposizionamenti primari
  - Aritmie
  - Trombosi venose catetere-correlata
  - Infezioni catetere-correlate
  - Dislocazione

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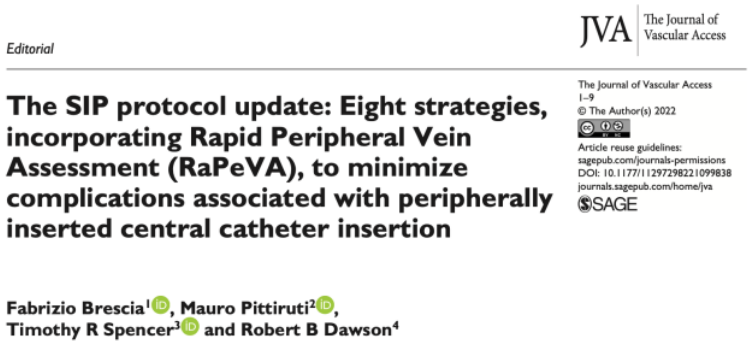
PICC



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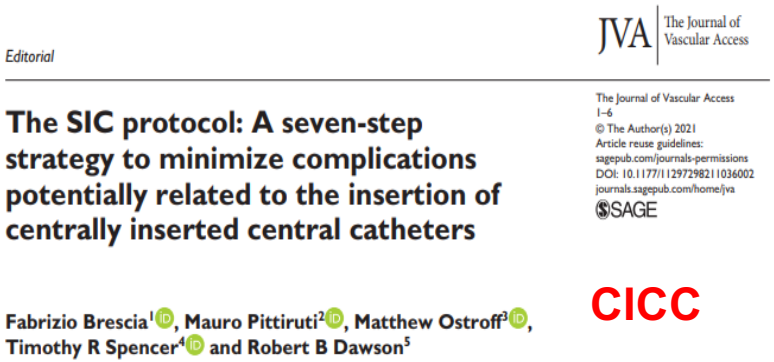

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CICC

FICC

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La filosofia che sta dietro ai protocolli di inserzione

- **Abbandono della fluoroscopia**
- **Abbandono della venolisi**
- **Abbandono della puntura alla cieca**
- **Abbandono del controllo radiologico**
- **Abbandono dei punti di sutura**

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La filosofia che sta dietro ai protocolli di inserzione

- **Uso globale dell'ecografo**
  - Scelta della vena
  - Puntura ecoguidata
  - Esclusione complicanze immediate
  - Tip navigation
  - Tip location
  - Esclusione complicanze tardive non infettive
- **Uso dell'ECG intracavitario**
- **Importanza cruciale dell'exit site**

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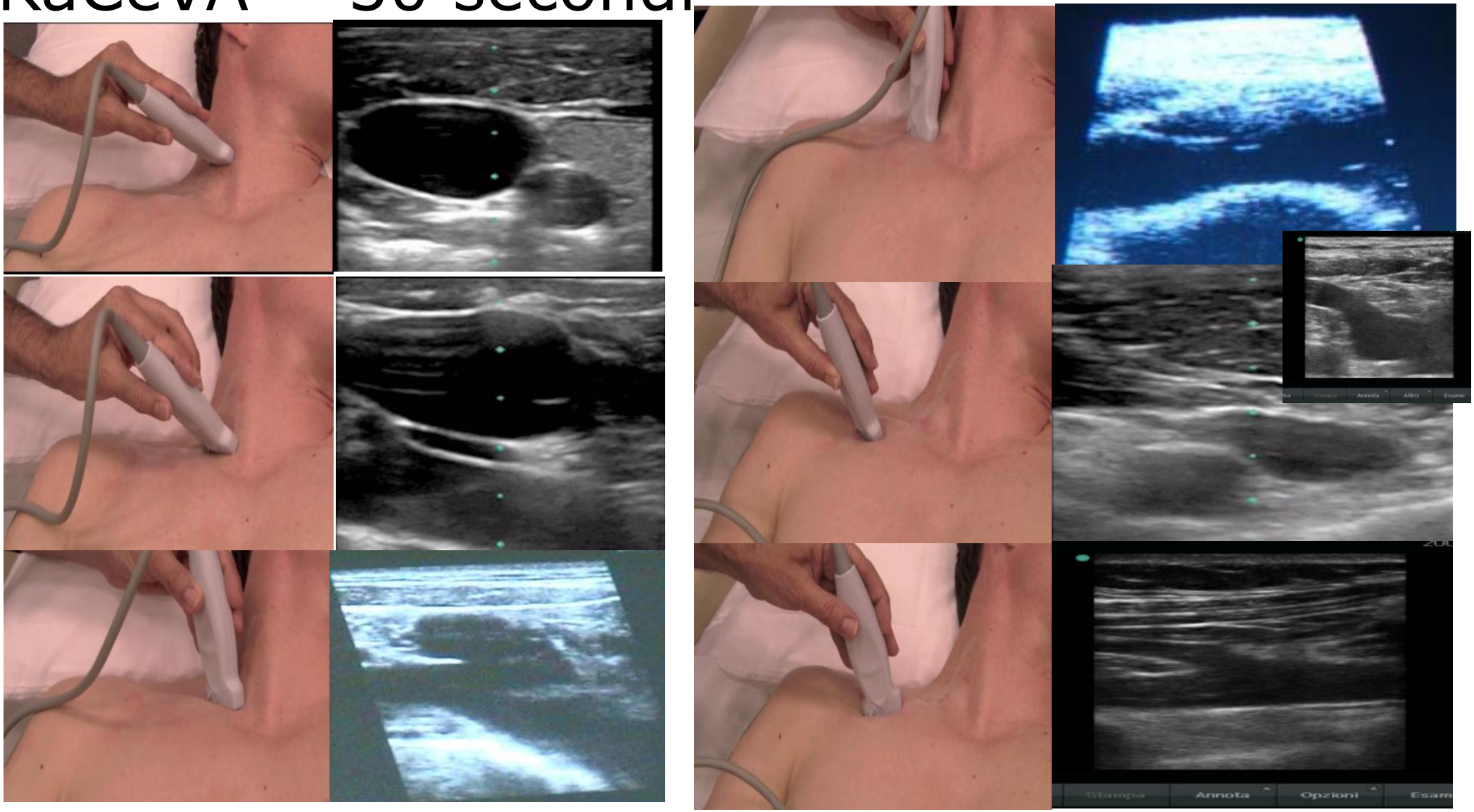
Table I. The seven steps of the SIC protocol.

Step 1	*Preprocedural evaluation*—choice of the vein by systematic ultrasound examination of the veins of the neck and of the supra/infraclavicular region (RaCeVA protocol) and choice of the ideal exit site (Central ZIM)
Step 2	*Appropriate aseptic technique*—hand hygiene, skin antisepsis with 2% chlorhexidine in 70% alcohol, maximal barrier precautions
Step 3	*Ultrasound-guided insertion*—ultrasound-guided venipuncture, ultrasound verification of the correct direction of the guidewire (tip navigation) and of the absence of pneumothorax (pleural scan)
Step 4	*Intra-procedural assessment of tip location*—verification of the central position of the tip by intracavitary ECG and/or by transthoracic echocardiography, using the "bubble test"
Step 5	*Adequate protection of the exit site*—reduction of the risk of bleeding and risk of contamination by sealing with cyanoacrylate glue
Step 6	*Proper securement of the catheter*—stabilization of the catheter using skin-adhesive sutureless devices, transparent dressing with integrated securement or subcutaneous anchorage
Step 7	*Appropriate coverage of the exit site*—use of semi-permeable transparent dressing, preferably with high breathability

RaCeVA = 30 secondi



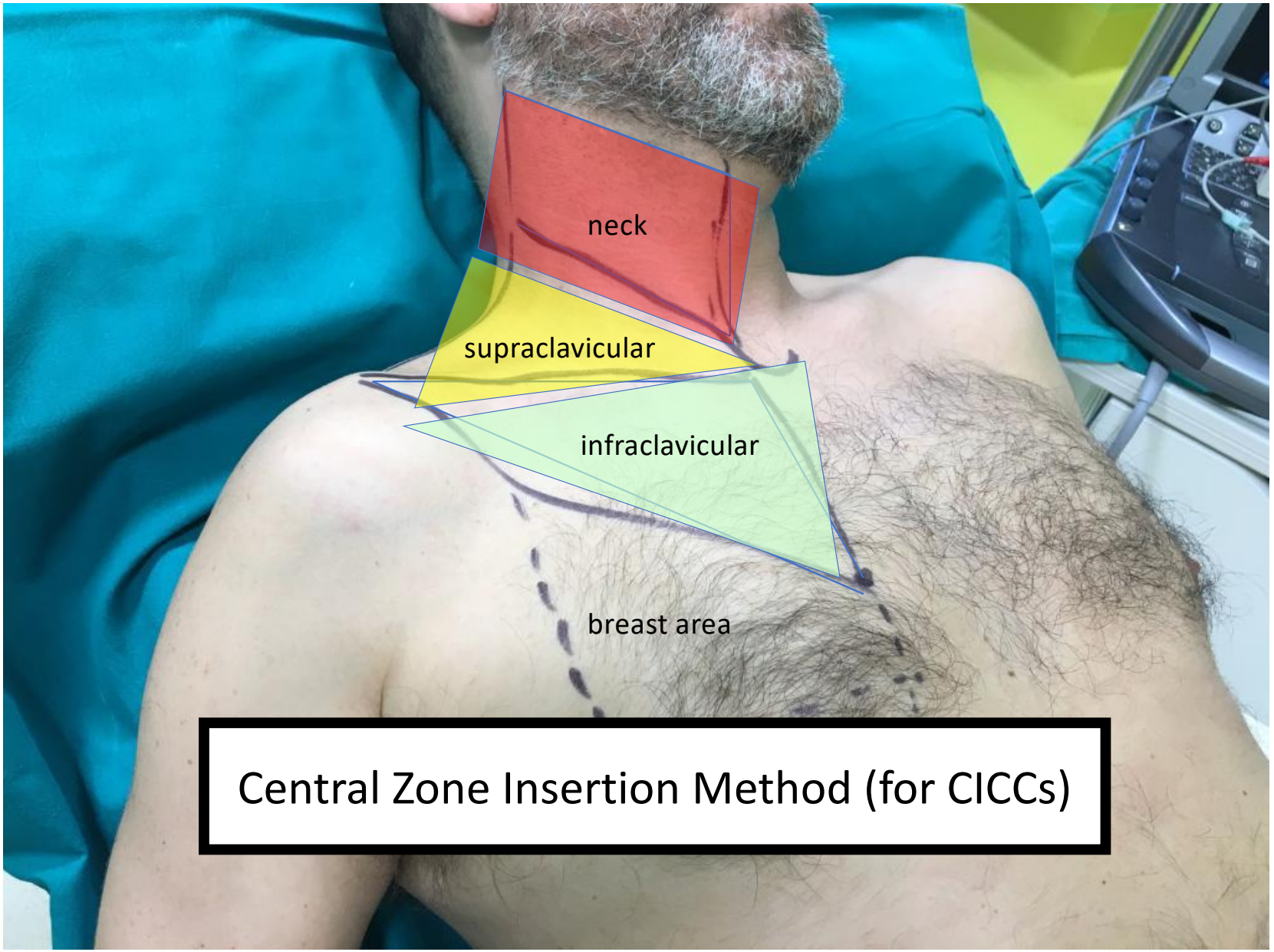

neck
supraclavicular
infraclavicular
breast area
Central Zone Insertion Method (for CICCs)

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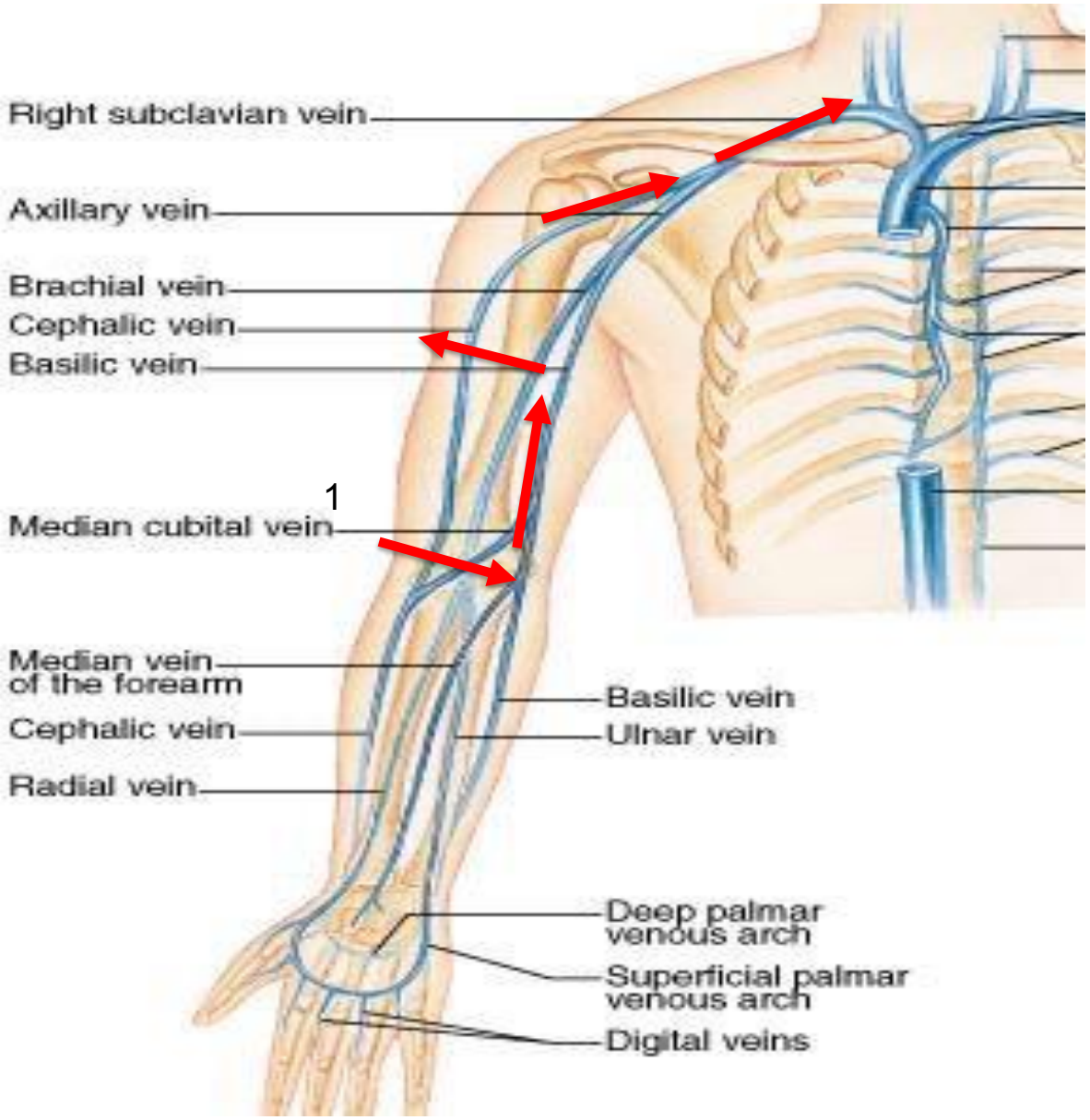
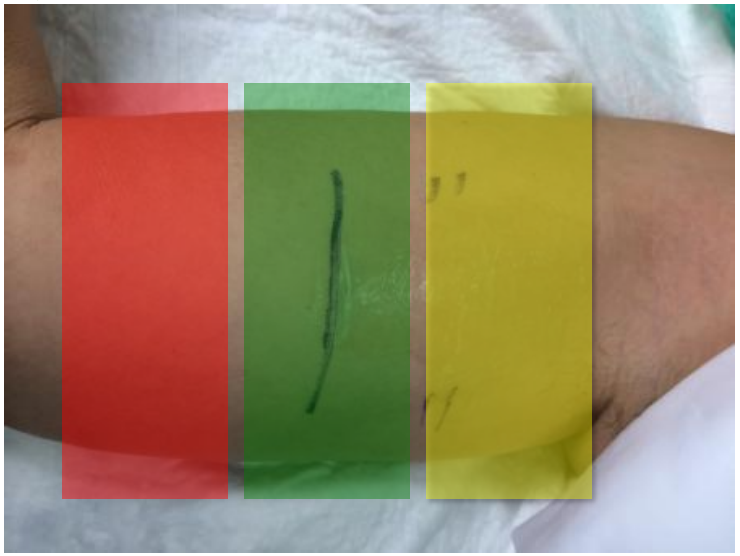
Table 1. The eight steps of the SIP Protocol.

Step 1	*Pre-procedural evaluation*—choose most appropriate vein by systematic ultrasound examination of the veins of the arms (see the RaPeVA protocol)
Step 2	*Appropriate antiseptic technique*—adopt a strict policy of hand hygiene, skin antisepsis with 2% chlorhexidine in 70% isopropyl alcohol, and use of maximal barrier precautions
Step 3	*Choice of vein size and exit site*—evaluate the diameter of the vein so to have an ideal catheter-vein ratio (1:3 or less); place the exit site in the green zone (see Dawson's ZIM™); consider the opportunity of tunneling the catheter, if the most appropriate vein is in the yellow zone (see the RAVESTO protocol)
Step 4	*Clear identification of median nerve and brachial artery*—identify each structure before venipuncture, using ultrasound
Step 5	*Ultrasound-guided venipuncture*—access a deep vein of the arm (either basilic or brachial vein), preferably adopting the short axis/out-of-plane approach, and use of a micro-introducer kit
Step 6	*Ultrasound-based tip navigation*—assess the correct direction of the guidewire, by a supra-clavicular ultrasound scan (see the ECHOTIP protocol)
Step 7	*Intra-procedural assessment of tip location*—use intracavitary ECG and/or ultrasound (subcostal or apical view, using the "bubble test": see the ECHOTIP protocol)
Step 8	*Appropriate securement of the catheter and protection of the exit site*—use sutureless devices only; reduce the risk of bleeding and bacterial contamination using cyanoacrylate glue and semi-permeable transparent membrane dressings

RaPeVA


Right subclavian vein
Axillary vein
Brachial vein
Cephalic vein
Basilic vein
1
Median cubital vein
Median vein of the forearm
Cephalic vein
Radial vein
Basilic vein
Ulnar vein
Deep palmar venous arch
Superficial palmar venous arch
Digital veins

Dawson's Zone Insertion Method



- Evitare la zona rossa
- Se si è scelta la zona gialla è necessario tunnellizzare

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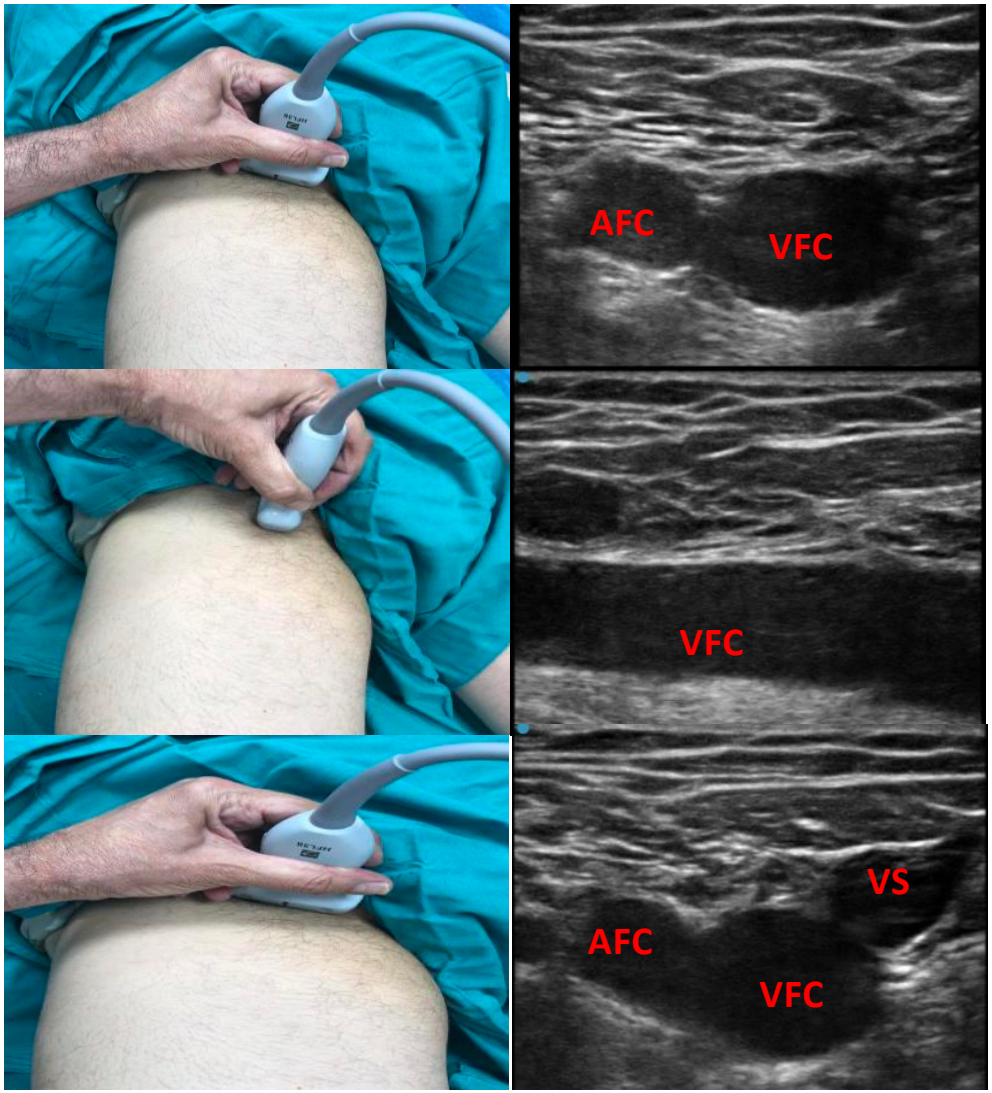
Table 1. The seven steps of the SIF Protocol.

Step 1	*Preprocedural evaluation*—choice of the vein by systematic ultrasound examination of the veins of the groin and the thigh (RaFeVA protocol) and choice of the ideal exit site (Femoral ZIM)
Step 2	*Appropriate aseptic technique*—hand hygiene, skin antisepsis with 2% chlorhexidine in 70% alcohol, maximal barrier precautions
Step 3	*Ultrasound-guided insertion*—ultrasound-guided venipuncture, ultrasound verification of the correct direction of the guidewire (tip navigation)
Step 4	*Intra-procedural assessment of tip location*—if the tip must be in IVC, use length estimation by anthropometric measurement and consider post-procedural x-ray; if the tip must be in RA or at IVC/RAJ, use intracavitary ECG and/or by transthoracic echocardiography (in subcostal view, using the "bubble test")
Step 5	*Adequate protection of the exit site*—reduction of the risk of bleeding and risk of contamination by sealing with cyanoacrylate glue
Step 6	*Proper securement of the catheter*—stabilization of the catheter using skin-adhesive sutureless devices, transparent dressing with integrated securement, or subcutaneous anchorage
Step 7	*Appropriate coverage of the exit site*—semi-permeable transparent dressing, preferably with high breathability

RaFeVA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VS
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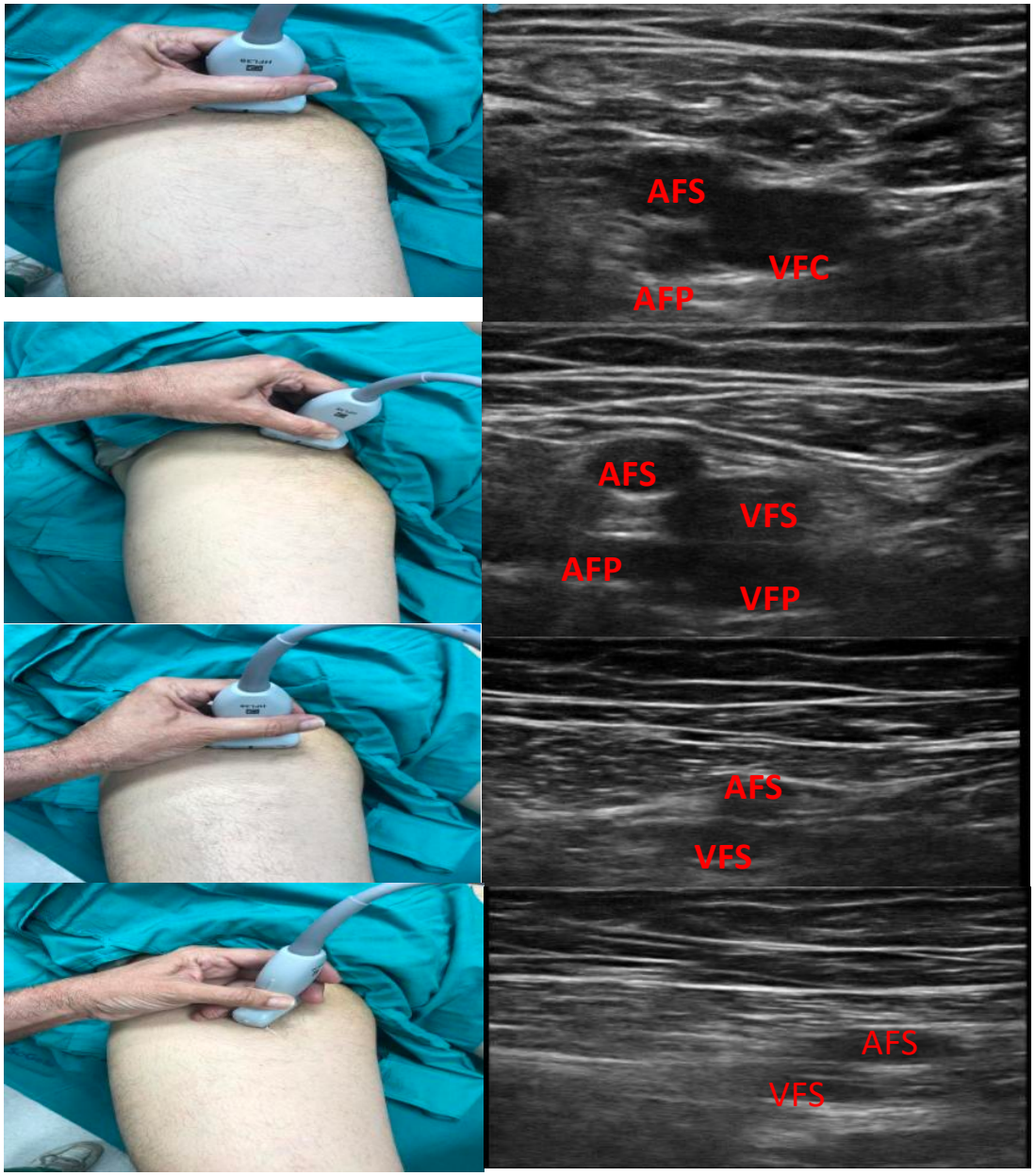
VFC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Red Zone

Alta contaminazione batterica della cute

Alto rischio di trombosi

Alto rischio di dislocazione

In comune a tutti e tre i protocolli:

- Tecnica asettica
- Scelta della vena di calibro adeguato
- Venipuntura ecoguidata
- Tip navigation ecoguidata
- Tip location mediante ECG intracavitario e/o ecografia
- Stabilizzazione del catetere
- Protezione del sito di emergenza

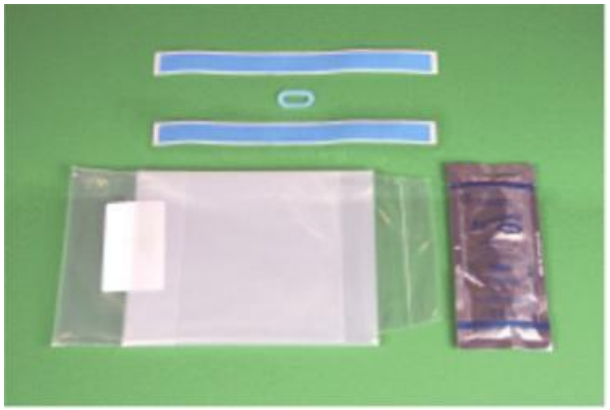
Lavaggio delle mani, tecnica asettica e massime protezione di barriera

- Massime protezioni di barriera include utilizzo di guanti sterili, mascherina, cappellino, camice sterile, ampio telo sterile che copre il corpo, coprisonda lungo

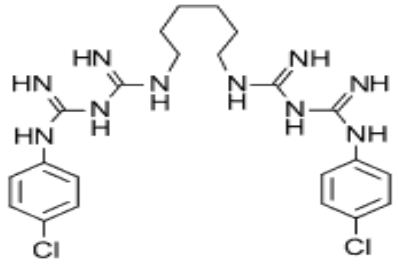
- Clorexidina 2% in soluzione alcolica (70% alcol iso-propilico) per la preparazione della cute

Lavaggio delle mani

Massime precauzioni di barriera



Clorexidina 2% in alcool



Scelta della vena appropriata (vein mm = or > cath Fr)

- Per minimizzare il rischio di trombosi venosa, il catetere dovrebbe essere inserito in vene il cui diametro sia almeno tre volte più largo del catetere stesso

  - Catetere 3 Fr : vena almeno di 9 Fr (3 mm)
  - Catetere 4 Fr : vena almeno di 12 Fr (4 mm)
  - Catetere 5 Fr: vena di almeno 15 Fr (5 mm)
  - Catetere 6 Fr: vena almeno di 18 Fr (6 mm)

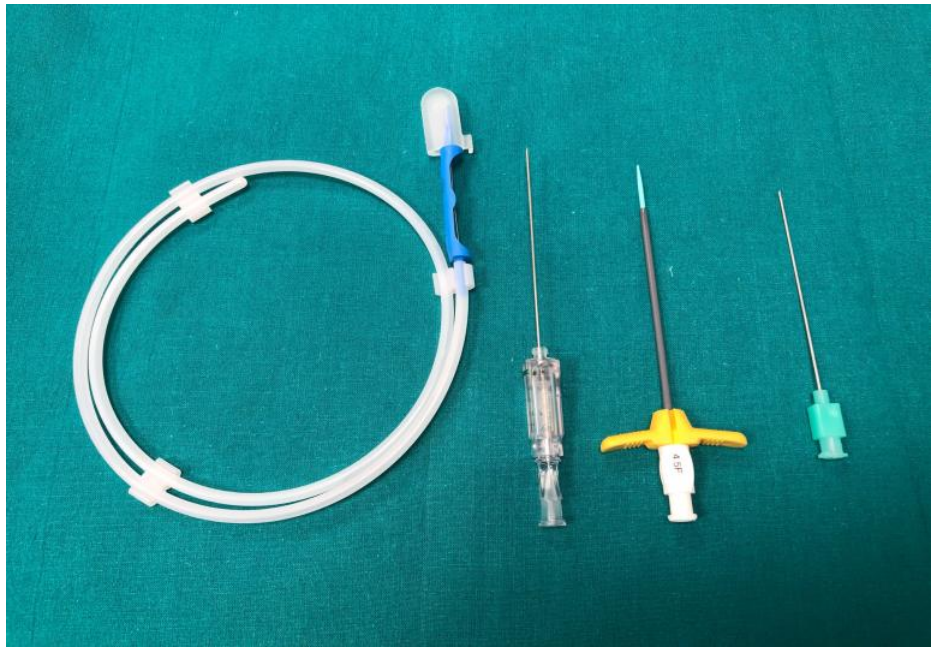
Puntura ecoguidata della vena

- Per la venipuntura utilizzare una puntura dinamica ecoguidata della vena

- L'utilizzo di un kit di micro-introduzione con un ago ecogeno e sottile (21 G) ed una guida di 0.018" con la punta diritta in nitinol

Venipuntura ecoguidata usando kit da microintroduzione

Kit da microintroduzione



Vantaggi

Venipuntura con ago mininvasivo

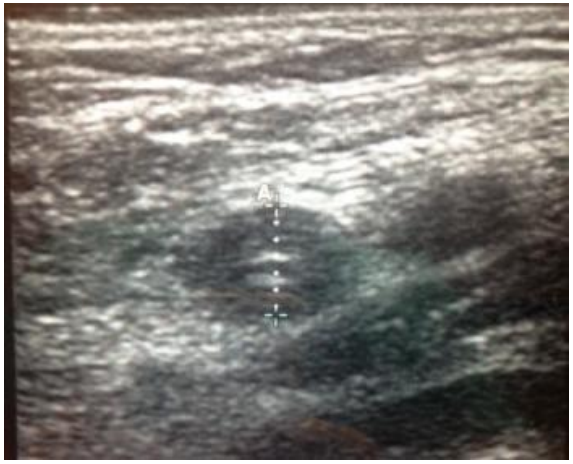
La cannulazione con filo guida morbido consente di superare più facilmente qualsiasi ostacolo

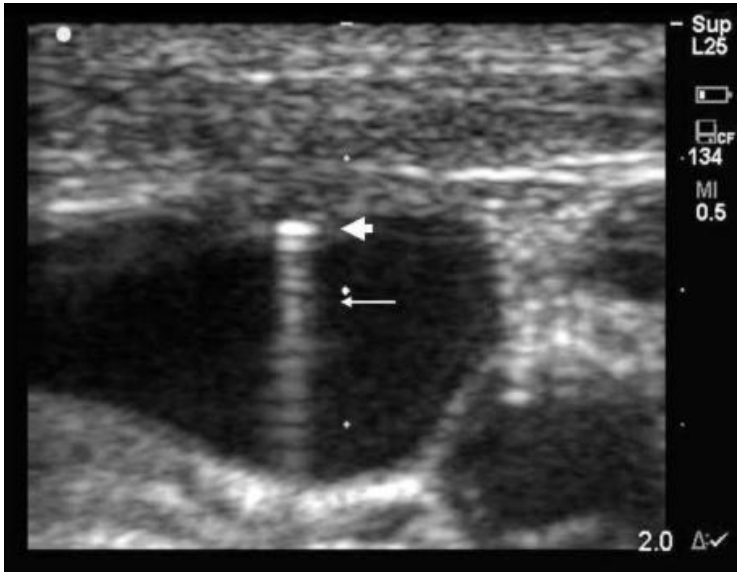
L'utilizzo del microintroduttore/dilatatore permette una dilatazione della vena meno traumatica

US tip navigation per controllare la corretta direzione della guida metallica e del catetere

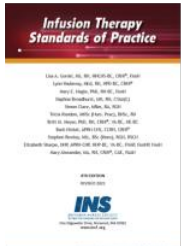
- Facile
- Accurato
- Senza costi aggiuntivi

IGV Assessment

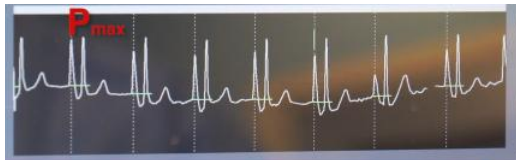




Tip Location



E. Use methods for identifying CVAD tip location during the insertion procedure (ie, "real-time") due to greater accuracy, more rapid initiation of infusion therapy, and reduced costs.[38-47] (III)
   1. Use electrocardiogram (ECG) methods with either a metal guidewire or a column of normal saline inside the catheter lumen and observe the ECG tracing to place the CVAD tip at the CAJ. Follow manufacturers' directions for use with other ECG-based technology using a changing light pattern to detect tip location.[1,2,4,11,23,24,26,27,43,44,48-61] (II)
   6. Postprocedure radiograph imaging is not necessary if alternative tip location technology confirms proper tip placement.[46,50,71] (II)



"Intra-procedural control of tip location is preferred to post-procedural control"

"FICC can be placed either in the Inferior Vena Cava (IVC) or in the right atrium (RA) or at the junction between IVC and RA"

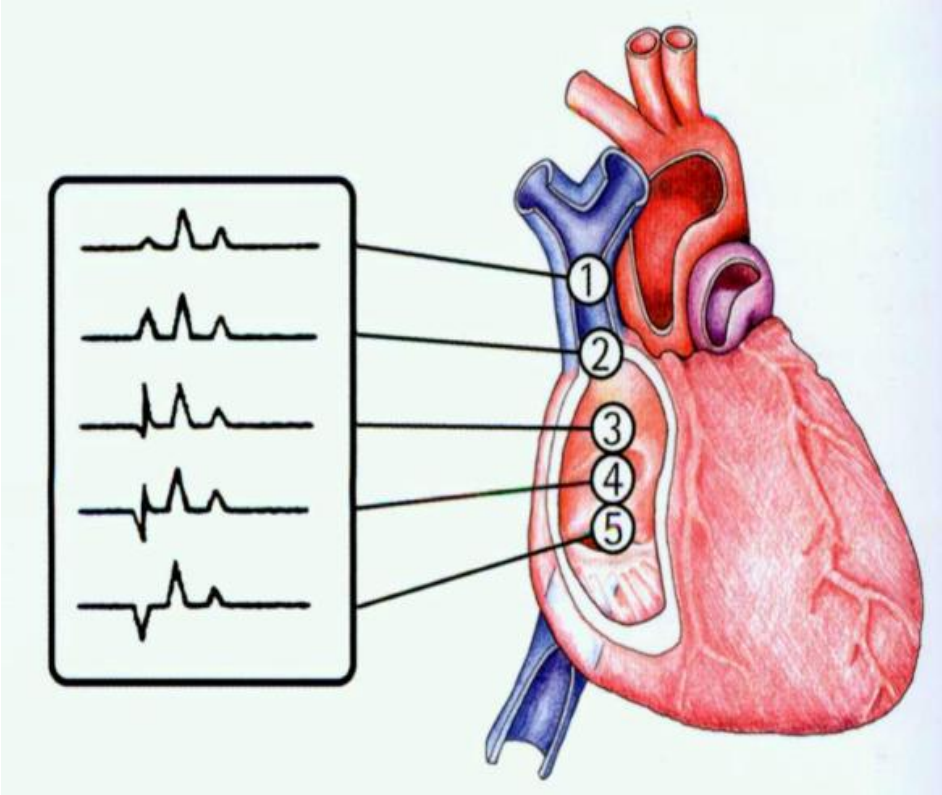
*"When the tip of the FICC is expected to be in the **IVC**, length estimation by anthropometric measurement is useful"*

*"FICCs with the tip in **RA** or at the **IVC/RAJ** - "Real time" identification of tip location by intracavitary ECG"*

IC-ECG per la tip position

- IC-ECG è un metodo economico, efficace e semplice per il controllo intra-procedurale della posizione della punta del catetere

IC-EKG method



- IC-ECG (derivazione II)
- L'elettrodo intracavitario è la punta del catetere
- Si basa sulle modifiche della onda P quando il catetere si avvicina alla giunzione cavo-atriale.
- Giunzione cavo-atriale picco massimale della onda P:
  (Stas, Yeon, Schummer, Pittiruti/La Greca, etc,)
  (= CRISTA TERMINALIS)

US TIP LOCATION

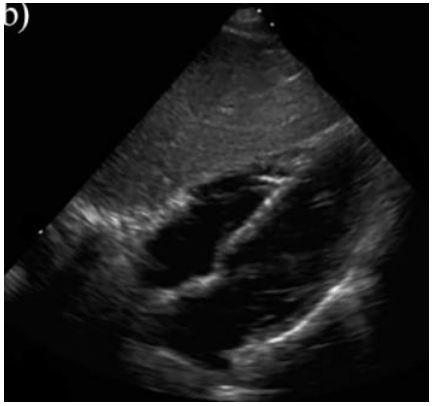
TTE
Transthoracic echocardiography

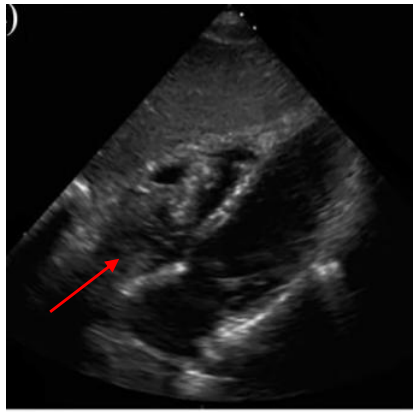
ECHOTIP: A structured protocol for ultrasound-based tip navigation and tip location during placement of central venous access devices in adult patients

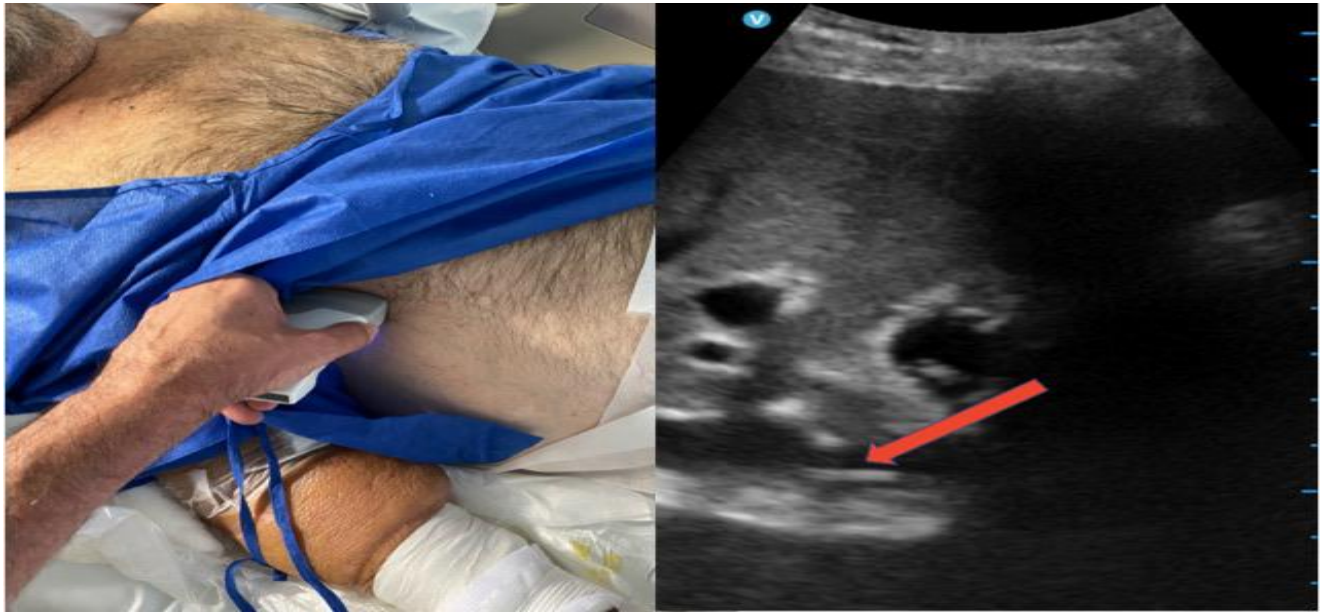
Antonio La Greca[1], Emanuele Iacobone[2], Daniele Elisei[2], Daniele Guerino Biasucci[3], Vito D'Andrea[4], Giovanni Barone[5], Geremia Zito Marinosci[6] and Mauro Pittiruti[1]

- Realizzabile in ogni setting clinico
- Non invasivo
- Può essere difficoltoso in alcuni pazienti
- Sicuro per l'operatore e per il paziente
- Meno semplice da apprendere rispetto all' IC-ECG: necessità di training
- Meno accurato negli adulti dell'IC-ECG: necessità di standardizzare la tecnica e definire la metodica

Bubble test







Stabilizzare il catetere con sistemi *sutureless*

- La stabilizzazione del catetere a livello dell'*exit site* con sistemi *sutureless* al fine di ridurre il rischio di infezioni, dislocazione, e trombosi

- L'utilizzo della colla in cianoacrilato + le medicazioni trasparenti semipermeabili riduce il sanguinamento post-inserzione e la contaminazione batterica

CONCLUSIONI

L'utilizzo di bundle

- **rende la manovra sicura**
- **aiuta l'operatore a eseguirla in modo standard**
- **aiuta l'istruttore a insegnarla**
- **garantisce il paziente proteggendolo da variabilità legate all'operatore**

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