The GAVeCeLT algorithm for choosing the most appropriate venous access device

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Why an algorithm?

A structured approach to the choice of the VAD is recommended by many guidelines and by many opinion leaders.

Advantages of an algorithm:
- Reduces the opinion-based variability
- Facilitates the education of the clinicians
- Improves the quality of care
Which algorithm?

• GAVeCeLT has developed an algorithm for the choice of the most appropriate VAD, based on the best evidence available in the international guidelines

• The algorithm has been recently adopted by the Hospital policies of the Catholic University Hospital (Rome, Italy)
Which VAD?

Any peripheral or central VAD used for infusion, blood sampling and/or monitoring in adult patients

- VADs for dialysis/pheresis are excluded
- VADs for children and neonates are excluded (separate algorithm)
First step: choice between a peripheral VAD and a central VAD
Indications to a central VAD

I.V. solutions with pH < 5 or > 9
Drugs with osmolarity > 600 mOsm/l
Parenteral nutrition
Vesicant drugs and any drug potentially associated with endothelial damage
Hemodynamic monitoring
Repeated blood samples
Need for medium or long term i.v. line (months or years)
Indications to a peripheral VAD

- pH between 5 and 9
- Non vesicant
- Non irritant
- Needed for less than 4-6 weeks
Necessità accesso venoso nel paziente adulto per infusione, prelievi o monitoraggio emodinamico

**Accesso venoso periferico**
- pH 5-9
- Farmaci con osmolarità <600
- Farmaci non vescicanti
- Farmaci non irritanti

**Accesso venoso centrale**
- pH >9 o <5
- Farmaci con osmolarità >600
- Farmaci vescicanti
- Farmaci irritanti
- Nutrizione parenterale con osmolarità >800
- Necessità di prelievi ripetuti e frequenti
- Necessità di monitoraggio emodinamico

**Agocannula**
- Vene superficiali del braccio disponibili
- Accesso periferico < 1 settimana
- Uso esclusivamente intraospedaliero

**Cannula periferica lunga**
- Vene superficiali del braccio non disponibili
- Accesso periferico > 1 settimana

**Catetere Midline**
- Accesso periferico > 3 settimane
- Accesso periferico ad uso extraospedaliero

**Catetere ad inserzione periferica PICC**
- Vene profonde del braccio disponibili
- Soltanto in elezione

**Catetere ad inserzione centrale CICC**
- Vene profonde del braccio non disponibili
- Inserzione in condizioni di urgenza
- Necessità di catetere ‘medicato’
- Necessità di > 3 lumi

**Catetere ad inserzione femorale**
- Non tunnellizzato
- In situazioni di emergenza
- Tunnellizzato
- Presenza di ostruzione vena cava superiore

**USO INTRA-OSPEDALIERO**
- Day Hospital, Domicilio, Hospice

**ACCESSI A MEDIO TERMINE (< 4 MESI)**
- PICC
  - Vene profonde del braccio disponibili
- CICC tunnellizzato
  - Vene profonde del braccio non disponibili

**ACCESSI A LUNGO TERMINE (> 4 MESI)**
- Uso episodico: < 1/settimana:
  - Port
- Uso frequente: > 1/settimana:
  - Catetere Cuffiato Tunnellizzato CCT
    - Ad inserzione periferica/centrale/femorale
Any need for infusion therapy, blood samples, emodynamic monitoring in an adult patient

Peripheral VAD
- pH between 5 and 9
- Non vesicant
- Non irritant
- Needed for less than 4 wks

Central VAD
- I.V. solutions with pH < 5 or > 9
- Drugs with osmolarity > 600 mOsm/l
- Parenteral nutrition (>800 mOsm/L or >4-6 weeks)
- Vesicant drugs and any drug potentially associated with endothelial damage
- Hemodynamic monitoring
- Repeated blood samples
- Need for medium or long term i.v. line (months or years)

- Non TUNNELED: emergency
- TUNNELED: SVC obstruction

Short peripheral cannula
- Superficial vein of the arm available
- Needed for < 1 week
- Intra-hospital use

Long peripheral cannula
- Superficial vein of the arm unavailable (US-guided insertion in deep veins of the arm)
- Needed for < 1 week but < 3 weeks
- Intra-hospital use

Midline catheter
- Superficial vein of the arm unavailable US-guided insertion in deep veins of the arm)
- Needed for > 3 weeks
- Intra and extra-hospital use

In-Hospital use
- PICC (“brachially” inserted CVC)
  - First choice unless contraindicated (see table)
- CICC (“cervical/thoracically” inserted CVC)
  - Deep arm veins unavailable or not suitable (see table)
  - Emergency
  - Anti-microbial catheter (until antimicrobial PICCs available on Italian the market)
  - More than 3 lumens needed or number of lumens conflicting with catheter-to-vein ratio
- FICC (“Femorally” inserted CVC)
  - NON TUNNELED: emergency
  - TUNNELED: SVC obstruction

Extra-Hospital use
- Day-Hospital, Home care, Hospice

Medium term (< 4 months)
- PICC
  - As a first choice unless contraindicated
- CICC
  - When PICC contraindicated (see table)
  - Possibly tunneled

Long term (> 4 months)
- PORT (brachial/chest/groin – see table for indications/contraindications)
- Frequent access (frequency > 1/week) and/or continuous infusion > 4 days/week
- TUNNELED-CUFFED DEVICE (brachial/chest/groin – see table for indications/contraindications)
Peripheral venous access

For less than 4 weeks
- < 1 week: Superficial veins available → SHORT PERIPH. CANNULA
- > 1 week: Superficial veins not available
  - LONG PERIPHERAL CANNULA (MINI-MIDLINE)

For more than 4 weeks (extrahospital use)
- MIDLINE
Central VAD for intra-hospital use

Elective CVC

Emergency CVC

First option: PICC

Second option: CICC (axillary)

Third option: CICC (supraclavicular)  preferably tunneled

Fourth option (SVC obstruction): tunneled FICC

FICC or CICC (to be removed within 48 hrs)
Extra-hospital venous access

Medium term (< 4-6 months)

First option: PICC, tunneled or not
Second option (if PICC contraindicated): tunneled CICC
Third option (SVC obstruction): tunneled FICC

Long term (> 4-6 months)

For infrequent use (< 1/week): chest port, PICC port
For frequent use (> 1/week): tunneled-cuffed CICC, tunneled-cuffed PICC, tunneled-cuffed FICC