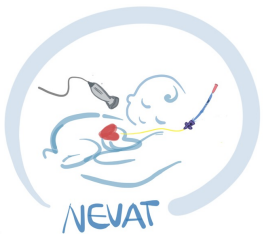




# Percorsi formativi NEVAT

Fiammetta Piersigilli



Neonatal European Vascular Access Team

# Courses on Vascular access in the neonate

WHY?

In most NICUs the clinical practice around venous access should be updated

## New technologies

Ultrasound, Glue,  
intracavitary ECG

## New materials

Polyurethane  
Chlorhexidine

## Recent recommendations

Tip location  
Tip navigation



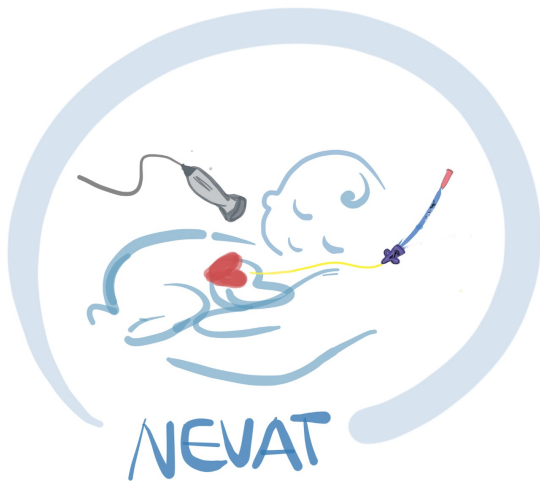


Association for Vascular Access

Safe, timely, and appropriate vascular access is a fundamental component of modern healthcare. Vascular access is a critical aspect of patient care across all settings and populations, from neonates to geriatrics, and should be delivered by **trained professionals** following **evidence-based practices**.



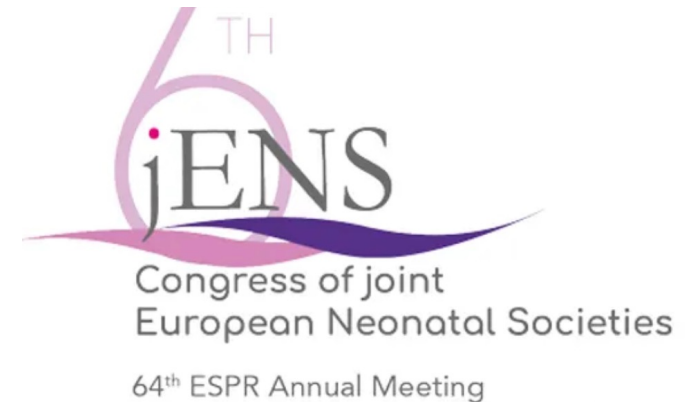
Comprehensive and **standardized training** is essential for the safe, effective, and evidence-based management of vascular access worldwide. As vascular access remains a cornerstone of modern medicine, the skill and knowledge of healthcare providers directly impact patient outcomes.



Neonatal European Vascular Access Team



## Course on neonatal vascular access



## Safe training



Allows for practice without risk to the patient

### **Practical and Standardized Learning**

Each trainee faces the same scenarios, ensuring educational consistency.

### **Development of Technical Skills**

Improvement of manual skills in techniques such as ultrasound-guided access, device selection, and complication management.

### **Immediate Feedback**

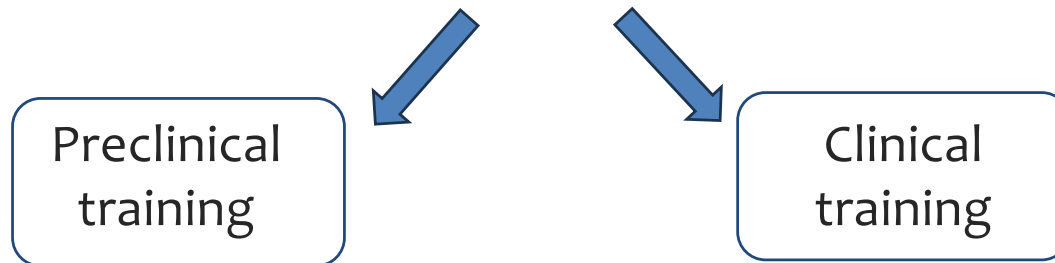
Real-time evaluations of errors and performance

### **Preparation for Complex Scenarios**

Simulates difficult access, critical patients

Advanced training = fewer complications and greater patient safety

# WoCoVa statement on training for vascular access



## Structured training programs

Frontal lessons covering device selection ,  
insertion techniques, maintenance,  
complication management

## Hands on practice

on simulators or volunteers with ultrasound

## Interdisciplinary education

Nurses, physicians, specialists

## Equal access across the world

Including low resource settings

## Proctored training

Learning curve





## Core content

Central venous  
access devices  
UVC – nPICCs - CICCs

Peripheral access  
devices

Arterial access  
devices

Scientific evidence - International guidelines



## Core content - Lessons

Overview of the main changes that are occurring in neonatal vascular access  
Current protocols for the choice of the catheters

### Techniques of insertion

Technique of UVC insertion and tip navigation/location  
Technique of nPICC insertion and tip navigation/location  
Technique of CICC insertion and tip navigation/location  
Analgesia /sedation for venous access procedures

### Maintenance

Care of the exit site  
(Glue, sutureless devices, transparent membranes)  
Prevention/early diagnosis of extravasation  
Strategies to minimize the risk of infection



## Core content - Ultrasound machine

**“Knobology”**



### Probes



- Always linear high frequency probes
- Set up machine to use this probe
- Sterile gel (individual packs)
- Ensure marker of probe matches the screen
- Note the reverse button





## Core content - Videos

Techniques of  
insertion

Tip navigation/  
location

Techniques of  
maintenance

Videos available at [neonat.org](http://neonat.org)



## Core content - skill stations

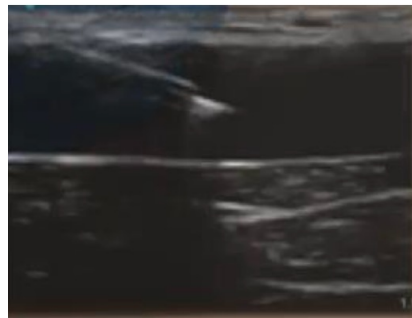
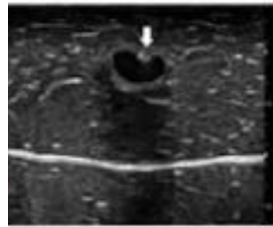
Ultrasound guided venipuncture      **Simulators**

**Simplified simulators**



## Simplified simulators

- 1. **Cross sectional,**  
short axis or  
out of plane
- 2. **Longitudinal,**  
long axis or in  
plane





## Core content - skill stations

Ultrasound guided venipuncture     **Simulators**

**Advanced simulators**





# Core content - skill stations

Ultrasound guided venipuncture      **Simulators**

## Biological simulators



*British Journal of Anaesthesia* **110** (3): 347–56 (2013)  
Advance Access publication 29 January 2013 · doi:10.1093/bja/aes499

BJA

## **Evidence-based consensus on the insertion of central venous access devices: definition of minimal requirements for training**

N. Moureau<sup>1</sup>, M. Lamperti<sup>2\*</sup>, L. J. Kelly<sup>3</sup>, R. Dawson<sup>4</sup>, M. Elbarbary<sup>5</sup>, A. J. H. van Boxtel<sup>6</sup> and M. Pittiruti<sup>7</sup>

### **Anatomical models**

There are a variety of inanimate models useful for simulating vessel anatomy visualization with ultrasound. The best simulation models should include vessels and also mimic the normal body anatomy with muscles, soft tissues, and bones. For this reason, inanimate animal models such as turkey breasts may be effective for simulation practice with ultrasound.

## Core content - skill stations

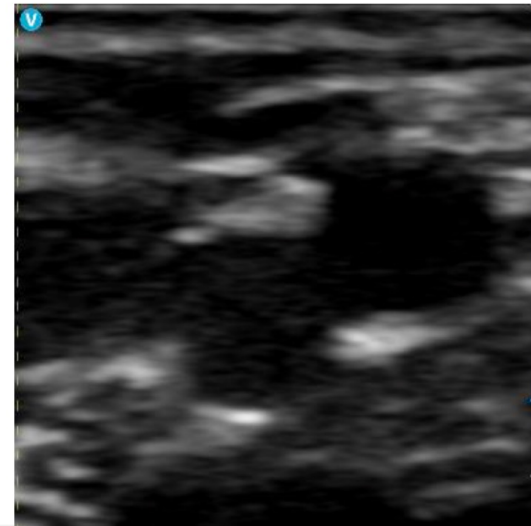
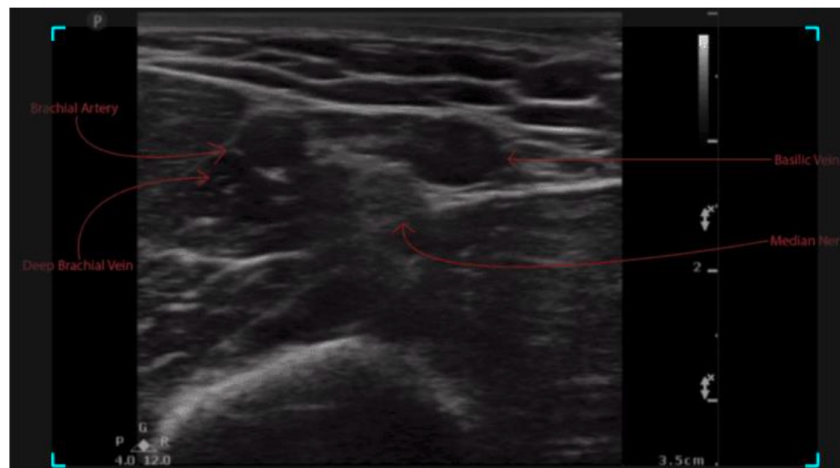
Visualization of superficial veins  
and deep veins by US

Volunteers



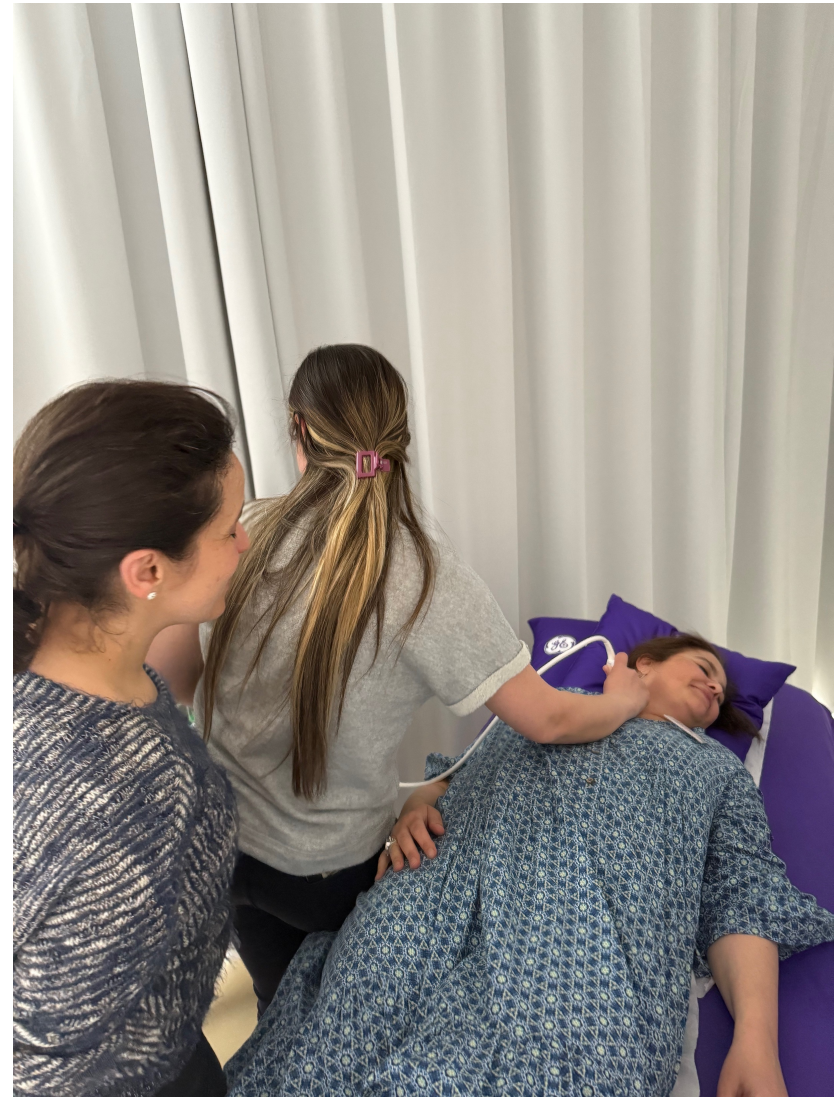
## Get to know the vein

- Map out the vein by **scanning up and down** a few centimeters to know anatomy and direction of the vein & making a mental note of any arteries.
- Use longitudinal view to understand the axis of the vein
- Double check by **compressing** the vein by adding pressure with the transducer causing the vein to collapse. If the vein is compressible you know it is patent.









## Core content - skill stations

Catheter insertion -  
securement

Simulators





## Core content

Attendees: Physicians / nurses

Even if device insertion is mainly performed by physicians, the nurse should know every detail of it

Even if device maintenance is mainly performed by nurses, physicians should know every detail of it

## Core content

Tutors: NICU clinicians

Ideal ratio between tutors and attendees

3-4

12-20

Tutors must be motivated and expert in neonatal vascular access

Clinicians actively working with neonates

Aware of the latest recommendations of international guidelines

Aware of the latest clinical studies



## Core content

A lot of NICUs are completely closed to novelties and it is difficult to overcome the closure

Courses are mainly preclinical and on simulators



## Course on scular access in the neonate

Expand the knowledge to the NICUs that are still not interested



## **Course on Vascular access in the neonate**

Expand the knowledge to the NICUs that are still not interested

Complete the educational course with a clinical training in the NICU

## Evidence-based consensus on the insertion of central venous access devices: definition of minimal requirements for training

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### Teaching CVAD insertion with children and neonates

Central venous catheterization in paediatric patients and neonates is considered a challenging procedure, even when ultrasound guidance is used. Several papers demonstrate a significant reduction in major complications when ultrasound guidance is used instead of the landmark technique.<sup>87–90</sup>

Central venous device placement in children and neonates requires specific training in order to achieve competence in central vein cannulation.

It is necessary to have minimal cannulation of 70 central vein punctures per year in order to maintain the skills and the competence in these patients.<sup>91</sup> Ultrasound guidance enhances first-time success and time to cannulation in small infants, but requires supervised training to gain proficiency. It has been demonstrated to take 15 supervised, ultrasound-guided cannulations to reach proficiency with small infants.<sup>91</sup>

## **Course on Vascular access in the neonate**

Expand the knowledge to the NICUs that are still not interested

Complete the educational course with a clinical training in the NICU

Train the trainer courses to expand the pool of potential tutors



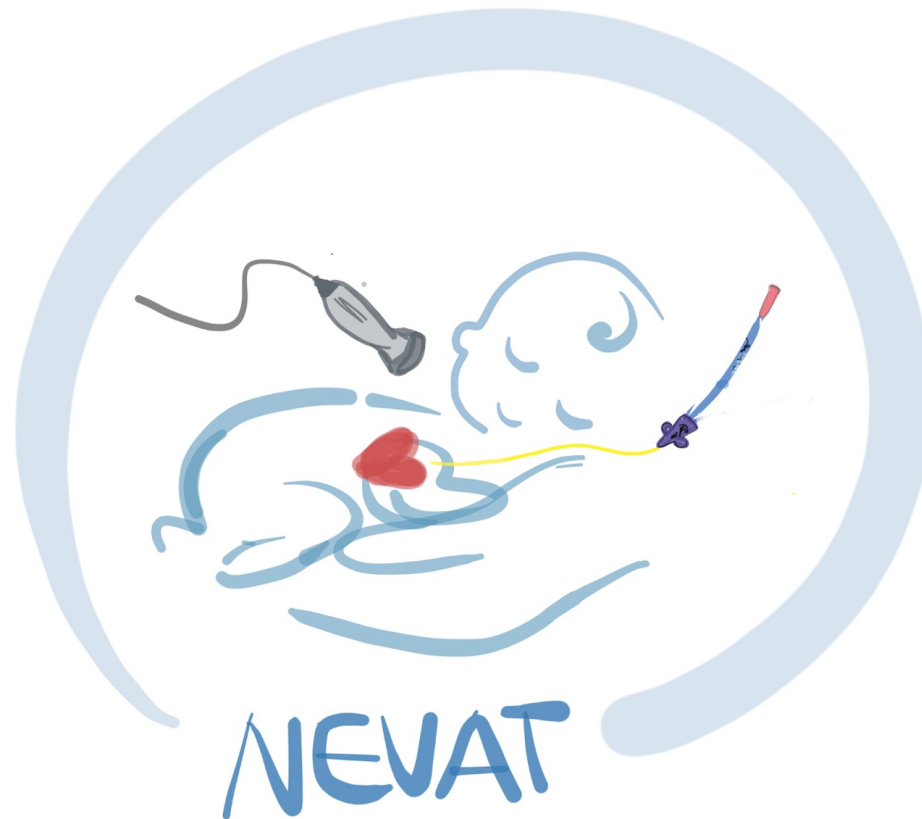


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Neonat.org

[www.espr.eu/SIGs/Paediatric\\_Neonatal\\_Vascular\\_Access.php](http://www.espr.eu/SIGs/Paediatric_Neonatal_Vascular_Access.php)

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