

WOCOVA  
7th World Congress on Vascular Access



16-18 OCTOBER MEGARON  
**2022** ATHENS  
GREECE



Ultrasound-guided peripheral venous access  
in small children; indication and challenges.



# Disclaimer

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- I have no financial relationships to disclose
- I am a neonatologist so my focus will be on small children
- However, the concepts presented can be easily translated to all patients

# **Reaching One Peripheral Intravenous Catheter (PIVC) Per Patient Visit With Lean Multimodal Strategy: the PIV5Rights™ Bundle**

**Lee Steere, RN, CRNI®, VA-BC™**

**Cheryl Ficara, RN, MS, NEA-BC**

**Michael Davis, RN, BSN, MBA, NE-BC**

Hartford Hospital, Hartford, CT

**Nancy Moureau, RN, PhD, CRNI®, CPUI, VA-BC™**

PICC Excellence, Inc., Hartwell, GA

<https://doi.org/10.2309/j.java.2019.003.004>

REVIEW

Open Access

## Ultrasound-guided peripheral vascular catheterization in pediatric patients: a narrative review

Yoshinobu Nakayama<sup>1,2\*†</sup> , Jun Takeshita<sup>3†</sup>, Yasufumi Nakajima<sup>4,5†</sup> and Nobuaki Shime<sup>6†</sup>



## Ultrasound for Pediatric Peripheral Intravenous Catheter Insertion: A Systematic Review

Evan O. Mitchell, MBBS,<sup>a,b,\*</sup> Philip Jones, MBBS MBIostat,<sup>a,c,d</sup> Peter J. Snelling, MBBS, MPHTM,<sup>a,d,e,f,\*</sup>  
PEDIATRICS Volume 149, number 5, May 2022:e2021055523

## Ultrasound-guided techniques for peripheral intravenous placement in children with difficult venous access

Farrukh Munshey<sup>1</sup>  | Dimitri A. Parra<sup>2</sup> | Conor McDonnell<sup>1</sup>  | Clyde Matava<sup>1,3</sup> 

*Pediatric Anesthesia*. 2020;30:108–115.

## Ultrasound-guided placement of peripherally inserted intravenous catheters increase catheter dwell time in children

James Thomas Cottrell<sup>1</sup>, Todd Chang<sup>2</sup>, Jennifer Baird<sup>1</sup>,  
Jbanna Barreras<sup>1</sup> and Marsha A Elkhunovich<sup>2</sup> 

The Journal of Vascular Access  
2021, Vol. 22(2) 189–193  
<sup>a</sup> The Author(s) 2020  
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# Indication

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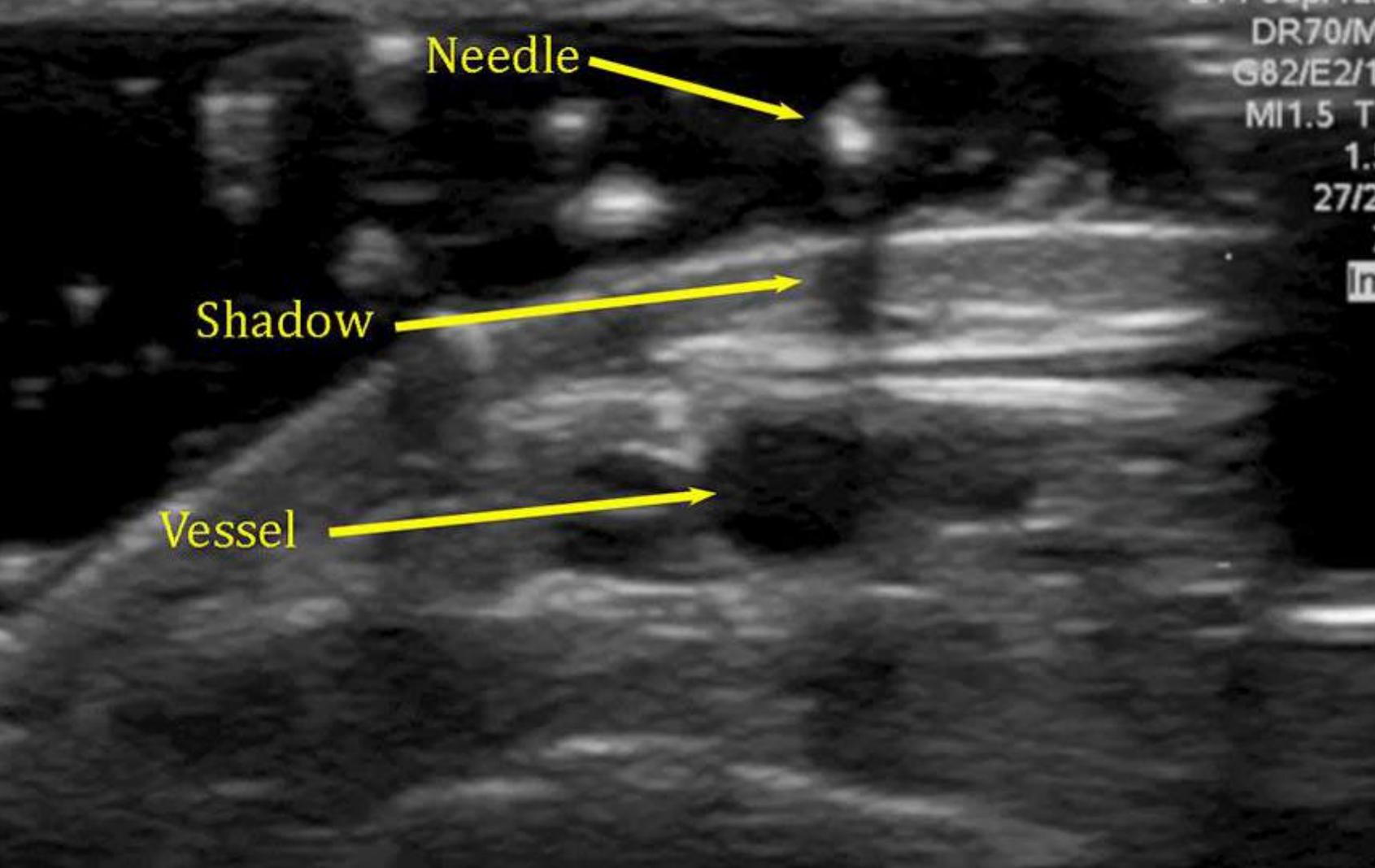
**SHORT TERM VENOUS ACCESS!!**

**short term = days**

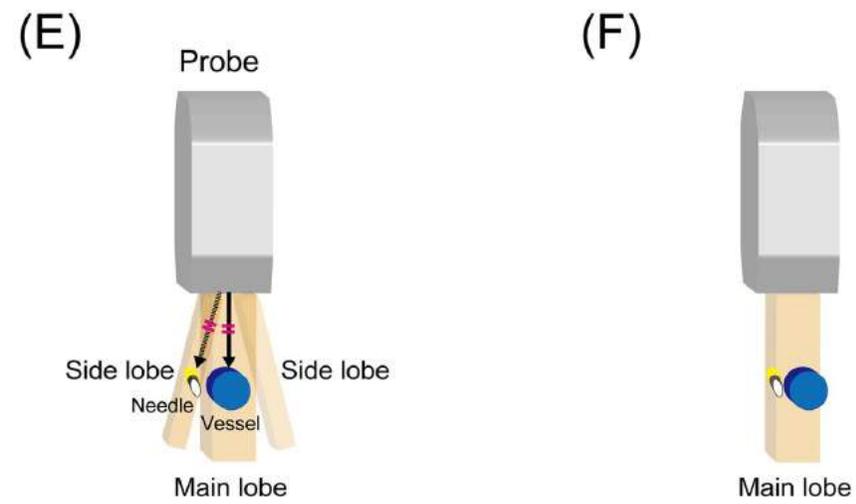
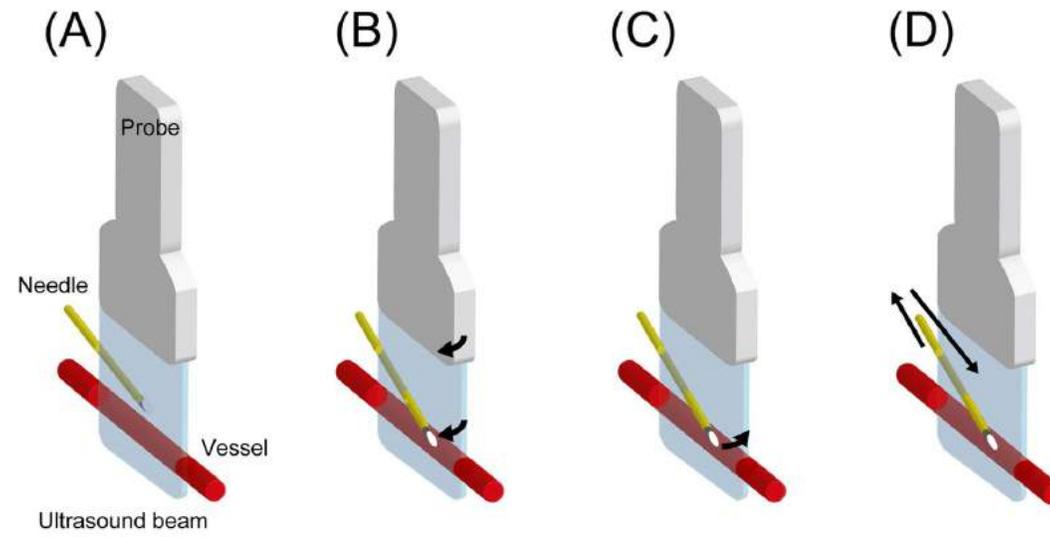
# Challenges

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- D-OOP or IP? Or combination?
- Size of patient and vessel
- Catheter length
- Practical implementation issues
- Training and maintaining proficiency

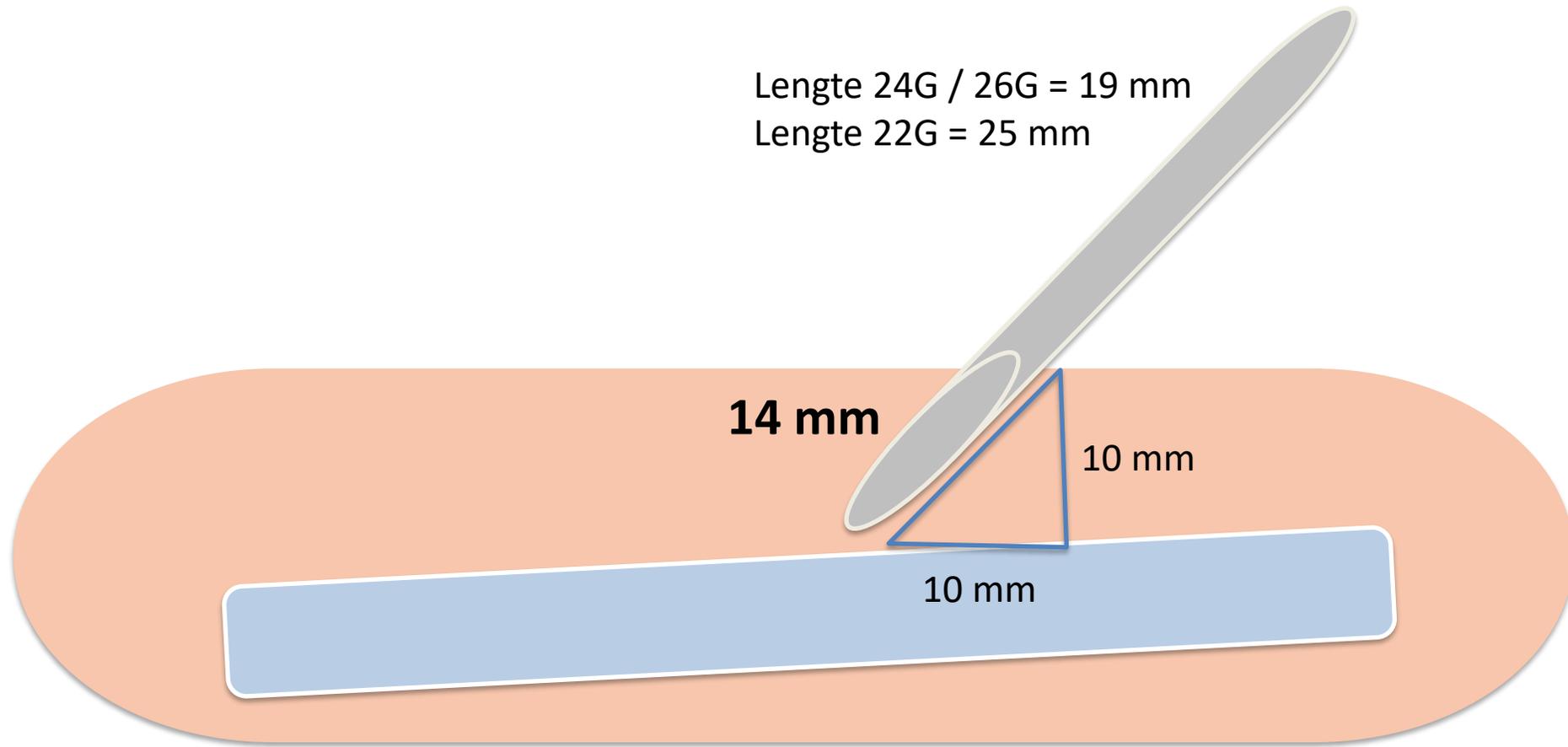








Lengthe 24G / 26G = 19 mm  
Lengthe 22G = 25 mm



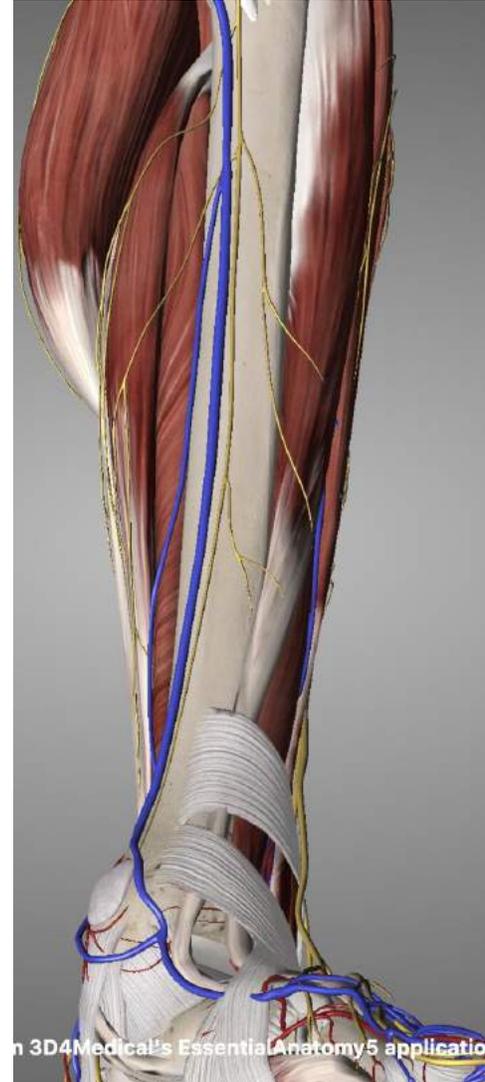
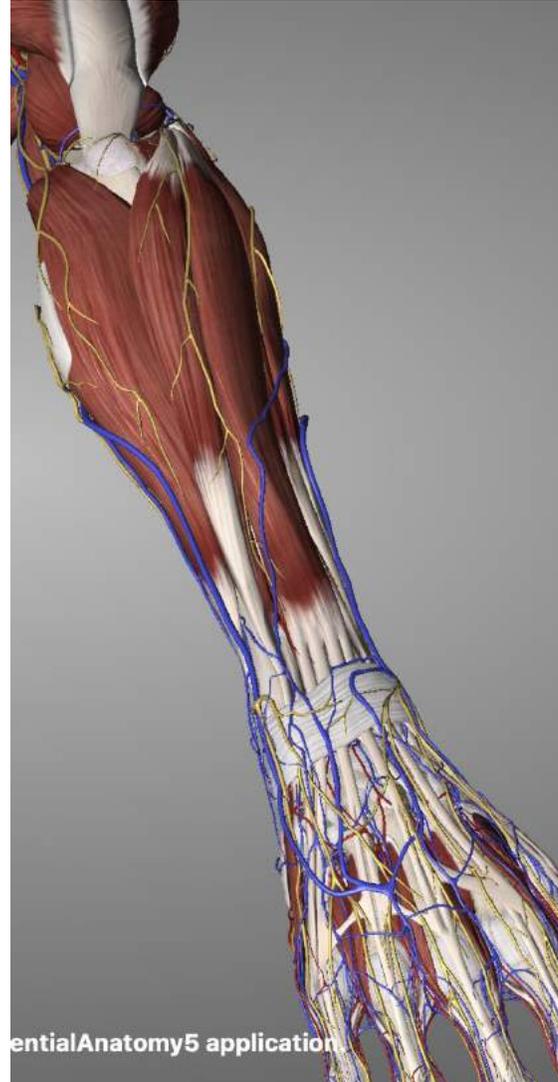
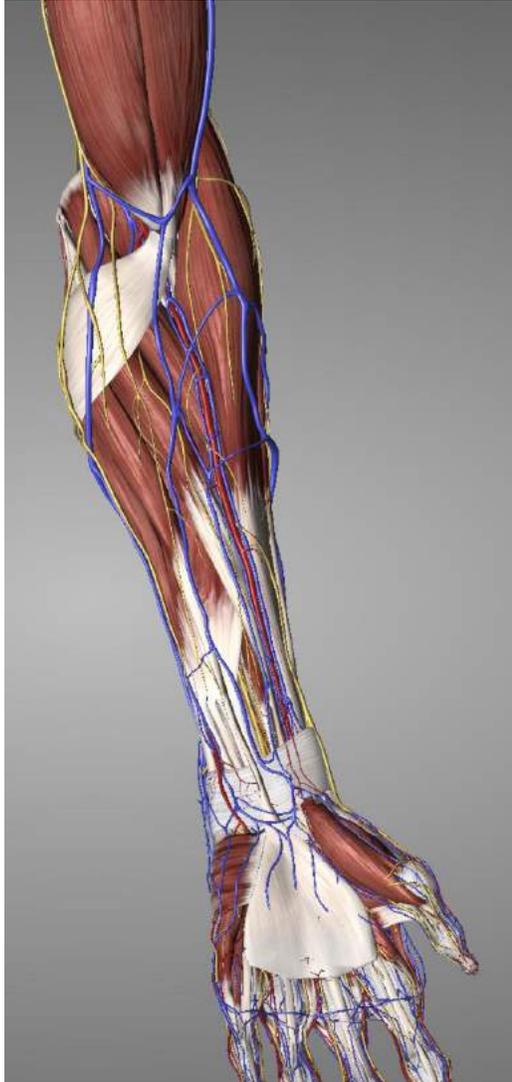
$$a^2 + b^2 = c^2$$

# Practical: scanners

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# Practical: location



# Practical: preparation and sedation

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- Caregivers can be essential
  - Preparation is everything
  - Use local analgesia
  - Distraction! Gentle fixation.
  - Ideally size of the team is at least 4 professionals
  - Sedation: oral, nasal, inhalation
- This takes time

# Training

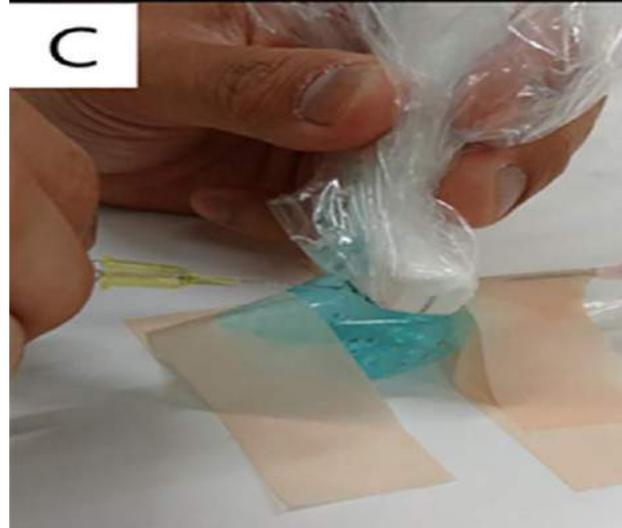
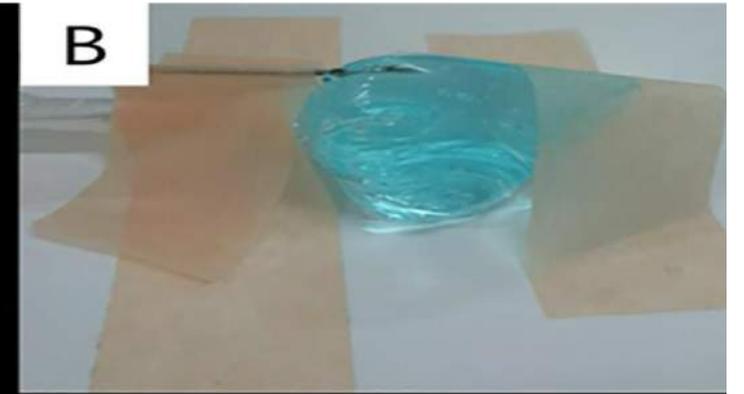
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- Should be part of comprehensive program: 5R's, bundles!
- Basics of ultrasound
- Eye-hand coordination
- Training everyone vs select team?
- Skill maintenance

# Models

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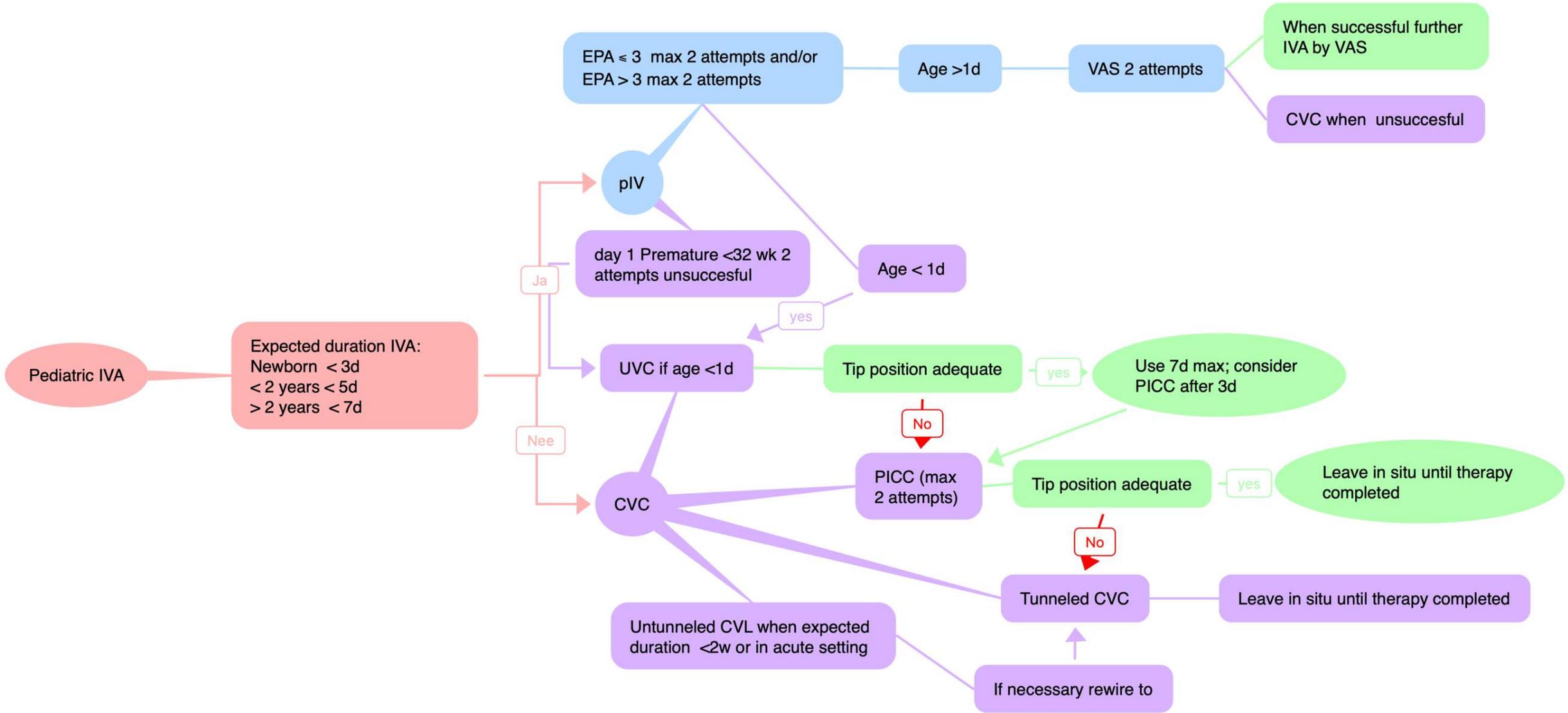
- Ideally with really small vessels (0,5-1,5 mm)
- Beware of animal tissue (in some settings)
- Tofu and silicone tubing
- Gel and cannula
- Block and cannula



# Developments in our Children's Hospital

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- Amalia Vascular Access Team
- PA, pediatric intensivists, neonatologists, anesthesiologists, interventional radiologists
- Dedicated department
- Cooperation is key
- Training





# Summary and thoughts

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- 5 R's
- USG pIV access is feasible also in small children
- Time and team consuming procedure
- Vascular Access Team increases robustness of this service
- Know that parents keenly observe what you accomplish...

# Amalia Vascular Access Team



## Dept of Pediatrics:

Philip van Haren

Eva van Kooten

Twan Aalbers

Caroline Lamers

Joris Fuijkschot

Lonneke Aarts

## Dept of Pediatric Intensive Care:

Gerald Jaspers

Marloes IJland

Annelies van Zwol

## Dept of Interventional Radiology

Mark Arntz

## Dept of Neonatal Intensive Care:

Lloret Hoenselaar

Paul Dirkes

Milou van Ingen

René Matthijsse

Tim Antonius

## Dept of Pediatric Anesthesiology:

Mila Leeuwerik

Chantal Mulder

## Dept of Pediatric Surgery:

Ivo de Blaauw

Horst Daniels

Bas Verhoeven