

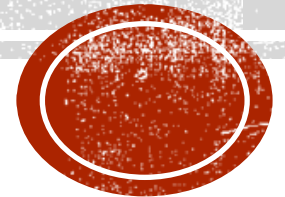
PAEDIATRIC CENTRAL VENOUS CATHETER AUDIT & NEW GUIDELINE

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AUDIT OBJECTIVES

- Audit of central venous catheters inserted in children under 1 year of age prior to, or during, PICU admission
- To review current practice in relation to what length CVCs are being inserted in relation to patient size
- To review how often the CVC tip position is either too long or too short, and whether this is due to inappropriate line selection in relation to patient size
- To review CVC complications and establish if these are related to line length and patient size
- Establish new guidance for CVC size and length in children

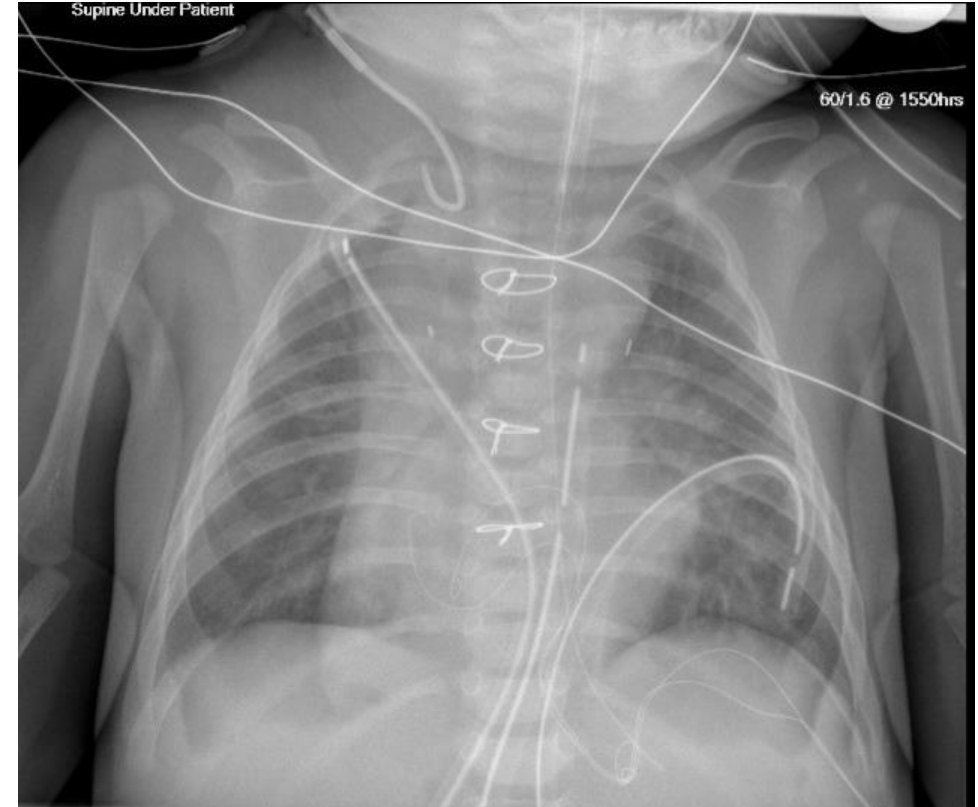
METHODOLOGY

- 200 patients under 1 year of age admitted to PICU between January 2019 and July 2020 who had CVC inserted
 - 100 Cardiac Surgery Patients
 - 100 Non-cardiac Surgery Patients



SUMMARY OF FINDINGS

- Wide variation in size/length of lines being inserted currently
- Poor documentation made data collection challenging
- Internal Jugular lines
 - Too short most commonly 5cm lines in >5kg babies
 - Too long most commonly 8cm lines but across all weight groups
- Complication rate 6.5%
- Complications most common with 5Fr 5cm lines



LEEDS CHILDREN'S HOSPITAL CENTRAL VENOUS ACCESS INSERTION GUIDELINE

Finn, Winton, Rawabdeh, Chauhan March 2021

**DOES YOUR PATIENT REALLY
NEED A CENTRAL VENOUS LINE?
IF SO, ARE THEY A CARDIAC
PATIENT DEPENDENT UPON
PATENT JUGULAR VEINS FOR
FUTURE SURGICAL
INTERVENTION?
IF YOU ARE NOT SURE - ASK!**

TARGET AUDIENCE

Any member of staff involved in the insertion and on-going care of central venous lines inserted in patients admitted to and being admitted post operatively to paediatric intensive care

SIZE AND LENGTH GUIDANCE FOR INTERNAL JUGULAR VEIN INSERTION

Weight of patient	Brand	Size/ Length of triple lumen line to be inserted
< 3kg	Cook	5Fr 5cm Triple lumen
3 - 8kg	VYGON	4.5Fr 6cm Triple lumen
8- 20kg	Cook	5 Fr 8cm Triple lumen
20 - 50kg	Cook	5Fr 12cm Triple lumen
50kg +	Cook	5Fr 15cm Triple lumen (or larger adult CVC)

SIZE AND LENGTH GUIDANCE FOR FEMORAL VEIN INSERTION

Weight of patient	Brand	Size/ Length of triple lumen line to be inserted
< 3kg	VYGON	4.5Fr 6cm Triple lumen
3 - 20kg	Cook	5Fr 8cm Triple lumen
20-50kg	Cook	5Fr 12cm Triple lumen
50kg +	Cook	5Fr 15cm Triple lumen (or larger adult CVC)

Please consider using a Vygon 4 or 5 lumen CVC in the 50kg+ group which can be obtained from adult ICU/adult theatres

INSERTION TECHNIQUE

Paediatric Critical Care Society
Procedure videos: Right Internal Jugular
Vein: <https://youtu.be/EX83FOV8fIQ>

Consider the use of 'Cook Micro-puncture' needle and wire sets for challenging central venous access.



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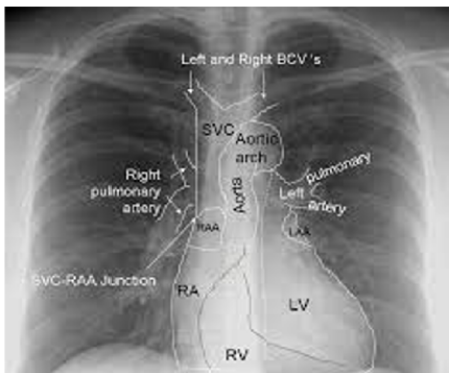


DOCUMENTATION

- Please complete the 'Central Venous Access' clinical form on patient record in PPM including the indication for line insertion.
- If there is a complication with a central venous line then please make a separate entry on PPM stating the complication and what action was taken.
- If a patient arrives from another hospital with a central line already in situ please ensure the size and length are documented.

POSITION

IDEAL POSITION IS WITHIN THE SVC-RAA JUNCTION



From Teleflex Academy; Find Your Rhythm: Where is the optimal tip position for CVCs?

Around T5-T6 on AP chest film

RISKS IF PROXIMAL:

- Migration of line & potential infusion leakage at skin
- Extravasation injury

RISKS IF DISTAL:

- Migration into right ventricle with damage to tricuspid valve apparatus
- Endocardial wall erosion leading to pericardial effusion +/- tamponade
- Thromboembolism

EVIDENCE

Finn, Winton, Rawabdeh, Chauhan, Leeds Children's Hospital Paediatric Intensive Care Central Venous Access Audit, 2021 (200 patient episodes)

Complications of Central Venous Access Devices: A Systematic Review, Amanda J. Ullman, Nicole Marsh, Gabor Mihala, Marie Cooke, Claire M. Rickard, Pediatrics Nov 2015, 136 (5) e1331-e1344; DOI: 10.1542/peds.2015-1507

Miller JW, Vu DN, Chai PJ, Kreutzer JH, John JB, Vener DF, Jacobs JP. Upper body central venous catheters in pediatric cardiac surgery. Paediatr Anaesth. 2013 Nov;23(11):980-8. doi: 10.1111/pan.12261. Epub 2013 Sep 19. PMID: 24088201

<https://www.teleflex.com/anz/en/australia-education/clinical-resources/Find-Your-Rhythm-What-is-the-Optimal-Tip-Position-for-CVCs-2016.pdf>