

Choice between Peripheral and Central Venous Access in ICU

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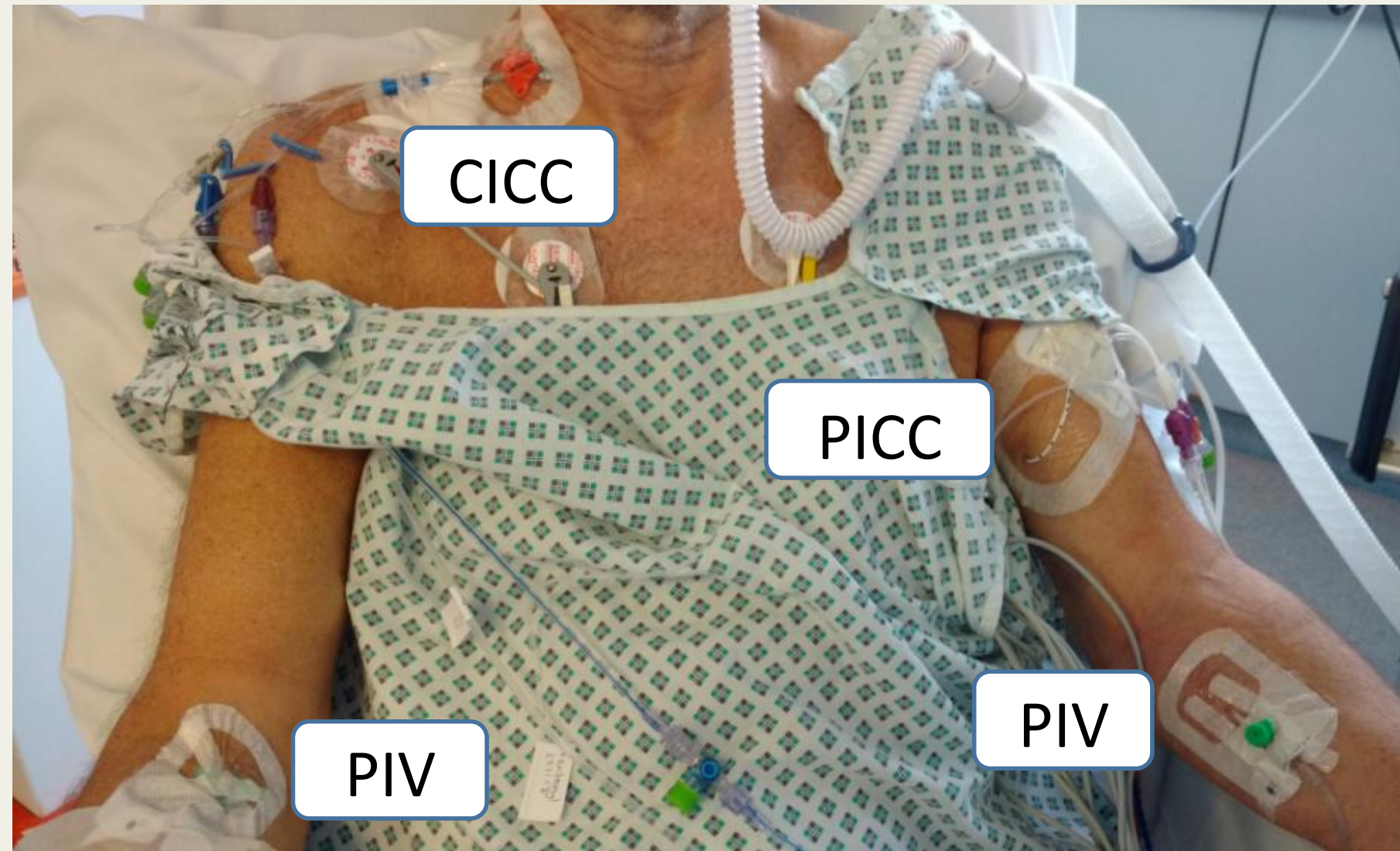
Clinical Lead for Vascular Access

UK NIVAS Board Member

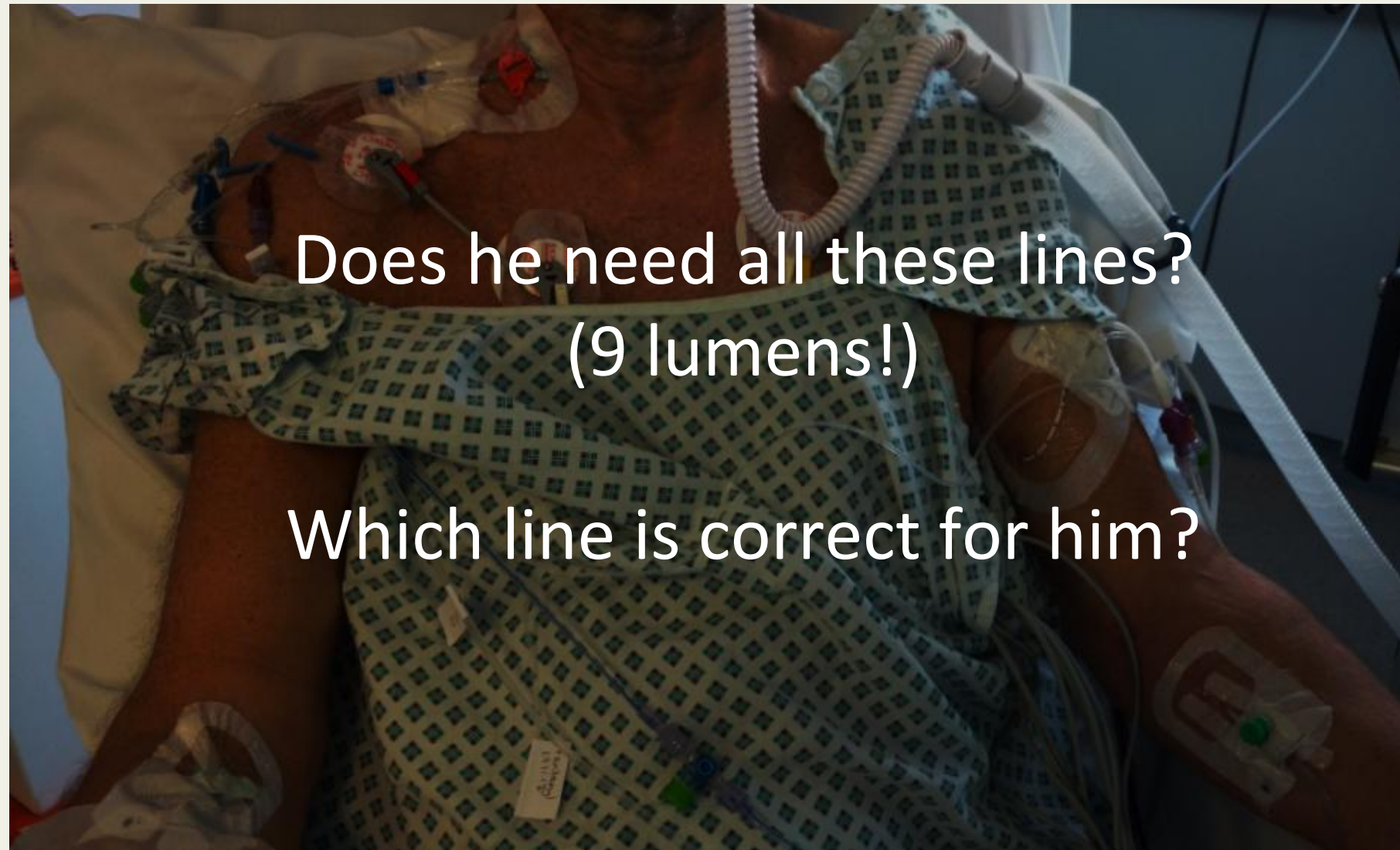
My ICU Patient!



My ICU Patient!



My ICU Patient!



Does he need all these lines?
(9 lumens!)

Which line is correct for him?

PIV or CICC ?

- Use and indications
- Placement
- Choice
- Risks and complications
- Current thinking / Evidence / Thoughts

IV Access on ICU

1. Administer drugs and medications
2. Administer IV fluids
3. Administer nutrition and other supplements
4. Draw regular blood samples
5. Monitor or measure some aspect of the cardiovascular system (*central*)
6. Administer a “one-off” solution/medication to aid diagnostic procedures e.g. CT (*peripheral*)

Drug/Fluid Administration

- Depends on:
 - Type of medication
 - Duration of administration
 - Rate of administration
- 1. Very high or very low pH (acidic, with pH approx. <5 or alkali, with pH approx. >9)
- 2. High osmolality (approx. >600 mOsm/L)
- 3. Very vesicant or irritant solutions
- 4. Continuous parenteral nutrition (TPN) formulations exceeding 10% dextrose and/or 5% protein
- 5. Continuous vesicant chemotherapy

Can vasopressors be given via a PIV?

Yes – Provided:

- Consider the **concentration** of the solution, with more dilute solutions being appropriate.
- Consider the **rate** of infusion, slower infusion rates are better.
- Consider the **size of the cannula** in relation to the size of the peripheral vein (discussed later), a smaller cannula in a larger vein is better.
- The **site** of the PIV is closely monitored.
- The expected duration of administration is relatively short.

Placement

- Urgency of need for venous access
- Skill and expertise of personnel
- Equipment and resources available
- Clinical situation
- Patient factors - anatomical and physiological

Patient factors - anatomical

- Tissue integrity
- Condition of skin
- Oedema, Infection
- Bruising or injuries
- Physical barriers (neck brace)

ICU patients have often been in hospital for some time, with multiple, previous PIVs









Patient factors - physiological

- Abnormalities of the clotting system, common among ICU patients
- Dysfunctional or low platelets
- Recent thrombolytic therapy

Relates to risks associated with CICC insertion

Peripheral venous cannulation

- Bad press in past
 - Just unreliable!
- Evidence suggests PIV can stay in.
- Can we do better on ICU...

YES WE CAN

Peripheral venous cannulation

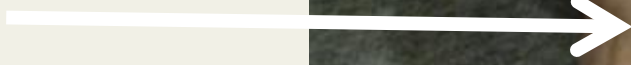
- Why do cannulae fail?
 - Poor initial placement
 - Poor vein selection

Vein Selection

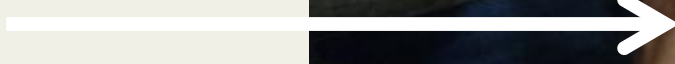


Vein Selection





Vein Selection



Peripheral venous cannulation

Poor Vein selection

- Vein size and calibre (larger veins are more suitable)
- Vein patency
- Vein integrity
- Presence of any valves, bifurcations or blind ended veins
- ULTRASOUND

RaCeVA  RaPeVA

Peripheral venous cannulation

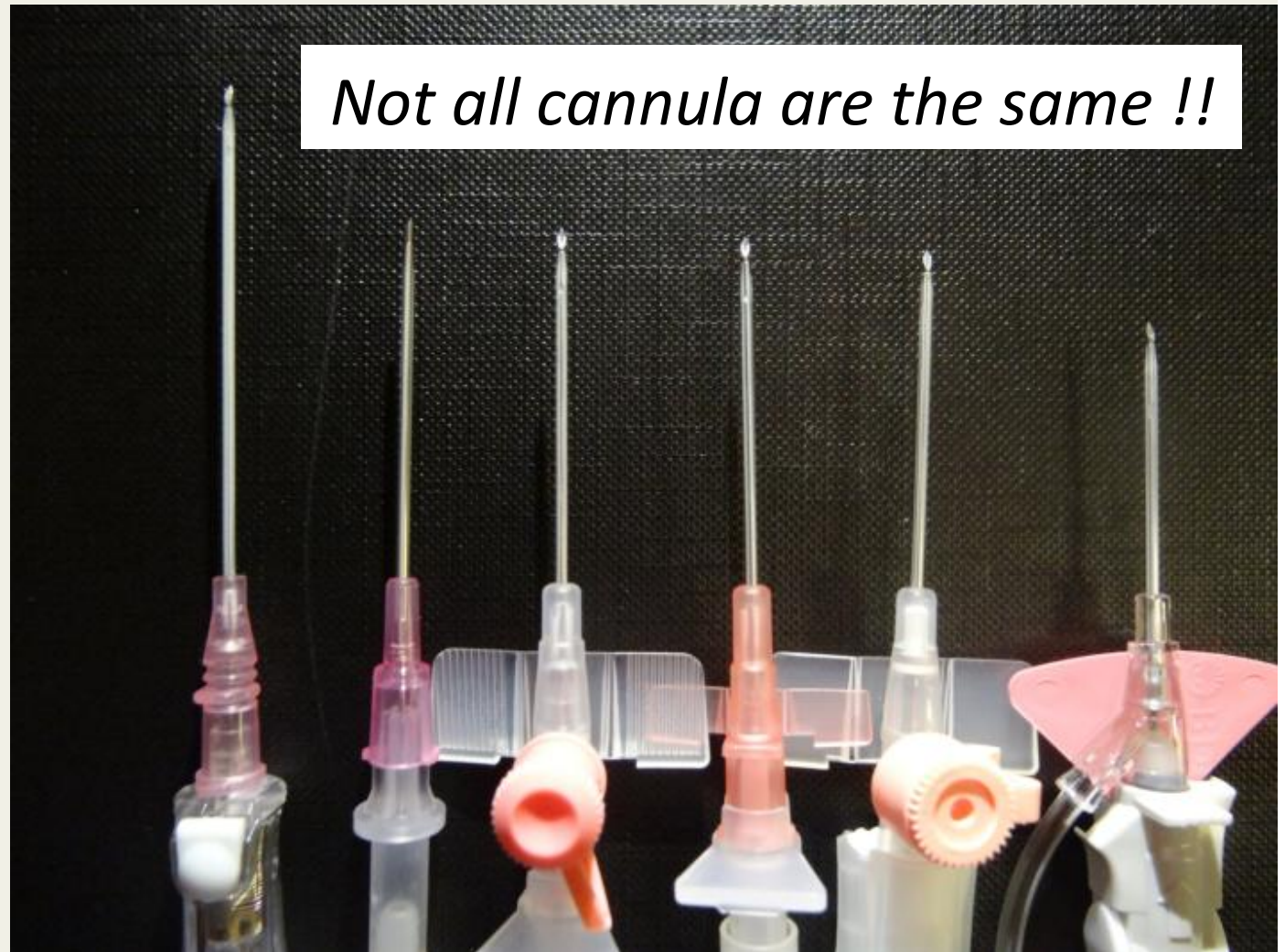
- Why do cannulae fail?
 - Poor vein selection
 - Poor initial placement
 - Poor choice of device
 - Inappropriate use
 - Poor ongoing care and maintenance

Peripheral venous cannulation

Poor choice of device

- **Length**
- Gauge
- Material
- Design

Not all cannula are the same !!



Risks / Complications

Related to:

	CICC	PIV
Insertion	++++	+
Phlebitis	-	++++
Infection (Local)	+	++
Infection (Systemic)	++++	+
Dislodgement	++	+
Thrombosis	+++	+
Other	++	+

Risks / Complications

- Infection of PIV:
 - Redness/warmth at or around the site of the cannula
 - Tenderness/pain around the site of the cannula
 - Induration
 - Oedema/swelling
 - Palpable venous cord
 - Presence of pus



Summary

- Consider PIV on ICU especially for short stay patients. They don't always need a CICC.
- Use Ultrasound
- Consider:
 - Your patient and their needs
 - Your PIV
- *Take care over your PIV and it will serve you well*

Thank you

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