

Umbilical **Vein** Catheter (UVC) Insertion Procedure

- ▶ Use sterile technique → equipment, gown, gloves, hat, mask, drapes
- ▶ Determine depth of insertion prior to starting
- ▶ Confirm placement with x-ray and repeat x-ray if the line is repositioned

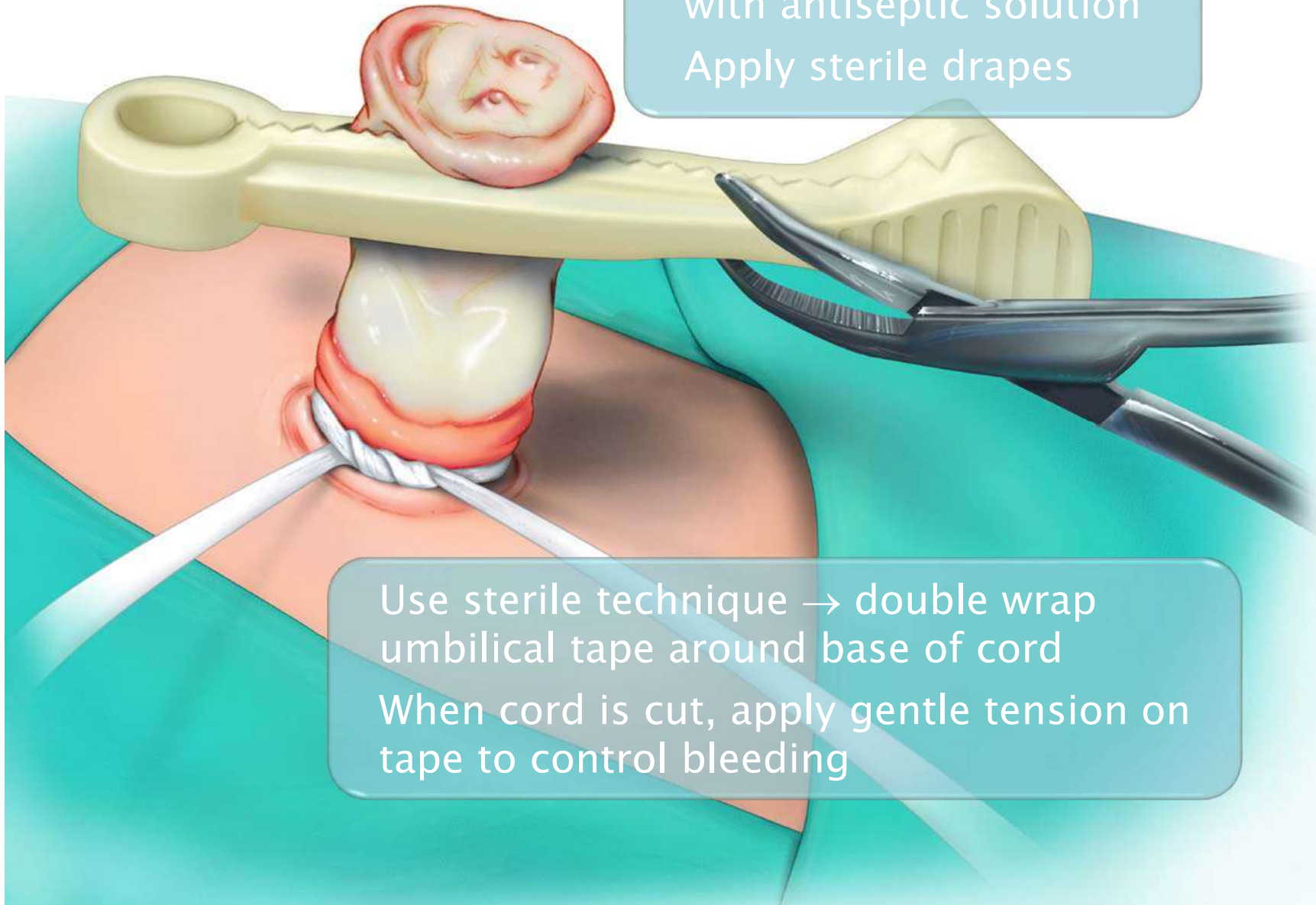
Catheter Size

- ▶ Under 1.5 kg → 3.5 French
- ▶ Over 1.5 kg → 5 French

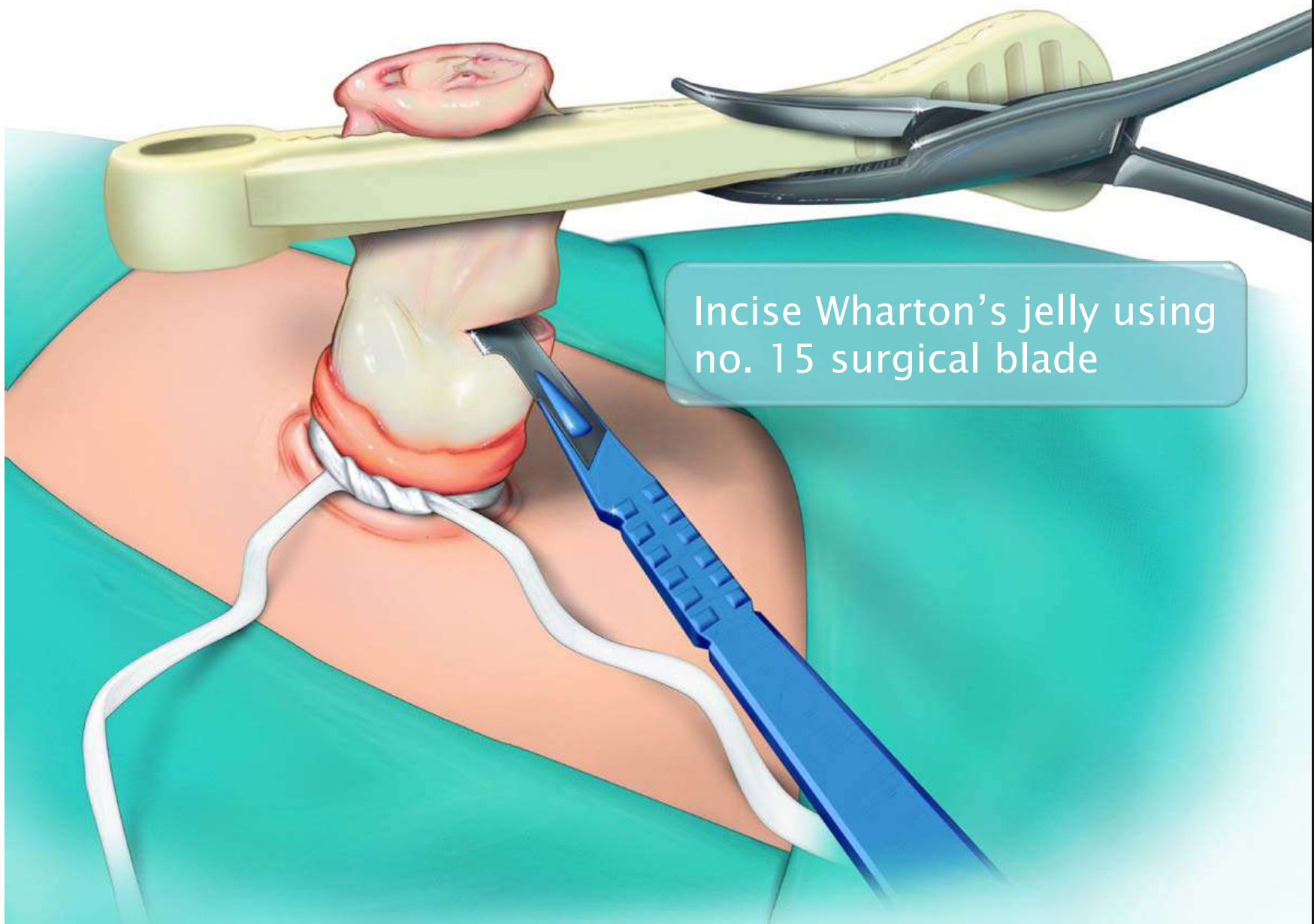


Umbilical **Vein** Catheter (UVC) Insertion Procedure

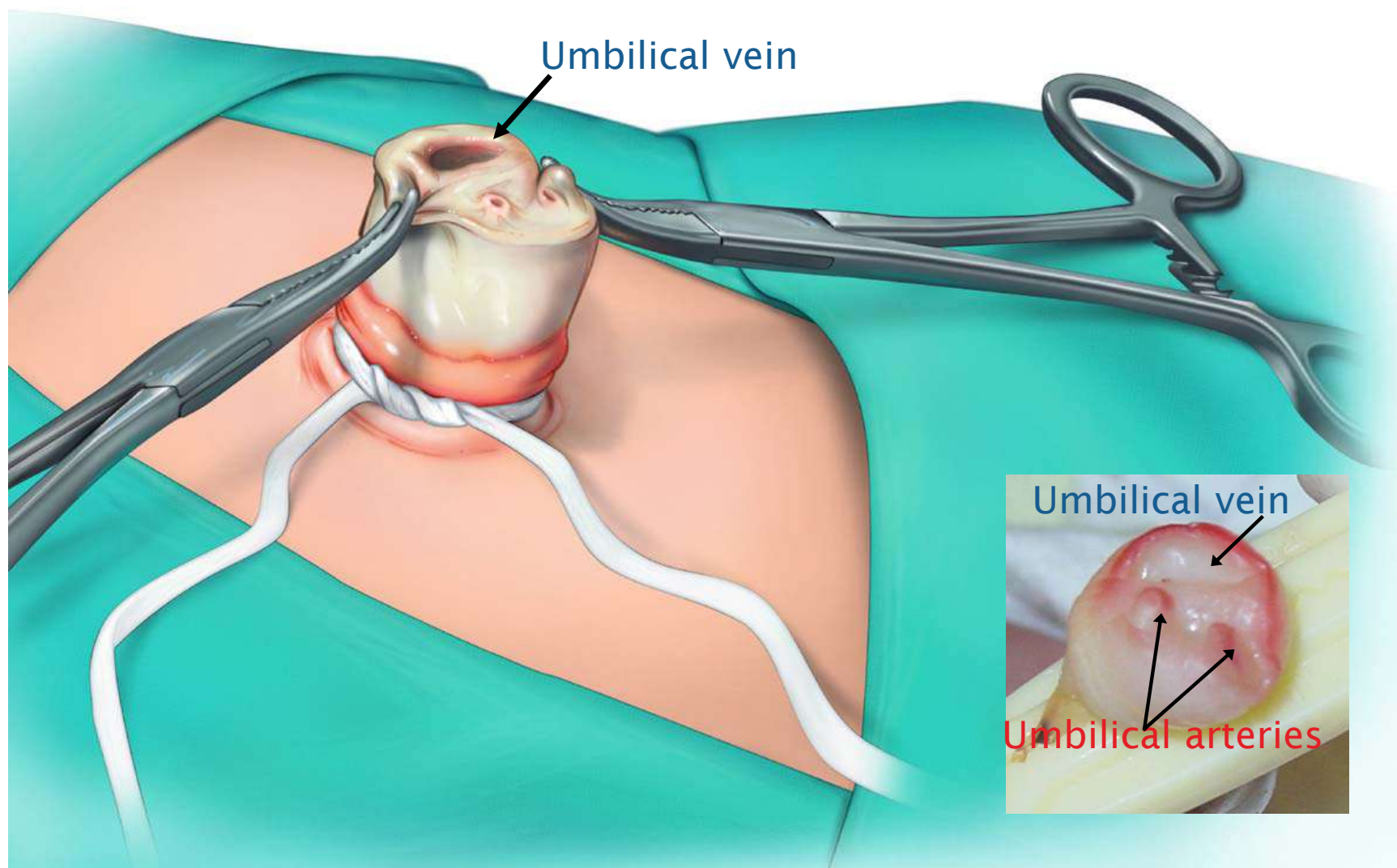
Cleanse umbilical cord
with antiseptic solution
Apply sterile drapes



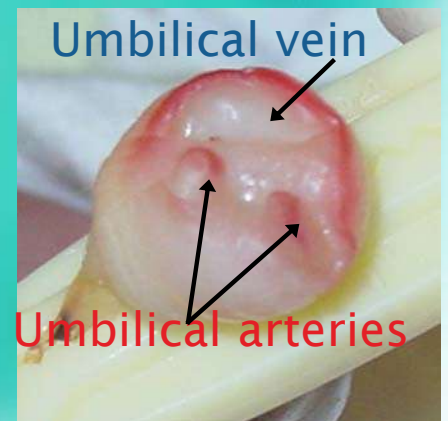
Use sterile technique → double wrap
umbilical tape around base of cord
When cord is cut, apply gentle tension on
tape to control bleeding

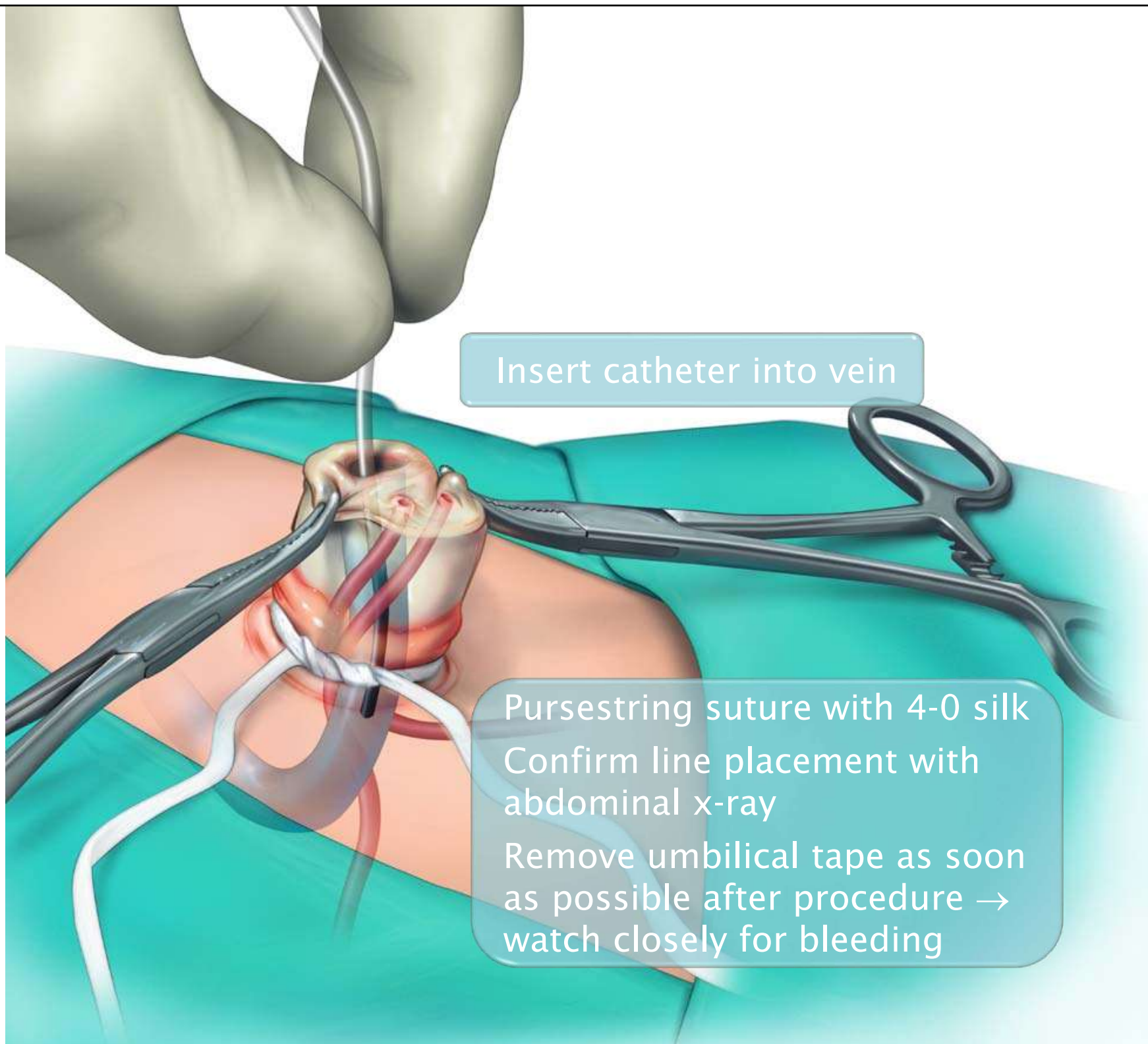


Incise Wharton's jelly using
no. 15 surgical blade



Use curved iris forceps to gently remove any clots from vein – before inserting catheter





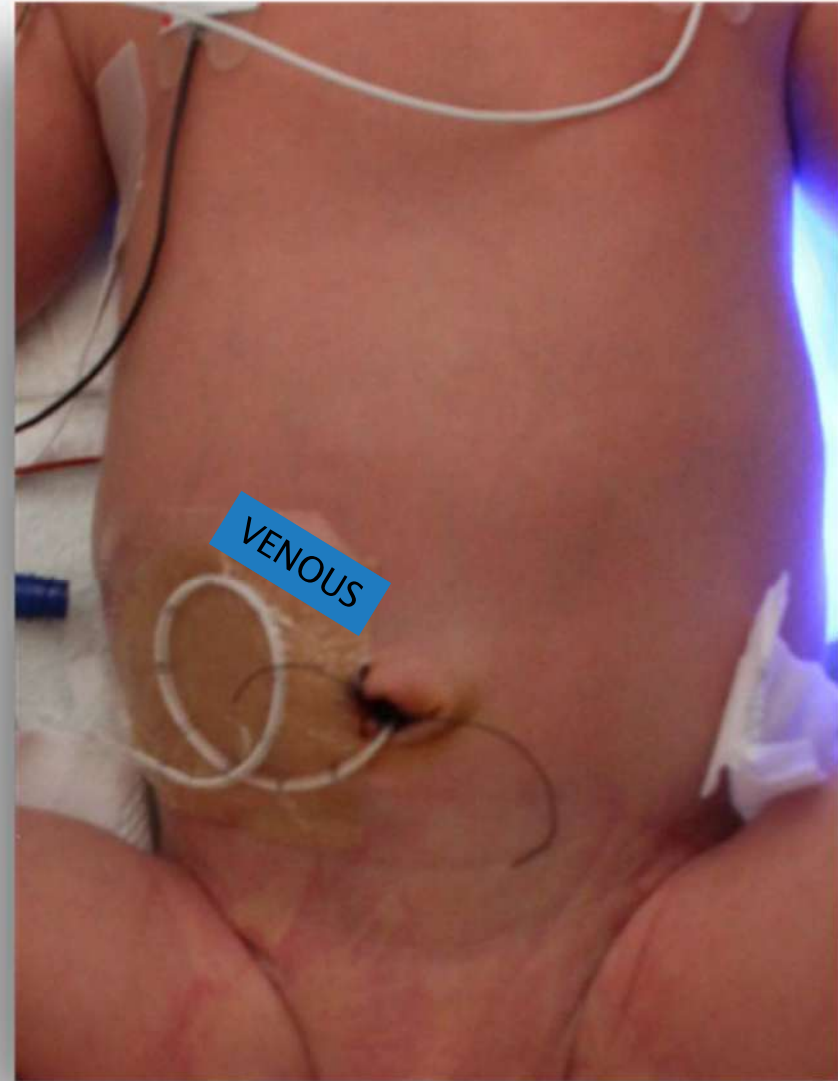
Insert catheter into vein

Pursestring suture with 4-0 silk
Confirm line placement with
abdominal x-ray

Remove umbilical tape as soon
as possible after procedure →
watch closely for bleeding

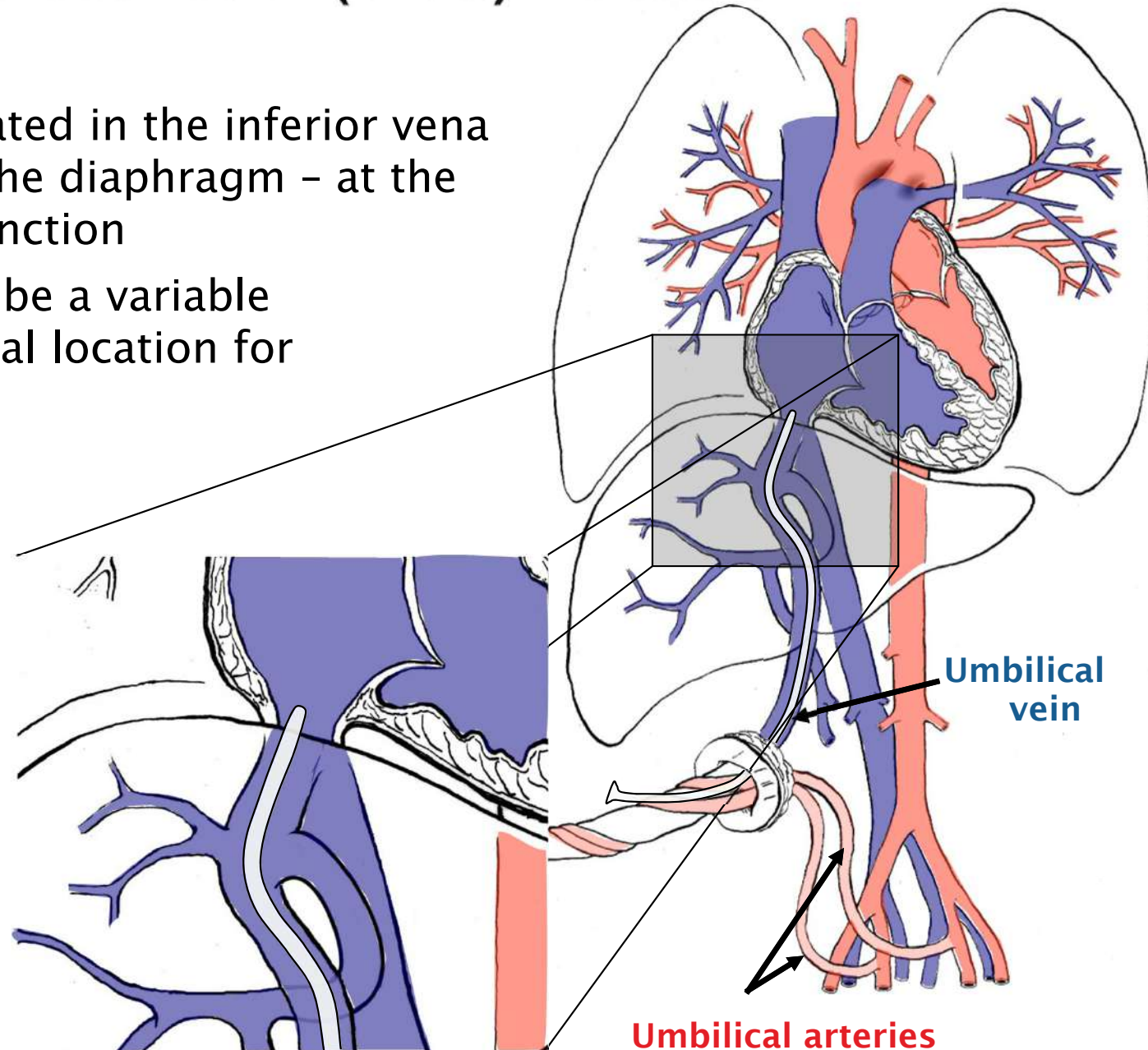
Umbilical **Vein** Catheter (UVC) Insertion Procedure

- ▶ After placement, use sterile water to remove antiseptic solution before applying the dressing
- ▶ Use hydrocolloid base layer to protect skin
- ▶ Apply transparent surgical dressing to secure the catheter
- ▶ Label central lines (venous or arterial) to clearly identify the type of line in place

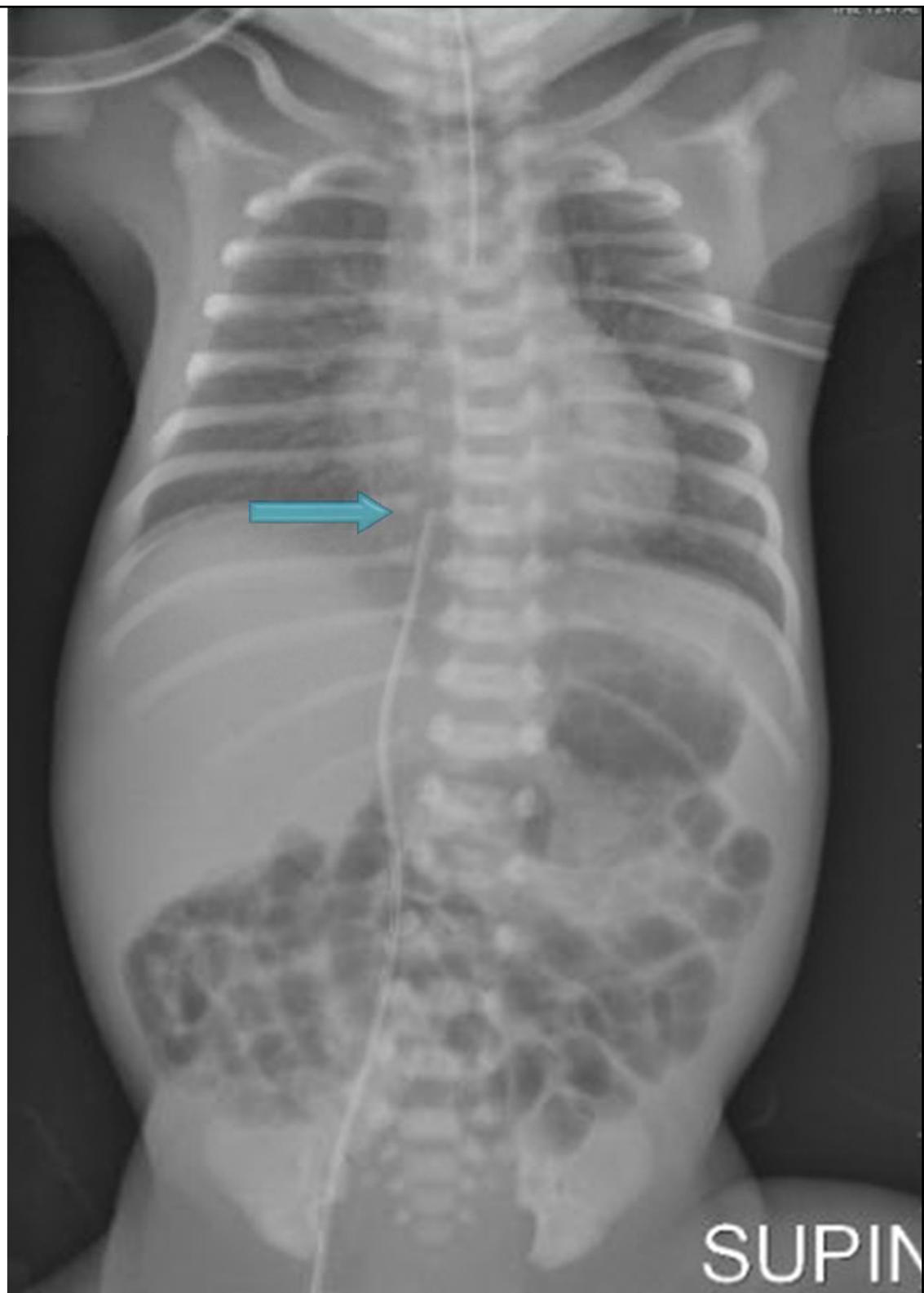


Umbilical Vein Catheter (UVC) Location

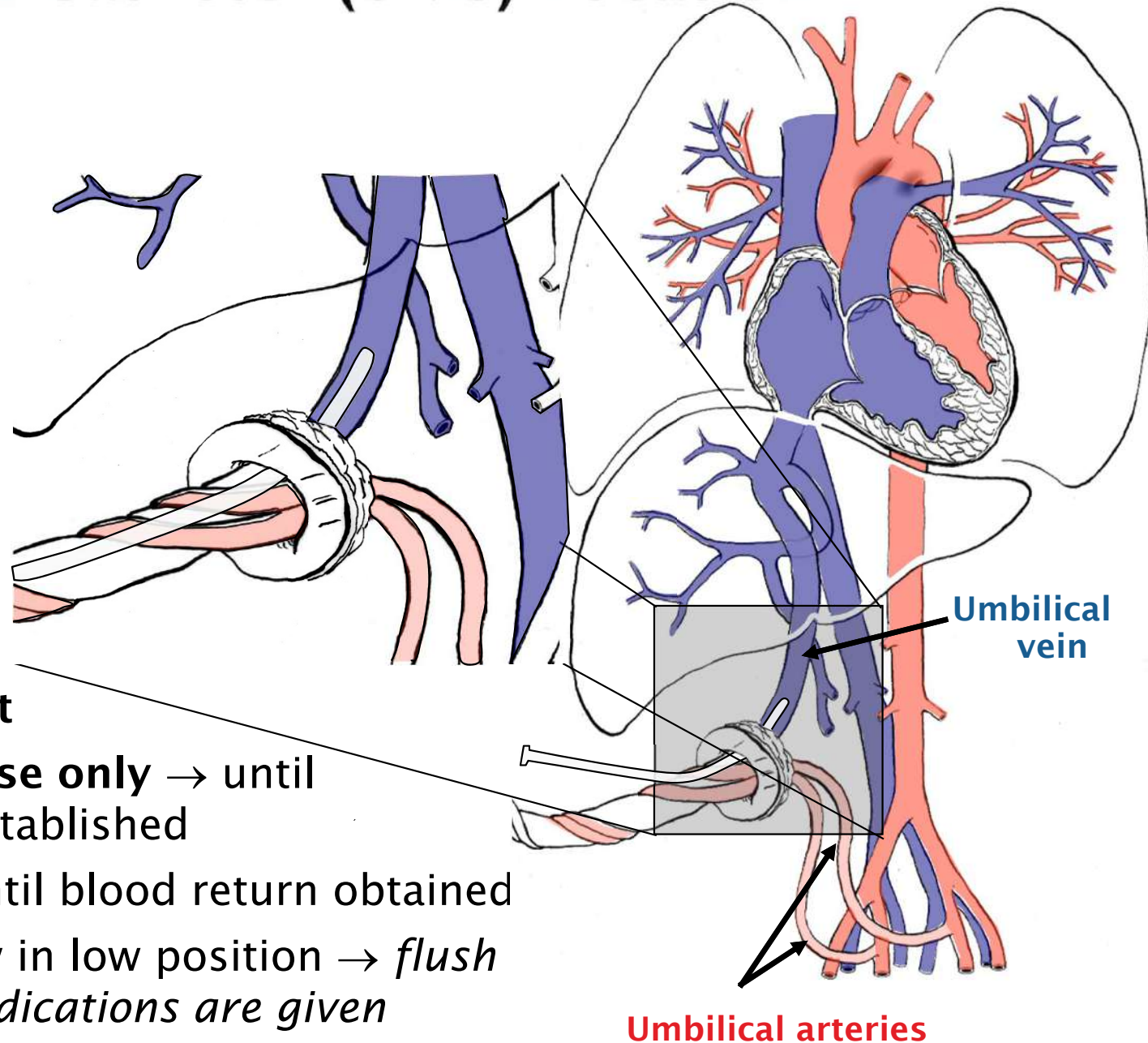
- ▶ Tip should be located in the inferior vena cava (IVC) above the diaphragm - at the right atrial (RA) junction
 - Note: there will be a variable thoracic vertebral location for each baby



UVC tip in optimal
position at inferior vena
cava/right atrial junction



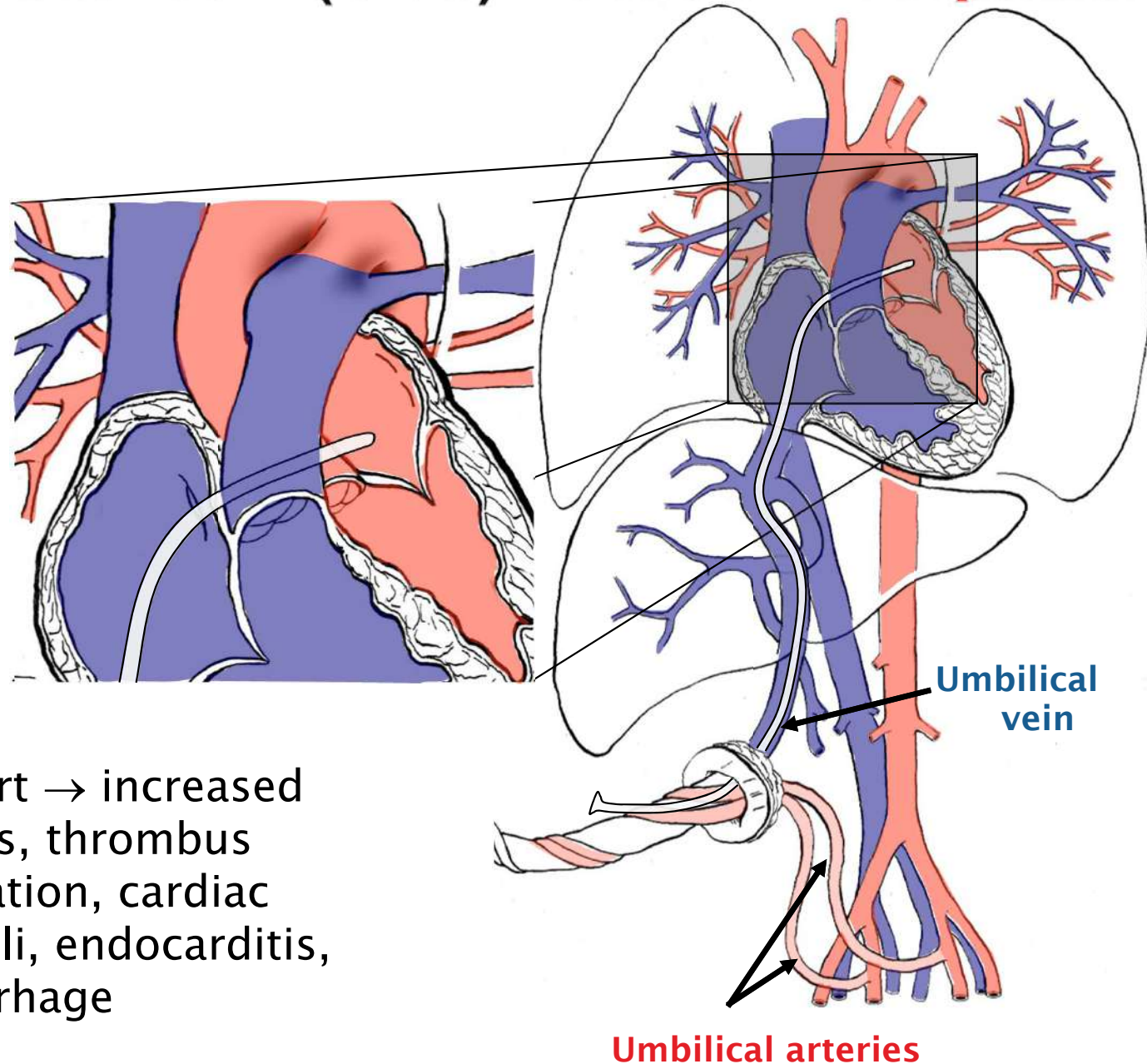
Umbilical Vein Catheter (UVC) Location



Low UVC Placement

- ▶ **For emergency use only** → until other IV access established
- ▶ Insert 2 – 4 cm until blood return obtained
- ▶ Non-pulsatile flow in low position → *flush catheter after medications are given*

Umbilical Vein Catheter (UVC) Location - Malposition

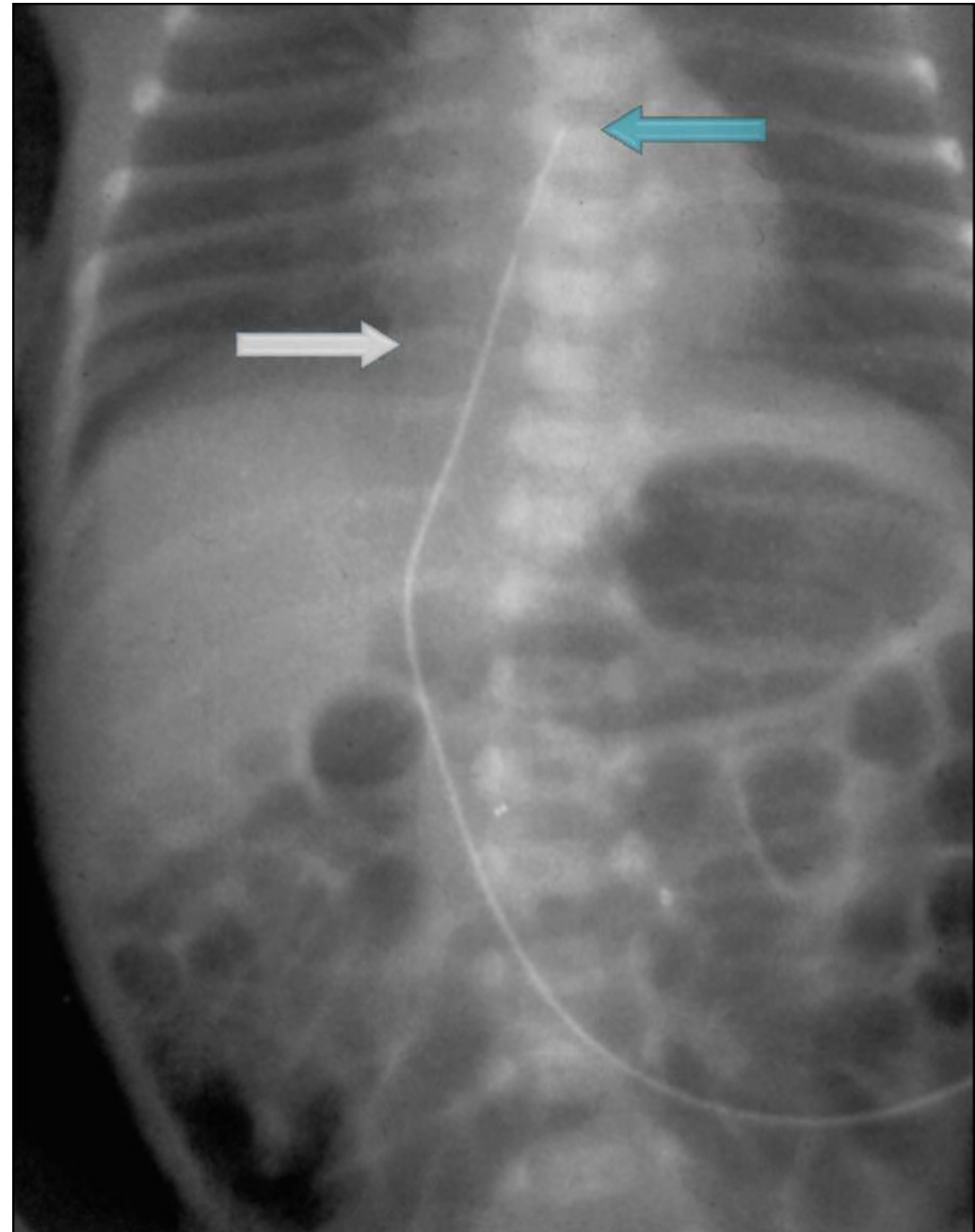


⚠ Tip located in heart → increased risk of arrhythmias, thrombus formation, perforation, cardiac tamponade, emboli, endocarditis, pulmonary hemorrhage

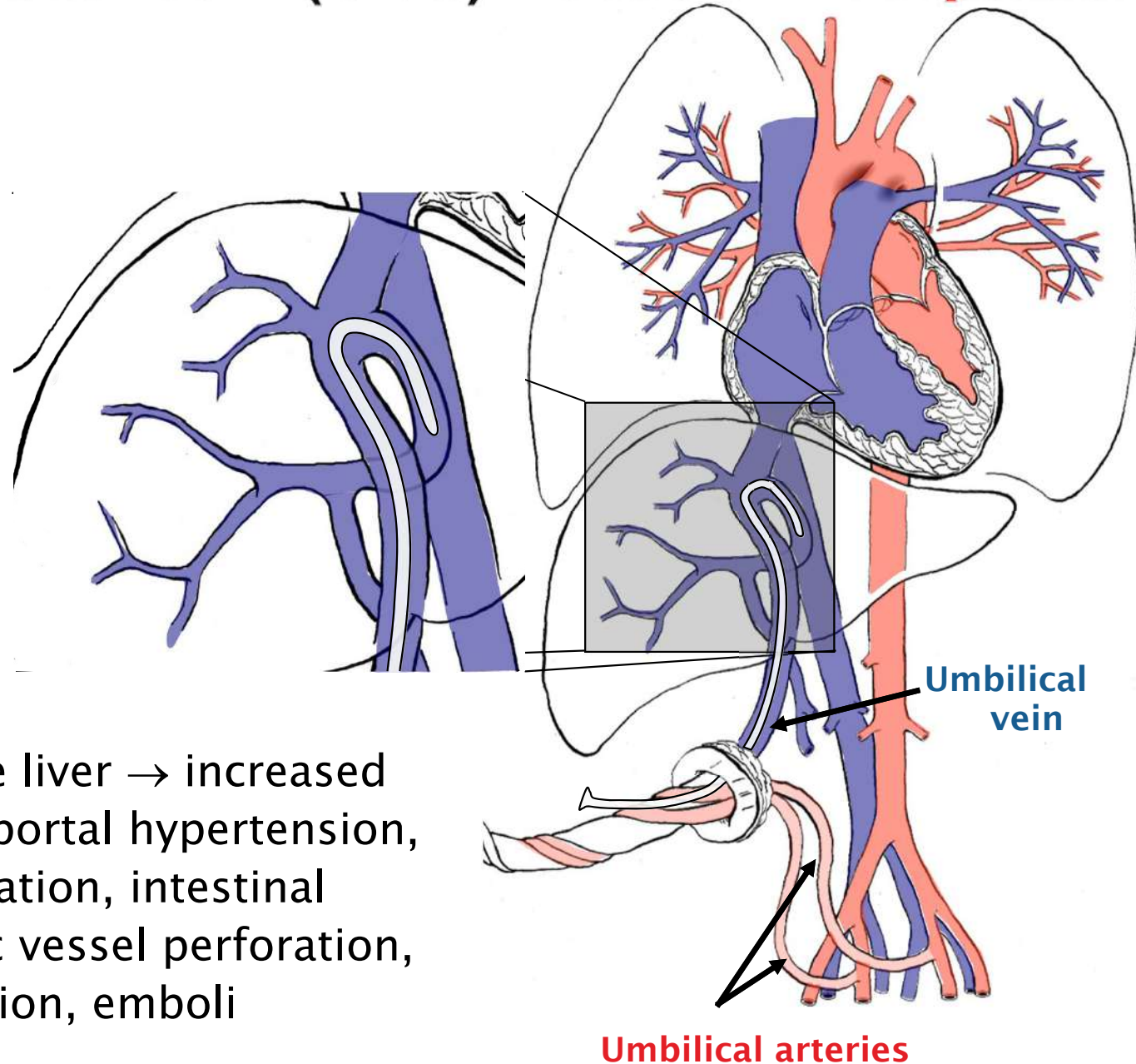
Umbilical Vein Catheter (UVC) Location - Malposition

UVC tip too deep – across foramen ovale in left atrium or pulmonary vein

Pull back to here (IVC/RA junction)



Umbilical Vein Catheter (UVC) Location - Malposition



⚠ Tip located in the liver → increased risk of necrosis, portal hypertension, peritoneal perforation, intestinal ischemia, hepatic vessel perforation, thrombus formation, emboli

Umbilical Vein Catheter (UVC) Location - **Malposition**

UVC tip malpositioned in the portal venous system and should be removed



Umbilical Vein Catheter (UVC) Location - Malposition

UVC tip malpositioned
in the liver and should
be removed

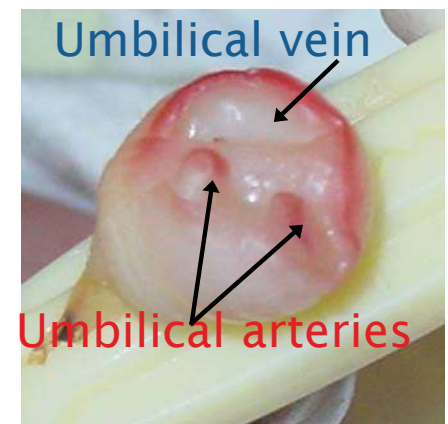
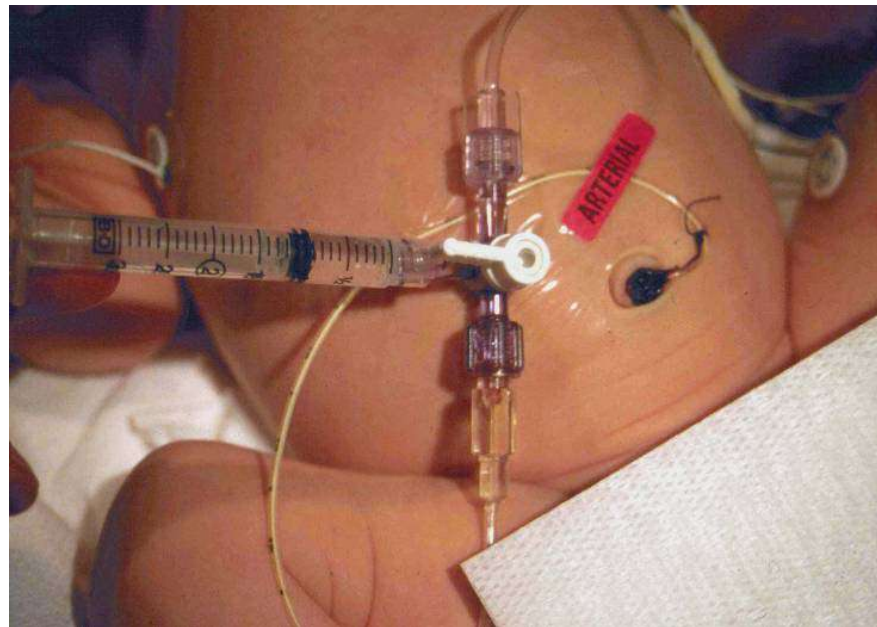


Umbilical **Artery** Catheter (UAC) Procedure

- ▶ Use sterile technique → equipment, gown, gloves, hat, mask, drapes

Catheter Size

- ▶ Under 1.5 kg → 3.5 French
- ▶ Over 1.5 kg → 5 French



Umbilical **Artery** Catheter (UAC) Procedure

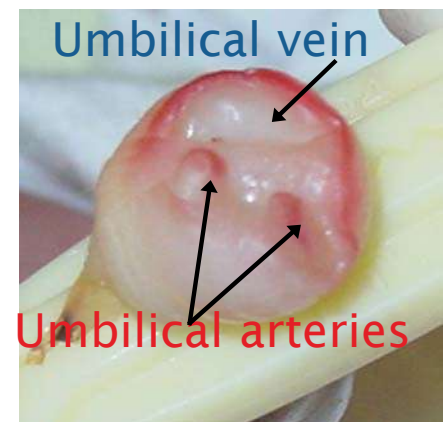
Location

- ▶ **High line** → tip located between T6 and T9 (*preferred location*)
- ▶ **Low line** → tip located between L3 and L4
- ▶ Determine depth of insertion before starting procedure

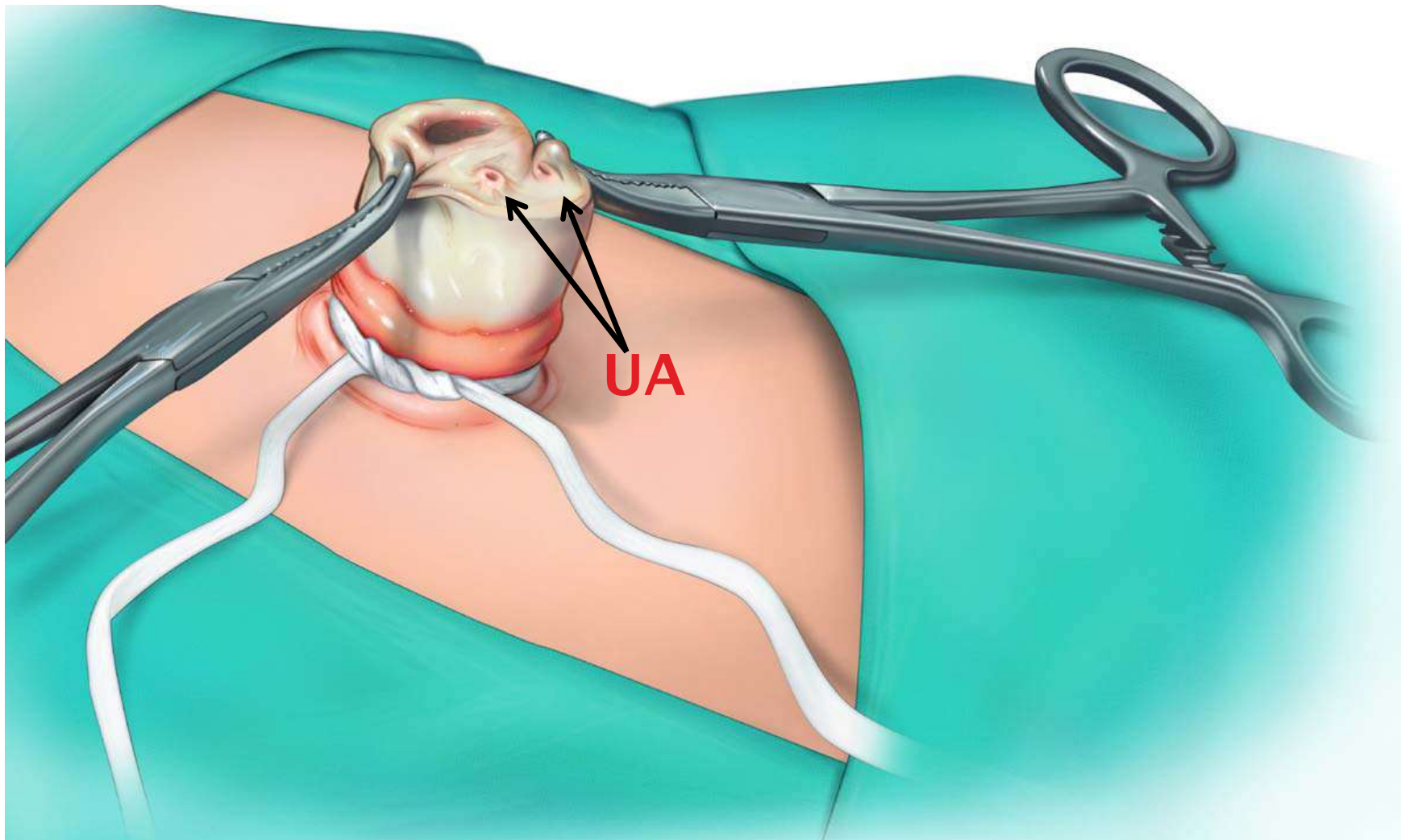
High UAC location calculation

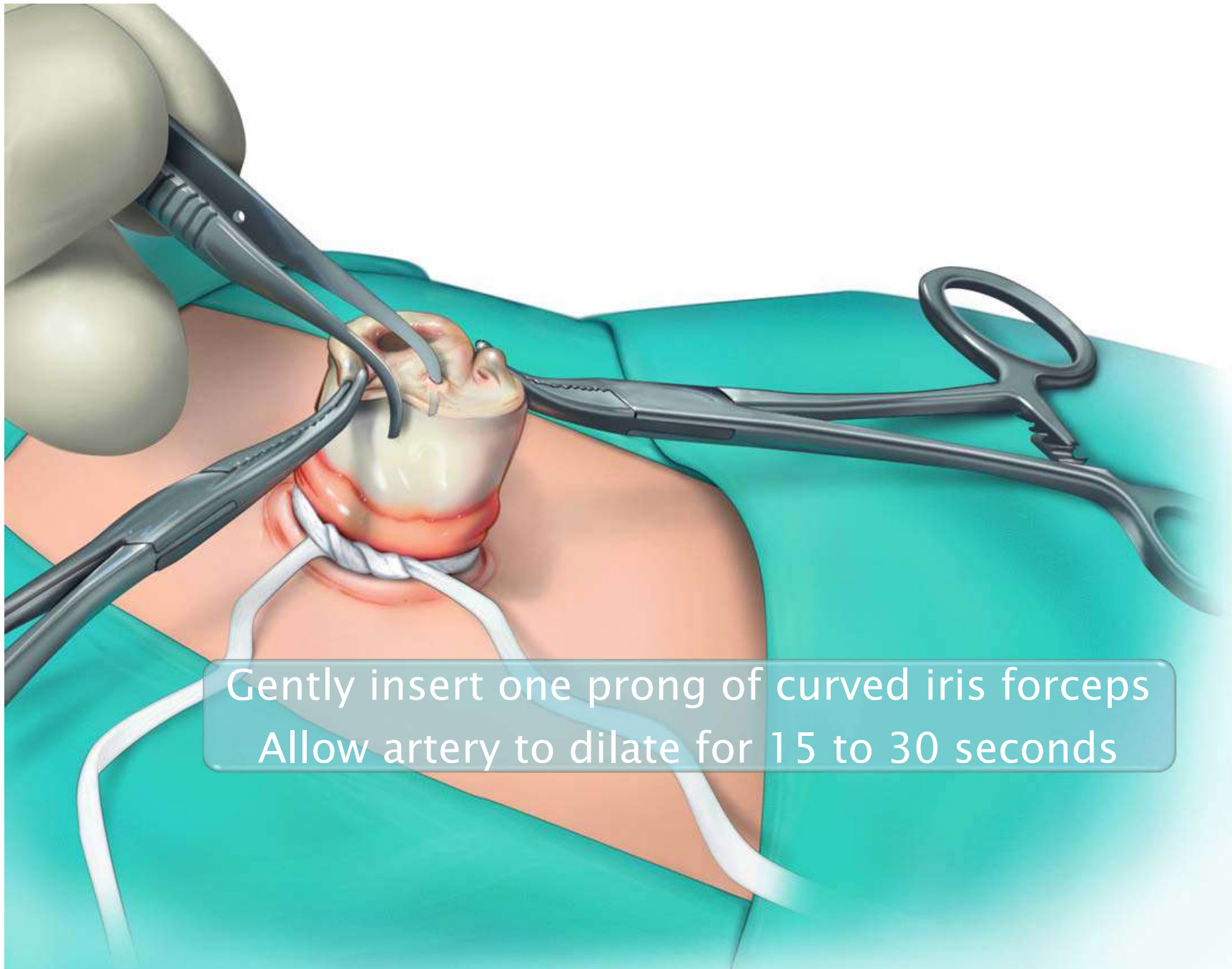
- ▶ To calculate the umbilical artery catheter insertion length (at the level of the umbilical cord), in centimeters
= **[3 X birth weight (in kg)] + 9**
- ▶ Confirm placement with x-ray and repeat the x-ray if the line is repositioned

Note: UVC insertion depth calculation:
[0.5 X high line UA catheter length (in cm)] + 1

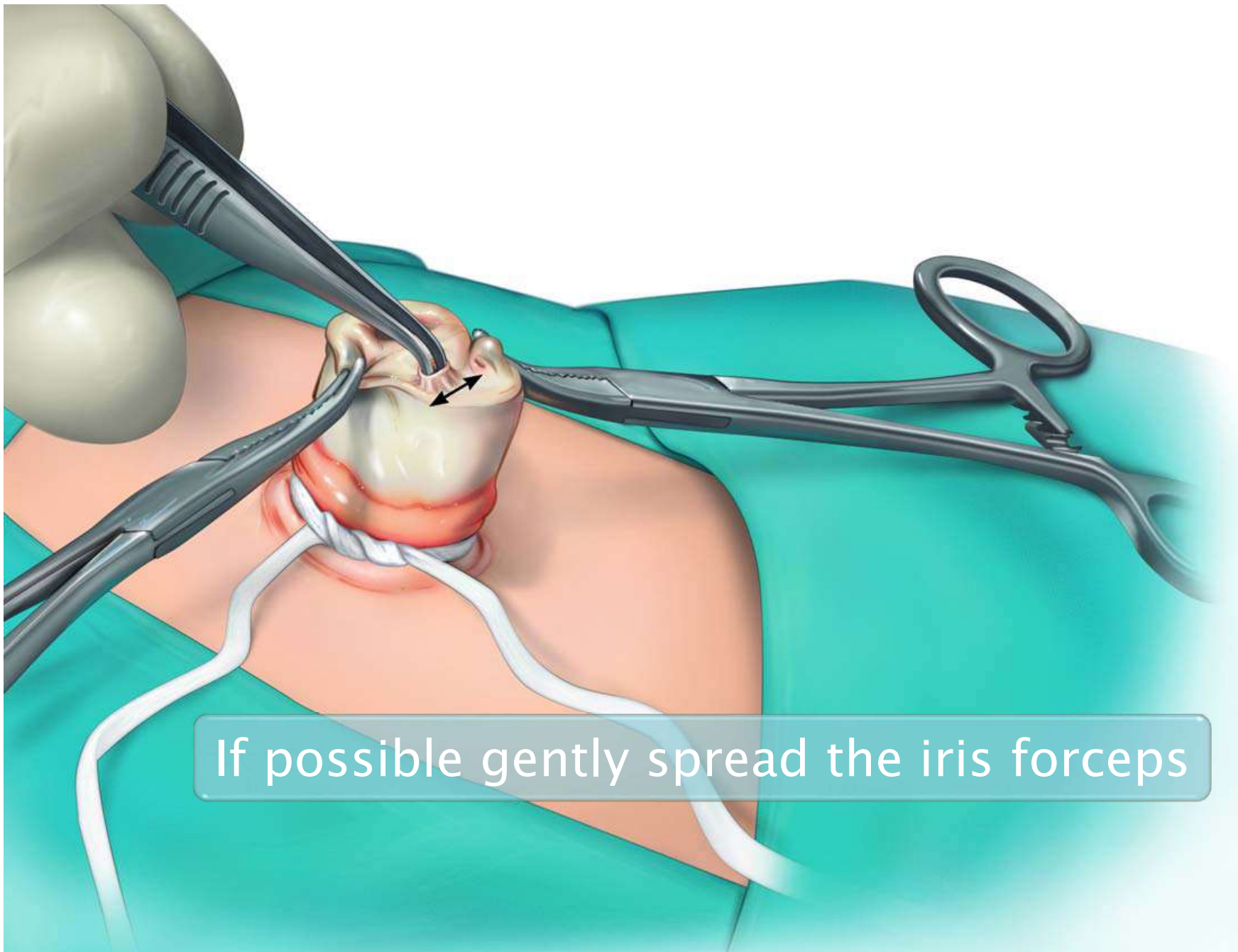


Securely hold umbilical cord through Wharton's jelly with curved hemostats





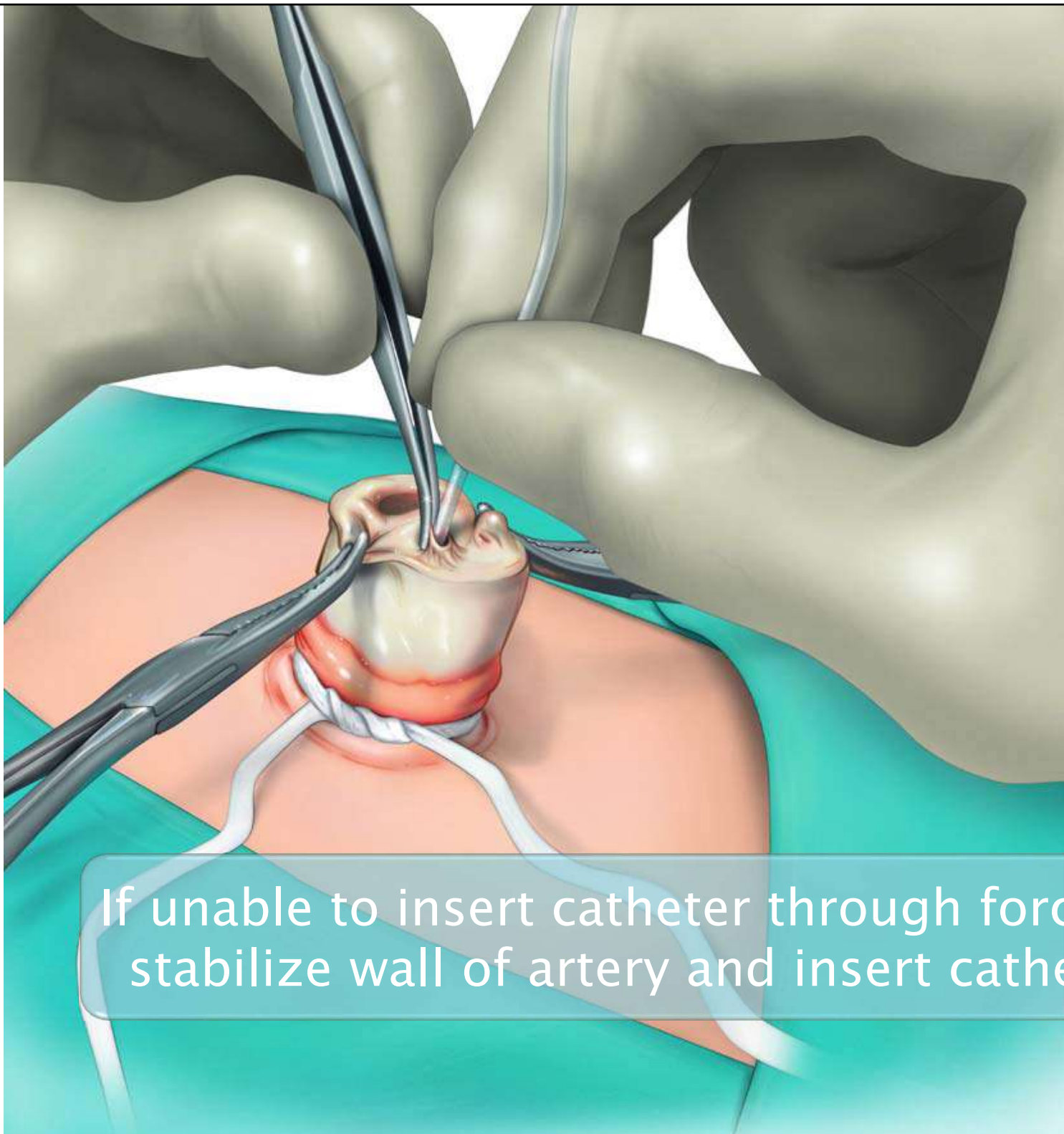
Gently insert one prong of curved iris forceps
Allow artery to dilate for 15 to 30 seconds



If possible gently spread the iris forceps



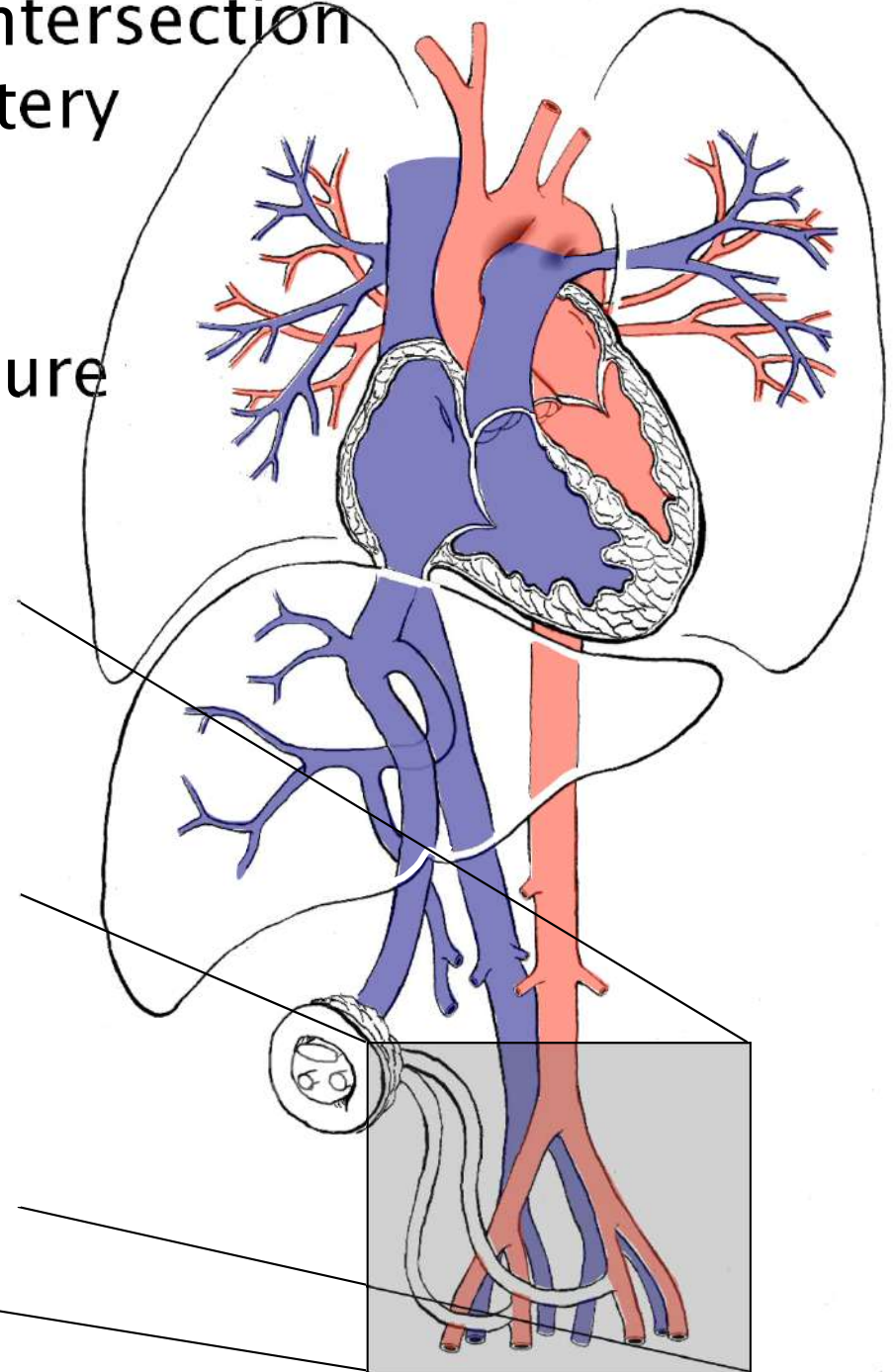
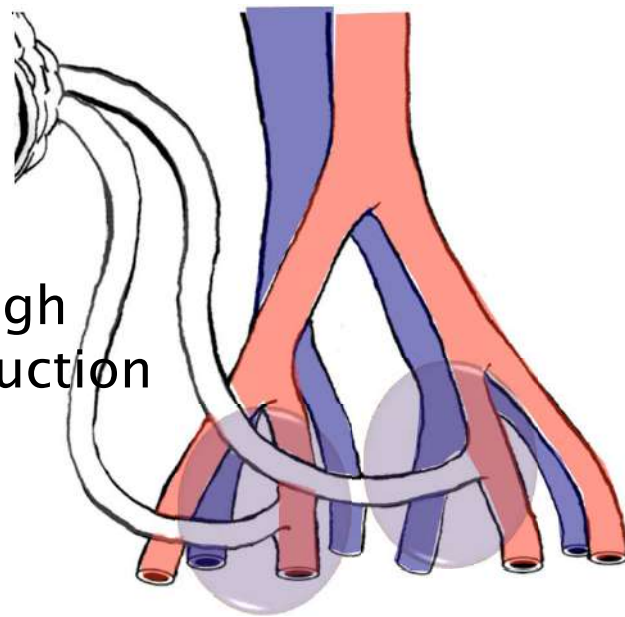
If possible insert catheter
through spread iris forceps



If unable to insert catheter through forceps, stabilize wall of artery and insert catheter

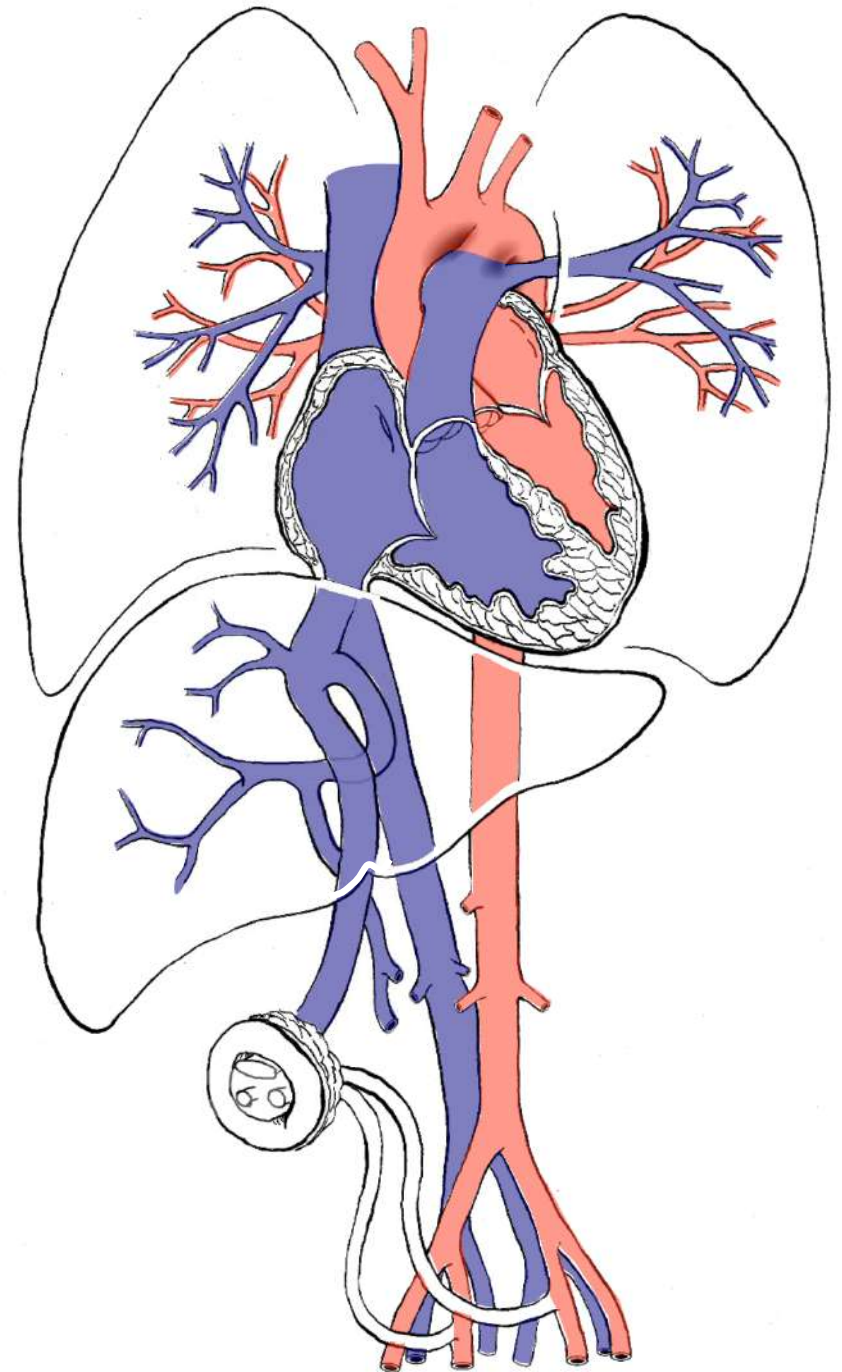
- ▶ Resistance may be met at intersection of umbilical artery / iliac artery
→ approximately 6 – 8 cm from umbilical stump
 - Apply steady gentle pressure for 30 – 60 seconds

Do not force
catheter through
areas of obstruction

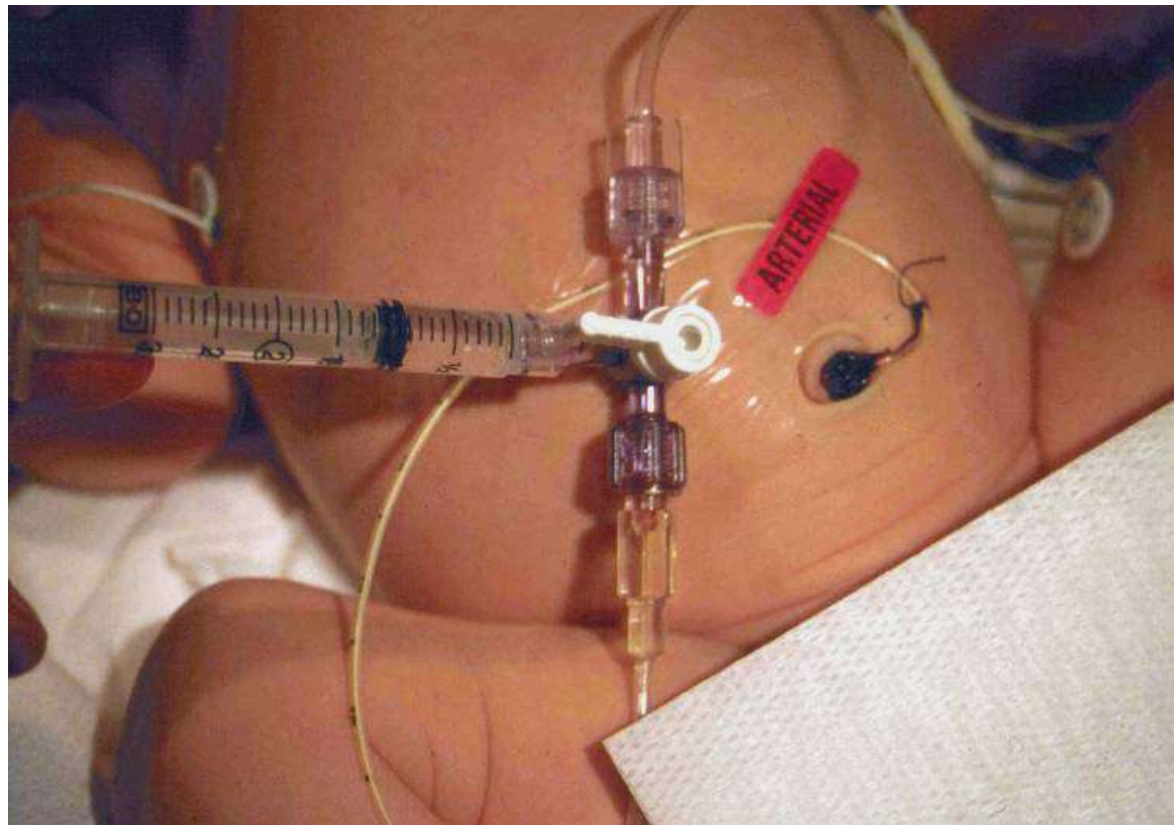


⚠ Forcing catheter through area of resistance often results in false luminal track

⚠ A 'popping' sensation usually indicates catheter in false track



- ▶ Insert catheter to appropriate distance
- ▶ Suture catheter through Wharton's jelly, not skin
- ▶ Use sterile water to remove antiseptic solution
- ▶ Secure catheter with surgical dressing
- ▶ Apply a label to identify the line is arterial



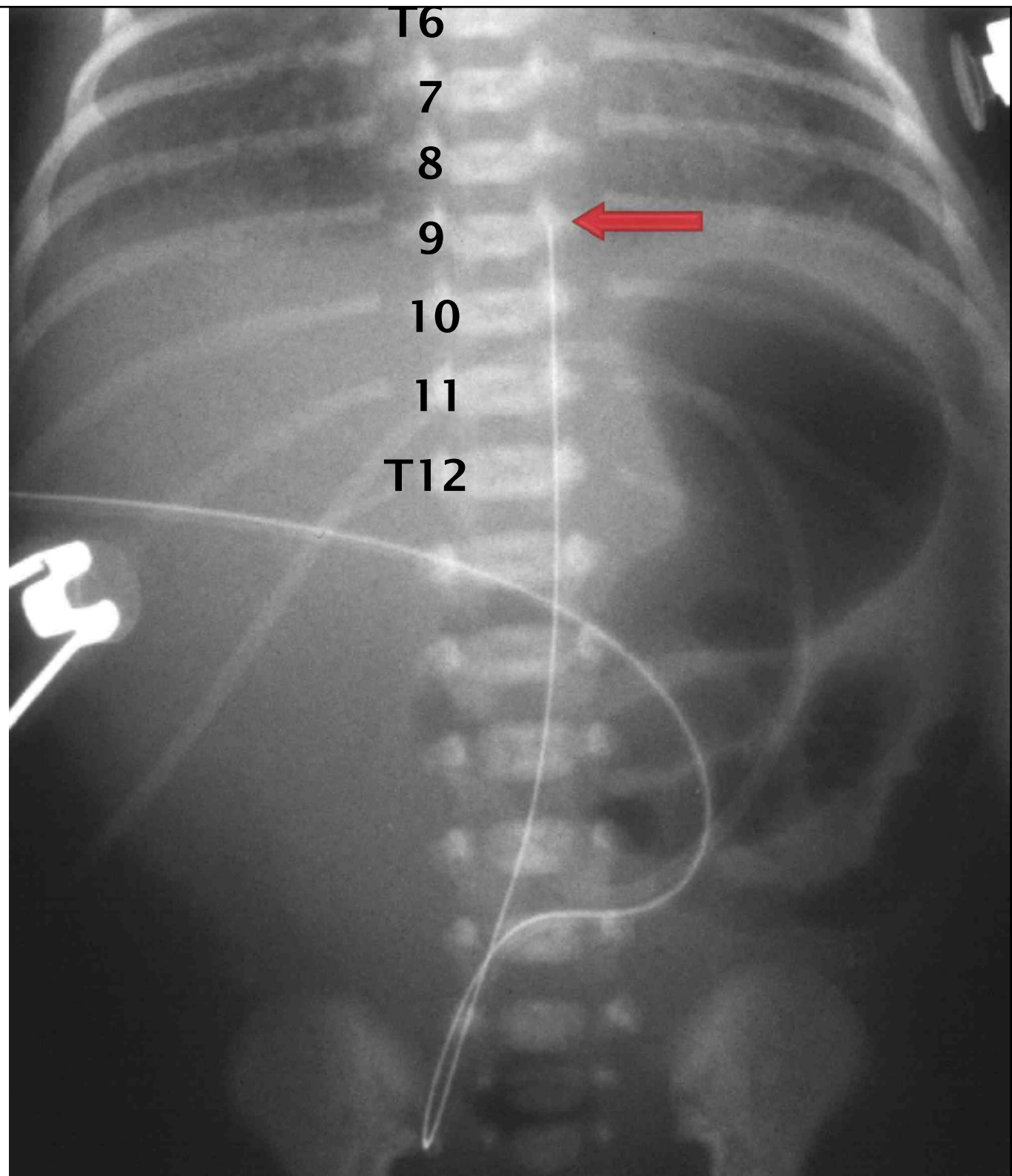


Do not advance catheter once sterile field disassembled

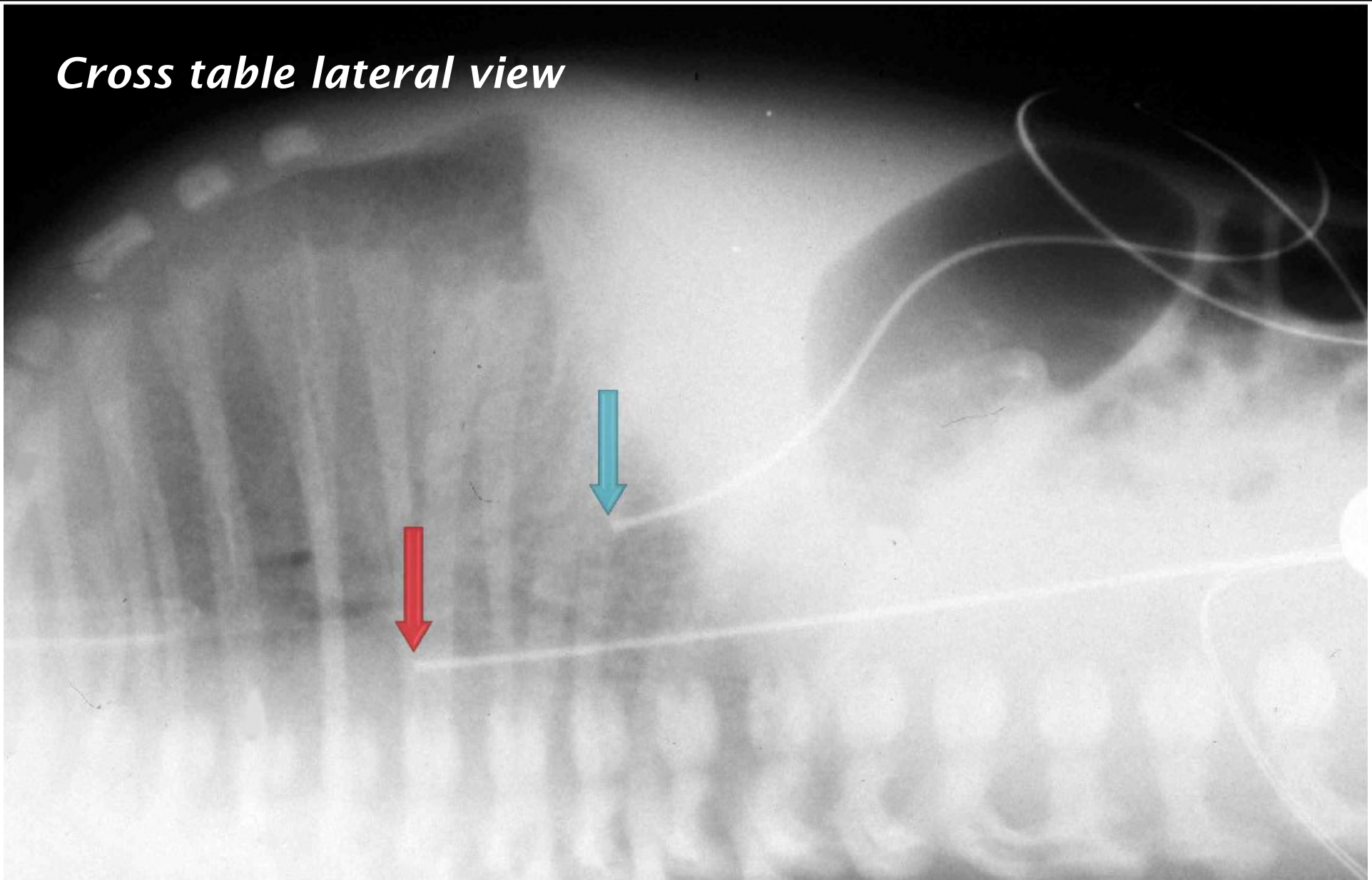
Remove catheter if:

- Tip is not in correct position
- There is no blood return once inserted
- There is evidence of vasospasm – check buttocks, feet/toes

UAC tip in good
position at T9



Cross table lateral view



UAC (red arrow) → note pathway along spine
UVC (blue arrow) → pathway more superficial