

STANDARD CARE

ASSESSMENT

- **Educated and competent** clinicians, patients, family/carers involved with CVAD management
- **Catheter selection:** insert CVAD with the minimum number of lumens for the prescribed therapy
- **CVAD catheter tip:** located at cavoatrial junction, lower third of the superior vena cava or upper right atrium for upper body insertions or inferior vena cava above the level of diaphragm for femoral vein insertions
- **Syringes:** with 10 mL or 20 mL
- **Flushing:**
 - Using 0.9% sodium chloride
 - Using a pulsatile/start-stop flush technique and complete with the appropriate clamping-disconnection sequence to maintain positive pressure at the catheter tip according to the type of needleless connector
 - Regularly to remove intraluminal drug residue, blood components and in between incompatible solutions
 - Adults: 10 mL increasing to 20 mL post blood sampling or infusions, viscous or sticky solutions e.g. CT contrast, medications, dextrose, TPN
 - Paediatrics: at least double the volume of the CVAD system
- **Locking:**
 - Using 0.9% sodium chloride
 - Using a pulsatile/start-stop flush technique and complete with the appropriate clamping-disconnection sequence to maintain positive pressure at the catheter tip according to the type of needleless connector
 - For every lumen
 - Frequency: according to type of CVAD, intermittent use or in between prescribed therapy episodes

Easy injection / easy aspiration? IN1/AS1

PATENCY ASSESSMENT
CINAS Catheter Injection Aspiration Classification

Assess *aspiration* and *injection* ability of the CVAD

CINAS CLASSIFICATION	INJECTION ABILITY (IN)			
	EASY ≥ 1 mL	DIFFICULT ≥ 1 mL	IMPOSSIBLE < 1 mL	UNKNOWN
EASY AS1	IN1AS1	IN2AS1	IN3AS1	INxAS1
DIFFICULT AS2	IN1AS2	IN2AS2	IN3AS2	INxAS2
IMPOSSIBLE AS3	IN1AS3	IN2AS3	IN3AS3	INxAS3
UNKNOWN ASx	IN1ASx	IN2ASx	IN3ASx	INxASx

Tool adapted from Goossens, G.A., Stas, M., Jérôme, M. and Moons, P., 2011. Systematic review: malfunction of totally implantable venous access devices in cancer patients. *Supportive care in cancer*, 19(7), pp.883-898.

Difficult aspiration / difficult injection? IN2/AS2

Impossible aspiration / injection? IN3/AS3

Unknown or no assessed aspiration or injection? INx/ASx

DOCUMENT

- SIGNS & SYMPTOMS: partial occlusion**
- No blood return but flushes easily
 - Flash back only and no frank blood return
 - Slow blood return
 - Increased resistance on flushing
 - Catheter tip not at cavoatrial junction on CXR
 - Sudden onset of resistance after medication administration
 - Drug precipitation in the catheter lumen
 - Prolonged creasing in catheter lumen
 - Blood remnants in catheter lumen
 - Closed clamp on catheter or IV tubing

- SIGNS & SYMPTOMS: complete occlusion**
- No blood return and
 - Inability to inject fluids

MECHANICAL occlusion

- INTERVENTIONS OR INVESTIGATIONS:**
- **Actions:** change patient position, ask patient to cough or deep breathe, open clamps, change dressing, replace blocked needleless connectors or filters, re-access TIVAD, replace IV administration line/s
 - **Investigations:** e.g. flow studies for kink, occlusion, fibrin sheath/sleeve, catheter fracture; CXR for suspected catheter tip malposition, pinch-off syndrome

- Is there evidence of a mechanical occlusion**
- **CVAD factors:** closed clamps on catheter lumen or non coring TIVAD needle; kinked catheter under dressing; malpositioned, angled or inappropriate length non coring TIVAD needle, change in catheter length, blood in catheter lumen
 - **IV administration lines** - kinks, twists or closed clamps in IV lines including additive lines or in-line filters, blood in needleless connector
 - **Patient factors** - patient position, catheter tip malposition or adjacent to vein wall

- Is there evidence of DVT?**
- Pain +/- swelling e.g. arm, chest wall, neck, face, jaw
 - Discoloration of the extremity
 - Altered sensation of the extremity
 - Reduced function in the extremity
 - Engorged peripheral veins on the extremity or chest wall on the side of catheter insertion

CLINICAL PRACTICE POINT
Act promptly and avoid delay in interventions

Resume use of CVAD

Easy injection / easy aspiration? IN1/AS1

Consult with medical staff

i Every patient: implement strategies for every patient, every time, for every CVAD by all clinical staff managing CVADs.

ASSESSMENT

INTERVENTION & OUTCOME

THROMBOTIC or CHEMICAL occlusion

CLINICAL PRACTICE POINT
If occlusion is not mechanical and no evidence of chemical occlusion - treat as thrombotic occlusion

THROMBOTIC occlusions: 58%
CHEMICAL & MECHANICAL occlusions: 42%

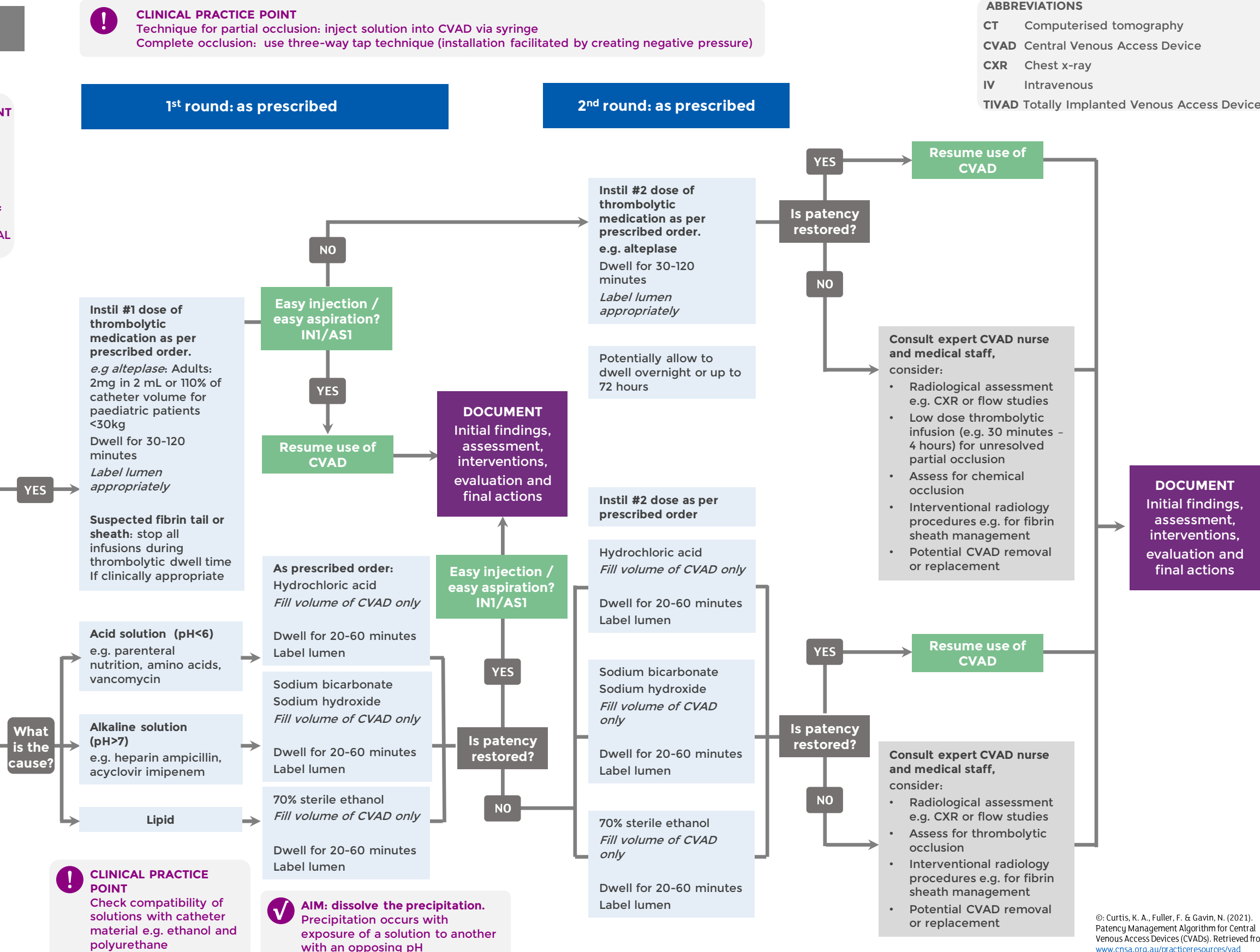
Is there evidence of THROMBOTIC OCCLUSION

- Visible blood in catheter, needleless connector or IV line
- Frequent, recurring administration pump alarm
- Resistance or inability to inject fluids
- Sluggish flow of intravenous fluids
- Inability to withdraw blood
- Flash back but no frank blood return

Is there evidence of CHEMICAL OCCLUSION

- Visible medication precipitation in catheter
- Recent administration of medication, lipid, viscous solutions
- Sudden onset of resistance after medication administration

Seek advice from pharmacist for management of chemical occlusions



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