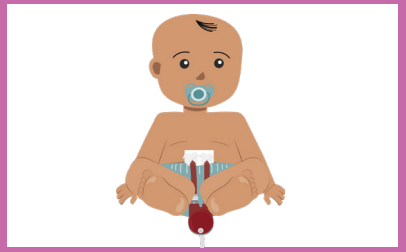
Berlin Heart Emergency Algorithms & Care Guide



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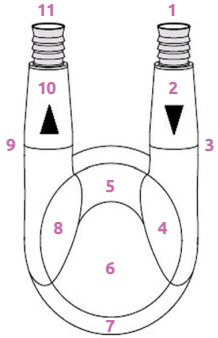
Collaborators: *Berlin Heart*

action

Pump Assessment

1. Transition inflow cannula, inflow connector
2. Inflow stub in front of inflow valve
3. Inflow valve
4. Inflow stub behind inflow valve
5. Area between inflow and outflow stubs
6. Remaining area of blood chamber
7. Transition blood chamber, membrane (directly above reinforcement ring)
8. Outflow stub in front of outflow valve
9. Outflow valve
10. Outflow stub behind outflow valve
11. Transition outflow connector, outflow cannula



Optimizing Pump Function

POOR FILL | **POOR EJECT**

CAUSES

CVP (Central Venous Pressure)

⬇	⬆
⬇ Hypovolemia ⬆ Inflow Cannula Obstruction ⬆ Tamponade ⬆ Right Heart Failure	⬆ Hypertension ⬆ Outflow Cannula Obstruction ⬆ Agitation

C.O. (Cardiac Output)

⬇	⬆
⬇ Hypovolemia ⬇ Inflow Cannula Obstruction ⬇ Tamponade ⬇ Right Heart Failure	⬇ Hypertension ⬇ Outflow Cannula Obstruction ⬇ Agitation

Patient Treatments

Hypovolemia: ***Give Fluid*** Inflow Cannula Obstruction: ***Evaluate Further*** Tamponade: ***Surgical Drainage*** Right Heart Failure: ***+/- Nitric Oxide & Inotropes***	Hypertension: ***Reduce Afterload*** Outflow Cannula Obstruction: ***Evaluate Further*** Agitation: ***Pain Control/ Sedation***

PUMP FIXES

Decrease Rate Increase Diastolic Pressure Decrease % Systole	Increase Systolic Pressure Increase % Systole

Berlin Heart CPR

Unresponsive Patient
Assess for a palpable pulse!

Pulse Present

Assess pump membrane movement

Assess for other causes of un-responsiveness:
- Stroke
- Hypoglycemia
- Sedative use
- Hypoxemia

Pulse Absent

Immediately begin chest compressions!
- Follow PALS protocol including defibrillation
- DO NOT CLAMP CANNULAE

Assess the following:
- Is the membrane moving, filling/ ejecting adequately?
- Are cannulae or driveline kinked?
- Is the IKUS powered & functioning?

If IKUS not functioning, **use manual hand pump** until back-up IKUS powered and ready for use.
- Hand pump at a rate of 60–80 bpm
- Recheck pulses

Pulse Absent?
- Resume chest compressions immediately!
- Follow PALS protocol

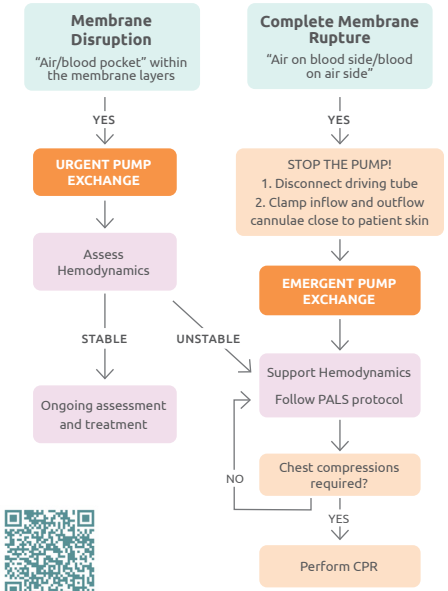
Notify Cardiovascular Surgery
- Consider ECMO

Pulse Present?

Hand pump at a rate of 60–80 bpm

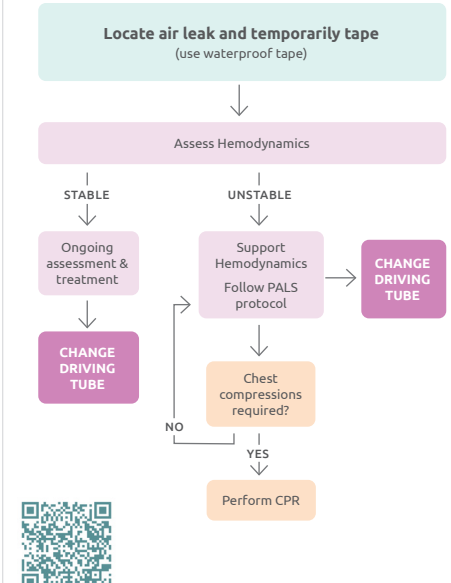
Membrane Malfunction

**Will require urgent/emergent pump exchange*



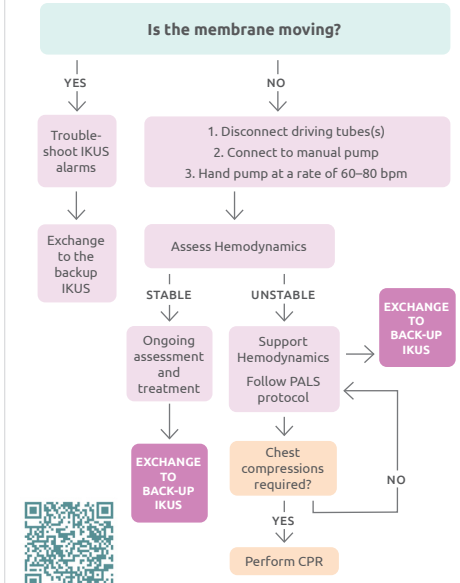
Cracked Driving Tube

**Will require urgent driving tube exchange*



IKUS Malfunction

**Will require urgent IKUS exchange*



Cannula Disruption