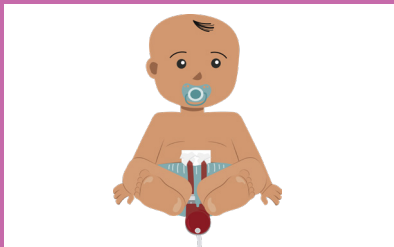


Berlin Heart Emergency Algorithms & Care Guide



Authors: *Andrea Maurich, RN, Deepa Mokshagundam, MD, Jennifer Conway, MD, & David Peng, MD*

Contributing Centers: *The Hospital for Sick Children, Primary Children's Hospital, Stollery Children's Hospital, Children's Hospital Colorado, C.S. Mott Children's Hospital, St. Louis Children's Hospital, Joe DiMaggio Children's Hospital, Morgan Stanley Children's Hospital of New York Presbyterian, University of Minnesota Masonic Children's Hospital, & UCSF Benioff Children's Hospital*

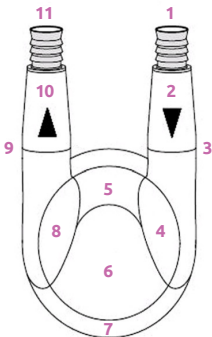
Collaborators: *Berlin Heart*

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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 unresponsiveness:

- 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

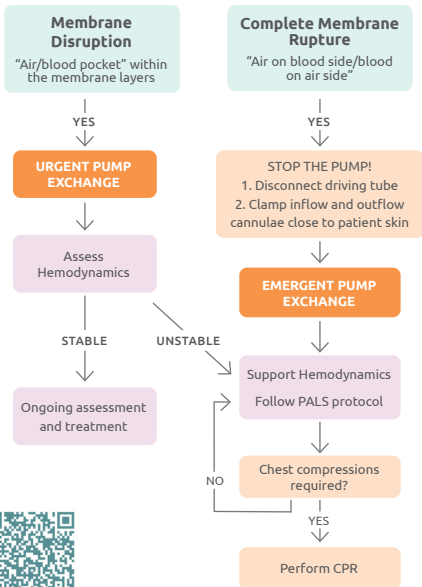
Pulse Present?

Hand pump at a rate of 60–80 bpm



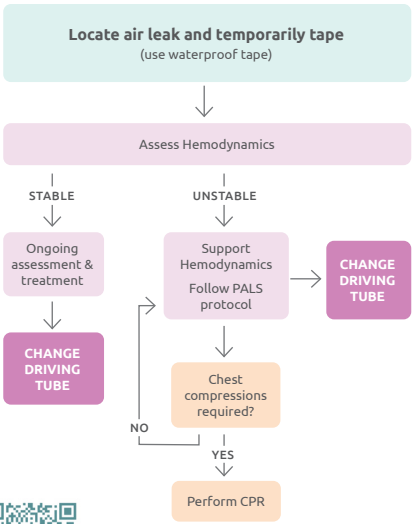
Membrane Malfunction

**Will require urgent/emergent pump exchange*



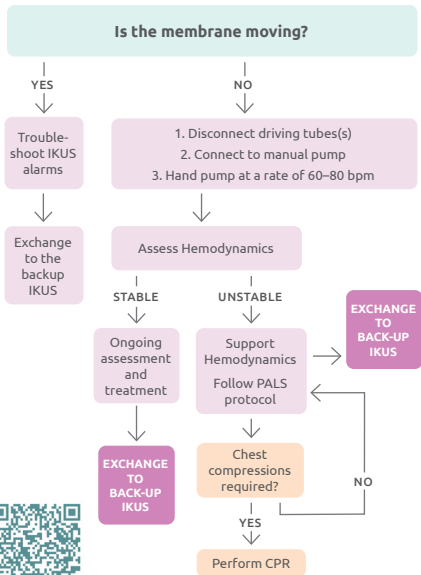
Cracked Driving Tube

**Will require urgent driving tube exchange*



IKUS Malfunction

**Will require urgent IKUS exchange*



Cannula Disruption

STOP THE PUMP!

1. Disconnect driving tube
2. Clamp inflow and outflow cannulae close to patient skin

Assess Hemodynamics

STABLE

Ongoing assessment
and treatment
Prepare for emergent
cannula/pump
exchange

UNSTABLE

Support Hemodynamics
Follow PALS protocol
Consider ECMO

Chest
compressions
required?

NO

YES

Perform CPR

