LVAD

REFERENCE

THE DEVICE

Semi-permanent hemodynamic support implanted in end-stage heart failure

Models include Heartmate 2/3 (Abbott), HVAD (Medtronic)

Used as bridge-to-transplant, destination therapy, or bridge-to-decision

Pump flow 4-6 L/min (surrogate for cardiac output); example reading 4.5 lpm

Pump speed 3000-9000 rpm; example 9500 rpm

Pulse index 3-7; example 3.6 — lower PI = less baseline heart function

Pump power typically 4-7 W; example 5.8 W — rising power can suggest incipient thrombosis

FIRST MOVES

- The patient has usually already talked to their VAD team — involve the VAD team in decisions
- Ask the patient their normal parameters
- If unconscious, bring all equipment, including backup controller and extra batteries
- If the VAD is alarming, check all connections; confirm batteries are charged and connected tightly

COMPLICATIONS

- Suction event: preload inadequate, LV collapses, flow stops transiently — consider transfusion to restore preload
- Stroke: primary cause of death at 6-24 months; 10.1% risk even with gen 2/3 devices
- Driveline infection in up to 30% after 3 months; Staph most common
- Pump thrombosis: up to 13% in 1st-generation devices, ~1% in 2nd/3rd gen; lifelong anticoagulation
- Equipment failure: driveline, controller, batteries — external power supply and monitor can troubleshoot
- Arrest: confirm the LVAD is not working or perfusing before compressions; CPR is OK but may cause LVAD malfunction

CONTROLLER EXCHANGE — CAUTION

- Only for a red high-priority alarm, and only the patient or caregiver changes to the backup controller
- Exchanging means removing the driveline from the controller that powers the pump
- Done only in emergencies, and as fast as possible
- If the controller has been without power and alarming for an unknown time, do not change it — transport immediately
- Restarting the pump risks throwing a clot

Take Home Message:

Involve the VAD team, bring every piece of equipment, and never restart a long-silent pump — transport instead.