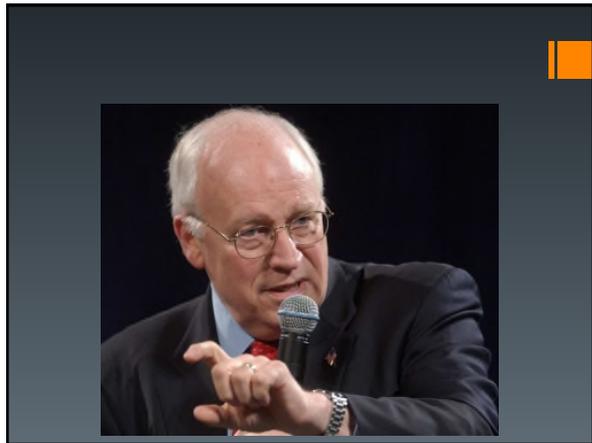




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Ventricular Assist Devices

- Mechanical circulatory assist
 - “artificial heart”
 - Usually L ventricular assist device/system
 - LVADS
- Currently about 6,000 outpatients in U.S.



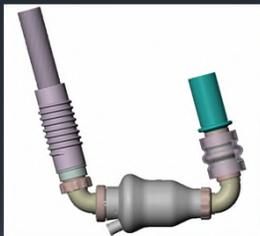
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Ventricular Assist Systems

- LVADs, RVADs or “total artificial heart” (TAH)
- Earlier devices were air driven
 - Pulsatile pumps
- Next gen devices are centrifugal
 - Magnetically levitated impeller propels blood
 - Non-pulsatile flow

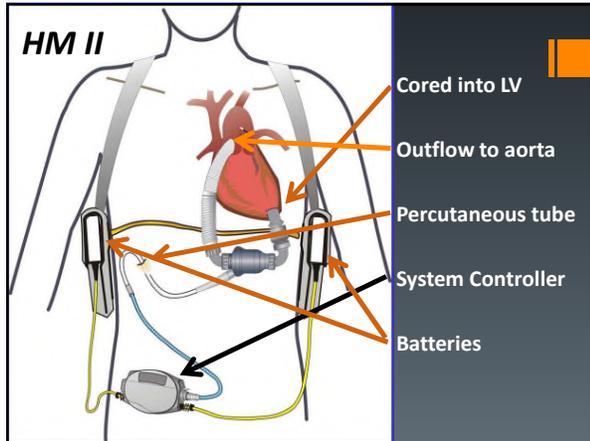
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HeartMate II LVAD - simple

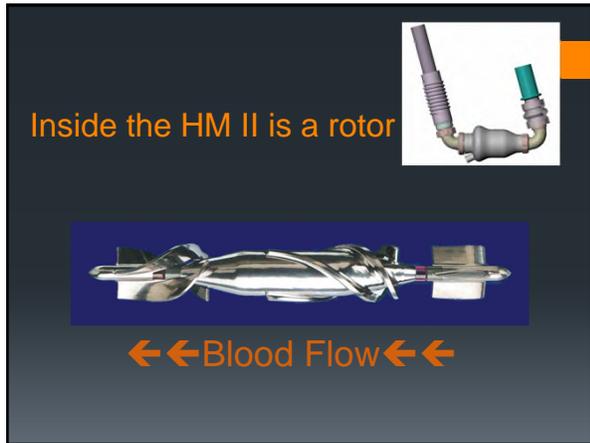


FDA: BTT 4/21/08, DT 1/20/10
Over 9,000 implants to date

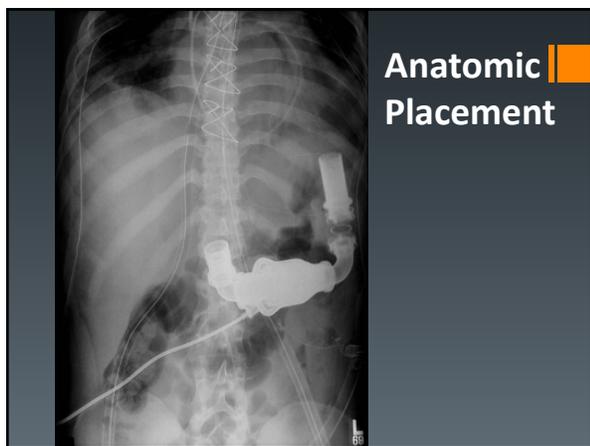
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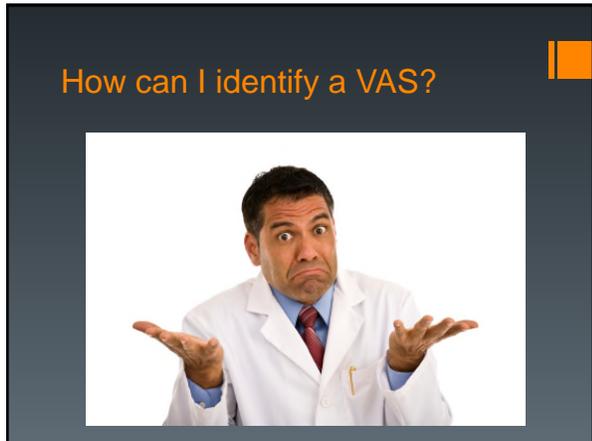
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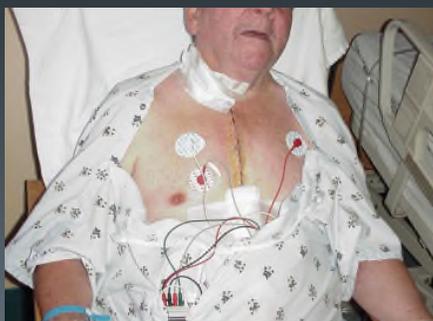
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How to ID a VAS Patient:

1. Sternotomy scar
2. Attached equipment
3. Caregivers
4. Medical alert identification

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Sternotomy



17

Sternotomy



18

External Equipment



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VAD Emergency Management

- ALL VADs are:
 - Preload-dependent (consider fluid bolus)
 - EKG-independent (but require a rhythm)
 - Afterload-sensitive (caution with pressors)
 - Anticoagulated (bleeding risk)
 - Prone to:
 - infection
 - thrombosis/stroke
 - mechanical malfunction
 - Key difference: pulsatile vs. non-pulsatile



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**CPR SHOULD NOT
BE PERFORMED ON
VAD
PATIENTS
UNLESS DIRECTED**

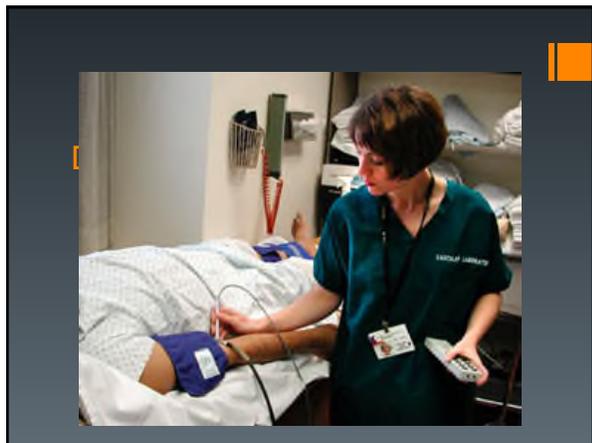
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VAD Resuscitation Measures

1. DO NOT unplug / remove equipment
2. Assess vitals (C-A-B)
Non-pulsatile flow requires doppler
MAP 70-80, keep < 90 mmHg
Pulse oximetry, NIBP likely inaccurate
3. NO CPR
4. Obtain immediate trained assistance
Family / caregivers are highly trained
Immediately contact VAD center as contact with OLMC unlikely to be helpful, wastes time



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Information on patient with Heartmate II ®

- 1. Patient's blood flow will be determined by set pump speed (6000 – 1500 rpm)
- 2. No palpable pulse due to continuous axial flow system (3- 10 LPM)
- 3. Use doppler to measure patient's blood pressure
- 4. May attempt to use an automatic blood pressure cuff to check patient's blood pressure, but may not be able to obtain.
- 12 L will show an Anterior MI (why?)

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Emergencies Heartmate II

- Patients will likely have a trained companion with them. The companion is familiar with VAD and emergency trouble shooting. Companions should go on transport with the patient and be responsible for the VAD.
- If defibrillation or cardioversion is necessary, follow the ACLS guideline. The pump is insulated so that electrical therapy should not be a problem. Do not disconnect the patient from the controller. Worst case the controller can be replaced at the hospital.
- NO CPR unless vital signs have deteriorated and other methods of correcting rhythm have not worked. It may dislodge the cannula from the ventricle.

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Emergencies Heartmate II

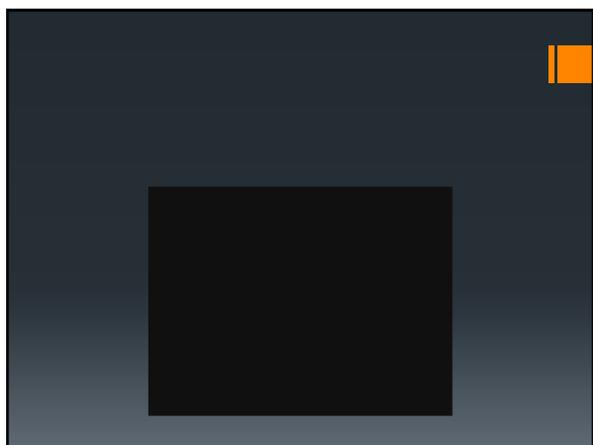
- Treat as you normally would, routine ACLS, NO CHEST COMPRESSIONS.
- Multiple back-ups' within system
 - a. Backup battery built into primary pocket controller (15 minutes backup power for pump)
 - b. Power save mode: the pump will operate at 8000 rpm if drawing from backup battery
- Keep in mind that they still have their own native heart as back-up
- Patients must be taken to NEAREST VAD CENTER. If transporting to the hospital please bring the PM (Power Module), UBC (Universal Battery Charger), and all associated cords along with the patient.

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VAD Centers

- No VAD Centers here in N. Nevada
- VAD Centers in Sacramento
 - Sutter General (has Helipad)
 - Mercy General (no helipad)
 - UCD (has helipad, is a VADC, but doesn't do implantation)

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