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Ambulating Patients with PA Catheters Who are Awaiting Heart Transplant in the Cardiac ICU

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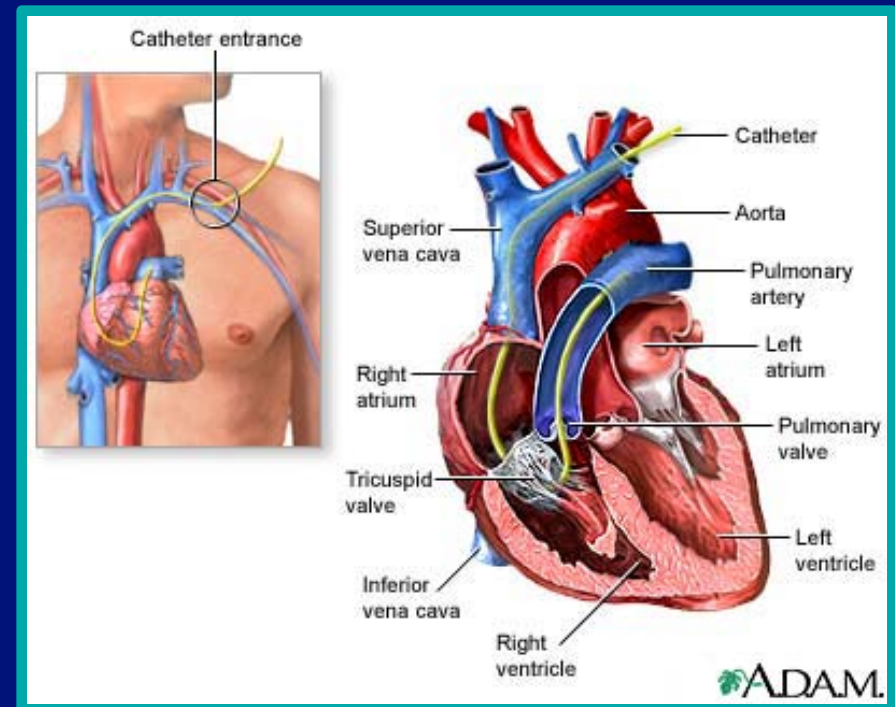
Dr. Daniel Jacoby, MD

Heart Failure Team Attending Physicians

Background

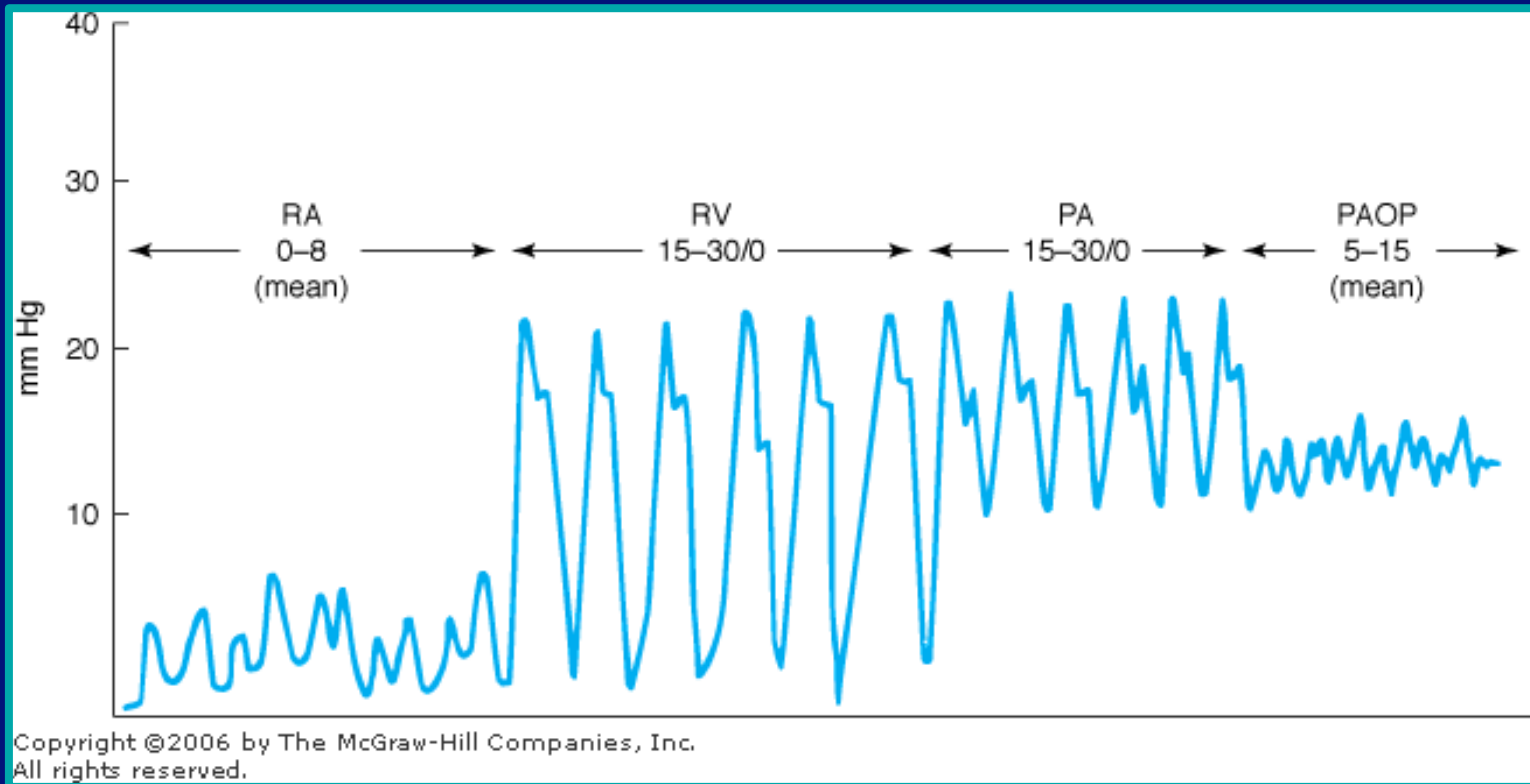
Pulmonary Artery (PA) Catheter

- Used to assess for type of shock and monitor responses to treatment
- Is a flow-directed balloon-tipped catheter
- Inserted into vein - floated through right atrium and right ventricle into pulmonary artery



Background (Cont'd)

- Chamber waveforms viewed on monitor screen during insertion process



Hemodynamic Wave Forms

Background (Cont'd)

- **Traditional care for patients with PA catheters is bedrest leading to:**
 - Social isolation & depression
 - Physical deconditioning
 - Higher risk for post-transplant complications
- **But – can hemodynamically stable patients be ambulated safely with a PA catheter?**
- **Important to help stable patients awaiting transplant maintain optimal physical & emotional condition, while ensuring safety**

Current Ambulation Protocol Patients Awaiting Heart Transplant

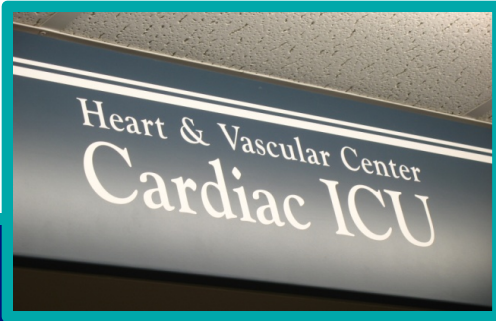
- UNOS 1A Status
- Wait for donor heart
- MD order to ambulate
- PT & OT evaluations
- Ambulate on monitor with RN – each lap around Cardiac ICU 225 feet
- Patient determines distance & duration of walk
- Is this safe? No evidence to support practice of ambulating patients with PA catheters



Purpose & Specific Aims

- **Purpose: To describe the physiologic & emotional responses to ambulation in patients with a PA catheter awaiting heart transplant**
- **Specific aims to determine:**
 1. **If there were changes in PA catheter position while ambulating (catheter migration)**
 2. **If ambulation is associated with patients' feeling of exertion & fatigue**
 3. **Patients' perception of how ambulation affects their sense of well-being**

Methods



Design: Prospective descriptive

Sample: Patients with PA catheter awaiting heart transplant

Setting: Cardiac ICU, HVC, YNHH

Human

Subjects: IRB approved by Yale HRPP

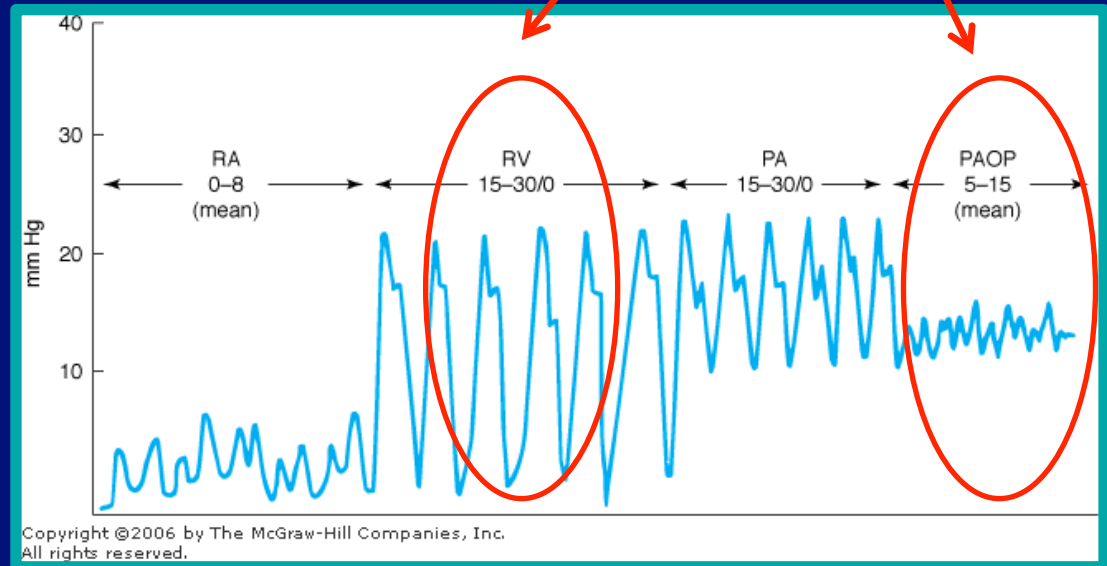
Measures

Catheter Migration

Documents measurement on the catheter as it exits the insertion site



Observes PA waveform for changes



Measures (cont'd)

Exertion

Borg Scale

Score	Definition
0	Nothing at all
0.5	Very, very, weak / light
1	Very weak / light
2	Weak / light
3	Moderate
4	Somewhat strong / hard
5	Strong / hard
6	
7	Very strong / hard
8	
9	
10	Very, very strong / hard

Fatigue

Fatigue Scale

None				Extreme
0	1	2	3	4

Measures (Cont'd)

- **Well-being Scale: (1=strongly disagree to 5=strongly agree)**

Having the opportunity to walk around the unit

1. helps me deal with being in the hospital waiting for a transplant
 2. is inconvenient because it interrupts my schedule
 3. is something I look forward to doing
 4. upsets me because it makes me see that I can no longer do what I used to do
 5. is not enjoyable
 6. helps to lift my spirits
 7. helps to keep me in better physical condition
- *How does walking make you feel emotionally and physically?*

Procedure

- **Obtain written informed consent**
- **Ambulate patient on portable monitor with RN**
- **Collect data before, during and after each walk**
 - **Vital signs**
 - **Evidence of change in PA catheter position**
 - **Patient's perception of exertion (Borg Scale)**
 - **Level of fatigue**
- **Assess patient's perception of how walking affects sense of well being (weekly)**

Sample Description

(N = 148 Walks by 8 Patients)

Patient #	1	2	3	4	5	6	7	8
Age	38	61	53	65	51	65	64	34
Gender	M	M	M	F	M	M	M	M
# of Walks (1-10 laps)	2	62	68	7	1	3	4	1

Characteristics			
Gender - Male	87.5%		
	Mean (SD)	Median	Range
Age (years)	53.9 (\pm 12.3)	57	34 – 65
# Walks	29.4 \pm 20.4	28.5	1-68

Research Question #1

Are there changes in PA catheter position while ambulating?

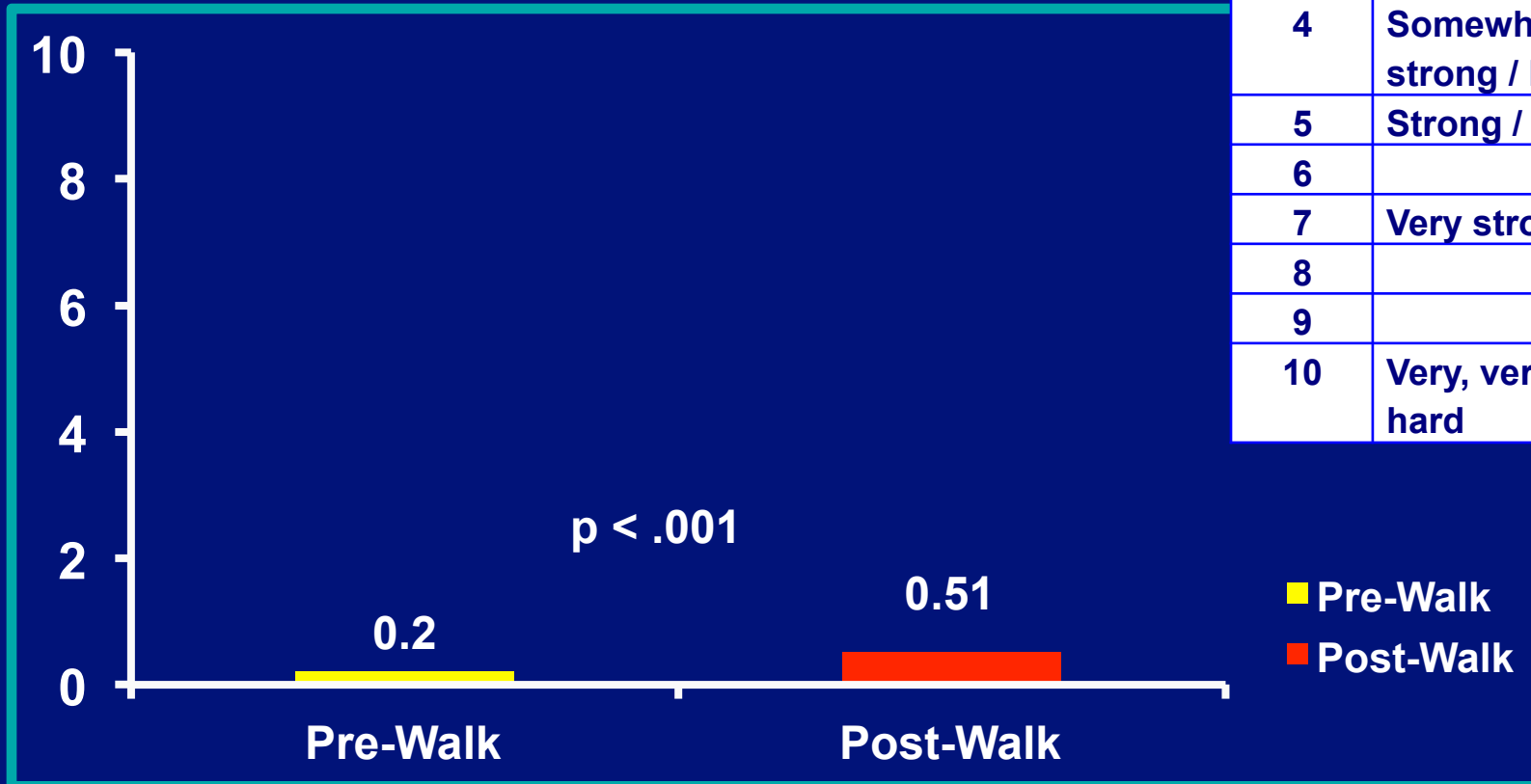
- 1 of 147 patient walks (0.7%) had change in catheter position (2 cm)
- No catheter-induced arrhythmias
- No changes in PA catheter waveform



Research Question #2a

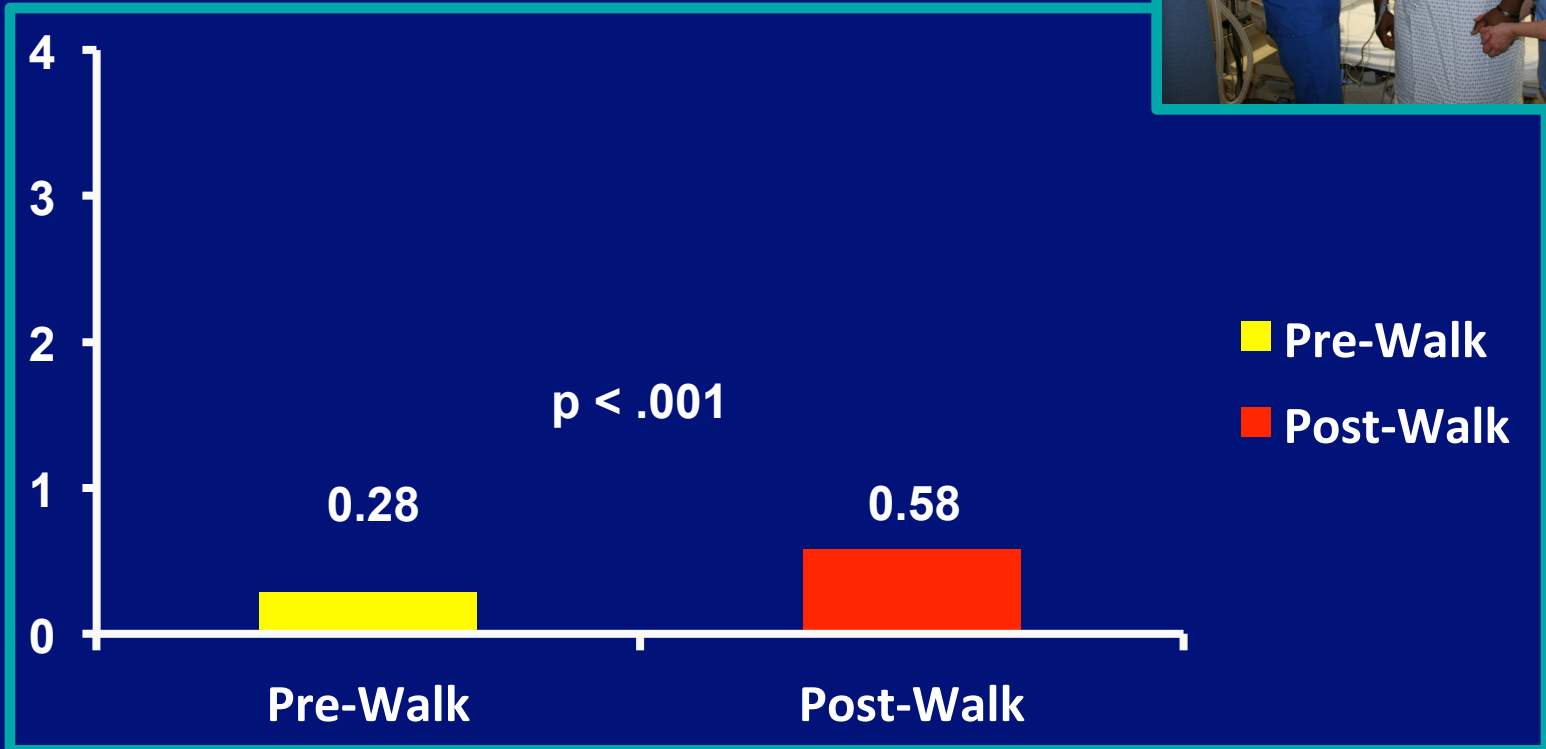
Is ambulation associated with a patient's feeling of exertion?

Borg Scale	
Score	Definition
0	Nothing at all
0.5	Very, very, weak / light
1	Very weak / light
2	Weak / light
3	Moderate
4	Somewhat strong / hard
5	Strong / hard
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10	Very, very strong / hard



Research Question #2b

Is ambulation associated with a patient's feeling of fatigue?



Research Question #3

How does ambulation affect a patient's sense of well-being?

- Well-being Scale: Maximum score = 35

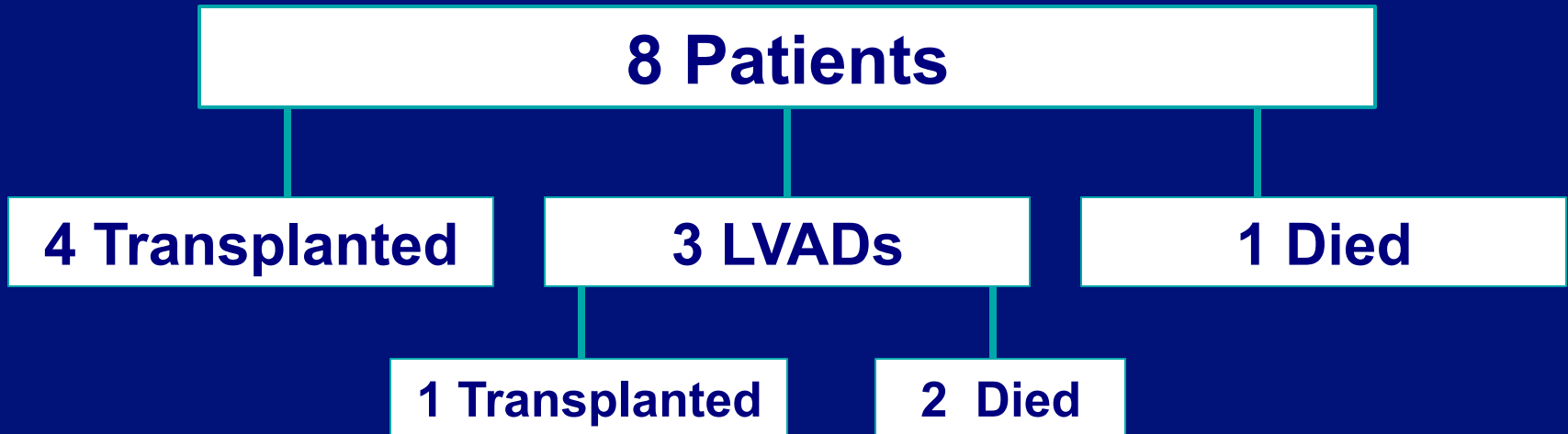
Pt #	Week 1	Week 2	Week 3
2	35	35	32
3	32	33	32
7	27		

Research Question #3 (Cont'd)

How does walking make you feel emotionally and physically?

- Helps deal with hospitalization, gives patients something to look forward to, and helps lift spirits
- Appreciate opportunity to increase physical activity
- Expressed feelings of improved physical well-being

Outcomes



Conclusions & Implications

- In stable patients awaiting heart transplant, ambulating with PA catheter is safe & patients maintained a good sense of well-being
- Patients should be better prepared to undergo transplant surgery & have an easier recovery

