What INTERMACS Patient Profile is this? 1, 2, or 3: Case Studies

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STS-INTERMACS Meeting 2019

Disclosures

- **Related Grant: Medtronic**
- **Related Consultant: NuPulse CV, Procyrion**
- Unrelated Consultant: Ortho Clinical Diagnostics
- Unrelated Grants: American Heart Association / Enduring Hearts Scientist Development Grant, Bayer, Merck

ADVANCES IN QUALITY & OUTCOMES:
A Data Managers Meeting

Special Thanks

< Previous Article

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INTERMACS profiles and modifiers: Heterogeneity of patient classification and the impact of modifiers on predicting patient outcome

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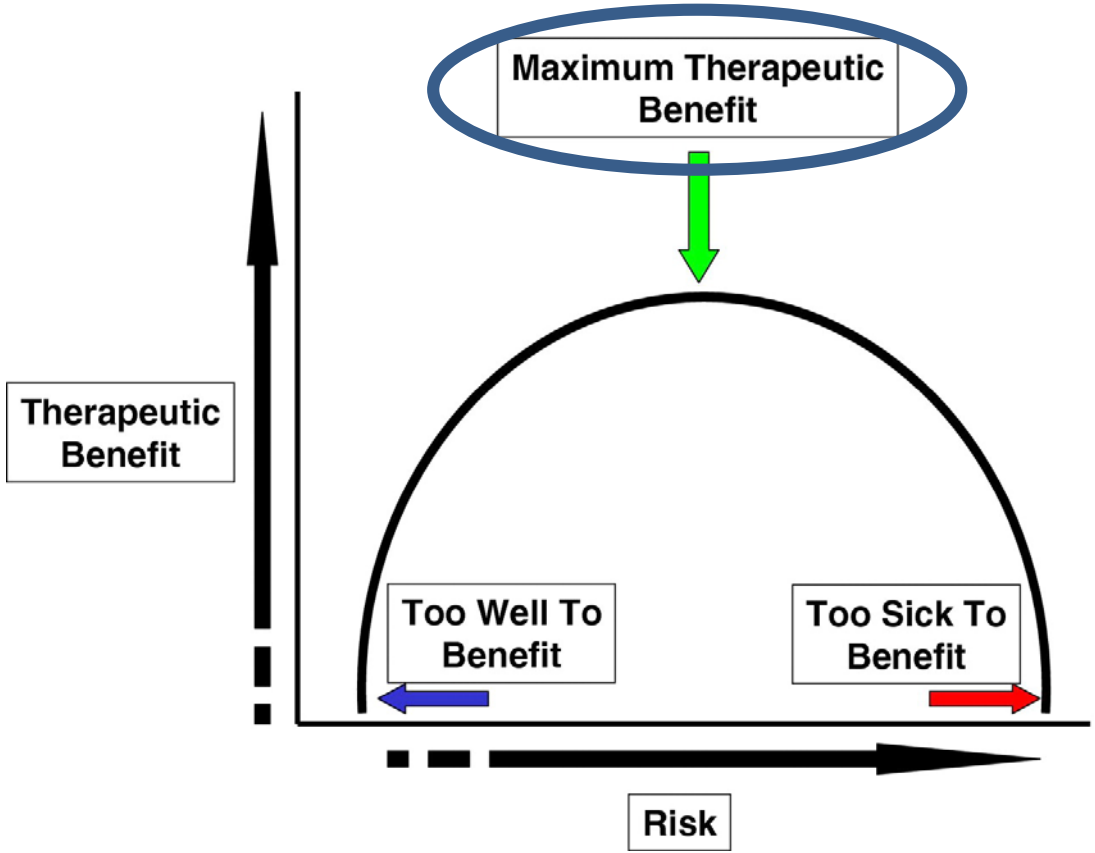
THE SOCIETY OF THORACIC SURGEONS
Established 1964

Learning Objectives

- Identify correct Intermacs Patient Profiles;
- Describe how to code clinically staged cases;
- Recognize the various differences in the Intermacs Patient Profiles.

Risk Assessment: The Ideal



Cleland, J.G.F. et al. J Am Coll Cardiol 2009;53:608-611.

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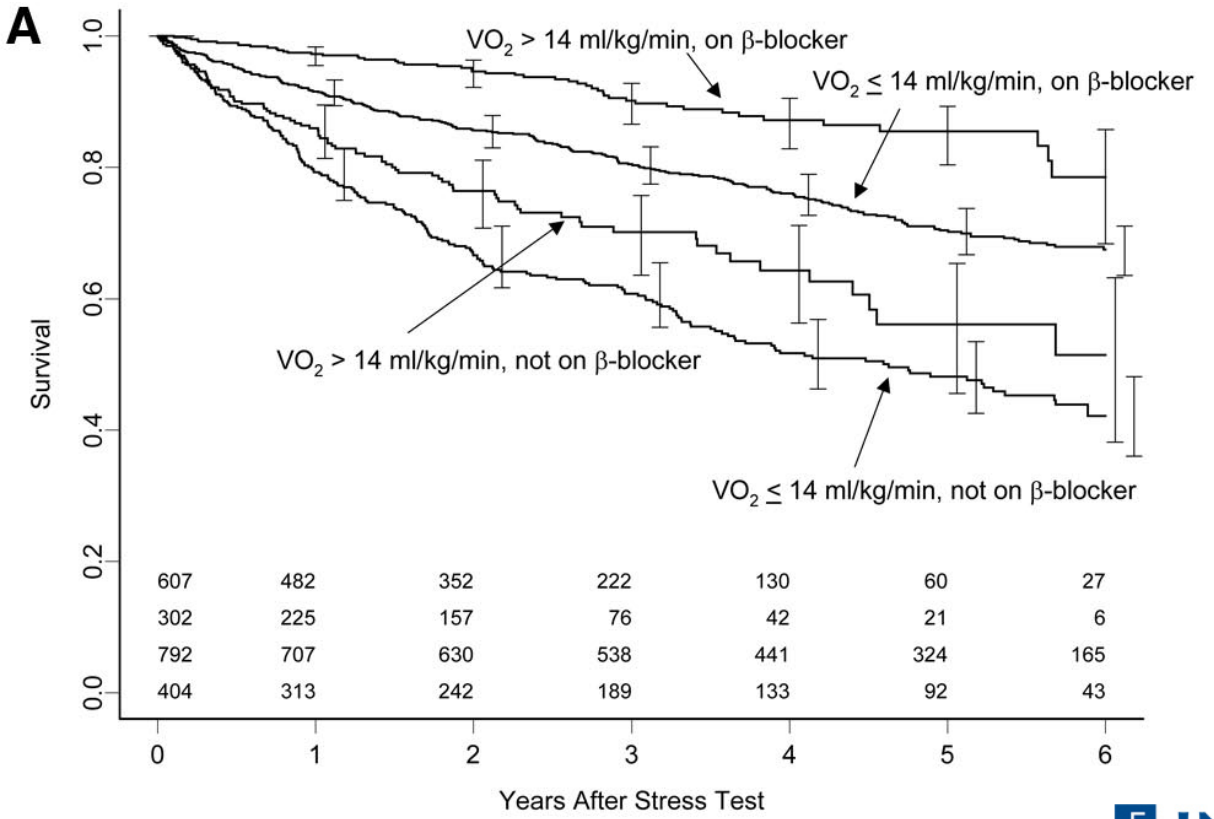
Peak VO2: With / Without Beta Blockers



O'Neill, JO, et al. Circulation. 2005;111:2313-2318.

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INTERMACS Profiles

Vasopressors, second inotrope, nitroprusside

Inotropes or TCS

ADULT PROFILES	Current CMS - DT Functional Indication	IV INO*	Official Shorthand	NYHA CLASS Assumed	Modifier option
INTERMACS LEVEL 1	Met	X	"Crash and burn"	IV	TCS A
INTERMACS LEVEL 2	Met	X	"Sliding fast" on inotropes	IV	TCS A
INTERMACS LEVEL 3	Met	X	"Stable" continuous inotrope dependent * Can be in hospital or at home	IV	TCA if hosp FF if home A
INTERMACS LEVEL 4	+ Peak $VO_2 \leq 12$		Resting symptoms on oral therapy at home	AMB IV	FF A
INTERMACS LEVEL 5	+ Peak $VO_2 \leq 12$		"Housebound", Comfortable at rest, symptoms with minimum activity ADL	AMB IV	FF A
INTERMACS LEVEL 6			"Walking wounded"-ADL possible but meaningful activity limited	IIIB	FF A
INTERMACS LEVEL 7			Advanced Class III	III	A only

* Intravenous inotropic therapy only approved for refractory Class IV s

Stewart GC, et al. Circulation 2011;123:1559-1568.

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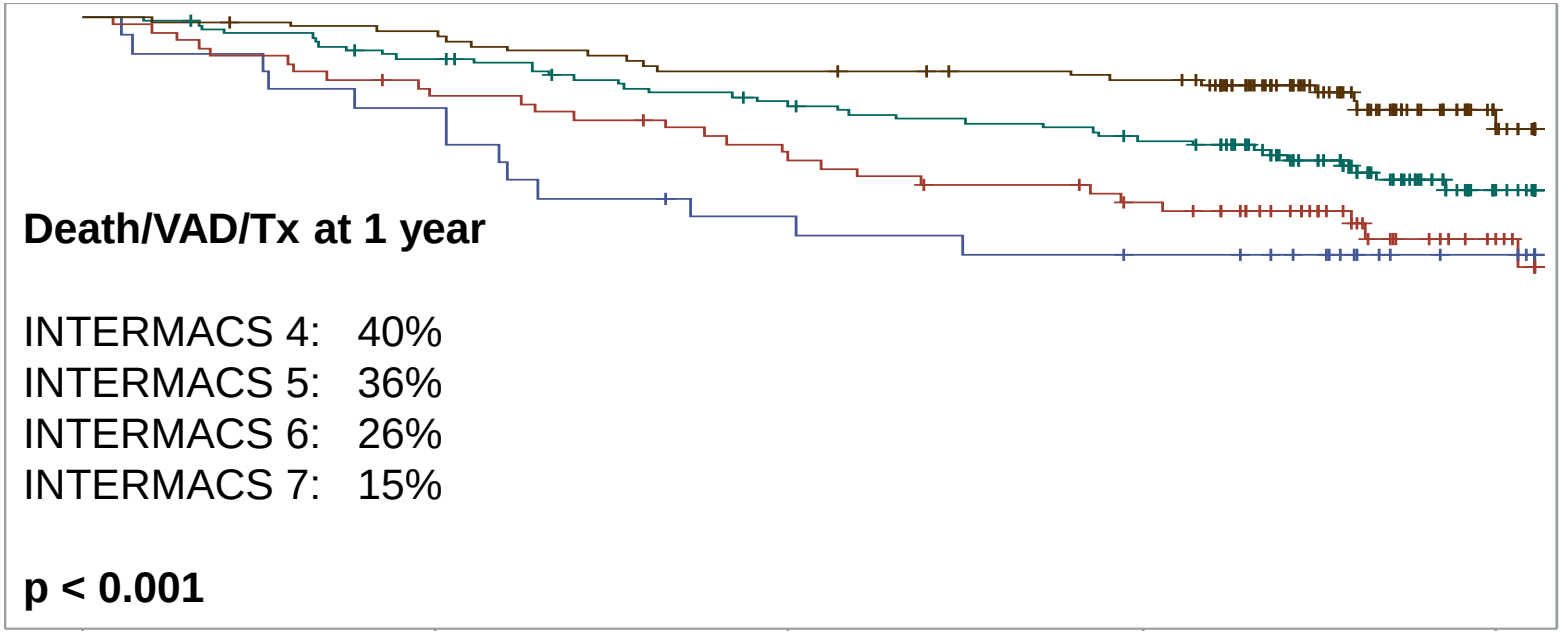
INTERMACS Modifiers

A: Arrhythmia – Profiles 1-7, recurrent VT, ICD shocks, usually more than twice in a week

TCS: Temporary Circulatory Support – Profiles 1-3, IABP, ECMO, Impella, TandemHeart, Centrimags

FF: Frequent Flyer – Profiles 3-6, at least two admissions in the past 3 months or three in the past 6 months

INTERMACS Profiles in HF



Death/VAD/Tx at 1 year

INTERMACS 4: 40%
INTERMACS 5: 36%
INTERMACS 6: 26%
INTERMACS 7: 15%

p < 0.001

Lala, A, Shah, P, et al. American Heart Association 2018

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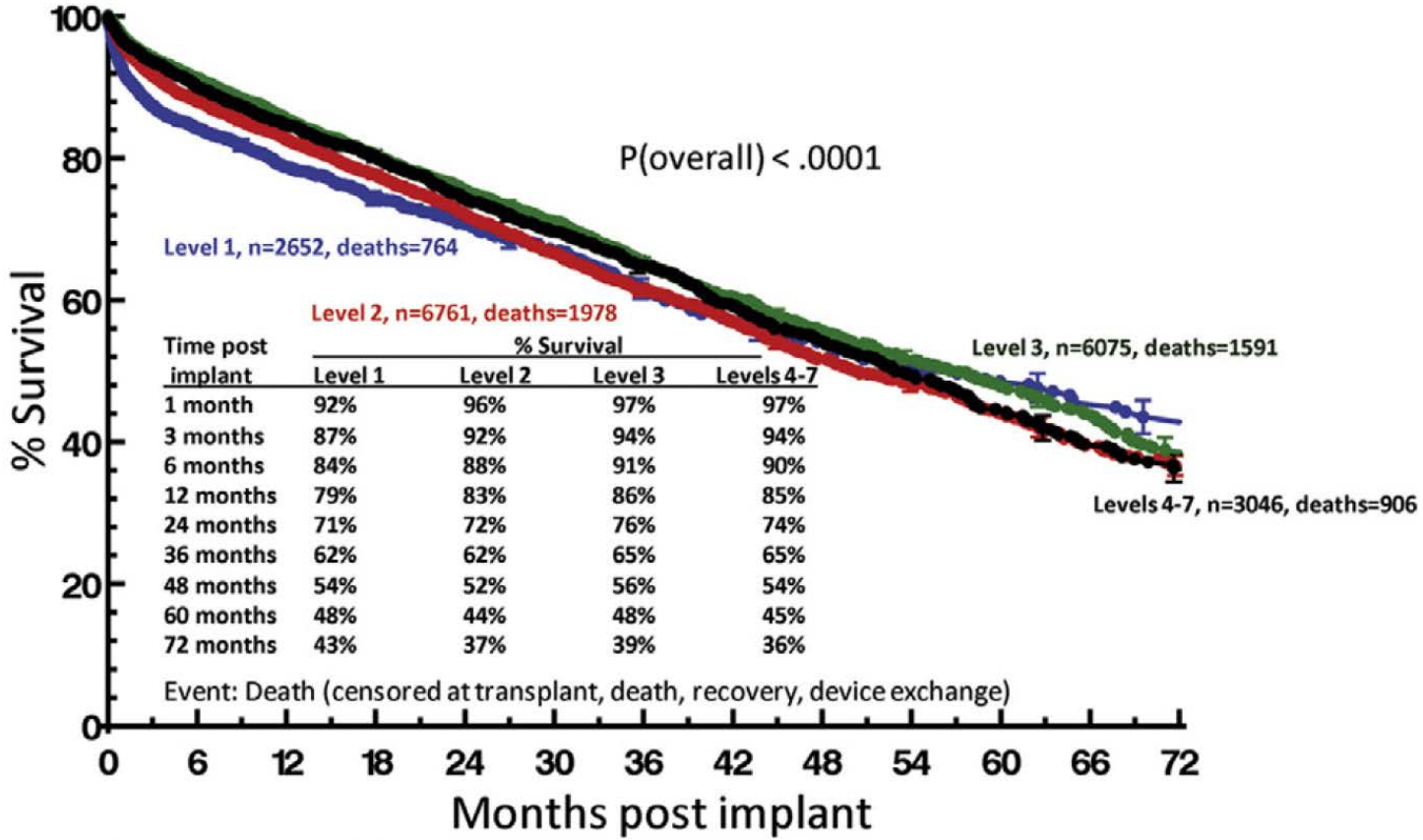
Post-LVAD Survival



Time post implant	% Survival			
	Level 1	Level 2	Level 3	Levels 4-7
1 month	92%	96%	97%	97%
3 months	87%	92%	94%	94%
6 months	84%	88%	91%	90%
12 months	79%	83%	86%	85%
24 months	71%	72%	76%	74%
36 months	62%	62%	65%	65%
48 months	54%	52%	56%	54%
60 months	48%	44%	48%	45%
72 months	43%	37%	39%	36%

Event: Death (censored at transplant, death, recovery, device exchange)

Kormos RL, et al. J Heart Lung Transplant 2019;38:114-126.

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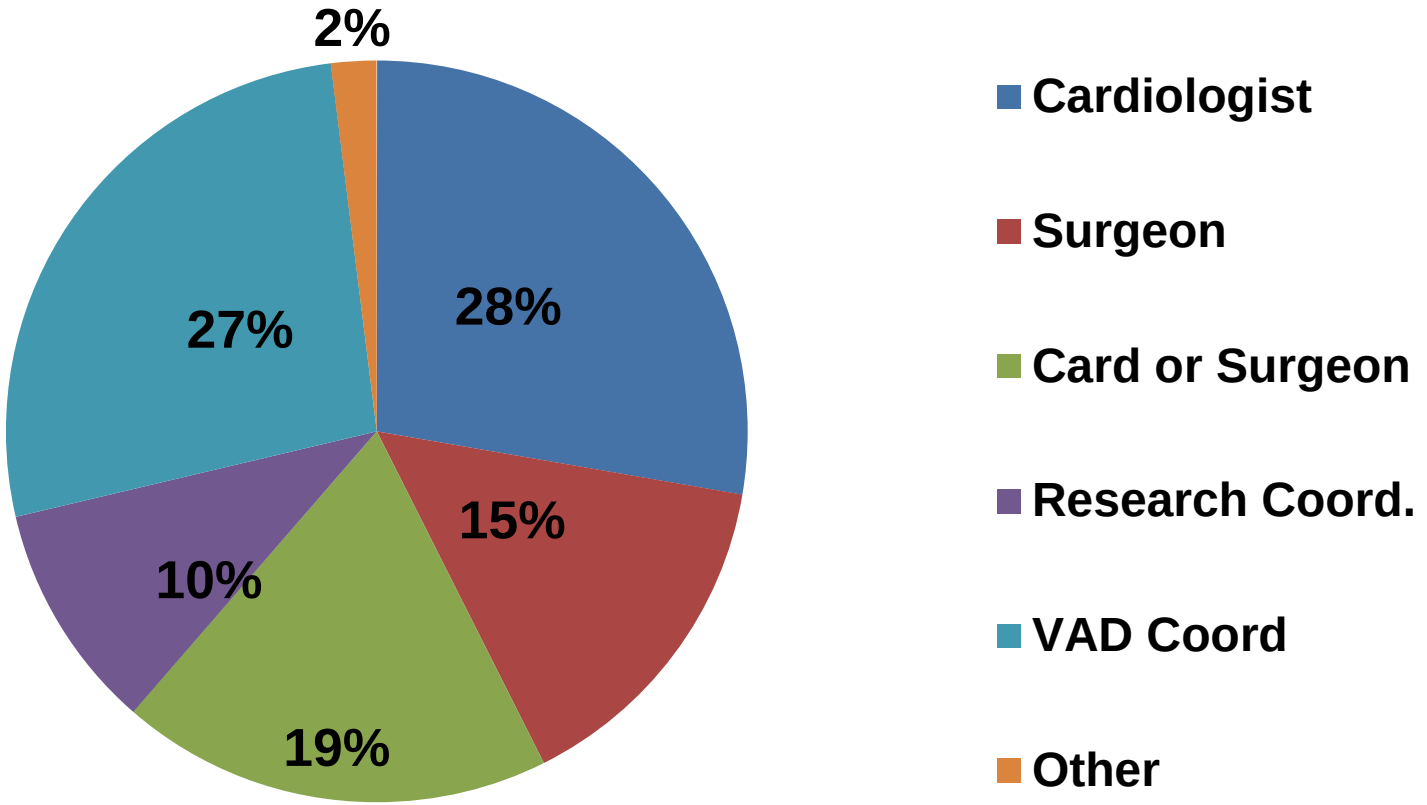
Who Assigns INTERMACS Profile at your Institution?



Cowger JA, Shah P, et al. J Heart Lung Transplant 2016;35:440-448.

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Scenario #1

56 year old male with chronic non-ischemic systolic heart failure admitted from clinic with NYHA class IIIB-IV symptoms and 20lb weight gain on 100 mg of torsemide. **Not on home inotropes. 3rd CHF admit in 6 months.** Baseline Cr 1.0 mg/dL. Admit Cr 1.5, ALT 20, INR 1.0. Currently on non-ICU floor on 0.125 mcg/kg/min milrinone and Lasix 10 mg/hr gtt. On day of operation, **Cr 1.1 mg/dL, ALT 28 IU/L, INR 1.0. Swan on 0.125 mcg/kg/min milrinone** following hemodynamics: **RA 9, PA 65/21, PCWP 20, cardiac index 2.3.**

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Scenario #1 – Polling Question

1. **Profile 2**
2. **Profile 3**
3. **Profile 4**
4. **Profile 5**
5. **Profile 6**

Also consider FF modifier

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Poll: Scenario #1

Scenario #2

56 year old male with acute non-ischemic biventricular heart failure in shock on admission who was placed **on ECMO then bilateral Centrimags**. Currently, patient is in the ICU on ventilator support and stable on **vasopressin 0.02 units/min, milrinone 0.5 mcg/kg/min, and amiodarone.** His mean arterial pressure is 77 mmHg and his heart rate is 110 bpm. He is making urine with a **Cr of 1.2 mg/dL (baseline 1.5), ALT 33, INR 1.1.**

Scenario #2 – Polling Question

1. Profile 1 – no TCS
2. Profile 2 - TCS
3. Profile 2 – no TCS
4. Profile 1 - TCS
5. Profile 3 - TCS

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Poll: Scenario #2

Scenario #3

56 year old male with chronic non-ischemic heart failure (EF <10%) admitted with 20lb weight gain, nausea and vomiting with **SBP 83/68 and HR 120** bpm. He is on 100 mg twice daily torsemide at home. **Not on home inotropes**. Currently, patient is in the ICU on an **IABP on vasopressin 0.04 units, milrinone 0.5 mcg/kg/min, dobutamine 5 mcg/kg/min and levophed 12 mcg/min**. His blood pressure is 85/65 mmHg and his heart rate is 125 bpm. Swan numbers: **cardiac index 1.5 mmHg**, RA 14, Wedge pressure 27, PA 53/30. He is making urine with a lot of IV diuretics. Day of operation: **Cr 1.7 mg/dL** (1.0 baseline), **INR is 1.5** (no warfarin), **ALT 100**. He is NOT vented.

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Scenario #3 – Polling Question

1. Profile 1
2. Profile 2
3. Profile 3
4. Profile 4
5. Profile 5

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Poll: Scenario #3

Scenario #4

56 year old male with chronic ischemic systolic heart failure admitted from home for **scheduled VAD implant**. Discharged 2 weeks ago after presenting with 20lb weight gain on 40 mg of lasix with acute kidney injury, creatinine peaked at 1.7 mg/dL. **NOT on home inotropes**. 2nd admit in 3 months. Currently on the tele (non-ICU) floor. Labs day of operation: **ALT 20, INR 0.8, Cr 1.5.** Pre-Op RHC numbers: RA 11, PA 65/28, PCWP 27, cardiac index 1.6.

Scenario #4 – Polling Question

1. **Profile 2**
2. **Profile 3**
3. **Profile 4**
4. **Profile 5**
5. **Profile 6**

Also consider FF modifier

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Poll: Scenario #4

Scenario #5

56 year old male with chronic non-ischemic systolic heart failure admitted from EP clinic with 2 ICD shocks for VT, refractory to ATP. Baseline Cr 1.0 increased to 1.5 mg/dL. Currently in the ICU on **amiodarone 1mg/hr** and Lasix 15 mg/hr gtt. No pressors, IABP, inotropes or ventilator. Labs on day of operation: **ALT 90, INR 1.3, Cr 2.1**. RHC numbers: **RA 20, PA 45/36, WP 32, cardiac index 1.6**

Scenario #5 – Polling Question

1. **Profile 1**
2. **Profile 2**
3. **Profile 3**
4. **Profile 4**
5. **Profile 5**

Also consider A modifier

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Poll: Scenario #5

Key Takeaways

- **Attempt to standardize institutional approach to INTERMACS Profile assignment**
- **Ideally multidisciplinary / selection committee**
- **TCS (IABP, ECMO, Tandem, Impella, Centrimag) = Profile 1-3**
- **Inotropes = Profiles 1-3**
- **FF = 2 or more admissions in 3 months or 3 or more in 6 months**

THANK YOU

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