XII Reunión. Estado del Arte en

INSUFICIENCIA CARDIACA

PRÁCTICA CLÍNICA Y MODELOS ORGANIZATIVOS

A Coruña Heart Failure Academy

Sede: Hotel Meliá María Pita, A Coruña (Av. de Pedro Barrié de la Maza, 3)

A Coruña 26-27 de septiembre de 2025

SESSION IX | SESIÓN IX

CARDIOGENIC SHOCK: TIME, TECHNOLOGY AND NETWORKING. HUB & SPOKE MODEL IN GALICIA

SHOCK CARDIOGENICO: TIEMPO, TECNOLOGIA Y NETWORKING: MODELO HUB & SPOKE EN GALICIA

Chairs: **Raquel Vázquez Mourelle, Marta Dorribo Masid y Francisco Estévez Cid.**

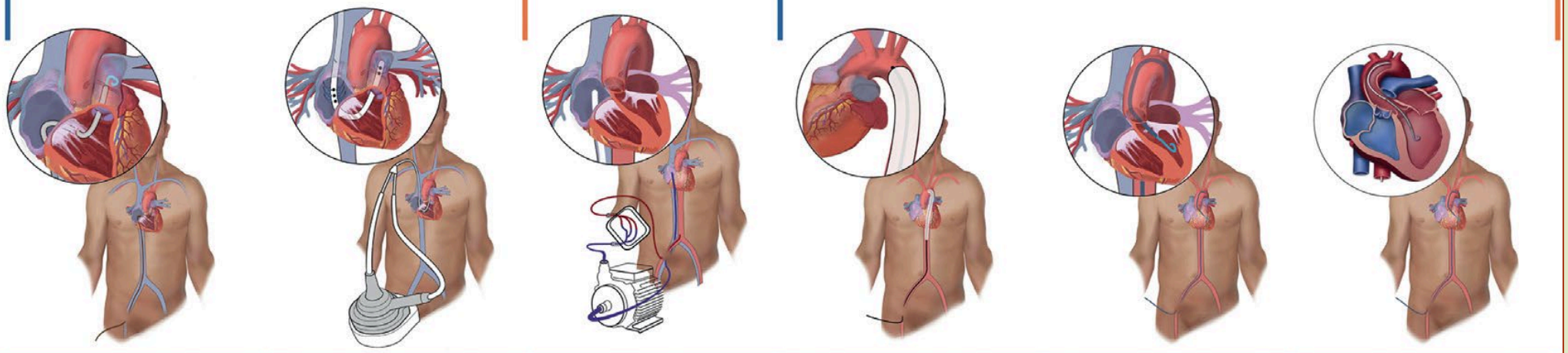
Introduction

Introducción

› **María G. Crespo Leiro y José Cuenca Castillo**

Right ventricular support

Left ventricular support

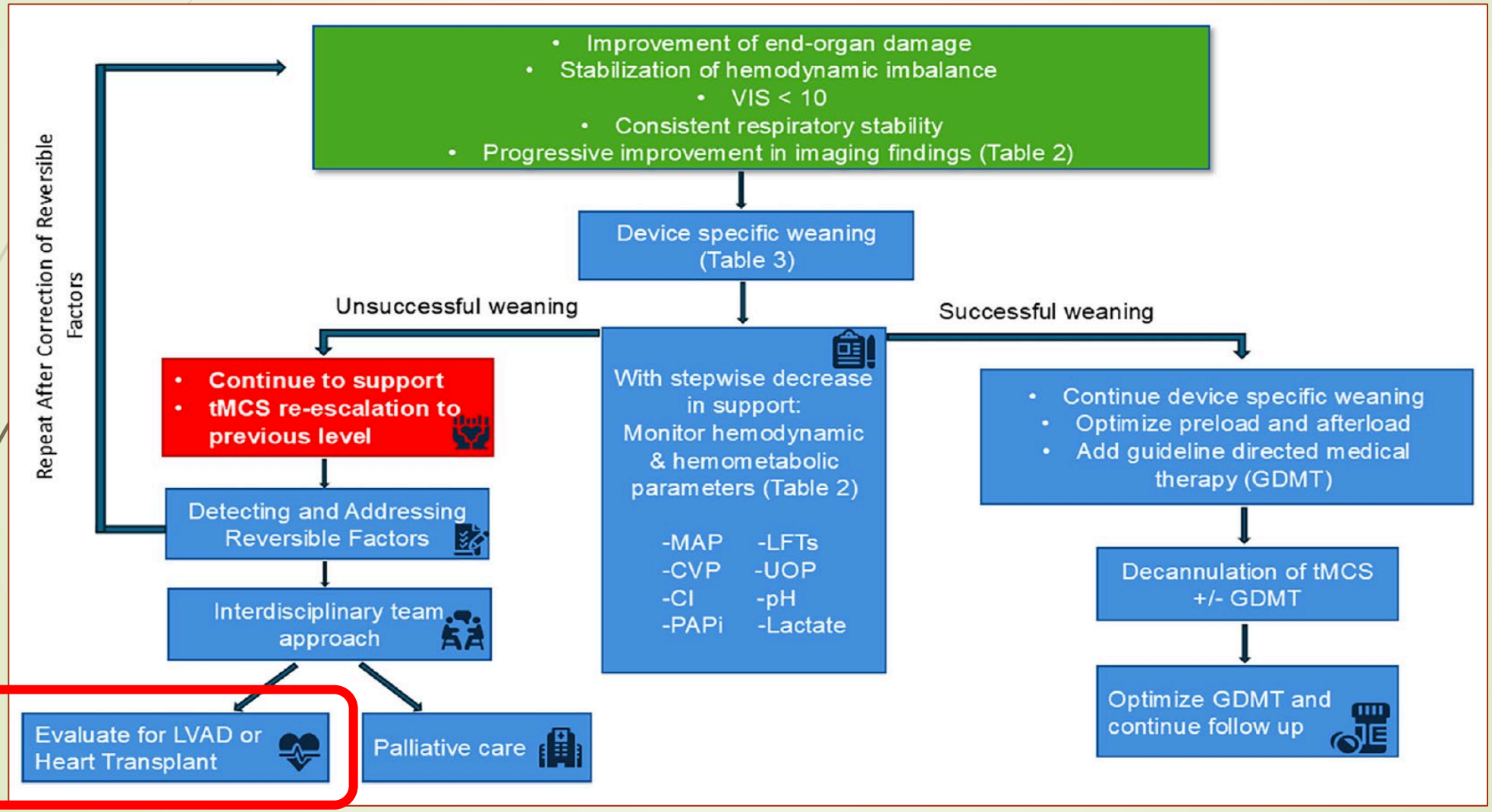


	Impella RP Flex	RA-PA pVAD	VA-ECMO	IABP	Impella CP	Impella 5.5
Max flow	3.0 - 4.0 L/min	4.0 - 5.0 L/min	5.0 - 7.0 L/min	0.5 - 1.0 L/min	3.0 - 4.3 L/min	5.0 – 6.0 L/min
Max pump speed	33,000 rpm	7,500 rpm	6,000 rpm	NA	46,000 rpm	33,000 rpm
Mechanism	Axial flow continuous pump (RA-to-PA)	Centrifugal flow continuous pump (RA-to-PA)	Centrifugal flow continuous pump (RA-to-AO)	Balloon inflation-deflation (AO)	Axial flow continuous pump (LV-to-AO)	Axial flow continuous pump (LV-to-AO)
Sheath size	23 F venous peel-away	29 or 31 F venous (inflow)	15-24 F arterial 19-25 F venous	7-8 F arterial	14 F arterial peel-away	23 F arterial peel-away
Typical insertion/ placement	Internal jugular vein	Internal jugular vein	Femoral vein (drain) Femoral artery (return)	Femoral artery or Axillary artery	Femoral artery or Axillary artery	Axillary artery
Direct LV unloading	-	-	-	-	+++	+++
Direct RV unloading	+	+	+	-	-	-
Afterload	-	-	↑↑↑	↓↓	↓	↓
Coronary perfusion	-	-	↑↑	↑↑	↑↑	↑↑

EXPERT CONSENSUS DOCUMENT SPELDE ET AL

ESCALATION/DE-ESCALATION OF TEMPORARY MCS

Ann Thorac Surg
2025;120:213–24



New 2023 allocation criteria for heart transplant in Spain. SEC/ONT/SECCE consensus document

ABSENCE OF MOF CRITERIA:

- SOFA > 11 points
- IMV > 7 days
- CKD in RRT
- MRC score < 36 points (myopathy)
- *Vasoactive inotropic score > 20 points*

URGENCY STATUS 0

- MCS with total biventricular support (VA-ECMO, CentriMag) → **0A**
- Implanted or external dVAD with mechanical dysfunction or cardioembolic complication → **0A**
- MCS with total univentricular support (eg, CentriMag, Impella 5.5) → **0B**
- Refractory arrhythmic storm without MCS → **0B**

URGENCY STATUS 1

- Complicated dVAD (infection, gastrointestinal bleeding, AR, RV failure)
- Properly functioning external dVAD
- Adult univentricular physiology, Fontan circulation with severe enteropathy
- Hypertrophic or restrictive cardiomyopathy (not candidate for MCS) + intravenous drug support

REGIONAL PRIORITY

- Hyperimmunized patients: cPRA > 80% (MFI > 5000) and virtual crossmatch

PEDIATRIC URGENCIES

- **G0**
  - MCS (including VA-ECMO)
  - Congenital heart disease + MV + inotropic agents
- **G1**
  - Restrictive CM with PVRI > WU/m2
    - Fontan circulation with severe enteropathy
    - On elective list > 2 years
  - Need for inotropic agents and admission

EXPERT CONSENSUS DOCUMENT SPELDE ET AL
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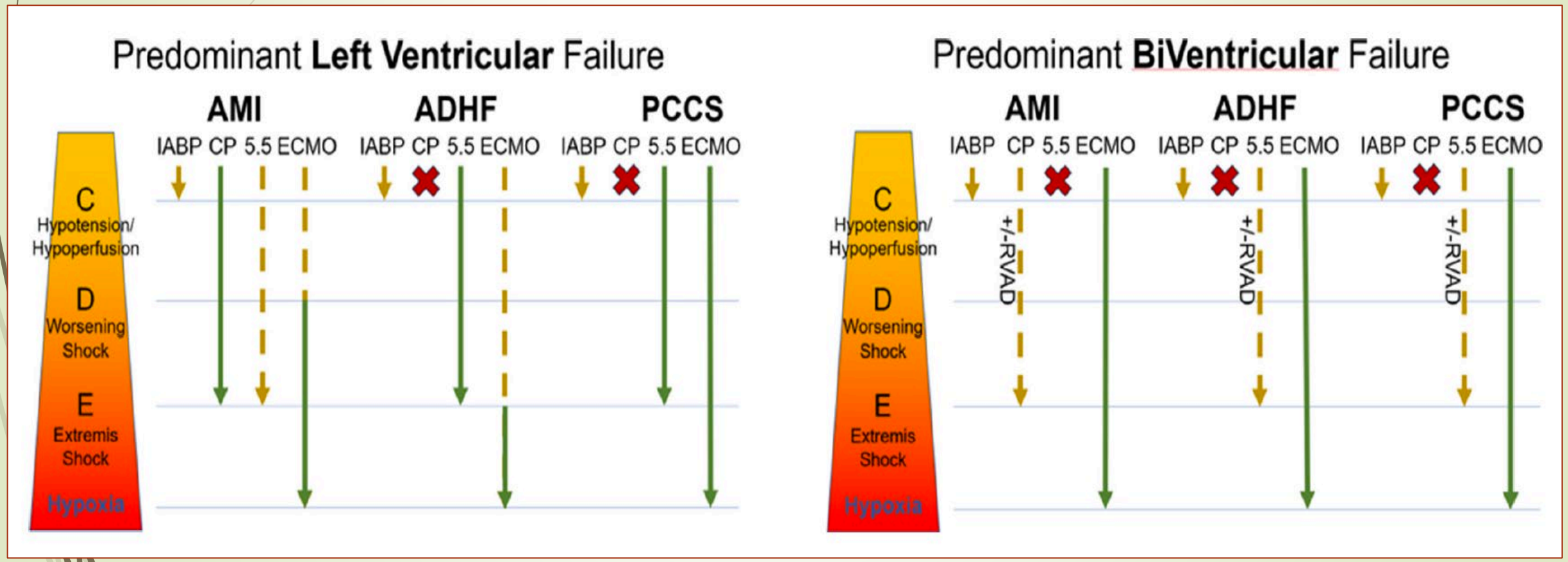


ANEXO 2. DEFINICIÓN DE FRACASO MULTIORGÁNICO PARA LA APLICACIÓN DE LOS CRITERIOS DE URGENCIA EN TRASPLANTE CARDIACO

Se considera que un paciente se encuentra en situación de fracaso multiorgánico (FMO) y por tanto deberá ser temporalmente excluido de lista de trasplante cardíaco si cumple AL MENOS UNO de los siguientes cinco criterios:

1. SOFA (por sus siglas en inglés) Sequential Organ Failure Assessment > 11 puntos, medida

2. Insuficiencia renal aguda o crónica que requiere terapia sustitutiva renal* (TSR) a excepción de pacientes con:
    - necrosis tubular aguda anúrica que cumplan los cuatro supuestos siguientes: i) más de cuatro semanas de soporte circulatorio de corta duración; ii) función renal previa al ingreso actual normal (FG>60 ml/min); iii) prueba de función renal (ej. renograma) que demuestra viabilidad del parénquima renal; iv) recuperación completa de la función del resto de órganos con escala SOFA <6.
    - insuficiencia renal crónica con TSR que son candidatos a trasplante cardiorrenal.

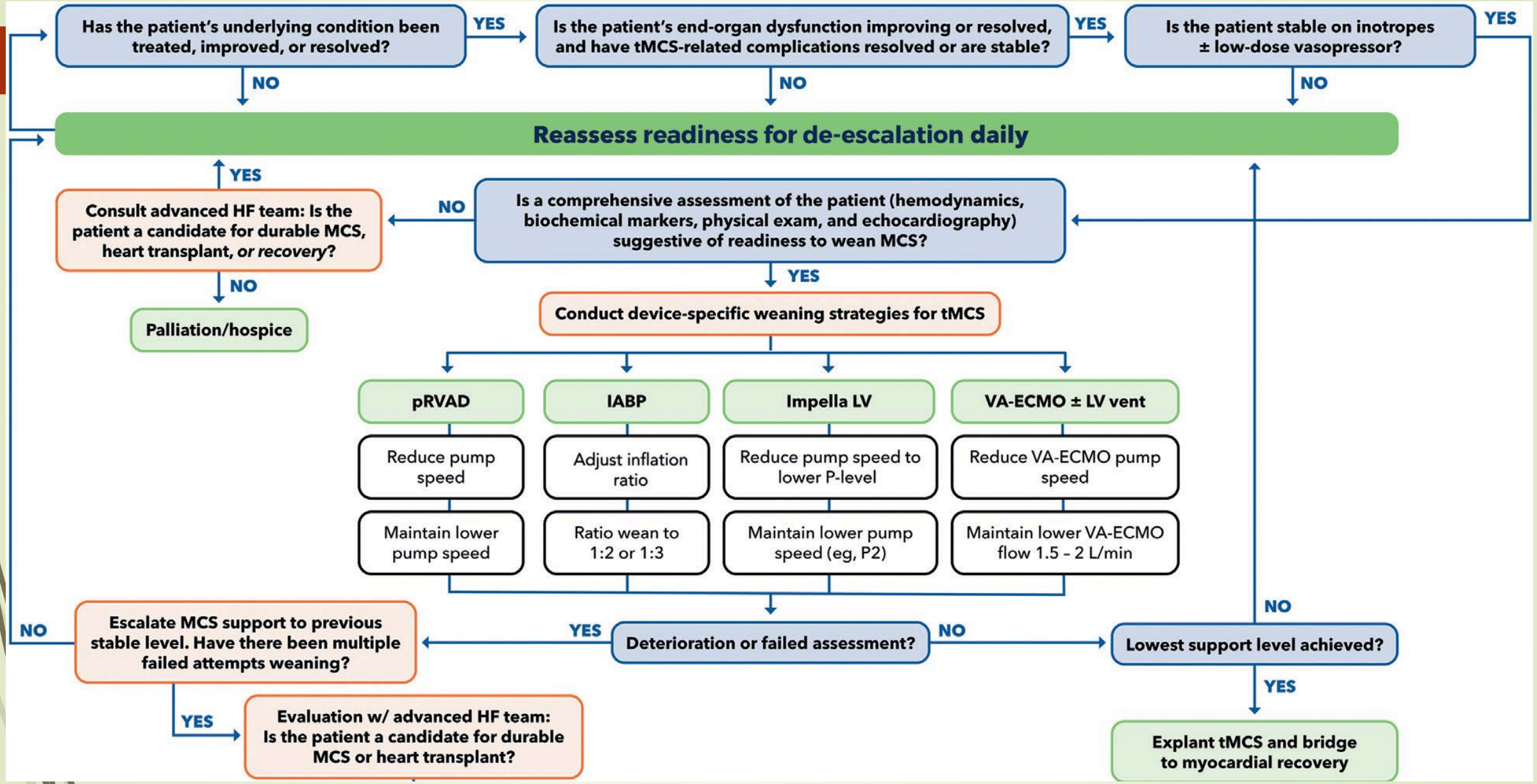
*La técnica de ultrafiltración para manejo de volumen no se considera TSR.

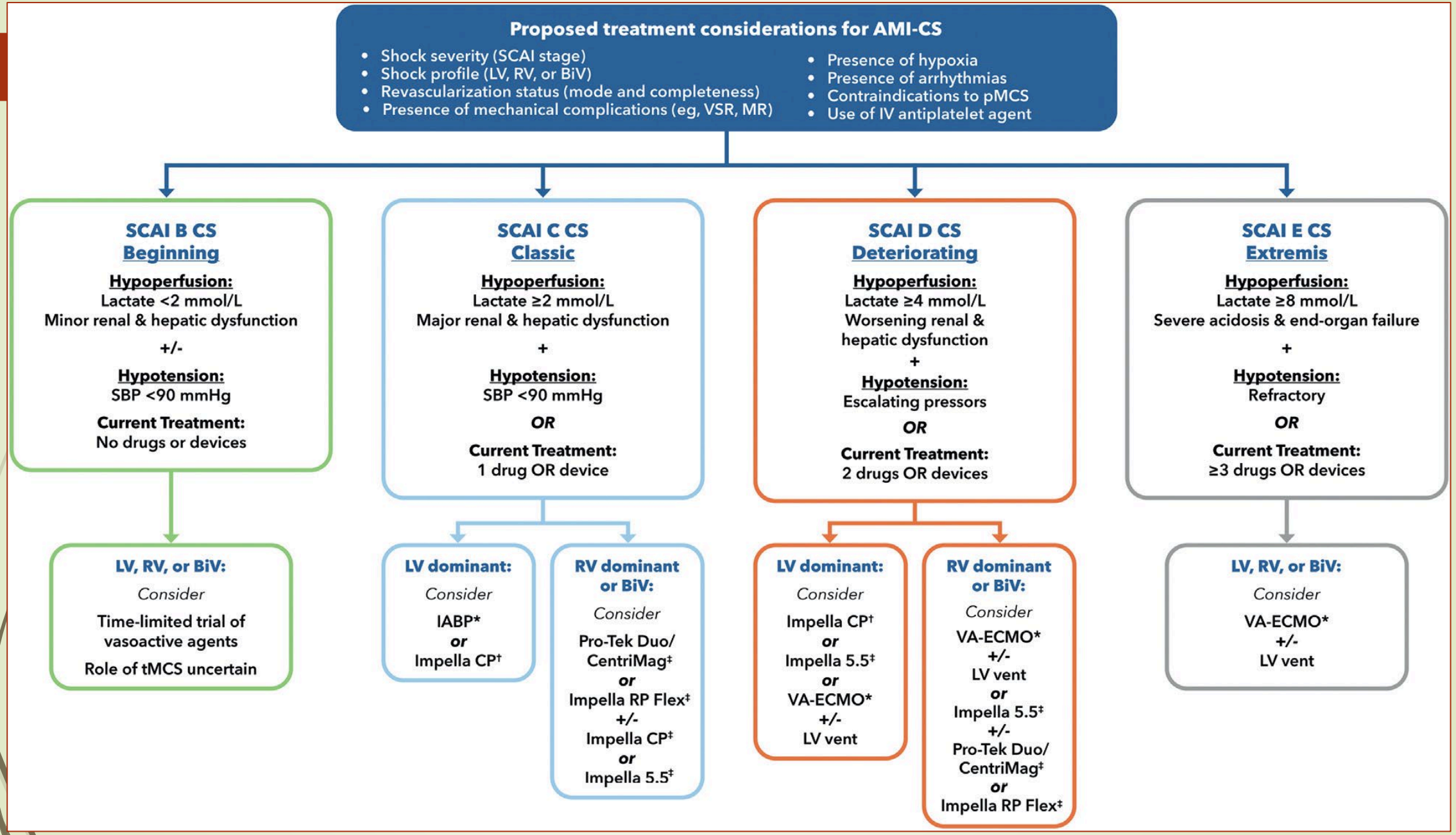
ANEXO 2. DEFINICIÓN DE FRACASO MULTIORGÁNICO PARA LA APLICACIÓN DE LOS CRITERIOS DE URGENCIA EN TRASPLANTE CARDIACO

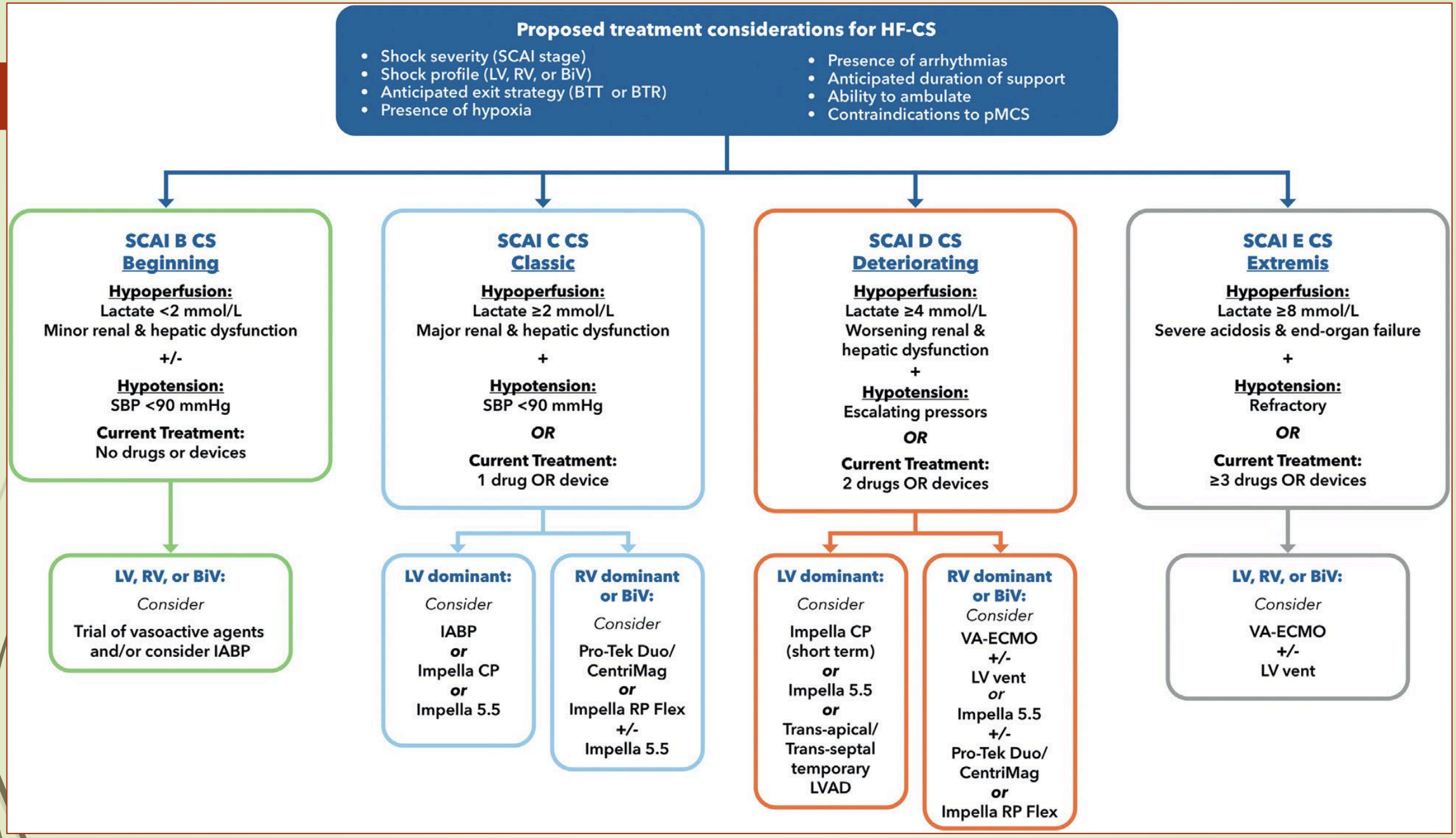
Se considera que un paciente se encuentra en situación de fracaso multiorgánico (FMO) y por tanto deberá ser temporalmente excluido de lista de trasplante cardíaco si cumple AL MENOS UNO de los siguientes cinco criterios:

3. Pacientes sometidos a ventilación mecánica invasiva (VMI) durante un tiempo total máximo de 7 días consecutivos.3 A excepción de los pacientes con tormenta eléctrica definida en el Anexo 3.

4. Pacientes que han estado sometidos a VMI durante más de 5 días y que tras extubación presentan Miopatía del Paciente Crítico con escala MRC < 36.


Has the patient's underlying condition been treated, improved, or resolved?
YES
Is the patient's end-organ dysfunction improving or resolved, and have tMCS-related complications resolved or are stable?
YES
Is the patient stable on inotropes ± low-dose vasopressor?
YES
NO
NO
NO
Reassess readiness for de-escalation daily
YES
Consult advanced HF team: Is the patient a candidate for durable MCS, heart transplant, or recovery?
NO
Is a comprehensive assessment of the patient (hemodynamics, biochemical markers, physical exam, and echocardiography) suggestive of readiness to wean MCS?
NO
YES
NO
Palliation/hospice
Conduct device-specific weaning strategies for tMCS
pRVAD
IABP
Impella LV
VA-ECMO ± LV vent
Reduce pump speed
Adjust inflation ratio
Reduce pump speed to lower P-level
Reduce VA-ECMO pump speed
Maintain lower pump speed
Ratio wean to 1:2 or 1:3
Maintain lower pump speed (eg, P2)
Maintain lower VA-ECMO flow 1.5 – 2 L/min
NO
Escalate MCS support to previous stable level. Have there been multiple failed attempts weaning?
YES
Deterioration or failed assessment?
NO
Lowest support level achieved?
YES
YES
Evaluation w/ advanced HF team: Is the patient a candidate for durable MCS or heart transplant?
Explant tMCS and bridge to myocardial recovery


Proposed treatment considerations for AMI-CS
Shock severity (SCAI stage)
Shock profile (LV, RV, or BiV)
Revascularization status (mode and completeness)
Presence of mechanical complications (eg, VSR, MR)
Presence of hypoxia
Presence of arrhythmias
Contraindications to pMCS
Use of IV antiplatelet agent
SCAI B CS
Beginning
Hypoperfusion:
Lactate <2 mmol/L
Minor renal & hepatic dysfunction
+/-
Hypotension:
SBP <90 mmHg
Current Treatment:
No drugs or devices
LV, RV, or BiV:
Consider
Time-limited trial of vasoactive agents
Role of tMCS uncertain
SCAI C CS
Classic
Hypoperfusion:
Lactate ≥2 mmol/L
Major renal & hepatic dysfunction
+
Hypotension:
SBP <90 mmHg
OR
Current Treatment:
1 drug OR device
LV dominant:
Consider
IABP*
or
Impella CP†
RV dominant or BiV:
Consider
Pro-Tek Duo/ CentriMag‡
or
Impella RP Flex‡
+/-
Impella CP‡
or
Impella 5.5‡
SCAI D CS
Deteriorating
Hypoperfusion:
Lactate ≥4 mmol/L
Worsening renal & hepatic dysfunction
+
Hypotension:
Escalating pressors
OR
Current Treatment:
2 drugs OR devices
LV dominant:
Consider
Impella CP†
or
Impella 5.5‡
or
VA-ECMO*
+/-
LV vent
RV dominant or BiV:
Consider
VA-ECMO*
+/-
LV vent
or
Impella 5.5‡
+/-
Pro-Tek Duo/ CentriMag‡
or
Impella RP Flex‡
SCAI E CS
Extremis
Hypoperfusion:
Lactate ≥8 mmol/L
Severe acidosis & end-organ failure
+
Hypotension:
Refractory
OR
Current Treatment:
≥3 drugs OR devices
LV, RV, or BiV:
Consider
VA-ECMO*
+/-
LV vent


Proposed treatment considerations for HF-CS
Shock severity (SCAI stage)
Shock profile (LV, RV, or BiV)
Anticipated exit strategy (BTT or BTR)
Presence of hypoxia
Presence of arrhythmias
Anticipated duration of support
Ability to ambulate
Contraindications to pMCS
SCAI B CS
Beginning
Hypoperfusion:
Lactate <2 mmol/L
Minor renal & hepatic dysfunction
+/-
Hypotension:
SBP <90 mmHg
Current Treatment:
No drugs or devices
LV, RV, or BiV:
Consider
Trial of vasoactive agents and/or consider IABP
SCAI C CS
Classic
Hypoperfusion:
Lactate ≥2 mmol/L
Major renal & hepatic dysfunction
+
Hypotension:
SBP <90 mmHg
OR
Current Treatment:
1 drug OR device
LV dominant:
Consider
IABP
or
Impella CP
or
Impella 5.5
RV dominant or BiV:
Consider
Pro-Tek Duo/ CentriMag
or
Impella RP Flex
+/-
Impella 5.5
SCAI D CS
Deteriorating
Hypoperfusion:
Lactate ≥4 mmol/L
Worsening renal & hepatic dysfunction
+
Hypotension:
Escalating pressors
OR
Current Treatment:
2 drugs OR devices
LV dominant:
Consider
Impella CP (short term)
or
Impella 5.5
or
Trans-apical/ Trans-septal temporary LVAD
RV dominant or BiV:
Consider
VA-ECMO
+/-
LV vent
or
Impella 5.5
+/-
Pro-Tek Duo/ CentriMag
or
Impella RP Flex
SCAI E CS
Extremis
Hypoperfusion:
Lactate ≥8 mmol/L
Severe acidosis & end-organ failure
+
Hypotension:
Refractory
OR
Current Treatment:
≥3 drugs OR devices
LV, RV, or BiV:
Consider
VA-ECMO
+/-
LV vent