Moltes novetats en 5 anys. Les noves guies d'insuficiència cardíaca

Insuficiència cardíaca aguda

Societat Catalana de Cardiologia

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- Diagnòstic
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- Xoc cardiogènic
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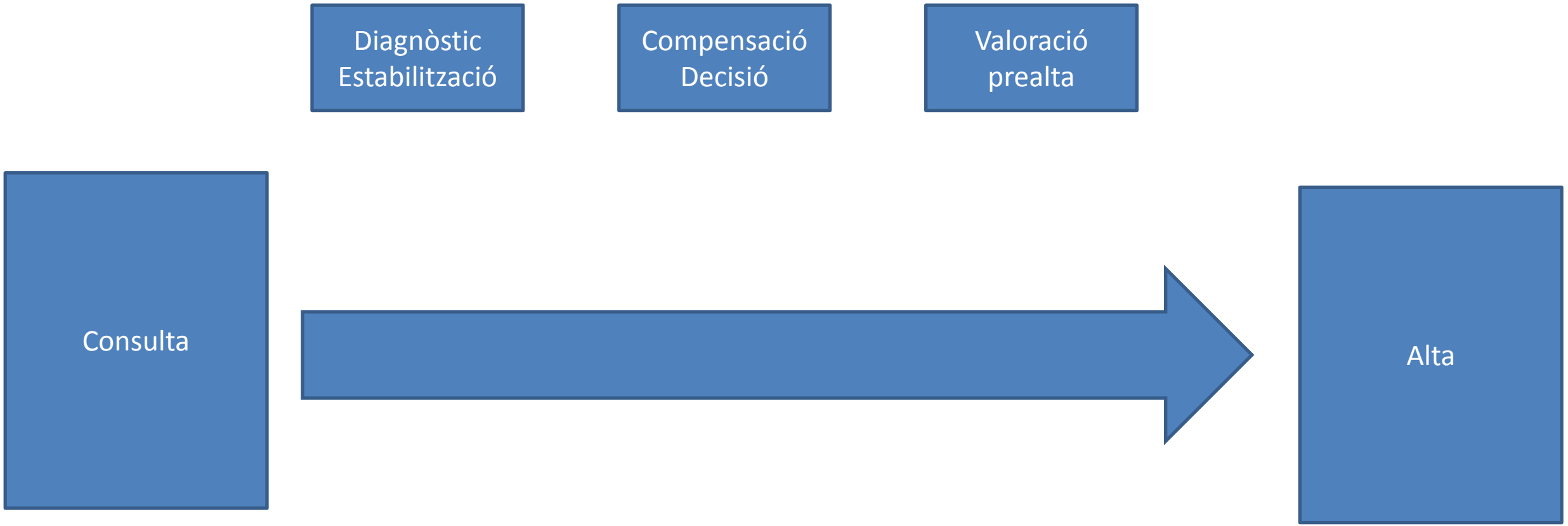
  - Suport mecànic
- Valoració i tractament pre alta

Introducció

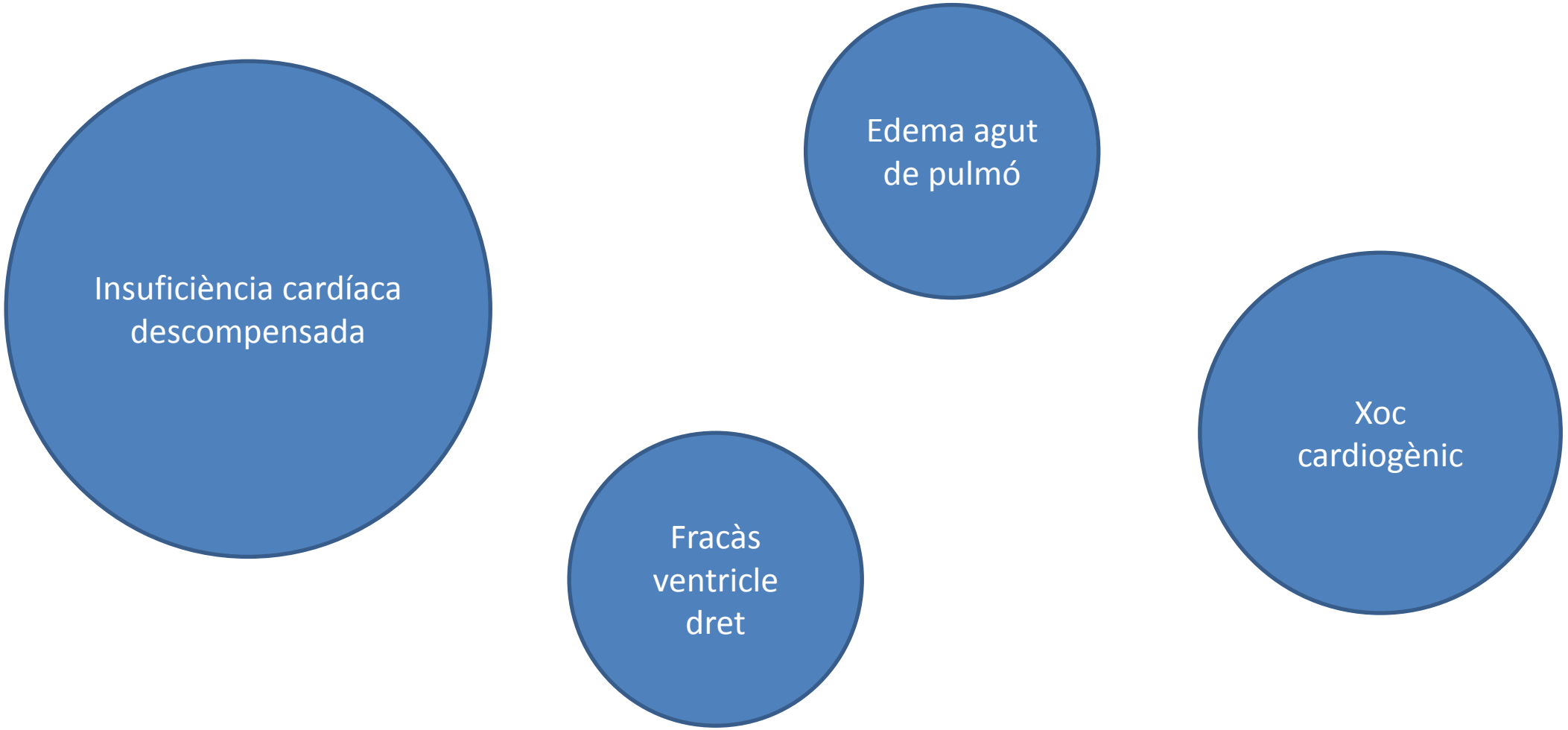
2021	Class	2016	Class
Recommendations for diagnosis of HF			
Invasive coronary angiography may be considered in patients with HFrEF with an intermediate to high pre-test probability of CAD and the presence of ischaemia in non-invasive stress tests.	IIb	Invasive coronary angiography should be considered in patients with HF and intermediate to high pre-test probability of CAD and the presence of ischaemia in non-invasive stress tests (who are considered suitable for potential coronary revascularization) in order to establish the diagnosis of CAD and its severity.	IIa
CTCA should be considered in patients with a low to intermediate pre-test probability of CAD or those with equivocal non-invasive stress tests in order to rule out coronary artery stenosis.	IIa	Cardiac CT may be considered in patients with HF and low to intermediate pre-test probability of CAD or those with equivocal non-invasive stress tests in order to rule out coronary artery stenosis.	IIb
Recommendations for device therapy in HFrEF			
An ICD should be considered to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III) of a non-ischaemic aetiology, and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.	IIa	Primary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status, and they have DCM.	I
CRT should be considered for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 ms and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIa	CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 ms and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	I
Patients with an LVEF ≤35% who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a significant proportion of RV pacing should be considered for 'upgrade' to CRT.	IIa	Patients with HFrEF who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a high proportion of RV pacing may be considered for upgrade to CRT. This does not apply to patients with stable HF.	IIb
Recommendations for management of patients with acute HF			
Combination of a loop diuretic with thiazide-type diuretic should be considered in patients with resistant oedema who do not respond to an increase in loop diuretic doses.	IIa	Combination of loop diuretic with either thiazide-type diuretic or spironolactone may be considered in patients with resistant oedema or insufficient symptomatic response.	IIb
In patients with AHF and SBP >110 mmHg, i.v. vasodilators may be considered as initial therapy to improve symptoms and reduce congestion.	IIb	In patients with hypertensive AHF, i.v. vasodilators should be considered as initial therapy to improve symptoms and reduce congestion.	IIa
Routine use of opiates is not recommended, unless in selected patients with severe/intractable pain or anxiety.	III	Opiates may be considered for cautious use to relieve dyspnoea and anxiety in patients with severe dyspnoea but nausea and hypopnea may occur.	IIb
Short-term MCS should be considered in patients with cardiogenic shock as a BTR, BTD, BTB. Further indications include treatment of the cause of cardiogenic shock or long-term MCS or transplantation.	IIa	Short-term MCS may be considered in refractory cardiogenic shock depending on patient age, comorbidities, and neurological function.	IIb

Recommendations for management of patients with HF and AF			
DOACs are recommended in preference to VKAs in patients with HF, except in those with moderate or severe mitral stenosis or mechanical prosthetic heart valves.	I	For patients with HF and non-valvular AF eligible for anticoagulation based on a CHA_2DS_2-VASc score, NOACs rather than warfarin should be considered for anticoagulation as NOACs are associated with a lower risk of stroke, intracranial haemorrhage, and mortality, which outweigh the increased risk of gastrointestinal haemorrhage.	IIa
Beta-blockers should be considered for short- and long-term rate control in patients with HF and AF.	IIa	For patients in NYHA class I–III, a beta-blocker, usually given orally, is safe and therefore is recommended as first-line treatment to control ventricular rate, provided the patient is euvolaemic.	I
In cases of a clear association between paroxysmal or persistent AF and worsening of HF symptoms, which persist despite medical therapy, catheter ablation should be considered for the prevention of AF.	IIa	AV node catheter ablation may be considered to control heart rate and relieve symptoms in patients unresponsive or intolerant to intensive pharmacological rate and rhythm control therapy, accepting that these patients will become pacemaker-dependent.	IIb
Recommendations for management of patients with HF and CCS			
Coronary revascularization should be considered to relieve persistent symptoms of angina (or an angina-equivalent) in patients with HFrEF, CCS, and coronary anatomy suitable for revascularization, despite OMT including anti-anginal drugs.	IIa	Myocardial revascularization is recommended when angina persists despite treatment with anti-anginal drugs.	I
Recommendations for management of patients with HF and diabetes			
SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin, ertugliflozin, sotagliflozin) are recommended in patients with T2DM at risk of CV events to reduce hospitalizations for HF, major CV events, end-stage renal dysfunction, and CV death.	I	Empagliflozin should be considered in patients with T2DM in order to prevent or delay the onset of HF and prolong life.	IIa

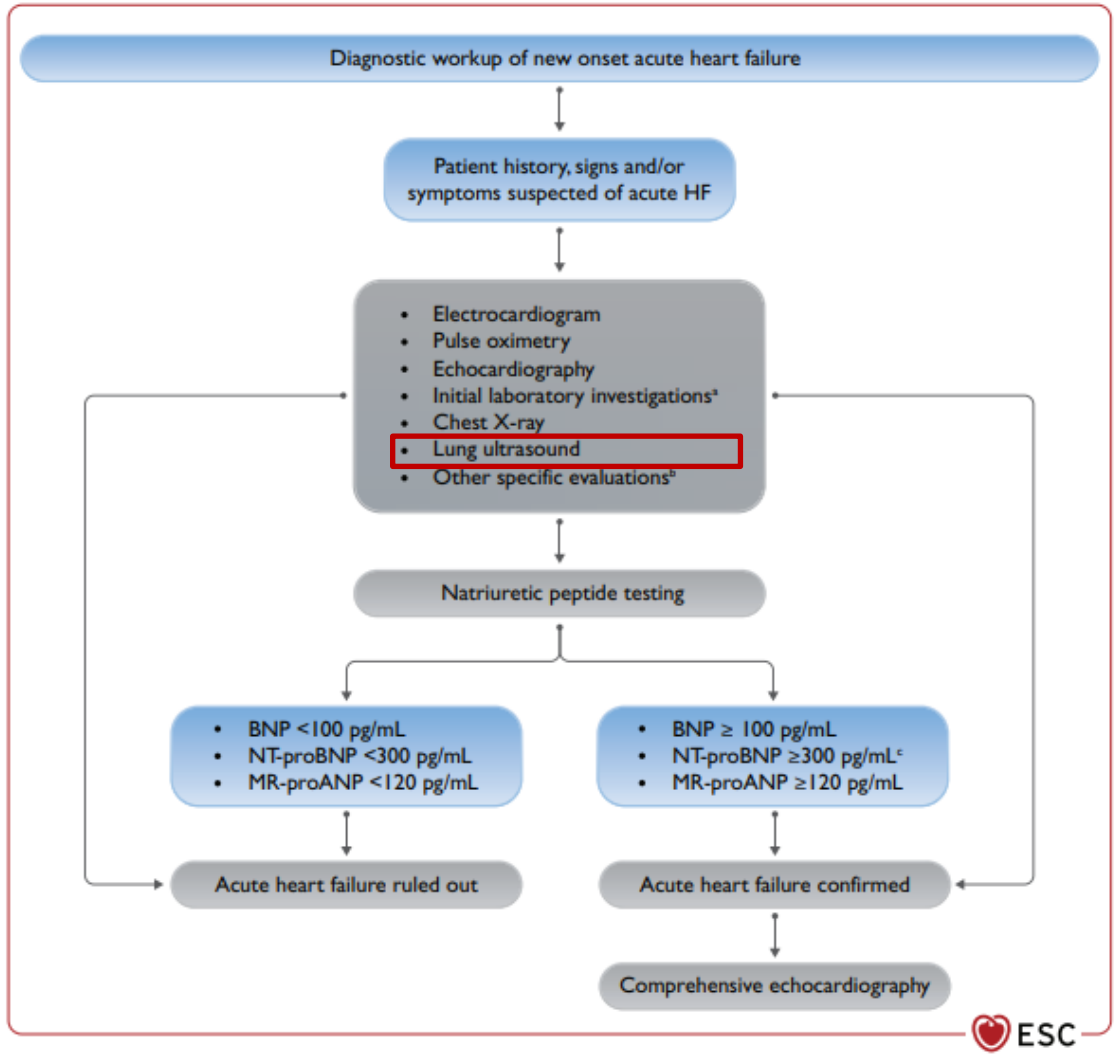
Introducció



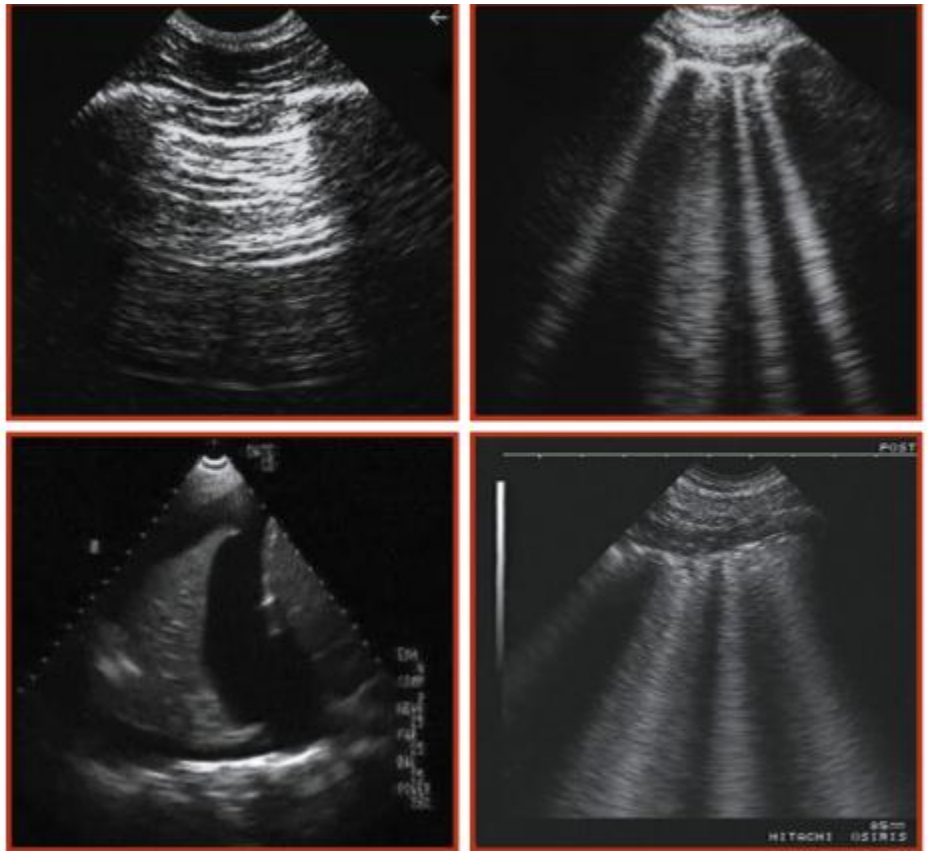
Introducció



Diagnòstic


Diagnostic workup of new onset acute heart failure
Patient history, signs and/or symptoms suspected of acute HF
Electrocardiogram
Pulse oximetry
Echocardiography
Initial laboratory investigations[a]
Chest X-ray
Lung ultrasound
Other specific evaluations[b]
Natriuretic peptide testing
BNP <100 pg/mL
NT-proBNP <300 pg/mL
MR-proANP <120 pg/mL
BNP ≥ 100 pg/mL
NT-proBNP ≥300 pg/mL[c]
MR-proANP ≥120 pg/mL
Acute heart failure ruled out
Acute heart failure confirmed
Comprehensive echocardiography
ESC

Ecografia pulmonar

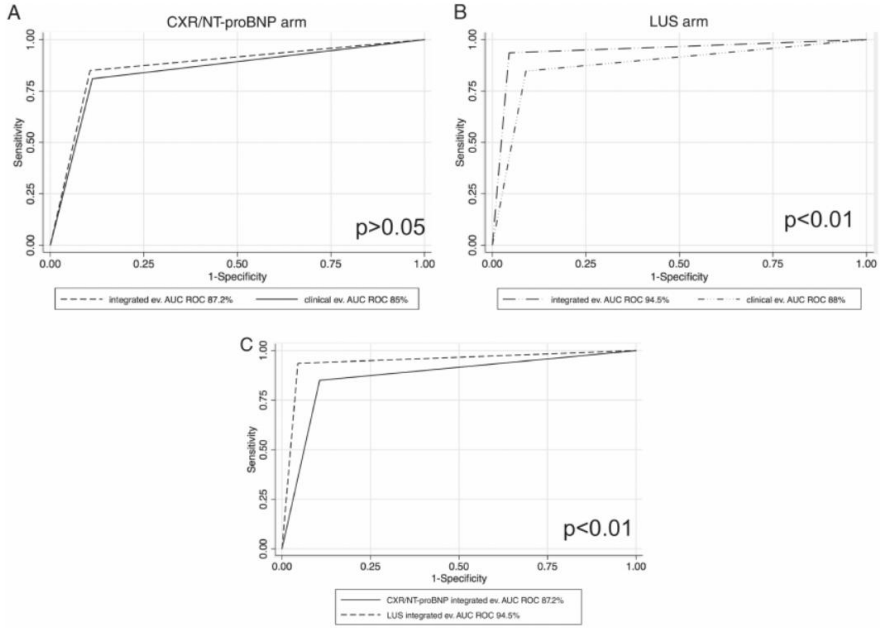


ESC European Society of Cardiology

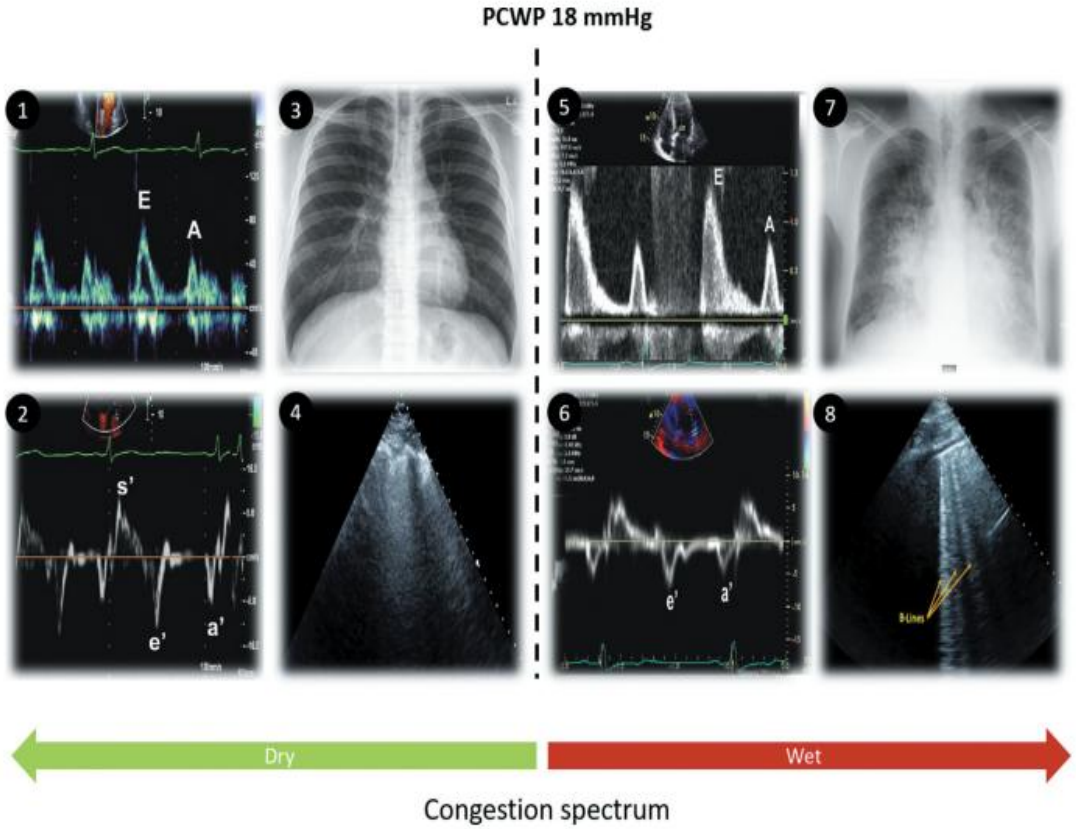
European Journal of Heart Failure (2019) 21, 754–766
doi:10.1002/ejhf.1379

RESEARCH ARTICLE

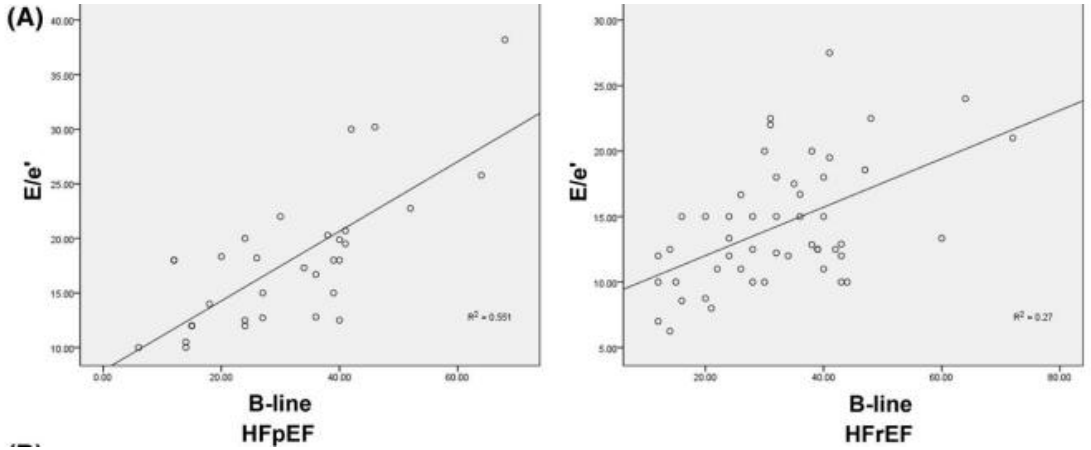
Lung ultrasound integrated with clinical assessment for the diagnosis of acute decompensated heart failure in the emergency department: a randomized controlled trial



Ecografia pulmonar

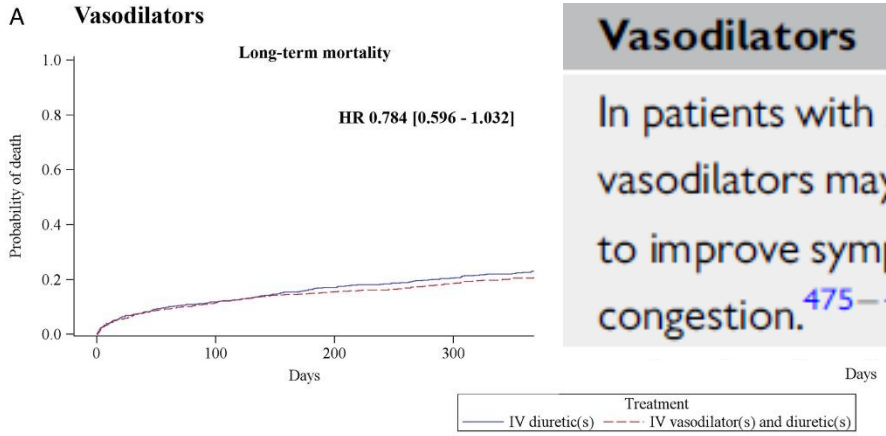


EXPERT REVIEW OF CARDIOVASCULAR THERAPY 2021, VOL. 19, NO. 2, 165–176



Echocardiography. 2017;34:1462–1469

Tractament vasodilatador

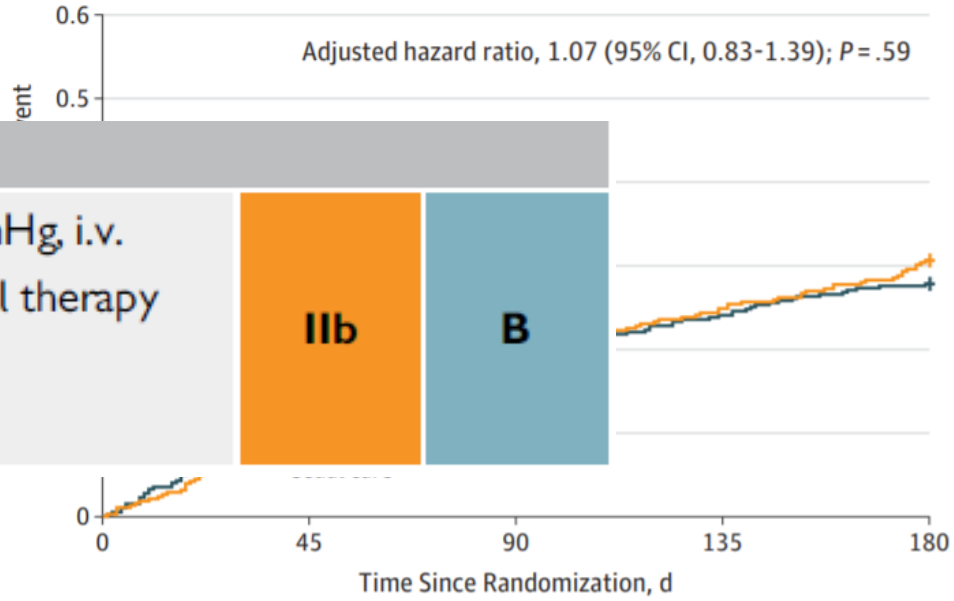


Vasodilators

In patients with AHF and SBP >110 mmHg, i.v. vasodilators may be considered as initial therapy to improve symptoms and reduce congestion.[475–477,479,480]

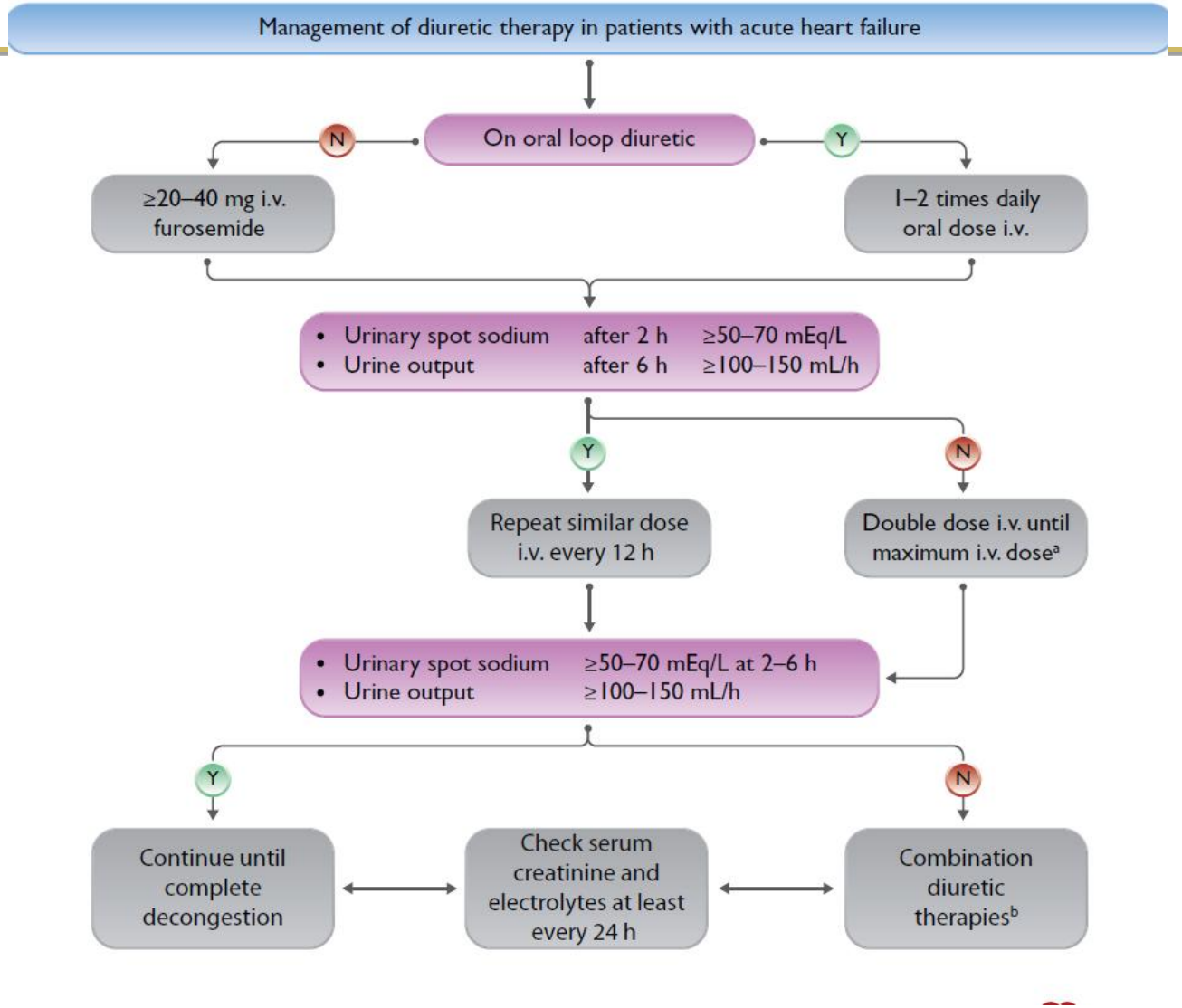
IIb

B



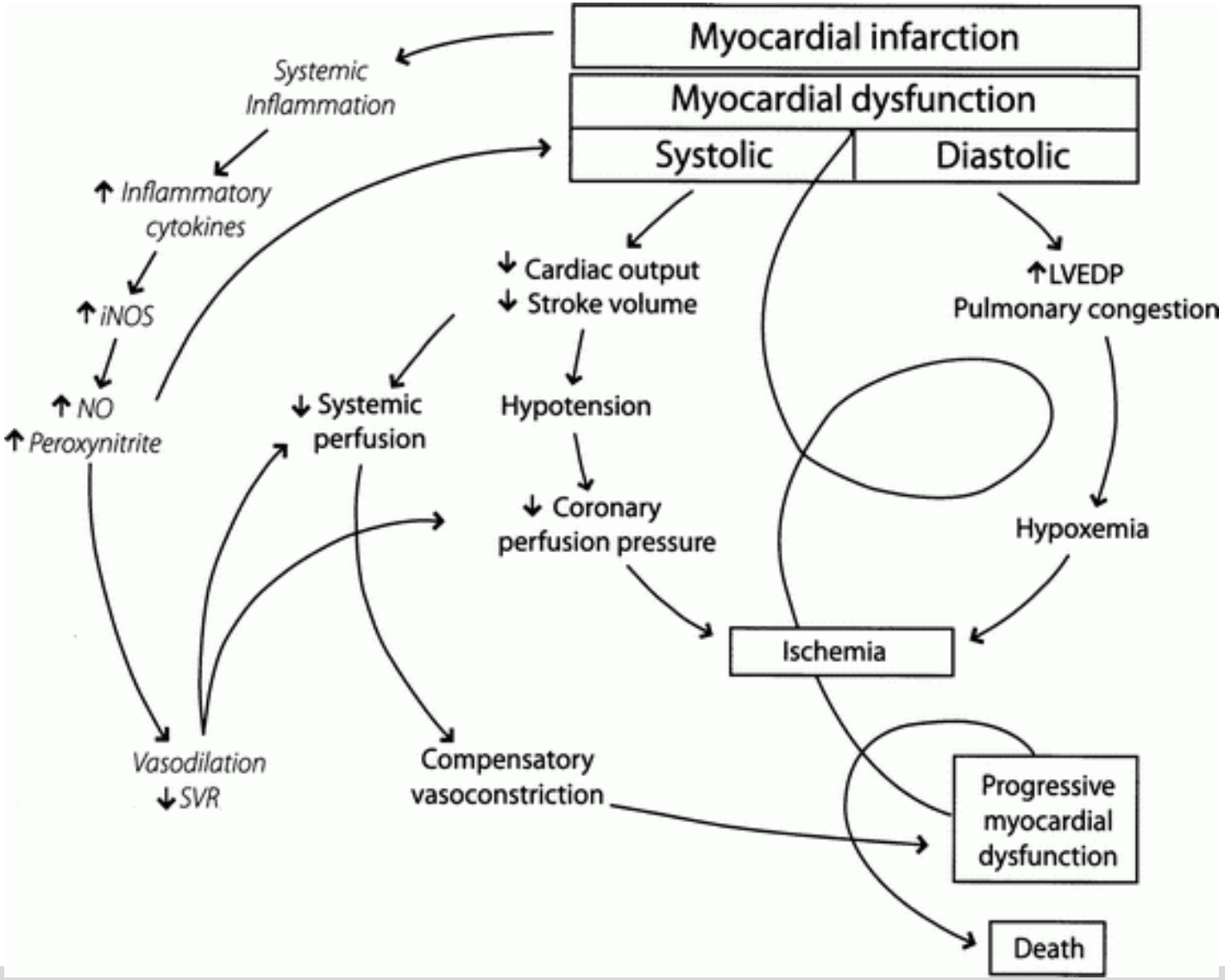
European Journal of Heart Failure (2018) 20, 332–34

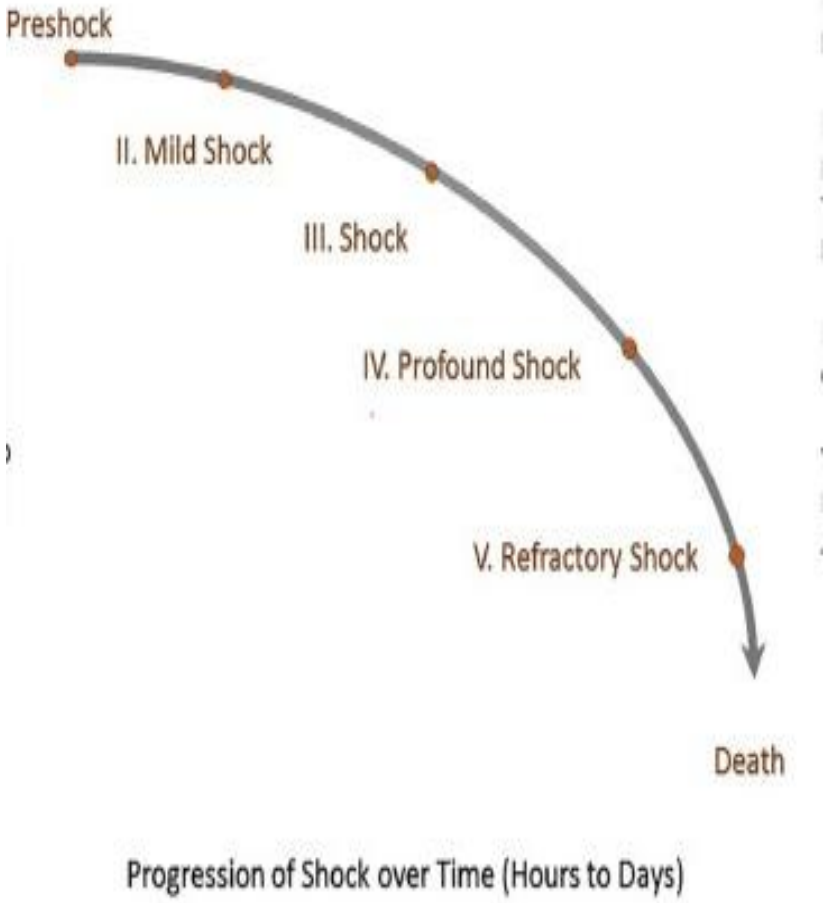
JAMA December 17, 2019 Volume 322, Number 23



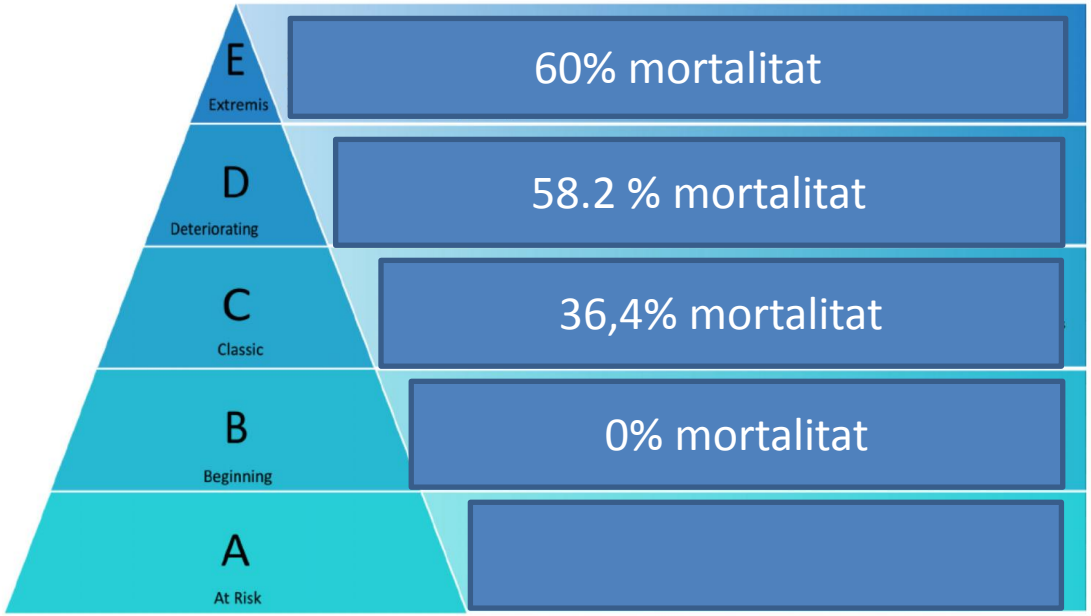
J Am Coll Cardiol 2020;75:1178–95

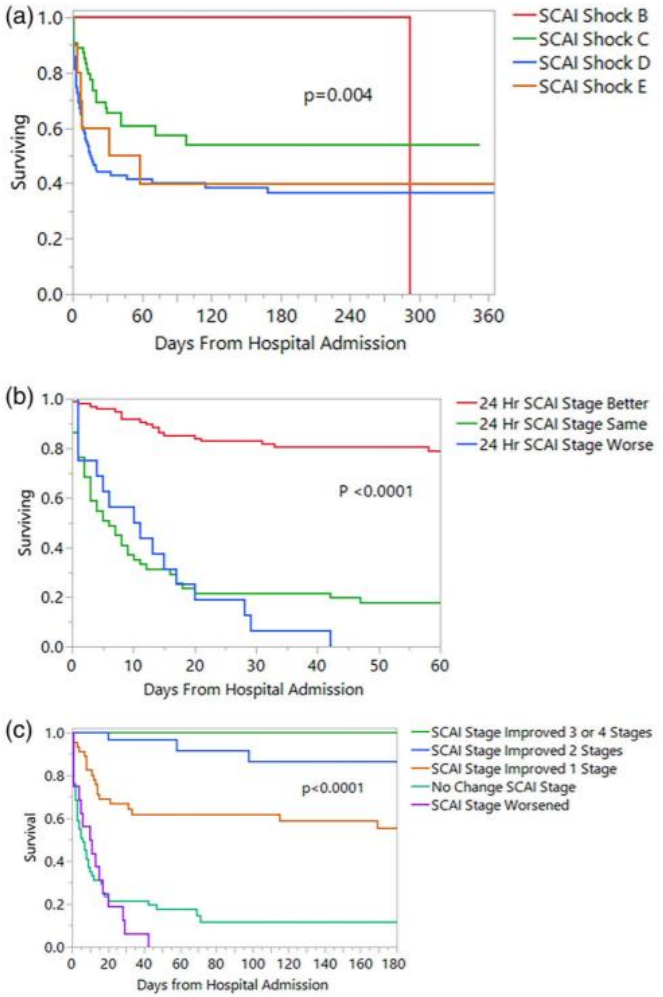
European Heart Journal (2021) 00, 11


Myocardial infarction
Myocardial dysfunction
Systolic
Diastolic
Systemic Inflammation
↑ Inflammatory cytokines
↑ iNOS
↑ NO
↑ Peroxynitrite
↓ Cardiac output
↓ Stroke volume
↑LVEDP
Pulmonary congestion
↓ Systemic perfusion
Hypotension
↓ Coronary perfusion pressure
Hypoxemia
Ischemia
Vasodilation
↓SVR
Compensatory vasoconstriction
Progressive myocardial dysfunction
Death


Preshock
II. Mild Shock
III. Shock
IV. Profound Shock
V. Refractory Shock
Death
Progression of Shock over Time (Hours to Days)

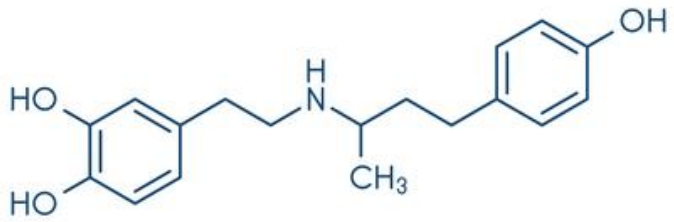
Catheter Cardiovasc Interv. 2019;94:29–37





Catheter Cardiovasc Interv. 2020;96:1339–1347

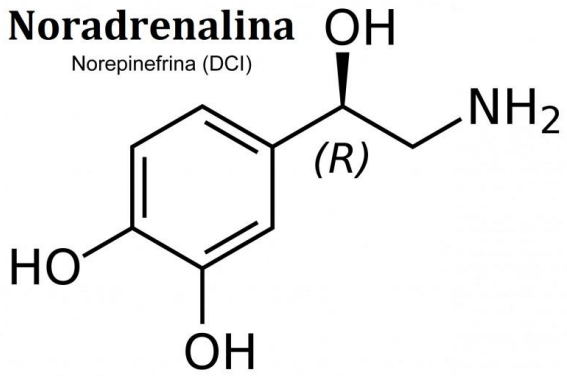
Tractament xoc cardiogènic

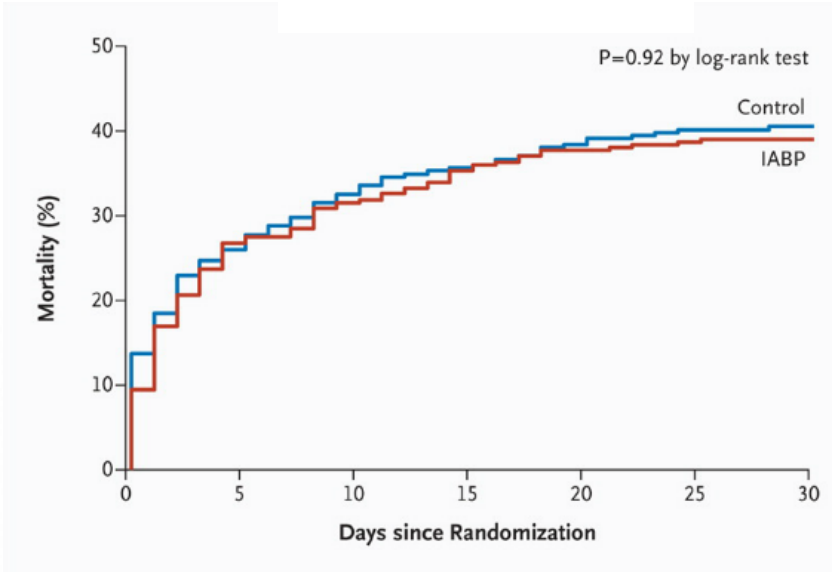


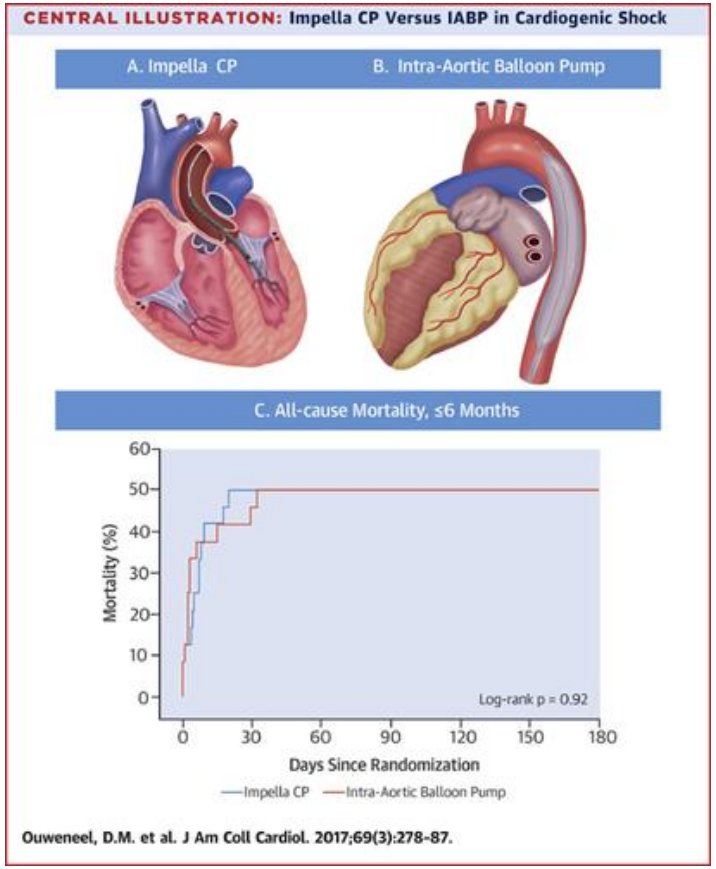
dobutamine

Noradrenalina

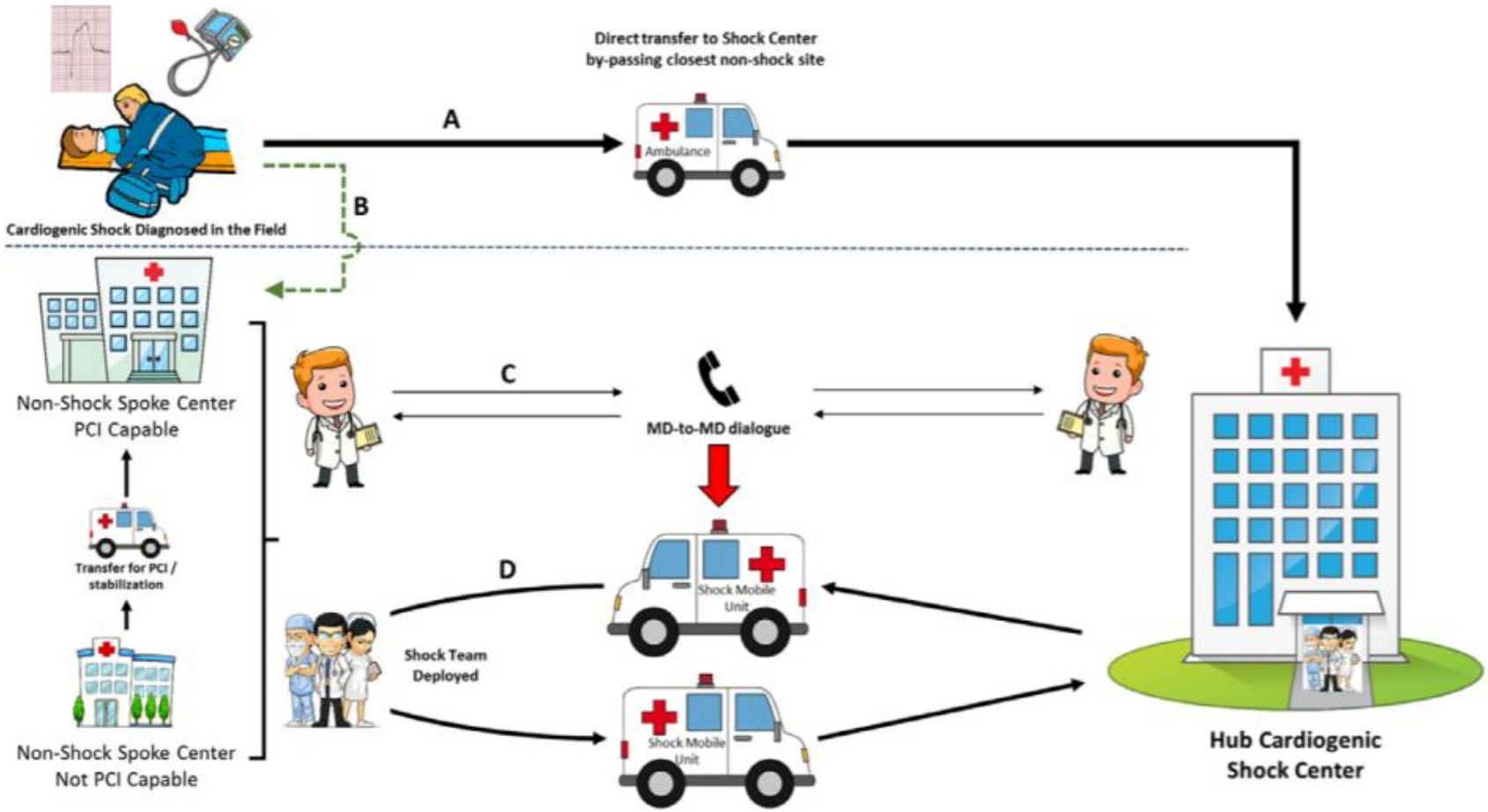
Norepinefrina (DCI)







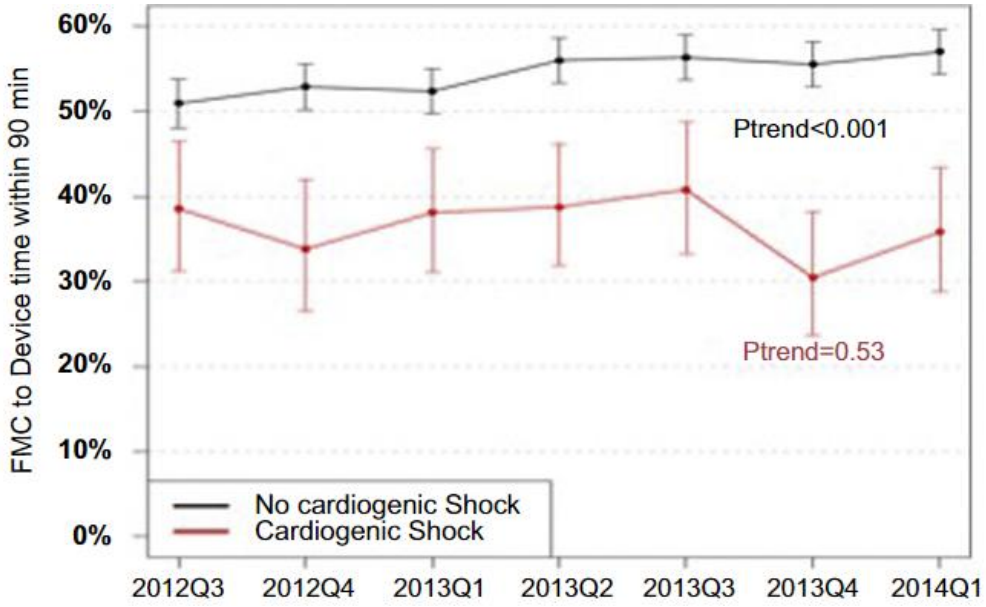
Centres de referencia xoc cardiogènic



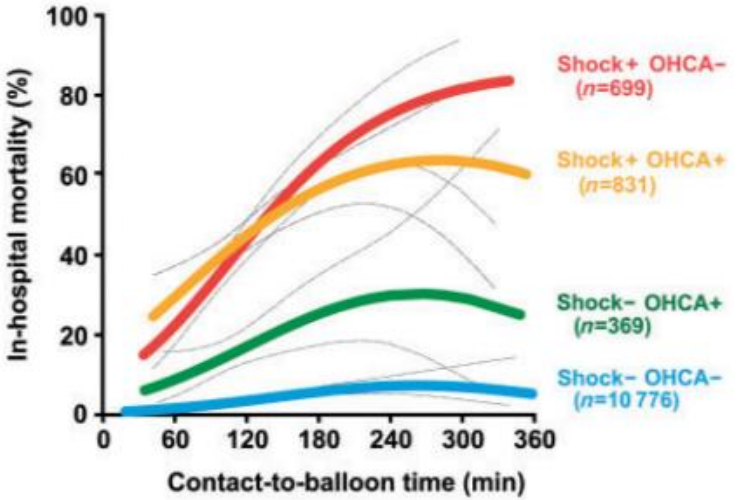
Circulation. 2017;136:e232–e268

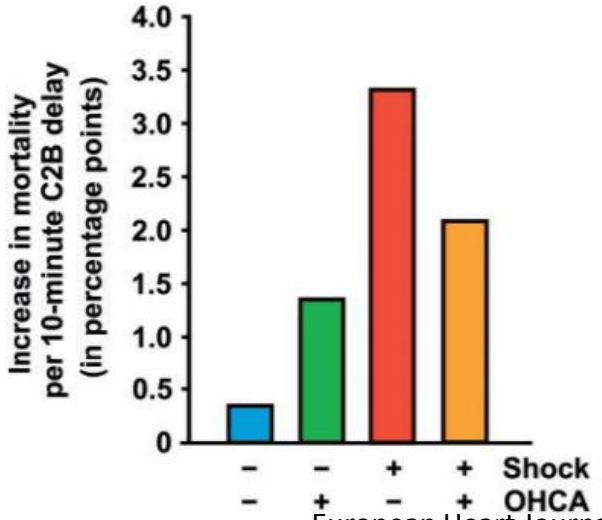
Centres Xoc cardiogènic

El temps importa



J Am Coll Cardiol Intv 2018;11:1824–33





European Heart Journal (2018) 39, 1065–1074

VS

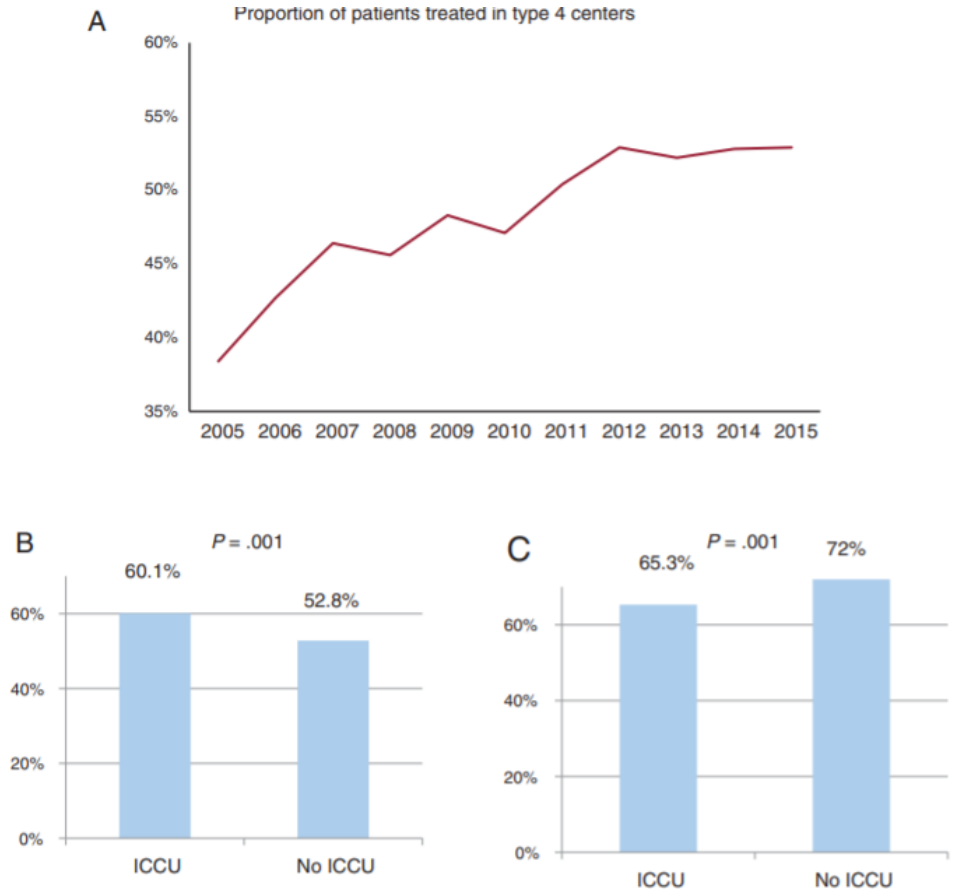
Mortalitat	**39%**	**43%**
CI precoç	41.8%	30.3%
ICP	49.9%	36.6%
MCS	46.3%	32.9%

Diferents dispositius

Circ Cardiovasc Interv. 2019 Jan;12(1):e007270.

RECALCAR criteria for classifying the different types of center

Hospital group	Characteristics
Group 1	No structured cardiac unit: < 1500 "cardiac disease" discharges a year, no specific coding for cardiac unit discharges or < 500 cases coded for cardiology each year
Group 2	Structured cardiac unit without catheterization laboratory: ≥ 1500 cardiac disease cases a year and encoding ≥ 500 discharges to cardiology, or, even though they encode ≥ 1500 cases, they do not perform ≥ 200 PCI a year
Group 3	Structured cardiac unit with catheterization laboratory, but without cardiac surgery: ≥ 1500 discharges for cardiac diseases per year, encoding ≥ 500 cases to cardiology, performing ≥ 200 PCI and < 50 CABG
Group 4	Structured cardiac unit with catheterization laboratory and cardiac surgery: ≥ 1500 discharges for cardiac disease per year, encoding ≥ 500 cases to cardiology, performing ≥ 200 PCI and ≥ 50 CABG a year
Group 5	Availability of catheterization laboratory and cardiac surgery without a structured cardiac unit: performing ≥ 200 PCI and ≥ 50 CABG a year, but encoding < 500 cases to cardiology



Sánchez-Salado JC Rev Esp Cardiol (Engl Ed). 2020 Jul;73(7):546-553.

DETROIT CARDIOGENIC SHOCK INITIATIVE ALGORITHM

EXCLUSION CRITERIA
- Evidence of Anoxic Brain Injury
- Unwitnessed out of hospital cardiac arrest or any cardiac arrest in which ROSC is not achieved in 30 minutes
- Transfer with IABP placed prior to Impella
- Septic, anaphylactic, hemorrhagic, and neurologic causes of shock
- Non-ischemic causes of shock/hypotension (Pulmonary Embolism, Pneumothorax, Myocarditis, Tamponade, etc.)
- Active Bleeding
- Mechanical Complications of AMI
- Known left ventricular thrombus
- Patient who did not received revascularization
- Mechanical aortic valve

INCLUSION CRITERIA

Acute Myocardial Infarction
- Ischemic Symptoms
- EKG and/or biomarker evidence of AMI (STEMI or NSTEMI)

Cardiogenic Shock
- Hypotension (<90/60) or the need for vasopressors or inotropes to maintain systolic blood pressure >90
- Evidence of end organ hypoperfusion (cool extremities, oliguria, lactic acidosis)

ACTIVATE CATH LAB

ACCESS & SUPPORT
- Obtain femoral arterial access (via direct visualization with use of ultrasound and fluoroscopy)
- Obtain venous access (Femoral or Internal Jugular)
- Obtain either Fick calculated cardiac index or LVEDP

IF LVEDP >15 or Cardiac Index < 2.2 AND anatomy suitable, place IMPELLA

Coronary Angiography & PCI
- Attempt to provide TIMI III flow in all major epicardial vessels other than CTO
- If unable to obtain TIMI III flow, consider administration of intra-coronary vasodilators

Perform Post-PCI Hemodynamic Calculations

1. Cardiac Power Output (CPO): $\frac{MAP \times CO}{451}$

2. Pulmonary Artery Pulsatility Index (PAPI): $\frac{sPAP - dPAP}{RA}$

Wean OFF Vasopressors and Inotropes

If CPO is >0.6 and PAPI >0.9, operators should wean vasopressors and inotropes and determine if Impella can be weaned and removed in the Cath Lab or left in place with transfer to ICU.

Escalation of Support

If CPO remains <0.6 operators should consider the following options:
- PAPI is <0.9 consider right sided hemodynamic support
- PAPI >0.9 consideration for additional hemodynamic support

Local practice patterns should dictate the next steps:
- Placement of more robust MCS device(s)
- Transfer to LVAD/Transplant center

If CPO is >0.6 and PAPI <0.9 consider providing right sided hemodynamic support if clinical suspicion for RV dysfunction/failure

Vascular Assessment
- Prior to discharge from the Cath Lab, a detailed vascular exam should be performed including femoral angiogram and Doppler assessment of the affected limb.
- If indicated, external bypass should be performed.

ICU Care
- Daily hemodynamic assessments should be performed, including detailed vascular assessment
- Monitor for signs of hemolysis and adjust Impella position as indicated

Device Weaning

Impella should only be considered for explantation once the following criteria are met:
- Weaning off from all inotropes and vasopressors
- CPO >0.6, and PAPI > 0.9

Bridge to Decision

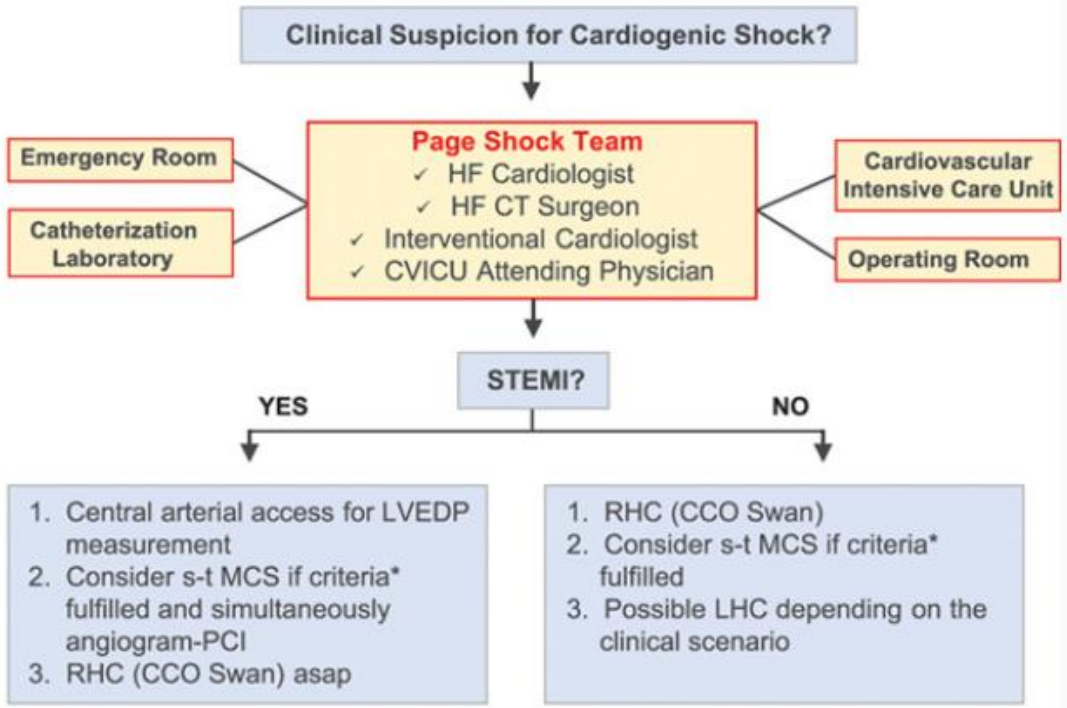
Patients who do not regain myocardial recovery within 3-5 days, as clinically indicated, should be transferred to an LVAD/Transplant center. If patients are not candidates, palliative care options should be considered.

**** QUALITY MEASURES ****
- Door to Support Time < 90 minutes
- Establish TIMI III Flow
- Wean off Vasopressors & Inotropes
- Maintain CPO >0.6 W
- Improve survival to discharge to >80%

DETROIT CARDIOGENIC SHOCK INITIATIVE

DetroitCSI@hfhs.org

www.henryford.com/cardiogenicshock



Generalitat de Catalunya Departament de Salut
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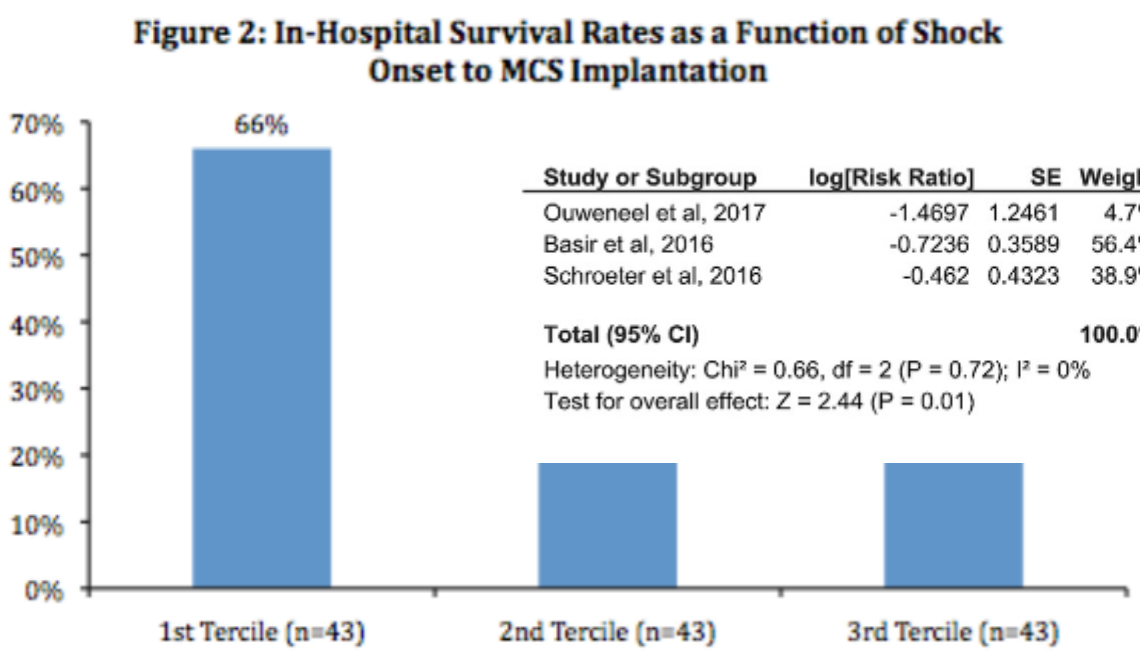
Universitat de Barcelona

Centres de xoc

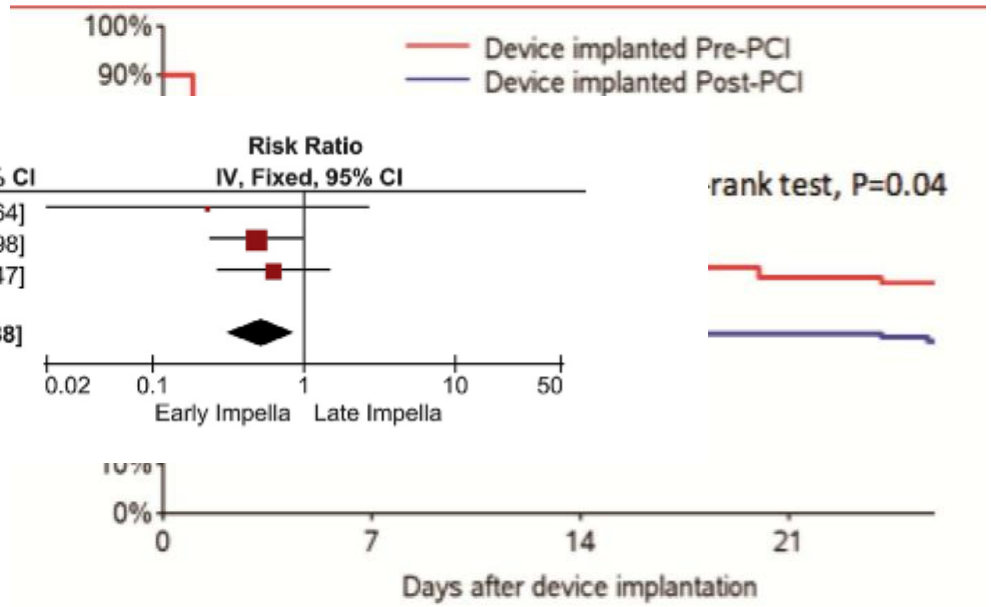
- Avaluar potencials candidats a SMC
- Decidir el tipus de suport més adequat
- Escurçar el temps d'implant
- Detectar pacients en que el SMC és futil

Importància del "timing" de l'implant



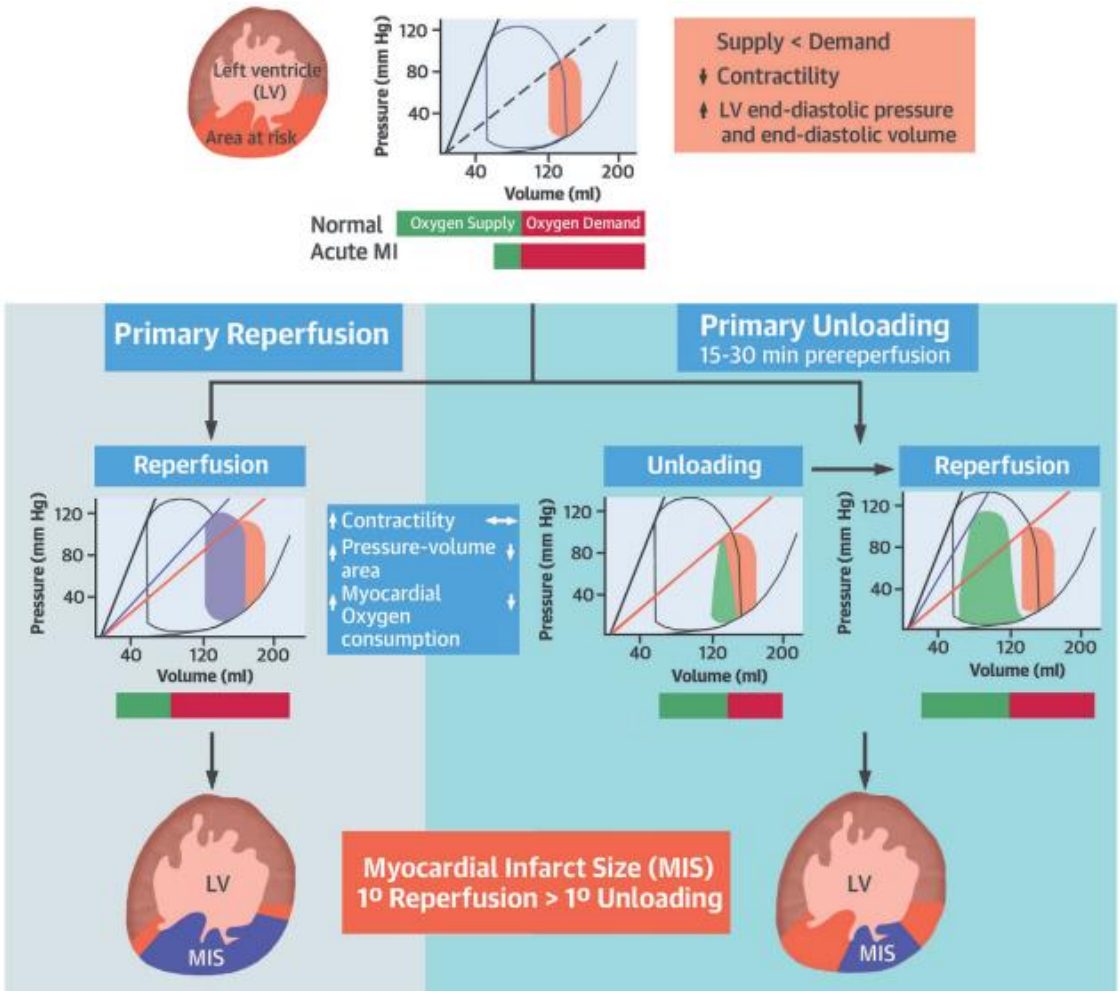
Study or Subgroup	log[Risk Ratio]	SE	Weight	Risk Ratio IV, Fixed, 95% CI
Ouweneel et al, 2017	-1.4697	1.2461	4.7%	0.23 [0.02, 2.64]
Basir et al, 2016	-0.7236	0.3589	56.4%	0.49 [0.24, 0.98]
Schroeter et al, 2016	-0.462	0.4323	38.9%	0.63 [0.27, 1.47]
Total (95% CI)			**100.0%**	**0.52 [0.31, 0.88]**

Heterogeneity: Chi² = 0.66, df = 2 (P = 0.72); I² = 0%
Test for overall effect: Z = 2.44 (P = 0.01)



Am J Cardiol. 2017 Mar 15;119(6):845-851

Porta- Suport



Uriel et al JACC VOL. 72, NO. 5,2018:569 – 8 0

Puerta -Soporte

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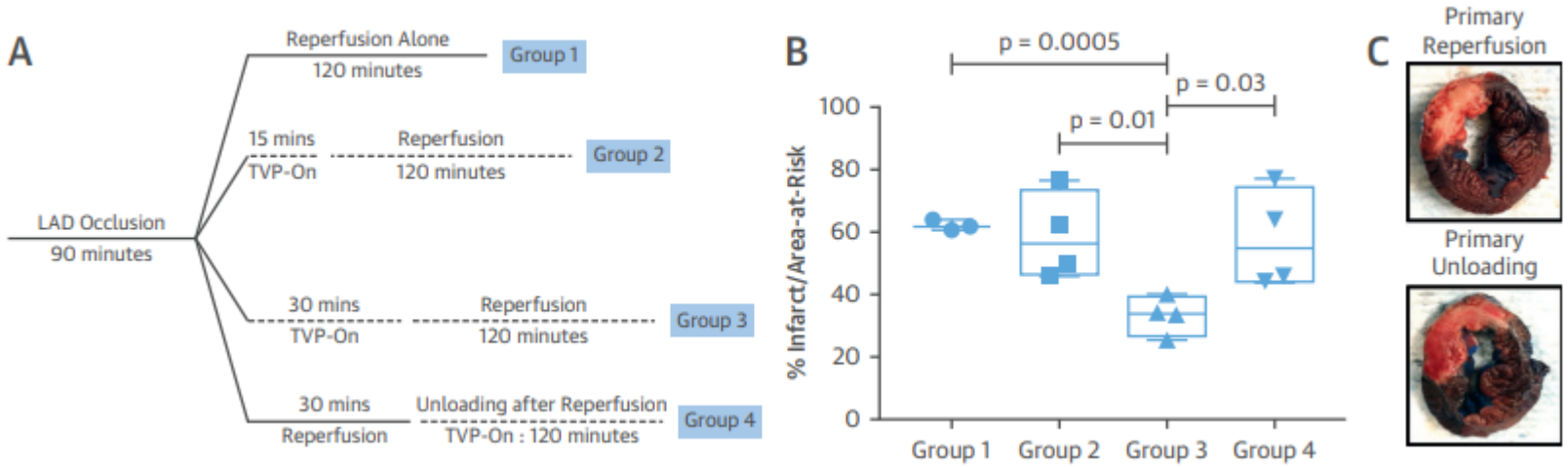
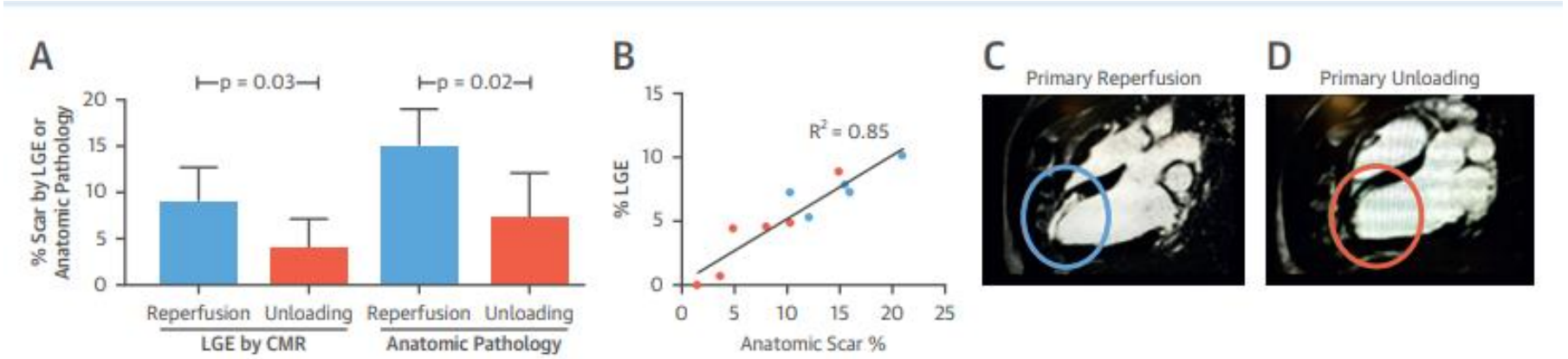
VOL. 72, NO. 5, 2018

Left Ventricular Unloading Before Reperfusion Promotes Functional Recovery After Acute Myocardial Infarction

Michele L. Esposito, MD,* Yali Zhang, MD, PhD,* Xiaoying Qiao, PhD,* Lara Reyelt, BS, Vikram Paruchuri, MD, Gavin R. Schnitzler, PhD, Kevin J. Morine, MD, Shiva K. Annamalai, MD, Courtney Bogins, BS, Peter S. Natov, BS, Robert Pedicini, BS, Catalina Breton, BS, Andrew Mullin, BS, Emily E. Mackey, MD, Ayan Patel, MD, Ethan Rowin, MD, Iris Z. Jaffe, MD, PhD, Richard H. Karas, MD, PhD, Navin K. Kapur, MD



Puerta- Soporte

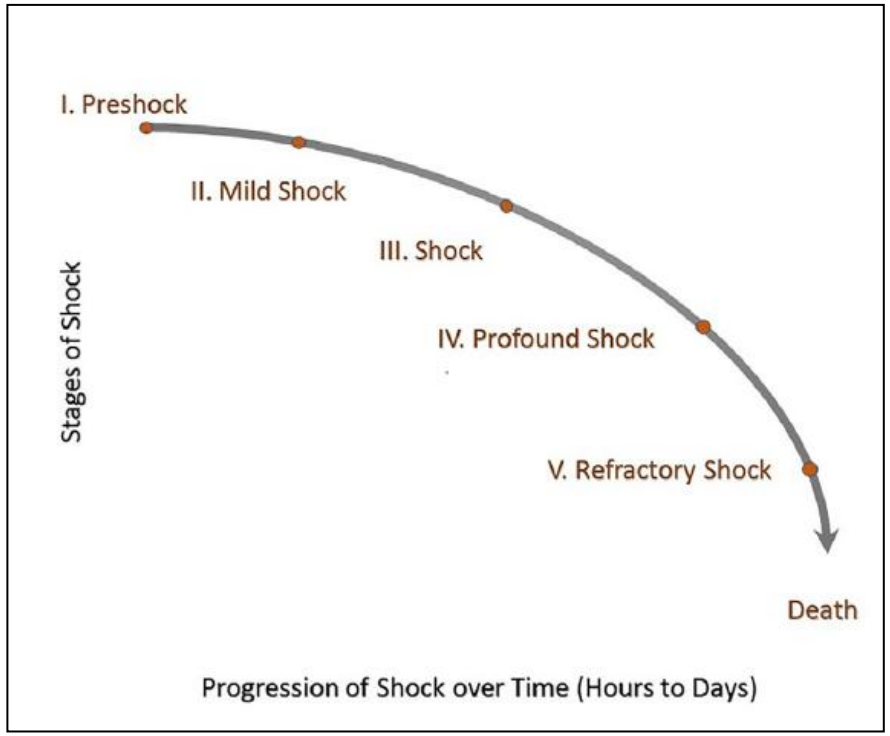


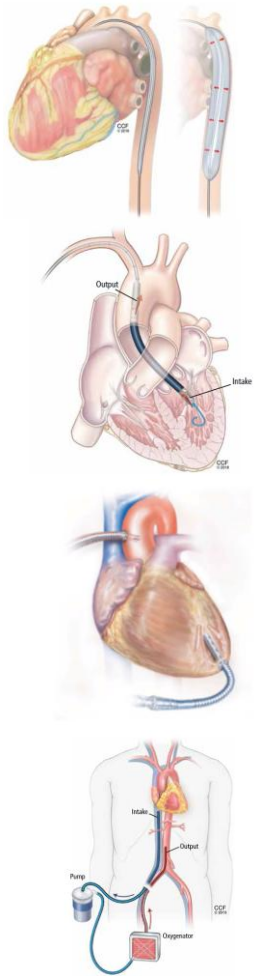
Detroit
98.9% Impella (2.5, CP o Rp)

Inova HV
66% suport
35.3% IABP
44.9% Impella sol
6.4% ECMO sol
13.5% ECMELLA

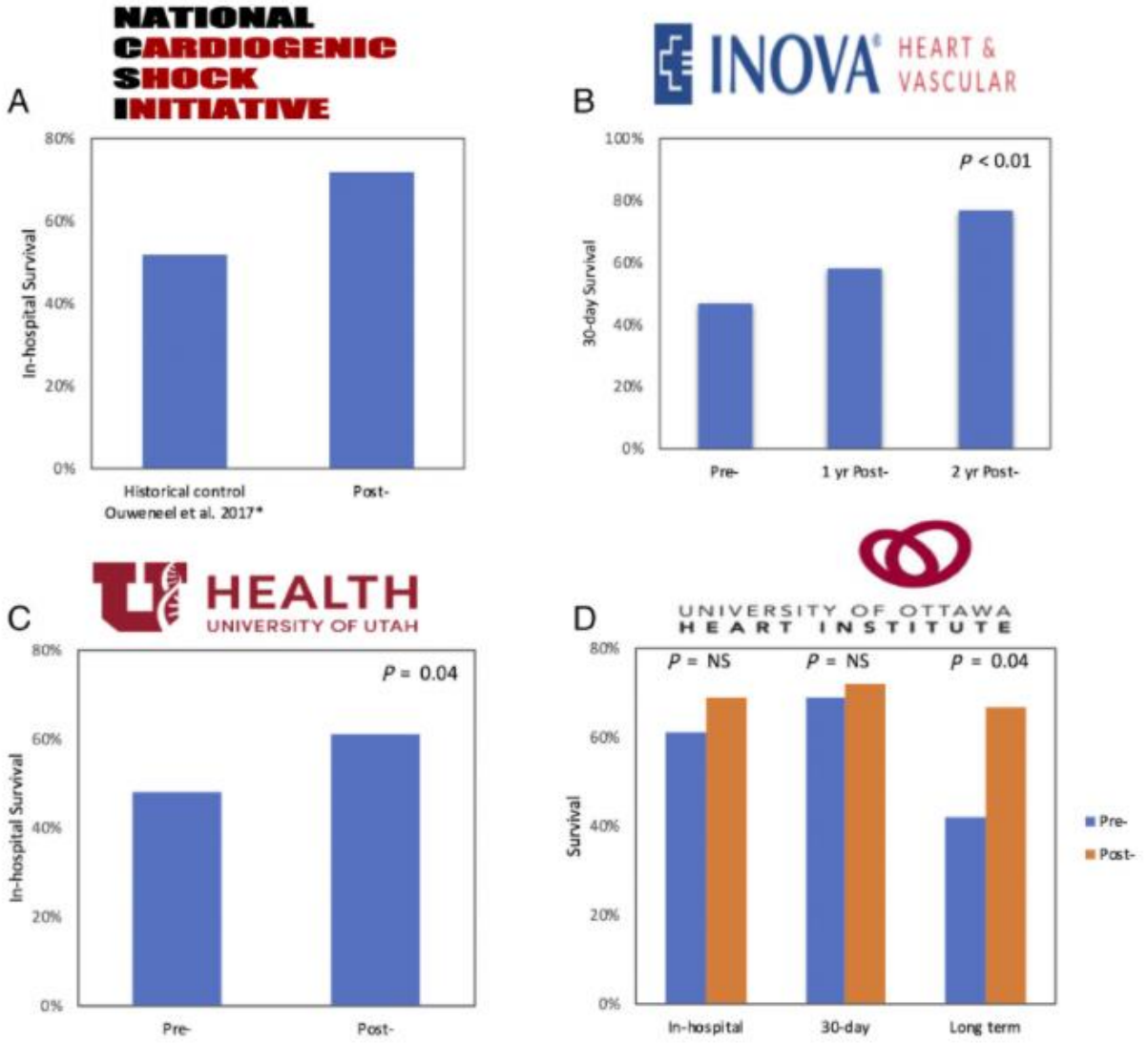
UTAH
30.2% IABP
33.3% Impella
8.9% ECMO
27.6% combinació

UOHI
45% SMC
34% IABP
28% Impella
14% combinació



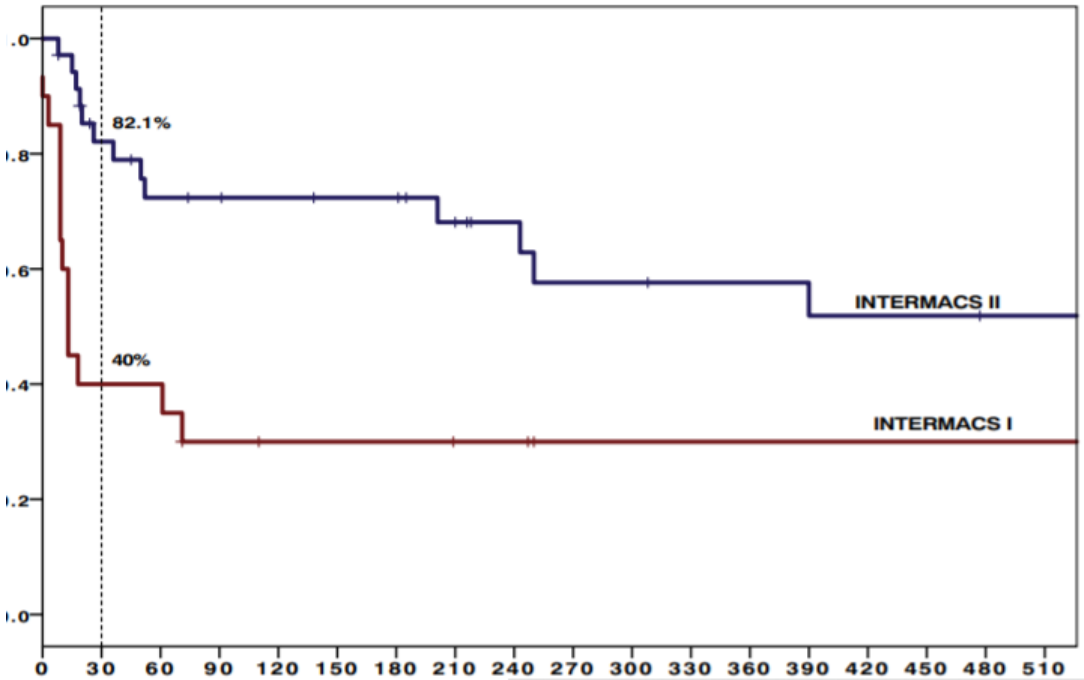


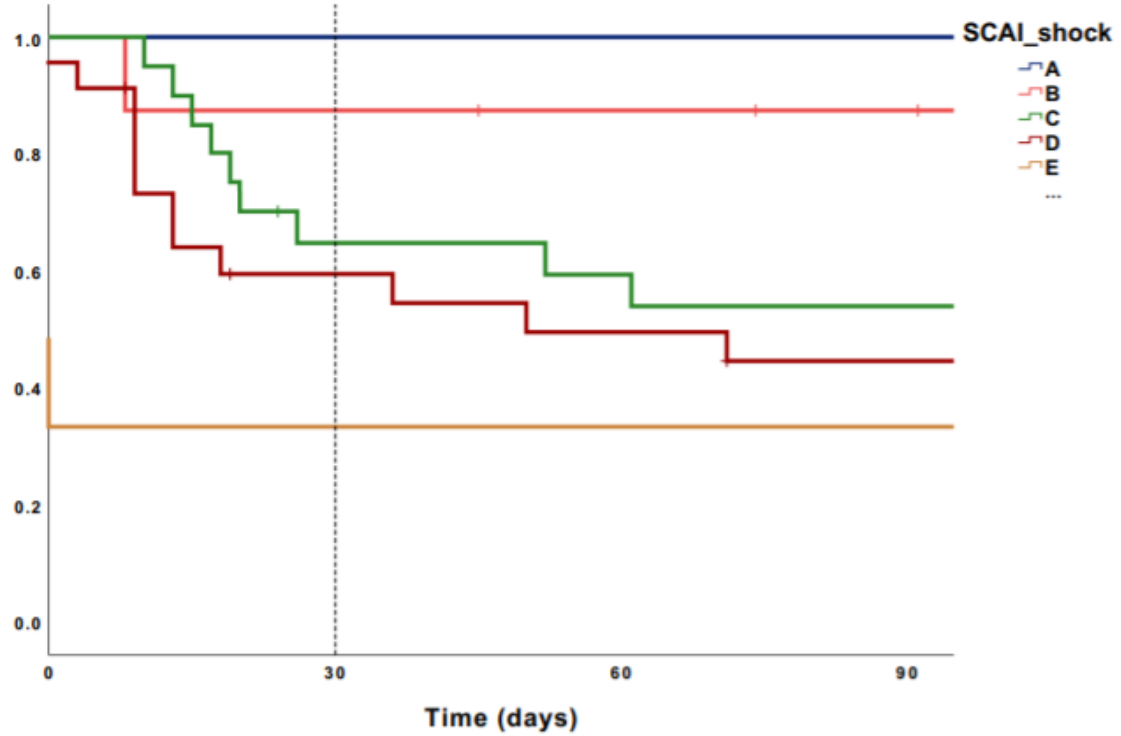
Resultats implementació de protocols i xarxa xoc



ESC Heart Failure 2021; 8: 988–998

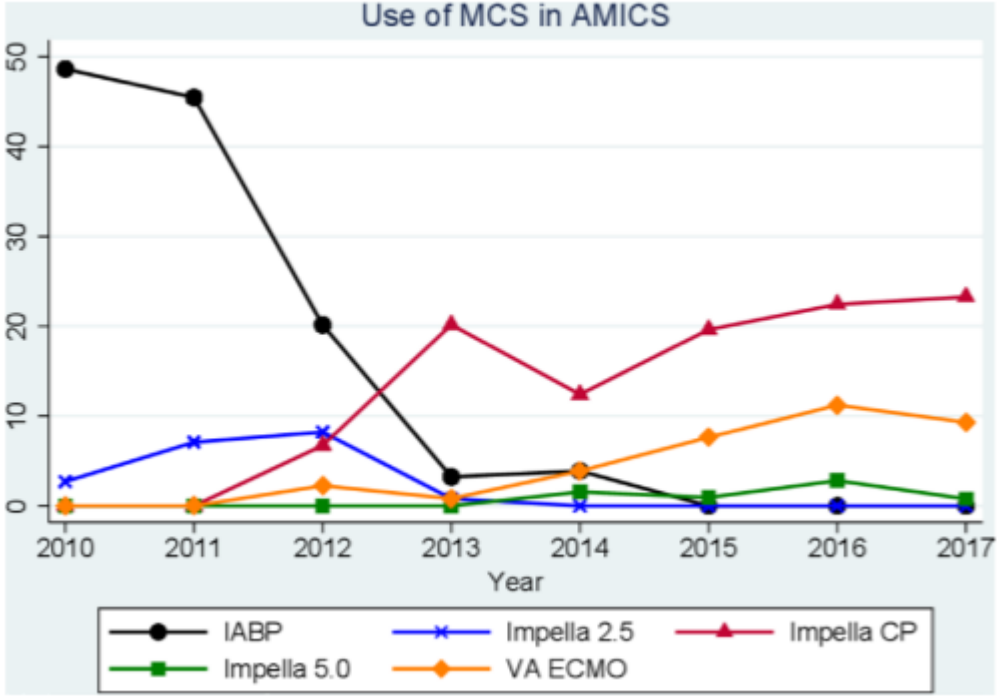
Impella Xoc cardiogènic

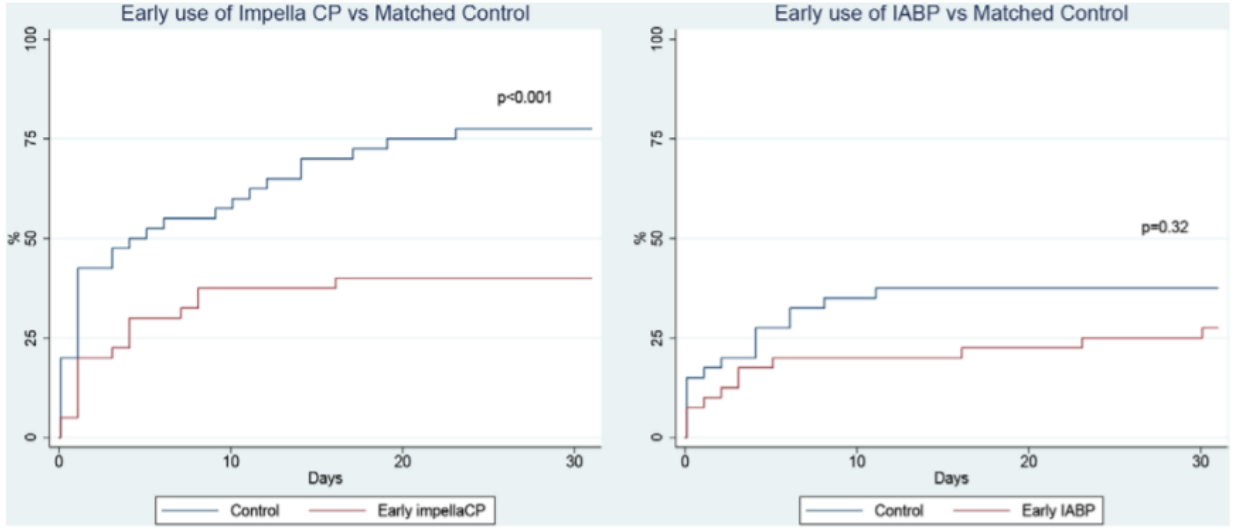




Milloria hemodinàmica
Reducció xifres de lactat

Cardiovasc Revasc Med. 2020 May;21(5)





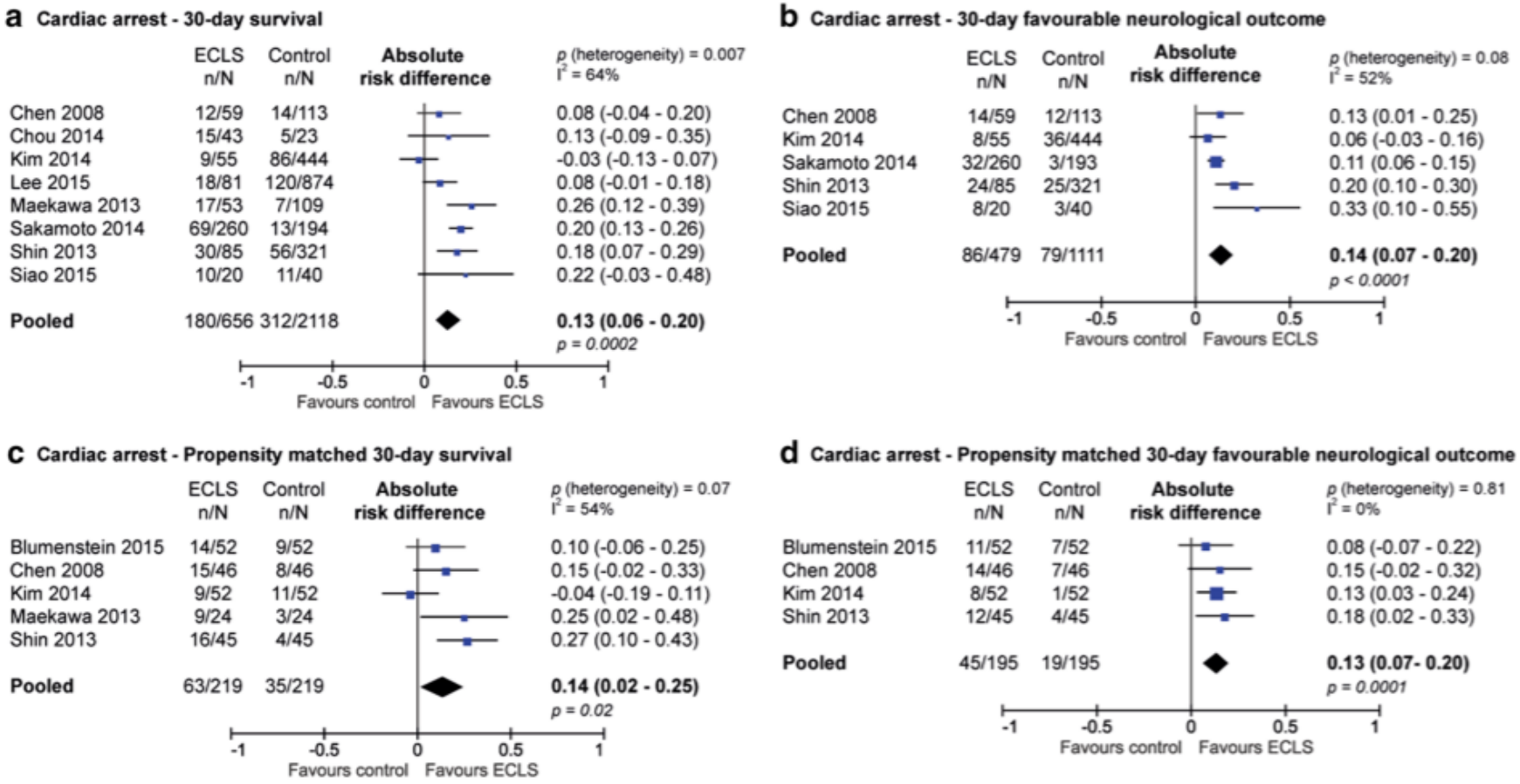
. Open Heart 2020;7:e001214

Intensive Care Med (2016) 42:1922–1934
DOI 10.1007/s00134-016-4536-8

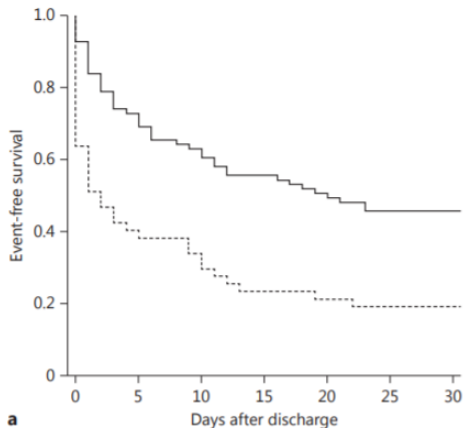
SYSTEMATIC REVIEW

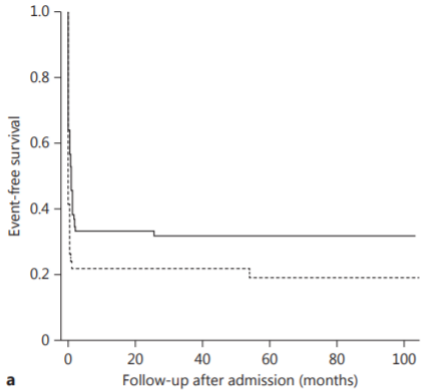
Extracorporeal life support during cardiac arrest and cardiogenic shock: a systematic review and meta-analysis

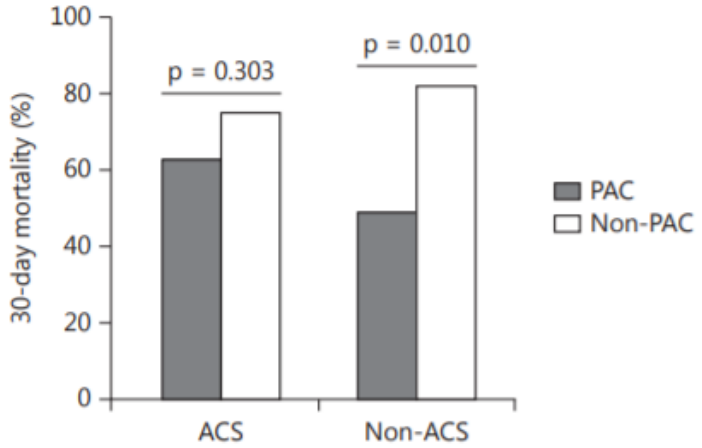
Dagmar M. Ouweneel[1], Jasper V. Schotborgh[1], Jacqueline Limpens[2], Krischan D. Sjauw[1], A. E. Engström[1], Wim K. Lagrand[3], Thomas G. V. Cherpanath[3], Antoine H. G. Driessen[1], Bas A. J. M. de Mol[1] and José P. S. Henriques[1*]



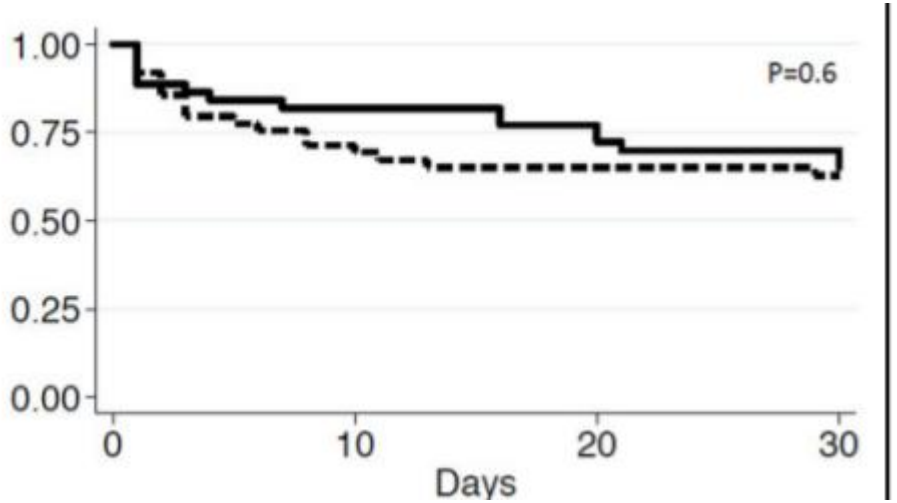
Catèter Swan- Ganz







Cardiology 2017;136:61–69



81% etiologia isquèmica

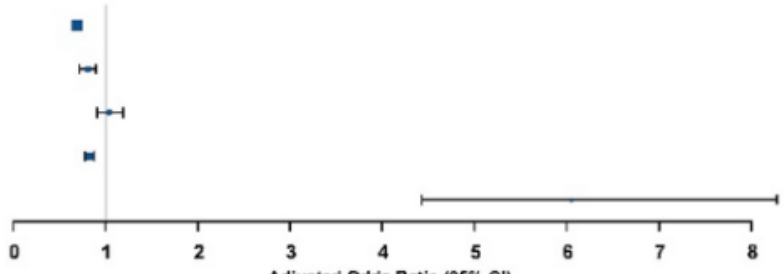
J Intensive Care Med. 2020 Dec;35(12):1426-1433

Right Heart Catheterization in Cardiogenic Shock Is Associated With Improved Outcomes: Insights From the Nationwide Readmissions Database

Sagar Ranka, MD †; Ioannis Mastoris, MD †; Navin K. Kapur, MD; Ryan J. Tedford, MD; Aniket Rali, MD; Prakash Acharya, MD; Robert Weidling, MD; Amandeep Goyal, MD; Andrew J. Sauer, MD; Bhanu Gupta, MD; Nicholas Haglund, MD; Kamal Gupta, MD; James C. Fang, MD; JoAnn Lindenfeld, MD; Zubair Shah, MD

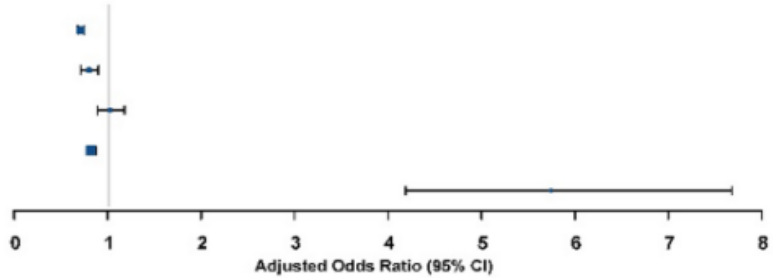
Impact of RHC On Outcomes in Patients Admitted with Cardiogenic Shock

Outcomes	Adjusted OR (95% CI)	p-Value
Death	0.69 (0.66-0.72)	<0.001
Stroke	0.81 (0.72-0.90)	<0.001
Need for Hemodialysis	1.04 (0.91-1.19)	0.49
Readmission	0.83 (0.78-0.88)	<0.001
OHT/LVAD on readmission	6.05 (4.43-8.28)	<0.001



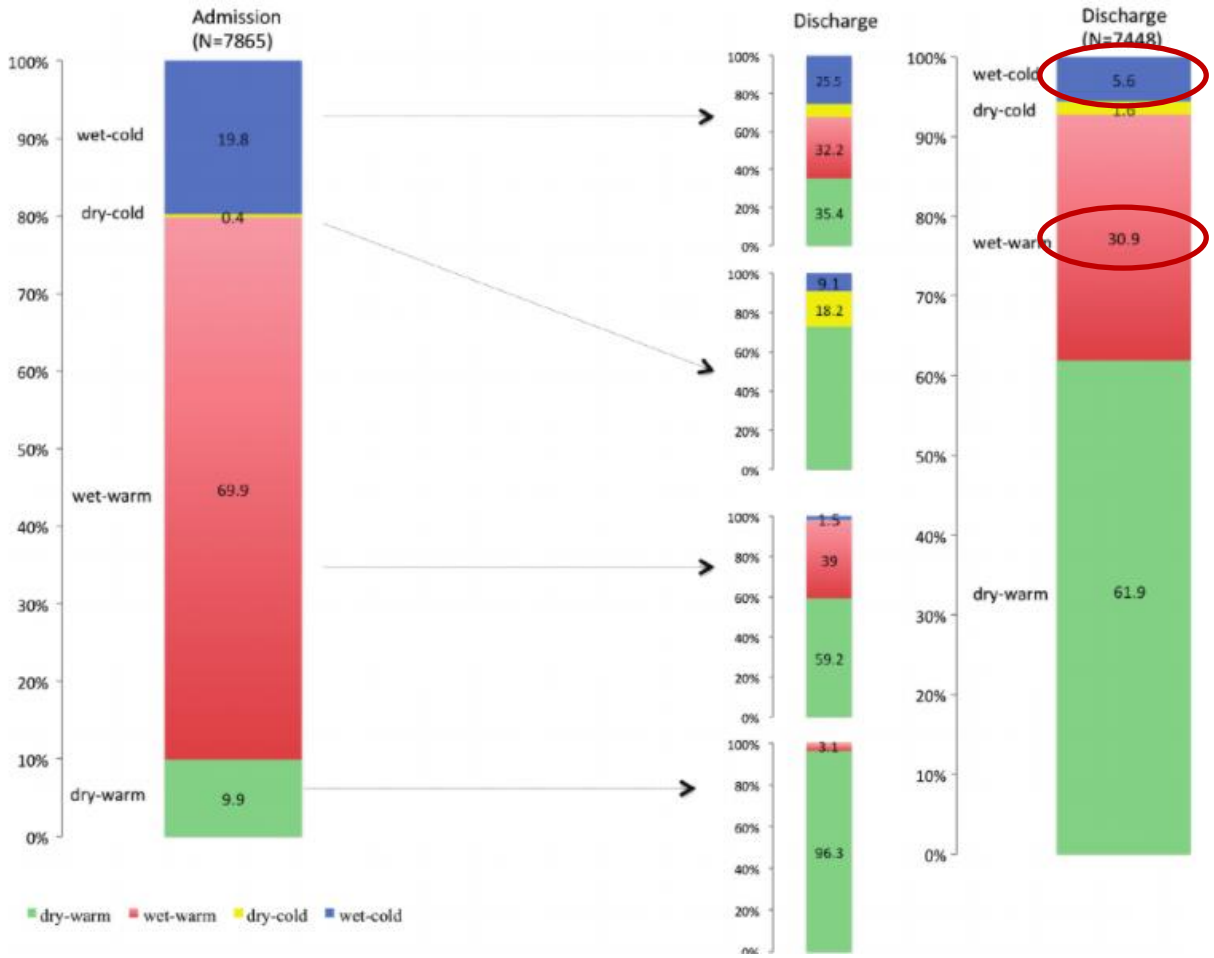
Impact of RHC On Outcomes in Patients Admitted with Cardiogenic Shock (Excluding Cardiac Arrest Patients)

Outcomes	Adjusted OR (95% CI)	p-Value
Death	0.71 (0.68-0.75)	<0.001
Stroke	0.80 (0.71-0.90)	<0.001
Need for Hemodialysis	1.03 (0.89-1.18)	0.68
Readmission	0.82 (0.77-0.87)	<0.001
OHT/LVAD on readmission	5.74 (4.19-7.86)	<0.001



J Am Heart Assoc. 2021;10:e019843

Valoració prealta



It is recommended that patients hospitalized for HF be carefully evaluated to exclude persistent signs of congestion before discharge and to optimize oral treatment.[427,472]	I	C

European Journal of Heart Failure (2019) 21, 1338–1352

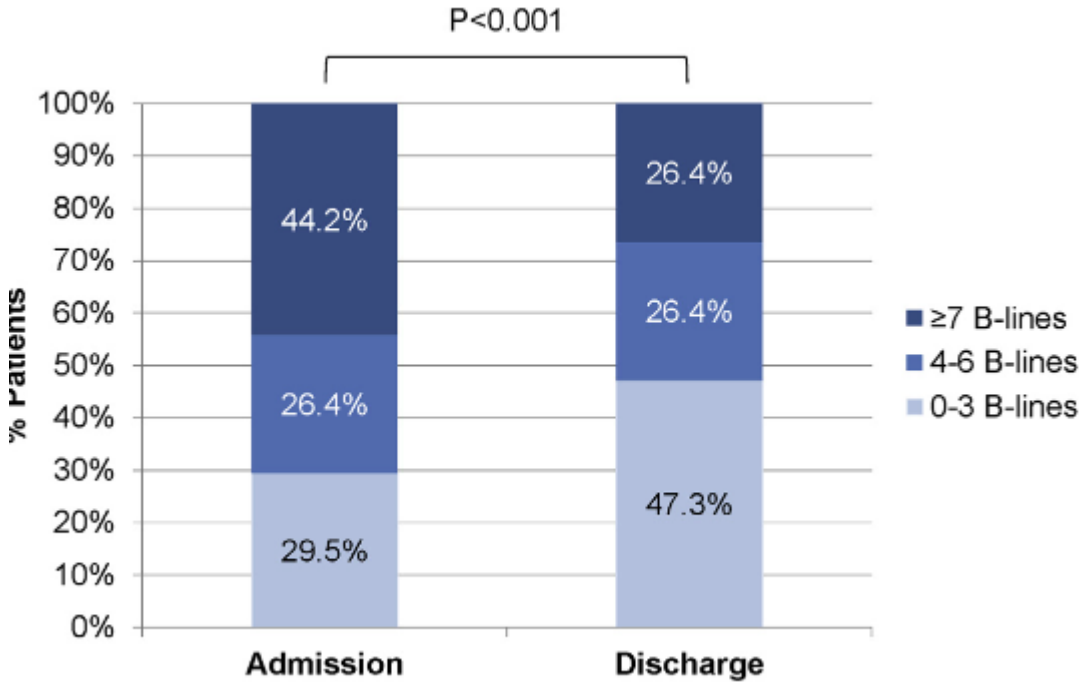
JACC: HEART FAILURE
VOL. 7, NO. 10, 2019

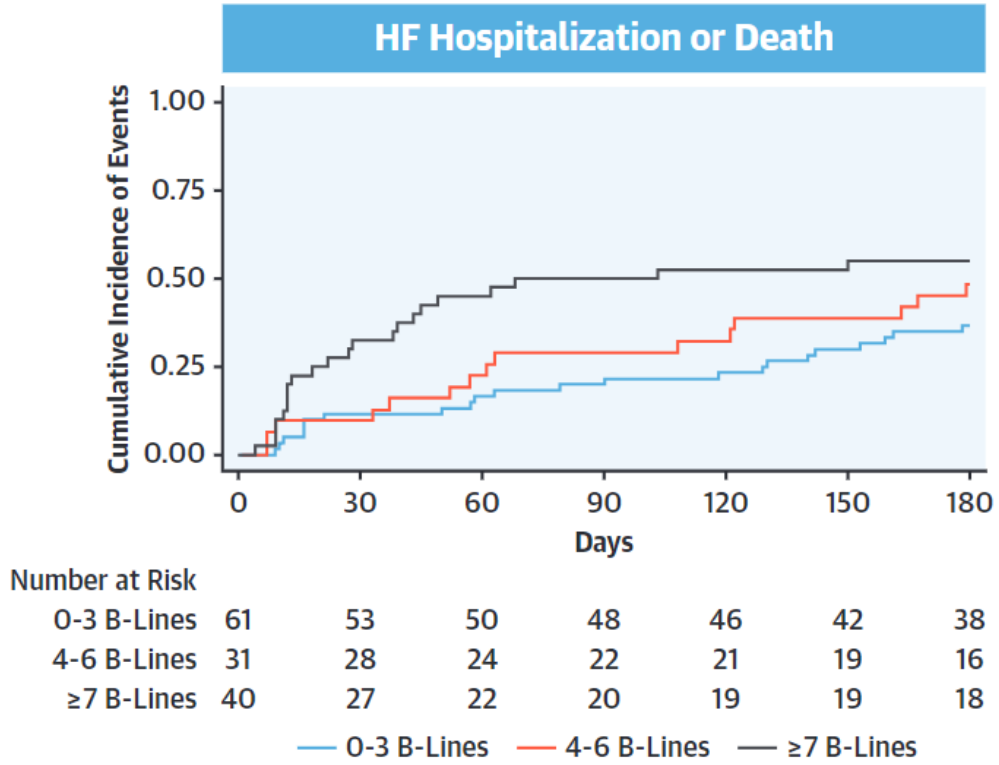
PUBLISHED BY ELSEVIER

Lung Ultrasound in Acute Heart Failure

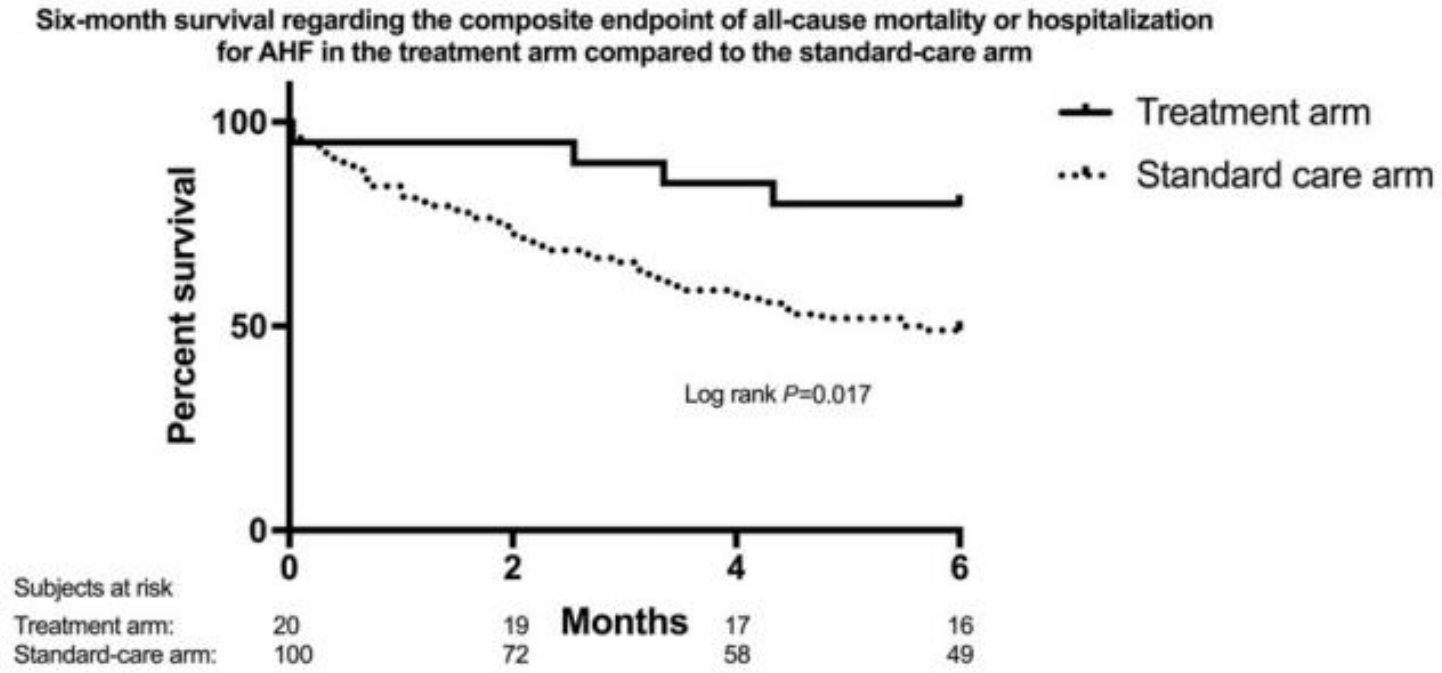
Prevalence of Pulmonary Congestion and Short- and Long-Term Outcomes

Elke Platz, MD, MS,[a,b,*] Ross T. Campbell, MBChB,[c,*] Brian Claggett, PhD,[b,d] Eldrin F. Lewis, MD, MPH,[b,d] John D. Groarke, MD, MPH,[b,d] Kieran F. Docherty, MBChB,[c] Matthew M.Y. Lee, MBChB,[c] Allison A. Merz, BA,[a,b] Montane Silverman, BA,[a,b] Varsha Swamy, BS,[a,b] Moritz Lindner, MD,[a,b] Jose Rivero, MD,[b,d] Scott D. Solomon, MD,[b,d] John J.V. McMurray, MBChB, MD[c]



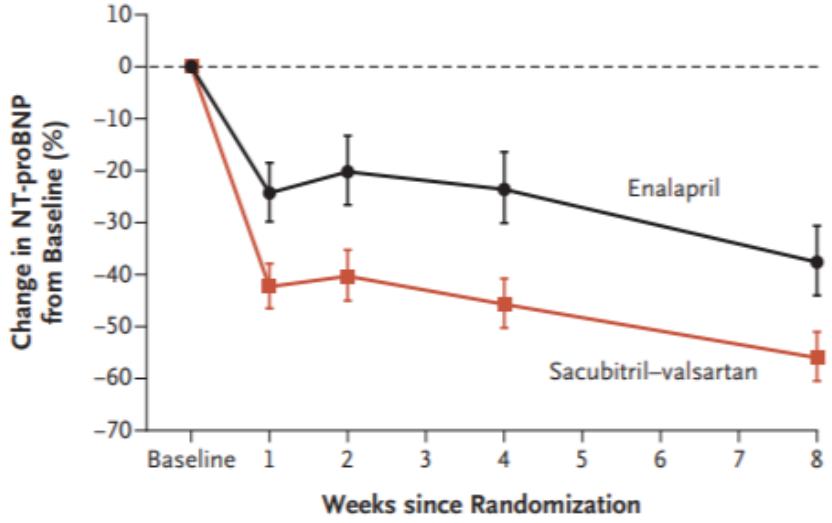


Ecografia pulmonar



ESC Heart Failure 2018; 5: 120–128

Teràpia neurohormonal

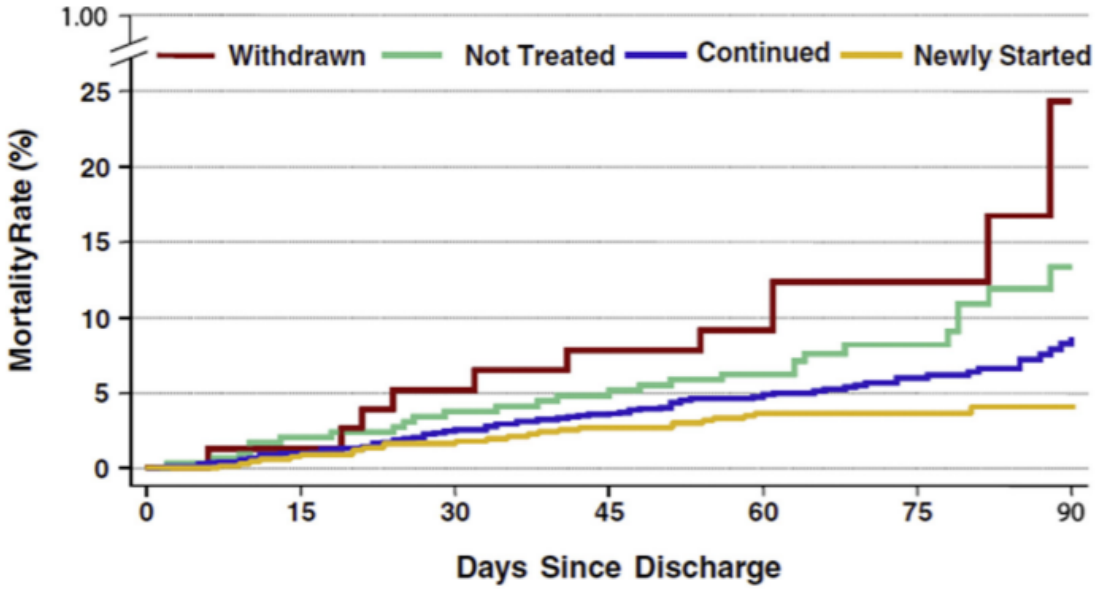


Outcome	Sacubitril–Valsartan (N=440)	Enalapril (N=441)	Sacubitril–Valsartan vs. Enalapril
Key safety outcomes — no. (%)			**Relative risk (95% CI)**
Worsening renal function†	60 (13.6)	65 (14.7)	0.93 (0.67 to 1.28)
Hyperkalemia	51 (11.6)	41 (9.3)	1.25 (0.84 to 1.84)
Symptomatic hypotension	66 (15.0)	56 (12.7)	1.18 (0.85 to 1.64)
Angioedema	1 (0.2)	6 (1.4)	0.17 (0.02 to 1.38)
Secondary biomarker outcomes — % (95% CI)‡			**Ratio of change (95% CI)**
Change in high-sensitivity troponin T concentration	−36.6 (−40.8 to −32.0)	−25.2 (−30.2 to −19.9)	0.85 (0.77 to 0.94)
Change in B-type natriuretic peptide concentration	−28.7 (−35.5 to −21.3)	−33.1 (−39.5 to −25.9)	1.07 (0.92 to 1.23)
Change in ratio of B-type natriuretic peptide to NT-proBNP	35.2 (28.8 to 42.0)	−8.3 (−3.6 to −12.7)	1.48 (1.38 to 1.58)
Exploratory clinical outcomes — no. (%)			**Hazard ratio (95% CI)§**
Composite of clinical events	249 (56.6)	264 (59.9)	0.93 (0.78 to 1.10)
Death	10 (2.3)	15 (3.4)	0.66 (0.30 to 1.48)
Rehospitalization for heart failure	35 (8.0)	61 (13.8)	0.56 (0.37 to 0.84)
Implantation of left ventricular assist device	1 (0.2)	1 (0.2)	0.99 (0.06 to 15.97)
Inclusion on list for heart transplantation	0	0	NA
Unplanned outpatient visit leading to use of intravenous diuretics	2 (0.5)	2 (0.5)	1.00 (0.14 to 7.07)
Use of additional drug for heart failure	78 (17.7)	84 (19.0)	0.92 (0.67 to 1.25)
Increase in dose of diuretics of >50%	218 (49.5)	222 (50.3)	0.98 (0.81 to 1.18)
Composite of serious clinical events¶	41 (9.3)	74 (16.8)	0.54 (0.37 to 0.79)

Reducció significativa NT-ProBNP 46.7 % vs 25.3 %

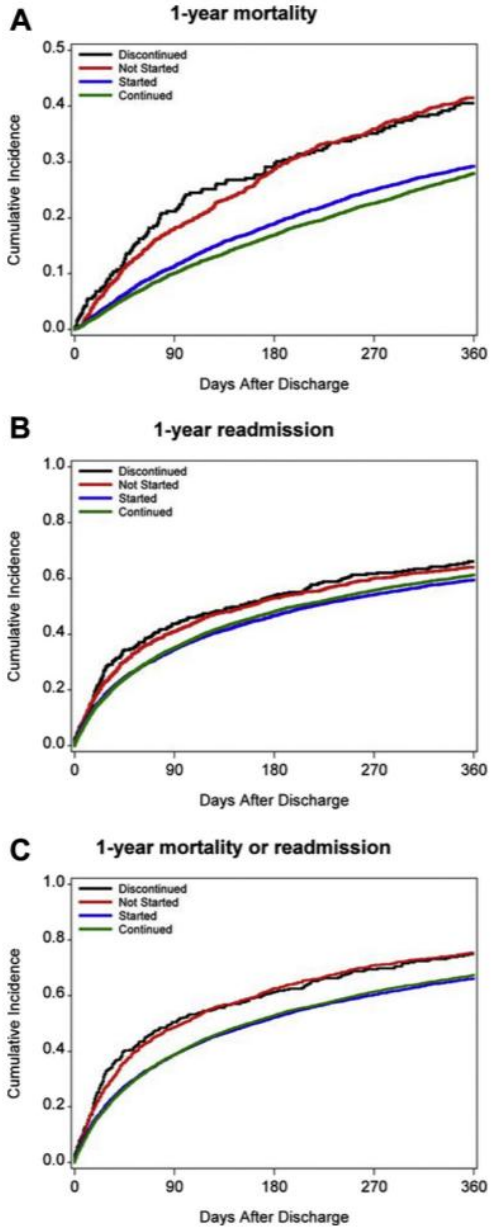
Igual seguretat

Milloria pronòstica (menor rehospitaliització) (no objectiu primari – anàlisi exploratori)



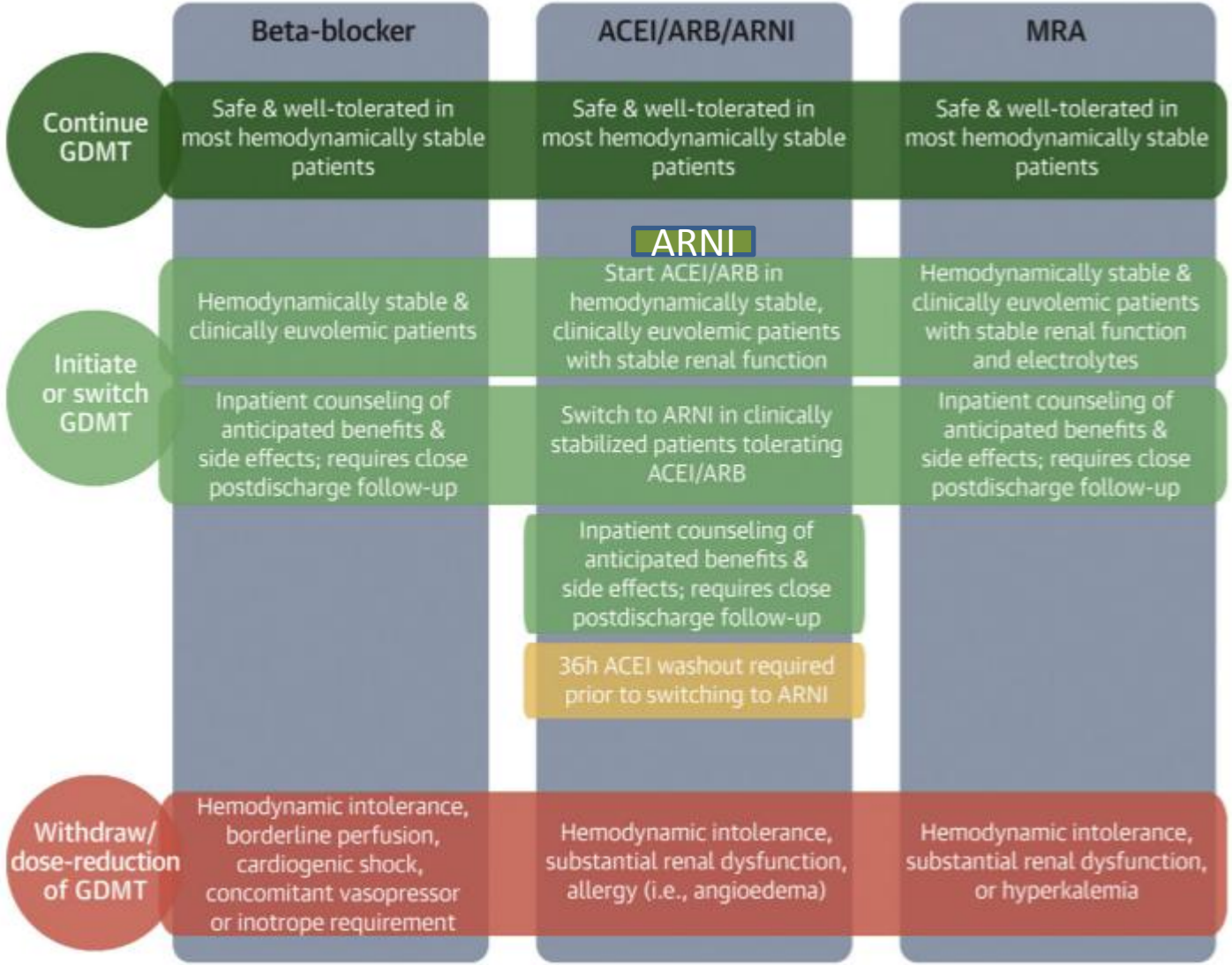
Betabloquejants

IECA



J Am Coll Cardiol HF 2019;7:1–12

ISLGT2



J Am Coll Cardiol HF 2019;7:1–12

Conclusions

- La ràpida i correcta identificació dels pacients amb insuficiència cardíaca és de vital importància. En aquest sentit l'ecografia pulmonar juga un paper molt destacat, el que obliga que la seva utilització penetri més en el nostre àmbit.

- El xoc cardiogènic segueix tenint una mortalitat molt elevada. La identificació precoç i una estratificació uniforme de la severitat permet decidir de forma més adequada els recursos terapèutics i probablement això tingui implicacions pronòstiques.

- La implantació de protocols de xoc cardiogènic en els centres especialitzats així com la creació de xarxes de xoc sembla tenir un efecte positiu en l'evolució d'aquests pacients

Conclusions

- En l'escenari del xoc cardiogènic hem d'anar "desenterrant" el Swan-Ganz.
- En cas de necessitat de suport ventricular, la implementació ha de ser precoç i en el AMI-CS és recomenable fer-ho abans de l'ICP.
- Cal evitar la presència de congestió en el moment de l'alta. En aquest sentit l'eco pulmonar també pot ser de gran ajuda.
- L'inici del tractament neurohormonal s'ha de realizar abans de l'alta i garantir un seguiment precoç després d'aquesta.

Generalitat de Catalunya
Departament de Salut

Bellvitge
Hospital Universitari

A L'ICS iguals

bellvitgehospital.cat