

Noves perspectives de tractament en la insuficiència cardíaca aguda

Joan Isaac Llaó Ferrando

Unitat de Crítics Cardiològics
Hospital Universitari de Bellvitge

Societat Catalana de Cardiologia

Febrer 2020

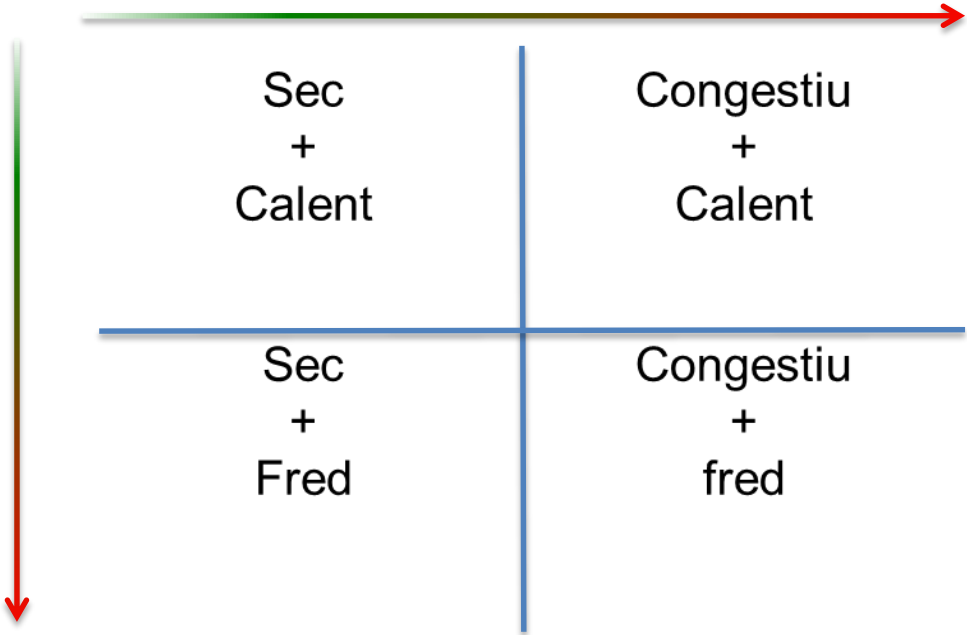


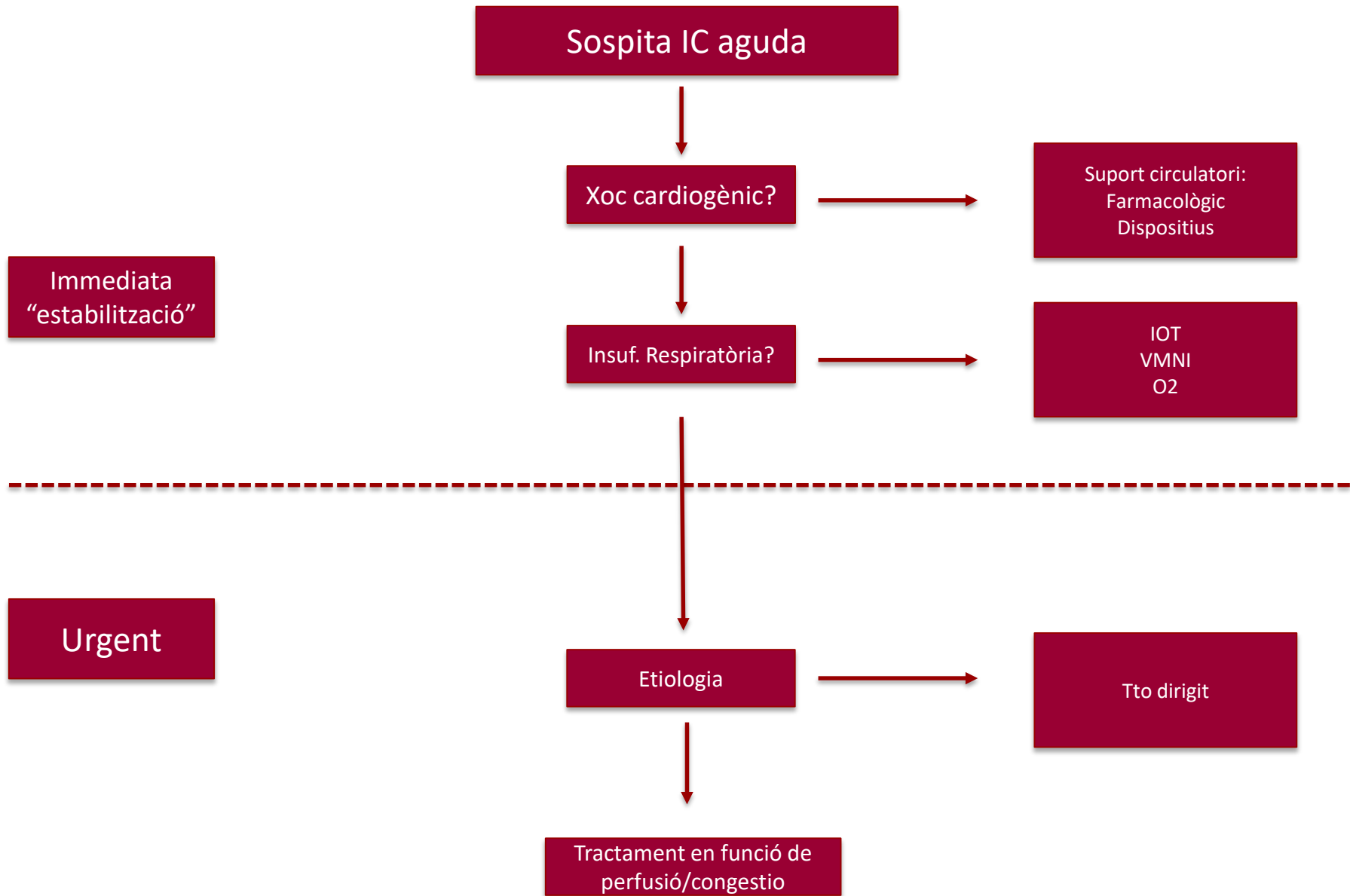
Perfusió:

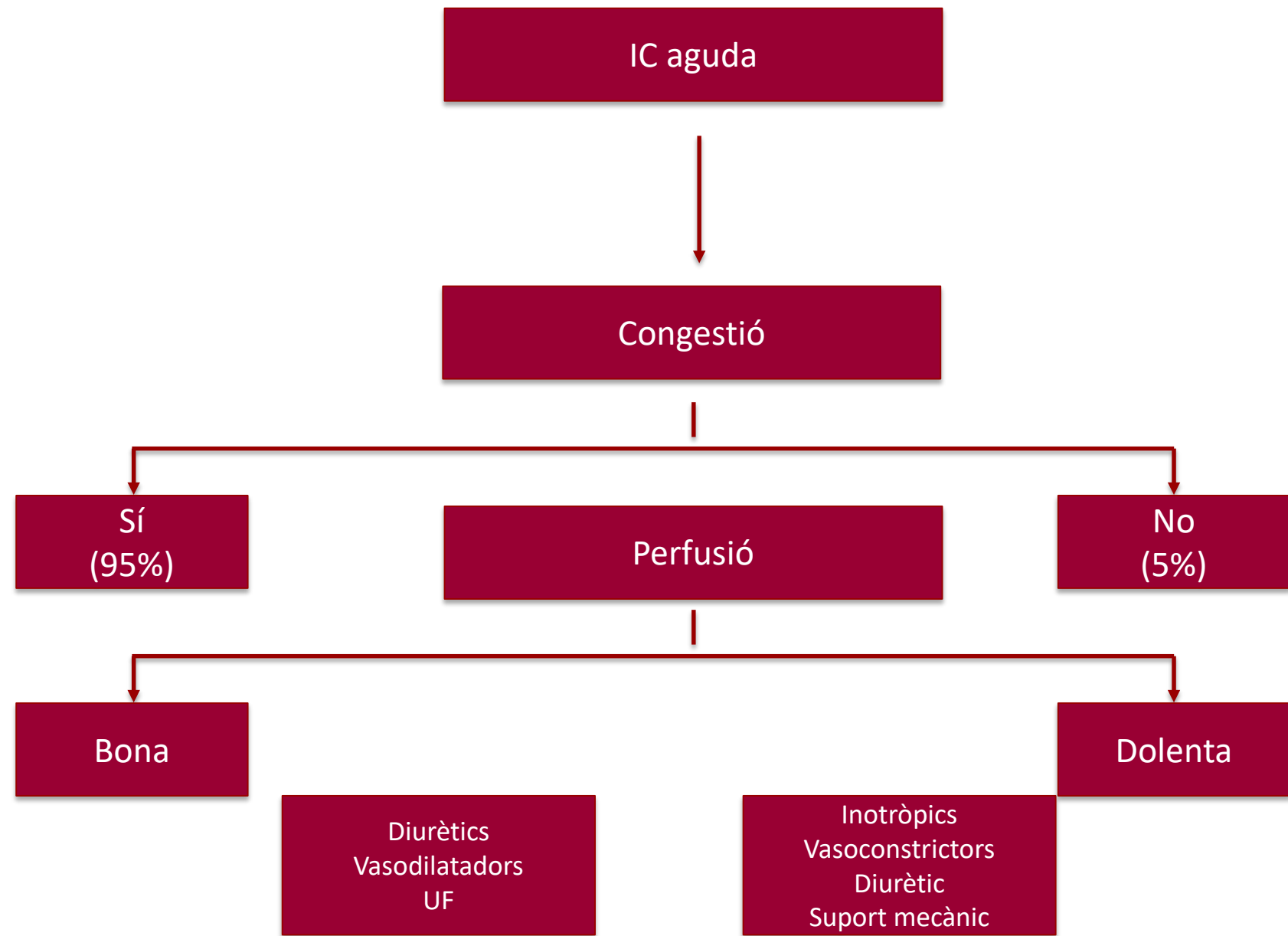
- Fredor
- Pal·lidesa.
- Baix nivell de consciència.
- Plenitut postpandrial.
- Mareig.
- Hipotensió

Congestió

- Crepitants.
- Ascitis.
- Edemes.
- 3 r soroll.
- RHJ







IC aguda "No xoc"

- "Nous" fàrmacs vasodilatadors
 - Seralaxina
- Sacubitril/Valsartan
- Ecografia pulmonar

Xoc cardiogènic

- Classificació xoc
- Porta-reperfusió vs porta-suport
- Codi Xoc.

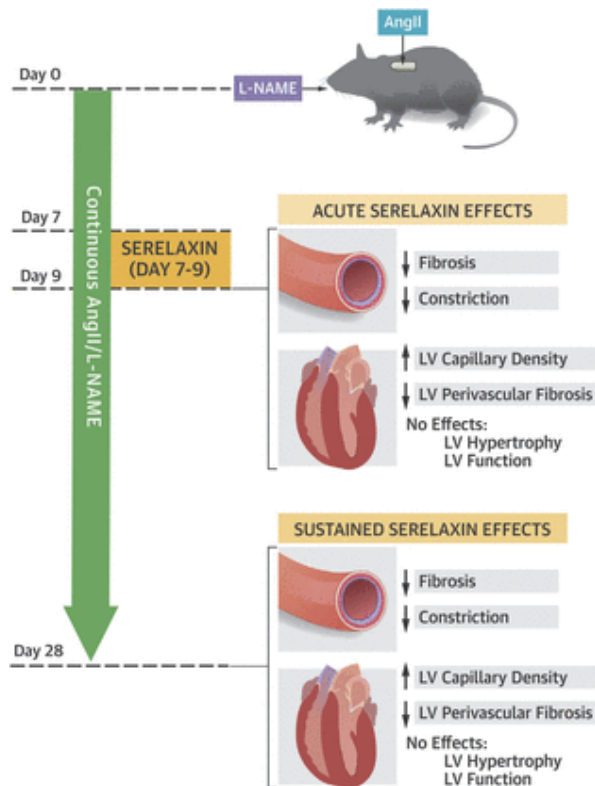
IC aguda
“No xoc”



ORIGINAL ARTICLE

Effects of Serelaxin in Patients with Acute Heart Failure

M. Metra, J.R. Teerlink, G. Cotter, B.A. Davison, G.M. Felker, G. Filippatos, B.H. Greenberg, P.S. Pang, P. Ponikowski, A.A. Voors, K.F. Adams, S.D. Anker, A. Arias-Mendoza, P. Avendaño, F. Bacal, M. Böhm, G. Bortman, J.G.F. Cleland, A. Cohen-Solal, M.G. Crespo-Leiro, M. Dorobantu, L.E. Echeverría, R. Ferrari, S. Golland, E. Gonçalvesová, A. Goudev, L. Køber, J. Lema-Osores, P.D. Levy, K. McDonald, P. Manga, B. Merkely, C. Mueller, B. Pieske, J. Silva-Cardoso, J. Špinar, I. Squire, J. Stepińska, W. Van Mieghem, D. von Lewinski, G. Wikström, M.B. Yilmaz, N. Hagner, T. Holbro, T.A. Hua,* S.V. Sabarwal, T. Severin, P. Szecsy, and C. Gimpelewicz, for the RELAX-AHF-2 Committees Investigators†

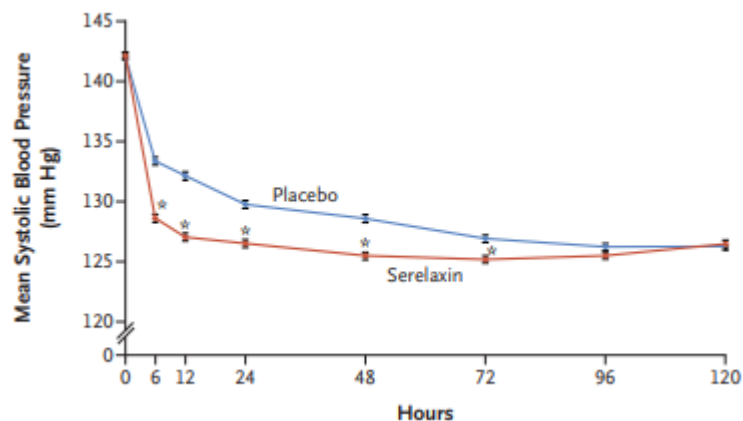


McCarthy, J.C. et al. J Am Coll Cardiol Basic Trans Science. 2017;2(3):285-96.

Table 1. Selected Characteristics of the Patients in the Intention-to-Treat Population at Baseline.*

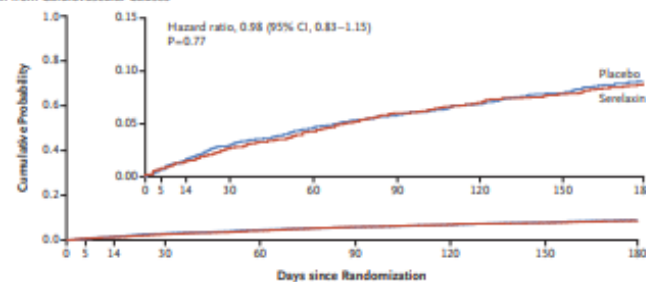
Characteristic	Serelaxin Group (N=3274)	Placebo Group (N=3271)
Age — yr	73.1±11.2	72.8±11.2
Age group — no. (%)		
<75 yr	1608 (49.1)	1635 (50.0)
≥75 yr	1666 (50.9)	1636 (50.0)
Male sex — no. (%)	1978 (60.4)	1930 (59.0)
Race — no. (%)†		
White	3017 (92.2)	2999 (91.7)
Black	163 (5.0)	171 (5.2)
Other or missing data	94 (2.9)	101 (3.1)
Weight — kg	84.0±20.0	84.3±20.2
Body-mass index‡	29.8±6.4	29.8±6.3
Systolic blood pressure — mm Hg	146.3±16.9	146.1±16.5
Diastolic blood pressure — mm Hg	82.2±14.2	82.0±13.9
Heart rate — beats/min	83.5±17.0	83.5±17.1
Respiratory rate — breaths/min	22.0±4.6	21.9±4.6
Temperature — °C	36.5±0.4	36.5±0.4
History of heart failure — no./total no. (%)	2411/3272 (73.7)	2443/3269 (74.7)
Previous hospitalization for heart failure — no./total no. (%)	1647/3066 (53.7)	1691/3049 (55.5)
No. of hospitalizations for heart failure within previous 1 yr	1.1±1.2	1.2±1.2
Ischemic cause of heart failure — no./total no. (%)	1313/2409 (54.5)	1294/2438 (53.1)
Ejection fraction at index hospitalization — %§	39.3±13.9	38.5±13.7
Ejection fraction ≥40% — no./total no. (%)	1571/3074 (51.1)	1609/3054 (52.7)
NYHA class 1 mo before admission — no./total no. (%)		
I	116/2365 (4.9)	94/2384 (3.9)
II	914/2365 (38.6)	934/2384 (39.2)
III	1089/2365 (46.0)	1095/2384 (45.9)
IV	246/2365 (10.4)	261/2384 (10.9)
Intravenous nitrates at randomization — no. (%)	179 (5.5)	181 (5.5)
Median BNP level (IQR) — ng/liter¶	1095 (741–1715)	1200 (773–1992)
Median NT-proBNP level (IQR) — ng/liter	6153 (3613–10,387)	6035 (3485–9567)
eGFR — ml/min/1.73 m ² **	51.3±14.3	51.3±14.5
Median time from either presentation or first intravenous loop diuretic, whichever occurred earlier, to randomization (IQR) — hr	7.1 (4.9–11.1)	6.9 (4.9–11.0)
Median time from presentation to randomization (IQR) — hr	7.0 (4.9–11.0)	6.9 (4.9–10.9)
Median time from first intravenous loop diuretic to randomization (IQR) — hr	5.3 (3.1–9.5)	5.2 (3.1–9.3)
Median time from randomization to administration of serelaxin or placebo (IQR) — hr	0.5 (0.3–1.0)	0.5 (0.3–1.0)

Serelaxina

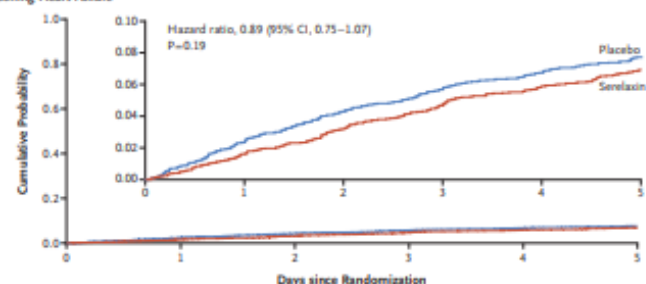


No reducció significativa de mort CV als 180 dies ni milloria de la insuficiència cardíaca als 5 dies

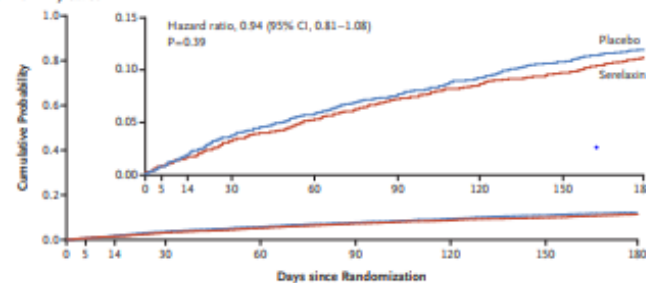
A Death from Cardiovascular Causes



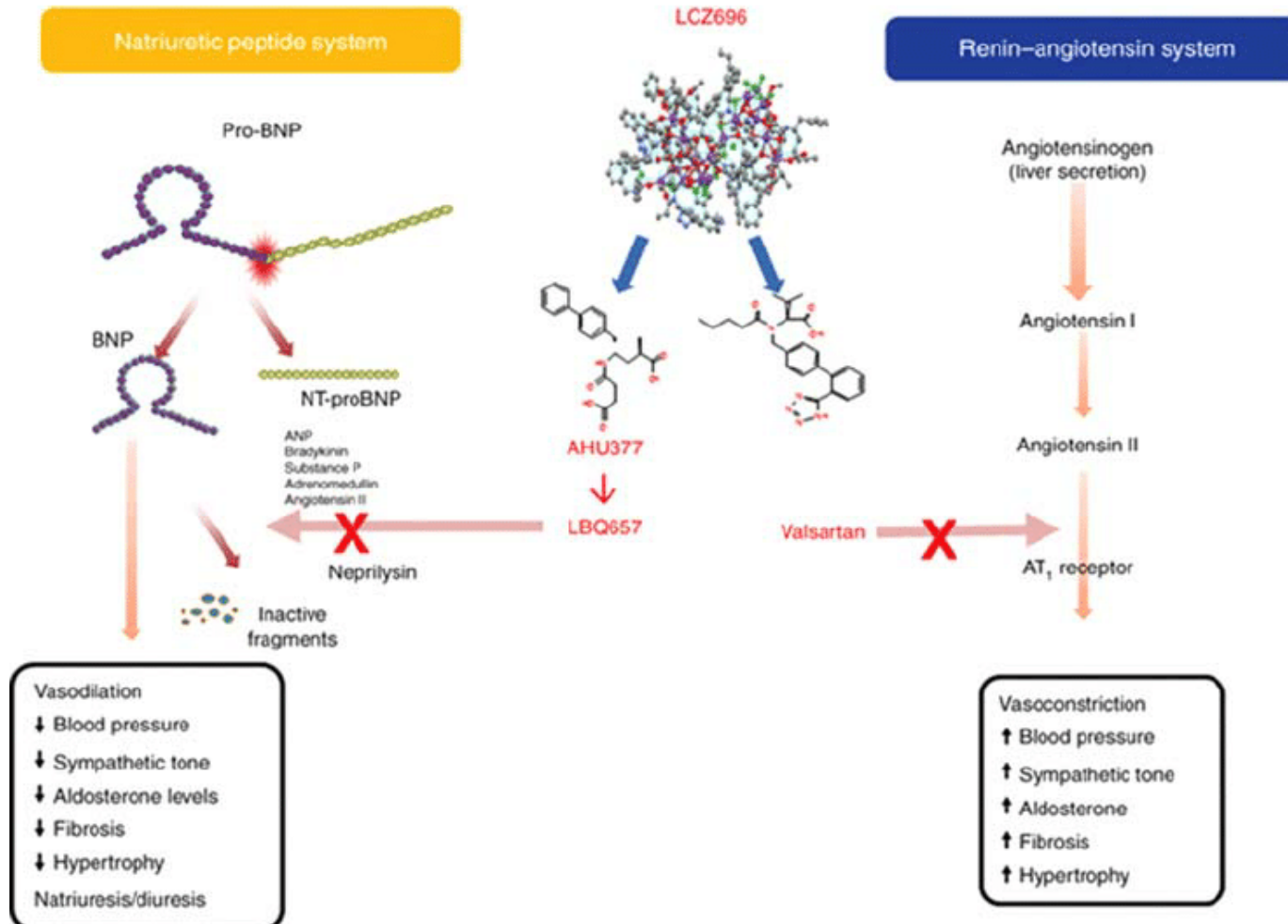
B Worsening Heart Failure



C Death from Any Cause



Sacubitril-Valsartan en la ICA



PIONEER-HF

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Angiotensin–Neprilysin Inhibition in Acute Decompensated Heart Failure

Eric J. Velazquez, M.D., David A. Morrow, M.D., M.P.H.,
Adam D. DeVore, M.D., M.H.S., Carol I. Duffy, D.O., Andrew P. Ambrosy, M.D.,
Kevin McCague, M.A., Ricardo Rocha, M.D., and Eugene Braunwald, M.D.,
for the PIONEER-HF Investigators*

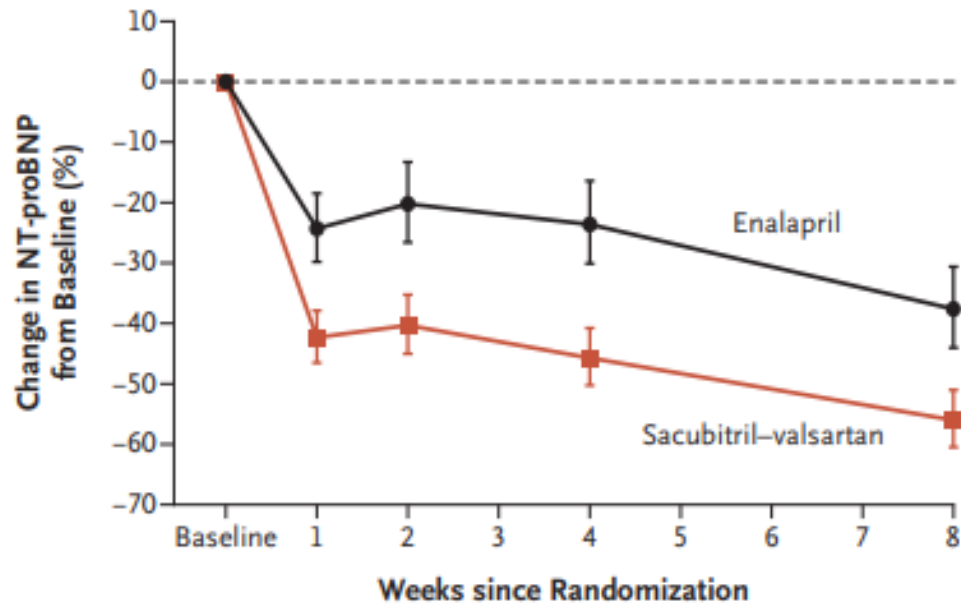
Críteris d'inclusió:

FEVE <40%

NT-proBNP > 1600/BNP >400

Símptomes/signes d'IC

Variable	Valsartan (N = 440)	Enalapril (N = 441)
Age — yr		
Median	61	63
Interquartile range	51–71	54–72
Female sex — no. (%)	113 (25.7)	133 (30.2)
Race — no. (%)†		
Black	158 (35.9)	158 (35.8)
White	261 (59.3)	254 (57.6)
Body-mass index‡		
Median	30.5	30.0
Interquartile range	25.9–37.1	25.8–36.3
Previous heart failure — no. (%)	298 (67.7)	278 (63.0)
Previous use of medication — no. (%)		
ACE inhibitor or ARB	208 (47.3)	214 (48.5)
Beta-blocker	262 (59.5)	263 (59.6)
MRA	48 (10.9)	40 (9.1)
Loop diuretic	262 (59.5)	240 (54.4)
Hydralazine	30 (6.8)	33 (7.5)
Nitrate	43 (9.8)	40 (9.1)
Digoxin	41 (9.3)	35 (7.9)
NYHA class — no. (%)		
I	4 (0.9)	5 (1.1)
II	100 (22.7)	122 (27.7)
III	283 (64.3)	269 (61.0)
IV	39 (8.9)	36 (8.2)
Not assessed	14 (3.2)	9 (2.0)
Systolic blood pressure — mm Hg§		
Median	118	118
Interquartile range	110–133	109–132
Pulse — beats per min§		
Median	81	80
Interquartile range	72–92	72–91
Left ventricular ejection fraction — %¶		
Median	24	25
Interquartile range	18–30	20–30
NT-proBNP at screening — pg/ml¶		
Median	4821	4710
Interquartile range	3109–8767	2966–8280
NT-proBNP at randomization — pg/ml¶		
Median	2883	2536
Interquartile range	1610–5403	1363–4917
Serum creatinine — mg/dl§		
Median	1.28	1.27
Interquartile range	1.07–1.51	1.05–1.50
Estimated GFR — ml/min/1.73 m ² §		
Median	58.4	58.9
Interquartile range	47.5–71.5	47.4–70.9
Serum potassium — mmol per liter§		
Median	4.20	4.25
Interquartile range	4.00–4.50	3.90–4.60

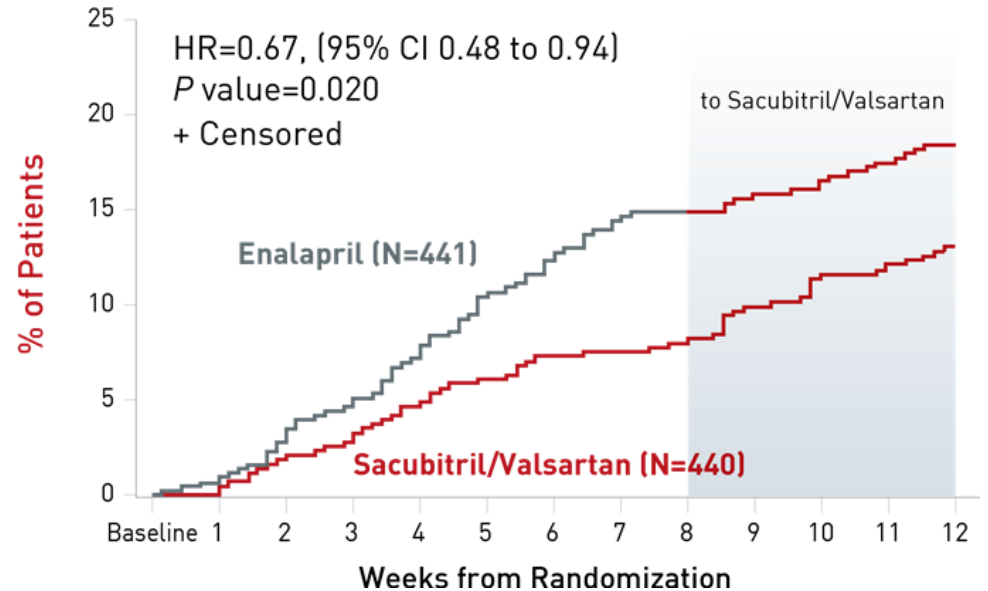
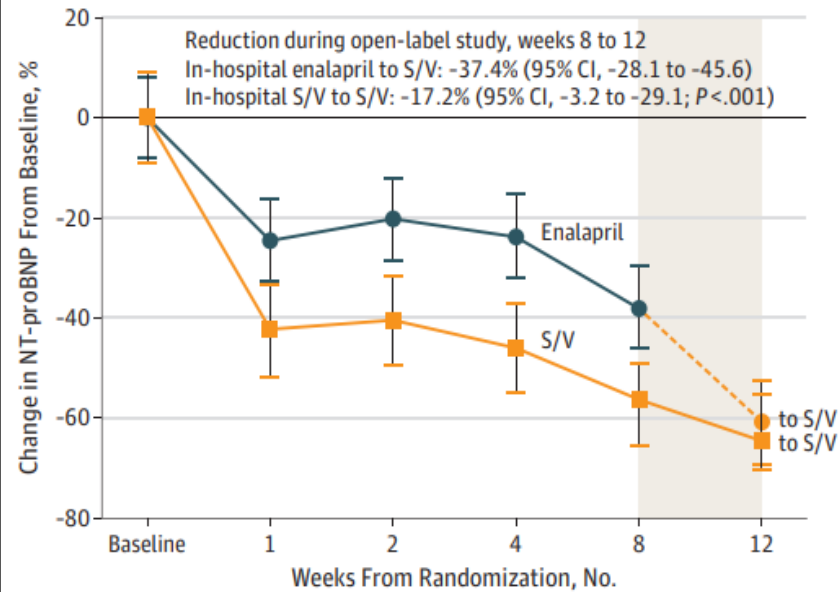


Reducció significativa NT-ProBNP 46.7 % vs 25.3 %

Igual seguretat

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

PIONEER-HF



Sacubitril/valsartan més eficaç per reducció de Nt proBNP independentment de quan s'iniciï

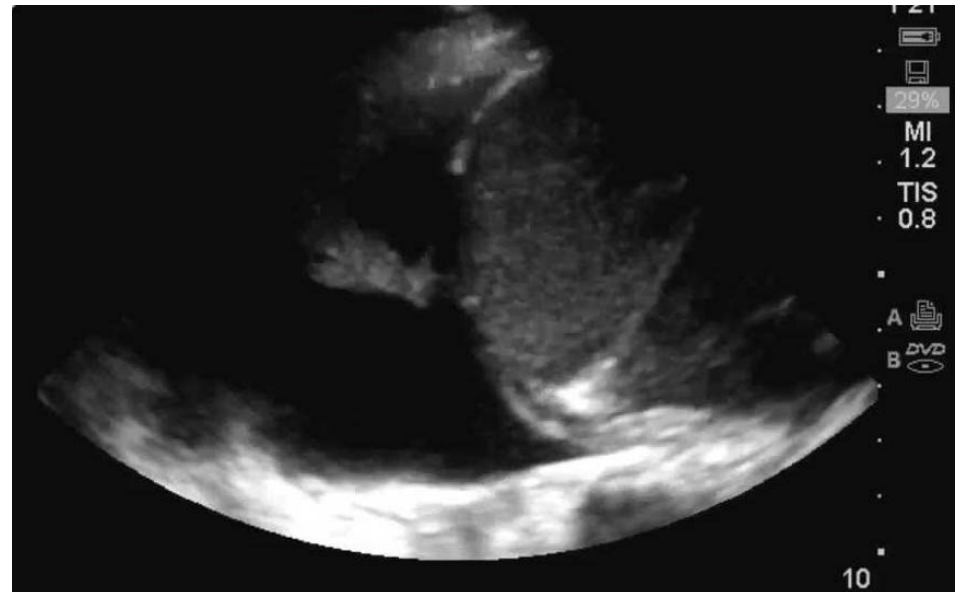
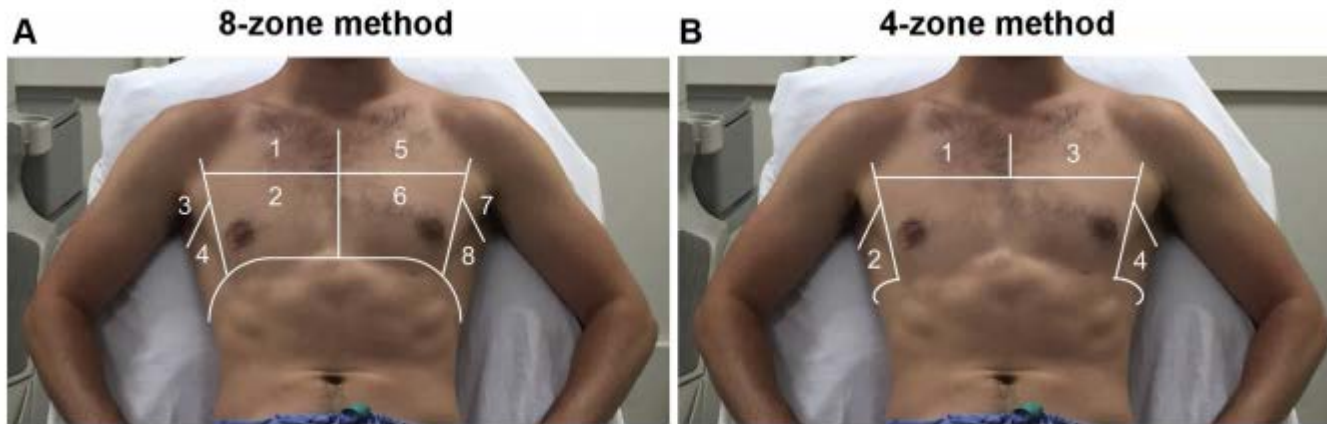
La millora dels esdeveniments clínics es produeix en el grup d'inici precoç

JAMA Cardiology Published online December 11, 2019

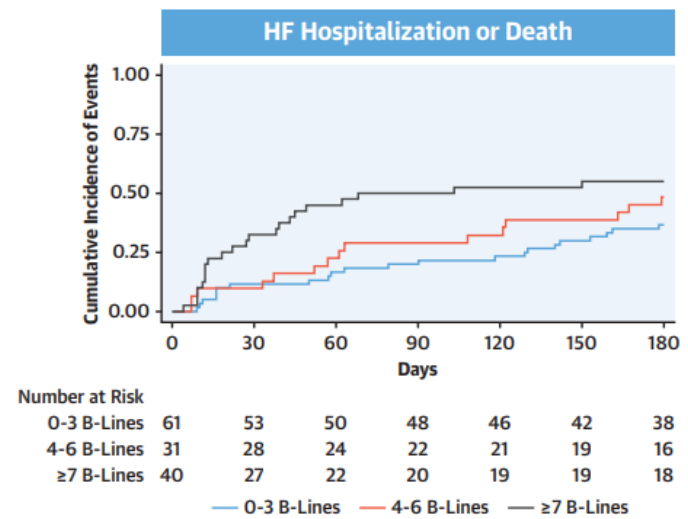
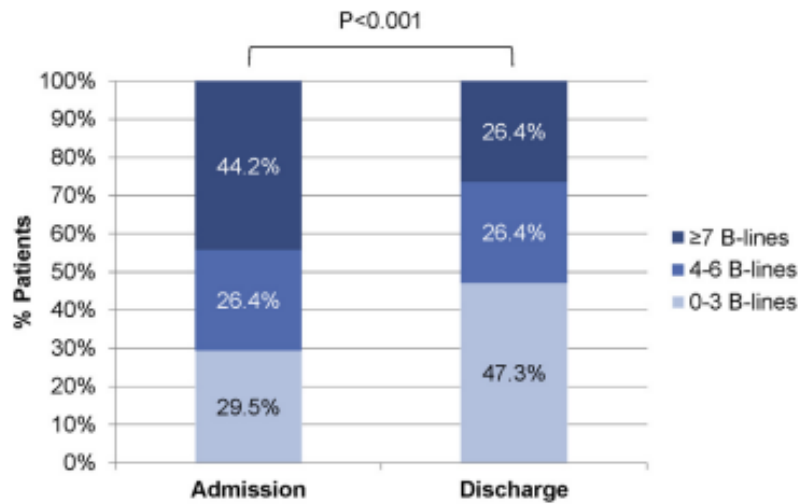
Clinical practice update on heart failure 2019: pharmacotherapy, procedures, devices and patient management. An expert consensus meeting report of the Heart Failure Association of the European Society of Cardiology

En pacients amb insuficiència cardíaca de debut o descompensació d'insuficiència cardíaca crònica es pot considerar iniciar sacubitril/valsartan, en lloc de IECA o ARA II per tal de reduir esdeveniments adversos a curt termini i simplificar el maneig

Ecografia pulmonar



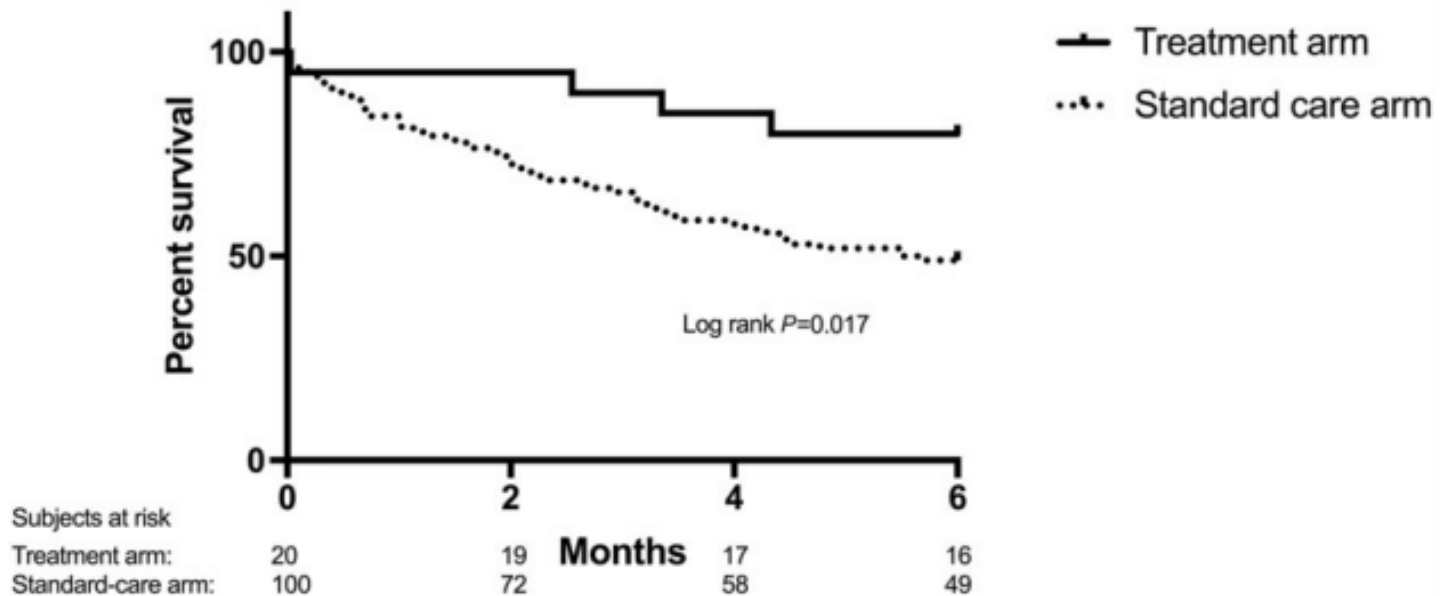
Ecografia pulmonar



Platz, E. et al. J Am Coll Cardiol HF. 2019;7(10):849–58

Ecografia pulmonar

Six-month survival regarding the composite endpoint of all-cause mortality or hospitalization for AHF in the treatment arm compared to the standard-care arm



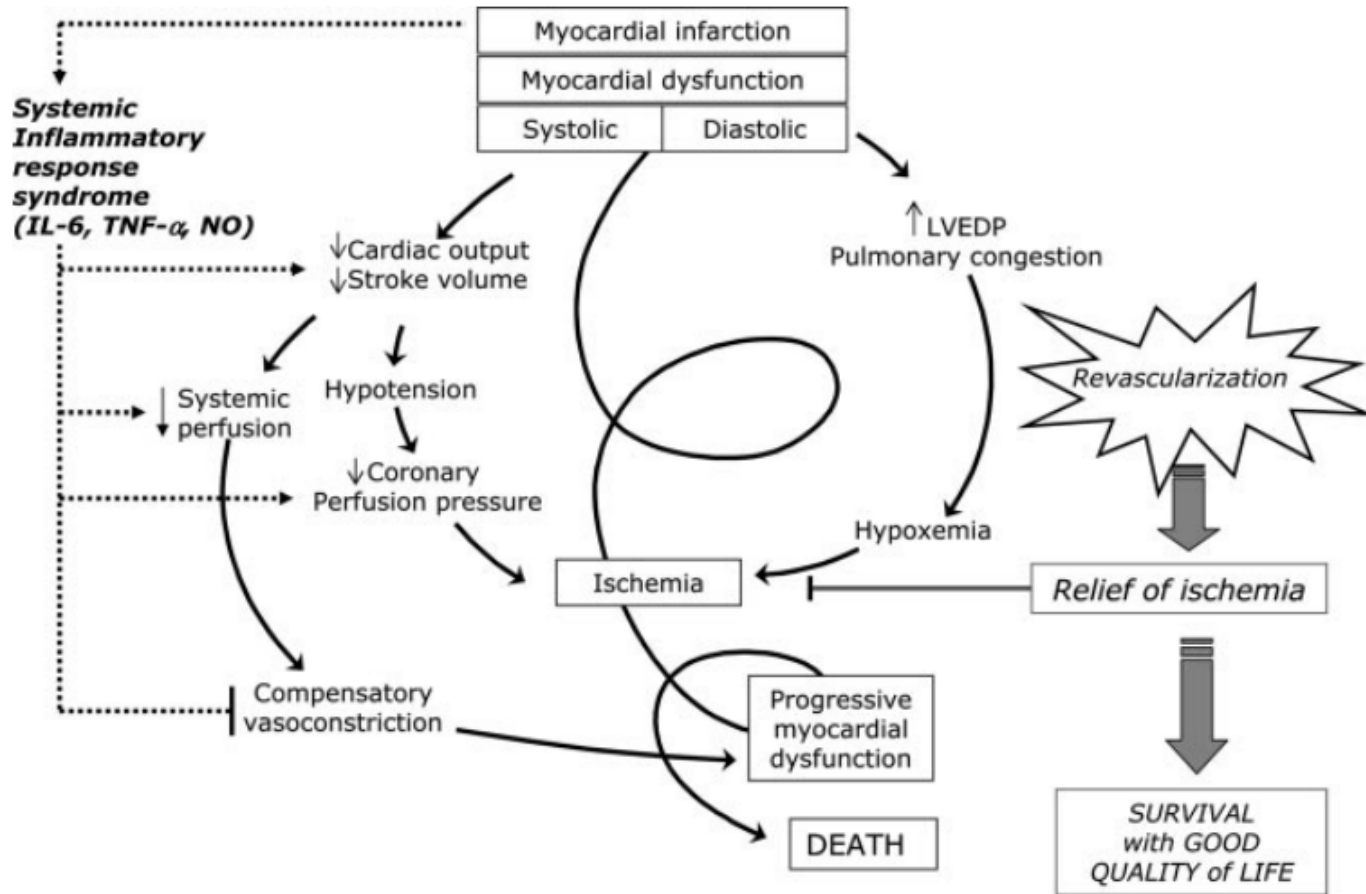
ESC Heart Failure 2018; 5: 120–128

IC aguda

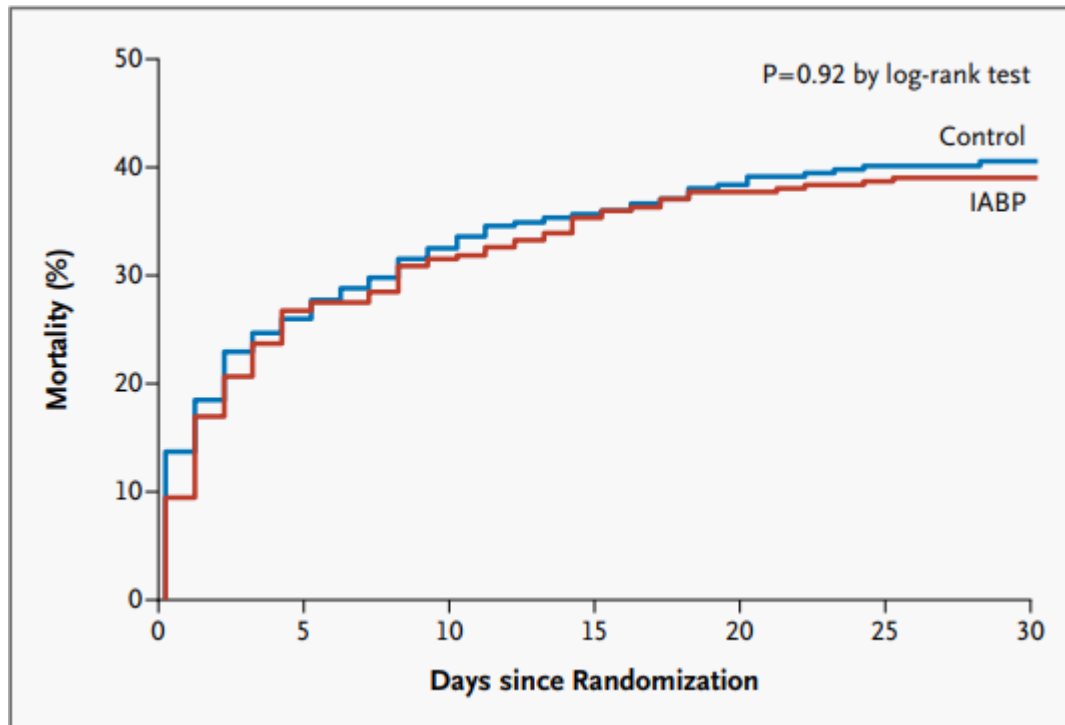
Xoc Cardiològic



Xoc Cardiògenic



IABP



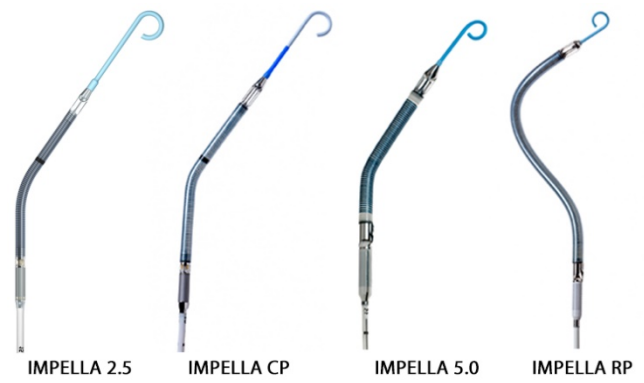
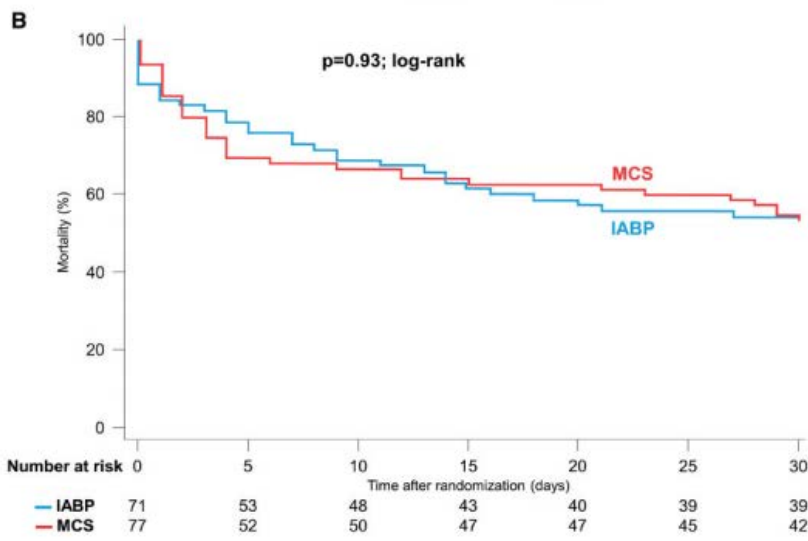
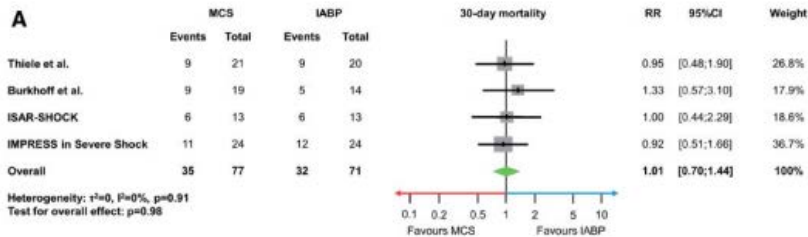
PCR 42-47%

Implante 86.6%
Post-ICP

10% Crossover

LVAD 3.7 vs 7.4%

N Engl J Med 2012; 367:1287-1296



Mortalitat al voltant del 50%

Identificació precoç

Monitorització hemodinàmica

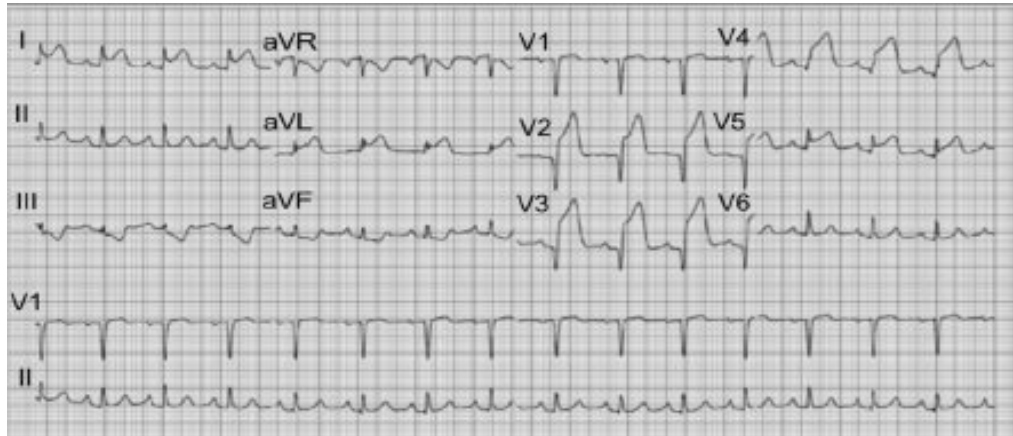
Implantació individualitzada de SMC

Atenció centralitzada

Centres Xoc

Codi Xoc

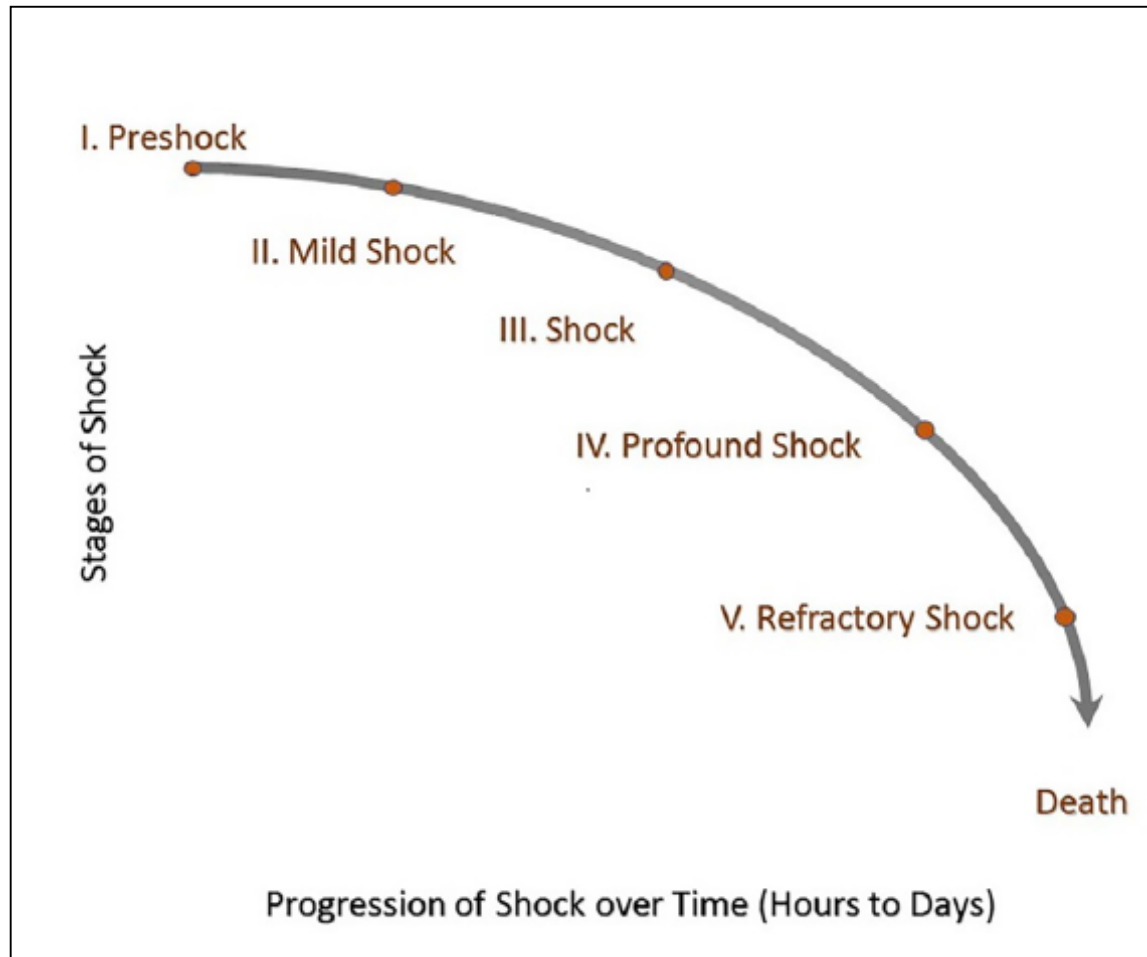
Identificació del xoc



- Conscient
- Sat 98% amb VMK al 31%
- Dobutamina 4mcg/kg.min
- TA 89/63 Fc 98
- Lactat 3mmol/L

- Obnubilada
- Sat 95% amb VMNI FIO2 60%
- Dobutamina 7 mcg/kg.min
- TA 84/52 FC 105
- Lactat 4mmol/L

- IOT FIO2 95%
- Dobutamina 10mcg/kg/min + noradrenalina 0,5 mg/hora
- TA 72/54 Fc 120lpm
- Lactat 7mmol/L



Am J Cardiol. 2018 Sep 15;122(6):1104-1110

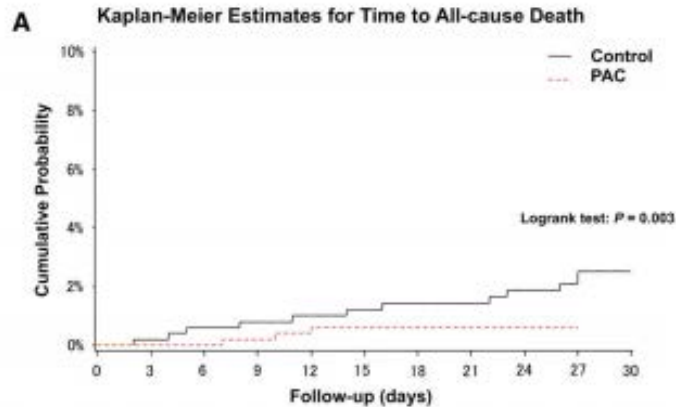
Identificació i estratificació del Xoc



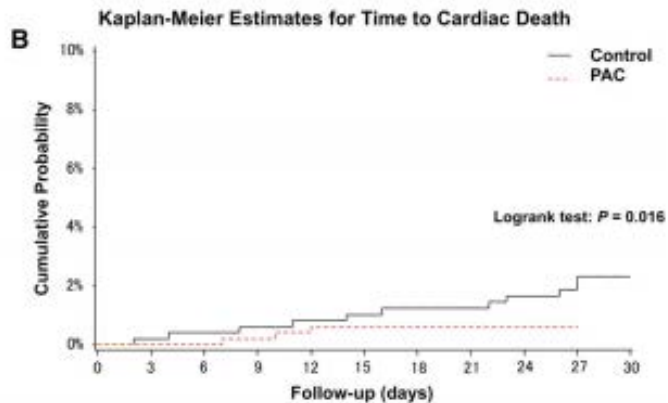
Catheter Cardiovasc Interv. 2019;94:29–37.



Monitorització hemodinàmica



Control group	502	501	493	486	476	468	458	454	444	437	429
PAC group	502	502	502	499	495	487	479	475	470	464	464



Control group	502	501	493	486	476	468	458	454	444	437	429
PAC group	502	502	502	499	495	487	479	475	470	464	464

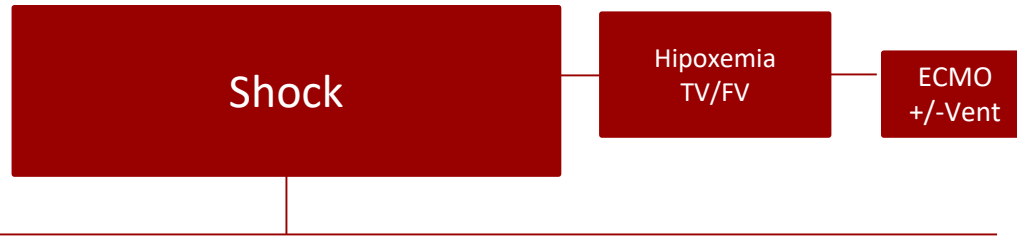
CAP podria ajudar en la reducció de la mortalitat, sobretot en pacients amb hTA i necessitat de suport vasoactiu

- Dubtes diagnòstics
- Dificultats de maneig
- Xoc moderat o sever

Y. Sotomi et al. / International Journal of Cardiology 172 (2014) 165–172

Individualització suport hemodinàmic

- DVI: predominio fallo izquierdo
- DVD: predominio fallo derecho
- BiV: fallo biventricular
- LTX: Levitronix
- PAPI: (PAPs-PAPd)/PAD



DVI

Impella CP/5

LTX

ECMO

DVD

Impella RP

Levitronix Dreta

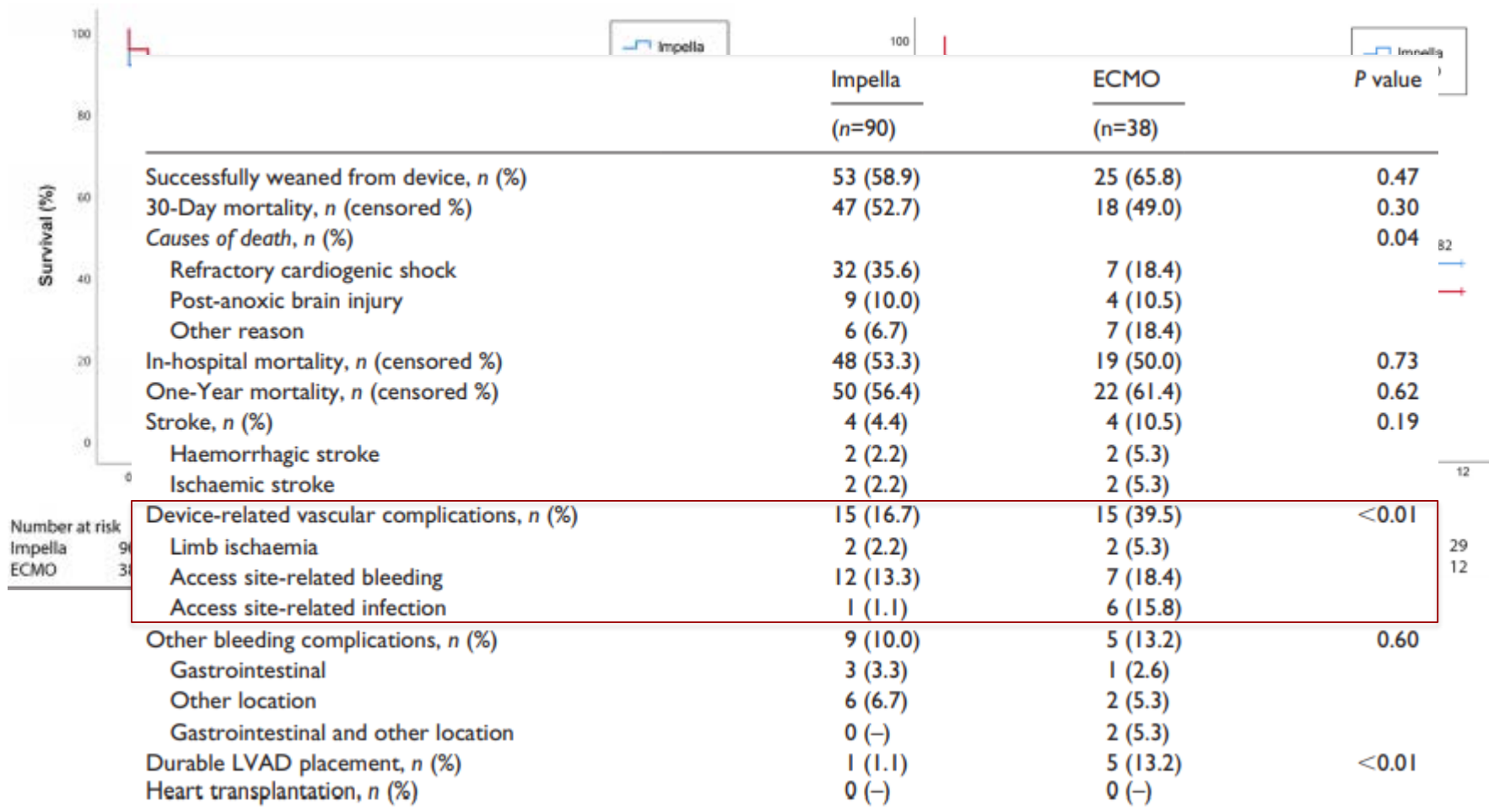
ECMO

BiV

PAPi >1:
Impella

PAPi <1:
LTX-Biv
ECMO

Individualització de suport circulatori mecànic

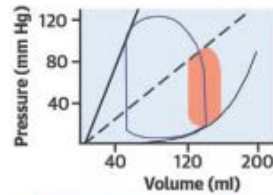


Karami et al European Heart Journal: Acute Cardiovascular Care

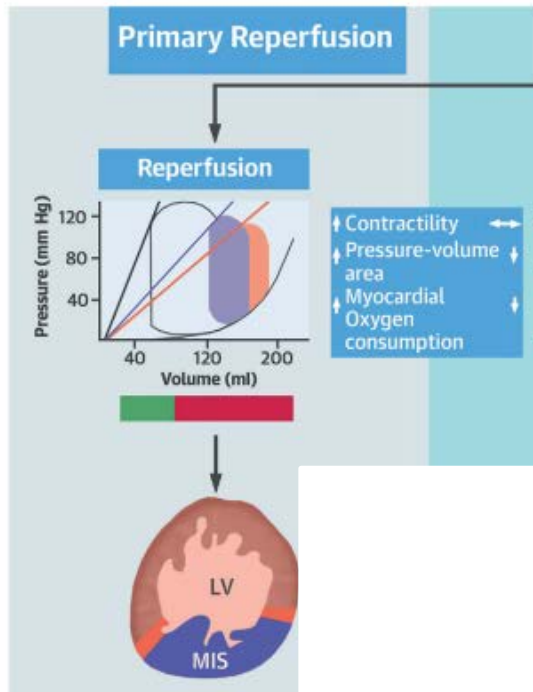
Our Mantra:



Porta- Suport



Supply < Demand
 ↓ Contractility
 ↑ LV end-diastolic pressure
 and end-diastolic volume



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

Puerta -Soporte

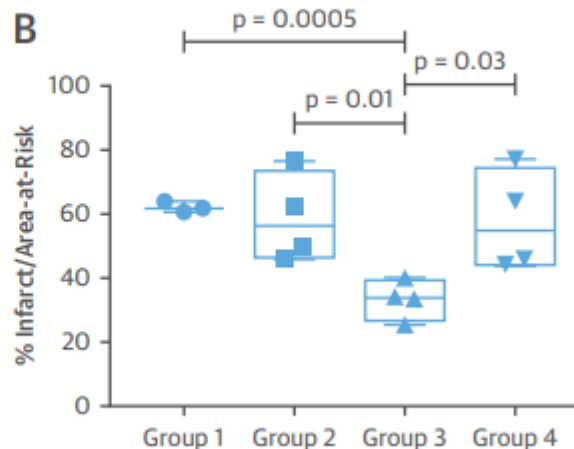
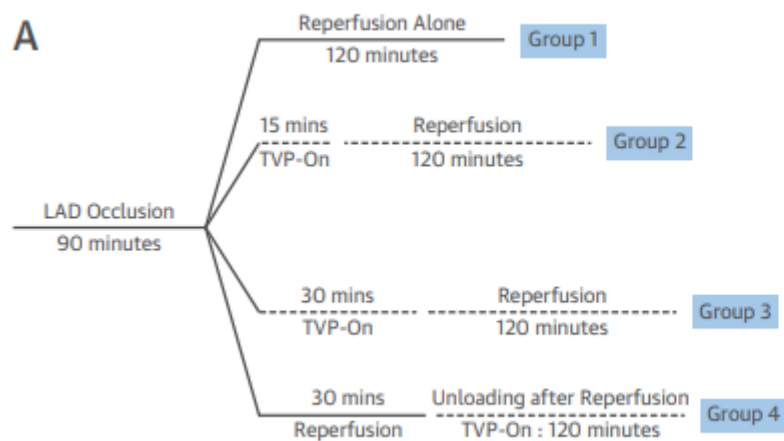
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
© 2018 PUBLISHED BY ELSEVIER ON BEHALF OF THE
AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION

VOL. 72, NO. 5, 2018

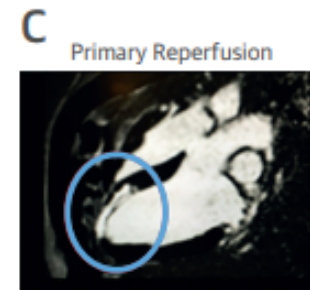
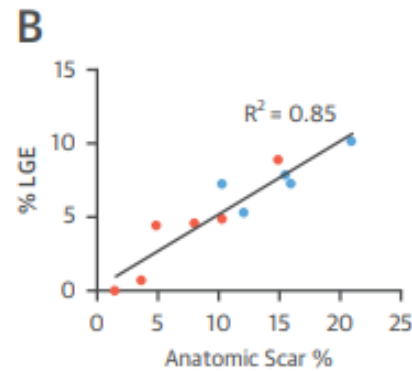
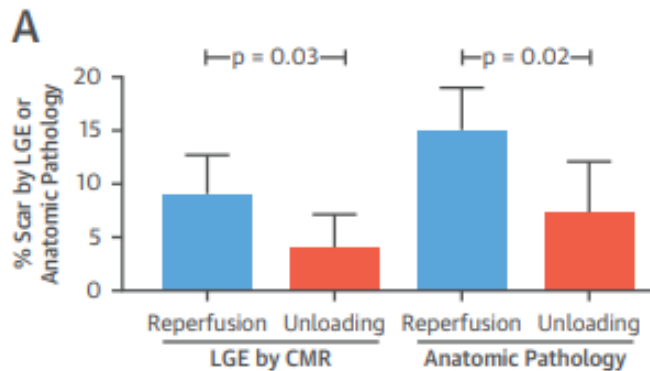
Left Ventricular Unloading Before Reperfusion Promotes Functional Recovery After Acute Myocardial Infarction



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



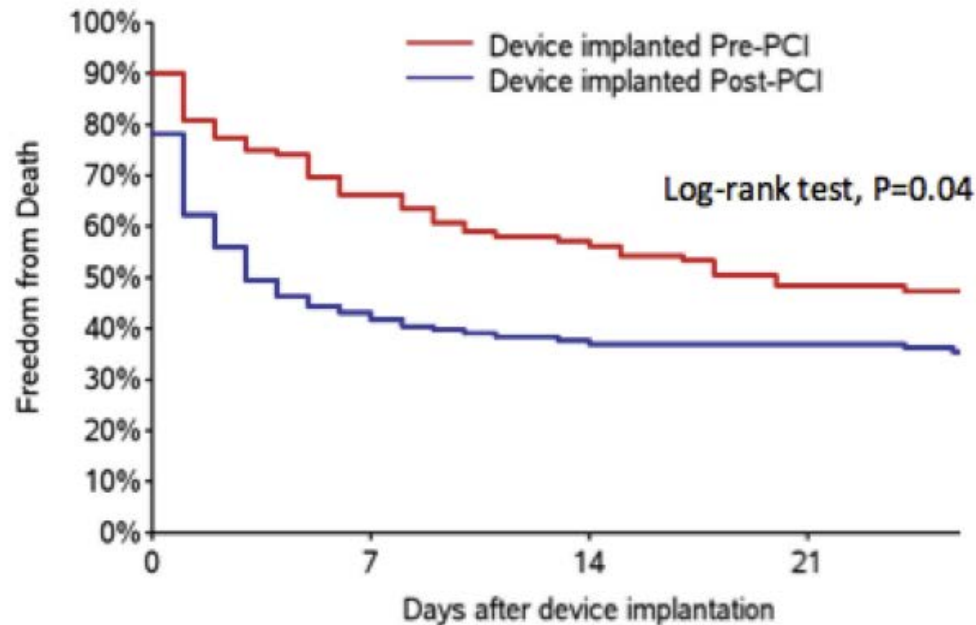
Puerta- Soporte



Effect of Early Initiation of Mechanical Circulatory Support on Survival in Cardiogenic Shock

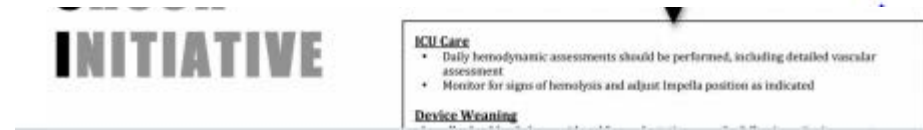
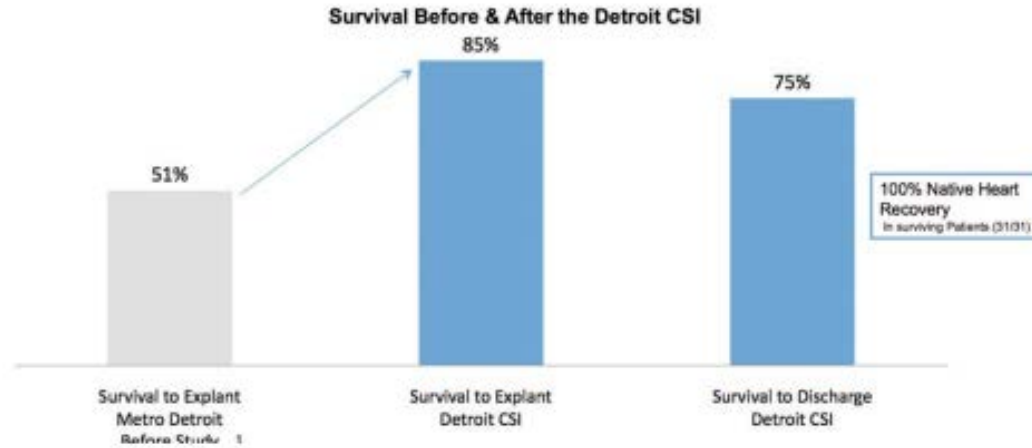
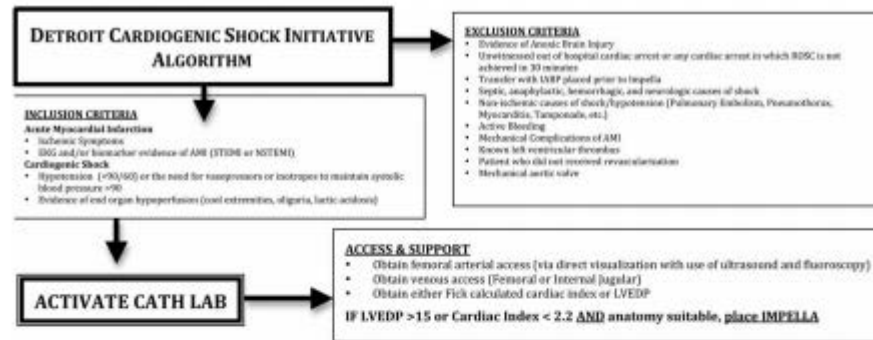


Mir B. Basir, DO^a, Theodore L. Schreiber, MD^b, Cindy L. Grines, MD^b, Simon R. Dixon, MD^c, Jeffrey W. Moses, MD^d, Brijeshwar S. Maini, MD^c, Akshay K. Khandelwal, MD^a, E. Magnus Ohman, MD^f, and William W. O'Neill, MD^{a,*}



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

Protocols de Xoc cardiogènic



Catheter Cardiovasc Interv. 2017;1-8.

Centres de Xoc

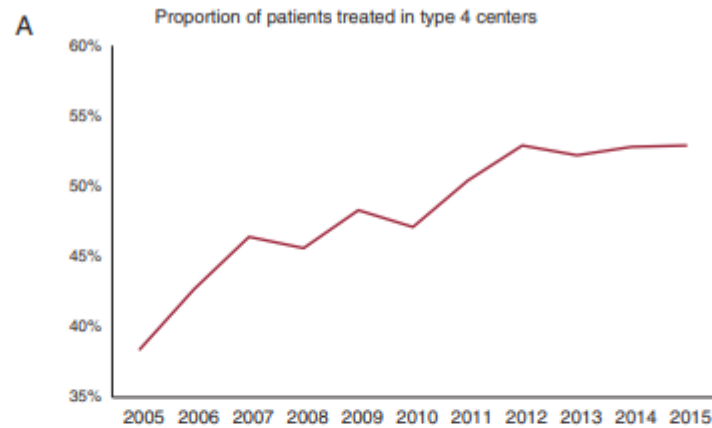
	Annual Hospital Volume of Cardiogenic Shock			
	≤27 Cases	28 to 58 Cases	59 to 106 Cases	≥107 Cases
No. of hospitals, %	2046 (76.49)	366 (13.68)	177 (6.62)	86 (3.21)
Odds ratio, 95% CI				
Unadjusted model	1.58 (1.45 to 1.73)	1.29 (1.17 to 1.41)	1.17 (1.06 to 1.29)	1.00 [Reference]
Multivariate model*	1.27 (1.15 to 1.40)	1.20 (1.08 to 1.32)	1.12 (1.01 to 1.24)	1.00 [Reference]
Mortality incidence, 95% CI				
Unadjusted model	45.32 (44.53 to 46.11)	40.27 (39.25 to 41.29)	37.96 (36.66 to 39.28)	34.40 (32.53 to 36.32)
Multivariate model*	41.97 (40.87 to 43.08)	40.72 (39.52 to 41.93)	39.31 (37.91 to 40.72)	37.01 (35.11 to 38.96)

MI indicates myocardial infarction

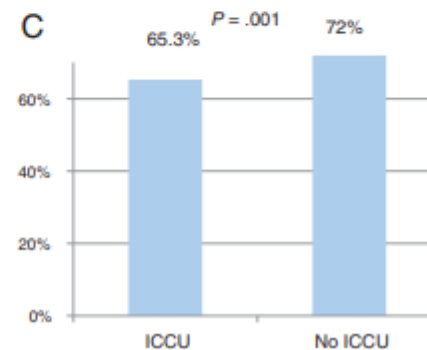
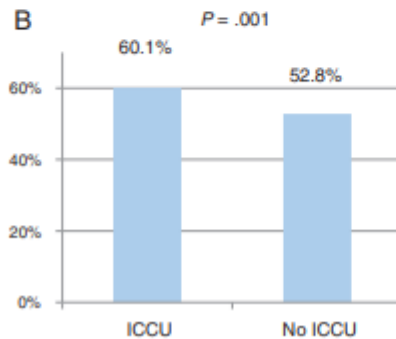
Més volum → menys mortalitat

J Am Heart Assoc. 2015;4:e001462 doi: 10.1161/JAHA.114.001462

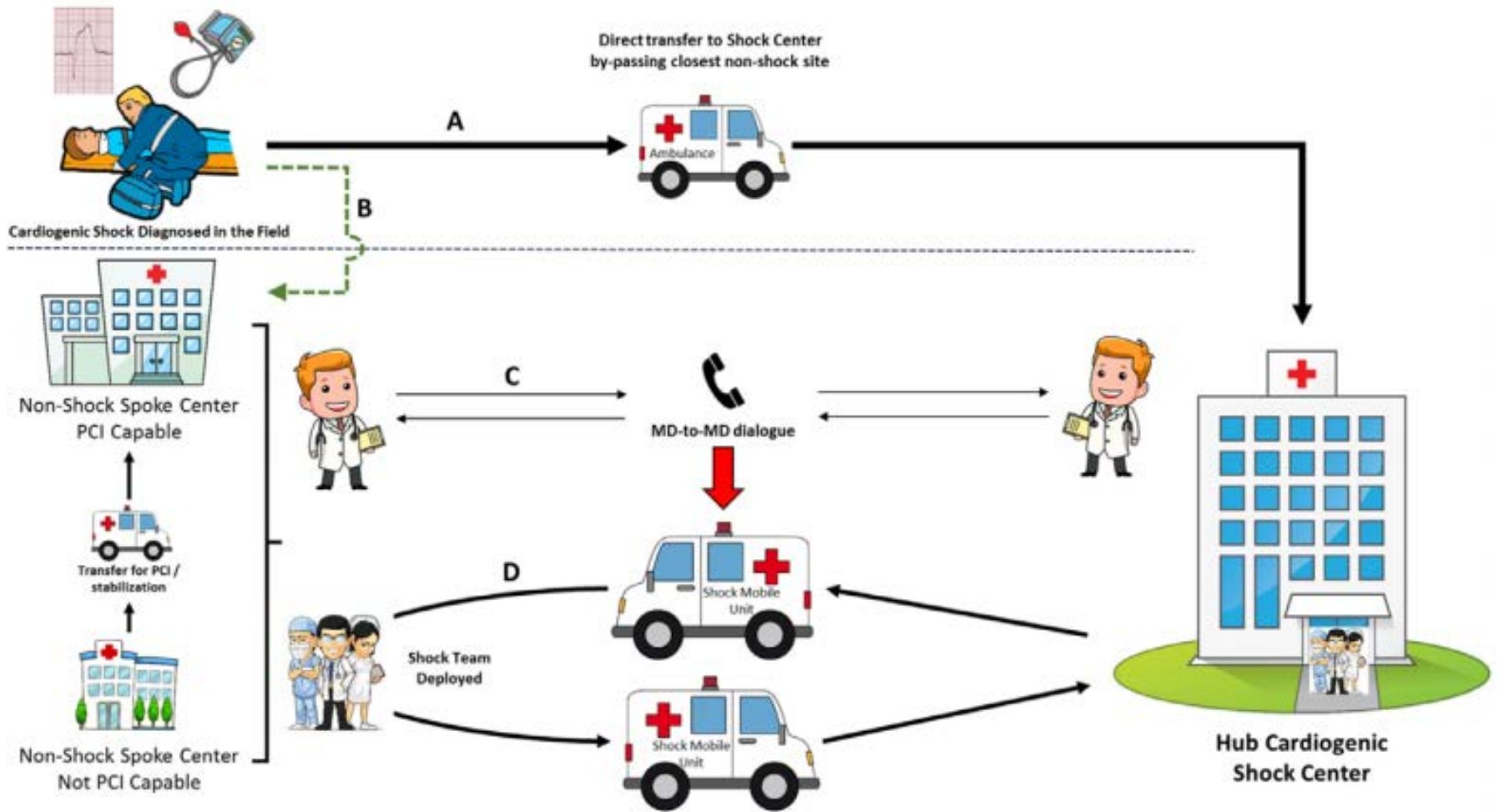
Centres de Xoc



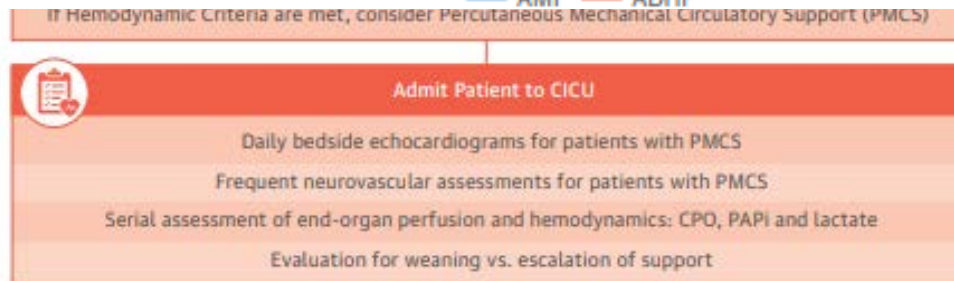
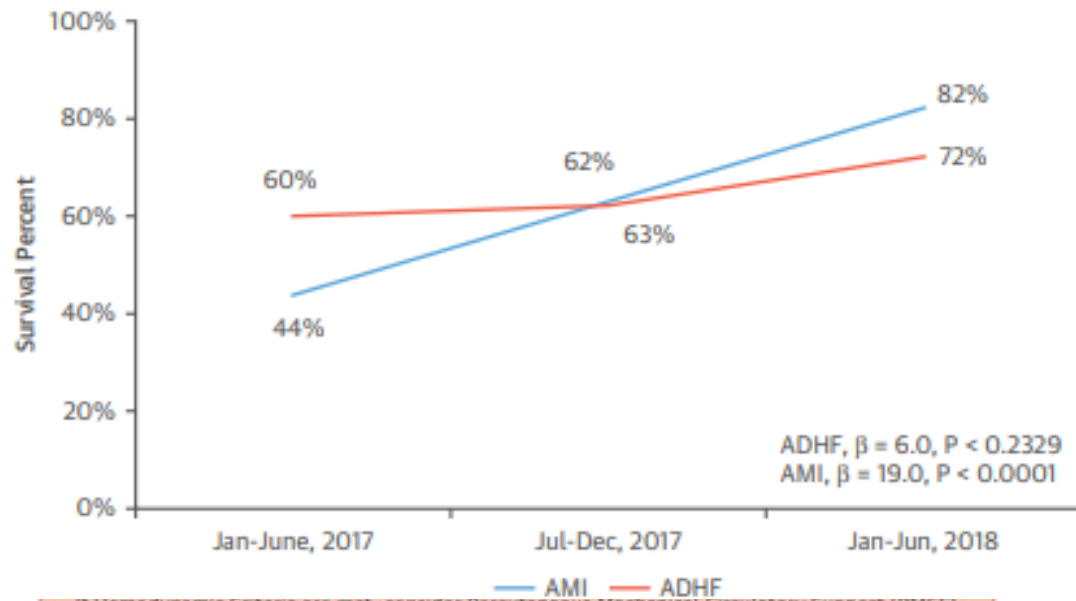
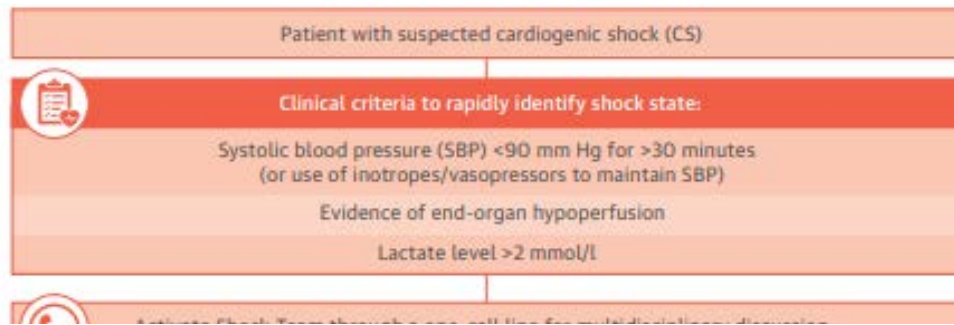
Si UCCC menys mortalitat



Sánchez-Salado et al. / Rev Esp Cardiol. 2019



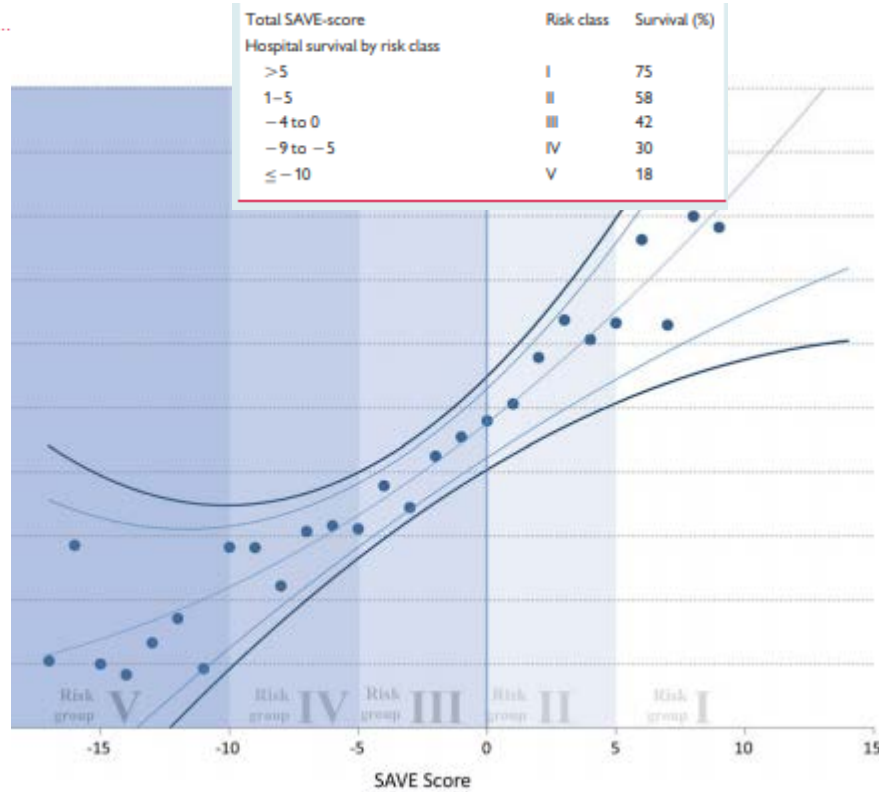
Circulation. 2017;136:e232–e268



Tehrani, B.N. et al. J Am Coll Cardiol. 2019;73(13):1659–69

SAVE Score

Parameter	Score
Acute cardiogenic shock diagnosis group (select one or more)	
Myocarditis	3
Refractory VT/VF	2
Post heart or lung transplantation	3
Congenital heart disease	-3
Other diagnoses leading to cardiogenic shock requiring VA-ECMO	0
Age (years)	
18-38	7
39-52	4
53-62	3
≥ 63	0
Weight (kg)	
≤ 65	1
65-89	2
≥ 90	0
Acute pre-ECMO organ failures (select one or more if required)	
Liver failure ^a	-3
Central nervous system dysfunction ^b	-3
Renal failure ^c	-3
Chronic renal failure ^d	-6
Duration of intubation prior to initiation of ECMO (h)	
≤ 10	0
11-29	-2
≥ 30	-4
Peak inspiratory pressure ≤ 20 cmH ₂ O	3
Pre-ECMO cardiac arrest	-2
Diastolic blood pressure before ECMO ≥ 40 mmHg ^e	3
Pulse pressure before ECMO ≤ 20 mmHg ^e	-2
HCO ₃ before ECMO ≤ 15 mmol/L ^e	-3
Constant value to add to all calculations of SAVE-score	-6



RESEARCH
Myocardial disease

ory

ne Sheldrake³,
1,3,
lcher^{1,3}

European Heart Journal (2015) 36, 2246-2256

Conclusions

- L'inici de Sacubitril-Valsartan es pot considerar en ICA un cop el pacient està estable hemodinàmicament.
- L'ecografia pulmonar ajuda a diagnosticar i monitoritzar la congestió i, per tant, el tractament, tenint impacte pronòstic.
- La identificació precoç i estratificació del xoc cardiogènic és important de cara a implantar un tractament precoç i adequat.
- El Catèter de Swan Ganz ha de ser considerat en els pacients en xoc cardiogènic.

Conclusions

- En cas de necessitat, la col·locació d'un dispositiu de suport ventricular, a poder ser percutani, ha de ser precoç i, en cas de SCA, millor abans de la ICP.
- La implementació de protocols de xoc, amb centres especialitzats i equips multidisciplinars ha demostrat un impacte pronòstic positiu en una patologia fins ara amb pronòstic molt desfavorable.

