

Actualités en Cardiologie

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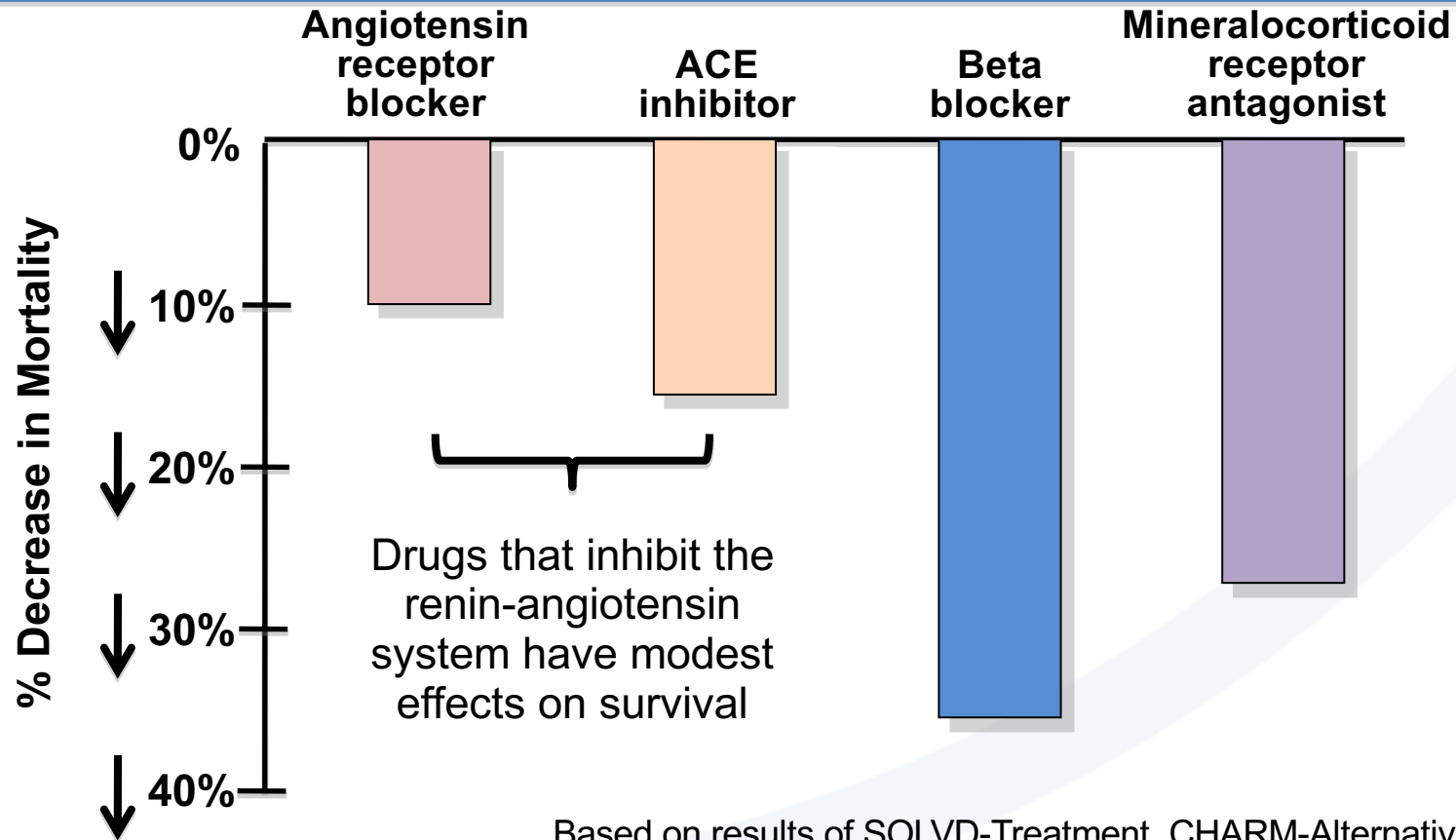
- *Entresto*: nouveau traitement de l'insuffisance cardiaque
- Un Pace maker sans sonde....
- TAVI 5 ans plus tard qu'en est il ?
- *Empagliflozin* un médicament contre le diabète qui peut aussi soigner votre cœur ...



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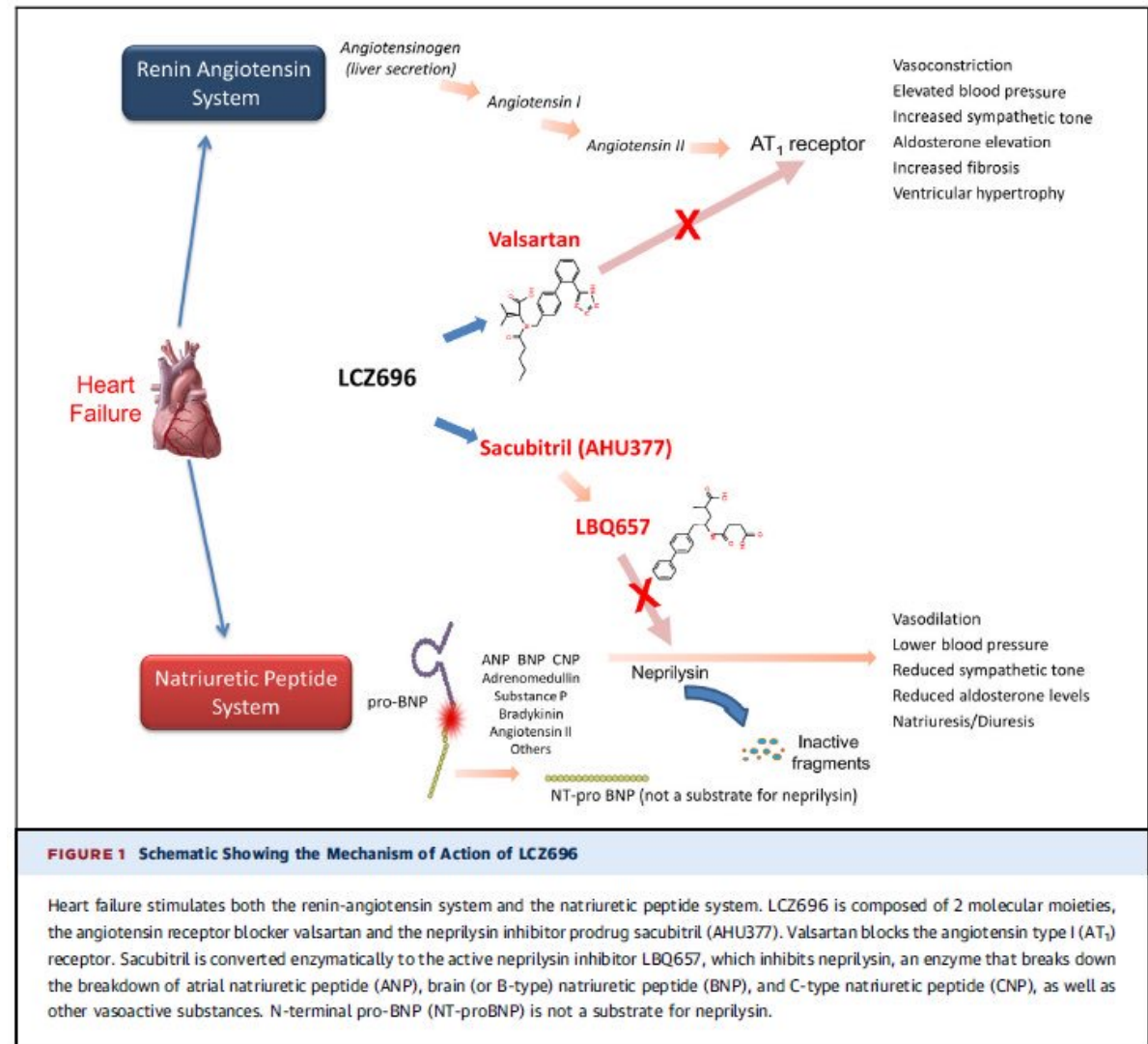
Drugs That Reduce Mortality in Heart Failure With Reduced Ejection Fraction



Based on results of SOLVD-Treatment, CHARM-Alternative, COPERNICUS, MERIT-HF, CIBIS II, RALES and EMPHASIS-HF



- l'association de :
 - Valsartan (ARA2)
 - Sacubitril (Neprilysin Inhibitor)
- 2 actions associées :
 - Blocage du SRAA
 - Inhibe la dégradation du BNP

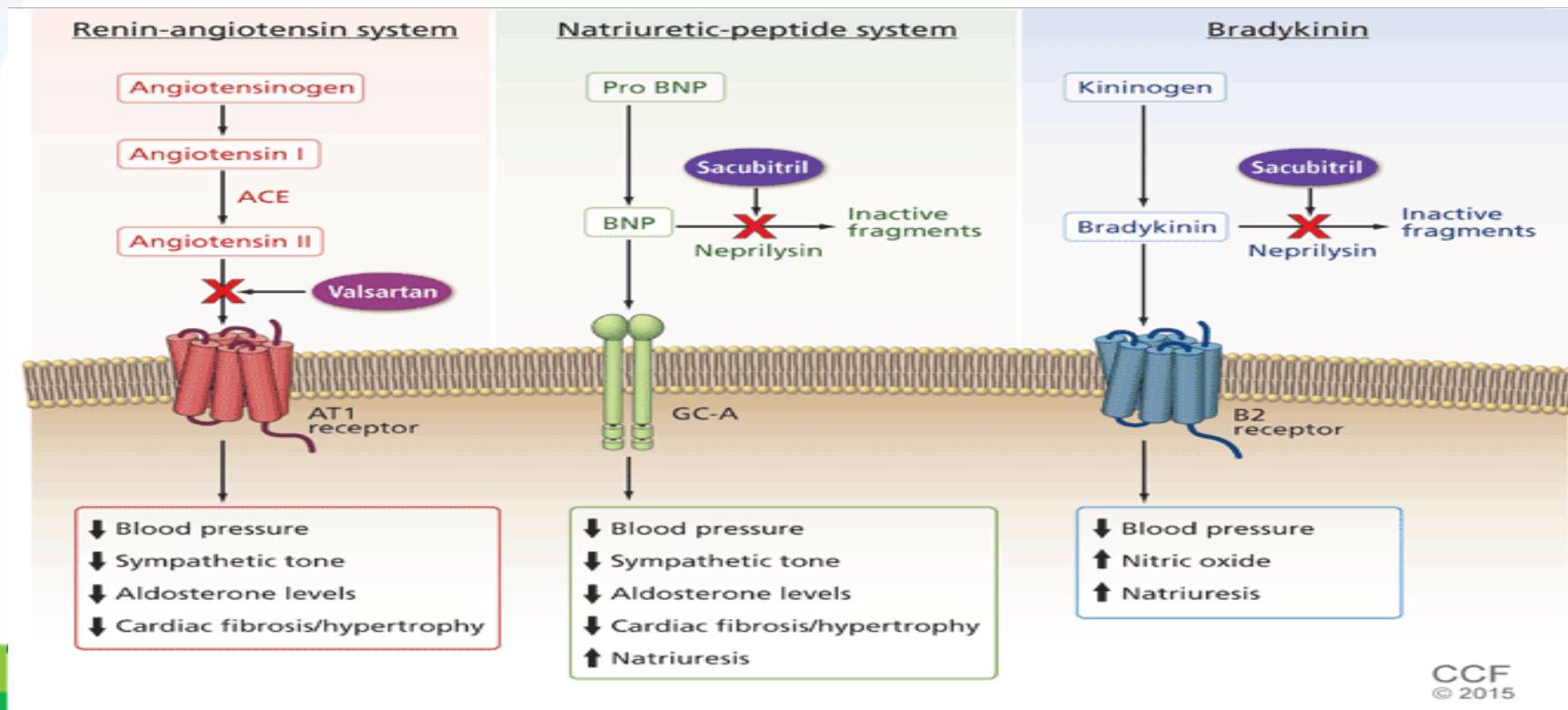


Sacubitril-valsartan, a new drug for heart failure with reduced ejection fraction

Sacubitril-valsartan (formerly LCZ696) is the first neprilysin-angiotensin receptor-inhibitor to be used in humans.

Valsartan, an angiotensin II receptor blocker, decreases vasoconstriction, sympathetic tone, release of aldosterone, and cardiac fibrosis and hypertrophy.

Sacubitril (formerly AHU377), a neprilysin inhibitor, blocks the breakdown of natriuretic peptides (B-type natriuretic peptide, atrial natriuretic peptide) as well as bradykinin, substance P, and adrenomedullin. This leads to vasodilation, decreased sympathetic tone, decreased release of aldosterone, decreased fibrosis and hypertrophy, and increased natriuresis.



Angiotensin–Neprilysin Inhibition versus Enalapril in Heart Failure

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Scott D. Solomon, M.D., Karl Swedberg, M.D., Ph.D., and Michael R. Zile, M.D.,
for the PARADIGM-HF Investigators and Committees*

- Etude multicentrique, compare l'association Valsartan/Sacubitril à l'Enalapril dans une population de patient stable avec une fraction d'éjection altérée < 40%



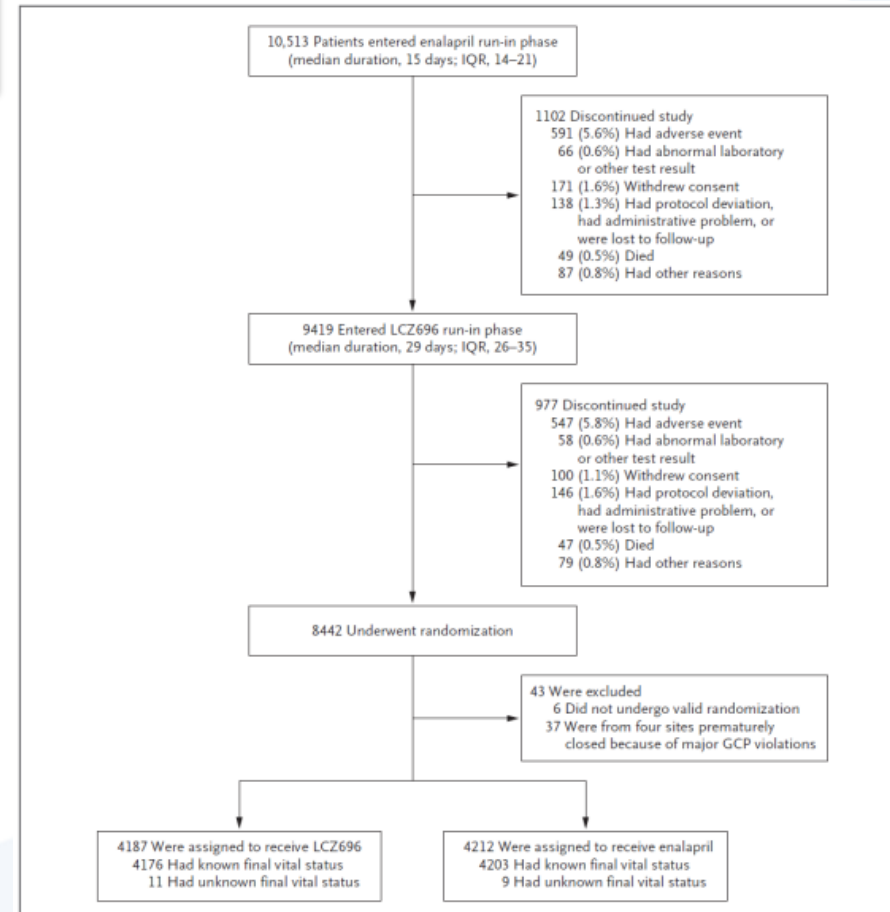
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- 10 521 pts > 18ans classe NYHA 2-4
- FE < 40% (35% après 2010)
- BNP ou NT pro BNP augmentés
- >1 mois traitement stable par BB- et IEC (ou ARA2) (dose maximale tolérée)

Critères d'exclusions:

- Hypotension
- Clairance < 30ml/min/m²
- Majoration de la créatinine de plus de 25% pendant l'étude de tolérance
- Hyperkaliémie et CI aux IEC ou ARA2 dont angioedème



Paradigm HF

METHODS

In this double-blind trial, we randomly assigned 8442 patients with class II, III, or IV heart failure and an ejection fraction of 40% or less to receive either LCZ696 (at a dose of 200 mg twice daily) or enalapril (at a dose of 10 mg twice daily), in addition to recommended therapy. The primary outcome was a composite of death from cardiovascular causes or hospitalization for heart failure, but the trial was designed to detect a difference in the rates of death from cardiovascular causes.

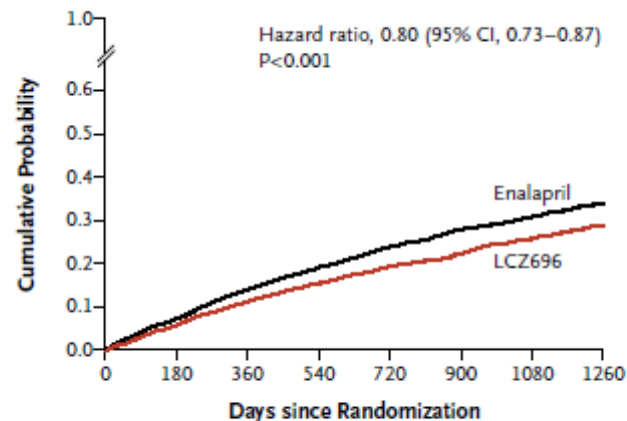
RESULTS

The trial was stopped early, according to prespecified rules, after a median follow-up of 27 months, because the boundary for an overwhelming benefit with LCZ696 had been crossed. At the time of study closure, the primary outcome had occurred in 914 patients (21.8%) in the LCZ696 group and 1117 patients (26.5%) in the enalapril group (hazard ratio in the LCZ696 group, 0.80; 95% confidence interval [CI], 0.73 to 0.87; $P < 0.001$). A total of 711 patients (17.0%) receiving LCZ696 and 835 patients (19.8%) receiving enalapril died (hazard ratio for death from any cause, 0.84; 95% CI, 0.76 to 0.93; $P < 0.001$); of these patients, 558 (13.3%) and 693 (16.5%), respectively, died from cardiovascular causes (hazard ratio, 0.80; 95% CI, 0.71 to 0.89; $P < 0.001$). As compared with enalapril, LCZ696 also reduced the risk of hospitalization for heart failure by 21% ($P < 0.001$) and decreased the symptoms and physical limitations of heart failure ($P = 0.001$). The LCZ696 group had higher proportions of patients with hypotension and nonserious angioedema but lower proportions with renal impairment, hyperkalemia, and cough than the enalapril group.



Paradigm HF

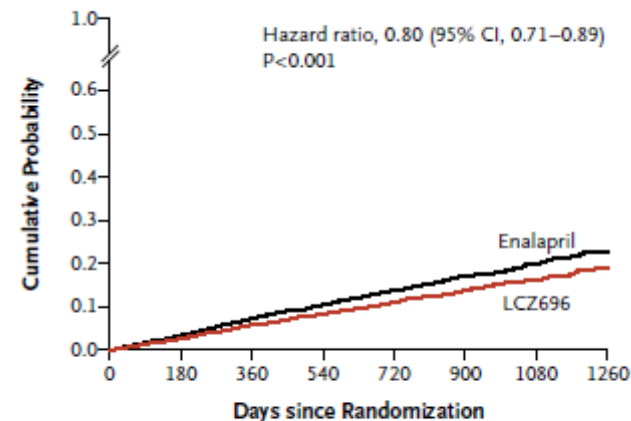
A Primary End Point



No. at Risk

LCZ696	4187	3922	3663	3018	2257	1544	896	249
Enalapril	4212	3883	3579	2922	2123	1488	853	236

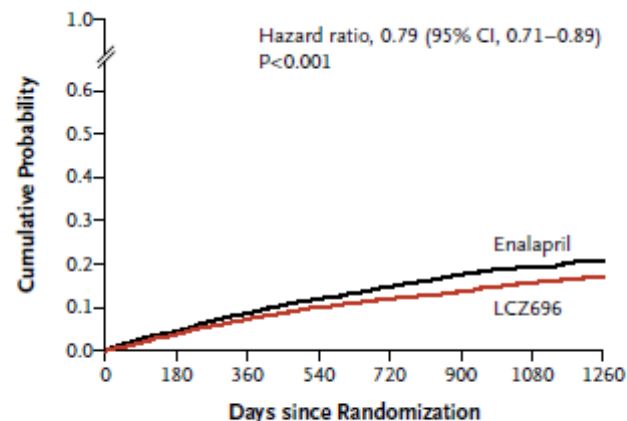
B Death from Cardiovascular Causes



No. at Risk

LCZ696	4187	4056	3891	3282	2478	1716	1005	280
Enalapril	4212	4051	3860	3231	2410	1726	994	279

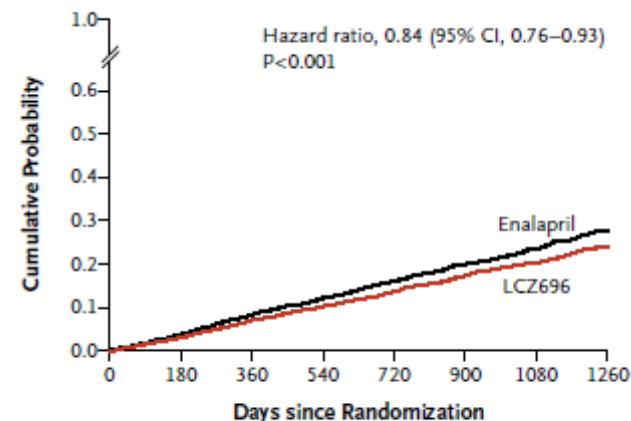
C Hospitalization for Heart Failure



No. at Risk

LCZ696	4187	3922	3663	3018	2257	1544	896	249
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Paradigm HF

Table 2. Primary and Secondary Outcomes.*

Outcome	LCZ696 (N= 4187)	Enalapril (N= 4212)	Hazard Ratio or Difference (95% CI)	P Value
Primary composite outcome — no. (%)				
Death from cardiovascular causes or first hospitalization for worsening heart failure	914 (21.8)	1117 (26.5)	0.80 (0.73–0.87)	<0.001
Death from cardiovascular causes	558 (13.3)	693 (16.5)	0.80 (0.71–0.89)	<0.001
First hospitalization for worsening heart failure	537 (12.8)	658 (15.6)	0.79 (0.71–0.89)	<0.001
Secondary outcomes — no. (%)				
Death from any cause	711 (17.0)	835 (19.8)	0.84 (0.76–0.93)	<0.001
Change in KCCQ clinical summary score at 8 mo†	–2.99±0.36	–4.63±0.36	1.64 (0.63–2.65)	0.001
New-onset atrial fibrillation‡	84 (3.1)	83 (3.1)	0.97 (0.72–1.31)	0.83
Decline in renal function§	94 (2.2)	108 (2.6)	0.86 (0.65–1.13)	0.28



Paradigm HF

Table 3. Adverse Events during Randomized Treatment.*

Event	LCZ696 (N=4187) <i>no. (%)</i>	Enalapril (N=4212) <i>no. (%)</i>	P Value
Hypotension			
Symptomatic	588 (14.0)	388 (9.2)	<0.001
Symptomatic with systolic blood pressure <90 mm Hg	112 (2.7)	59 (1.4)	<0.001
Elevated serum creatinine			
≥2.5 mg/dl	139 (3.3)	188 (4.5)	0.007
≥3.0 mg/dl	63 (1.5)	83 (2.0)	0.10
Elevated serum potassium			
>5.5 mmol/liter	674 (16.1)	727 (17.3)	0.15
>6.0 mmol/liter	181 (4.3)	236 (5.6)	0.007
Cough	474 (11.3)	601 (14.3)	<0.001
Angioedema†			
No treatment or use of antihistamines only	10 (0.2)	5 (0.1)	0.19
Use of catecholamines or glucocorticoids without hospitalization	6 (0.1)	4 (0.1)	0.52
Hospitalization without airway compromise	3 (0.1)	1 (<0.1)	0.31
Airway compromise	0	0	—

Paradigm HF: en résumé

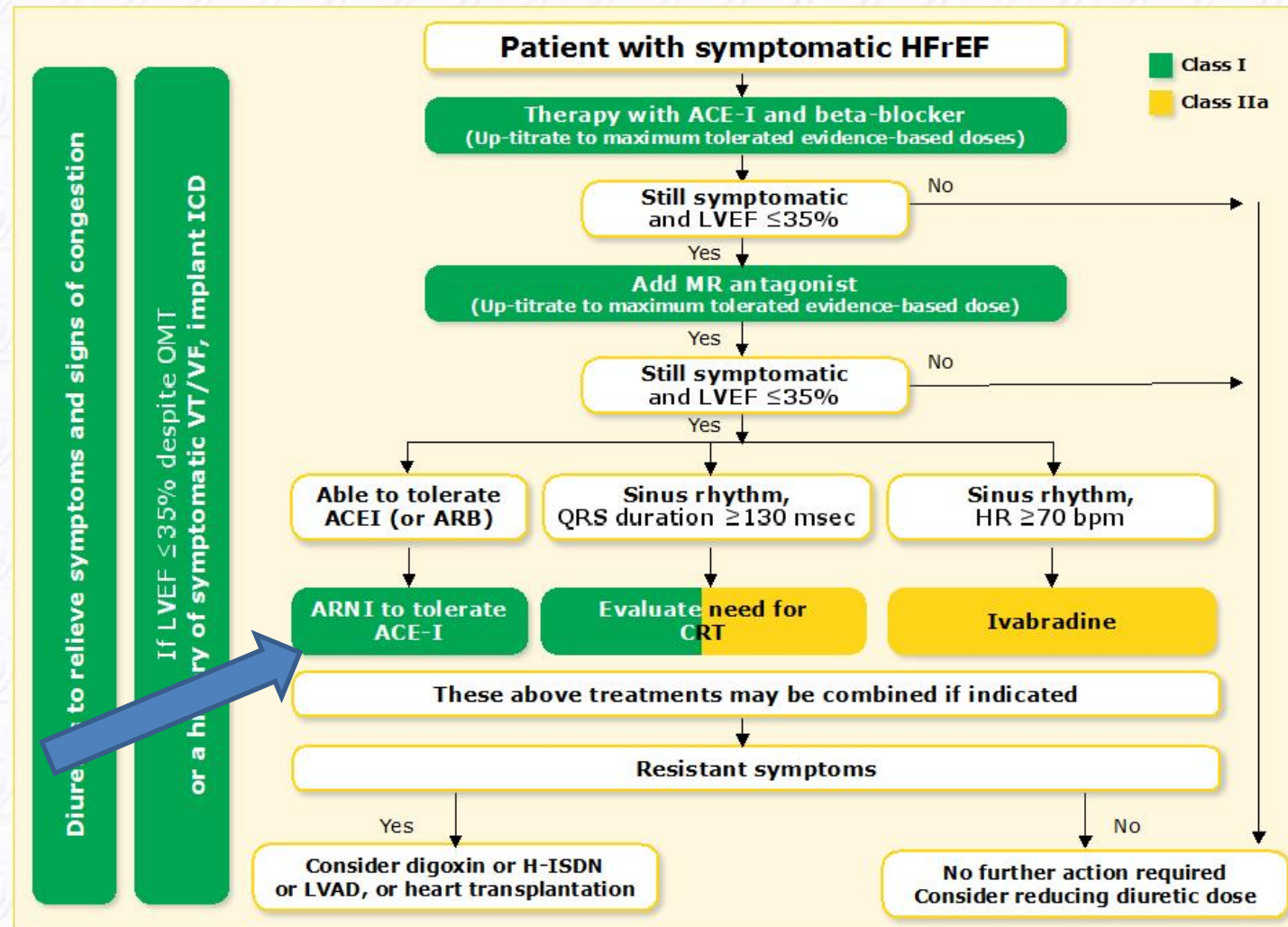
- Entresto réduit la mortalité cardiovasculaire ainsi que les hospitalisations pour décompensation cardiaque versus Enalapril chez des patients ayant une IC avec FE altérée et sous traitement médical optimal.
- Réduit la mortalité toutes causes
- moins d'hyperkaliémie grave ou d'IRA
- **plus** d'hypotension symptomatique




Guidelines ESC insuffisance cardiaque 2016

Therapeutic algorithm for a patient with symptomatic heart failure with reduced ejection fraction

19



Guidelines ESC diabète 2019



Recommendations	Class	Level
Sacubitril/valsartan is indicated instead of ACEIs to reduce the risk of HF hospitalization and death in patients with HFrEF and DM who remain symptomatic despite treatment with ACEIs, beta-blockers, and MRAs.	I	B
Diuretics are recommended in patients with HFpEF, HFmrEF, or HFrEF with signs and/or symptoms of fluid congestion, to improve symptoms.	I	B
Cardiac revascularization with CABG surgery has shown similar benefits for the reduction of long-term risk of death in patients with HFrEF with and without DM, and is recommended for patients with two- or three-vessel CAD, including a significant LAD stenosis.	I	B

www.escardio.org/guidelines

ESC Guidelines on Diabetes, pre-diabetes and cardiovascular diseases in collaboration with EASD (European Heart Journal 2019 - doi/10.1093/eurheartj/ehz486)



Insuffisance cardiaque à fonction préservée

Type of HF		HFrEF	HFmrEF	PFpEF
CRITERIA	1	Symptoms ± Signs	Symptoms ± Signs	Symptoms ± Signs
	2	LVEF <40%	LVEF 40–49%	LVEF ≥ 50%
	3	–	1.Elevated levels of natriuretic peptides. 2.At least one additional criterion: a.relevant structural heart disease (LVF and/or LAE); b.diastolic dysfunction (for details see Section 4.3.2.).	1.Elevated levels of natriuretic peptides. 2.At least one additional criterion: a.relevant structural heart disease (LVF and/or LAE); b.diastolic dysfunction (for details see Section 4.3.2.).

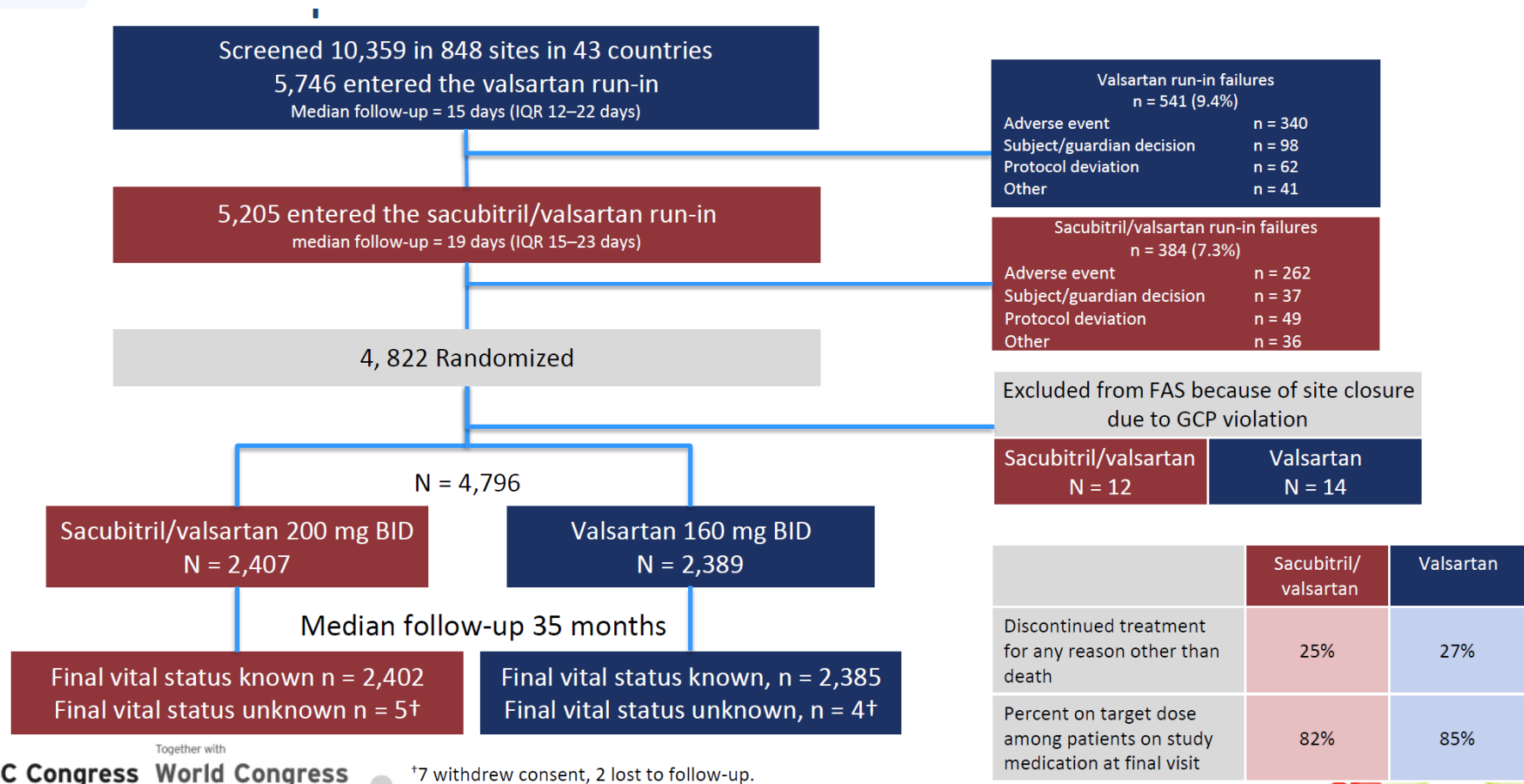
Entresto© et HRpEF Paragon

Key inclusion & exclusion criteria

Key inclusion criteria	Key exclusion criteria
<ul style="list-style-type: none">• ≥ 50 years of age and LVEF $\geq 45\%$• Heart failure signs/symptoms (NYHA Class II–IV) requiring treatment with diuretic(s) for at least 30 days prior to enrollment• Structural heart disease (LAE or LVH by echocardiography)• Elevation in natriuretic peptides<ul style="list-style-type: none">• NT-proBNP 200 pg/ml if hospitalized for HF within 9 months, and 300 pg/ml if not hospitalized; 3-fold increase for patients in AF at enrollment	<ul style="list-style-type: none">• Any prior measurement of LVEF $< 40\%$• Current acute decompensated heart failure• Alternative reason for signs and symptoms• SBP < 110 or > 180mm Hg (or > 150mm Hg if patient not taking 3 or more antihypertensive medications)



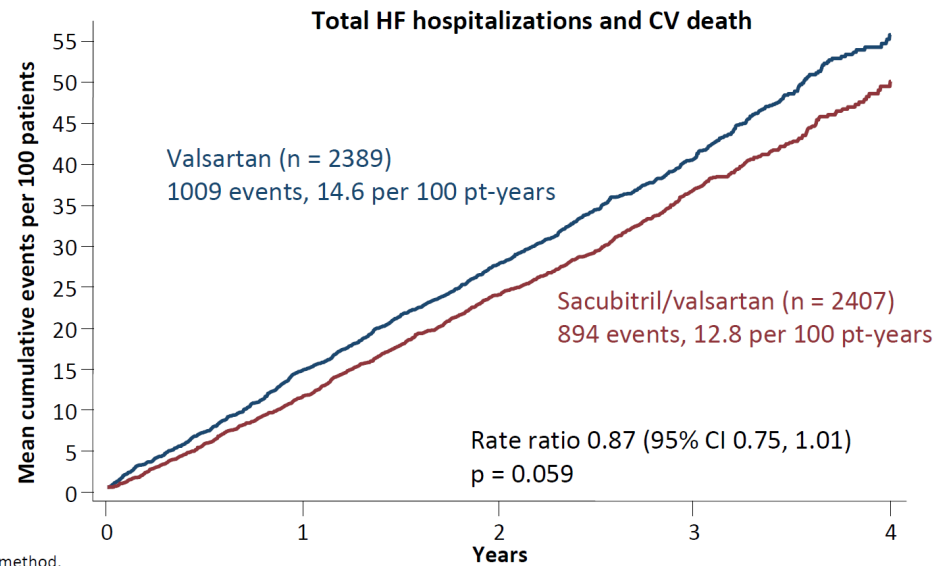
Paragon



Paragon

PARAGON-HF primary results

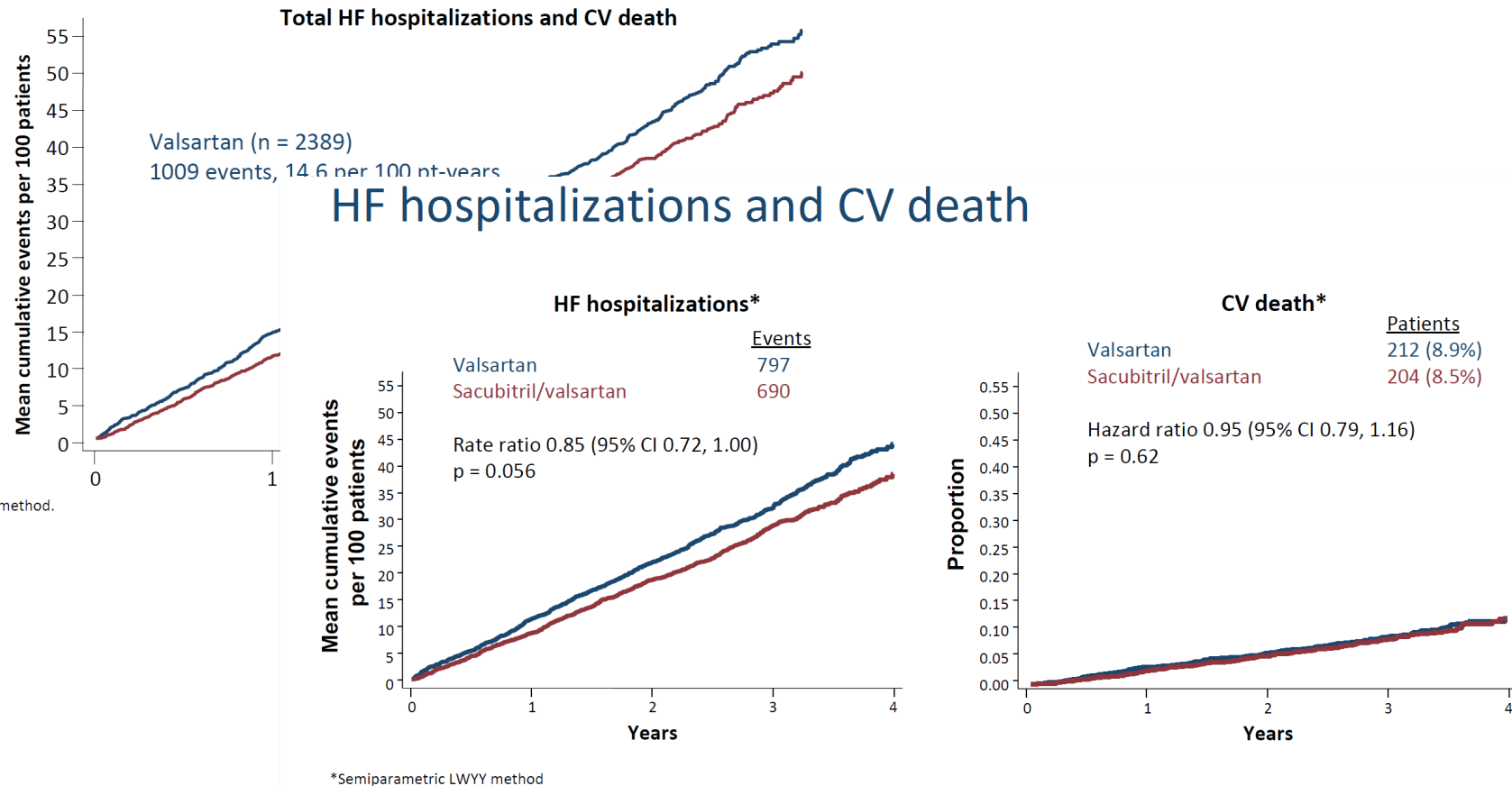
Recurrent event analysis of total HF hospitalizations and CV death*



Paragon

PARAGON-HF primary results

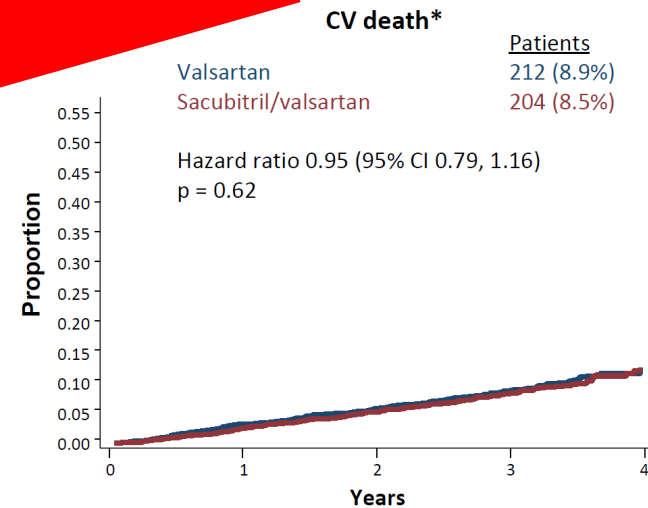
Recurrent event analysis of total HF hospitalizations and CV death*



Paragon

PARAGON-HF primary results

Recurrent event analysis of total HF hospitalizations and CV death*



Aucun avantage chez les patients avec insuffisance cardiaque à fonction préservée



En pratique: indications

- Traitement chez l'adulte de l'insuffisance cardiaque avec dysfonction systolique ventriculaire gauche (fraction d'éjection ventriculaire gauche $\leq 40\%$) symptomatique :
- de classe fonctionnelle NYHA II ou > ,
- insuffisamment contrôlée par les thérapeutiques non médicamenteuses ou médicamenteuses



En pratique: initier le traitement

- Interrompre le traitement par ACE ou ARB au moins 36 h avant de débuter le traitement par Entresto
- Posologie initiale: comprimé de 49 mg/51 mg 2 fois par jour.
- Sauf chez les patients avec une TA limite ou sous très faible doses ACE ou ARB dose initiale est de 24/26 2X/jour
- Cette dose doit être doublée toutes les 2 à 4 semaines jusqu'à la dose cible de 97 mg/103 mg 2 fois par jour



En pratique ;

Ne pas administrer si

- chez les patients ayant une kaliémie supérieure à 5,4 mmol/l ;
- chez les patients ayant une PAS (pression artérielle systolique) inférieure à 100 mm Hg.
- Les patients avec histoire d'angiooedème
- Prise de d'aliskirène (inhibiteur direct de la rénine)
- Prise ACE et /ou ARB

A surveiller

- Kaliémie et insuffisance rénale, arrêt si majoration insuffisance renale
- Hypotension
- Survenue angio oedème



En pratique ;

A surveiller

- BNP : n'est pas un marqueur approprié
- Nt –Pro BNP : plus adapté

cfr mode d'action

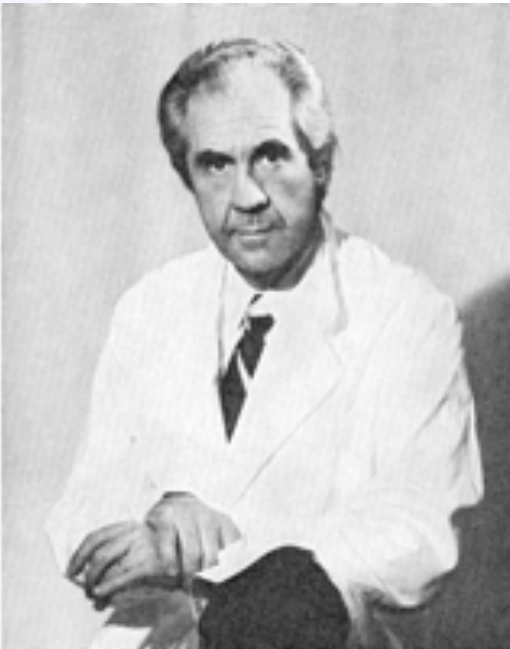


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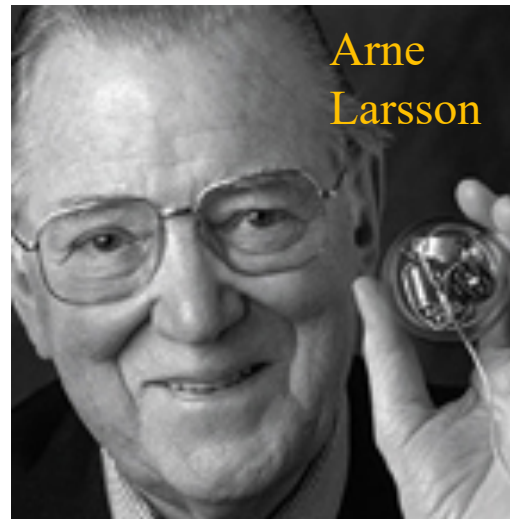


Première implantation d'un pace maker ...

- Première implantation d'un pace maker a eu lieu en Suède, par Ake Senning en 1958



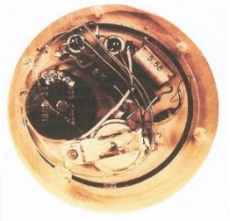
Ake Senning



Arne Larsson (26/5/1915-28/12/2001) est décédé à l'âge de 86 ans après avoir eu 26 pacemaker en 43 ans !



Histoire des pace maker



First implanted
Elmqvist's pacemaker
Weight: 73,4 gr
Size: 35 cc

1958



First implantable
Pacemaker
Chardck – Greatbach

1960



Activitrax
Medtronic
First rate response

1984



Thera™
First
mode switching

1995



Full automaticity
MRI safe
Weight: 20 gr
Size: 12 cc

2010

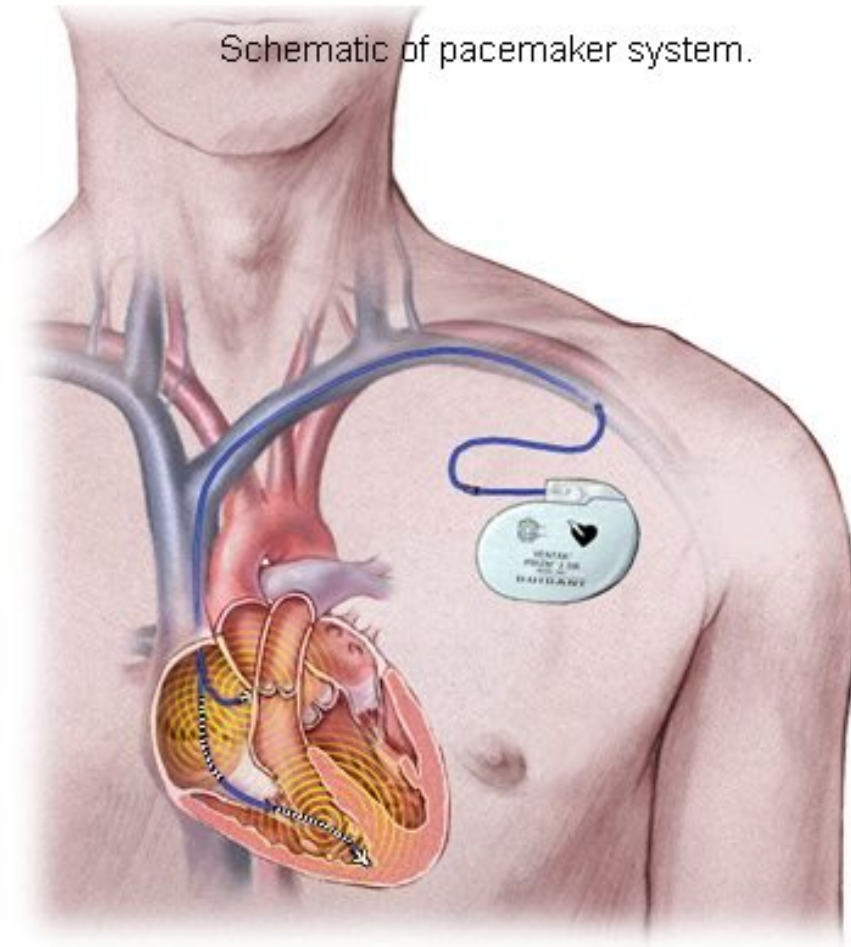
Pace maker classique..



- 1=pacing ventriculaire
- 2= pacing ventriculaire et auriculaire
- 3= resynchronisation CRT

Pace maker classique..

- Ponction veineuse pour la mise en place des sondes
- Intervention chirurgicale pour la réalisation de la poche d'implantation du boîtier
- Anesthésie générale



Complications après implantation

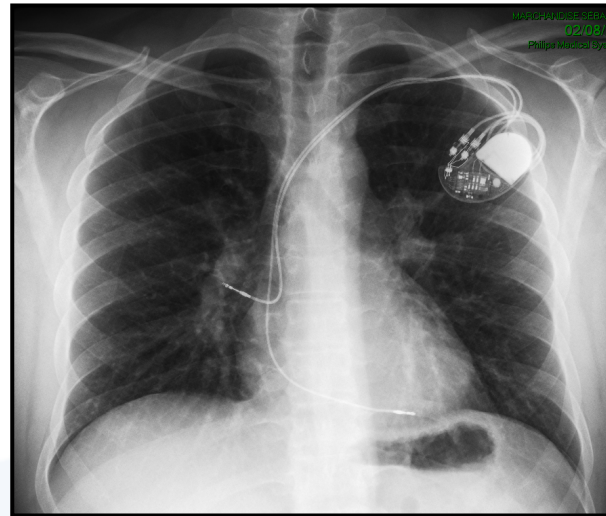
		All (n = 5918)	New implant (n = 4355)	Generator replacement (n = 1136)	Upgrade/ lead revision (n = 427)
Any complication		562 (9.5; 8.7–10.2)	432 (9.9; 9.0–10.8)	67 (5.9; 4.5–7.3)	63 (14.8; 11.4–18.1)
Any major complication		329 (5.6; 5.0–6.1)	253 (5.8; 5.1–6.5)	40 (3.5; 2.4–4.6)	36 (8.4; 5.8–11.1)
Any minor complication		250 (4.2; 3.7–4.7)	189 (4.3; 3.7–4.9)	30 (2.6; 1.7–3.6)	31 (7.3; 4.8–9.7)
Major complications					
Lead related re-intervention	✓	143 (2.4; 2.0–2.8)	120 (2.8; 2.3–3.2)	10 (0.9; 0.3–1.4)	13 (3.0; 1.4–4.7)
Infection		49 (0.8; 0.6–1.1)	24 (0.6; 0.3–0.8)	17 (1.5; 0.8–2.2)	8 (1.9; 0.6–3.2)
Local infection		22 (0.4; 0.2–0.5)	10 (0.2; 0.1–0.4)	8 (0.7; 0.2–1.1)	4 (1.0; 0.0–1.9)
Systemic infection/endocarditis	✓	27 (0.5; 0.3–0.6)	14 (0.3; 0.2–0.5)	9 (0.8; 0.3–1.3)	4 (0.9; 0.0–1.9)
Pneumothorax requiring drainage	✓	51 (0.9; 0.6–1.1)	45 (1.0; 0.7–1.3)	0	6 (1.4; 0.3–2.5)
Cardiac perforation	✓	38 (0.6; 0.4–0.8)	35 (0.8; 0.5–1.1)	0	3 (0.7; 0.0–1.5)
No intervention		21 (0.4; 0.2–0.5)	18 (0.4; 0.2–0.6)	0	3 (0.7; 0.0–1.5)
Intervention ^b		17 (0.3; 0.2–0.4)	17 (0.4; 0.2–0.6)	0	0
Pocket revision because of pain	✓	25 (0.4; 0.3–0.6)	10 (0.2; 0.1–0.4)	9 (0.8; 0.3–1.3)	6 (1.4; 0.3–2.5)
Generator-lead interface problem with re-intervention	✓	7 (0.1; 0.0–0.2)	3 (0.1; 0.0–0.1)	4 (0.4; 0.0–0.7)	0
Haematoma requiring re-intervention		10 (0.2; 0.1–0.3)	9 (0.2; 0.1–0.3)	1 (0.1; 0.0–0.3)	0
Other ^c		16 (0.3; 0.1–0.4)	16 (0.4; 0.2–0.5)	0	0
Minor complications					
Haematoma ^d		138 (2.3; 1.9–2.7)	104 (2.4; 1.9–2.8)	20 (1.8; 1.0–2.5)	14 (3.3; 1.6–5.0)
Wound infection treated with antibiotics	✓	69 (1.2; 0.9–1.4)	47 (1.1; 0.8–1.4)	12 (1.0; 0.5–1.7)	10 (2.3; 0.9–3.8)
Pneumothorax conservatively treated	✓	39 (0.7; 0.5–0.9)	32 (0.7; 0.5–1.0)	0	7 (1.6; 0.4–2.8)
Lead dislodgement without re-intervention	✓	10 (0.2; 0.1–0.3)	9 (0.2; 0.1–0.3)	0	1 (0.2; 0.0–0.7)

Complication post implantation

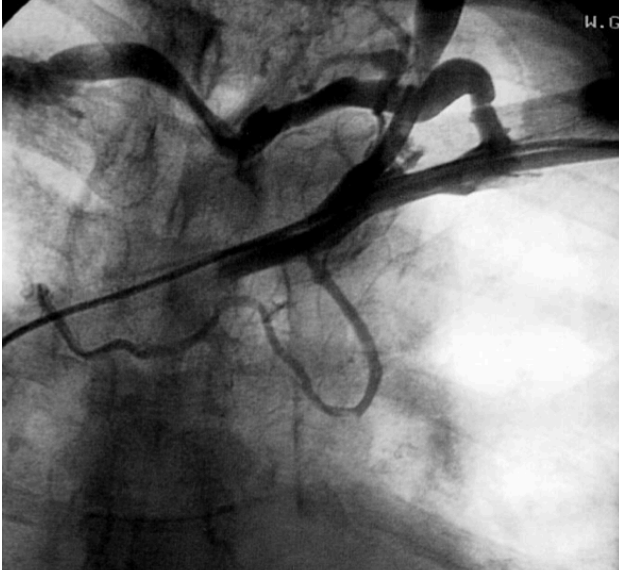
- Erosion de sonde



- Problèmes liés aux sondes: déplacement, rupture



Complication post implantation



● Thrombose veineuse sur sonde

● Douleurs chroniques sur le matériel

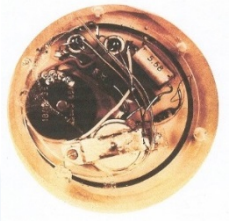
● infection

Rationnel pour un pace maker sans sonde

- Intérêt de simplifier la technique pour diminuer le nombre de complications
- Pace maker sans sonde
- Mise en place simplifiée



Histoire des pace maker



First implanted
Elmqvist's pacemaker
Weight: 73,4 gr
Size: 35 cc

1958



First implantable
Pacemaker
Chardck – Greatbach

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Leadless
Pacemaker
Weight: 2 gr
Size: 0,8 cc

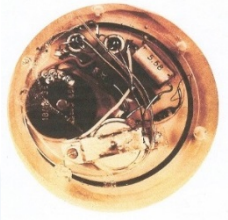
2013



1994

1999

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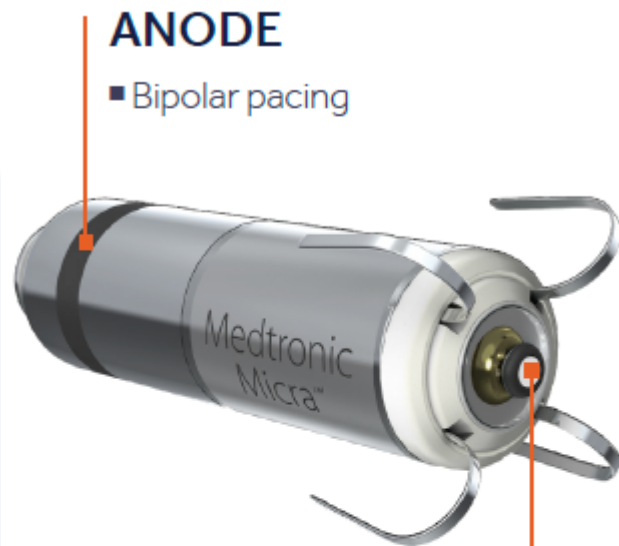
Leadless
Pacemaker
Weight: 2 gr
Size: 0,8 cc

2013

1994

1999

Un pace maker sans sonde ...



ANODE

- Bipolar pacing

CATHODE

- Steroid eluting electrode
- Separated from FlexFix tines to ensure optimal contact with myocardium

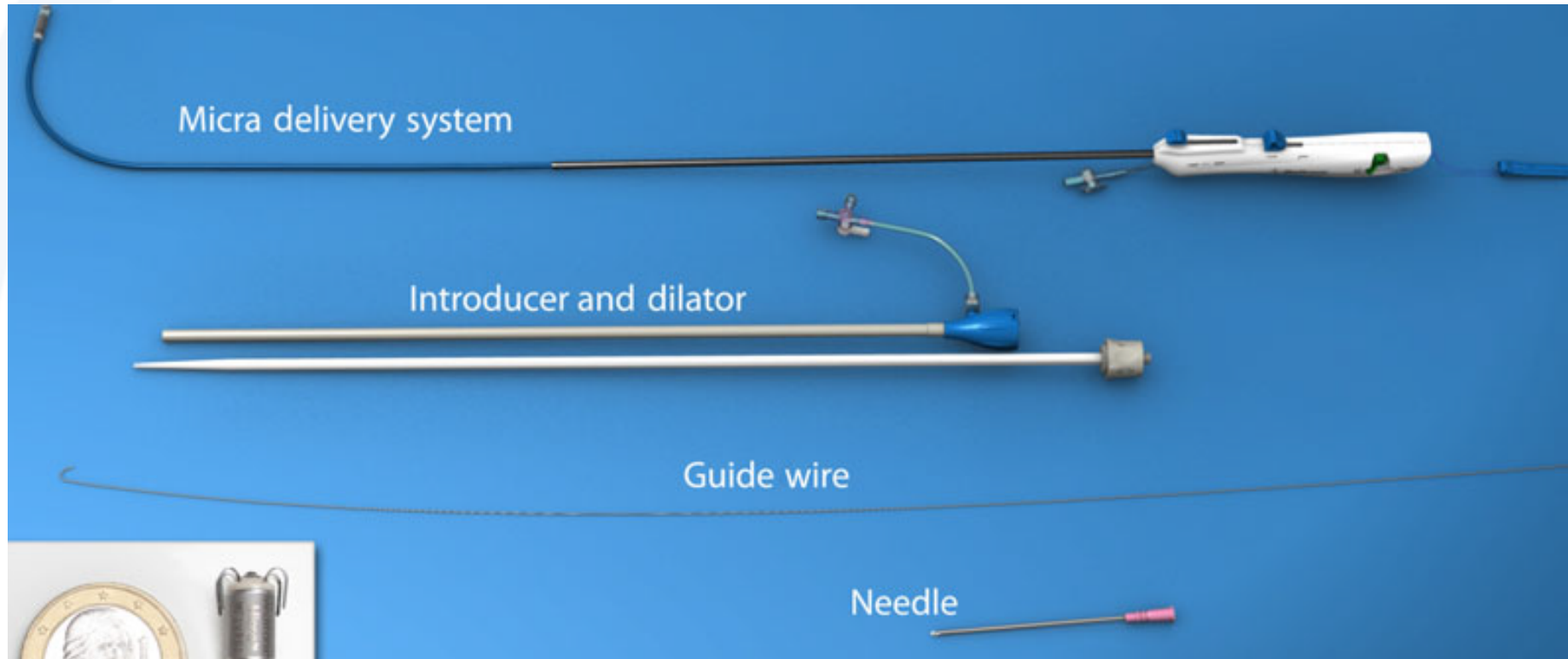
PACING CAPSULE¹⁰

Parameter	Micra
Pacing Mode	VVIR
Mass	1.75 g
Volume	0.8 cc
Electrode Spacing	18 mm
Programmable 3-axis Accelerometer	

« Micra » Medtronic



Pace maker sans sonde



Pace maker sans sonde



Pace maker sans sonde

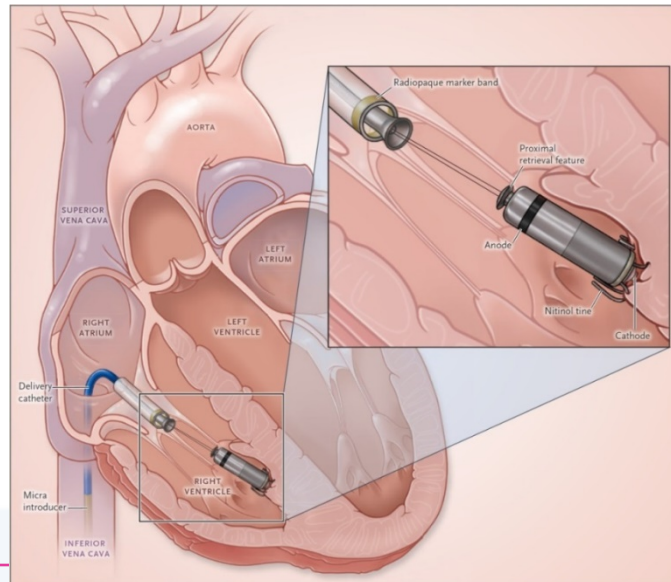
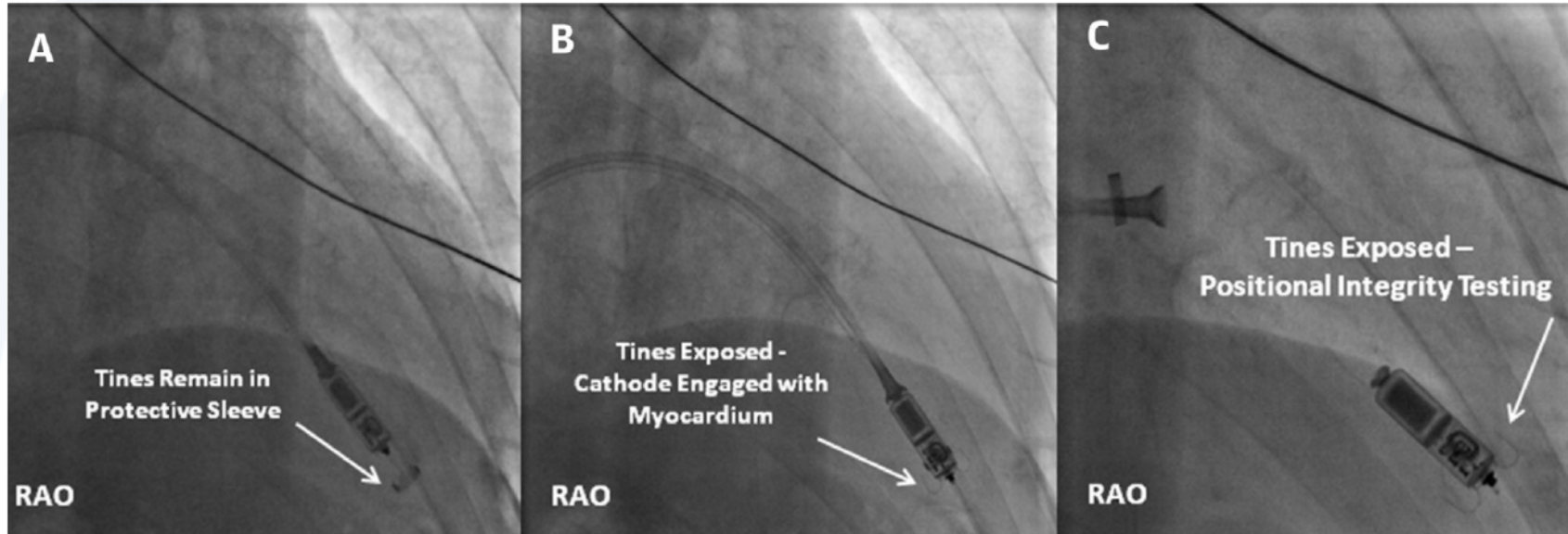
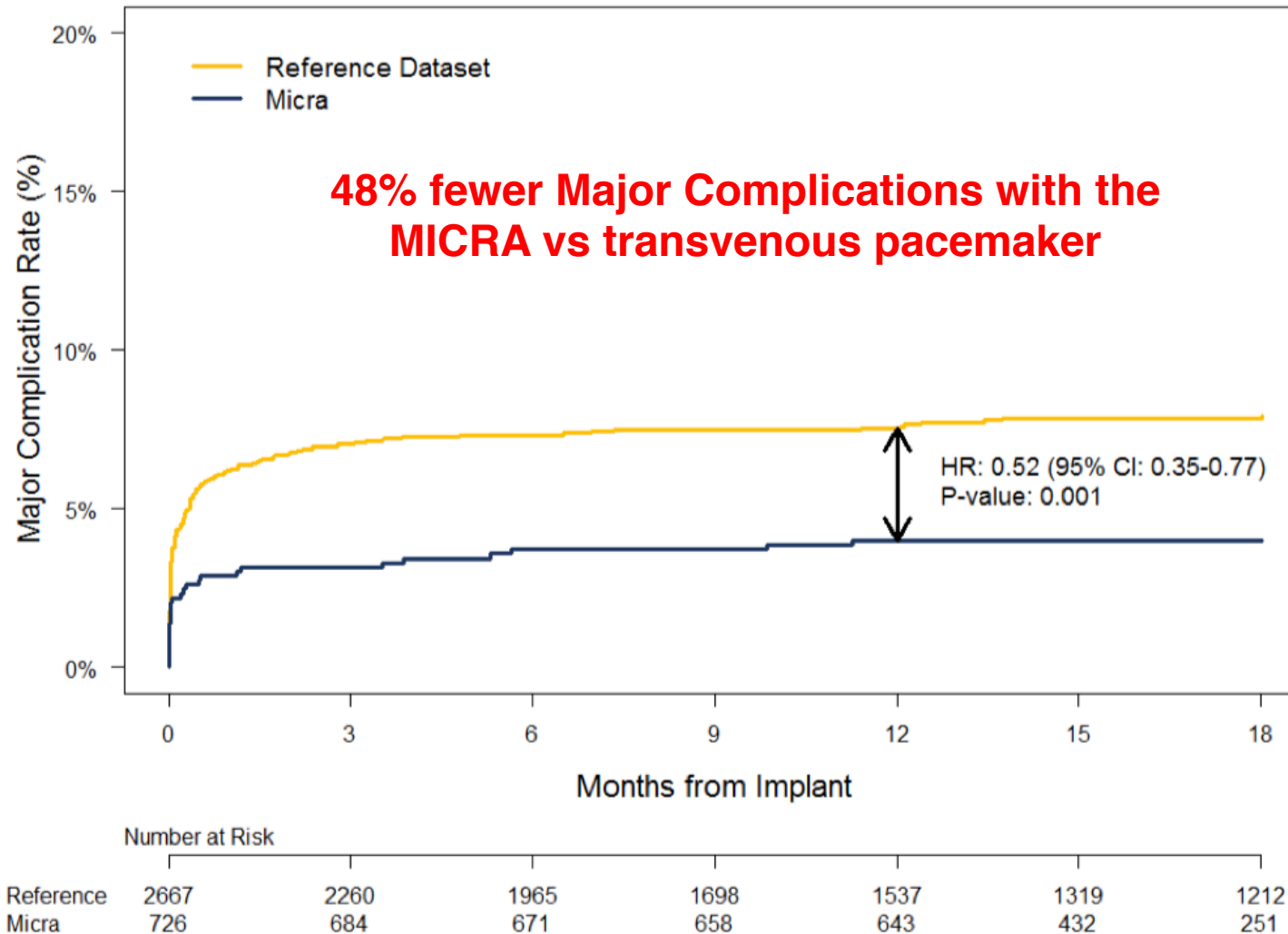


Figure 1. Micro Transcatheter Pacing System Positioned in the Right Ventricle.

Moins de complications ?



Moins de complications ?

Major complications (patients with an attempted Micra implant; N = 726)

Adverse event key term	No. of events (No. of subjects, %)			Total major complications
	Within 30 d	30 d to 6 mo	> 6 mo	
Total major complications	24 (21, 2.89%)	6 (6, 0.83%)	2 (2, 0.28%)	32 (29, 3.99%)
Embolism and thrombosis	2 (2, 0.28%)	0 (0, 0%)	0 (0, 0%)	2 (2, 0.28%)
Deep vein thrombosis	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Pulmonary embolism	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Events at groin puncture site	5 (5, 0.69%)	0 (0, 0%)	0 (0, 0%)	5 (5, 0.69%)
Arteriovenous fistula	4 (4, 0.55%)	0 (0, 0%)	0 (0, 0%)	4 (4, 0.55%)
Vascular pseudoaneurysm	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Cardiac effusion/perforation	10 (10, 1.38%)	1 (1, 0.14%)	0 (0, 0%)	11 (11, 1.52%)
Pacing issues: elevated thresholds	2 (2, 0.28%)	0 (0, 0%)	0 (0, 0%)	2 (2, 0.28%)
Other	5 (5, 0.69%)	5 (5, 0.69%)	2 (2, 0.28%)	12 (12, 1.65%)
Acute myocardial infarction	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Cardiac failure	0 (0, 0%)	4 (4, 0.55%)	2 (2, 0.28%)	6 (6, 0.83%)
Metabolic acidosis	1 (1, 0.14%)*	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Pacemaker syndrome	1 (1, 0.14%)	1 (1, 0.14%)	0 (0, 0%)	2 (2, 0.28%)
Presyncope	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)
Syncope	1 (1, 0.14%)	0 (0, 0%)	0 (0, 0%)	1 (1, 0.14%)

*Led to procedure-related death in a patient with end-stage renal disease.

Actualités en Cardiologie : pace maker sans sonde

Moins de complication ?

Registre Micra : 200 centers around the World (**UCL 56 patients**)
Major complications (patients with an attempted Micra implant; N = 1498)

Event	Within 30 Days		>30 Days	
	Number	Subjects (%)	Number	Subjects (%)
Total Major Complications	27	24 (1.60%)	4	4 (0.27%)
Thrombosis	1	1 (0.07%)		
Events at groin puncture site	11	10 (0.67%)		
Arterial injury	1	1 (0.07%)		
Arteriovenous fistula	2	2 (0.13%)	1	1 (0.07%)
Hematoma	2	2 (0.13%)		
Hematoma infection	1	1 (0.07%)		
Incision site hemorrhage	1	1 (0.07%)		
Persistent lymphatic fistula	1	1 (0.07%)		
Vascular pseudoaneurysm	2	2 (0.13%)		
Vessel puncture site hemorrhage	1	1 (0.07%)		
Cardiac effusion/perforation	6	6 (0.40%)		
Pacing issues	4	4 (0.27%)	2	2 (0.27%)
Device dislodgement	1	1 (0.07%)		
Elevated thresholds	3	3 (0.20%)	2	2 (0.27%)
Other	5	5 (0.33%)	1	1 (0.7%)

Pourquoi un pace maker sans sonde?

- Potential advantages

- **Less Invasive**
 - No surgery
 - Fewer complication
 - Less radiation exposure
 - More cosmetic (« invisible »)
- **Improved Efficiency**
 - No surgery, less infection risk
 - Femoral venous access
 - No system connections
 - More readily MRI conditional
 - Better pacing thresholds
- **More Cost-Effective**
 - Reduced lenght of hospital day (one day)
 - Fewer acute and chronic complication
- **Up-gradable**



Pourquoi un pace maker sans sonde?

- Potential advantages

- **Less Invasive**
 - No surgery
 - Fewer complication
 - Less radiation exposure
 - More cosmetic (« invisible »)
- **Improved Efficiency**
 - No surgery, less infection risk
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 - Better pacing thresholds
- **More Cost-Effective**
 - Reduced lenght of hospital day (one day)
 - Fewer acute and chronic complication
- **Up-gradable**

- Potential disadvantages

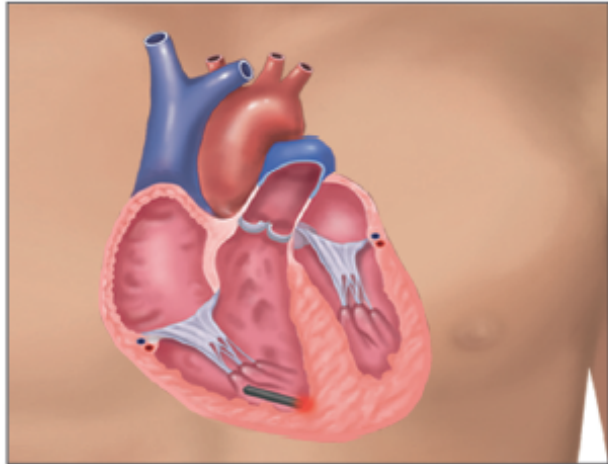
- **Multiple chamber pacing more complex**
 - Wireless communication
 - Memory capacity
- **Implants risk**
 - Large diameter sheaths
 - Embolization/retrieval
 - Repositioning difficulty
 - Epicardial access issues
- **Removal/replacement**
 - Longevity limitations
 - Abandon vs explant ?



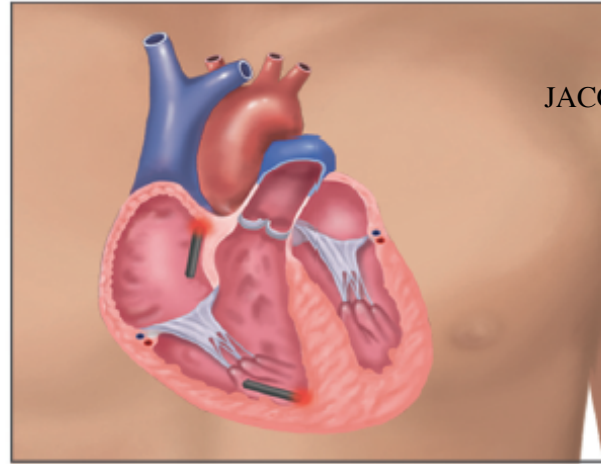
Et le futur ?

- Actuellement pacing uniquement ventriculaire : VVIR
- Dans le futur....

Single-Chamber Pacemaker



Dual-Chamber Pacemaker

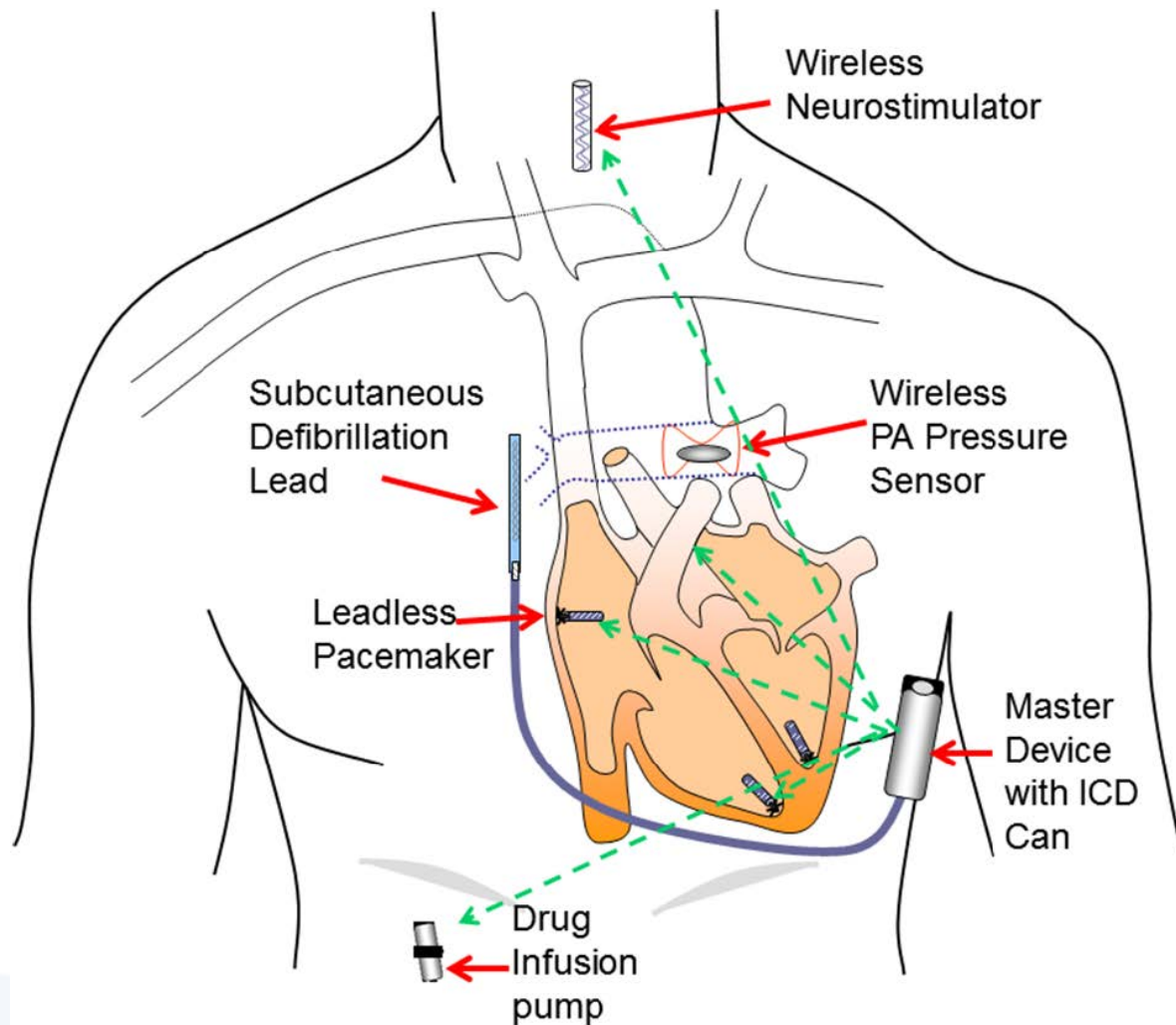


JACC 2015; 66(10): 1179-1189

- Pace maker atrial sans sonde, communication entre pace atrial et ventriculaire



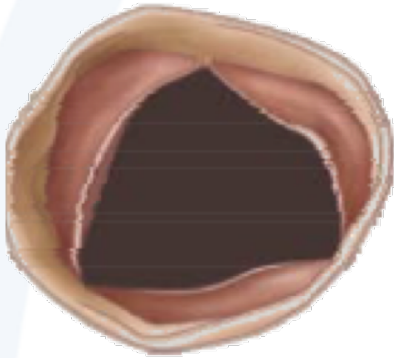
Vue futuriste pour les devices implantables pour le contrôle du rythme



- *Entresto*: nouveau traitement de l'insuffisance cardiaque
- Un Pace maker sans sonde...
- *TAVI* 5 ans plus tard qu'en est il ?
- *Empagliflozin* un médicament contre le diabète qui peut aussi soigner votre cœur ...



Histoire de la sténose aortique



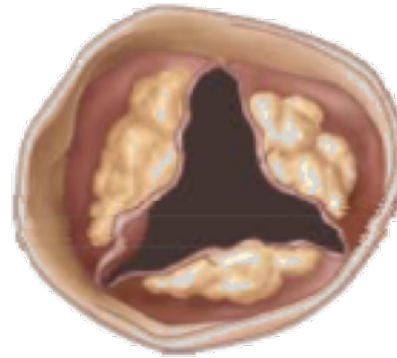
Valve normale

$V_{\max} < 1 \text{ m/sec}$



Sclérose aortique

$V_{\max} < 2.5 \text{ m/sec}$
 $SvAo > 1.5 \text{ cm}^2$



Sténose aortique
modérée

$V_{\max} 2.5 - 4 \text{ m/sec}$
 $SvAo 1 - 1.5 \text{ cm}^2$



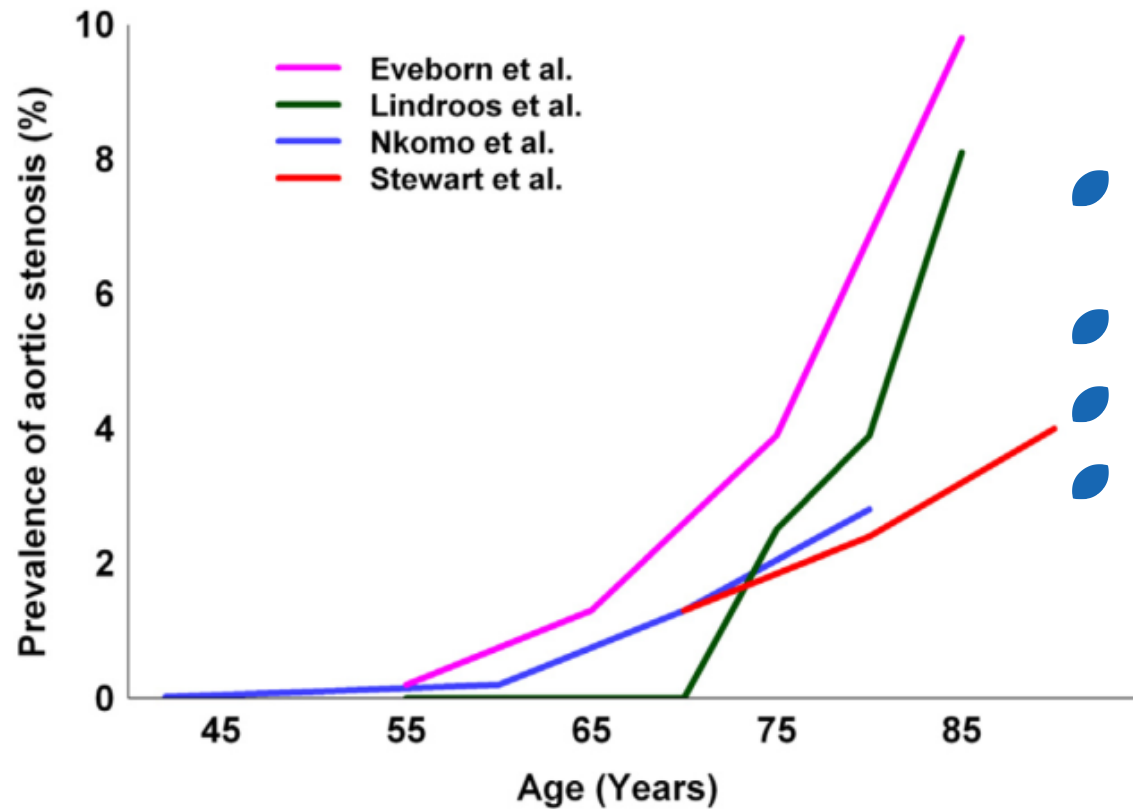
Sténose aortique
serrée

$V_{\max} > 4 \text{ m/sec}$
 $SvAo < 1 \text{ cm}^2$

Réduction moyenne de surface de $0.12 \text{ cm}^2/\text{an}$



Augmentation des sténoses aortiques avec le vieillissement de la population

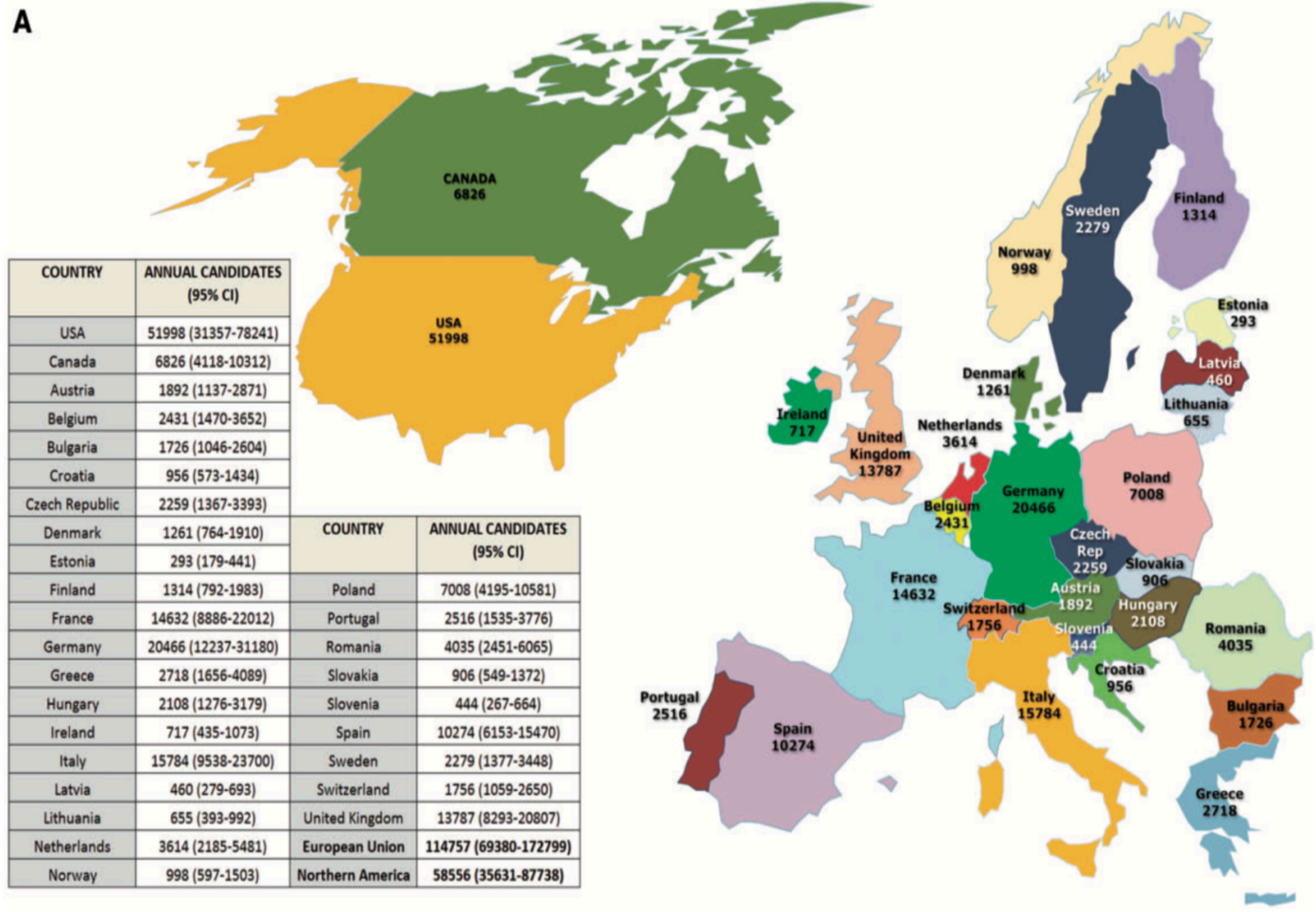


- Eveborn: Norvège > 15 mmHg gradient moyen
- Lindroos: Finlande AVA < 1.2 cm²
- Nkomo: USA AVA < 1.5 cm²
- Stewart: USA Max bel > 2,5 msec



Actualités en Cardiologie: TAVI

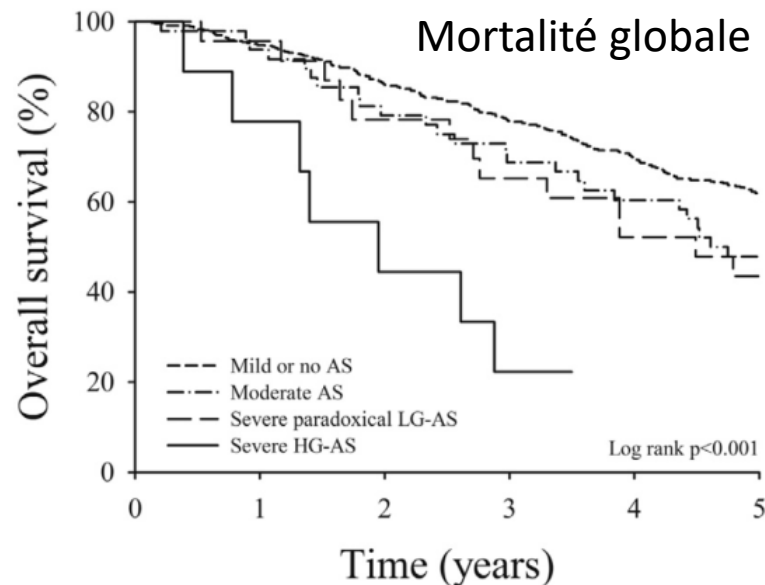
4,4/1000 patients de plus de 65 ans ont une sténose aortique!



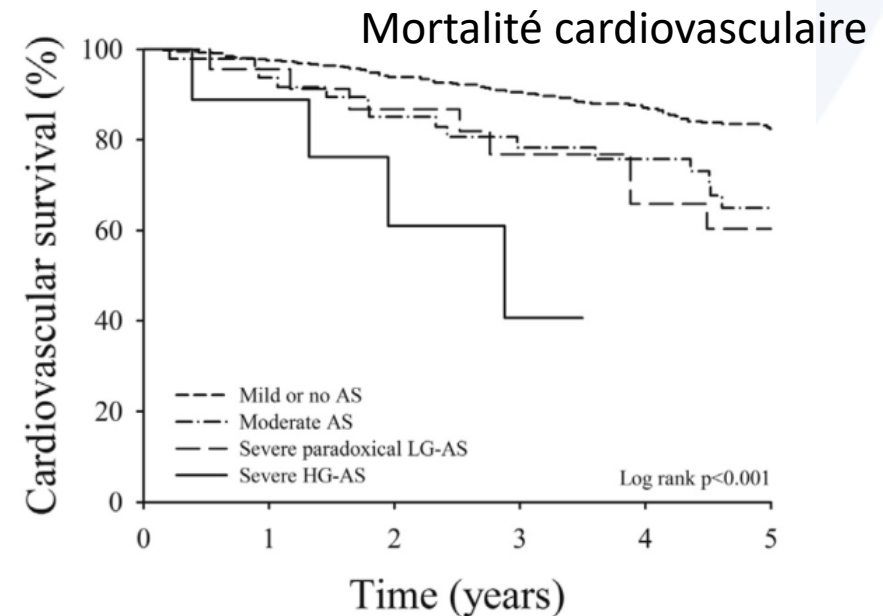
Influence sur la qualité de vie: The Belfrail Study



Prevalence and Prognostic Impact of Valve Area—Gradient Patterns in Patients ≥ 80 Years With Moderate-to-Severe Aortic Stenosis (from the Prospective BELFRAIL Study)



Mild or no AS	462	438	398	360	323	201
Moderate AS	48	45	38	33	29	13
Severe paradoxical LG-AS	23	22	18	15	12	9
Severe HG-AS	9	7	4	2		




Mild or no AS	462	438	398	360	323	201
Moderate AS	48	45	38	33	29	13
Severe paradoxical LG-AS	23	22	18	15	12	9
Severe HG-AS	9	7	4	2		

L'âge est un facteur de risque opératoire

Table 5. Risk Assessment Combining STS Risk Estimate, Frailty, Major Organ System Dysfunction, and Procedure-Specific Impediments

	Low Risk (Must Meet ALL Criteria in This Column)	Intermediate Risk (Any 1 Criterion in This Column)	High Risk (Any 1 Criterion in This Column)	Prohibitive Risk (Any 1 Criterion in This Column)
STS PROM*	<4%	4%–8%	>8%	Predicted risk with surgery of death or major morbidity (all-cause) >50% at 1 y
	AND	OR	OR	OR
Frailty†	None	1 Index (mild)	≥2 Indices (moderate to severe)	>50% at 1 y
	AND	OR	OR	OR
Major organ system compromise not to be improved postoperatively‡	None	1 Organ system	No more than 2 organ systems	≥3 Organ systems
	AND	OR	OR	OR
Procedure-specific impediment§	None	Possible procedure-specific impediment	Possible procedure-specific impediment	Severe procedure-specific impediment



CALCULATOR

SUPPORT

Procedure Type

Isolated CAB

Isolated AVR

Isolated MVR

AVR + CAB

MVR + CAB

MV Repair

MV Repair + CAB

Age

Enter a value between 1 and 110

STS Adult Cardiac Surgery Database Version 2.9

RISK SCORES

Procedure: Isolated AVR

CALCULATE

Risk of Mortality: NA

Renal Failure: NA

Permanent Stroke: NA

Prolonged Ventilation: NA

DSW Infection: NA

Reoperation: NA

Morbidity or Mortality: NA

Short Length of Stay: NA

Long Length of Stay: NA

PRINT

CLEAR

Details of Selected Field:

No field selected

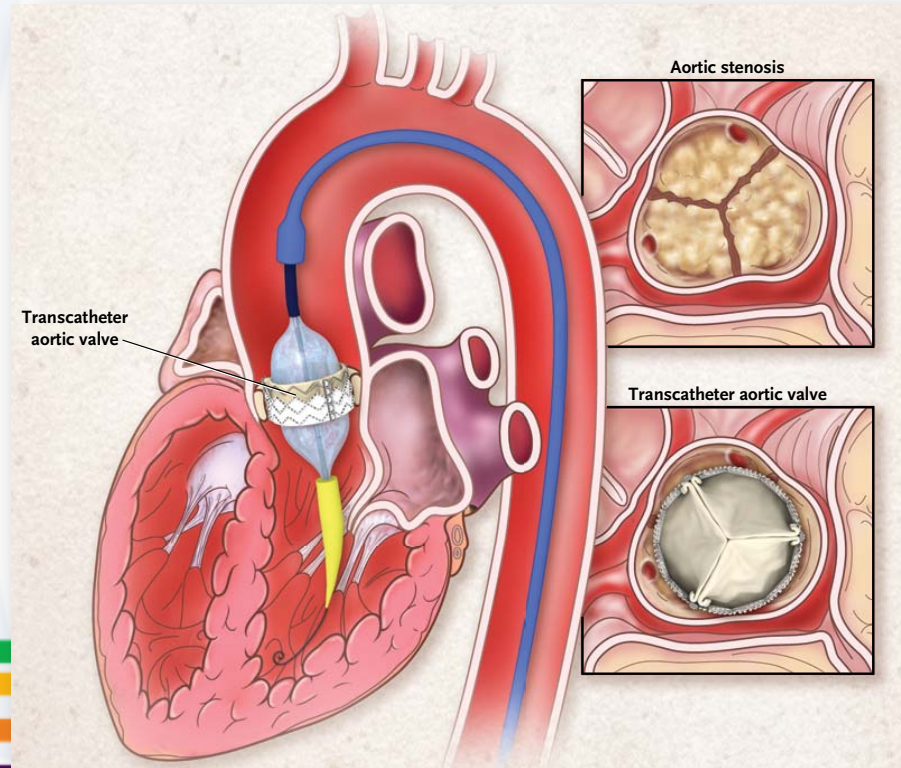
No field details available



**The Society
of Thoracic
Surgeons**

Transcatheter Aortic Valve Implantation

FIM : 16 april 2002



Cribier A, NEJM 2002;106:3001-5



Δ at 1 yr = 20.0%
NNT = 5.0 pts

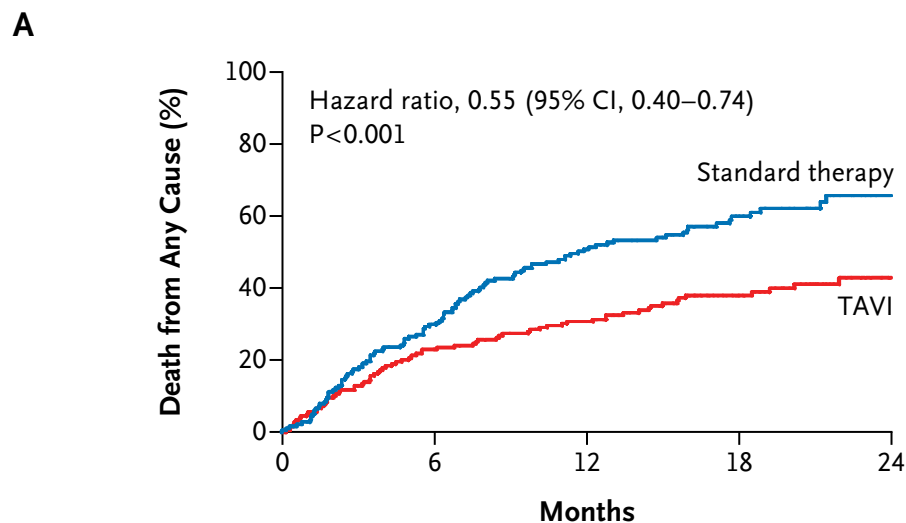
The NEW ENGLAND JOURNAL of MEDICINE

Transcatheter Aortic-Valve Implantation for Aortic Stenosis in Patients Who Cannot Undergo Surgery

Martin B. Leon, M.D., Craig R. Smith, M.D., Michael Mack, M.D., D. Craig Miller, M.D., Jeffrey W. Moses, M.D., Lars G. Svensson, M.D., Ph.D., E. Murat Tuzcu, M.D., John G. Webb, M.D., Gregory P. Fontana, M.D., Raj R. Makkar, M.D., David L. Brown, M.D., Peter C. Block, M.D., Robert A. Guyton, M.D., Augusto D. Pichard, M.D., Joseph E. Bavaria, M.D., Howard C. Herrmann, M.D., Pamela C. Douglas, M.D., John L. Petersen, M.D., Jodi J. Akin, M.S., William N. Anderson, Ph.D., Duolao Wang, Ph.D., and Stuart Pocock, Ph.D., for the PARTNER Trial Investigators*

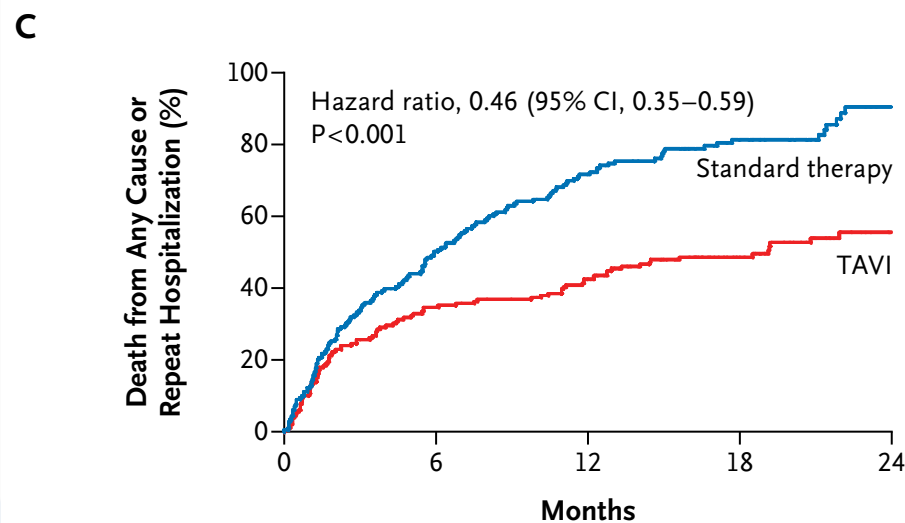
Mean age
83 yrs
in both groups

Δ at 1 yr = 29.1%
NNT = 3.4 pts



No. at Risk

TAVI	179	138	122	67	26
Standard therapy	179	121	83	41	12



No. at Risk

TAVI	179	117	102	56	22
Standard therapy	179	86	49	23	4

Leon M et al, NEJM 2010

The NEW ENGLAND JOURNAL of MEDICINE

Transcatheter versus Surgical Aortic-Valve Replacement in High-Risk Patients

Craig R. Smith, M.D., Martin B. Leon, M.D., Michael J. Mack, M.D., D. Craig Miller, M.D., Jeffrey W. Moses, M.D.,
Lars G. Svensson, M.D., Ph.D., E. Murat Tuzcu, M.D., John G. Webb, M.D., Gregory P. Fontana, M.D.,
Raj R. Makkar, M.D., Mathew Williams, M.D., Todd Dewey, M.D., Samir Kapadia, M.D., Vasilis Babaliaros, M.D.,
Vinod H. Thourani, M.D., Paul Corso, M.D., Augusto D. Pichard, M.D., Joseph E. Bavaria, M.D.,
Howard C. Herrmann, M.D., Jodi J. Akin, M.S., William N. Anderson, Ph.D., Duolao Wang, Ph.D.,
and Stuart J. Pocock, Ph.D., for the PARTNER Trial Investigators*

2011

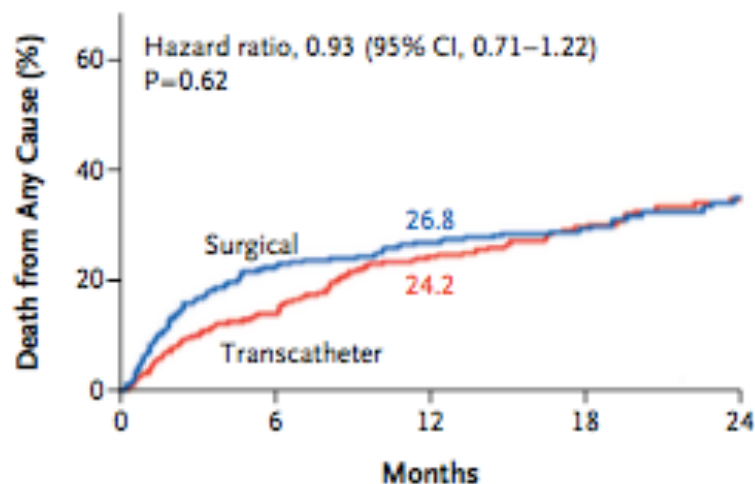
PARTNER 1A

Mean age:

TAVR: 83,6 yrs

AVR : 84,5 yrs

A Death from Any Cause, All Patients



No. at Risk					
Transcatheter	348	298	260	147	67
Surgical	351	252	236	139	65

The NEW ENGLAND JOURNAL of MEDICINE

Transcatheter versus Surgical Aortic-Valve Replacement in High-Risk Patients

Craig R. Smith, M.D., Martin B. Leon, M.D., Michael J. Mack, M.D., D. Craig Miller, M.D., Jeffrey W. Moses, M.D.,
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Vinod H. Thourani, M.D., Paul Corso, M.D., Augusto D. Pichard, M.D., Joseph E. Bavaria, M.D.,
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and Stuart J. Pocock, Ph.D., for the PARTNER Trial Investigators*

2011

PARTNER 1A

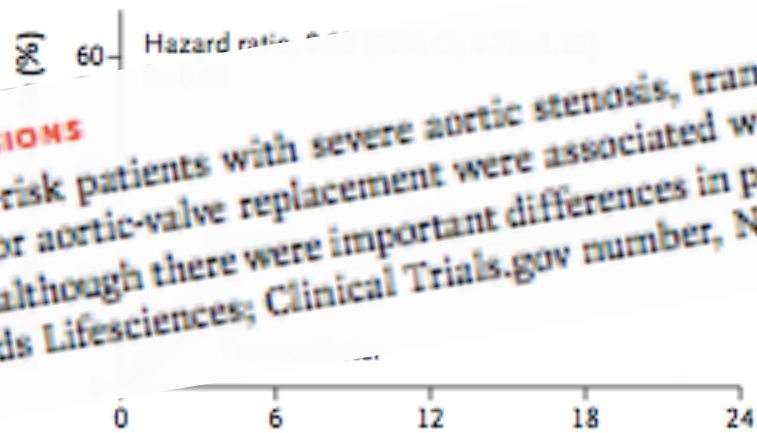
Mean age:

TAVI: 73,6 yrs

AVR: 64,5 yrs

A Death from Any Cause, All Patients

CONCLUSIONS
In high-risk patients with severe aortic stenosis, transcatheter and surgical procedures for aortic-valve replacement were associated with similar rates of survival at 1 year, although there were important differences in periprocedural risks. (Funded by Edwards Lifesciences; Clinical Trials.gov number, NCT00530894.)



	0	6	12	18	24
Months					
No. at Risk					
Transcatheter	348	298	260	147	67
Surgical	351	252	236	139	65

TAVI

- ✓ Anesthésie locale
- ✓ Ventilation spontanée
- ✓ Endovasculaire
- ✓ Pas de CEC
- ✓ Mobilisation en chambre J1
- ✓ Domicile J3

Chirurgie

- ✓ Générale
- ✓ Intubation
- ✓ Sternotomie
- ✓ CEC
- ✓ Soins intensifs
- ✓ Revalidation



Quoi de neuf ?

- Choisir le bon patient pour un TAVI
- Résultats des TAVI
- Evolution des indications
- Durabilité des prothèses



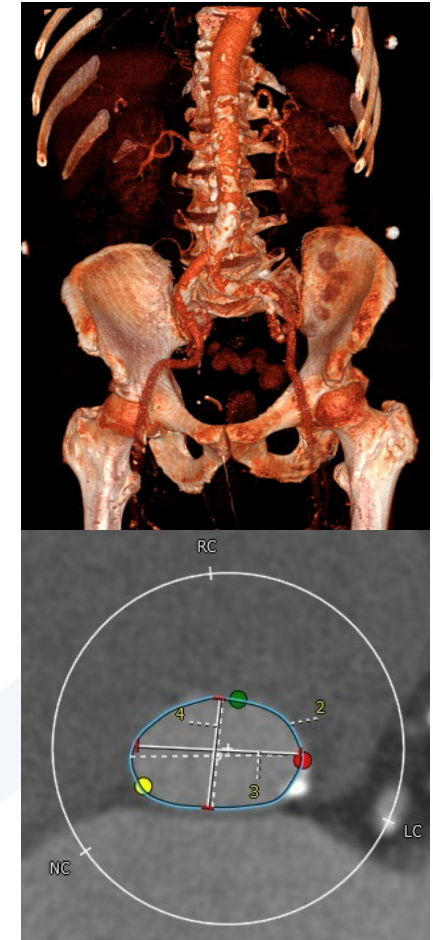
Choisir le bon patient pour un TAVI

- Tous les patients avec une sténose aortique ne sont pas de bons candidats...



Un bon screening est la clé du succès

- Sténose aortique sévère symptomatique
- Espérance de vie > 2 ans
- Anatomie favorable pour un TAVI
 - Scanner aorte, vaisseaux iliaques, carotides (accès)
 - Taille anneau aortique, calcifications
 - Coronaires: position , lésions coronaires
- Absence de fragilité gériatrique
- Discussion au sein d'un heart team: cardiologue, gériatres, imageurs...



Score de fragilité gériatrique

Impact of frailty scores on outcome of octogenarian patients undergoing transcatheter aortic valve implantation

Michele KAMGA¹, MD; Benoit BOLAND², MD, PhD; Pascale CORNETTE², MD, PhD;
Marianne BEECKMANS², RN; Christophe DE MEESTER¹, MS; Patrick CHENU¹, MD, PhD;
Olivier GURNÉ¹, MD, PhD; Jean RENKIN¹, MD, PhD; Joëlle KEFER¹, MD, PhD

¹Division of Cardiology and ²Geriatrics, Cliniques Universitaires Saint-Luc, University of Louvain, Brussels, Belgium.

Table 5 Univariate and multivariate analysis for predictors of 1-year survival according to Cox models

Variable	HR	Univariate analysis	
		95% CI	P value
SHERPA (1 point increase)	2.01	1.29-3.12	0.002
BMI (1 unit increase)	0.81	0.66-1.01	0.051
Pulmonary hypertension	4.29	1.02-17.99	0.047
Male gender	7.53	0.92-61.27	0.059
Diabetes	5.71	1.41-23.21	0.015
	HR	Multivariate analysis	
		95% CI	P value
SHERPA (1 point increase)	2.74	1.39-5.39	0.004
BMI (1 unit increase)	0.54	0.35-0.85	0.007

SHERPA: Score Hospitalier d'Evaluation du Risque de Perte d'Autonomie, BMI: body mass index, HR: hazard ratio, CI: confidence interval.

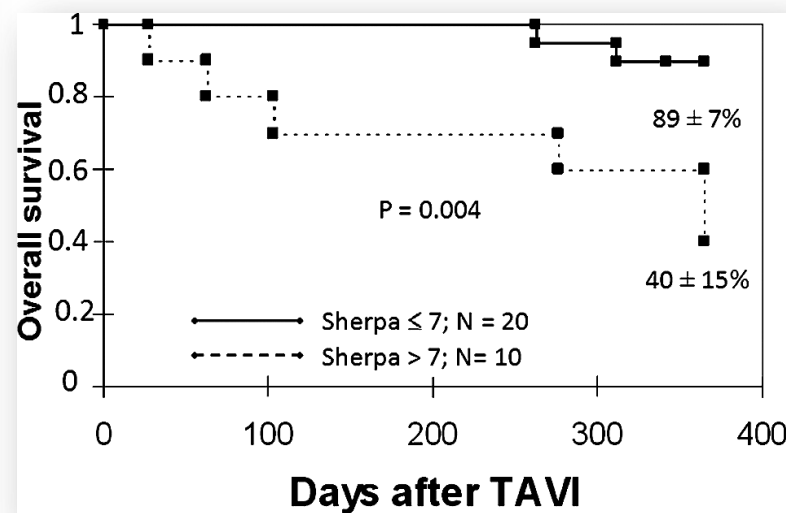


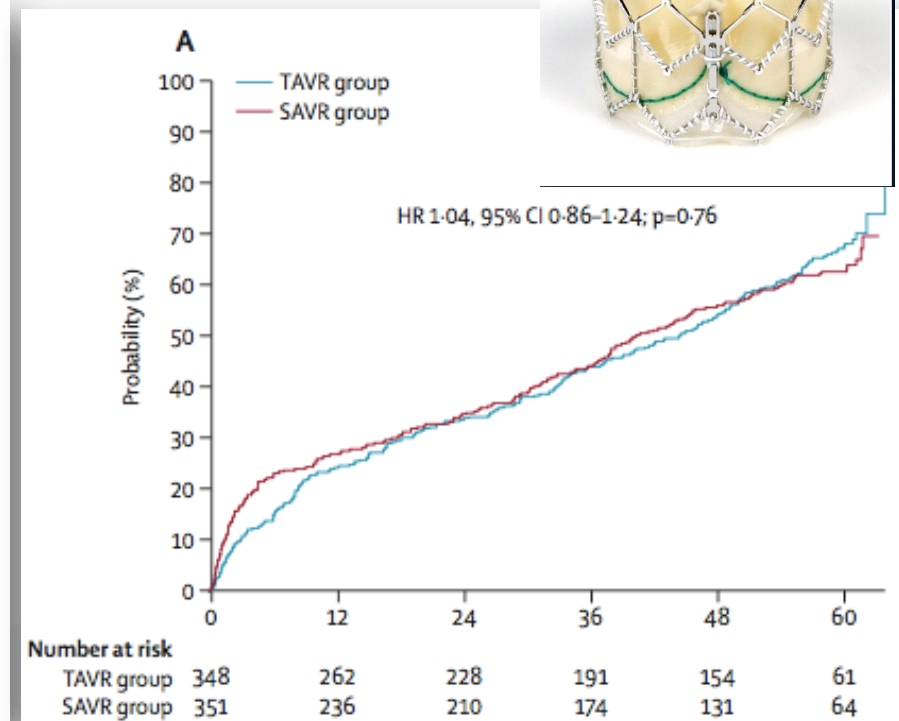
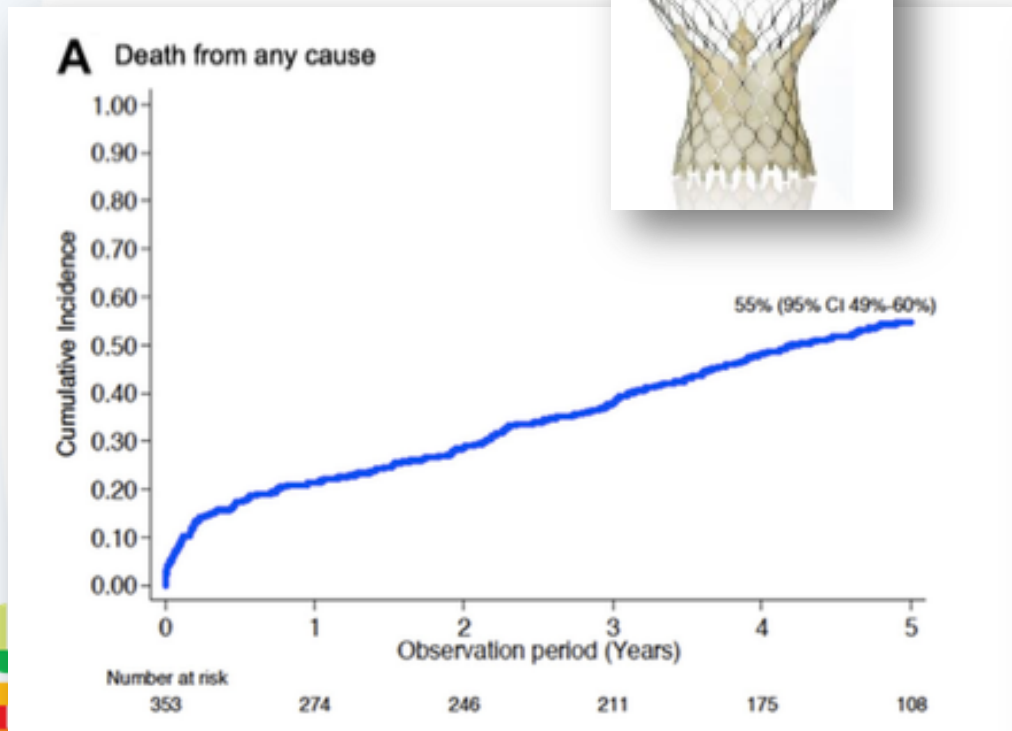
Fig. 2 Kaplan-Meier analysis shows the effect of the SHERPA score on 1-year survival. Patients with a SHERPA > 7 had reduced survival.

Kamga et al, *Acta Cardiologica* 2013, 68:599-606

Quels résultats ? devenir à 5 ans des patients avec TAVI

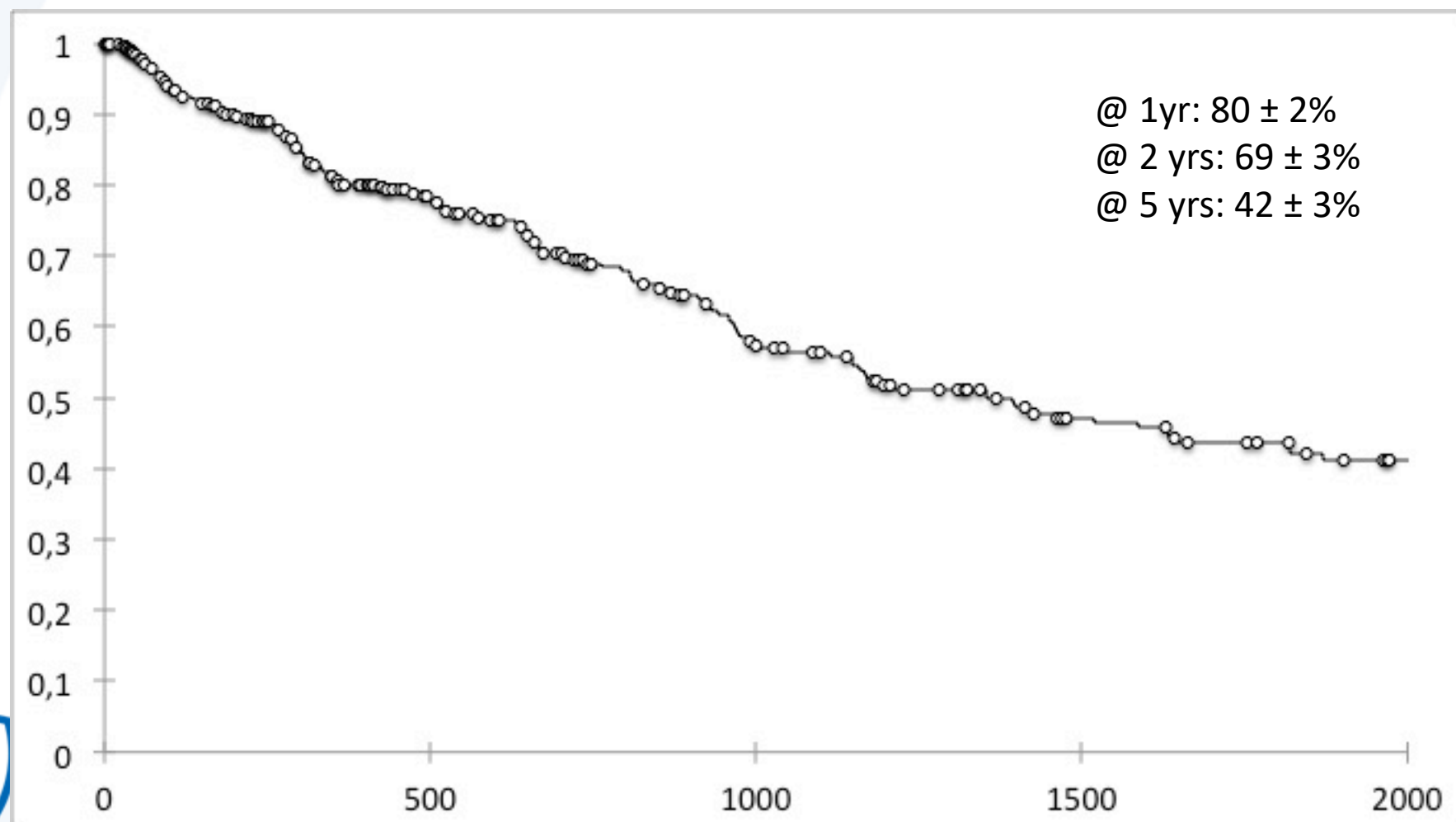
@ 1yr: 79 %
@ 2 yrs: 71 %
@ 5 yrs: 45%

@ 1yr: 76 %
@ 2 yrs: 70 %
@ 5 yrs: 32%



Quels résultats ? devenir à 5 ans des patients avec TAVI

Survie à 5 ans des patients avec TAVI au CUSL



Patients avec un risque opératoire intermédiaire

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

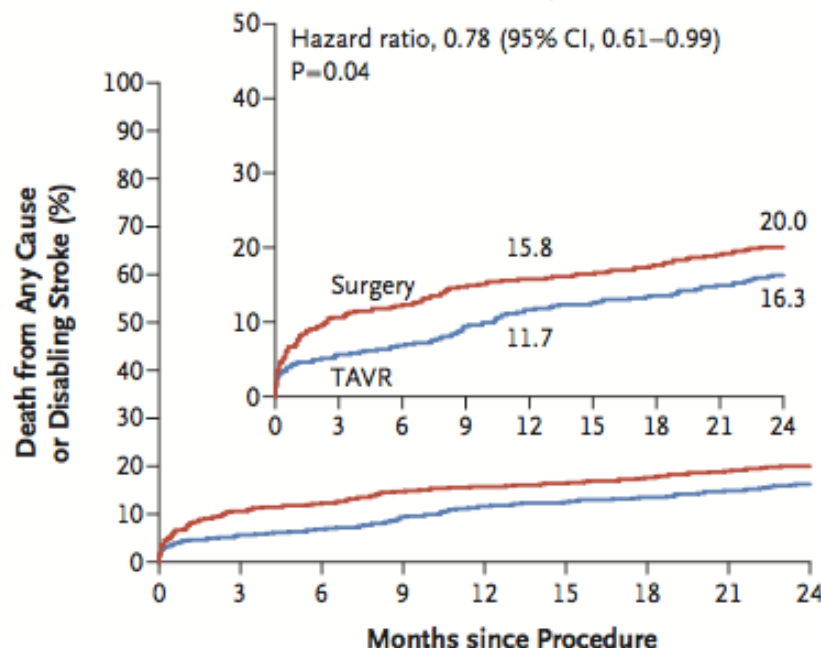
APRIL 28, 2016

VOL. 374 NO. 17

Transcatheter or Surgical Aortic-Valve Replacement in Intermediate-Risk Patients

2016

D Transfemoral-Access Cohort, As-Treated Analysis



No. at Risk

TAVR	762	717	708	685	663	652	644	634	612
Surgery	722	636	624	600	591	573	565	555	537

ABSTRACT

BACKGROUND

Previous trials have shown that among high-risk patients with aortic stenosis, survival rates are similar with transcatheter aortic-valve replacement (TAVR) and surgical aortic-valve replacement. We evaluated the two procedures in a randomized trial involving intermediate-risk patients.

METHODS

We randomly assigned 2032 intermediate-risk patients with severe aortic stenosis, at 57 centers, to undergo either TAVR or surgical replacement. The primary end point was death from any cause or disabling stroke at 2 years. The primary hypothesis was that TAVR would not be inferior to surgical replacement. Before randomization, patients were entered into one of two cohorts on the basis of clinical and imaging findings; 76.3% of the patients were included in the transfemoral-access cohort and 23.7% in the transthoracic-access cohort.

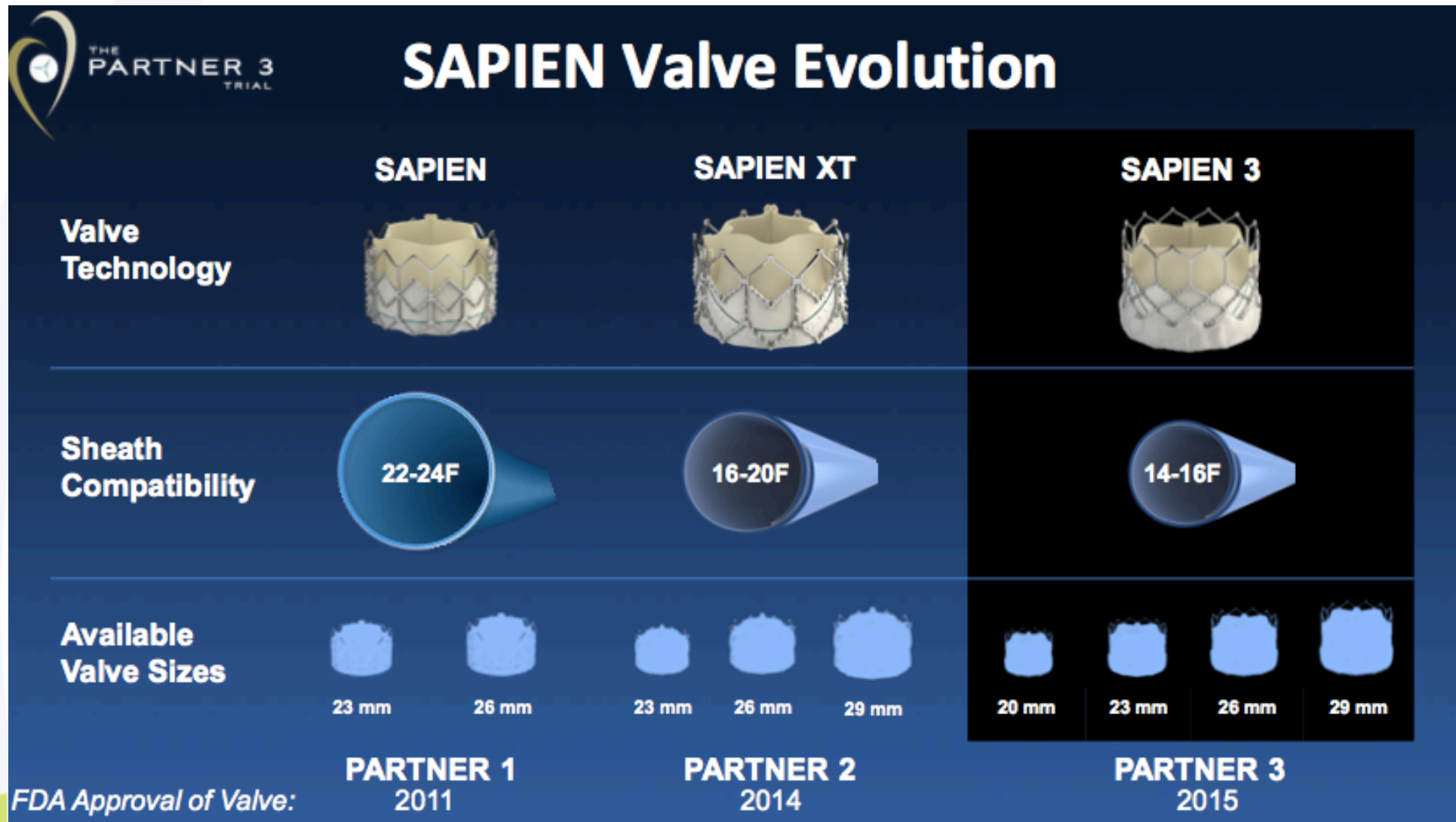
RESULTS

The rate of death from any cause or disabling stroke was similar in the TAVR group and the surgery group (P=0.001 for noninferiority). At 2 years, the Kaplan-Meier event rates were 19.3% in the TAVR group and 21.1% in the surgery group (hazard ratio in the TAVR group, 0.89; 95% confidence interval [CI], 0.73 to 1.09; P=0.25). In the transfemoral-access cohort, TAVR resulted in a lower rate of death or disabling stroke than surgery (hazard ratio, 0.79; 95% CI, 0.62 to 1.00; P=0.05), whereas in the transthoracic-access cohort, outcomes were similar in the two groups. TAVR resulted in larger aortic-valve areas than did surgery and also resulted in lower rates of acute kidney injury, severe bleeding, and new-onset atrial fibrillation; surgery resulted in fewer major vascular complications and less paravalvular aortic regurgitation.

CONCLUSIONS

In intermediate-risk patients, TAVR was similar to surgical aortic-valve replacement with respect to the primary end point of death or disabling stroke. (Funded by Edwards Lifesciences; PARTNER 2 ClinicalTrials.gov number, NCT01314313.)

N ENGL J MED 374:17 NEJM.ORG APRIL 28, 2016



Major vascular complications: 11%

2,2%

7,9%

Peut on encore aller plus loin....

- Pourrais t'on envisager des TAVI chez des patients à faible risque ou chez des patients plus jeunes...



Peut on encore aller plus loin....

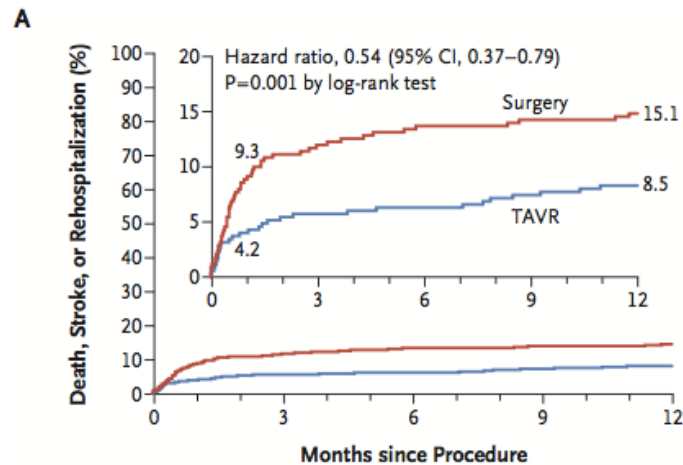
- Pourrais t'on envisager des TAVI chez des patients à faible risque ou chez des patients plus jeunes...
- Quelle est la durabilité des prothèses ?



ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Balloon-Expandable Valve in Low-Risk Patients

M.J. Mack, M.B. Leon, V.H. Thourani, R. Makkar, S.K. Kodali, M. Russo, S.R. Kapadia, S.C. Malaisrie, D.J. Cohen, P. Pibarot, J. Leipsic, R.T. Hahn, P. Blanke, M.R. Williams, J.M. McCabe, D.L. Brown, V. Babaliaros, S. Goldman, W.Y. Szeto, P. Genereux, A. Pershad, S.J. Pocock, M.C. Alu, J.G. Webb, and C.R. Smith, for the PARTNER 3 Investigators*



No. at Risk						
Surgery	454	408	390	381	377	374
TAVR	496	475	467	462	456	451

Favors TAVR:

↓ stroke, bleeding, renal failure, a fib
Shorter hospital stay, ↑QoL

Favors SAVR: ↓ LBBB, mild PVL

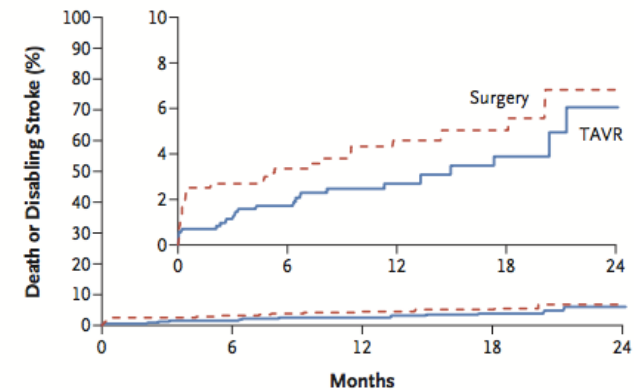
Equal : PCMK

ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Self-Expanding Valve in Low-Risk Patients

Jeffrey J. Popma, M.D., G. Michael Deeb, M.D., Steven J. Yakubov, M.D., Mubashir Mumtaz, M.D., Hemal Gada, M.D., Daniel O'Hair, M.D., Tanvir Bajwa, M.D., John C. Heiser, M.D., William Merri, D.O., Neal S. Kleiman, M.D., Judah Askew, M.D., Paul Sorajja, M.D., Joshua P. Fink, M.D., Stanley J. Chetcuti, M.D., David H. Adams, M.D., Paul S. Teirstein, M.D., George L. Zorn III, M.D., John K. Forrest, M.D., Didier Tchétché, M.D., Jon Resar, M.D., Antony Walton, M.D., Nicolò Piazza, M.D., Ph.D., Basel Ramlawi, M.D., Newell Robinson, M.D., George Petrossian, M.D., Thomas G. Gleason, M.D., Jae K. Oh, M.D.,

B Incidence of Primary End Point



No. at Risk					
Surgery	678	576	366	195	69
TAVR	725	648	435	233	80

Favors TAVR:

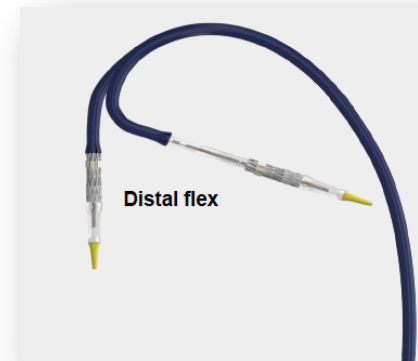
↓ stroke, bleeding, renal failure, a fib
↑AoVA, ↓ gradient

Favors SAVR: ↓ PCMK, moderate PVL

Patients à faible risque et TAVI

ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Balloon-Expandable Valve in Low-Risk Patients



CONCLUSIONS

Among patients with severe aortic stenosis who were at low surgical risk, the rate of the composite of death, stroke, or rehospitalization at 1 year was significantly lower with TAVR than with surgery. (Funded by Edwards Lifesciences; PARTNER 3 ClinicalTrials.gov number, NCT02675114.)

Actualités en Cardiologie :TAVI

Peut on encore aller plus loin....

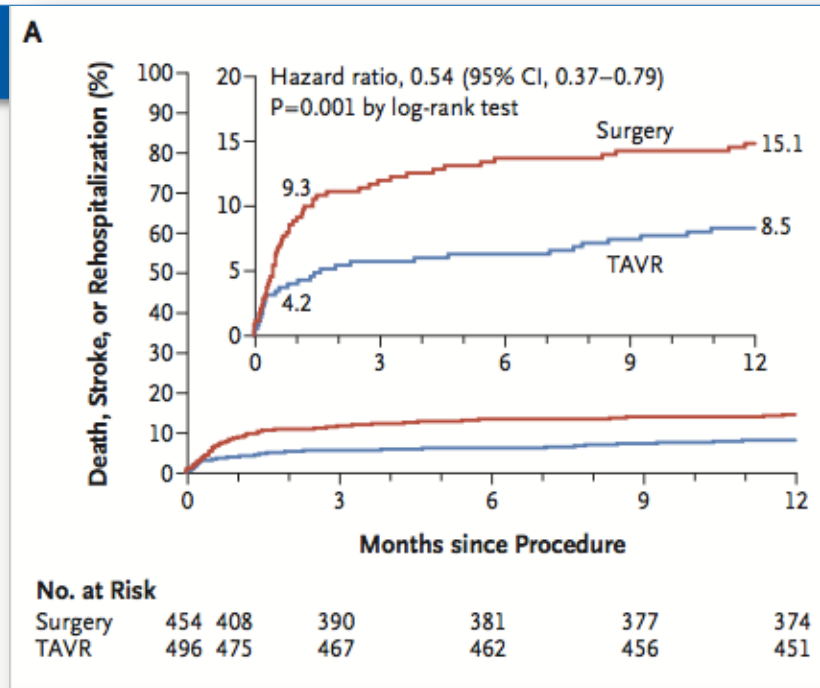
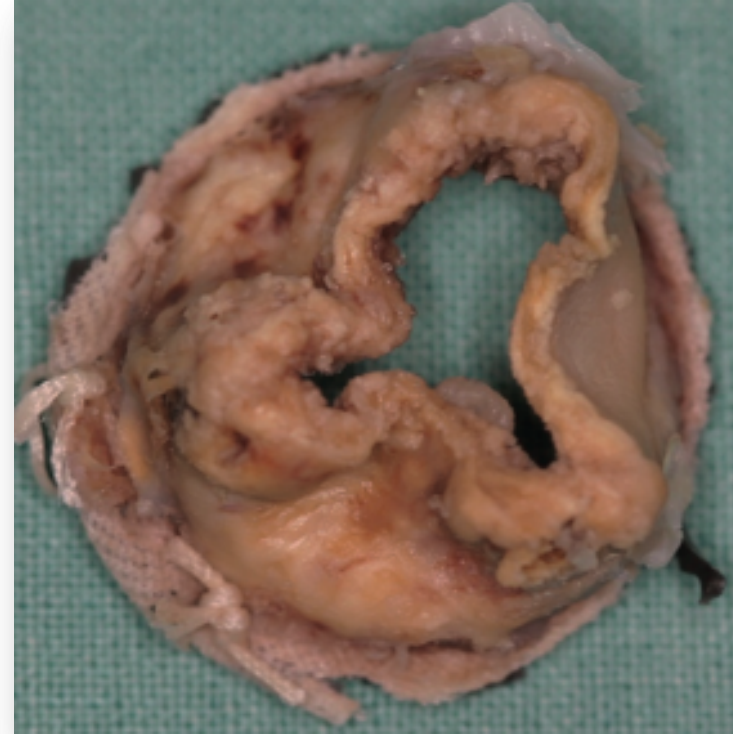


Table 2. Key Secondary End Points.*

End Point	TAVR (N=496)	Surgery (N=454)	TAVR vs. Surgery (95% CI) [†]	P Value [‡]
New-onset atrial fibrillation at 30 days — no./total no. (%)§¶	21/417 (5.0)	145/369 (39.5)	0.10 (0.06 to 0.16)	<0.001
Length of index hospitalization — median no. of days (inter-quartile range)	3.0 (2.0 to 3.0)	7.0 (6.0 to 8.0)	−4.0 (−4.0 to −3.0)	<0.001
Death from any cause, stroke, or rehospitalization at 1 year — no. (%)§	42 (8.5)	68 (15.1)	0.54 (0.37 to 0.79)	0.001
Death, KCCQ score of <45, or decrease from baseline in KCCQ score of ≥10 points at 30 days — no./total no. (%)	19/492 (3.9)	133/435 (30.6)	−26.7 (−31.4 to −22.1)	<0.001
Death or stroke at 30 days — no. (%)§	5 (1.0)	15 (3.3)	0.30 (0.11 to 0.83)	0.01
Stroke at 30 days — no. (%)§	3 (0.6)	11 (2.4)	0.25 (0.07 to 0.88)	0.02

Dégradation des bioprothèses chirurgicale

- ✓ Rétraction des feuillets
- ✓ Calcifications
- ✓ Pannus
- ✓ Déchirures
- ✓ Fibrose



Arsalan M Eurointervention 2015;11:119-122.

Dégradation des bioprothèses chirurgicales:
1-5% @5 ans; 5-10% @ 10 ans; 15-50% @ 20 ans

Cause possible de détérioration des TAVI vs prothèses chirurgicales....

- ✓ Persistance des calcifications de la valve native
- ✓ Stress mécanique sur le stent
- ✓ Plicature de la valve avant son déploiement
- ✓ Géométrie des feuillets valvulaires
- ✓ L'expansion de la valve avec le ballon ou la post dilatation



Détérioration des TAVI ce que l'on sait...

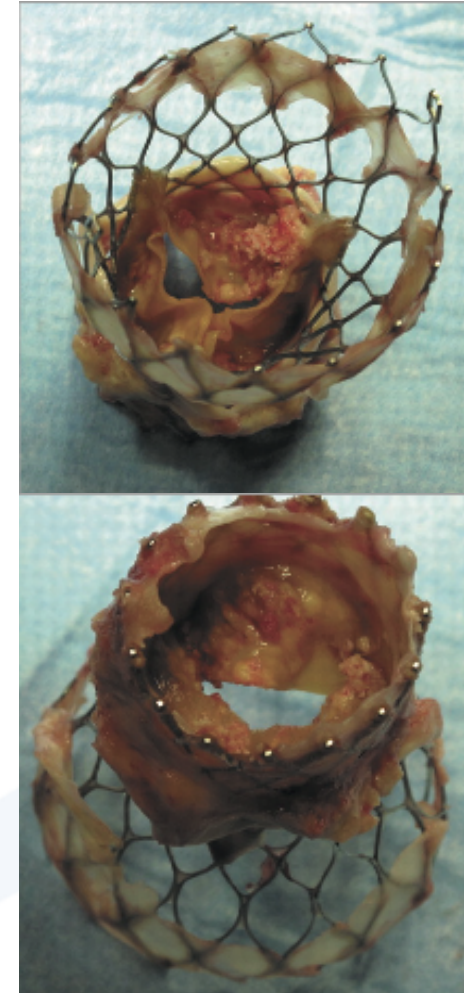
- ✓ @ 5 yrs :
- ✓ 0 SVD /53 patients vivants dans PARTNER IA
- ✓ 1.4% CV registre italien

- ✓ @> 5 yrs :
- ✓ 2.4% Registre de Vancouver



Détérioration des TAVI

- ✓ Leaflet reduced mobility
 - ✓ Thickening
 - ✓ Thrombus
 - ✓ Calcifications
- ✓ Stent frame fracture
- ✓ Increase of gradient and/or regurgitation



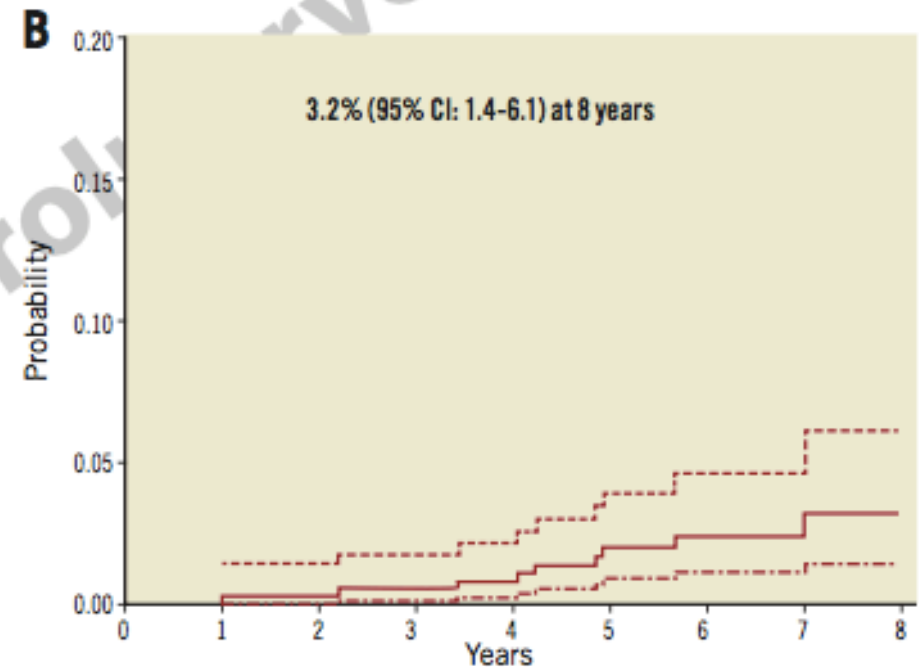
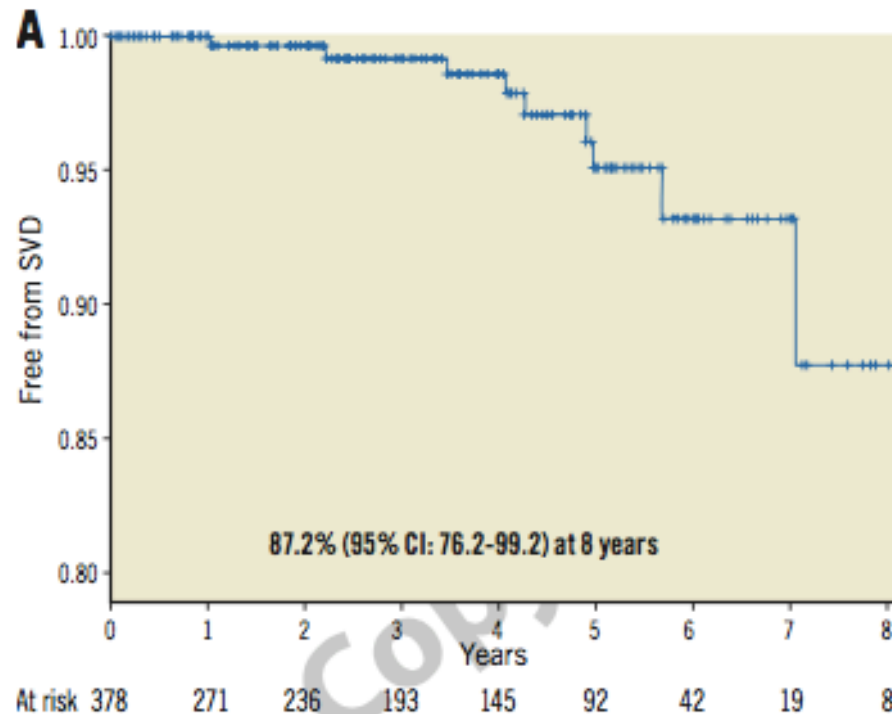
Arsalan M Eurointervention 2015;11:119-122.

Données de détérioration des TAVI.

Assessment of structural valve deterioration of transcatheter aortic bioprosthetic balloon-expandable valves using the new European consensus definition



Hélène Eltchaninoff^{1,2*}, MD; Eric Durand^{1,2}, MD, PhD; Guillaume Avinée^{1,2}, MD; Christophe Tron¹, MD; Pierre-Yves Litzler^{2,3}, MD; Fabrice Bauer^{1,2}, MD; Jean-Nicolas Dacher^{2,4}, MD; Camille Werhlin¹, MD; Najime Bouhzam¹, MD; Nicolas Bettinger¹, MD; Pascal Candolfi⁵, PhD; Alain Cribier¹, MD.



Conclusion

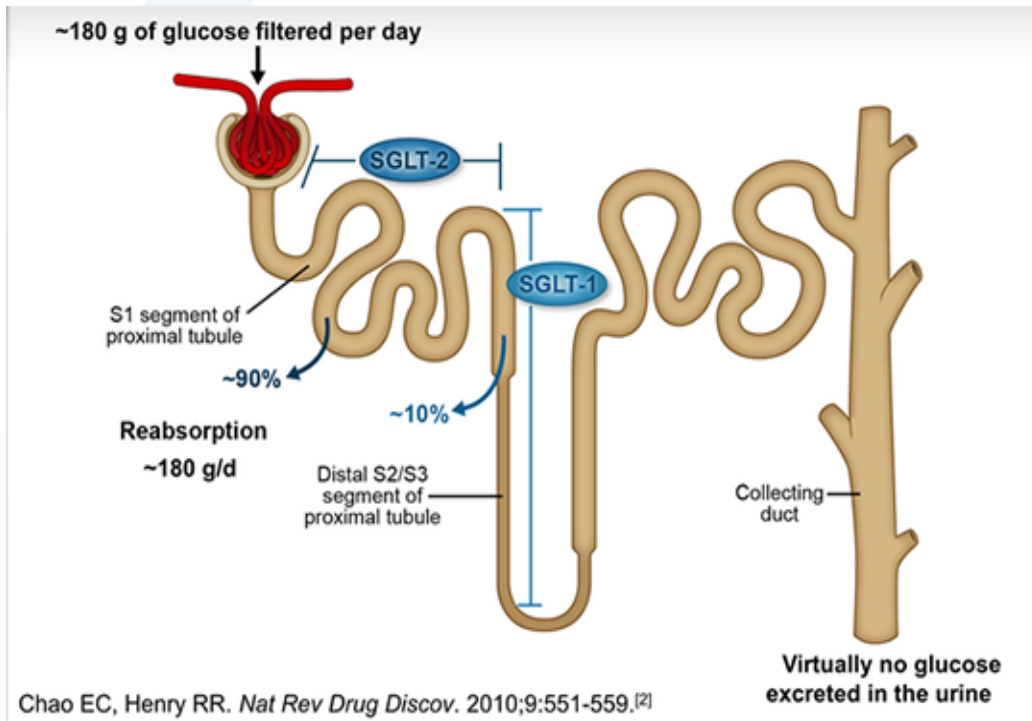
- En 2019 , le TAVI peut être considéré comme technique sûre et fiable comme traitement de la sténose aortique.
- Les bons résultats font que cette technique est applicable a des patients a faible risque opératoire
- Il n'y a actuellement aucun argument pour dire que la durabilité de ces prothèses serait inférieure aux prothèses chirurgicales .
- L'avenir verra certainement un extension des indications pour les TAVI



- *Entresto*: nouveau traitement de l'insuffisance cardiaque
- Un Pace maker sans sonde...
- TAVI 5 ans plus tard qu'en est il ?
- *Empagliflozin inhibiteur SGLT2* un médicament contre le diabète qui peut aussi soigner votre cœur ...



Le rein et l'homéostasie du glucose



Les tubules contournés proximaux réabsorbent le glucose filtré par les glomérules (10-200g/l) ce mécanisme permet d'empêcher la fuite urinaire du glucose. Le seuil rénal est de 180 -200 mg/dl.

Si la glycémie **< 180-200 mg/dl**, tout le glucose est réabsorbé. La glucosurie est négative.

Si la glycémie **> 180 à 200 mg/dl**, on dépasse la capacité de réabsorption et il y a glucosurie

Actualité en Cardiologie: SGLT 2 inhibiteurs

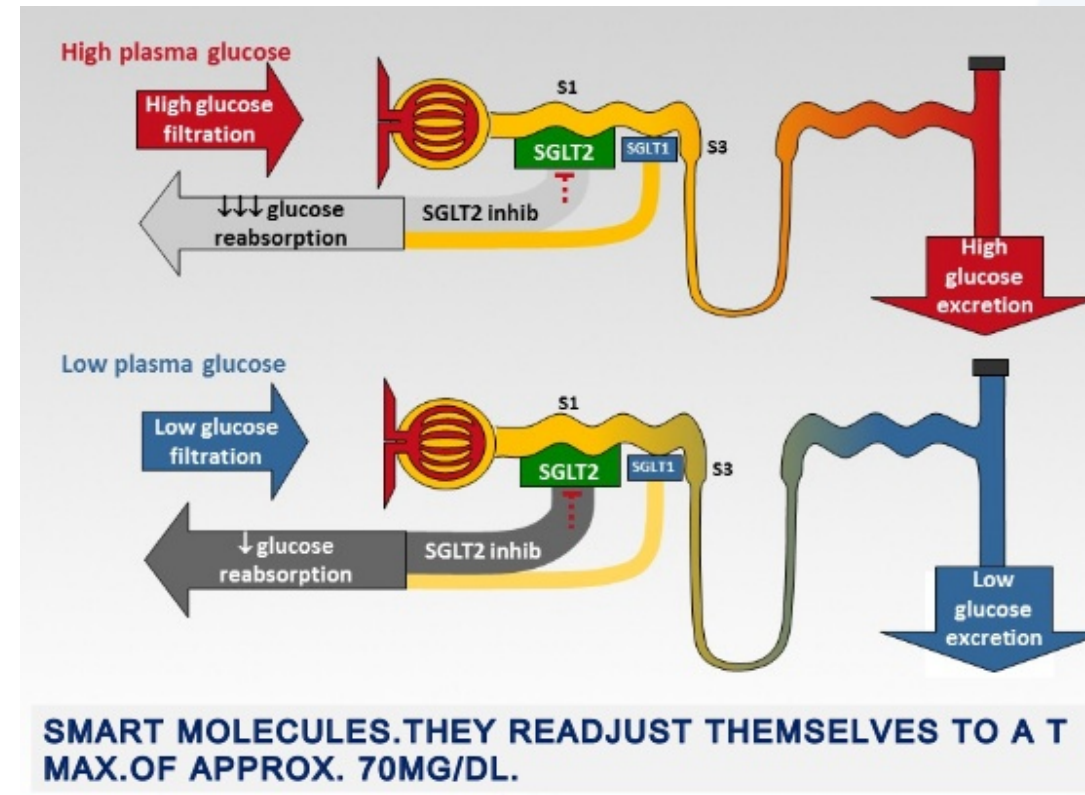
Le rein et l'homéostasie du glucose

Le glucose est réabsorbé par 2 transporteurs spécifiques SGLT (sodium glucose co transporter).

SGLT-2 partie initiale des tubes contournés, 90 % de la réabsorption

SGLT-1 partie distale des tubes contournés, 10% de la réabsorption

En cas de **diabète de type 2**, il y a **surexpression de SGLT-2** qui entraîne une absorption accrue de glucose (élévation du seuil rénal à 250 mg/dl) contribue à l'hyperglycémie.

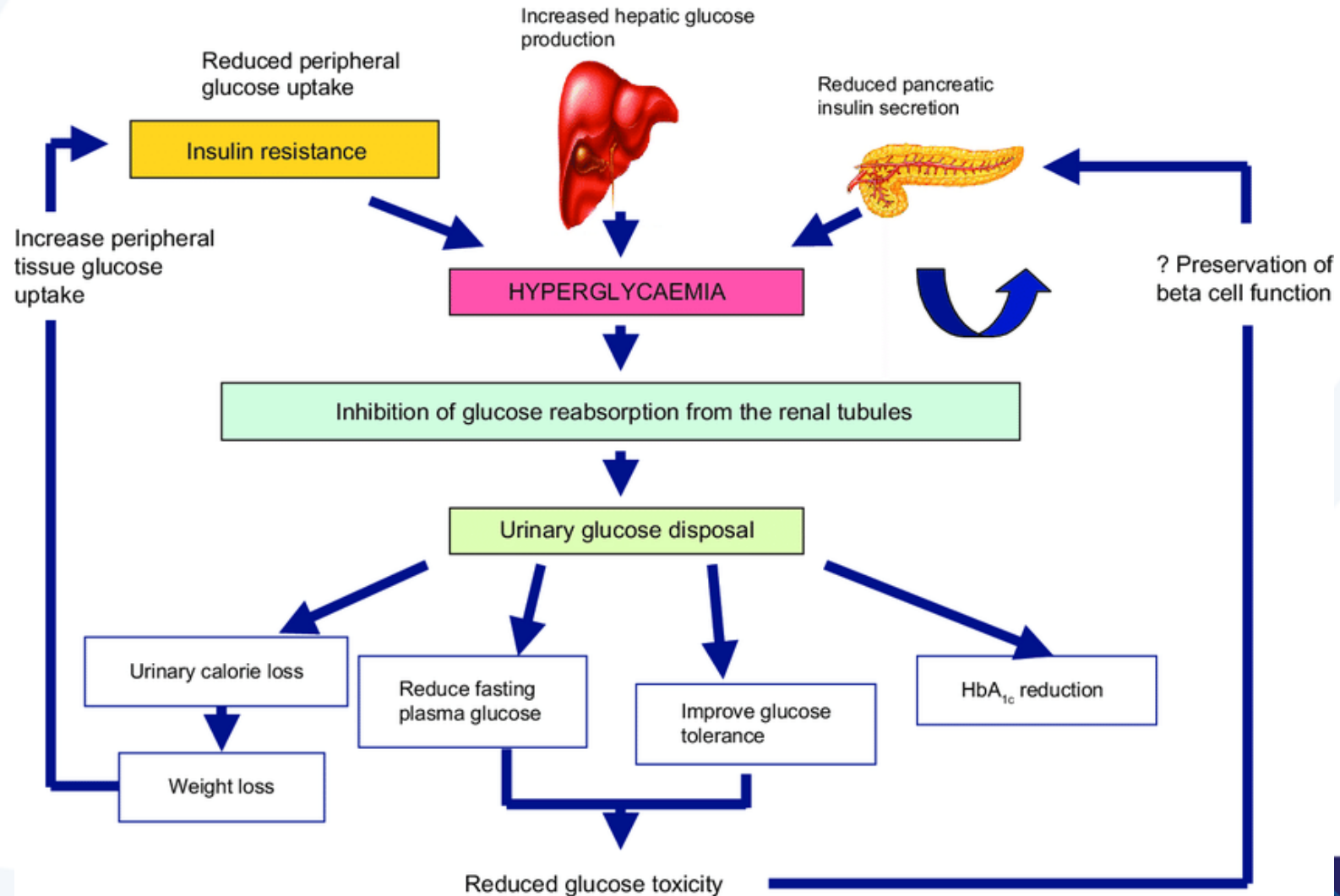


Les inhibiteurs SGLT-2

- Les gliflozines ou inhibiteurs SGLT-2 i sont des médicaments orales qui inhibent les transporteurs SGLT-2, et la réabsorption du glucose.
- Effet « *glucorétique* » (70g/j) avec comme conséquence une réduction de la glycémie , une perte calorique d'environ 280 kcal/j (4 kcal par gramme d glucose « uriné ») et une natriurèse (co transporteur NA/glucose.
- Le mécanisme d'action est *lié aux taux plasmatiques de glucose* et indépendant de la sécrétion et /ou action insuline Ils sont donc actifs, à tous les stades d'évolution de la maladie.



Les inhibiteurs SGLT-2



Les inhibiteurs SGLT-2

SGLT2 Inhibitors:

- Dapagliflozin (**Farxiga**): le premier et le plus étudié
- Canagliflozin (**Invokana**)
- **Empagliflozin** (**Jardiance**)
- Ipragliflozin
- Tofogliflozin
- Remogliflozin etabonate
- Sergliflozin etabonate



SGLT- 2 et risque cardiovasculaire

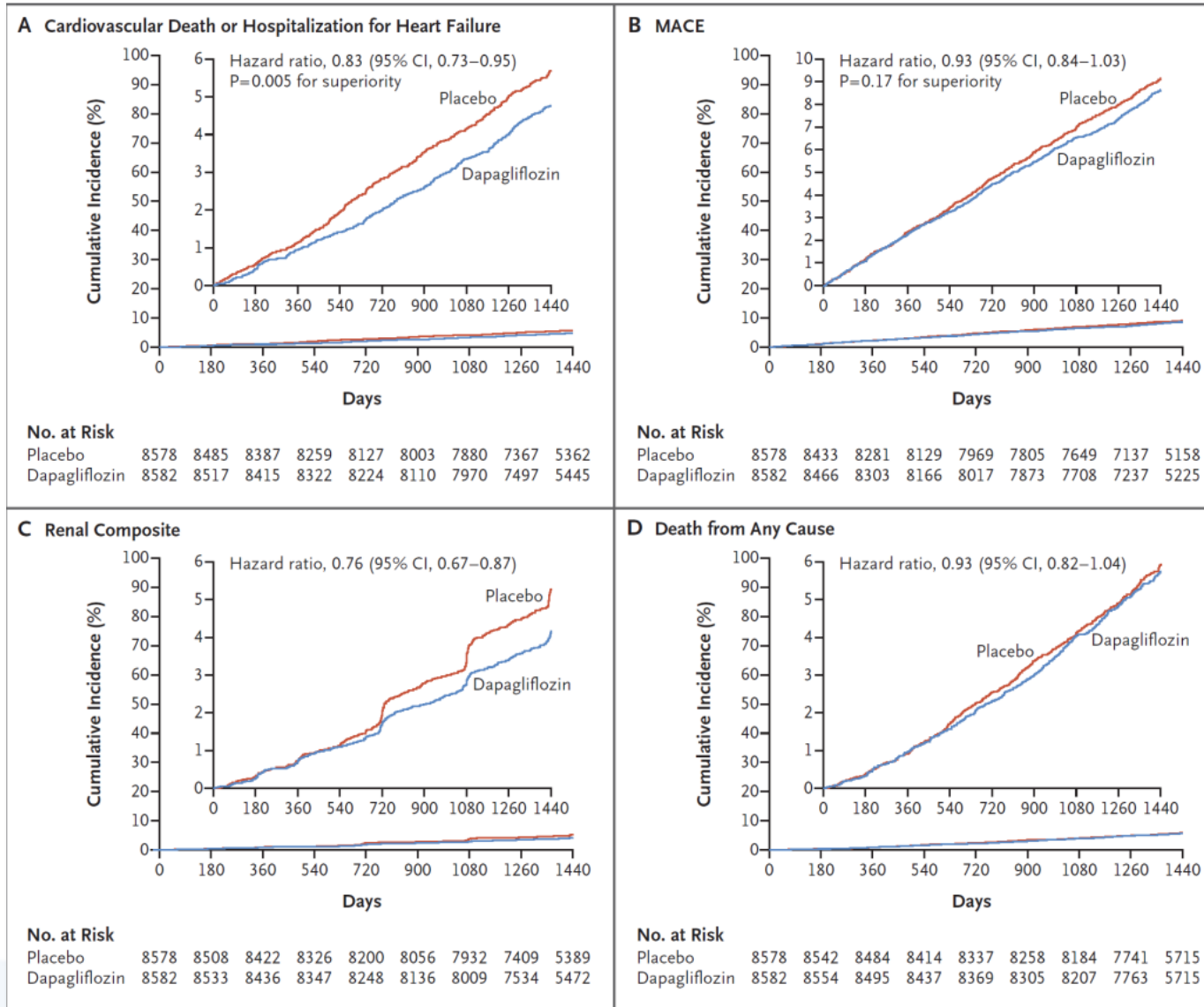
ORIGINAL ARTICLE

Dapagliflozin and Cardiovascular Outcomes in Type 2 Diabetes

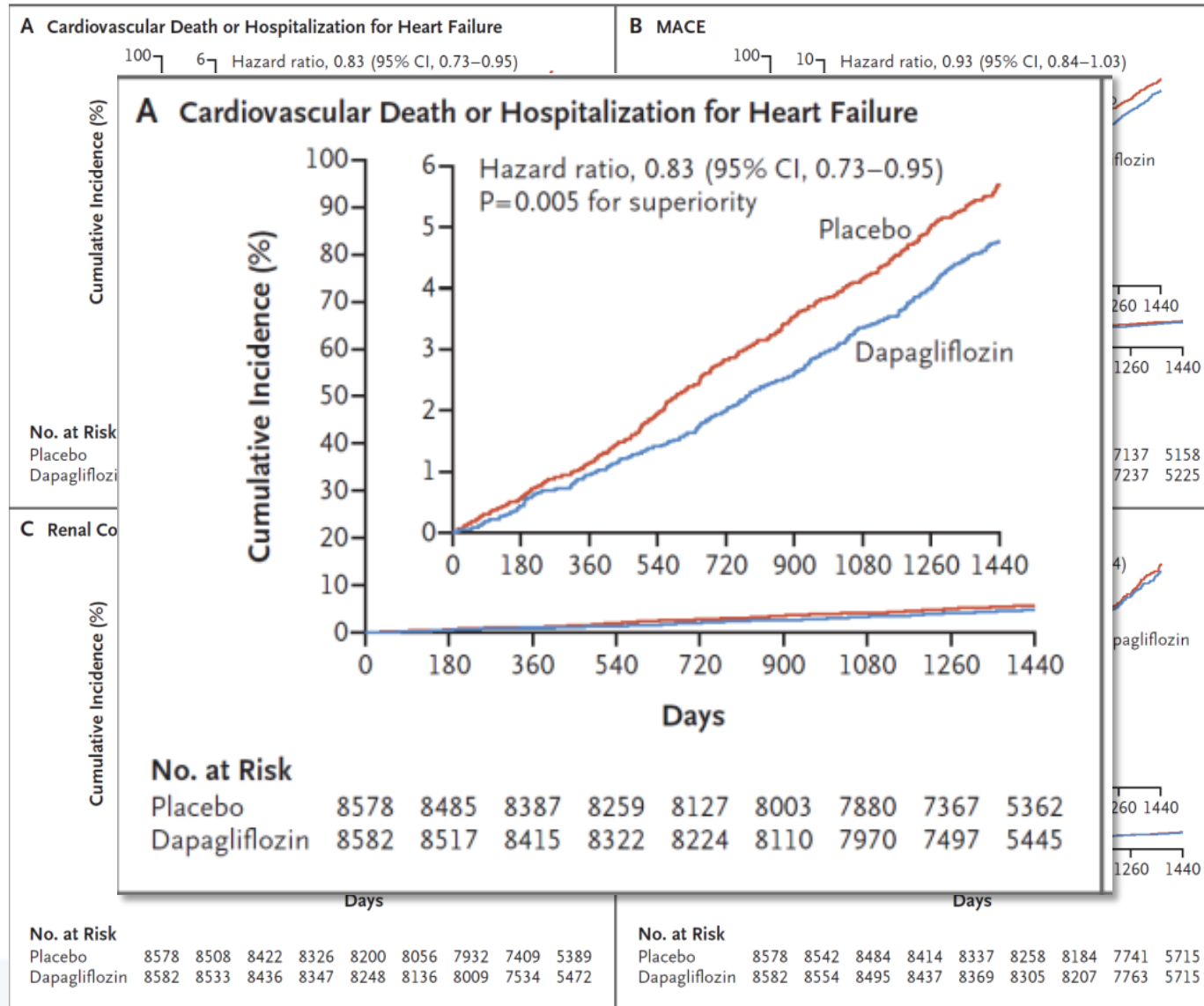
S.D. Wiviott, I. Raz, M.P. Bonaca, O. Mosenzon, E.T. Kato, A. Cahn, M.G. Silverman, T.A. Zelniker, J.F. Kuder, S.A. Murphy, D.L. Bhatt, L.A. Leiter, D.K. McGuire, J.P.H. Wilding, C.T. Ruff, I.A.M. Gause-Nilsson, M. Fredriksson, P.A. Johansson, A.-M. Langkilde, and M.S. Sabatine, for the DECLARE-TIMI 58 Investigators*



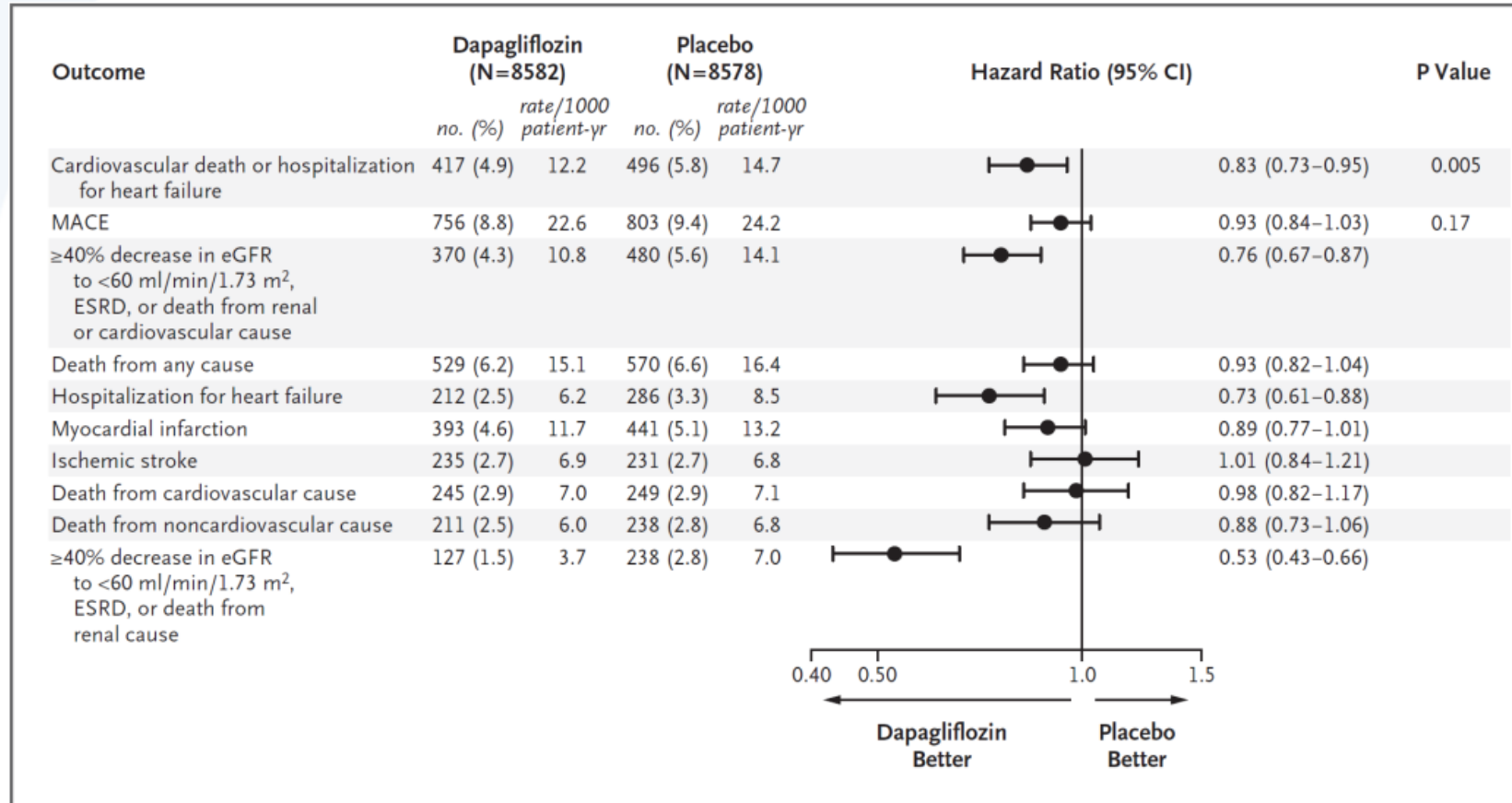
SGLT- 2 et risque cardiovasculaire



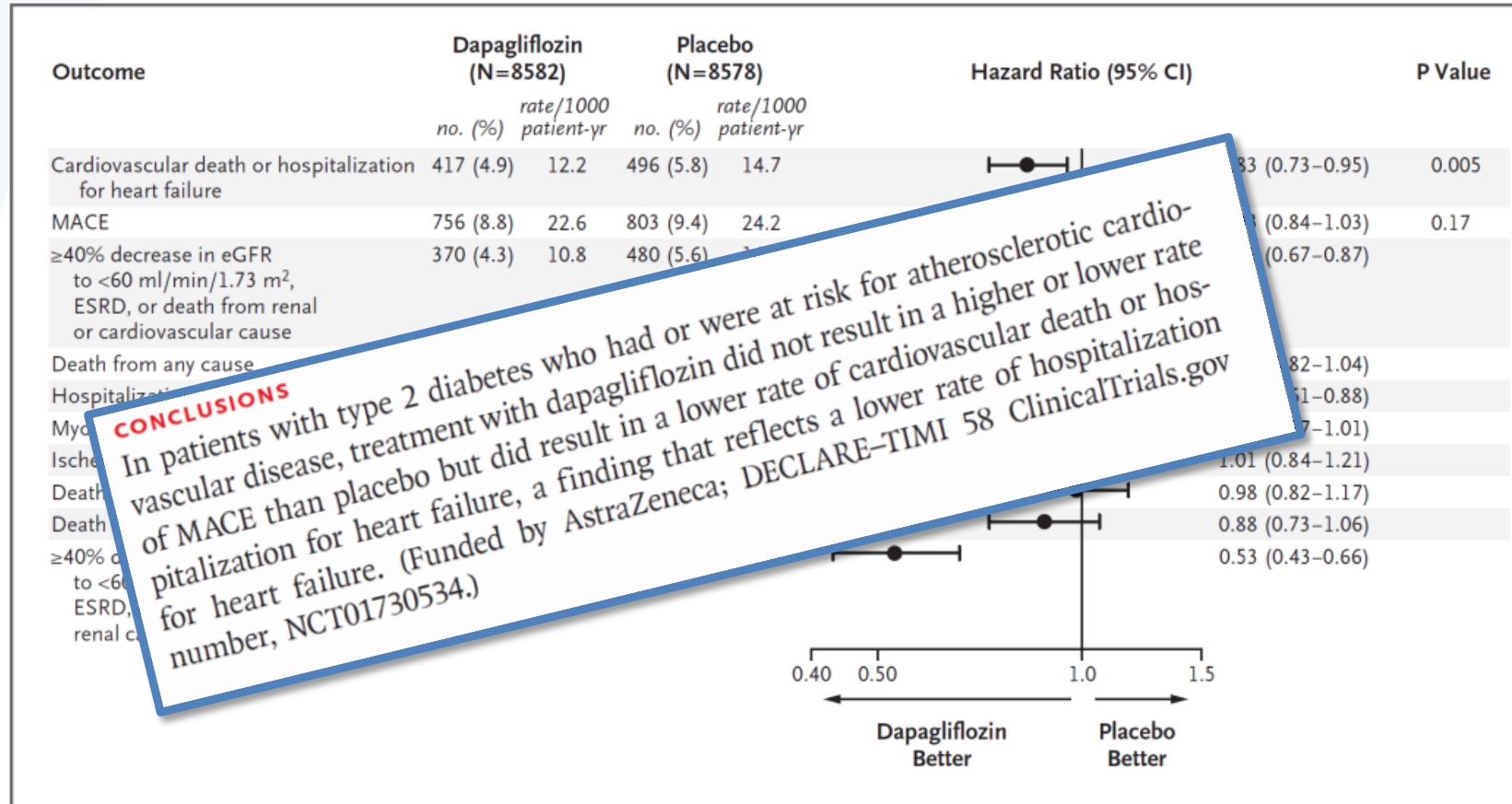
SGLT- 2 et risque cardiovasculaire



SGLT- 2 et risque cardiovasculaire



SGLT- 2 et risque cardiovasculaire



Bénéfice chez les patients avec une insuffisance cardiaque ?



Bénéfice chez les patients avec une insuffisance cardiaque ?

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Dapagliflozin in Patients with Heart Failure and Reduced Ejection Fraction

J.J.V. McMurray, S.D. Solomon, S.E. Inzucchi, L. Køber, M.N. Kosiborod, F.A. Martinez, P. Ponikowski, M.S. Sabatine, I.S. Anand, J. Böhlhávek, M. Böhm, C.-E. Chiang, V.K. Chopra, R.A. de Boer, A.S. Desai, M. Diez, J. Drozd, A. Dukát, J. Ge, J.G. Howlett, T. Katova, M. Kitakaze, C.E.A. Ljungman, B. Merkely, J.C. Nicolau, E. O'Meara, M.C. Petrie, P.N. Vinh, M. Schou, S. Tereshchenko, S. Verma, C. Held, D.L. DeMets, K.F. Docherty, P.S. Jhund, O. Bengtsson, M. Sjöstrand, and A.-M. Langkilde, for the DAPA-HF Trial Committees and Investigators*

BACKGROUND

In patients with type 2 diabetes, inhibitors of sodium–glucose cotransporter 2 (SGLT2) reduce the risk of a first hospitalization for heart failure, possibly through glucose-independent mechanisms. More data are needed regarding the effects of SGLT2 inhibitors in patients with established heart failure and a reduced ejection fraction, regardless of the presence or absence of type 2 diabetes.

METHODS

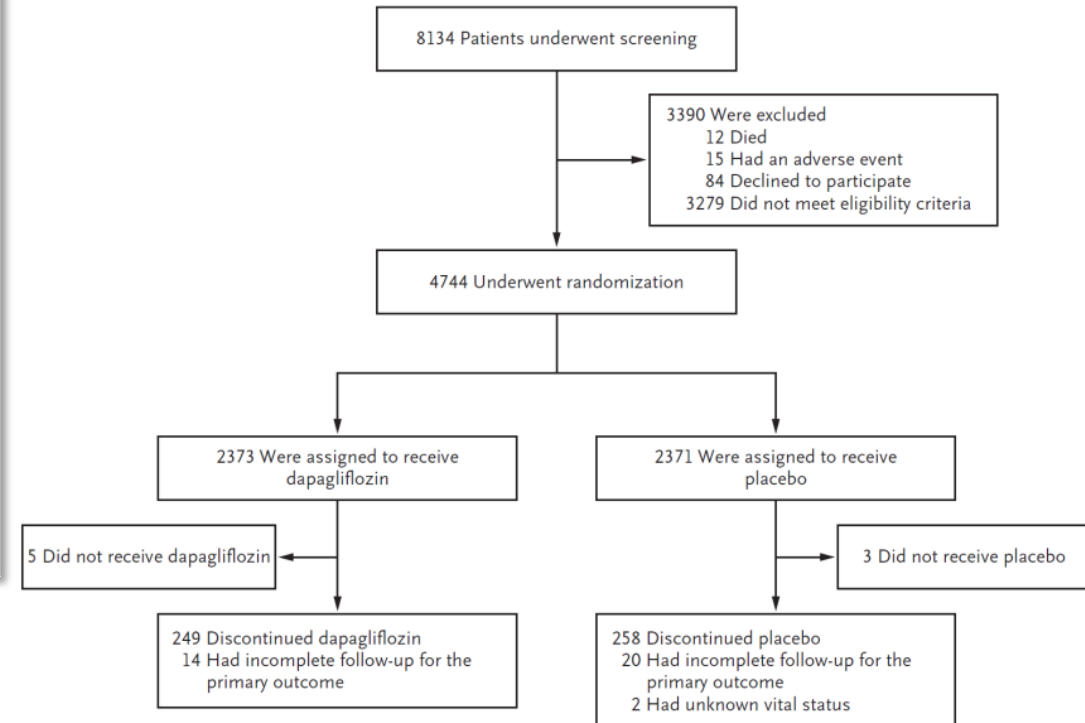
In this phase 3, placebo-controlled trial, we randomly assigned 4744 patients with New York Heart Association class II, III, or IV heart failure and an ejection fraction of 40% or less to receive either dapagliflozin (at a dose of 10 mg once daily) or placebo, in addition to recommended therapy. The primary outcome was a composite of worsening heart failure (hospitalization or an urgent visit resulting in intravenous therapy for heart failure) or cardiovascular death.



Bénéfice chez les patients avec une insuffisance cardiaque ?

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	Dapagliflozin (N = 2373)	Placebo (N = 2371)
Age — yr	66.2±11.0	66.5±10.8
Female sex — no. (%)	564 (23.8)	545 (23.0)
Body-mass index†	28.2±6.0	28.1±5.9
Heart rate — beats/min	71.5±11.6	71.5±11.8
Systolic blood pressure — mm Hg	122.0±16.3	121.6±16.3
Left ventricular ejection fraction — %	31.2±6.7	30.9±6.9
Median NT-proBNP (IQR) — pg/ml	1428 (857–2655)	1446 (857–2641)
Principal cause of heart failure — no. (%)		
Ischemic	1316 (55.5)	1358 (57.3)
Nonischemic	857 (36.1)	830 (35.0)
Unknown	200 (8.4)	183 (7.7)
Medical history — no. (%)		
Hospitalization for heart failure	1124 (47.4)	1127 (47.5)
Atrial fibrillation	916 (38.6)	902 (38.0)
Diabetes mellitus‡	993 (41.8)	990 (41.8)
Estimated GFR		
Mean — ml/min/1.73 m ²	66.0±19.6	65.5±19.3
Rate of <60 ml/min/1.73 m ² — no./total no. (%)	962/2372 (40.6)	964/2371 (40.7)
Device therapy — no. (%)		
Implantable cardioverter–defibrillator¶	622 (26.2)	620 (26.1)
Cardiac resynchronization therapy	190 (8.0)	164 (6.9)



Dapagliflozine et insuffisance cardiaque

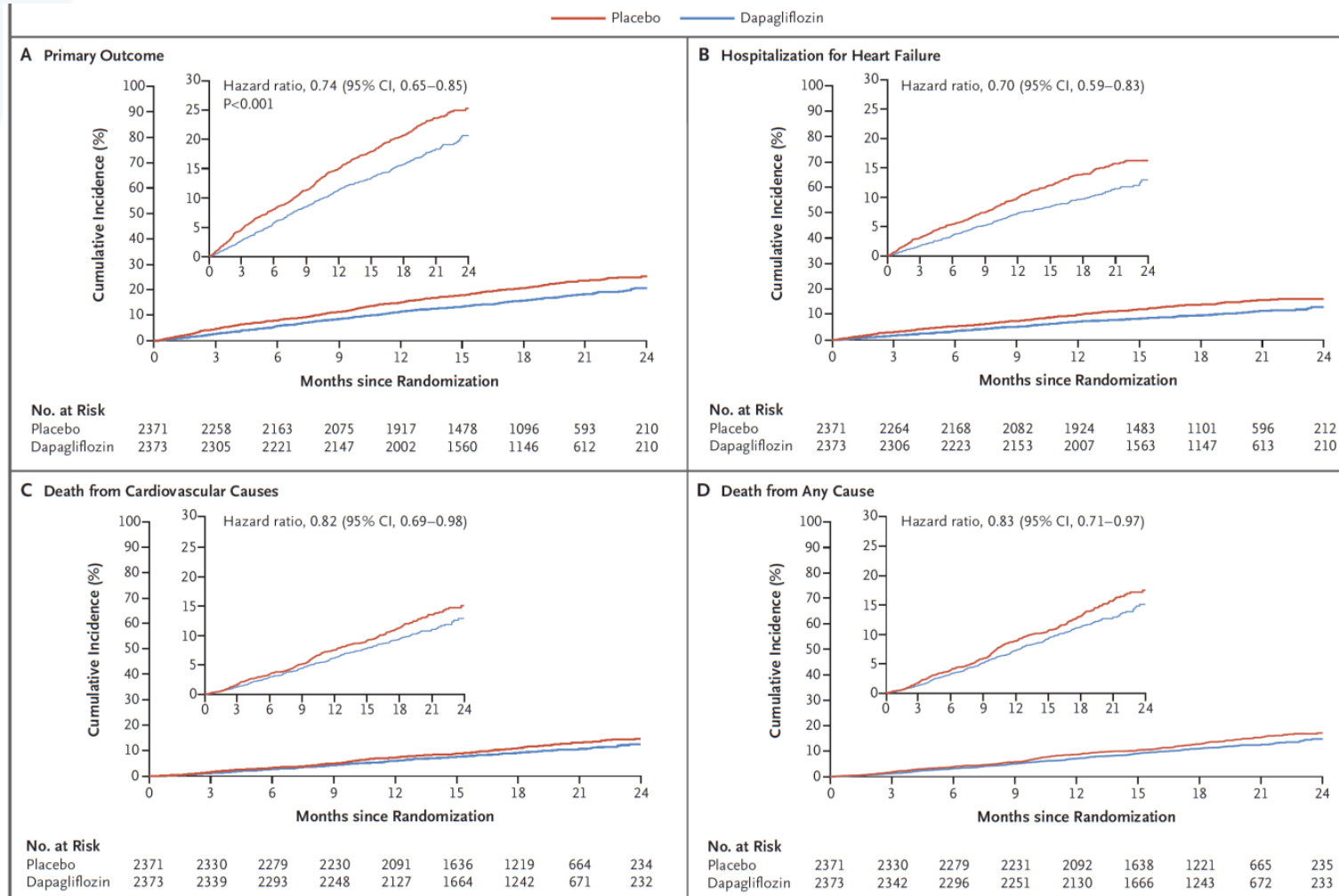
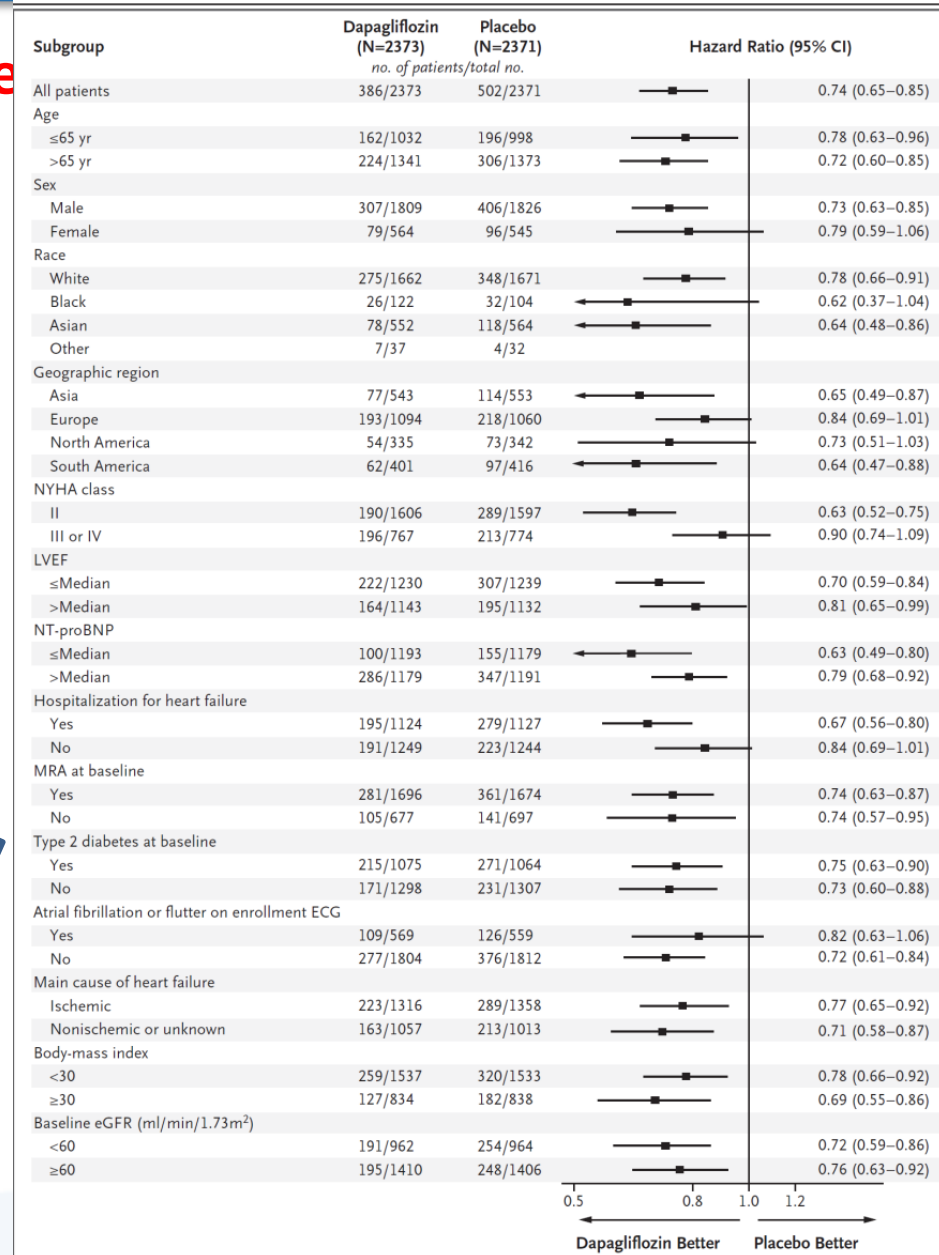


Figure 2. Cardiovascular Outcomes.

The primary outcome was a composite of death from cardiovascular causes, hospitalization for heart failure, or an urgent visit resulting in intravenous therapy for heart failure (Panel A). The cumulative incidences of the primary outcome, hospitalization for heart failure (Panel B), death from cardiovascular causes (Panel C), and death from any cause (Panel D) were estimated with the use of the Kaplan–Meier method; hazard ratios and 95% confidence intervals were estimated with the use of Cox regression models, stratified according to diabetes status, with a history of hospitalization for heart failure and treatment-group assignment as explanatory variables. Included in these analyses are all the patients who had undergone randomization. The graphs are truncated at 24 months (the point at which less than 10% of patients remained at risk). The inset in each panel shows the same data on an enlarged y axis.

Dapagliflozine et insuffisance



Dapagliflozine et insuffisance cardiaque

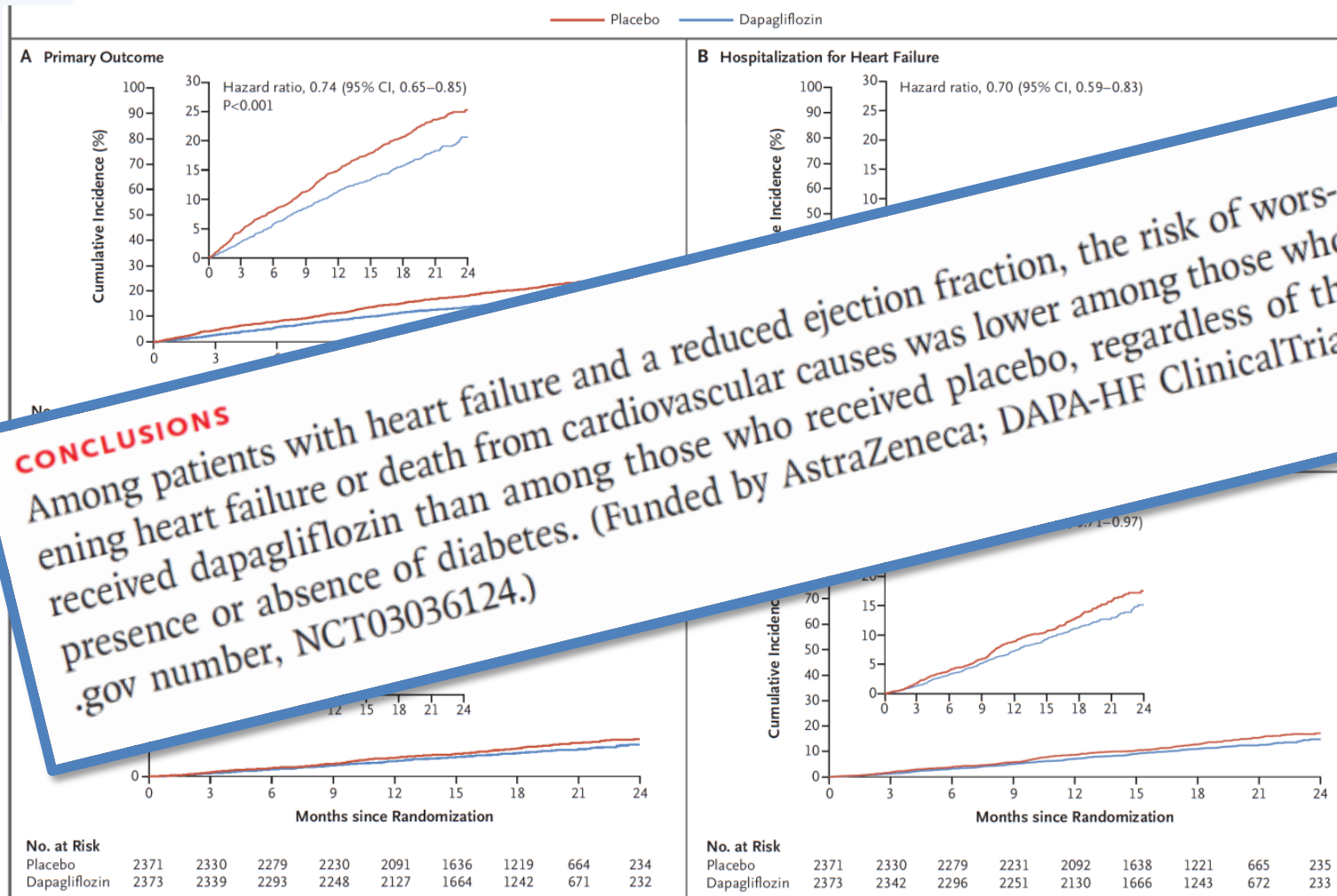


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Recommandations ESC 2019 diabète :

Glucose-lowering treatment

Empagliflozin, canagliflozin, or dapagliflozin are recommended in patients with T2DM and CVD or at very high/high CV risk to reduce CV events

Empagliflozin is recommended in patients with T2DM and CVD to reduce the risk of death

DM treatment to reduce HF risk

SGLT2 inhibitors (empagliflozin, canagliflozin, and dapagliflozin) are recommended to lower risk of HF hospitalization if eGFR >30 mL/min/1.73 m²

Management of CKD

SGLT2 inhibitors are recommended to reduce progression of diabetic kidney disease



En pratique:

Effets secondaires:

- Hypotension (cfr deshydratation)
- infections urinaires et/ou génitales: essentiellement des femmes (de l'ordre de 10 à 15 % en moyenne). moins de 5% des sujets masculins.
- infections mycotiques génitales: entre moins de 1 % et 10 % des patient(e)s.

Interactions médicamenteuses:

- **Diurétiques** !, risque de déshydratation, hypotension
- Adapter les doses !



En pratique:

Contre indication:

- Diabète de type 1
- Acido cétose diabétique.
- Atteinte sévère de la fonction rénale
- Insuffisance rénale terminale
- Patient en dialyse



Conclusion

- Nouvelle classe d'antidiabétique oraux avec un mode d'action unique: action « glucorétique », liée au niveau de glycémie
- Effet positif sur la mortalité cardiovasculaire et l'insuffisance cardiaque chez les patients diabétiques à haut risque cardiovasculaire ou avec atteinte cardiovasculaire.
- Mais: effet positif également sur la survenue d'épisode d'insuffisance cardiaque et la mortalité cardiovasculaire chez les patients avec une altération de la fonction VG qu'ils soient diabétique ou non !



Conclusion

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Nouveau traitement de l'insuffisance cardiaque !!!!





*Merci pour
votre attention*