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Lékařská fakulta
Univerzita Palackého v Olomouci

KOMPLEXNÍ KARDIOVASKULÁRNÍ CENTRUM
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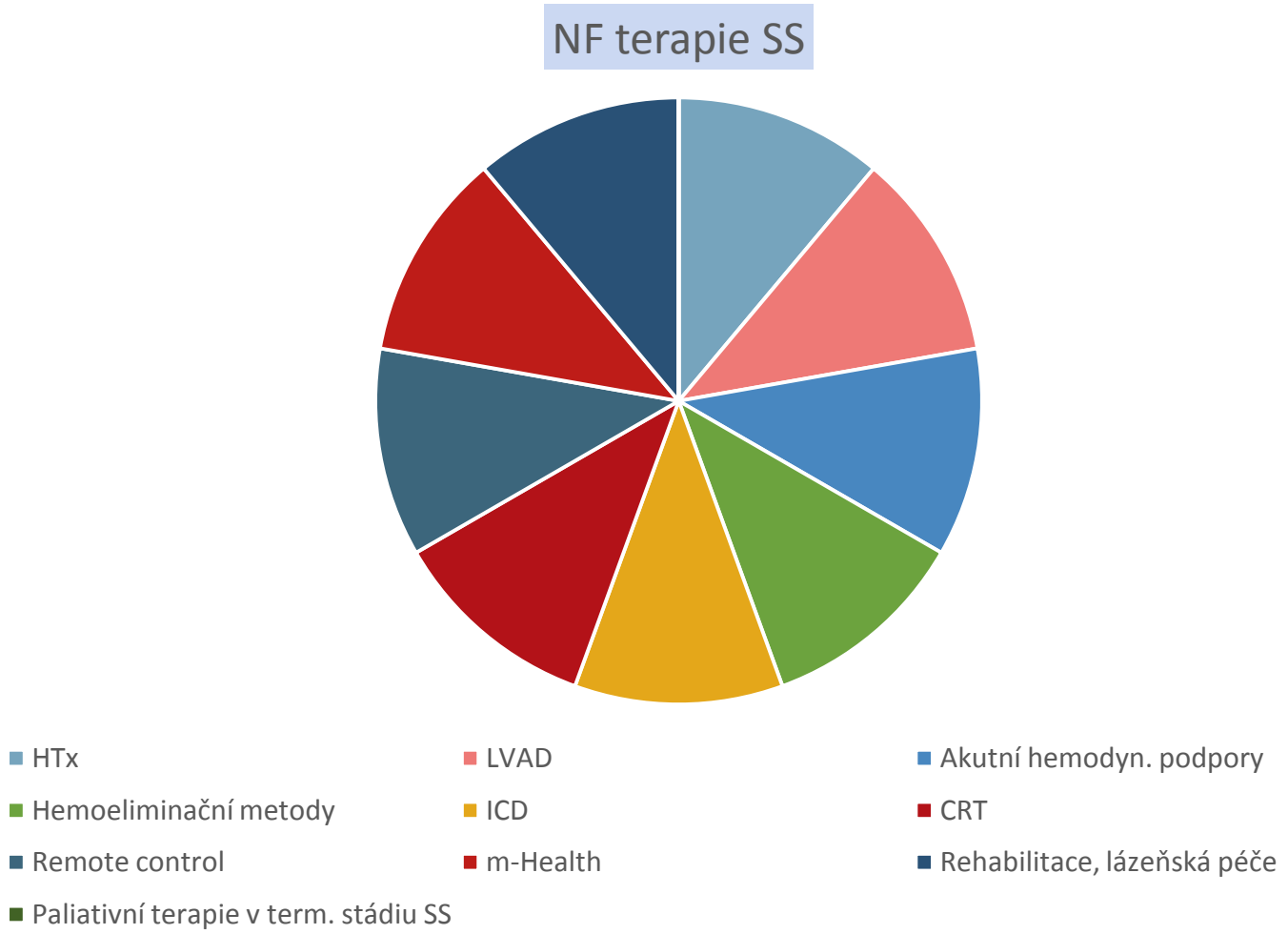
Současné trendy nefarmakologické léčby srdečního selhání:

Miloš Táborský

XXV. Výroční sjezd ČKS

Brno, 7.5.2017

Spektrum nefarmakologické léčby srdečního selhání



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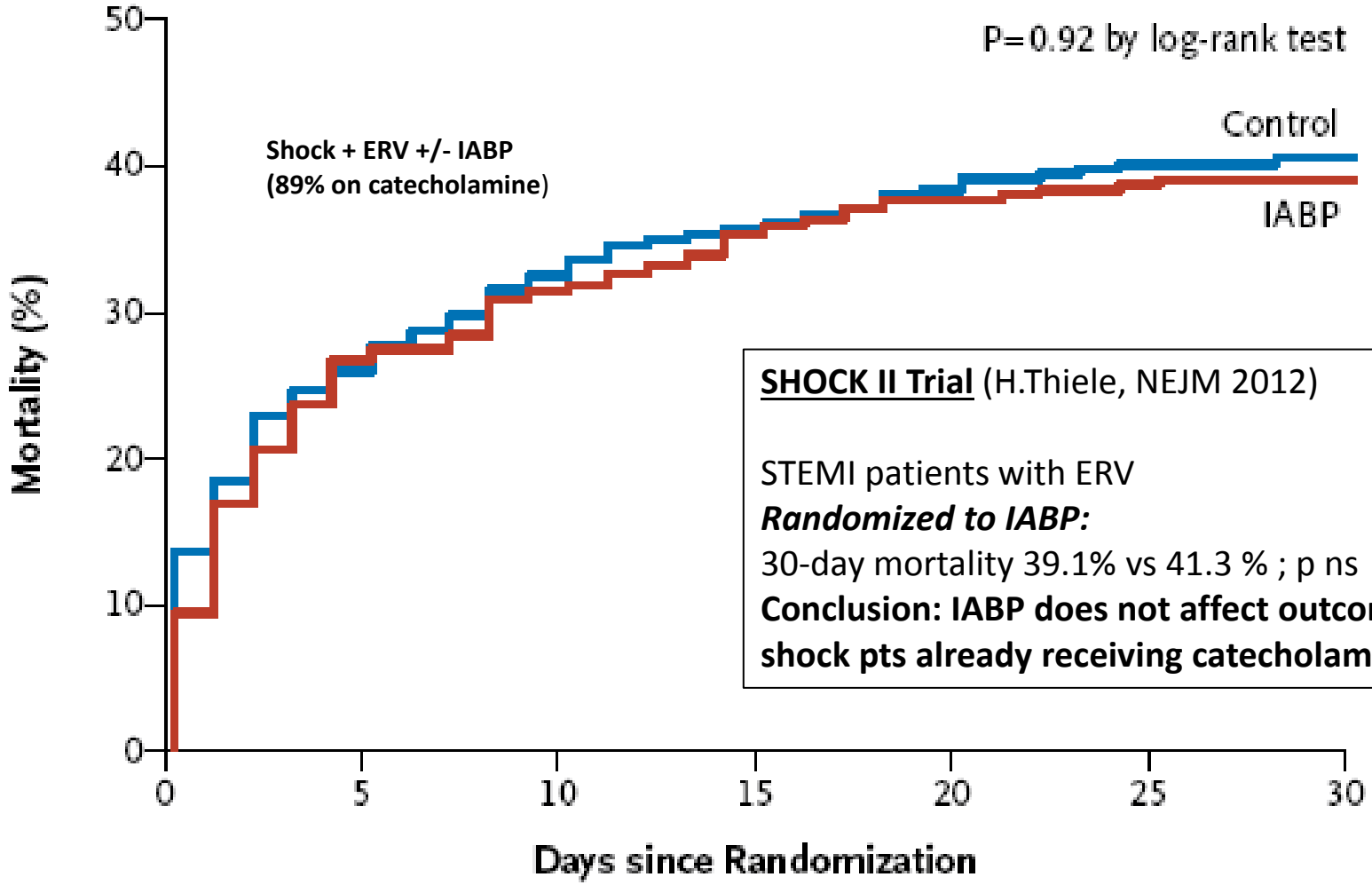
I: Akutní hemodynamické podpory

Racionále

- Přibývá pacientů s potřebou okamžité hemodynamické stabilizace v akutní fázi KV onemocnění
- Jsou k dispozici vědecká data a koncenzuální stanovisko odborných společností
- Významný pokrok technologií – přechod od chirurgických k endovazálním technikám zavádění HP

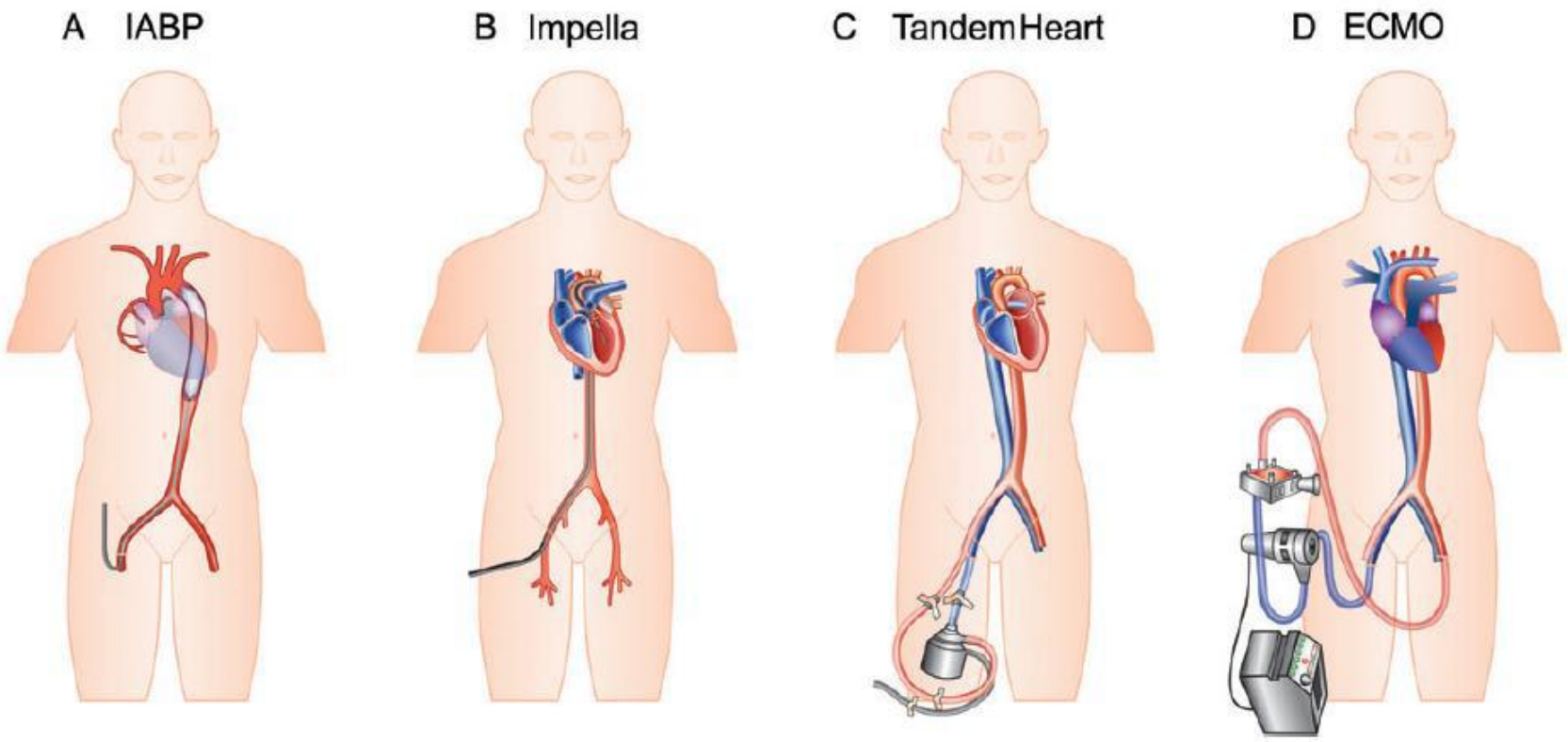
IABP: Kontroverzní indikace v současné době



SHOCK II Trial (H.Thiele, NEJM 2012)

STEMI patients with ERV
Randomized to IABP:
30-day mortality 39.1% vs 41.3 % ; p ns
Conclusion: IABP does not affect outcomes in shock pts already receiving catecholamines

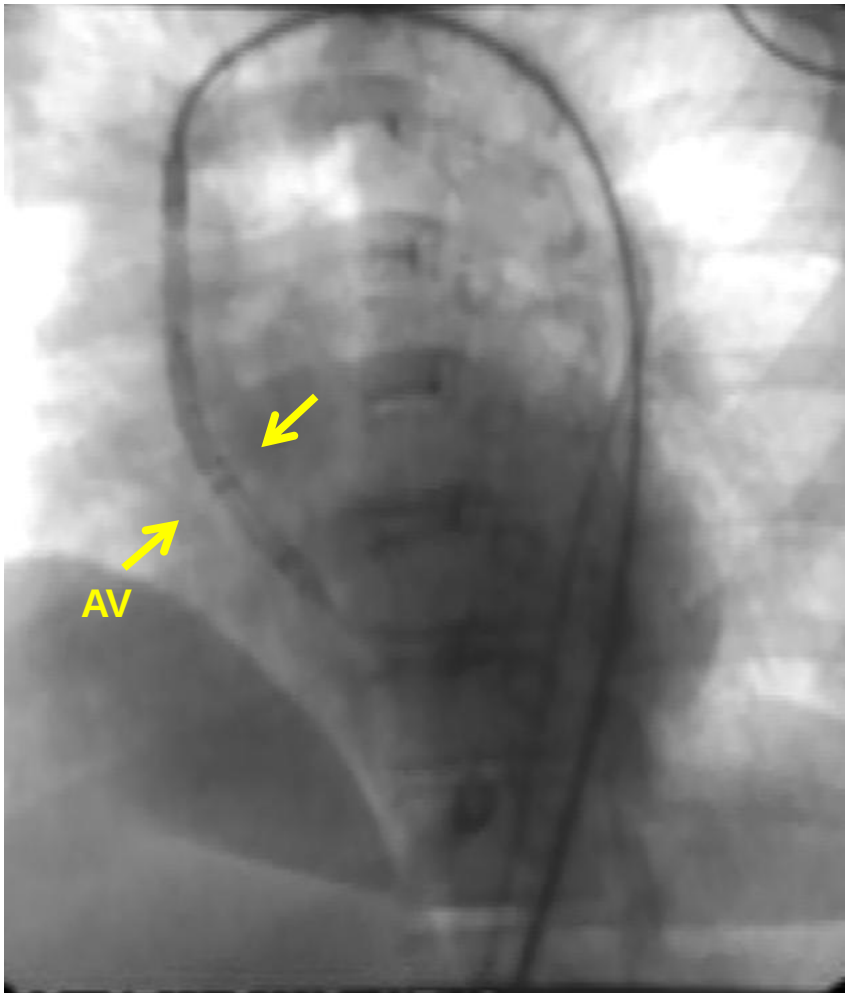
Současné krátkodobé perkutánní mechanické srdeční podpory

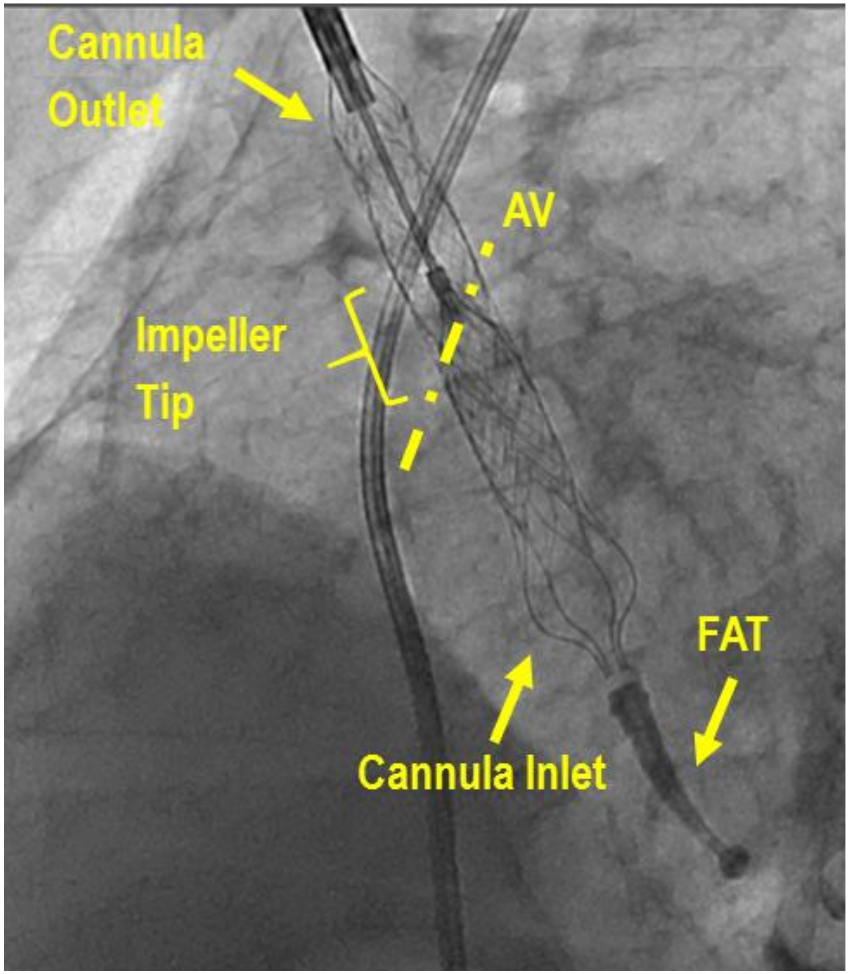


Jak účinná a bezpečná může být léčba perkutánními MSP

	Impella 2.5™	Impella CP®	Impella 5.0™	Impella LD™
Avg max flow rate (L/m)	2.5	3.5	5.0	5.0
Circulatory Support	Partial	Partial	High-flow	High-flow
Catheter size	9 Fr	9 Fr	9 Fr	9 Fr
Pump size	12 Fr	14 Fr	21 Fr	21 Fr
Insertion method	Percutaneous via introducer sheath	Percutaneous via introducer sheath	Peripheral via arterial cut-down	Direct, surgical insertion
Guidewire thickness	0.018”	0.018”	0.018”	N/A
Placement measurement	Fluid-filled pressure lumen	Fluid-filled pressure lumen	Differential pressure sensor	Differential pressure sensor
Cannula geometry	Curved, Pigtail	Curved, Pigtail	Curved, Pigtail	Straight

Současné krátkodobé perkutánní mechanické srdeční podpory II





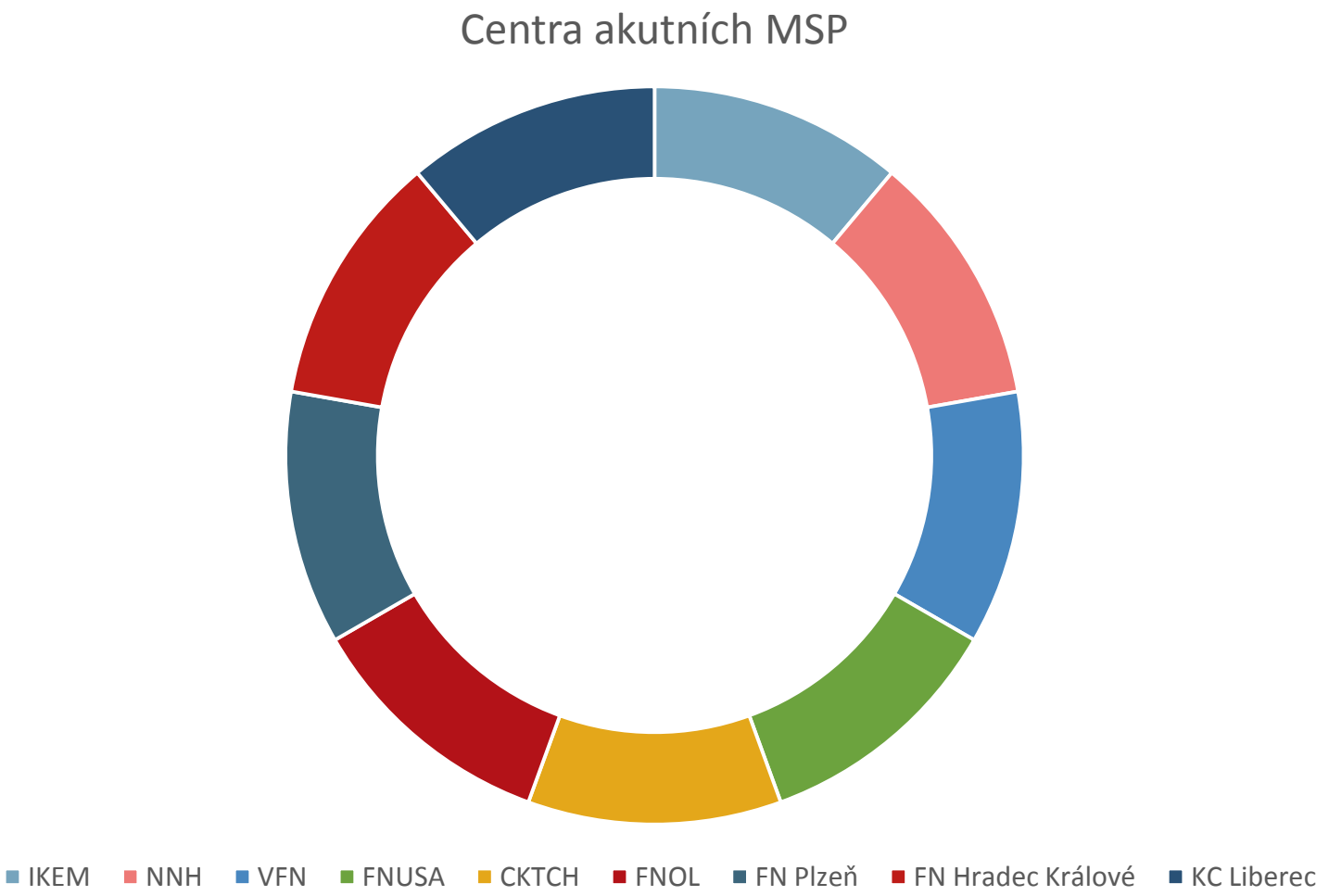
Stanoviska odborných společností

1. Centra pro oběhovou zástavu

2. Centra hemodynamických podpor
   platí:
   - **trvalé MSP: pouze transplantační centra**, péče o pacienty s MSP může být vedena ve special. ambulancích srdečního selhání regionálně

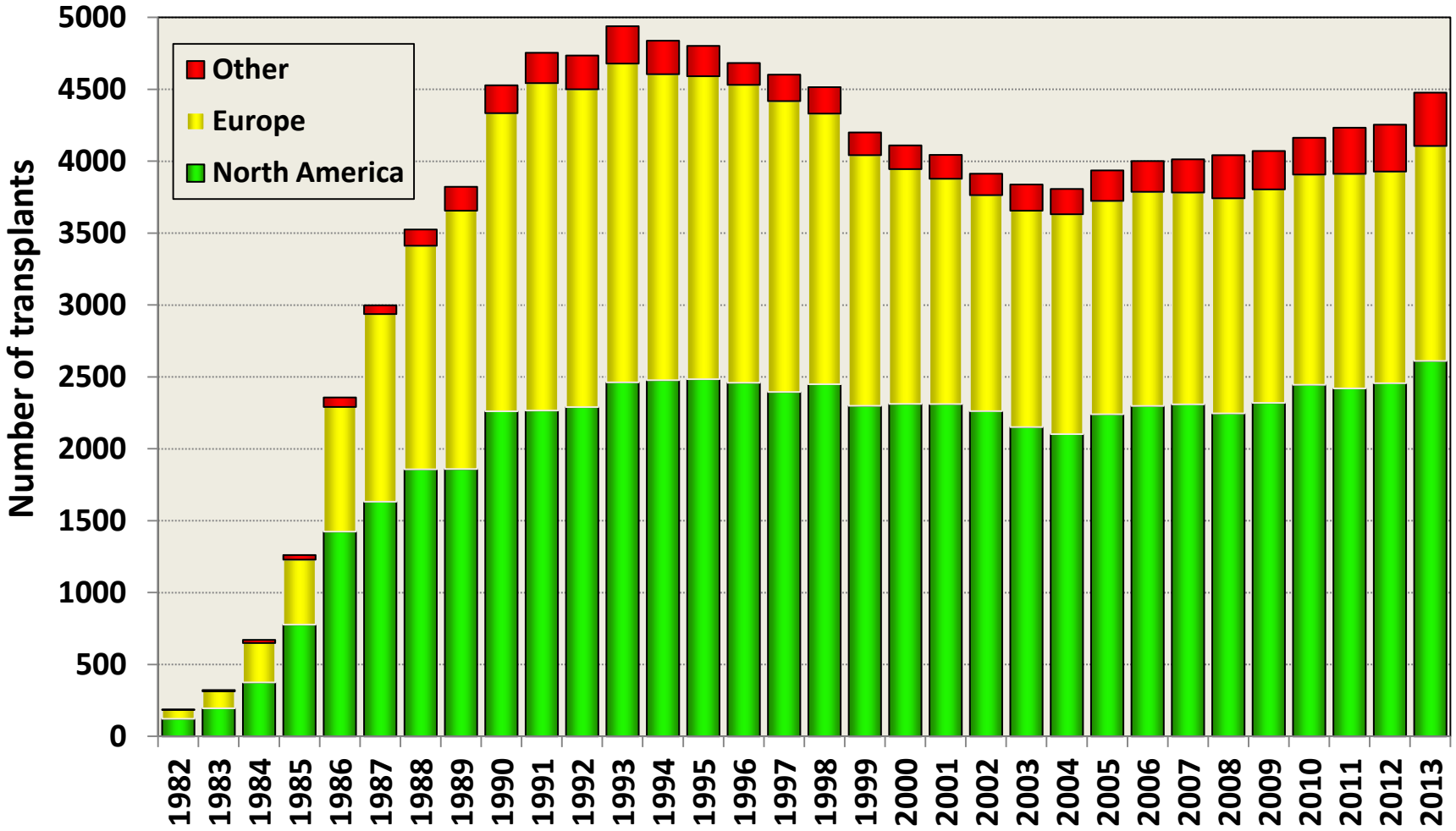
   - **dočasné MSP:** definovaná centra = princip kontrolované centrové péče

Návrh center akutních perkutánních MSP

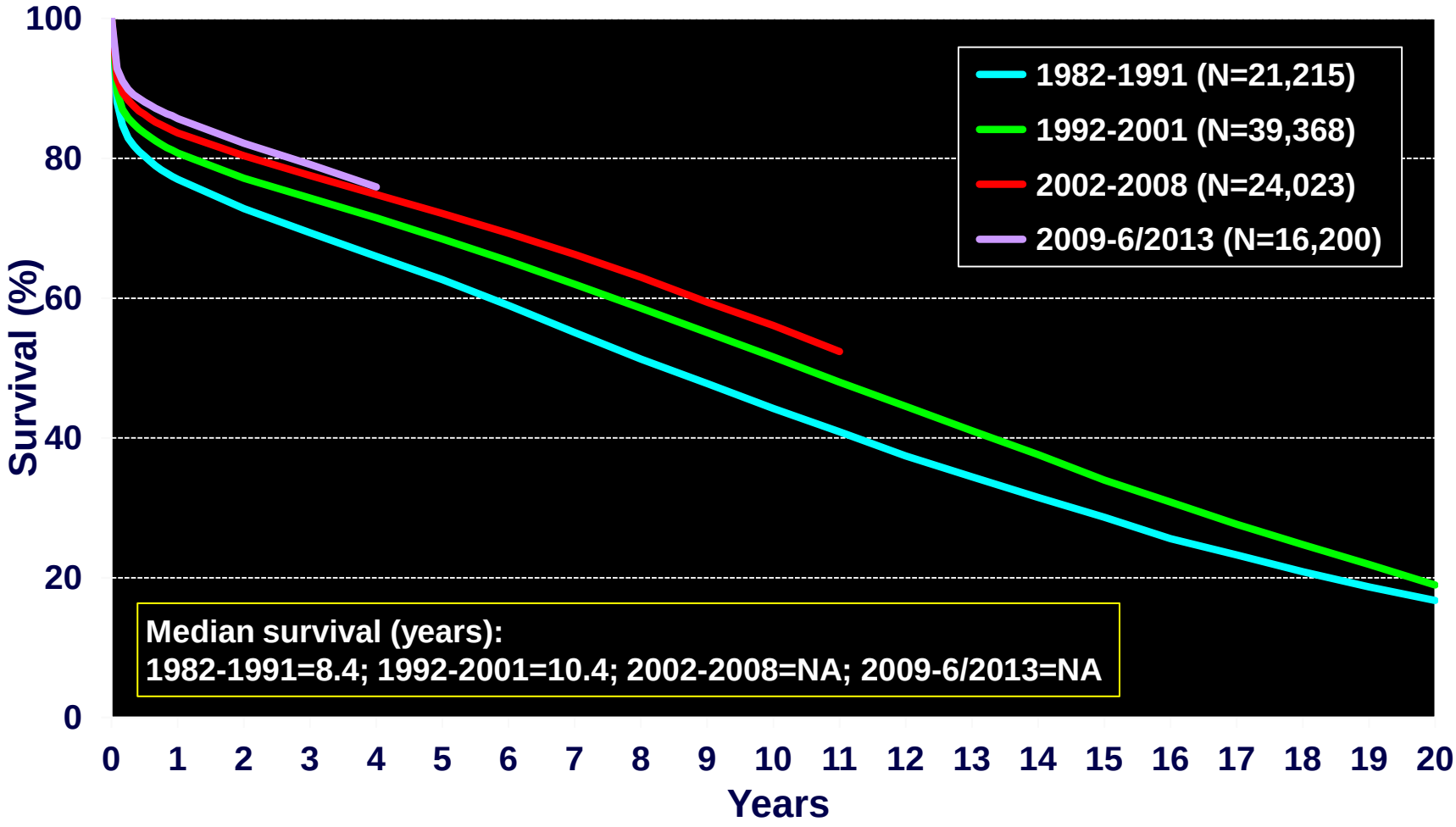


II: Srdeční transplantace

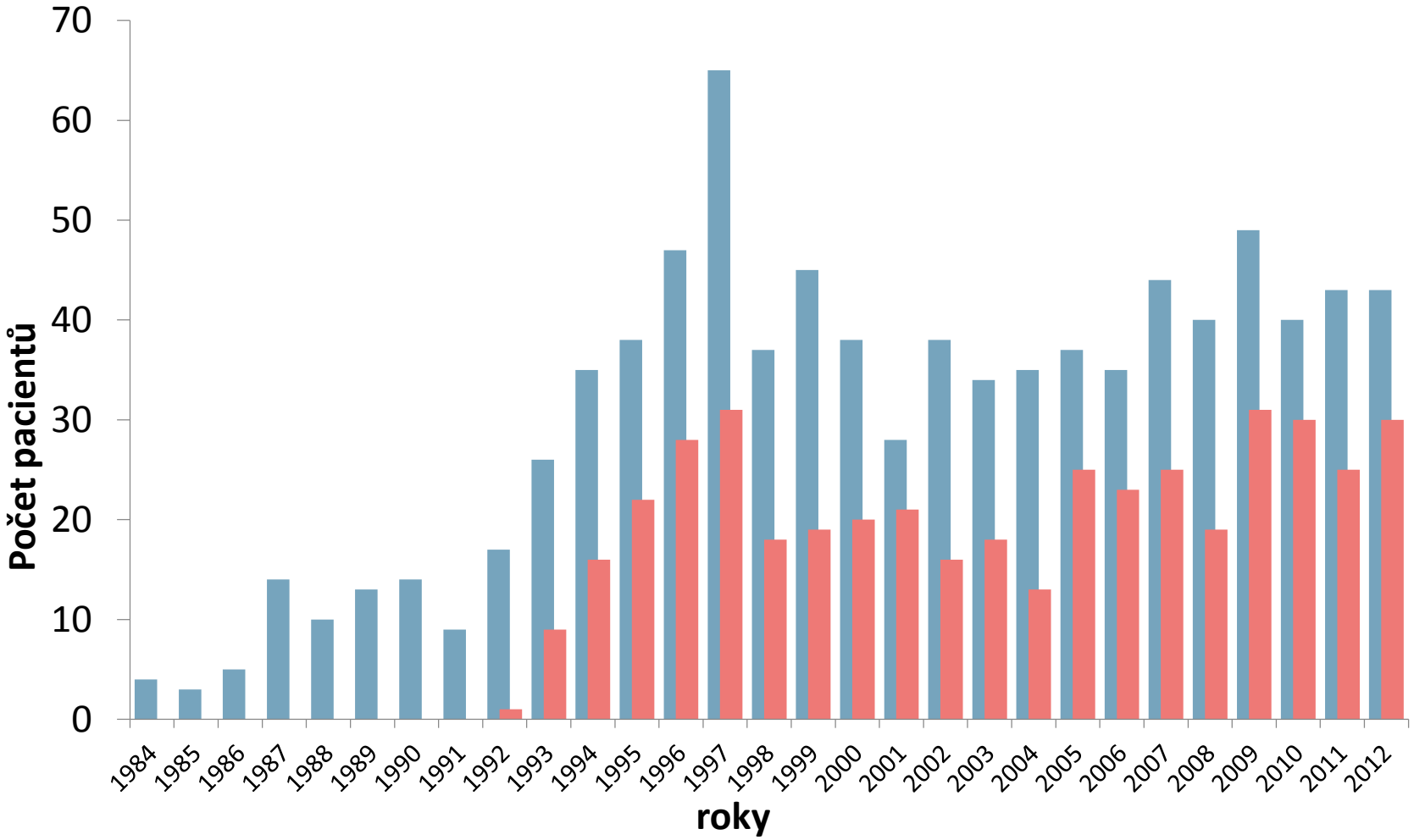
International Society for Heart and Lung Transplantation (počty transplantací)



International Society for Heart and Lung Transplantation (přežívání)



Transplantace srdce v ČR



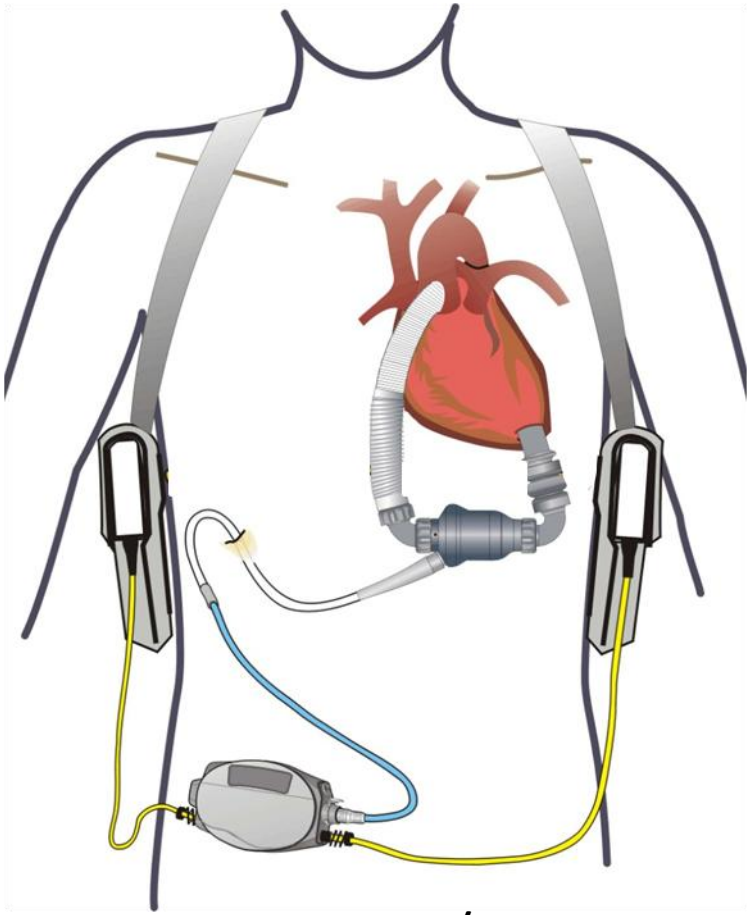
Koordinační středisko transplantací, MZ ČR, 2013

III: Dlouhodobé hemodynamické podpory

Program srdečních podpor v ČR

- experimentální práce - 70. léta (prof. Vašků, Brno)
- rozvoj transplantačního programu v 90.letech
- pokles počtu transplantací na přelomu tisíciletí
- zvyšující se mortalita na čekací listině
- program přemostění k transplantaci srdce zahájen **3. 4. 2003**
- **2 centra: IKEM a CKTCH Brno**

2 HTx centra – 2 různé technologie



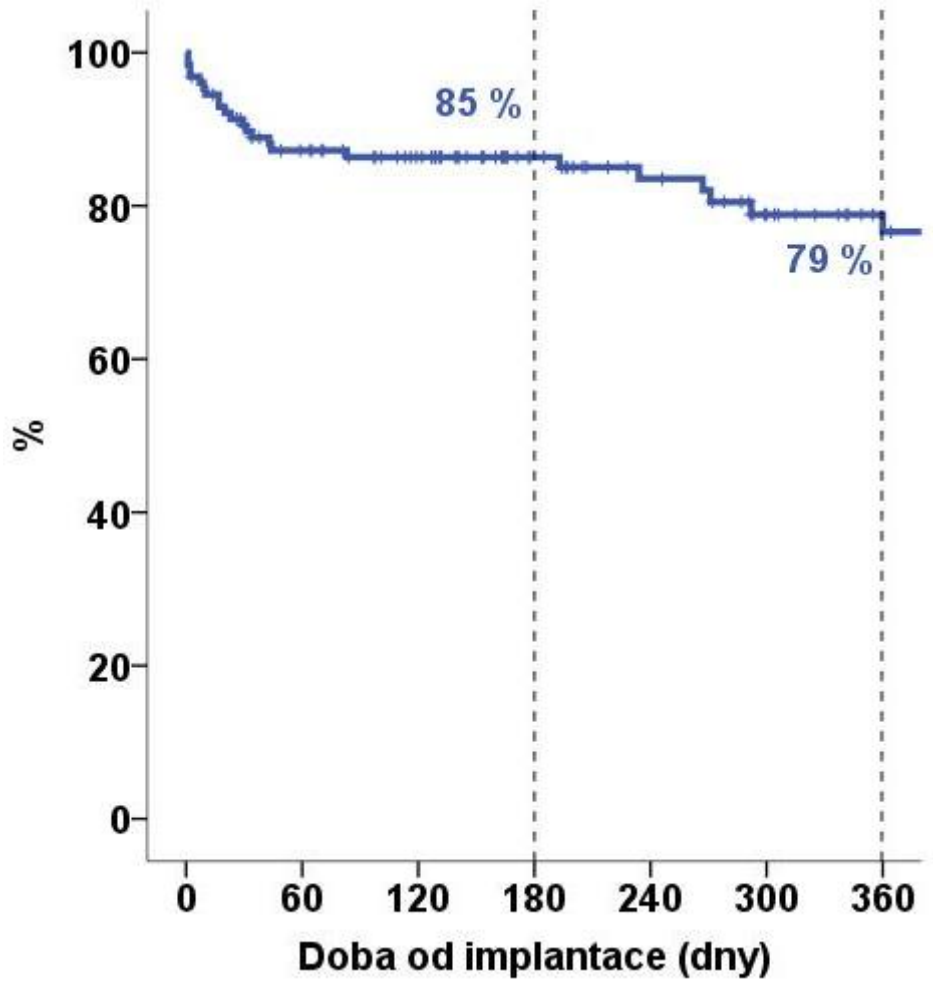
HeartMate II/III

Heartware MVAD

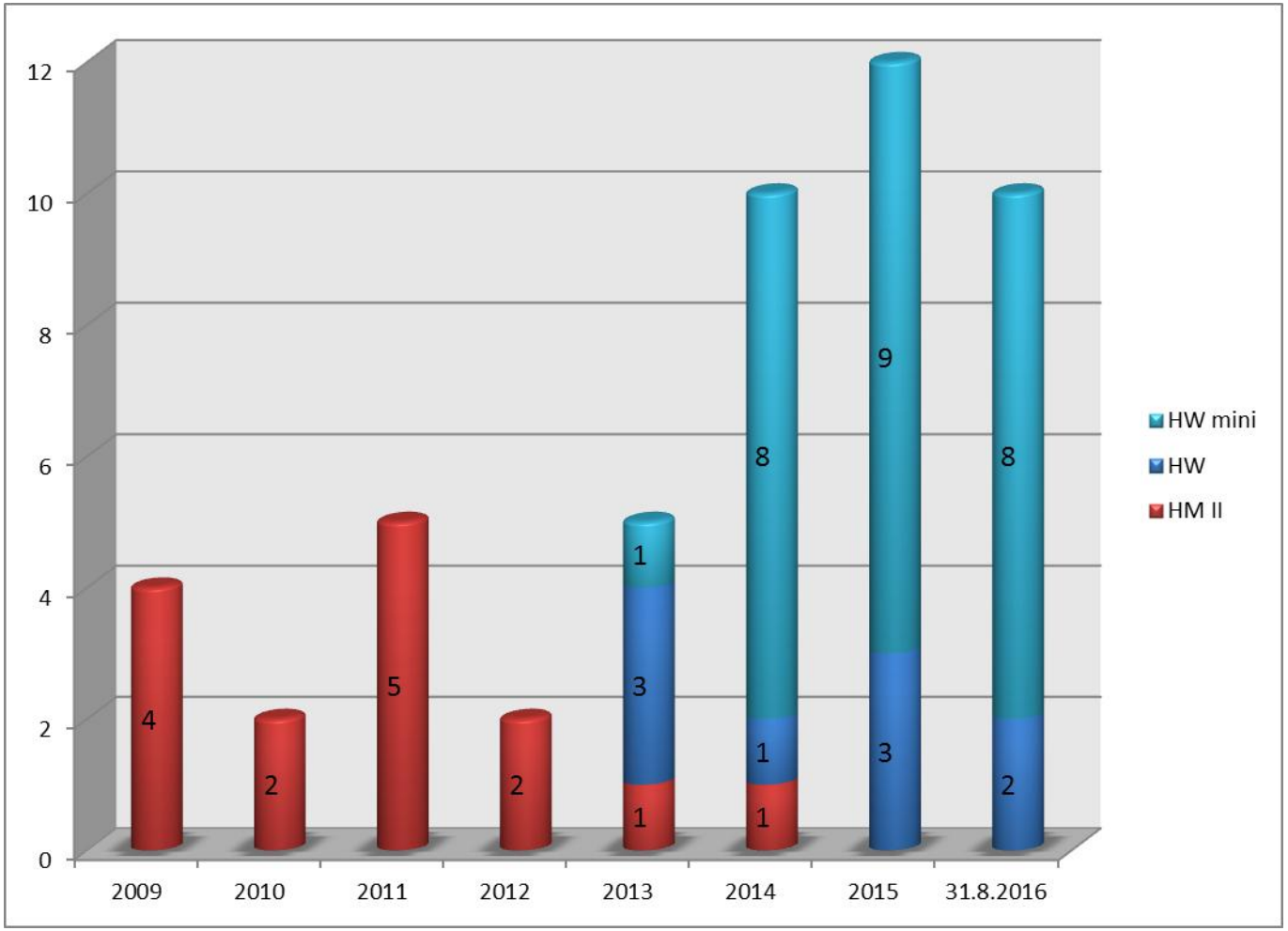
Charakteristika souboru nemocných IKEM (2006 - 2015)

	N = 183
Muži/ženy	148/35
Věk (roky)	49 (15-71)
Srdeční index (l/min/m^2)	1,9 ± 0,40
Inotropika (%)	92,5
NYHA IV (%)	88,1
EF levé komory (%)	19 ± 6
EF pravé komory (%)	30 ± 6

Přežívání po implantaci MSP (IKEM)

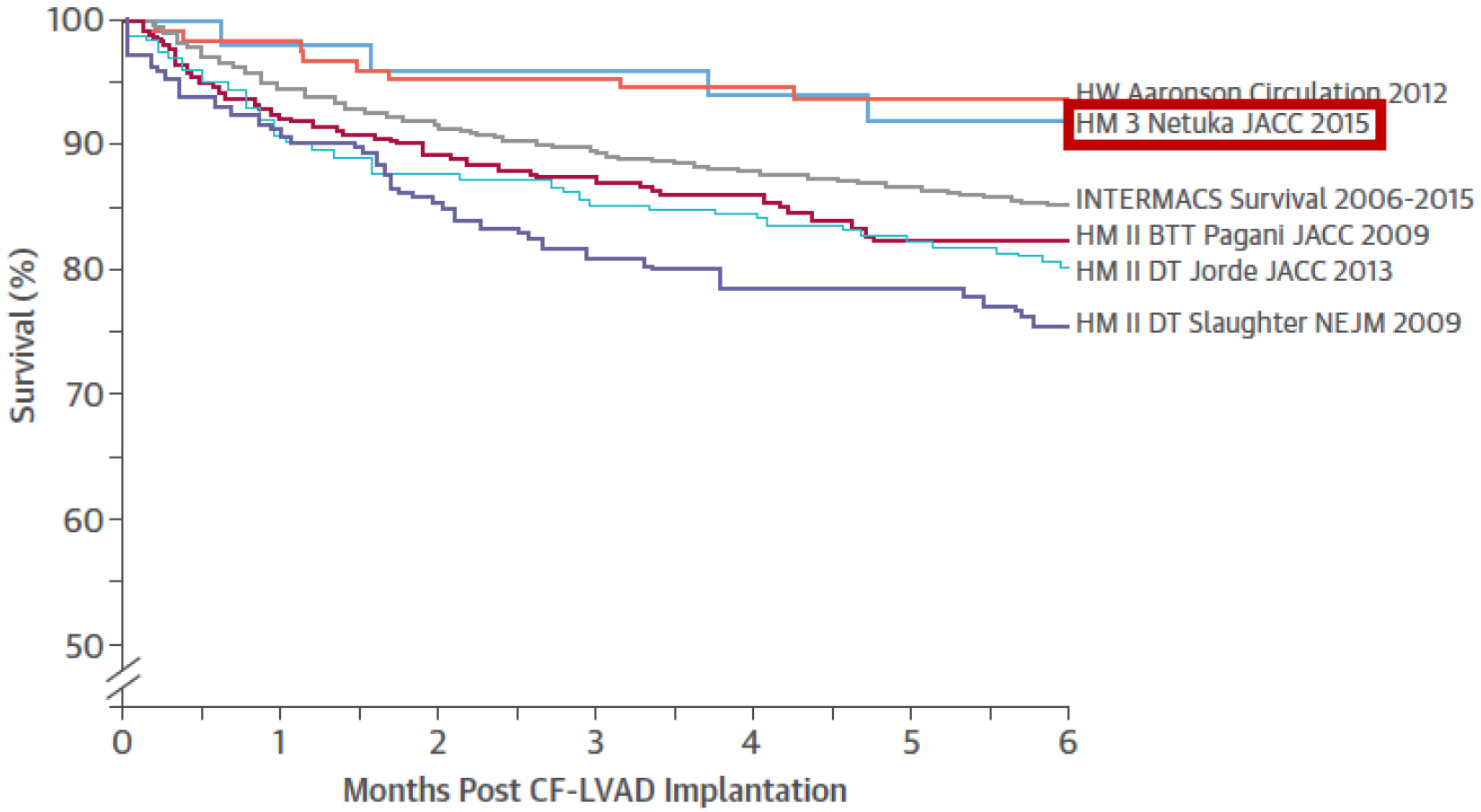


Výsledky ISP CKTCH Brno

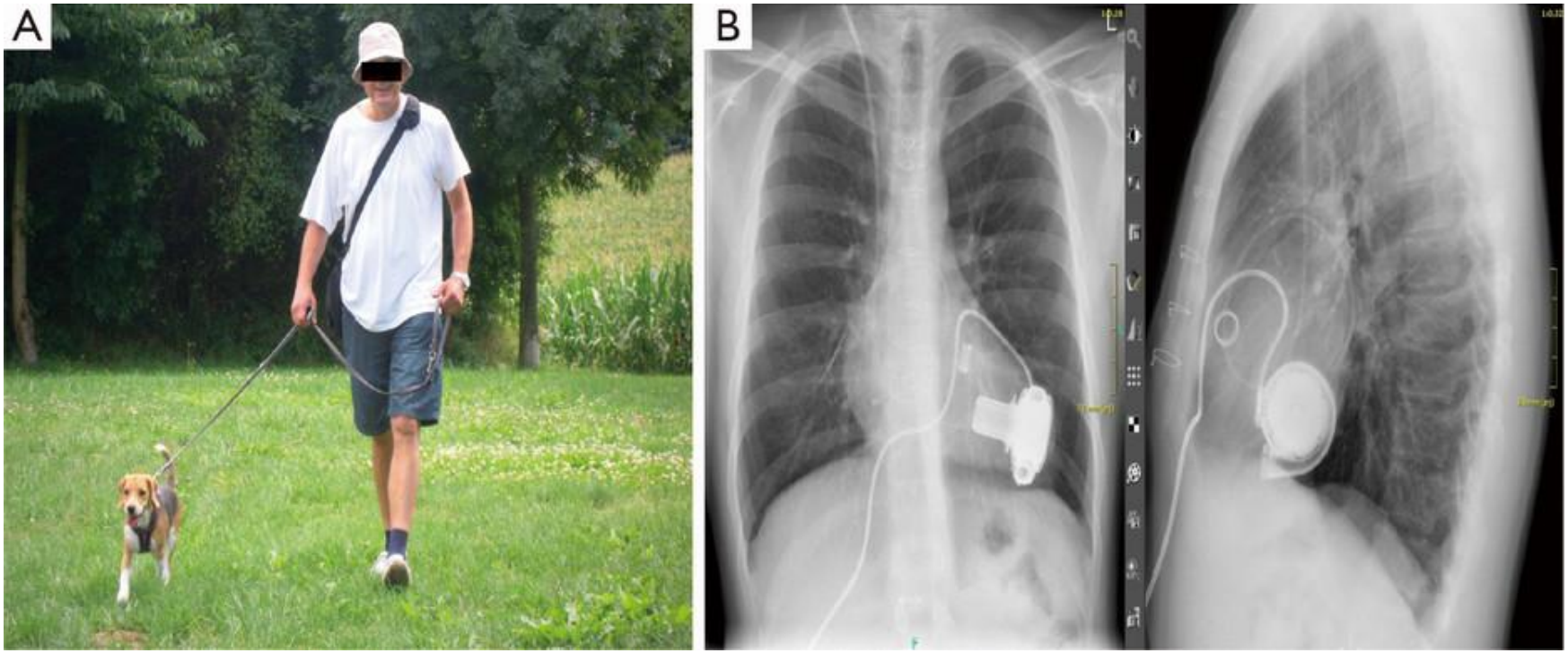


Zdroj: P. Němec, CKTCH Brno

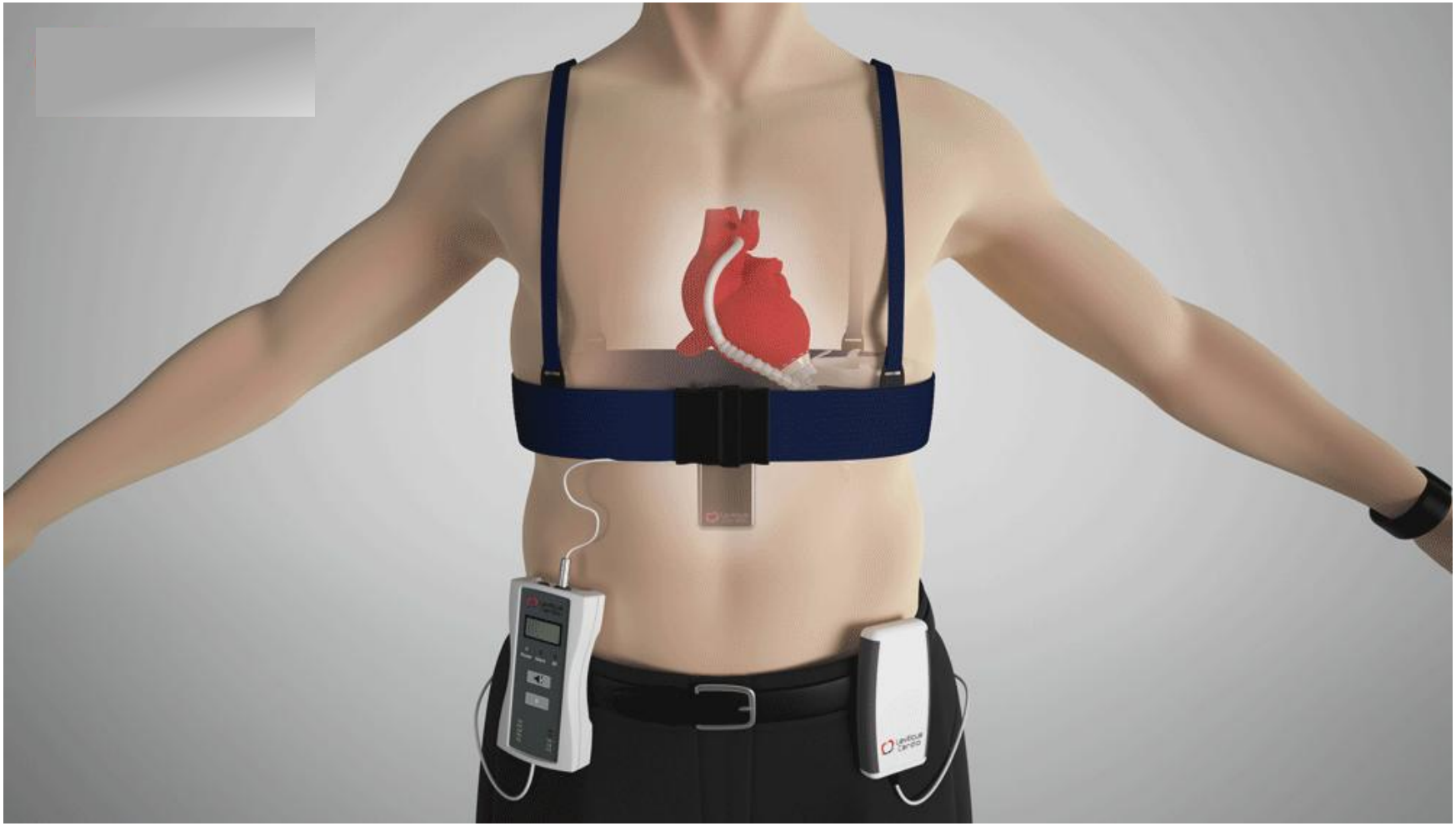
Destinační terapie: Nový trend NF léčby SS



Současnost ISP



Budoucnost ISP



Bezdrátové technologie

IV: Srdeční resynchronizační léčba

Pozor: Změna v indikačních kritériích CRT – ESC 2016

Recommendations	Class [a]	Level [b]	Ref [c]
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	A	261–272
CRT should be considered for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIa	B	261–272
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	B	266, 273
CRT may be considered for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIb	B	266, 273
CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class who have an indication for ventricular pacing and high degree AV block in order to reduce morbidity. This includes patients with AF (see Section 10.1).	I	A	274–277
CRT should be considered for patients with LVEF ≤35% in NYHA Class III–IV[d] despite OMT in order to improve symptoms and reduce morbidity and mortality, if they are in AF and have a QRS duration ≥130 msec provided a strategy to ensure bi-ventricular capture is in place or the patient is expected to return to sinus rhythm.	IIa	B	275, 278–281
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	B	282
CRT is contra-indicated in patients with a QRS duration < 130 msec.	III	A	266, 283–285

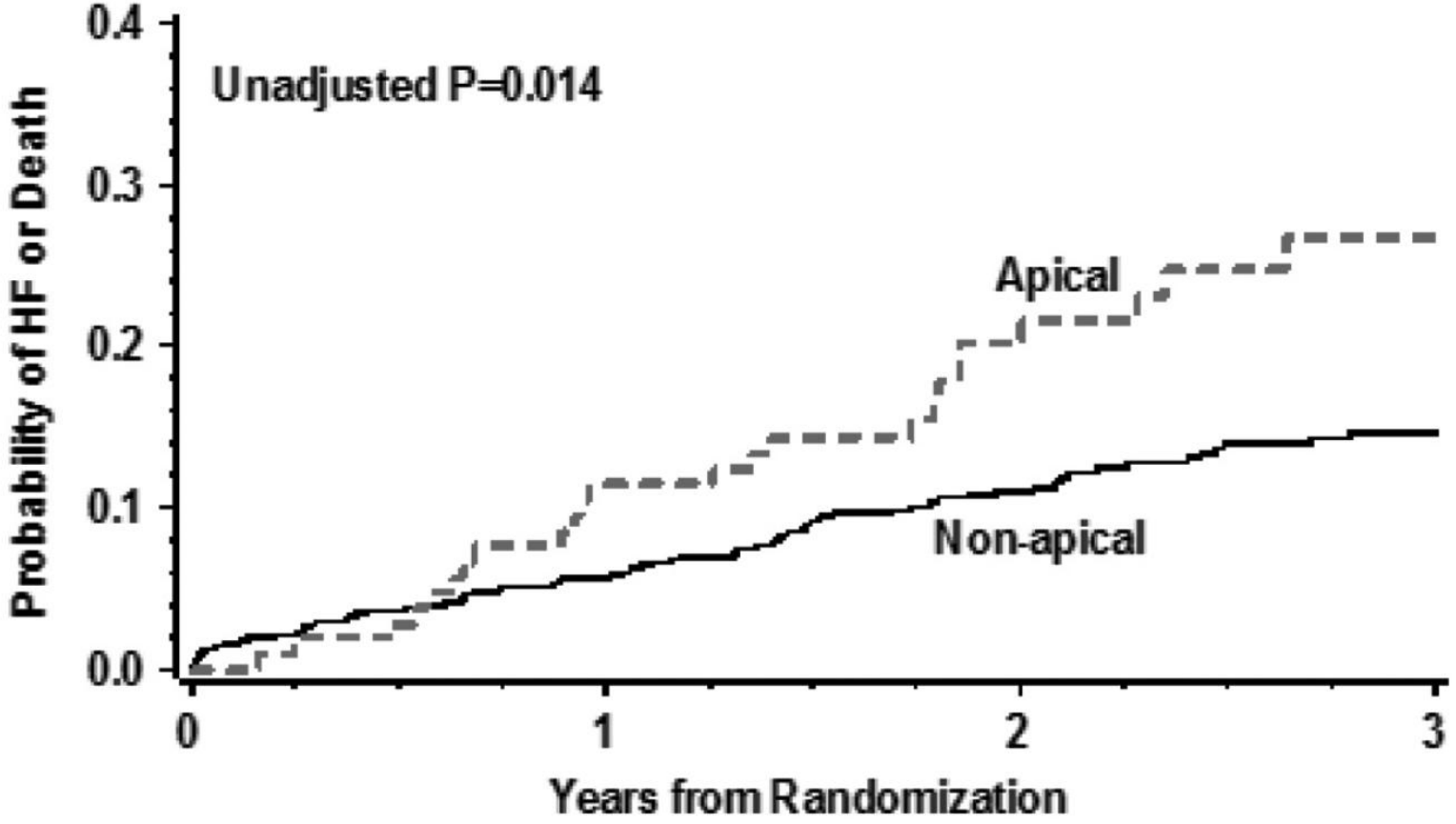
European Heart Journal (2016) 37, 2129–2200
doi:10.1093/eurheartj/ehw128

Pts/substates/outcomes changes after 20 years of CRT

- Therapy o CAD/AMI – PCI 95 % in EU → dif. substrates
- HF therapy (sacubitril/valsartan…), early detection, special HF programs…
- DM therapy - In DM 2 population, those who received thiazolidinediones (TZDs or glitazones) or dipeptidyl peptidase-4 (DPP-4) inhibitors (gliptins) alone or in combination therapy had a lower risk of heart failure, cardiovascular disease, and all-cause mortality compared with those who did not receive these drugs x a number of controversies…
- Are the results of the pioneer CRT studies is still valid today?

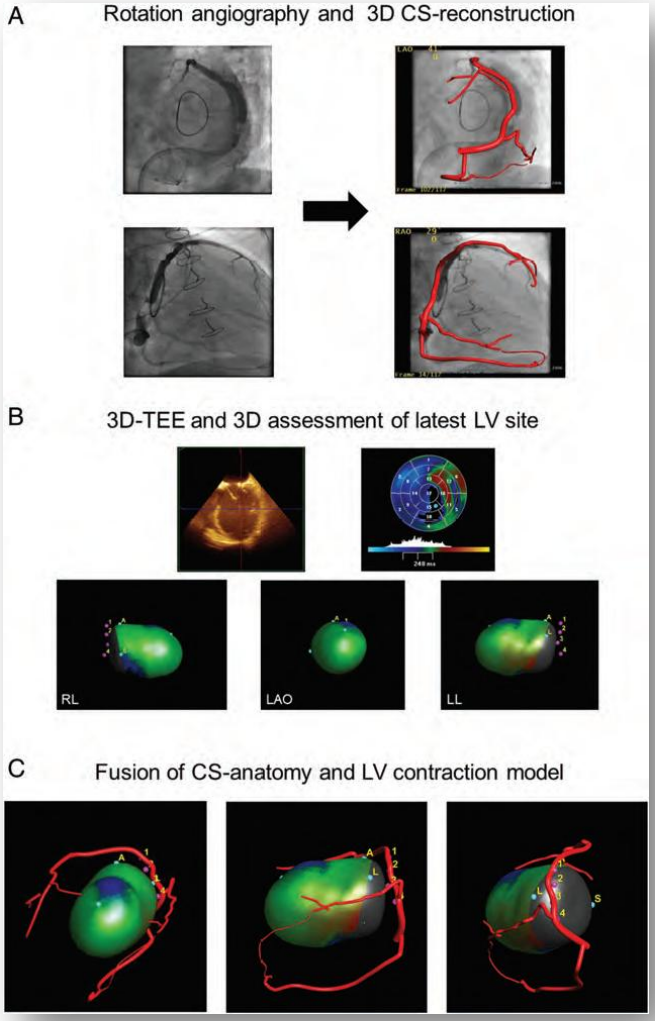
Hippisley-Cox J. BMJ 2016;354:i3477

Preferably avoid the LV apical location (MADIT CRT)



Singh J P: Circulation. 2011;123:1159-1166

Individually tailored LV lead placement

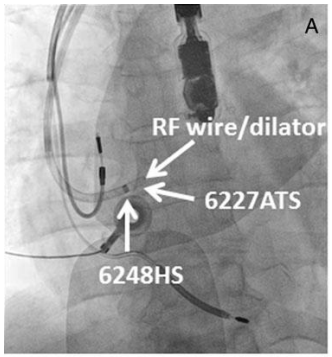


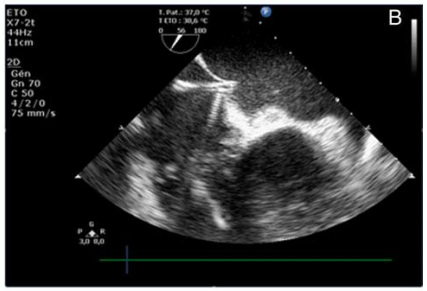
Results:

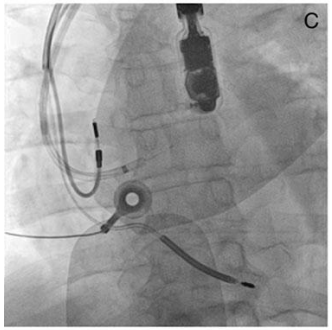
- In 36 of 37 (97%) patients an appropriate target vein was identified and successful
- Implantation could be performed in 34 of 37 (92%) patients.
- Among those patients clinical and echocardiographic response was observed in 91% and 81%, respectively.

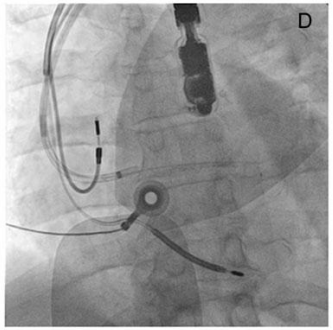
Döring M. Europace (2013) 15, 718–727, doi:10.1093/europace/eus396

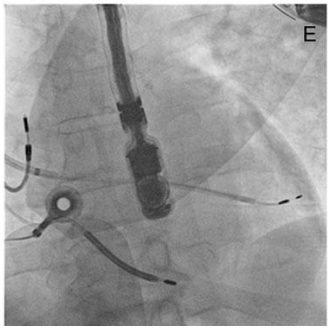
CRT: LV endocardial pacing

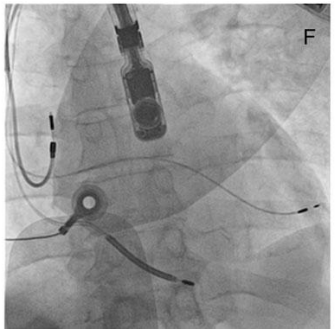


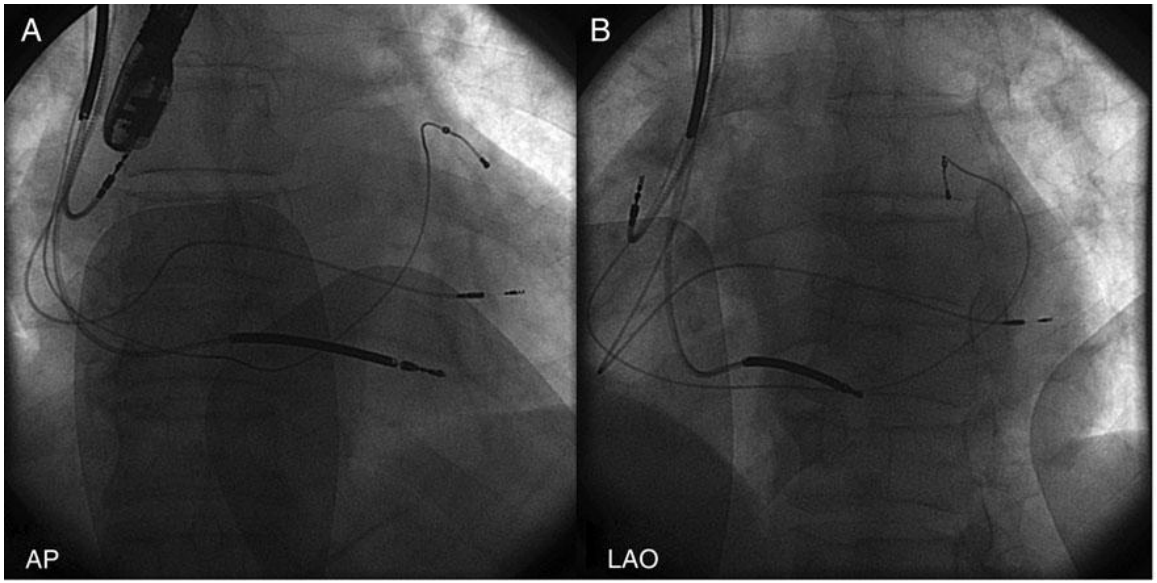












Morgan J.M. European Heart Journal (2016) 37, 2118–2127
doi:10.1093/eurheartj/ehv723

Faculty of Medicine
and Dentistry
Palacky University Olomouc

DEPARTMENT OF INTERNAL
MEDICINE I – CARDIOLOGY
UNIVERSITY HOSPITAL OLOMOUC

SELECT –LV Study

Cardiac Resynchronization Therapy With Wireless Left Ventricular Endocardial Pacing

The SELECT-LV Study

Vivek Y. Reddy, MD,[a] Marc A. Miller, MD,[a] Petr Neuzil, MD,[b] Peter Søgaard, MD,[c] Christian Butter, MD,[d] Martin Seifert, MD,[d] Peter Paul Delnoy, MD,[e] Lieselot van Erven, MD,[f] Martin Schalji, MD,[f] Lucas V.A. Boersma, MD,[g] Sam Riahi, MD, PhD[c]

ABSTRACT

BACKGROUND A total of 30% to 40% of patients with congestive heart failure eligible for cardiac resynchronization therapy (CRT) either do not respond to conventional CRT or remain untreated due to an inability or impediment to coronary sinus (CS) lead implantation. The WiSE-CRT system (EBR Systems, Sunnyvale, California) was developed to address this at-risk patient population by performing biventricular pacing via a wireless left ventricular (LV) endocardial pacing electrode.

OBJECTIVES The SELECT-LV (Safety and Performance of Electrodes implanted in the Left Ventricle) study is a prospective multicenter non-randomized trial assessing the safety and performance of the WiSE-CRT system.

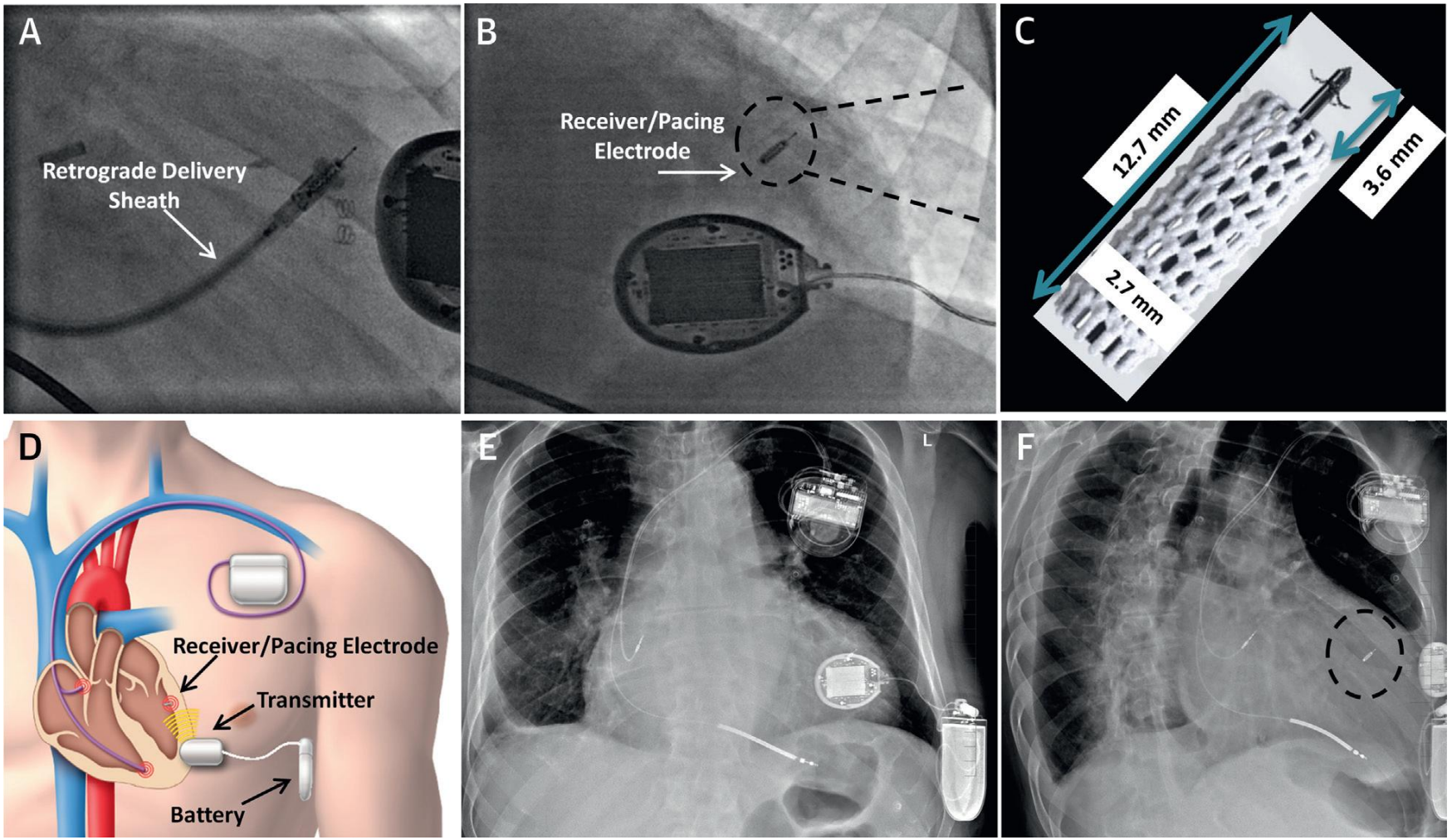
METHODS A total of 35 patients indicated for CRT who had "failed" conventional CRT underwent implantation of an LV endocardial pacing electrode and a subcutaneous pulse generator. System performance, clinical efficacy, and safety events were assessed out to 6 months post-implant.

RESULTS The procedure was successful in 97.1% (n = 34) of attempted implants. The most common indications for endocardial LV pacing were difficult CS anatomy (n =12), failure to respond to conventional CRT (n = 10), and a high CS pacing threshold or phrenic nerve capture (n = 5). The primary performance endpoint, biventricular pacing on the 12-lead electrocardiogram at 1 month, was achieved in 33 of 34 patients. A total of 28 patients (84.8%) had improvement in the clinical composite score at 6 months, and 21 (66%) demonstrated a positive echocardiographic CRT response (≥5% absolute increase in LV ejection fraction). There were no pericardial effusions, but serious procedure/device-related events occurred in 3 patients (8.6%) within 24 h, and 8 patients (22.9%) between 24 h and 1 month.

CONCLUSIONS The SELECT-LV study demonstrates the clinical feasibility for the WiSE-CRT system, and provided clinical benefits to a majority of patients within an otherwise "failed" CRT population. (Safety and Performance of Electrodes Implanted in the Left Ventricle [SELECT-LV]; NCT01905670) (J Am Coll Cardiol 2017;69:2119–29)

Reddy V.Y. J Am Coll Cardiol 2017;69:2119–29

Wireless Endocardial Left Ventricular Pacing



(A and B) *Fluoroscopic images of the retrograde delivery sheath and pacing electrode engaged into the myocardium and following deployment.* ***(C)*** *Photograph and dimensions of the pacing electrode.* ***(D to F)*** *Schematic representations of the implanted system and posteroanterior/lateral chest x-rays the day after implant. The* ***dashed line*** *encircles the receiver/pacing electrode.*

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I. INTERNÍ KLINIKA KARDIOLOGICKÁ
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Clinical Efficacy Endpoints and Response to CRT

Parameter	Baseline	6 Months	Change	p Value	Response Definition	Response Rate at 6 Months (%)
LVESV, ml (n = 25)	183.8 ± 62.9	157.0 ± 75.7	−26.8 ± 45.1	0.007	≥15% relative reduction	52
LVEDV, ml (n = 25)	243.1 ± 70.7	222.4 ± 77.0	−20.6 ± 41.5	0.02	≥10% relative reduction	40
LVEF, % (n = 32)	25.9 ± 6.4	33.0 ± 10.3	+7.1 ± 8.0	<0.0001	≥5% absolute increase	66
NYHA functional class I/II/III/IV	3/24/73/0	24/67/3/6	+0.8 ± 0.8		≥1 class improvement	67
Global assessment			Markedly improved: 42.4% Moderately improved: 27.3% Mild improvement: 6.1% No change: 15.2% Slightly worse: 0.0% Moderately worse: 3.0% Markedly worse: 6.1%		Markedly or moderately improved	70

Values are mean ± SD or %.
LVEDV = left ventricular end-diastolic volume; LVESV = left ventricular end-systolic volume; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association

Device- or Procedure-Related Adverse Events (n = 35)

<24 h	3 (8.6%)
VF during catheter contact with LV endocardium	1
Electrode embolization to lower extremity	1
Femoral artery fistula (required surgical repair)	1
24 h to 1 month	8 (22.3)
Acute CVA (AF noncompliant with anticoagulation)	1
Femoral pseudoaneurysm	2
Pocket hematoma (generator)	1
Suspected infection (generator site)	3
Death (following VF during initial implant procedure)	1
1 to 6 months	3 (8.6)
Defective transmitter circuitry	3

Values are n (%) or n.
AF = atrial fibrillation; CVA = cerebrovascular accident; LV = left ventricular; VF = ventricular fibrillation.

V: ICD indikace u srdečního selhání

ESC guidelines 2016:

Recommendations	Class [a]	Level [b]	Ref [c]
Secondary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for >1 year with good functional status.	I	A	223–226
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 one year with good functional status, and they have:			
• IHD (unless they have had an MI in the prior 40 days – see below).	I	A	149, 156, 227
• DCM.	I	B	156, 157, 227
ICD implantation is not recommended within 40 days of an MI as implantation at this time does not improve prognosis.	III	A	158, 228
ICD therapy is not recommended in patients in NYHA Class IV with severe symptoms refractory to pharmacological therapy unless they are candidates for CRT, a ventricular assist device, or cardiac transplantation.	III	C	229–233
Patients should be carefully evaluated by an experienced cardiologist before generator replacement, because management goals and the patient's needs and clinical status may have changed.	IIa	B	234–238
A wearable ICD may be considered for patients with HF who are at risk of sudden cardiac death for a limited period or as a bridge to an implanted device.	IIb	C	239–241

European Heart Journal (2016) 37, 2129–2200
doi:10.1093/eurheartj/ehw128

DANISH Study: Blesk z čistého nebe

Defibrillator Implantation in Patients with Nonischemic Systolic Heart Failure

Lars Køber, M.D., D.M.Sc., Jens J. Thune, M.D., Ph.D., Jens C. Nielsen, M.D., D.M.Sc., Jens Haarbo, M.D., D.M.Sc., Lars Videbæk, M.D., Ph.D., Eva Korup, M.D., Ph.D., Gunnar Jensen, M.D., Ph.D., Per Hildebrandt, M.D., D.M.Sc., Flemming H. Steffensen, M.D., Niels E. Bruun, M.D., D.M.Sc., Hans Eiskjær, M.D., D.M.Sc., Axel Brandes, M.D., Anna M. Thøgersen, M.D., Ph.D., Finn Gustafsson, M.D., D.M.Sc., Kenneth Egstrup, M.D., D.M.Sc., Regitze Videbæk, M.D., Christian Hassager, M.D., D.M.Sc., Jesper H. Svendsen, M.D., D.M.Sc., Dan E. Høfsten, M.D., Ph.D., Christian Torp-Pedersen, M.D., D.M.Sc., and Steen Pehrson, M.D., D.M.Sc., for the DANISH Investigators*

ABSTRACT

BACKGROUND

The benefit of an implantable cardioverter–defibrillator (ICD) in patients with symptomatic systolic heart failure caused by coronary artery disease has been well documented. However, the evidence for a benefit of prophylactic ICDs in patients with systolic heart failure that is not due to coronary artery disease has been based primarily on subgroup analyses. The management of heart failure has improved since the landmark ICD trials, and many patients now receive cardiac resynchronization therapy (CRT).

METHODS

In a randomized, controlled trial, 556 patients with symptomatic systolic heart failure (left ventricular ejection fraction, ≤35%) not caused by coronary artery disease were assigned to receive an ICD, and 560 patients were assigned to receive usual clinical care (control group). In both groups, 58% of the patients received CRT. The primary outcome of the trial was death from any cause. The secondary outcomes were sudden cardiac death and cardiovascular death.

RESULTS

After a median follow-up period of 67.6 months, the primary outcome had occurred in 120 patients (21.6%) in the ICD group and in 131 patients (23.4%) in the control group (hazard ratio, 0.87; 95% confidence interval [CI], 0.68 to 1.12; P=0.28). Sudden cardiac death occurred in 24 patients (4.3%) in the ICD group and in 46 patients (8.2%) in the control group (hazard ratio, 0.50; 95% CI, 0.31 to 0.82; P=0.005). Device infection occurred in 27 patients (4.9%) in the ICD group and in 20 patients (3.6%) in the control group (P=0.29).

CONCLUSIONS

In this trial, prophylactic ICD implantation in patients with symptomatic systolic heart failure not caused by coronary artery disease was not associated with a significantly lower long-term rate of death from any cause than was usual clinical care. (Funded by Medtronic and others; DANISH ClinicalTrials.gov number, NCT00542945.)

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*A complete list of investigators in the Danish Study to Assess the Efficacy of ICDs in Patients with Non-ischemic Systolic Heart Failure on Mortality (DANISH) is provided in the Supplementary Appendix, available at NEJM.org.

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I. INTERNÍ KLINIKA KARDIOLOGICKÁ
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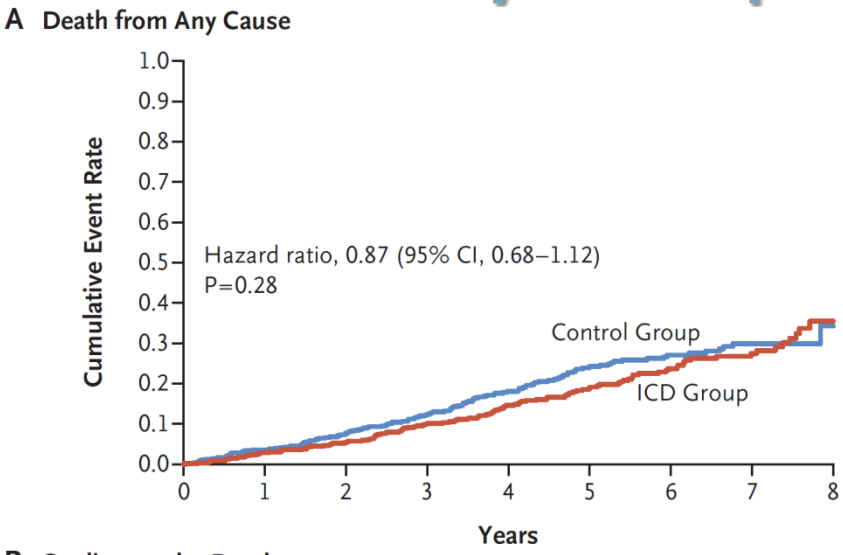
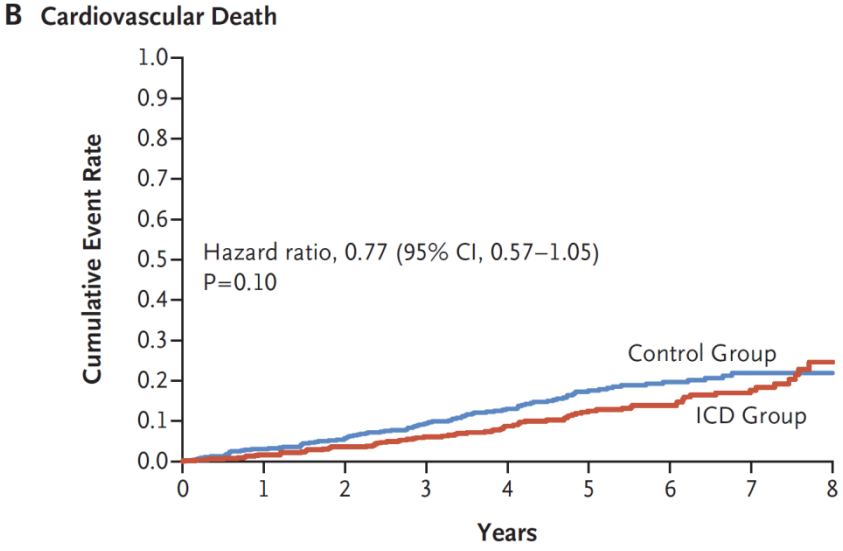
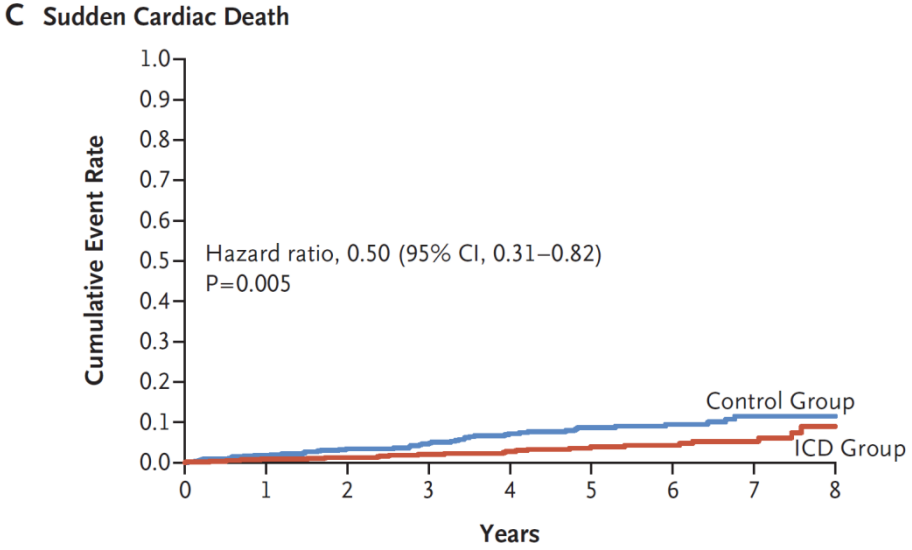
DANISH Study: ICD u pacientů s neischemickou KMP

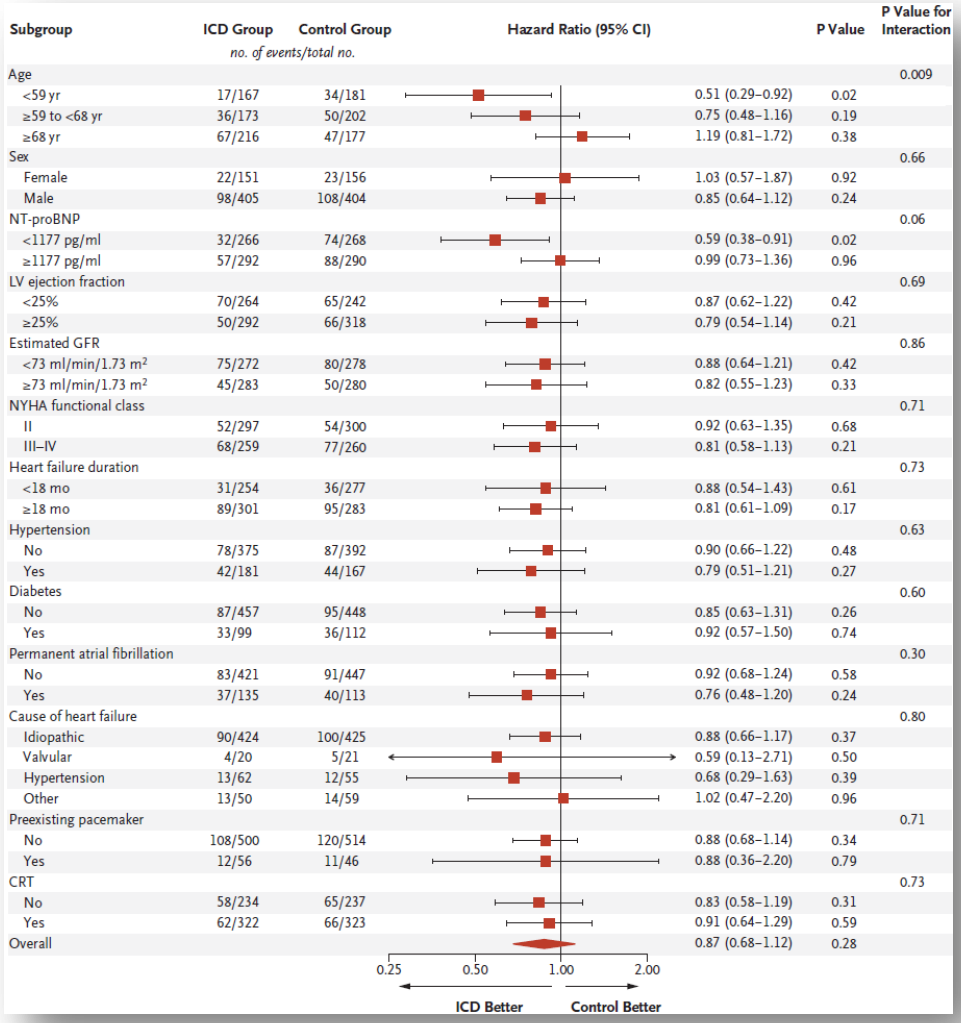






Køber L, Thune JJ, Nielsen JC, et al. Defibrillator implantation in patients with nonischemic systolic heart failure. N Engl J Med 2016; DOI:10.1056/NEJMoa1608029.

Kdo profituje z léčby ICD u NI KMP ?



Subgroup	ICD Group	Control Group	Hazard Ratio (95% CI)	P Value	P Value for Interaction
	no. of events/total no.				
Age					0.009
<59 yr	17/167	34/181	0.51 (0.29–0.92)	0.02	
≥59 to <68 yr	36/173	50/202	0.75 (0.48–1.16)	0.19	
≥68 yr	67/216	47/177	1.19 (0.81–1.72)	0.38	
Sex					0.66
Female	22/151	23/156	1.03 (0.57–1.87)	0.92	
Male	98/405	108/404	0.85 (0.64–1.12)	0.24	
NT-proBNP					0.06
<1177 pg/ml	32/266	74/268	0.59 (0.38–0.91)	0.02	
≥1177 pg/ml	57/292	88/290	0.99 (0.73–1.36)	0.96	
LV ejection fraction					0.69
<25%	70/264	65/242	0.87 (0.62–1.22)	0.42	
≥25%	50/292	66/318	0.79 (0.54–1.14)	0.21	
Estimated GFR					0.86
<73 ml/min/1.73 m^2	75/272	80/278	0.88 (0.64–1.21)	0.42	
≥73 ml/min/1.73 m^2	45/283	50/280	0.82 (0.55–1.23)	0.33	
NYHA functional class					0.71
II	52/297	54/300	0.92 (0.63–1.35)	0.68	
III–IV	68/259	77/260	0.81 (0.58–1.13)	0.21	
Heart failure duration					0.73
<18 mo	31/254	36/277	0.88 (0.54–1.43)	0.61	
≥18 mo	89/301	95/283	0.81 (0.61–1.09)	0.17	
Hypertension					0.63
No	78/375	87/392	0.90 (0.66–1.22)	0.48	
Yes	42/181	44/167	0.79 (0.51–1.21)	0.27	
Diabetes					0.60
No	87/457	95/448	0.85 (0.63–1.31)	0.26	
Yes	33/99	36/112	0.92 (0.57–1.50)	0.74	
Permanent atrial fibrillation					0.30
No	83/421	91/447	0.92 (0.68–1.24)	0.58	
Yes	37/135	40/113	0.76 (0.48–1.20)	0.24	
Cause of heart failure					0.80
Idiopathic	90/424	100/425	0.88 (0.66–1.17)	0.37	
Valvular	4/20	5/21	0.59 (0.13–2.71)	0.50	
Hypertension	13/62	12/55	0.68 (0.29–1.63)	0.39	
Other	13/50	14/59	1.02 (0.47–2.20)	0.96	
Preexisting pacemaker					0.71
No	108/500	120/514	0.88 (0.68–1.14)	0.34	
Yes	12/56	11/46	0.88 (0.36–2.20)	0.79	
CRT					0.73
No	58/234	65/237	0.83 (0.58–1.19)	0.31	
Yes	62/322	66/323	0.91 (0.64–1.29)	0.59	
Overall			0.87 (0.68–1.12)	0.28	

Køber L, Thune JJ, Nielsen JC, et al. Defibrillator implantation in patients with nonischemic systolic heart failure. N Engl J Med 2016; DOI:10.1056/NEJMoa1608029.

Nutná reevaluace pacientů s ischemickou kardiomyopatií

2016:

1. Zcela jiný substrát
2. D-PCI = standard léčby AIM
3. Standardní léčba po IM
4. Moderní léčba srdečního selhání
5. Nová antidiabetika u pacientů s KV onemocněními

- → **RESET-SCD's ultimate goal is to re-evaluate the optimal treatment strategies for prevention of sudden cardiac death (SCD) in patients with ischemic cardiomyopathy and reduced left ventricular ejection fraction and specifically to re-evaluate the role of implantable cardioverter-defibrillator (ICD). Current guidelines for SCD prevention are based on research from 15-20 years ago. While these recommendations were a tremendous advancement for the field, major recent advances in pharmaceuticals and medical devices require that these guidelines are updated to reflect the current state of the art. To achieve this, we will conduct a multinational randomised clinical trial and perform a cost-effectiveness study.**

Další pokračování:

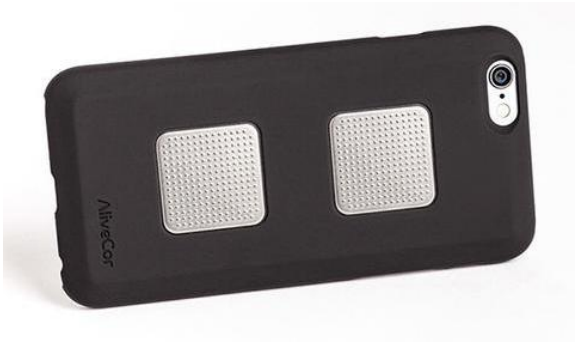
- 1. Studie EHRA: G. Hindricks – **RESET – ICD Study** – ischemické kardiomyopatie

- 2. **VISZEGRAD Study**: M. Táborský/ R. Hatala/ B:Merkely – CRT-P x CRT-D + remote monitoring – neischemické KMP bez KT

VI: Monitorace, remote control, big data …

Monitoring v EP

- Přechod od implantátů k sofistikovaným externím monitorům



https://alivecor.com/

Metaanalýza Remote Control

TABLE 1 Enrollment Criteria for Included RCTs

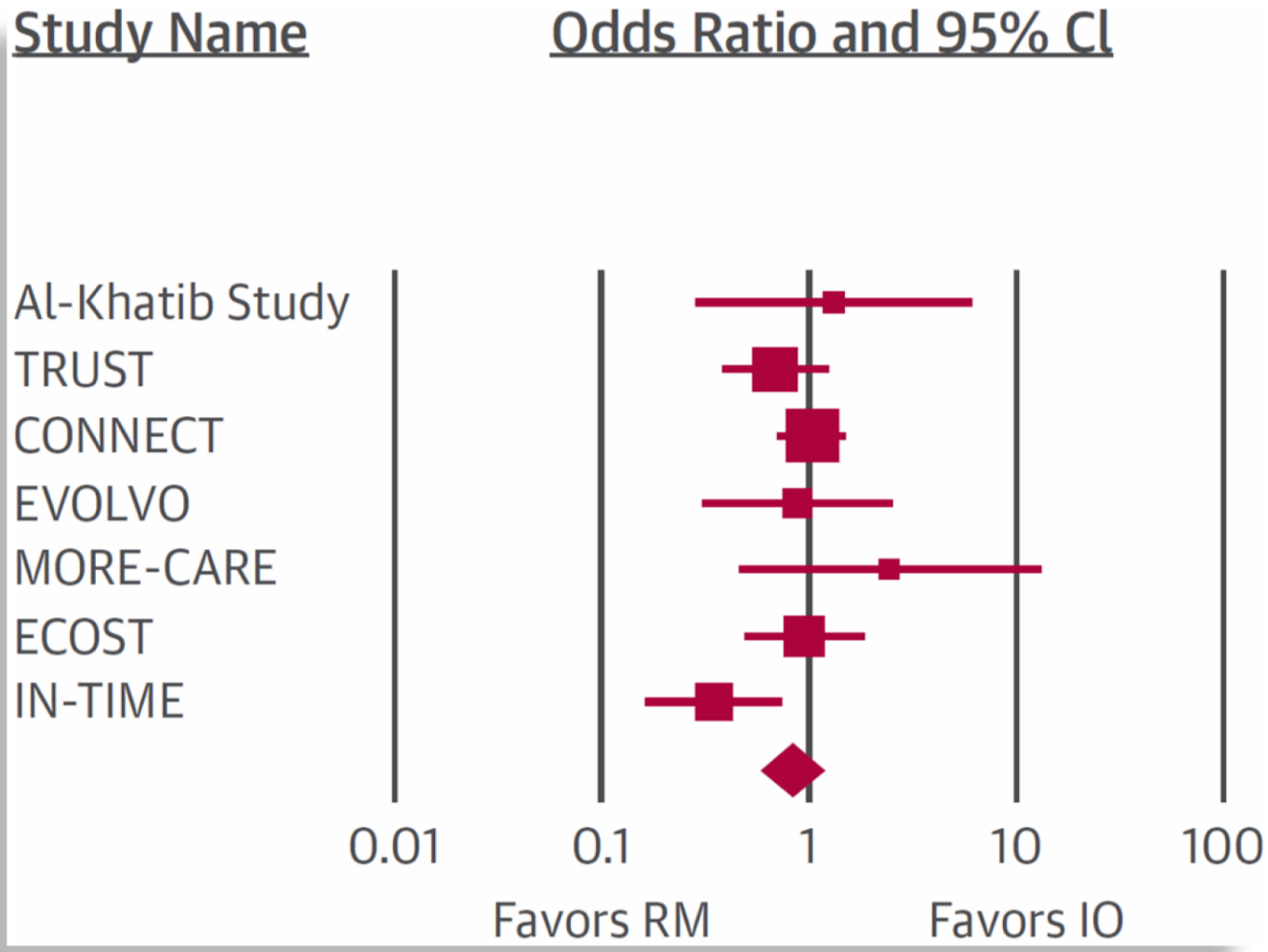
Study (Ref. #)	Number of Centers	Eligibility	Home Monitoring Group	IO
Al-Khatib et al., 2010 (15)	Single	≥18 yrs of age, have an ICD with or without CRT for an approved indication, devices followed-up at center, must have a telephone (land line)	Patient-initiated transmissions every 3 months plus IO visit at 12 months	IO visit every 3 months
TRUST, 2010 (16)	Multicenter	≥18 yrs of age, implanted within the last 45 days or being considered for implant with a Biotronik ICD for class 1 indications, not pacemaker dependent	IO visit at 3 and 15 months; RM replaced office visits at 6, 9, and 12 months	IO visit every 3 months
CONNECT, 2011 (17)	Multicenter	≥18 yrs of age, implanted with a Medtronic Conexus-enabled CRT-D or ICD	IO visit at 1, 3, and 15 months; RM replaced office visits at 6, 9, and 12 months	IO visit every 3 months
EVOLVO, 2012 (18)	Multicenter	LVEF ≤35%, implanted with a wireless-transmission-enabled Medtronic ICD or CRT-D	IO visit at 8 and 16 months; RM replaced office visits at 4 and 12 months	IO visit every 4 months
EVATEL, 2012 (14)	Multicenter	≥18 yrs of age, first implantation of single- or dual-chamber ICD in primary or secondary prevention, ICD with data-transmission features, GSM mobile phone network at patient home compatible with remote transmission	IO visit at 6 weeks and 12 months; RM replaced office visits at 3, 6, and 9 months	IO visit at 6 weeks, then every 3 months
SAVE-HM, 2013 (19)	Single	ICD indicated for primary prevention of sudden cardiac death in patients experiencing chronic systolic heart failure, geographically stable with a stable medical condition, and sufficient GSM network coverage at their place of residence	IO visit at 12 months; RM replaced office visits at 6 months	IO visit every 6 months
MORE-CARE, 2013 (20)	Multicenter	Left ventricular systolic dysfunction (LVEF ≤35%), NYHA functional class III to IV, QRS ≥120 ms, with CRT-D devices	IO visit at 1 and 8 months; RM replaced office visits at 4 and 12 months	IO visit at 1 month, then every 4 months
ECOST, 2013 (21)	Multicenter	Indication for single- or dual-chamber ICD except for NYHA functional class IV	IO visit at 1-3 months and 15 and 27 months; RM replaced office visits at 9 and 21 months	IO visit at 1-3 months, then every 6 months
IN-TIME, 2014 (7)	Multicenter	Indication ICD or CRT-D, heart failure (≥3 months), NYHA functional class II or III, LVEF ≤35%	IO visit at 12 months; RM replaced office visits at 6 months	IO visit every 6 months

All RM was activated automatically.

CONNECT = Clinical Evaluation of Remote Notification to Reduce Time to Clinical Decision; CRT = cardiac resynchronization therapy; CRT-D = cardiac resynchronization therapy-defibrillator; ECOST = Effectiveness and Cost of ICDs Follow-up Schedule with Telecardiology; EVATEL = Evaluation of Tele Follow-up; EVOLVO = Evolution of Management Strategies of Heart Failure Patients with Implantable Defibrillators; GSM = global system for mobile communications; ICD = implantable cardioverter-defibrillator; IN-TIME = Influence of Home Monitoring on Mortality and Morbidity in Heart Failure Patients with Impaired Left Ventricular Function; IO = in-office; LVEF = left ventricular ejection fraction; MORE-CARE = Monitoring Resynchronization Devices and Cardiac Patients; NYHA = New York Heart Association; RCT = randomized clinical trial; RM = remote monitoring; SAVE-HM = Socio-economic Effects and Cost Saving Potential of Remote Patient Monitoring; TRUST = Lumos-T Safely Reduces Routine Office Device Follow-up.

Parthiban N. JACC 65, NO. 24, 2015:2591-600

Výsledky metaanalýzy: + -



Parthiban N. JACC 65, NO. 24, 2015:2591-600

Realistický pohled na problematiku remote control

Pro	Kontra
Časná informace o změně zdravotního stavu	Vyšší náklady
Redukce rehospitalizací, mortality a morbidity (studie IN-TIME a CHAMPION)	Absence dat o redukci rehospitalizací, mortality a morbidity (studie OptiLINK, REM-HF)
Zlepšená compliance pacientů k léčbě SS	Spíše pro specializovaná centra
Kontinuální dlouhodobá monitorace	Malé počty pacientů ve studiích

G. Hindricks, Aktuel Kardiol 2017;6:156-158.

VI: Terminální fáze SS

Realita 2017

- Paliativní péče o nemocné v terminální fázi srdečního selhání je nedostatečná
- Obtížný přechod z ambulance SS do hospicové péče – nepřipravenost
- Jedna ze zásadních problémů – legální „impotence“ pro možnost deaktivace ICD
- Pokud bychom realizovali, byl by to postup non lege artis
- Možná výjimka: předem vyslové přání

NF léčba SS 2016: Take home message …

1. Transplantace – základ NF léčby pokročilého SSS
2. Narůstají počty LVAD
3. Prosazuje se destinační terapie i v podmínkách ČR
4. Otvírá se znovu otázka TAH
5. CRT indikace 2017: QRS ≥ 130 ms
6. Technický vývoj CRT – MSP
7. Pravděpodobná změna indikací ICD pro futuro
8. Specializovaná centra péče o pacienty se SS – komplexní pohled na moderní farmakologickou i nefarmakologickou léčbu srdečního selhání

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