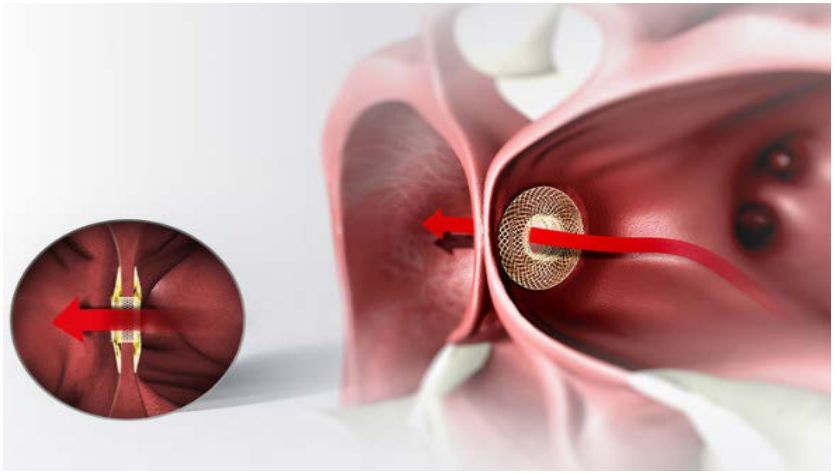
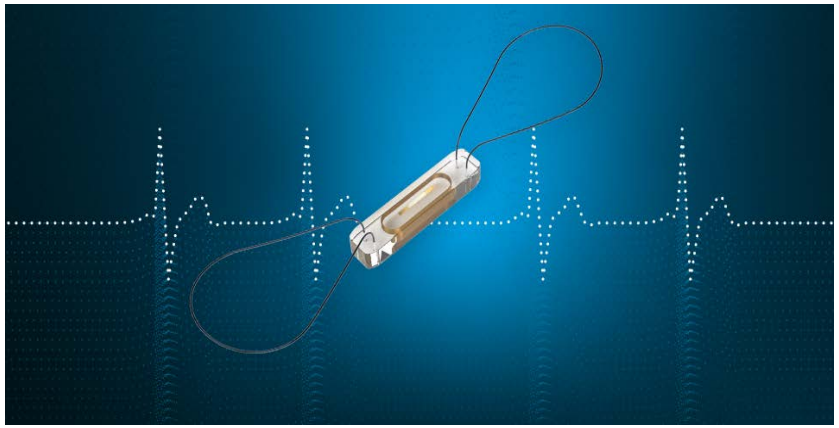
İnteratrial şunt cihazı və implantasiya ediləbilən hemodinamik monitor. Nə vaxt və kimə?





Ülvi Mirzoyev

Təqdimat Planı

1

İnteratrial şunt cihazları

Texnika,
Xəstə seçimi,
Sübut əsası,
Perspektivlər

2

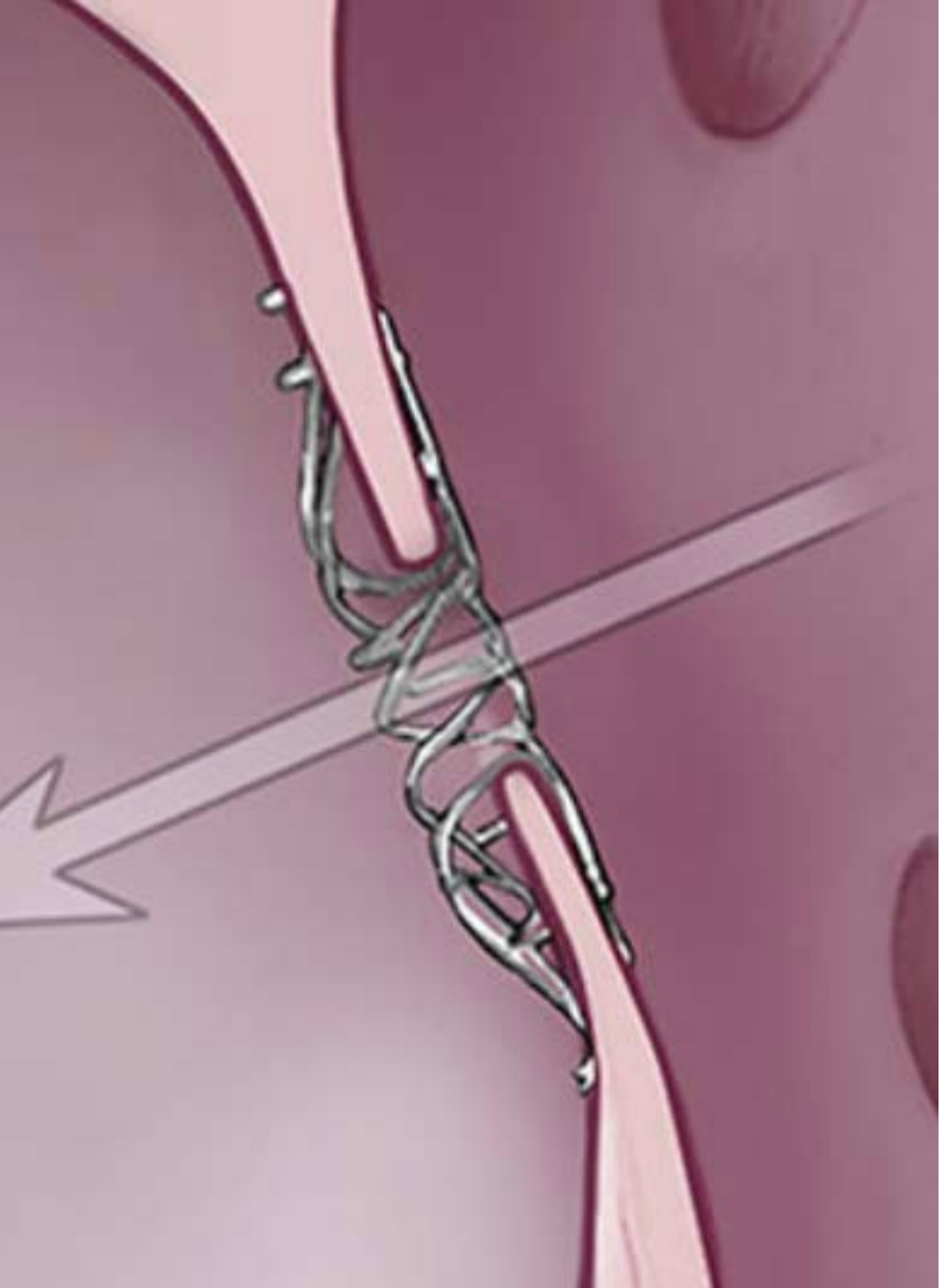
İnvaziv Hemodinamik Monitorlar

Növləri,
Kliniki üstünlüklər,
Sübut əsası,
Perspektivlər

3

Xülasə

Ürək Çatışmazlığının idarəedilməsində gələcək fürsətlər

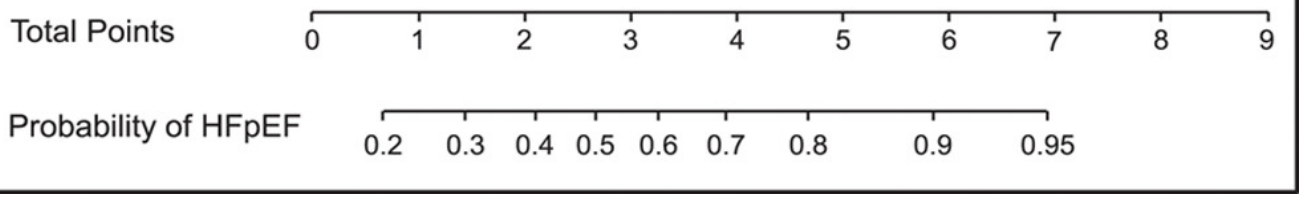


İnteratrial şunt cihazı

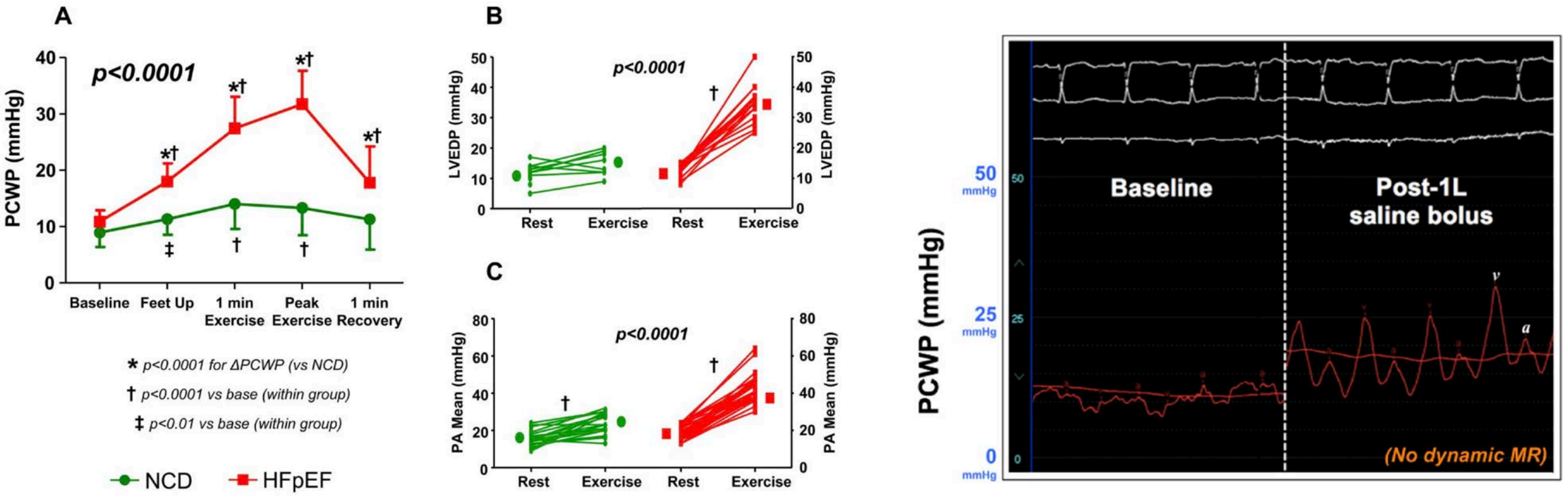
HFpEF

- Bütün ÜÇ ½ HFpEF
- ≥ 65 yaş üstü hospitalizasiyalarda ən sıx diaqnozdur
- Həcm yüklənməsi yoxdur
- LA komplians azalıb
- LA təzyiq ↑
- Sistemik diuretik müalicələrdə yan təsirlər-hipovolemiya və azotemiya
- Mexanik cihazlara ehtiyac vardır

	Clinical Variable	Values	Points
H_2	**H**eavy	Body mass index > 30 kg/m^2	2
	Hypertensive	2 or more antihypertensive medicines	1
F	Atrial **F**ibrillation	Paroxysmal or Persistent	3
P	**P**ulmonary Hypertension	Doppler Echocardiographic estimated Pulmonary Artery Systolic Pressure > 35 mmHg	1
E	**E**lder	Age > 60 years	1
F	**F**illing Pressure	Doppler Echocardiographic E/e' > 9	1
H_2FPEF score			Sum (0-9)



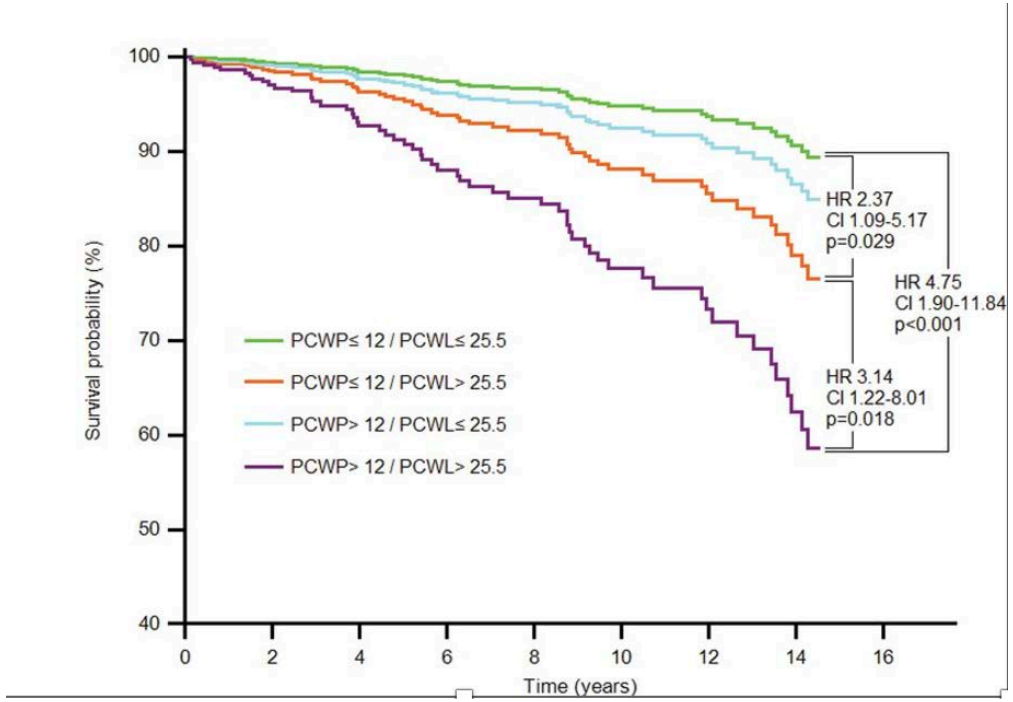
Yogesh N.V. Reddy. Circulation. A Simple, Evidence-Based Approach to Help Guide Diagnosis of Heart Failure With Preserved Ejection Fraction, Volume: 138, Issue: 9, Pages: 861-870, DOI: (10.1161/CIRCULATIONAHA.118.034646)

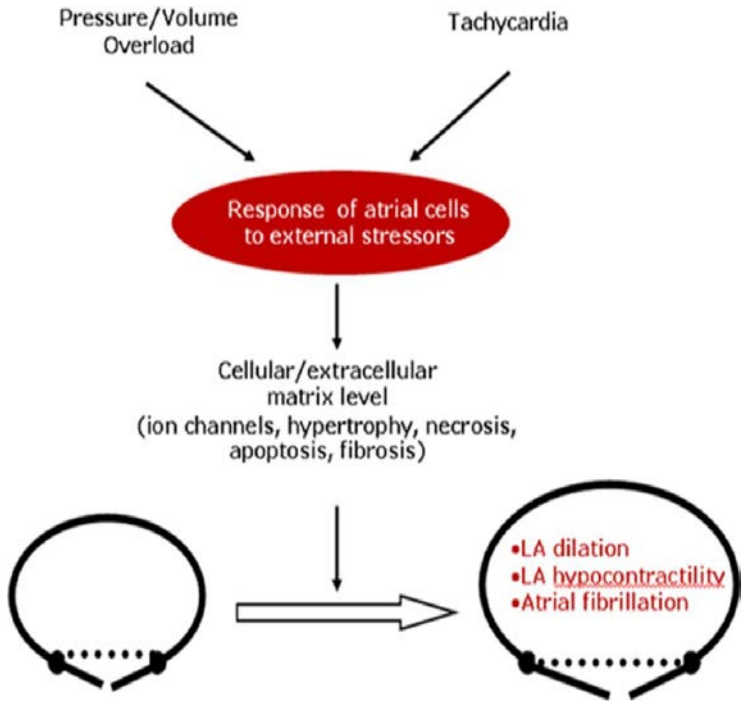


- Normal subyektlərlə müqayisədə artan fiziki yüklə LA/PCWP nəzərəçarpan artım, baxmayaraq ki istirahətdə bir birinə yaxın

- Fiziki yük dayandırıldıqdan sonra bir neçə dəqiqə ərzində PCWP-də sürətli azalma, bu xəstələrin hipervolemik olmadığını vurğulayır

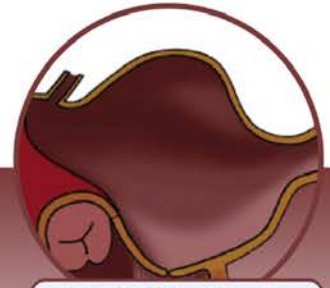
- Həcm Həssaslığı: 600 ml venadaxili maye tətbiqi ilə LA təzyiqinin surroqatı olan PCWP nəzərəçarpacaq dərəcədə artması





- FY zamanı iş yükü ilə korreksiya edilmiş daha yüksək pik PCWP, HFpEF xəstələrində fiziki yük dözümlülüyün azalması və daha pis nəticələrlə əlaqəlidir

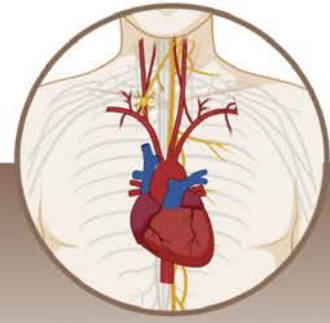
- LA intrinsic mexaniki disfunksiyası AF artması halları ilə əlaqələndirilir və HFpEF-də pis nəticələrin səbəbi kimi tanınır.



LA Dilation

LV Hypertrophy

STRUCTURAL REMODELLING

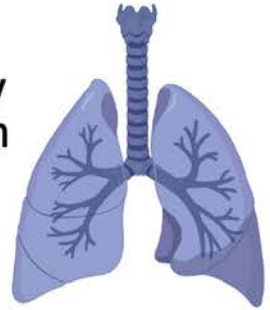


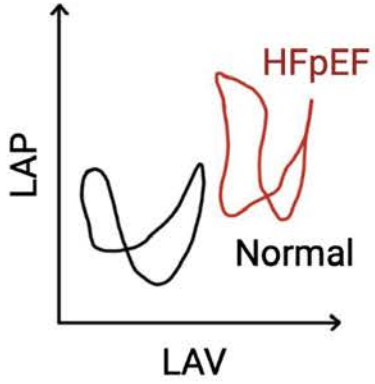
AUTONOMIC IMBALANCE

↑ Sympathetic Activity

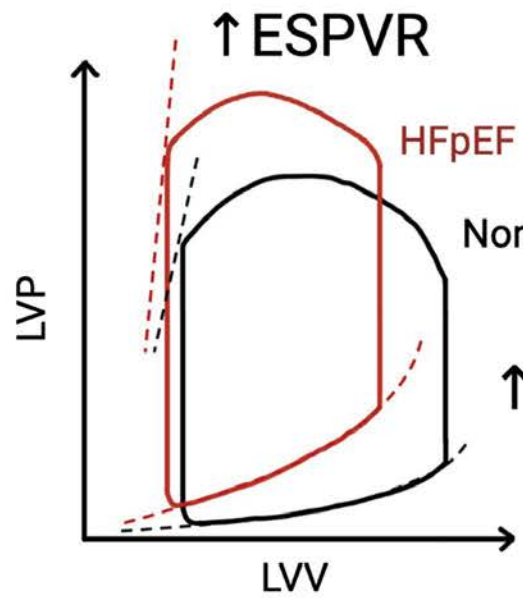
↓ Parasympathetic Activity

Pulmonary congestion





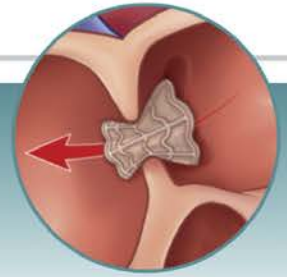
↑ LAP



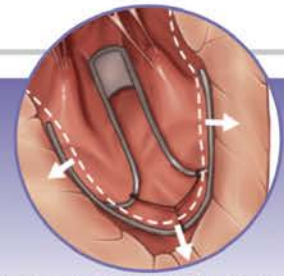
↑ EDPVR

Exercise intolerance

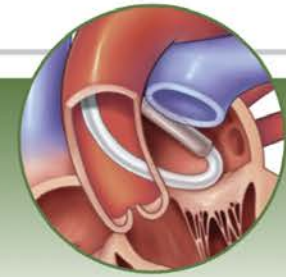
Atrial fibrillation



ATRIAL SHUNTS



LV EXPANDERS



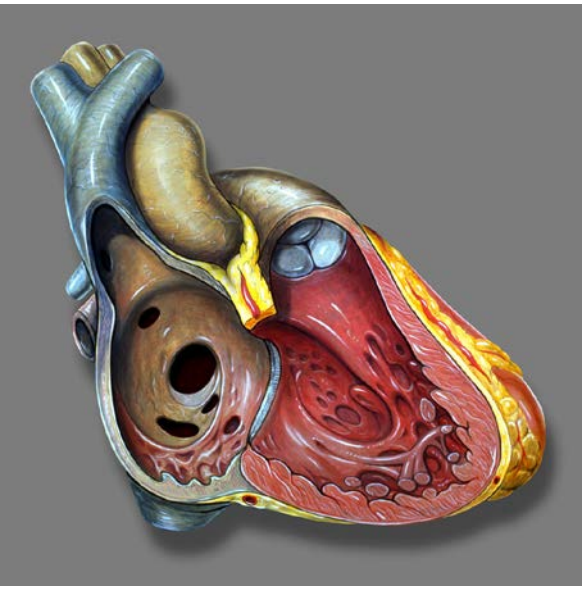
MCS DEVICES

STIMULATION

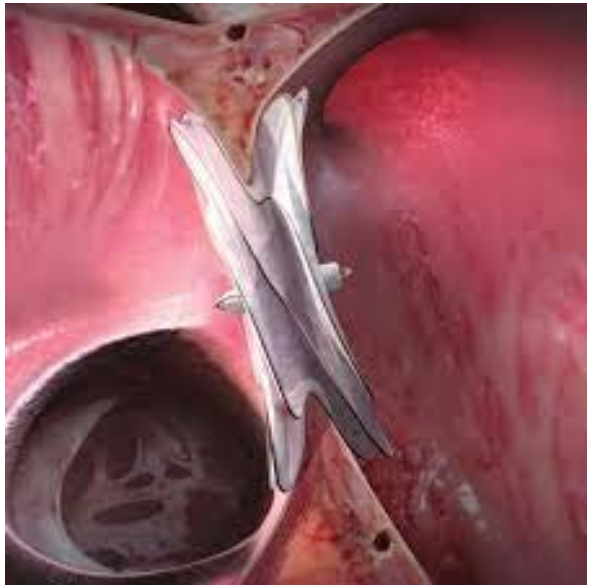
- Əhalinin yaşlanması morbidlik və mortallığın azalması üçün yeni müalicələr tələbi gətirir

- İnvaziv monitorinq və həkim nəzarəti ilə özünüidarə yolu ilə LA təzyiqinə yaxından təqibi NYHA sinifində yaxşılaşma, eləcə rehospitalizasiya və ölüm hallarının azalması ilə əlaqəlidir

İnteratrial Şunt Cihazı - Əsaslandırma



ASD+LV disfunksiyası



ASD bağlanması

LA təzyiqi↑
ÜÇ dekompensasiyası

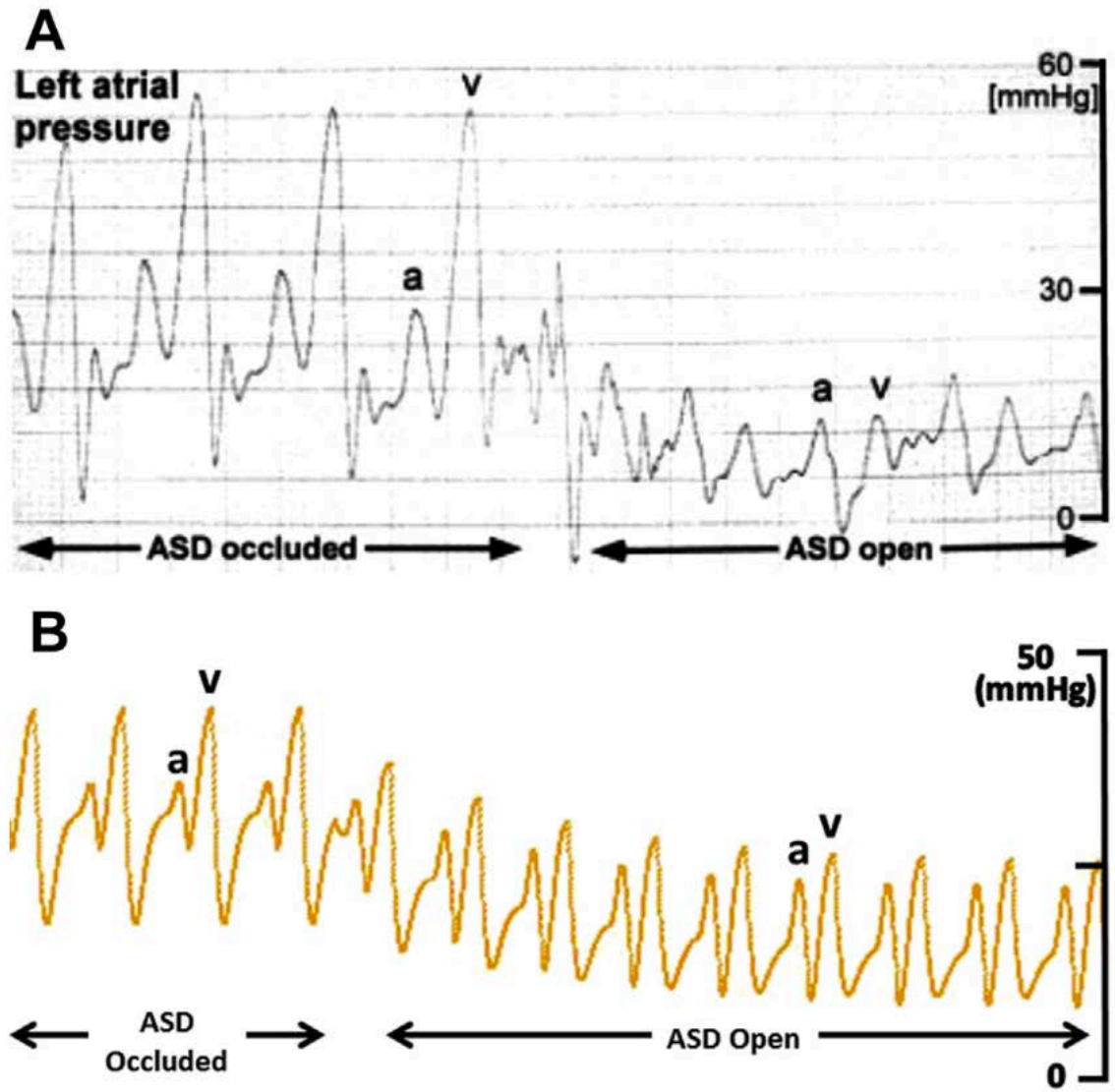
Journal of Cardiac Failure Vol. 20 No. 3 2014

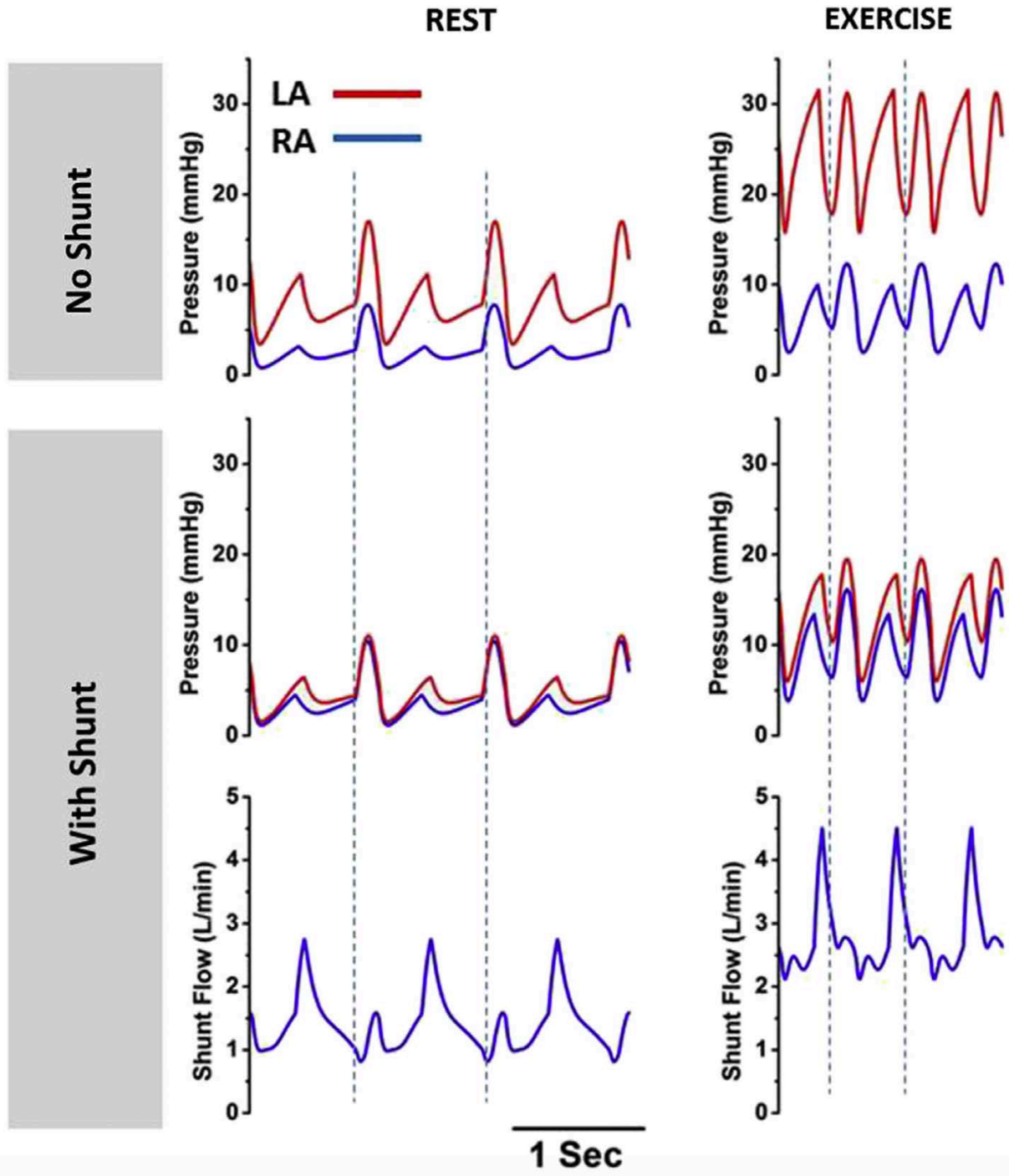
Basic Science and Experimental Studies

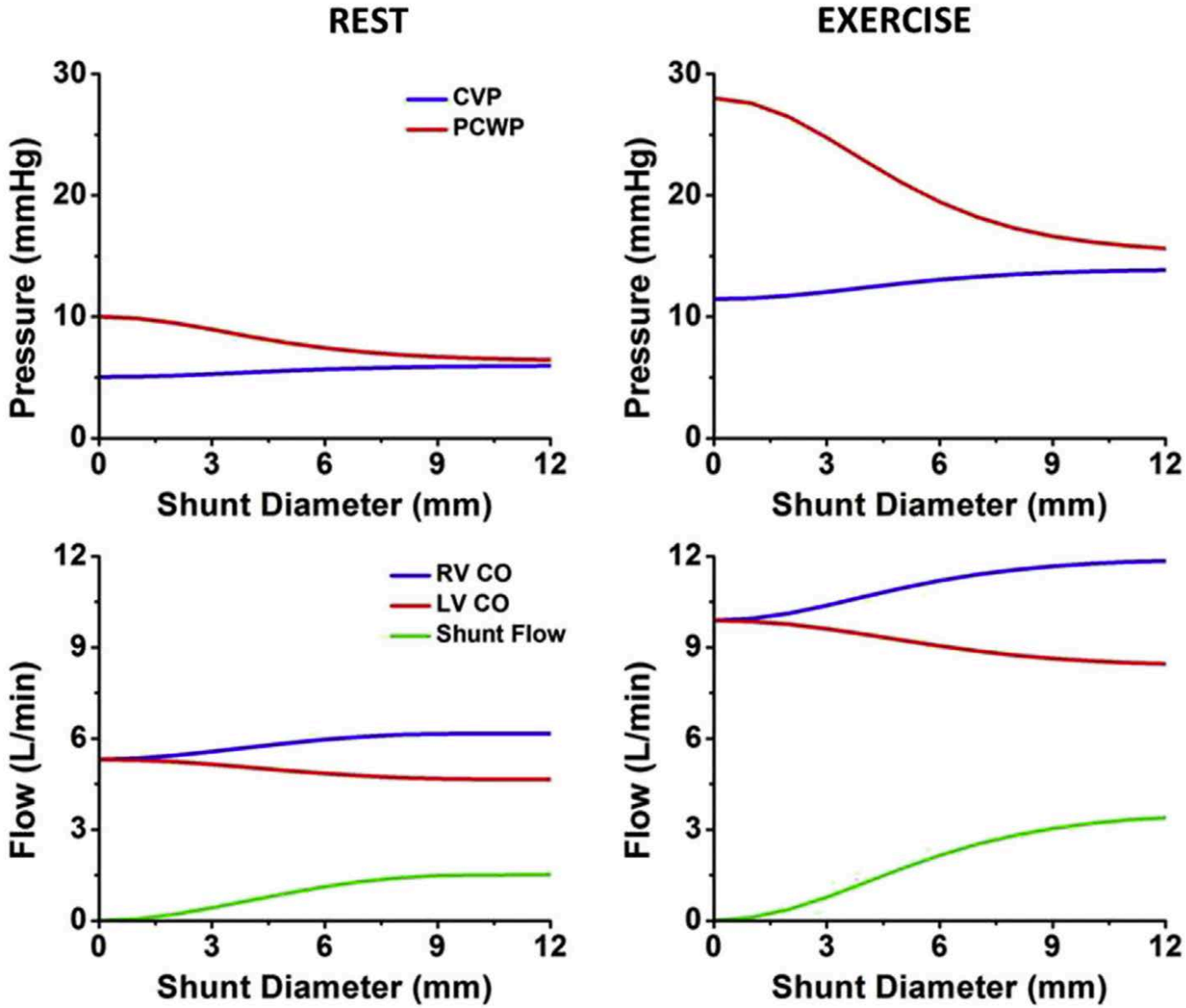
Effects of an Interatrial Shunt on Rest and Exercise Hemodynamics: Results of a Computer Simulation in Heart Failure

DAVID KAYE, MD, PhD,[1] SANJIV J. SHAH, MD,[2] BARRY A. BORLAUG, MD,[3] FINN GUSTAFSSON, MD,[4] JAN KOMTEBEDDE, DVM,[5] SPENCER KUBO, MD,[6] CHRIS MAGNIN,[5] MATHEW S. MAURER, MD,[7] TED FELDMAN, MD,[8] AND DANIEL BURKHOFF, MD, PhD[7]

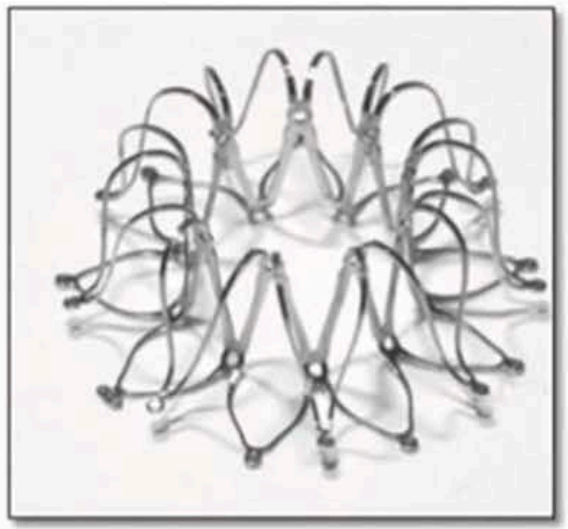
Melbourne, Australia; Chicago and Evanston, Illinois; Rochester and Minneapolis, Minnesota; Copenhagen, Denmark; Boston, Massachusetts; and New York, New York


A
Left atrial pressure
v
a
60
[mmHg]
30
a
v
0
ASD occluded
ASD open
B
v
a
50
(mmHg)
a
v
ASD Occluded
ASD Open
0


REST
EXERCISE
No Shunt
With Shunt
LA
RA
Pressure (mmHg)
Shunt Flow (L/min)
0
10
20
30
1
2
3
4
5
1 Sec

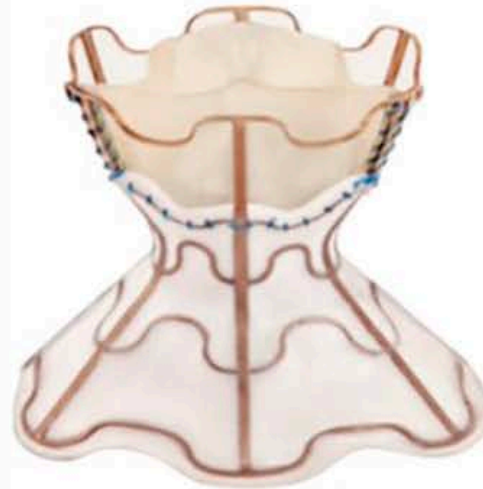

REST
EXERCISE
CVP
PCWP
Pressure (mmHg)
Shunt Diameter (mm)
RV CO
LV CO
Shunt Flow
Flow (L/min)
0
3
6
9
10
12
20
30

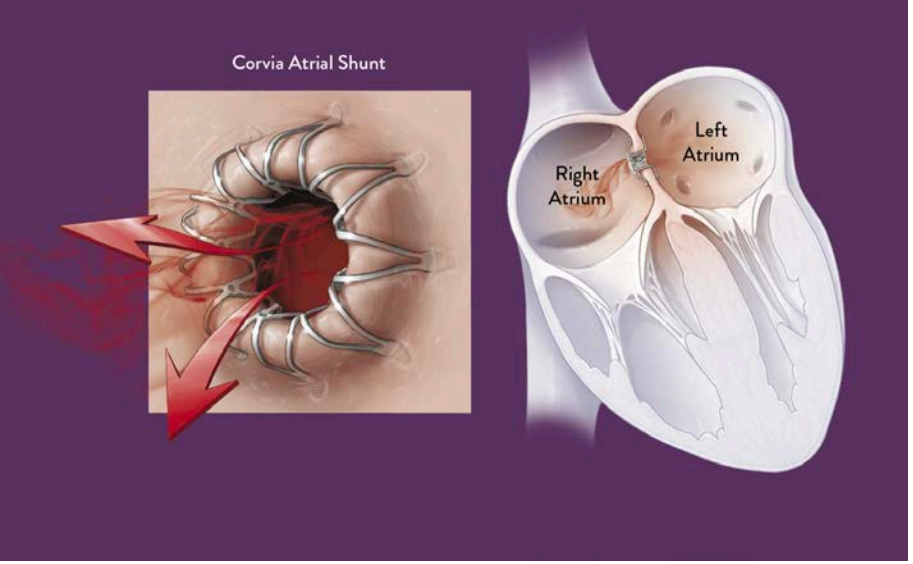
IASD device
(Corvia)

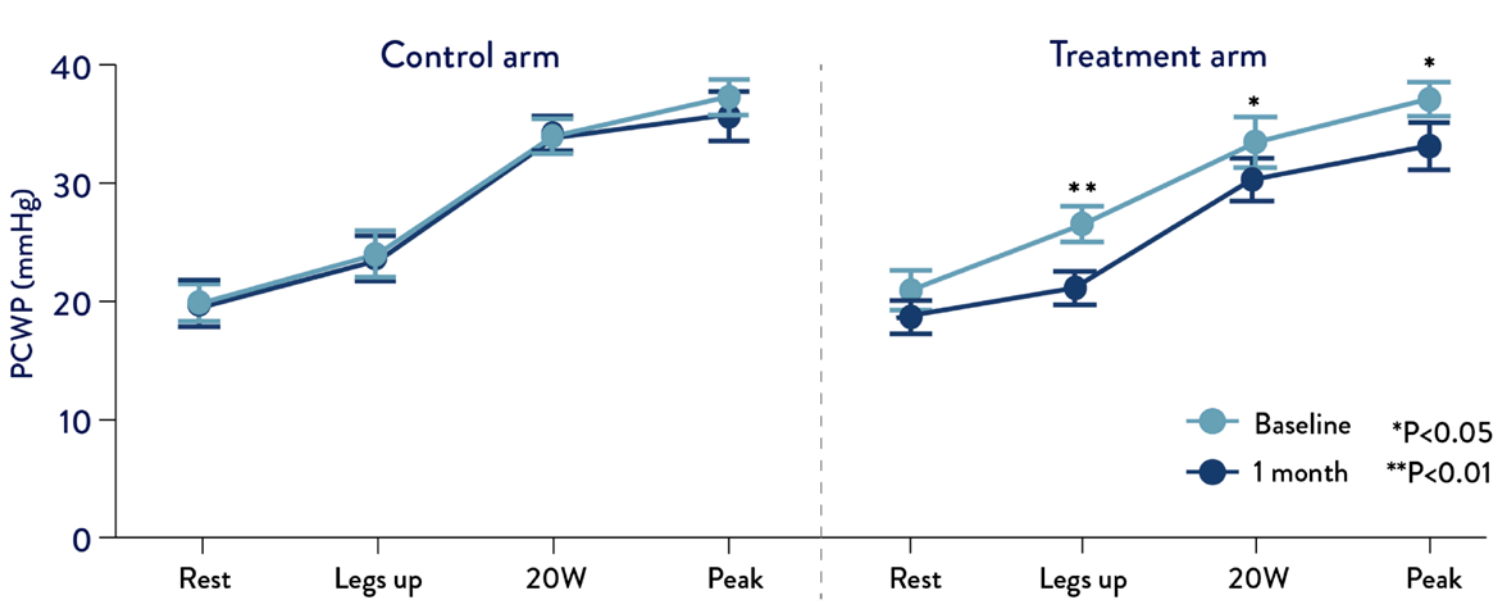


AFR device
(Occlutech)

V-Wave
device
(V-Wave Medical)







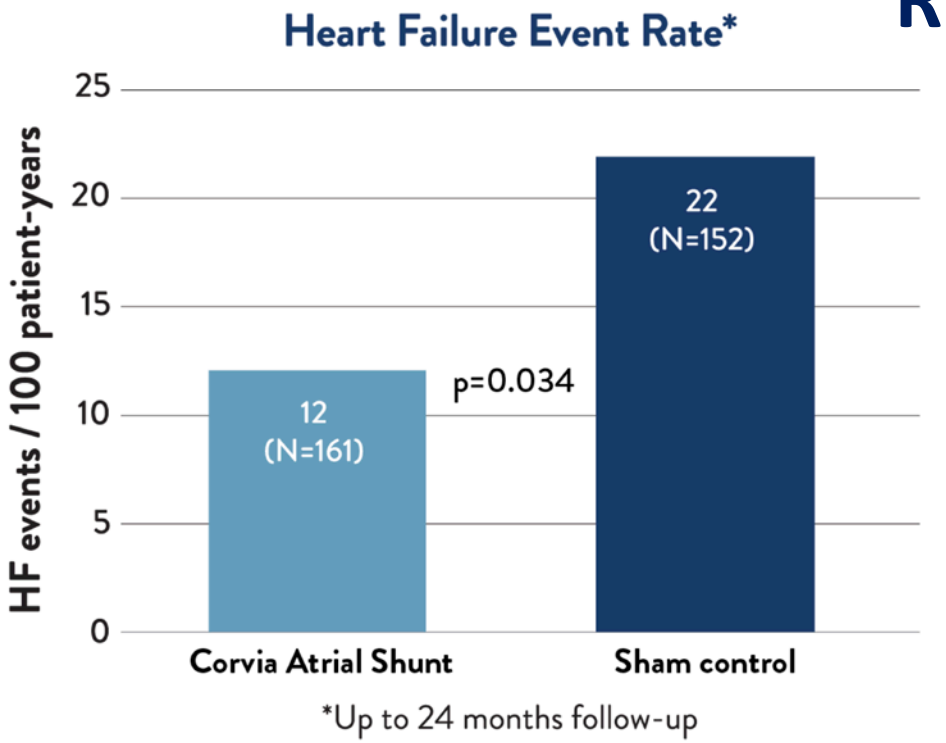
PWCP AZALMASI

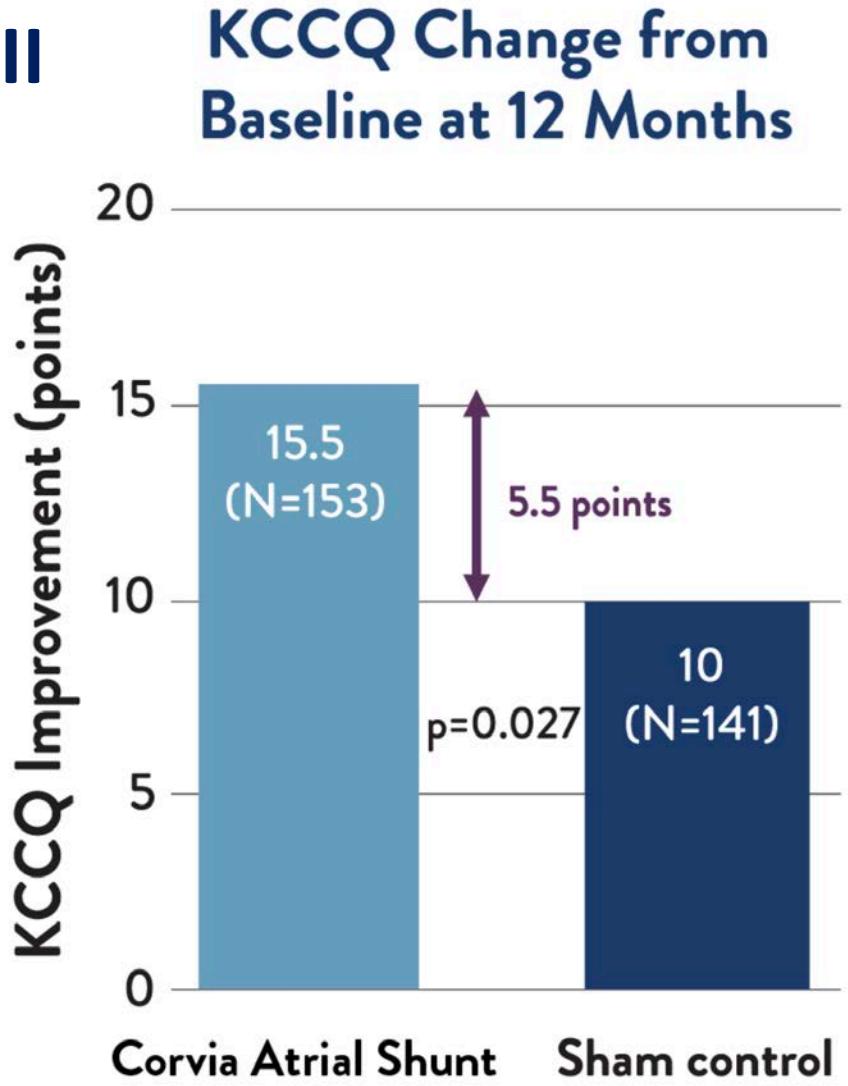
PCWP dərhal və əhəmiyyətli dərəcədə (3-5mmHg) azalıb, **kliniki yaxşılaşma 12 aydan çox davam edib**

corvia®

Feldman T, Mauri L, Kahwash, et al. Transcatheter Interatrial Shunt Device for the Treatment of Heart Failure With Preserved Ejection Fraction (REDUCE LAP-HF I): A Phase 2, Randomized, Sham-Controlled Trial. Circ. 2018;137(4):364-375

REDUCE LAP-HF II





ÜRƏK ÇATIŞMAZLIĞI OLAYLARI

Corvia Atrial Shunt ilə müalicə REDUCE LAP-HF II Responder subqrupunda ürək çatışmazlığı hadisələrində **45% azalmaya** səbəb olmuşdur

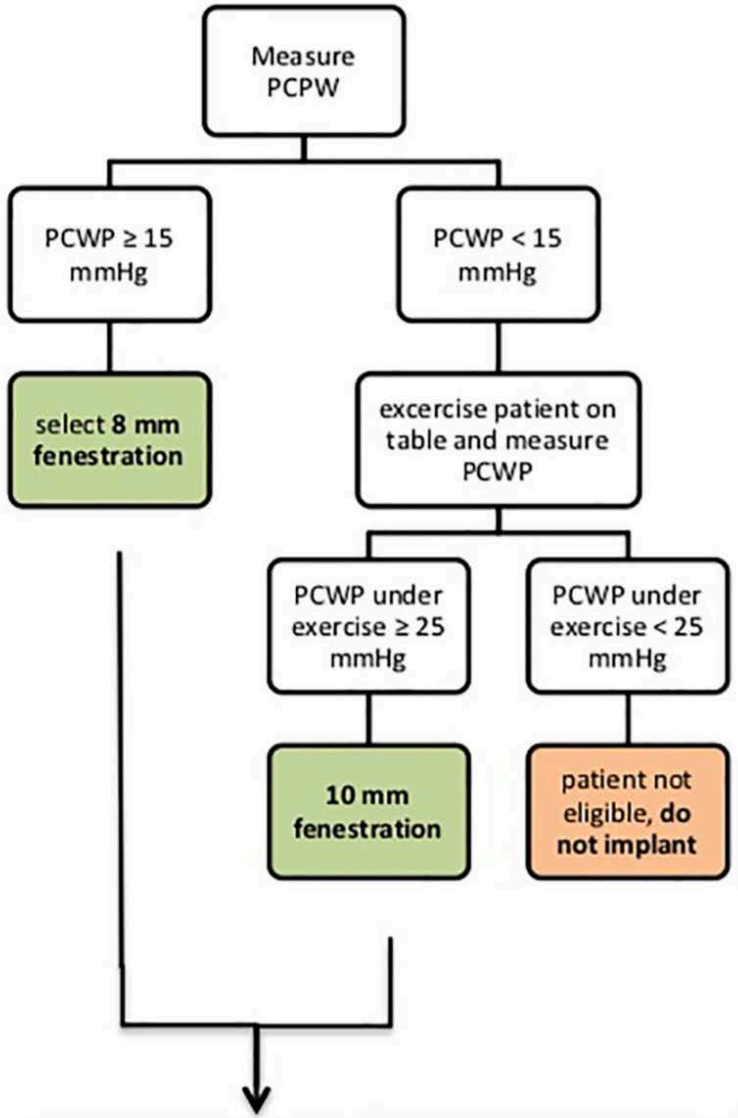
HƏYAT KEYFIYYƏTI

12 ayda, atrial shunt Responder subqrup pasientlərində KCCQ skorunda sham kontrol qrupu ilə müqayisədə bazal rəqəmlərə görə **55% daha yaxşı düzəlmə görülmüşdür.**

Borlaug BA, Blair J, Bergmann MW, et al. Latent Pulmonary Vascular Disease May Alter the Response to Therapeutic Atrial Shunt Device in Heart Failure [published correction appears in Circulation. 2022 Jul 26;146(4):e12]. Circulation. 2022;145(21):1592-1604.

Occlutech Atrial Flow Regulator (AFR)

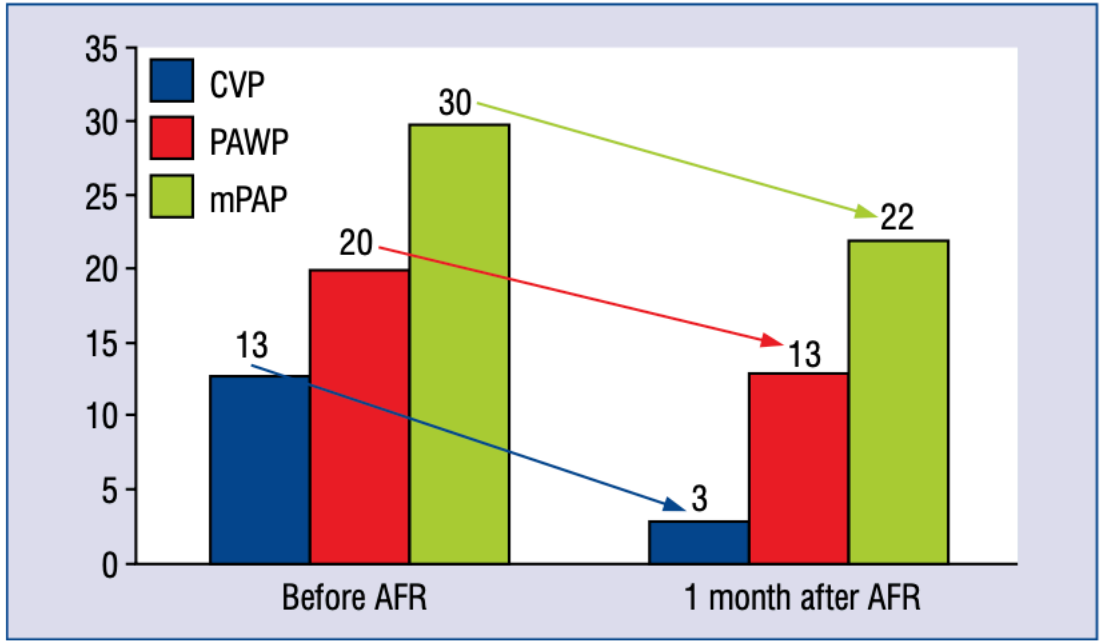
Perfecting Flow



Septal thickness	Height of the device (h)
≤5 mm	5mm
≥6 up to 10mm	10mm

a

b



ОРИГИНАЛЬНЫЕ СТАТЬИ

Bakhshaliyev Nijad, Ozdemir Ramazan
Bezmialem Vakif University, Istanbul, Turkey

The impact of atrial flow regulator implantation on hemodynamic parameters in patients with heart failure

Figure 5. Temporal changes in PAP (a), mean RAP (b), CO (c) and mean PAWP (d) in HFrEF patients

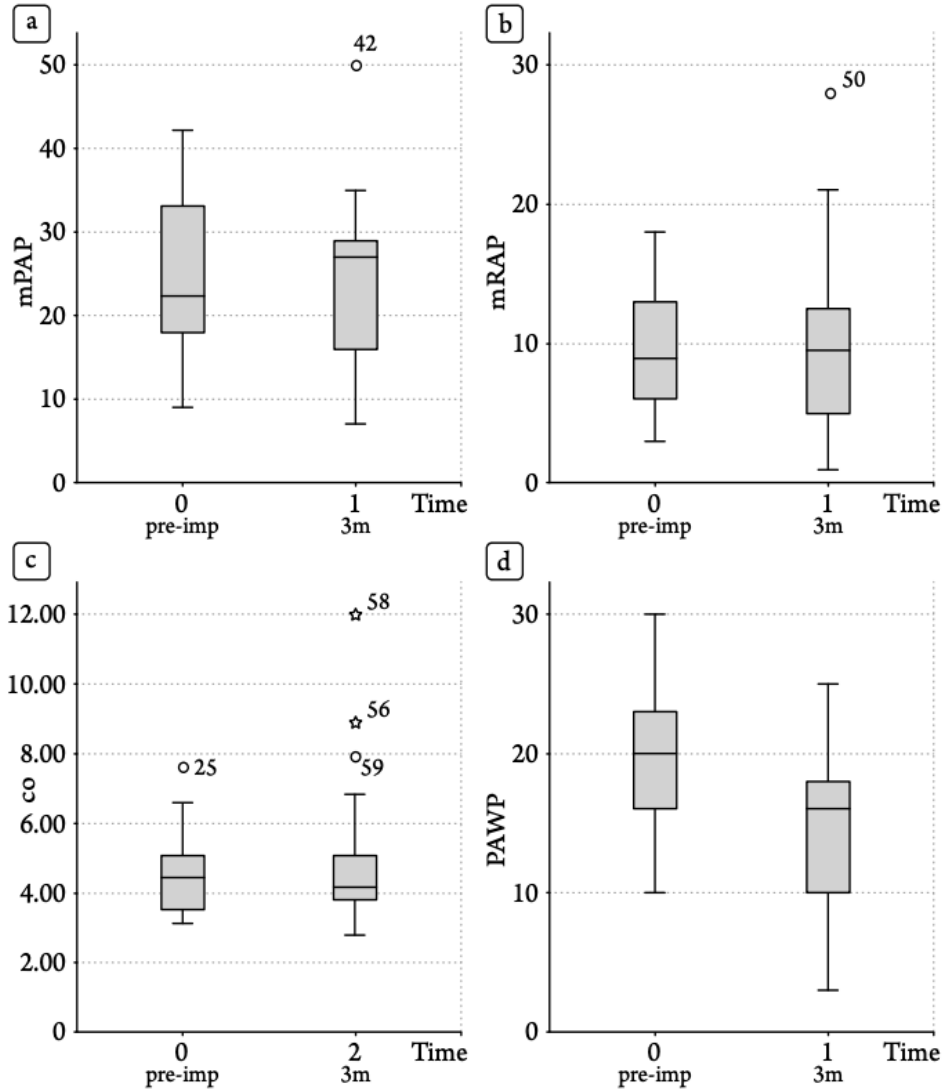
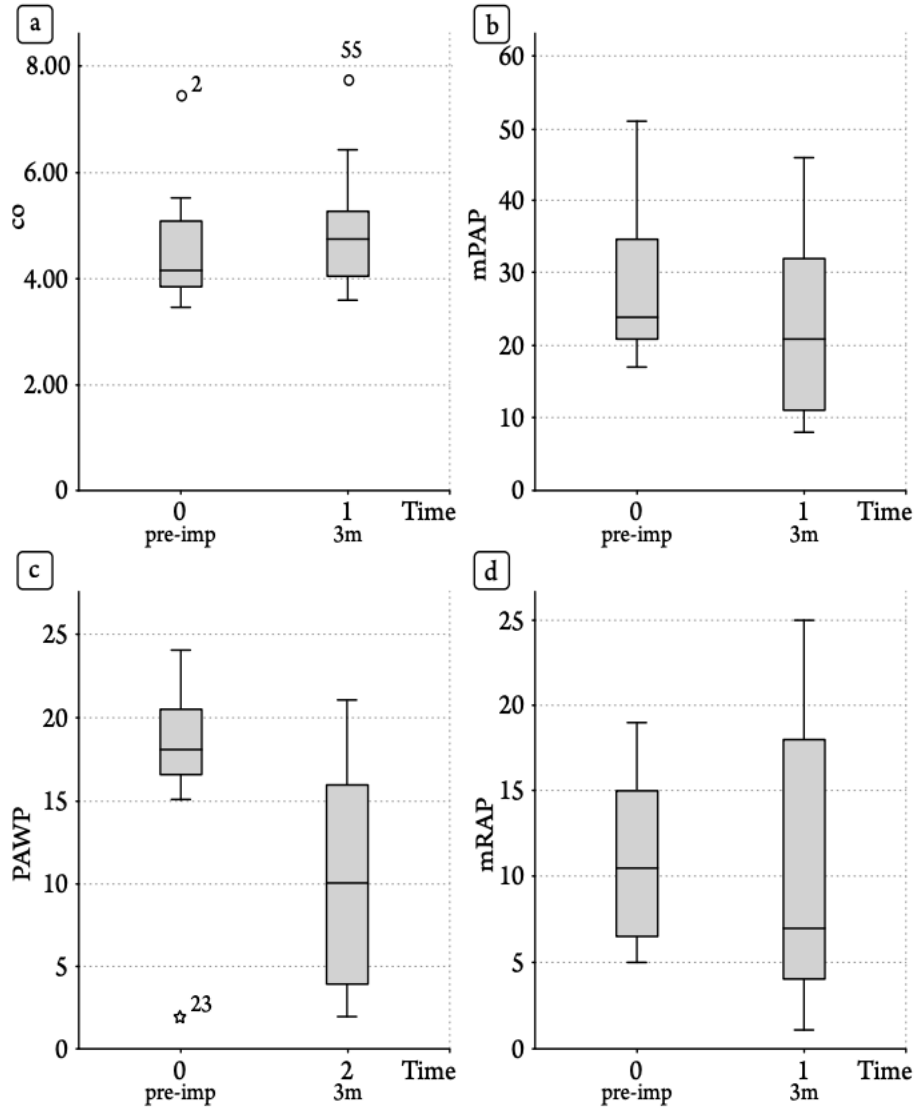


Figure 6. Temporal changes in CO (a), mean PAP (b), PAWP (c) and mean RAP (d) in HFpEF patients



ESC European Society of Cardiology

European Journal of Heart Failure (2021) **23**, 800–810
doi:10.1002/ejhf.2119

RESEARCH ARTICLE

One-year results of the first-in-man study investigating the Atrial Flow Regulator for left atrial shunting in symptomatic heart failure patients: the PRELIEVE study

Christina Paitazoglou[1], Martin W. Bergmann[1]*, Ramazan Özdemir[2], Roman Pfister[3], Jozef Bartunek[4], Teoman Kilic[5], Alexander Lauten[6], Alexander Schmeisser[7], Mehdi Zoghi[8], Stefan D. Anker[6], Horst Sievert[9], and Felix Mahfoud[10], on behalf of the AFR-PRELIEVE Investigators

[1]Interventional Cardiology, Cardiologicum Hamburg, Hamburg, Germany; [2]Department of Cardiology, Bezmiâlem Vakif University, Istanbul, Turkey; [3]Department of Cardiology, Pulmonology, Angiology and Intensive Care Medicine, Heart Center University Clinic Köln, Köln, Germany; [4]Cardiovascular Center, Onze-Lieve-Vrouw Hospital, Aalst, Belgium; [5]Department of Cardiology, Kocaeli University Medical Faculty, Kocaeli, Turkey; [6]Department of Cardiology (CVK) and Berlin Institute of Health Center for Regenerative Therapies (BCRT), German Centre for Cardiovascular Research (DZHK) partner site Berlin, Charité Universitätsmedizin Berlin, Berlin, Germany; [7]Department of Cardiology and Angiology, |University clinic Magdeburg A.ö.R, Magdeburg, Germany; [8]Department of Cardiology, Ege University Medical Faculty, Bornova/Izmir, Turkey; [9]Cardiovascular Center Frankfurt, Frankfurt, Germany; and [10]Department of Internal Medicine, Cardiology, Angiology and Intensive Care Medicine, University Clinic Saarland, Homburg, Germany

Received 10 November 2020; revised 16 January 2021; accepted 3 February 2021; online publish-ahead-of-print 5 March 2021

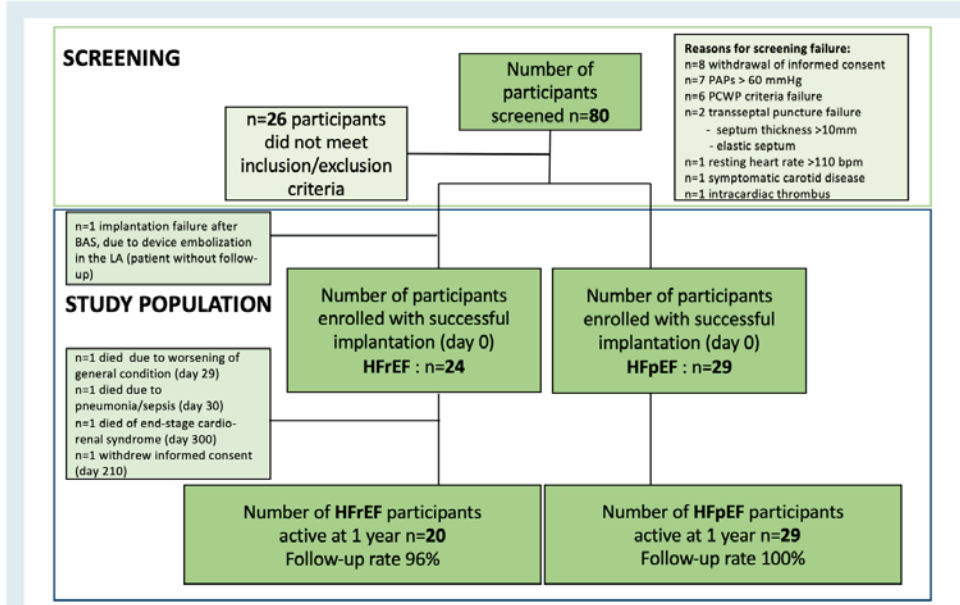
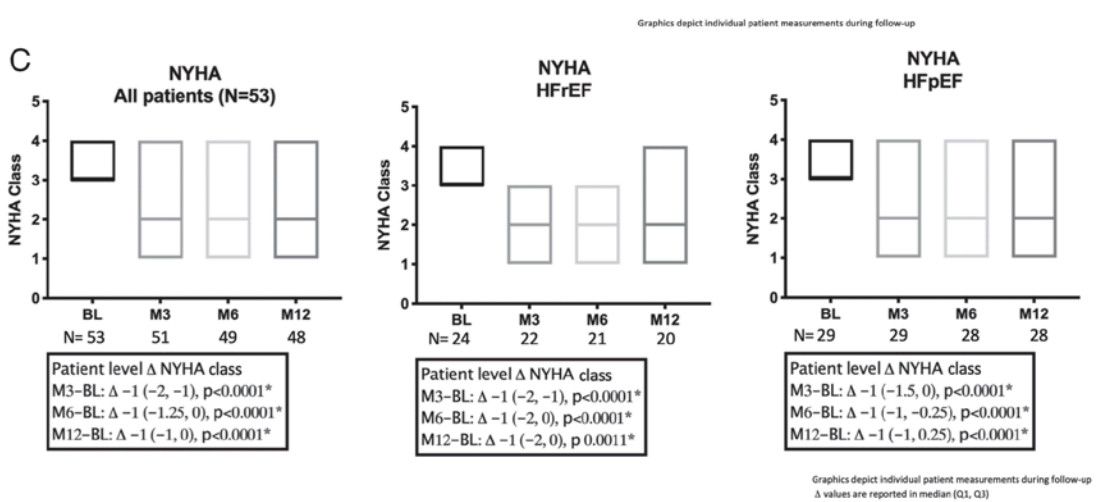
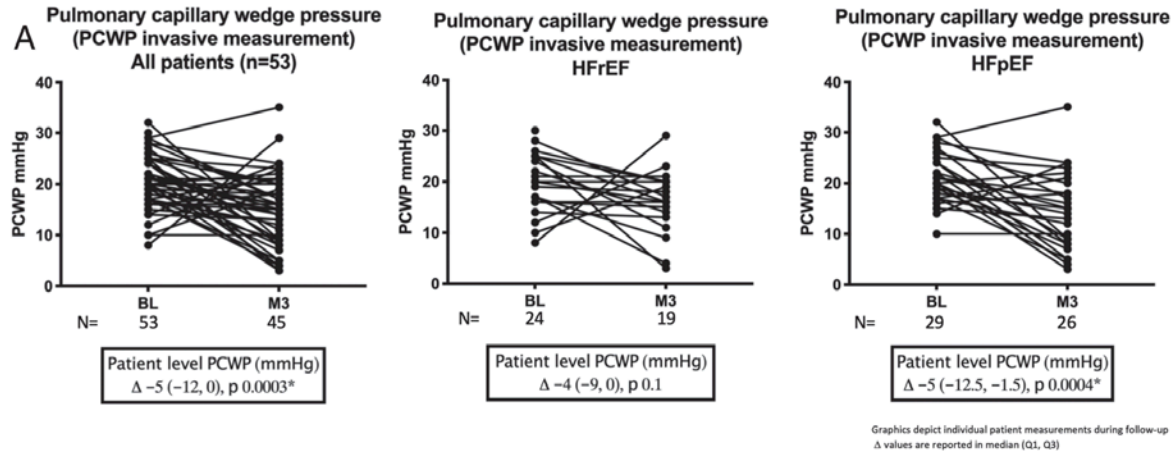


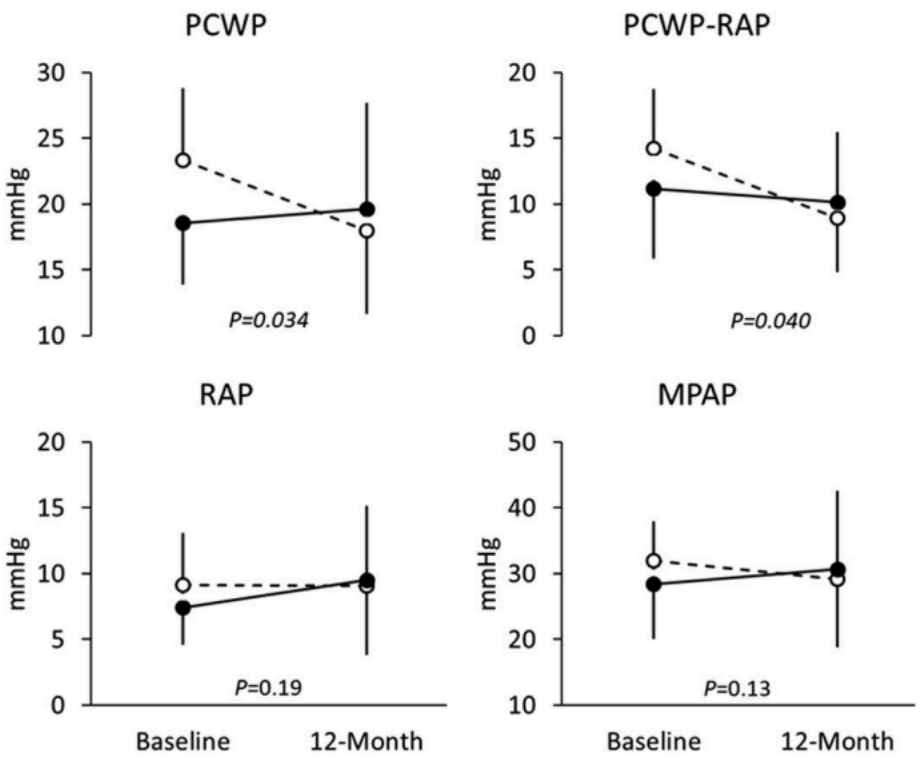
Figure 1 The PRELIEVE study participant disposition flow chart. BAS, balloon atrioseptostomy; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; LA, left atrium; PAPs, systolic pulmonary artery pressure; PCWP, pulmonary capillary wedge pressure.





The V-Wave® Ventura® Interatrial Shunt System

FIGURE 4 Changes in Hemodynamic Parameter Values According to Patency Subgroup at Baseline and 12 Months



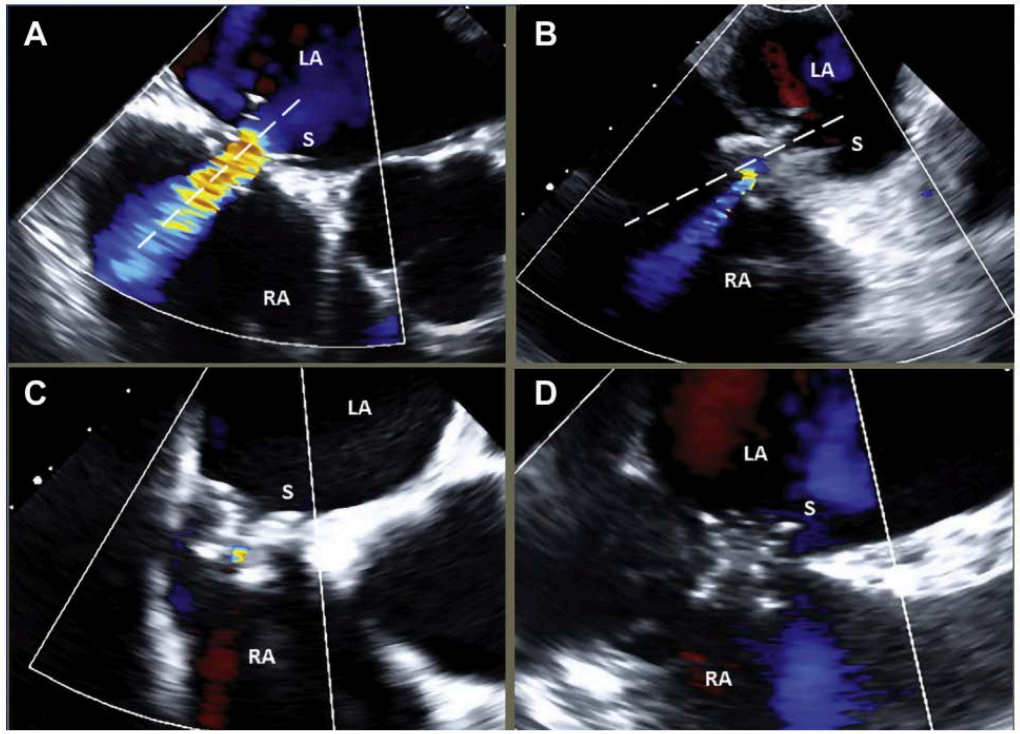
Patent shunt patients **(open circles)** and stenotic or occluded shunt patients **(solid circles)**. P values are for comparisons between subgroups of the differences between baseline and 12 months. MPAP = mean pulmonary artery pressure; PCWP = pulmonary capillary wedge pressure; RAP = right atrial pressure.

Interatrial Shunting for Heart Failure

Early and Late Results From the First-in-Human Experience With the V-Wave System

Josep Rodés-Cabau, MD,[a] Mathieu Bernier, MD,[a] Ignacio J. Amat-Santos, MD, PhD,[b] Tuvia Ben Gal, MD,[c] Luis Nombela-Franco, MD, PhD,[d] Bruno García del Blanco, MD,[e] Arthur Kerner, MD,[f] Sebastien Bergeron, MD,[a] Maria del Trigo, MD, PhD,[a] Philippe Pibarot, PhD,[a] Sergio Shkurovich, PhD,[g] Neal Eigler, MD,[g] William T. Abraham, MD[h]

FIGURE 2 Examples of Transesophageal Echocardiographic Color Doppler Shunt Patency Analysis at 12-Month Follow-Up



(A) Widely patent (nonstenotic) shunt with vena contracta of 4.8 mm. **(B)** Stenotic shunt. The vena contracta is 2 mm and skewed off axis **(dashed line)** by 26°. **(C)** Stenotic shunt with subtotal occlusion. **(D)** Occluded shunt. LA = left atrium; RA = right atrium; S = shunt.

Current Cardiology Reports (2018) 20: 85
https://doi.org/10.1007/s11886-018-1027-2

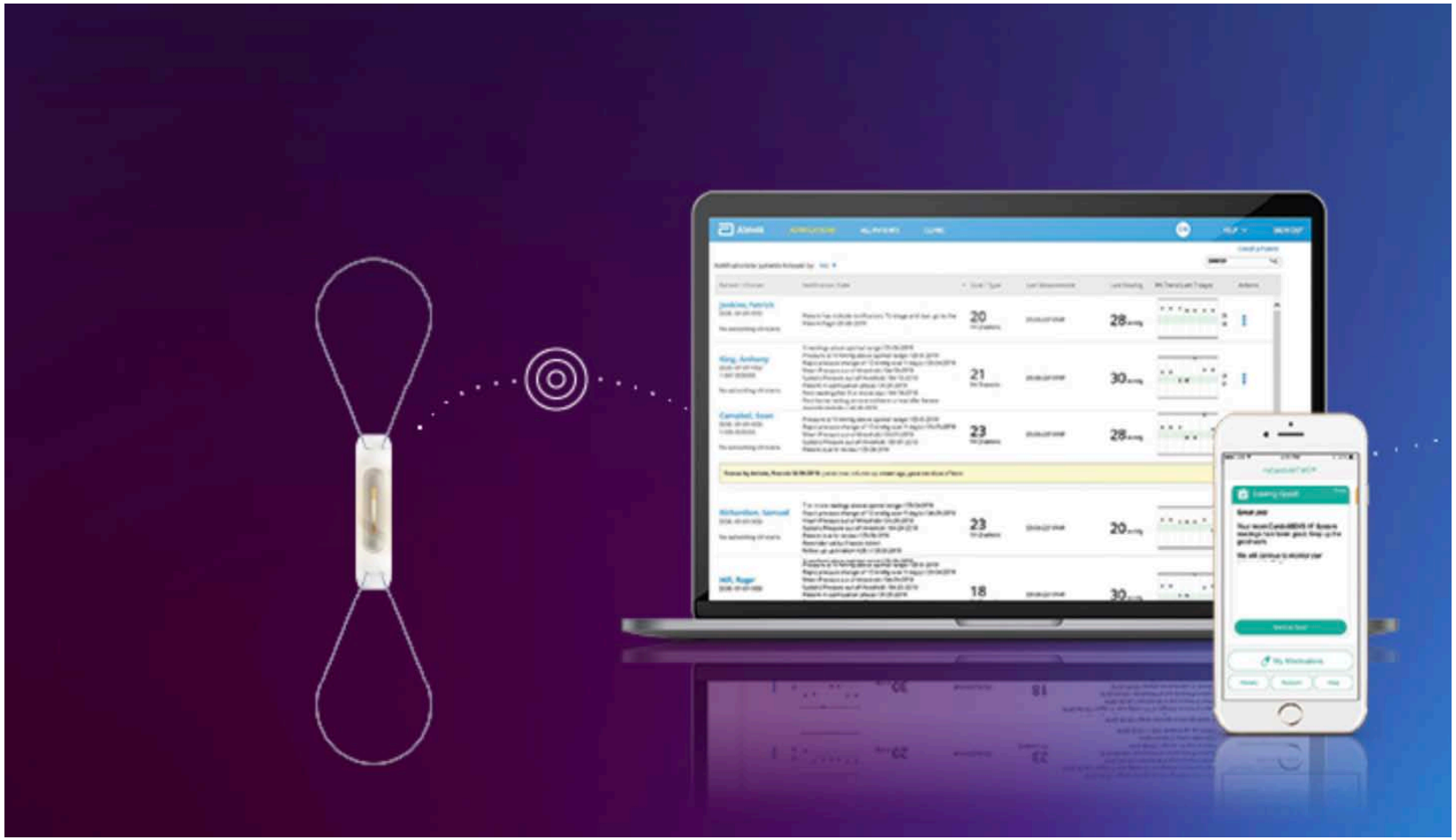
INTERVENTIONAL CARDIOLOGY (SR BAILEY, SECTION EDITOR)

Update on Devices for Diastolic Dysfunction: Options for a No Option Condition?

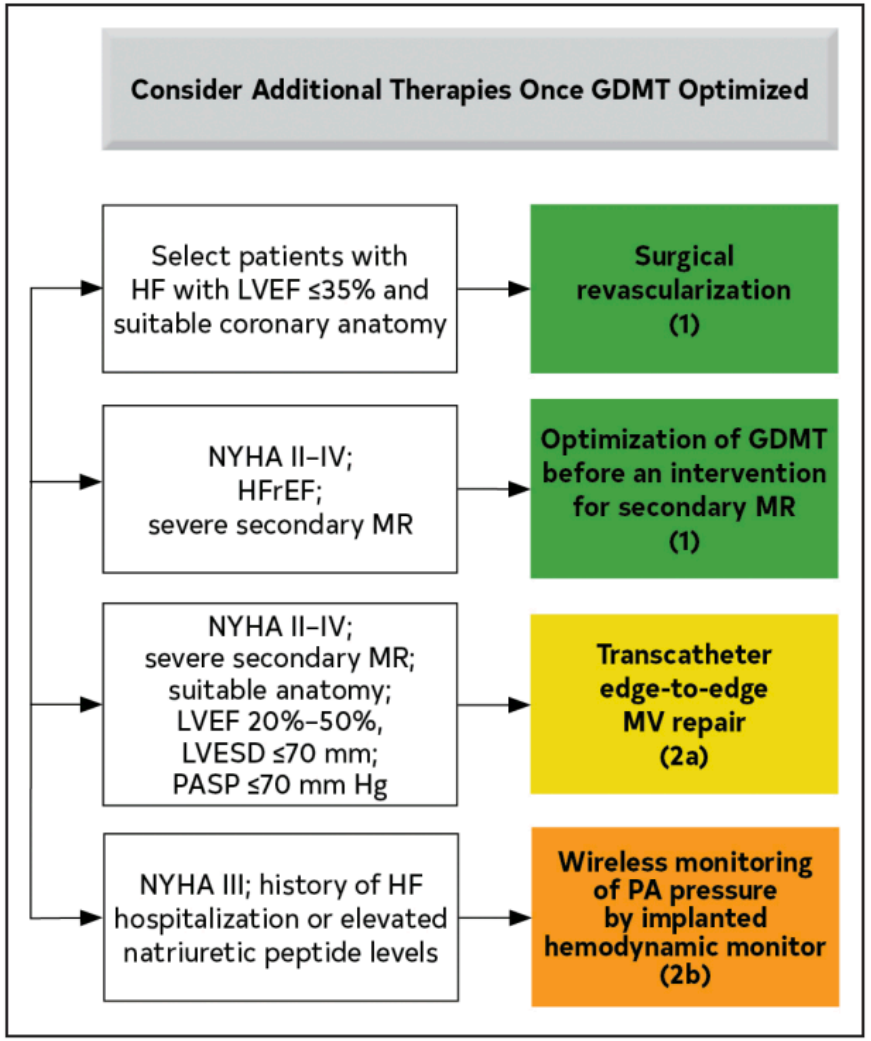
Amit Gupta [1] · Steven R. Bailey [1]

Published online: 15 August 2018

İmplantasiya edilə bilən hemodinamik monitor



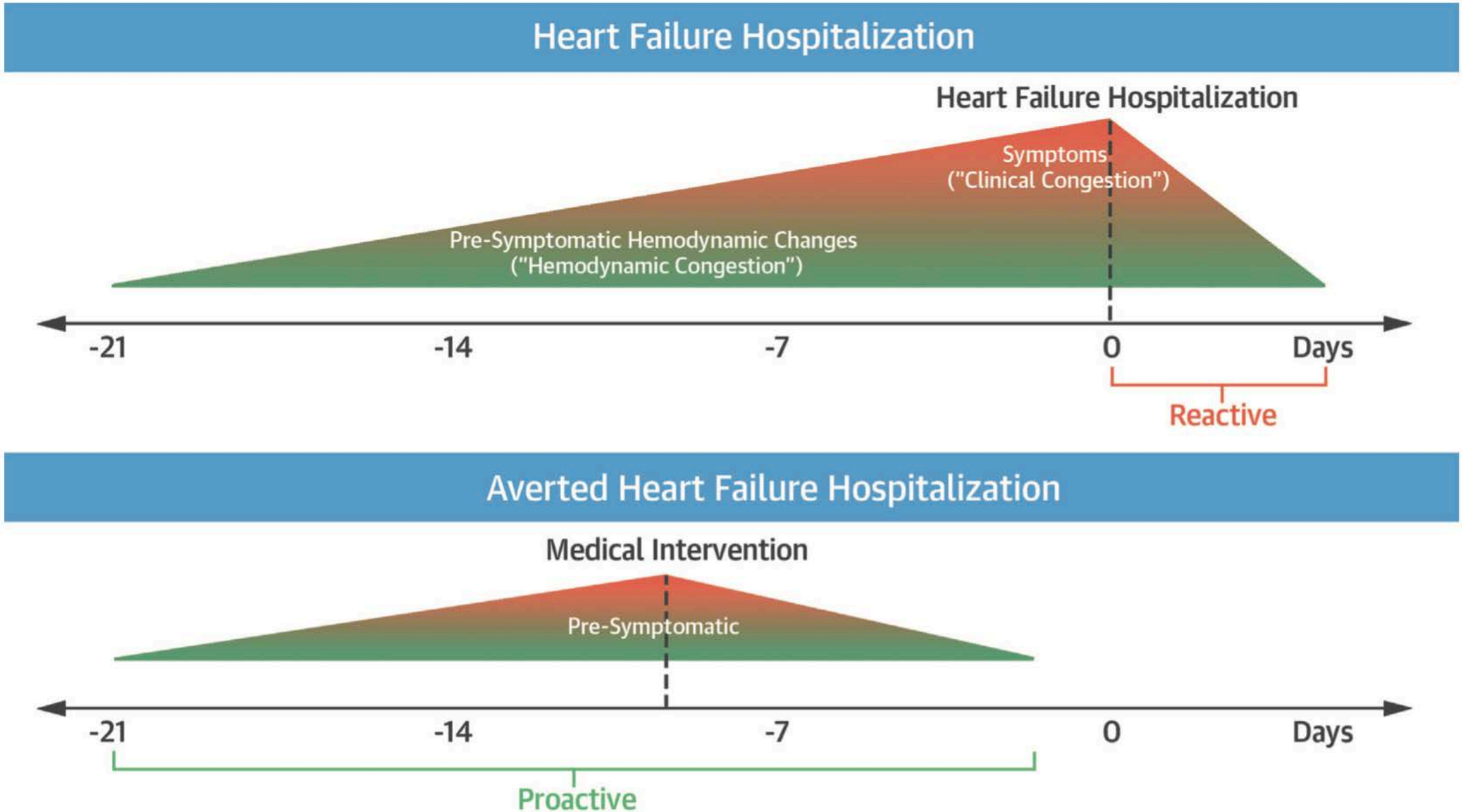
Rəhbər tövsiyələr nə deyir?



Recommendations for telemonitoring

Recommendations	Class[a]	Level[b]
Non-invasive HTM may be considered for patients with HF in order to reduce the risk of recurrent CV and HF hospitalizations and CV death.[374]	IIb	B
Monitoring of pulmonary artery pressure using a wireless haemodynamic monitoring system may be considered in symptomatic patients with HF in order to improve clinical outcomes.[372]	IIb	B

CV = cardiovascular; HF = heart failure; HTM = home telemonitoring; LVEF = left ventricular ejection fraction.
[a]Class of recommendation.
[b]Level of evidence.



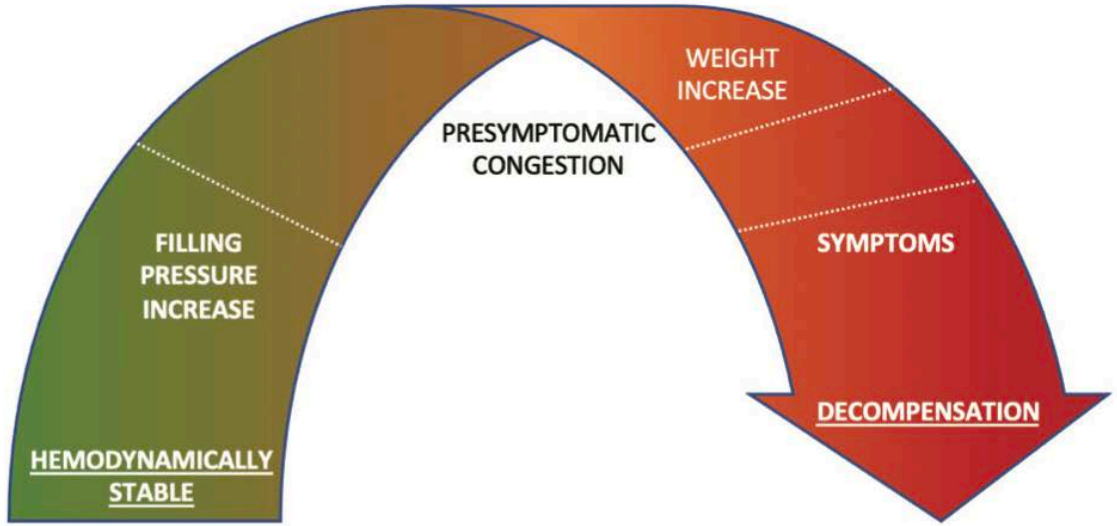
Abraham, W.T. et al. J Am Coll Cardiol. 2017;70(3):389-98.

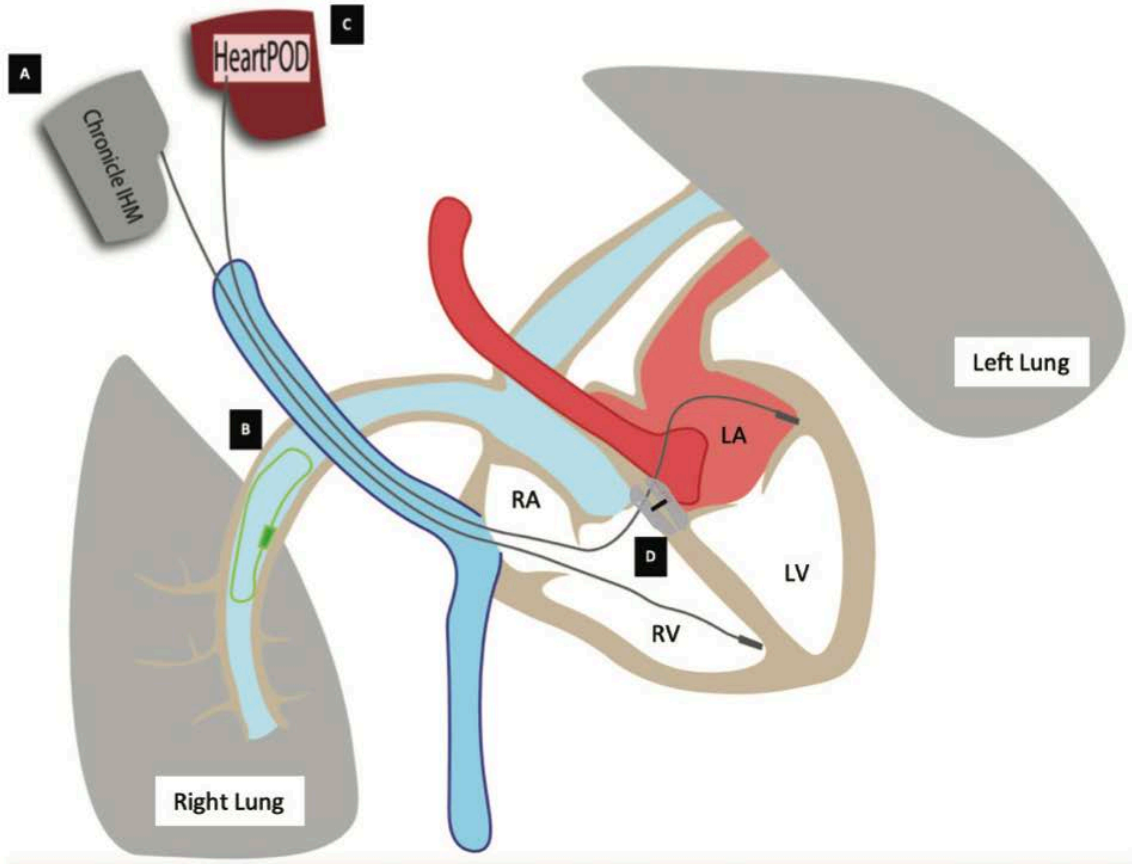
İmplantasiya edilən hemodinamik monitor

RV (Chronicle HCM) (A)

PA (CardioMEMS, Cordella) (B)

LA (HeartPod) (C), V-LAP (D)



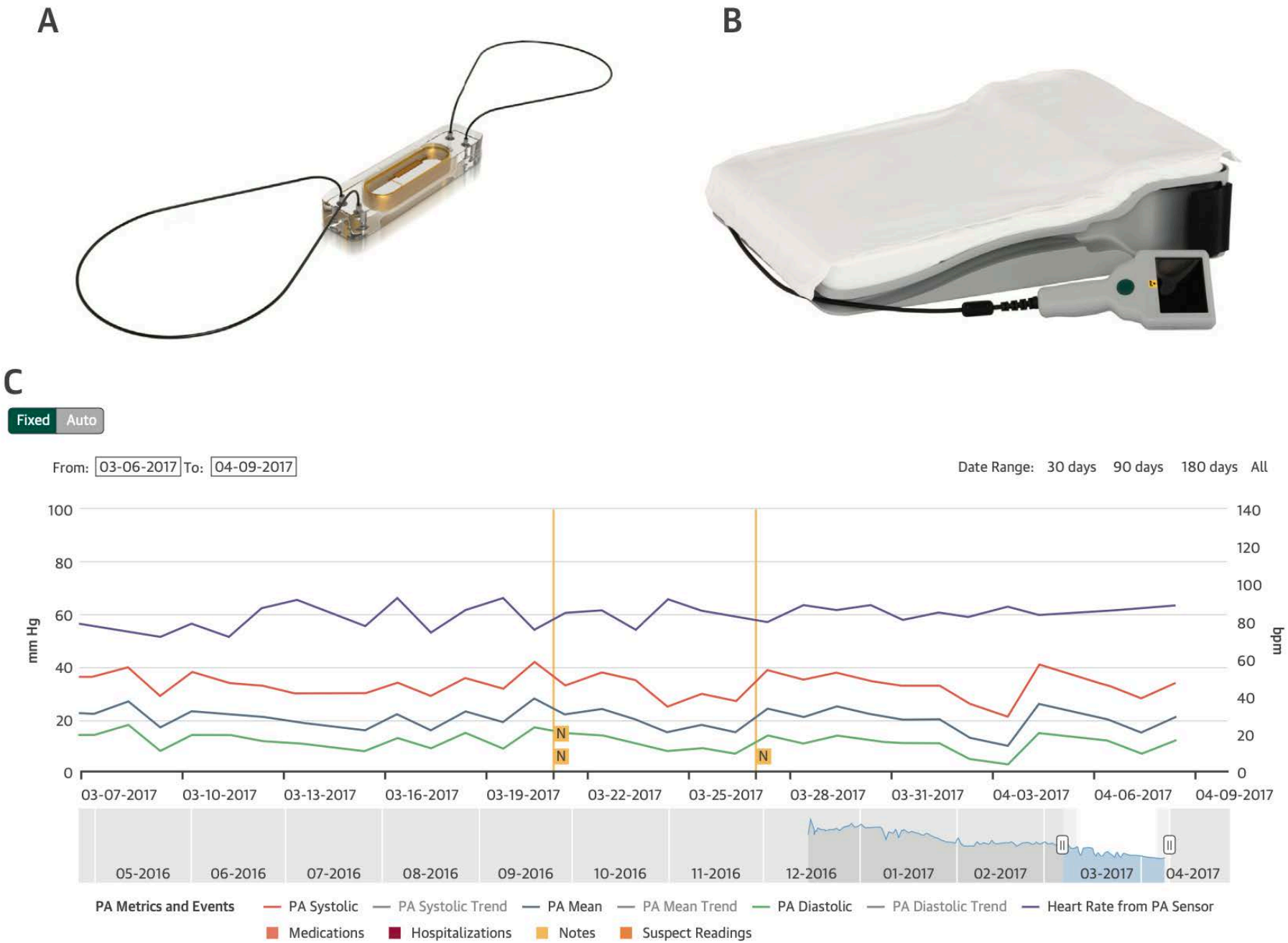


Birinci və İkinci Nəsil Sol Atrial Təzyiq Sensorları

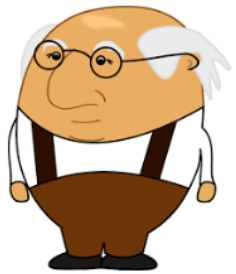
(A) The HeartPOD sol atrial təzyiq monitorinq sistemi (Abbott, Sylmar, California)

(B) V- LAP sol atrial təzyiq sensoru

FIGURE 1 The Major Components of the CardioMEMS HF System

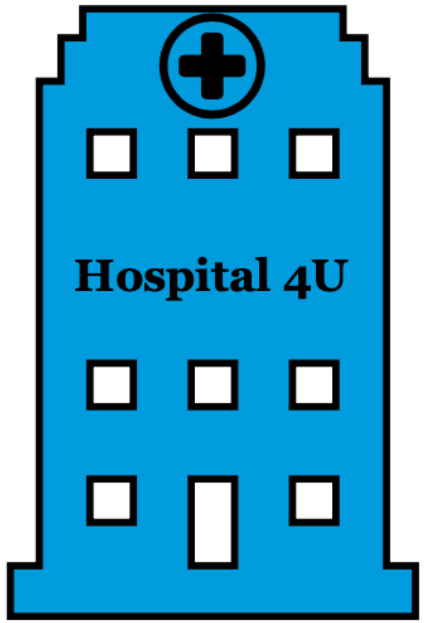


CardioMEMS HF System



Daily Pulmonary Artery Pressure Readings

Proactive Therapy Updates

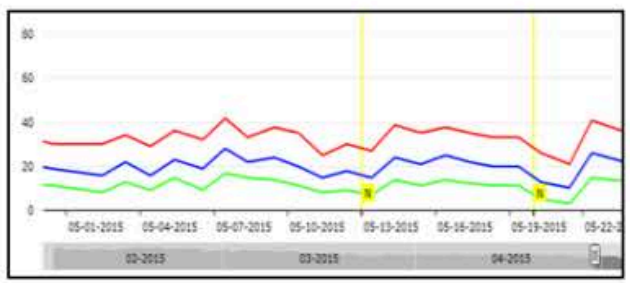


Heart Failure Patient

- NYHA III
- At least 1 HF hospitalization in the year prior to implant/inclusion
- BMI < 35

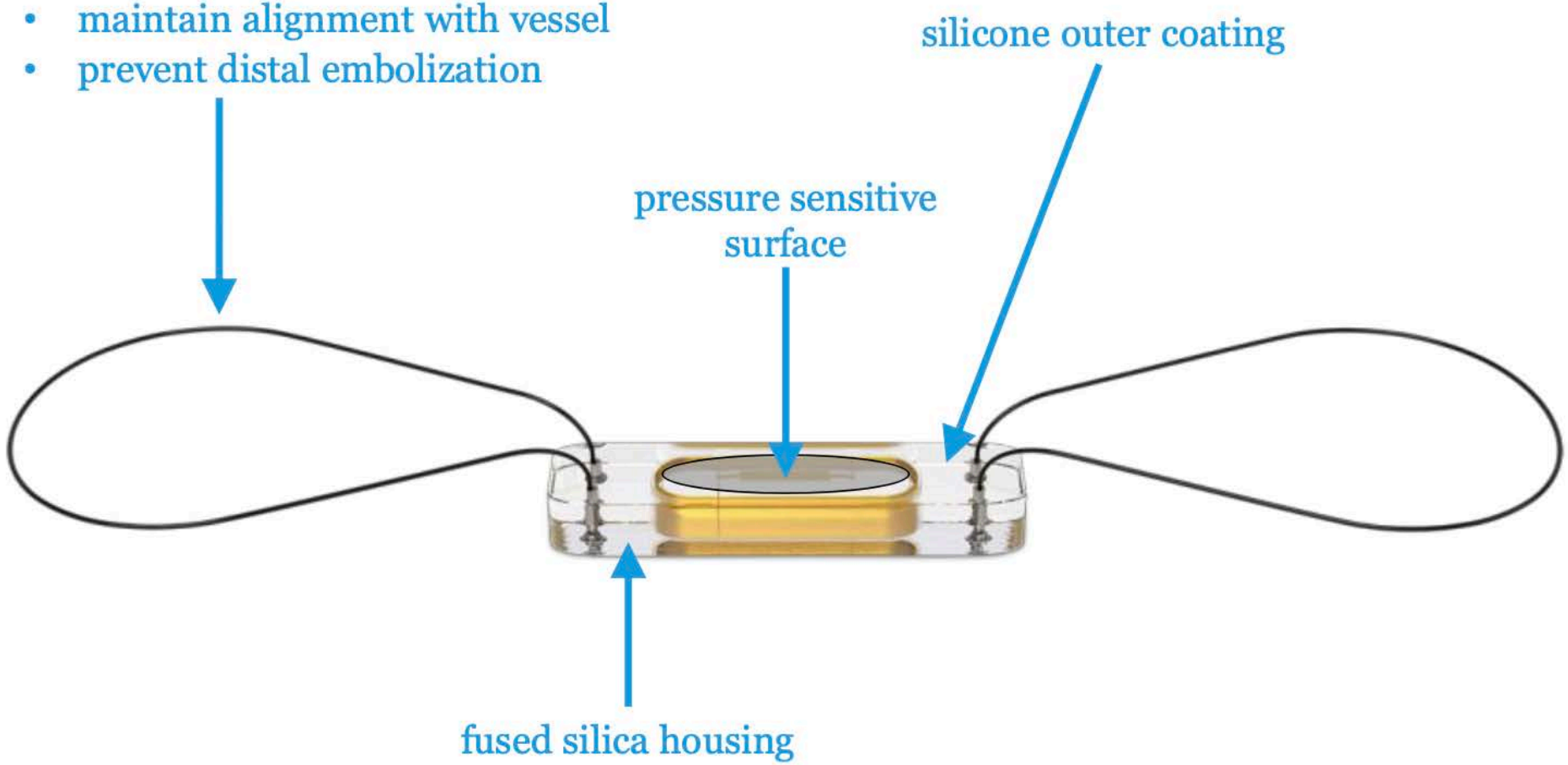
CardioMEMS HF System

Pulmonary Artery Pressure Sensor + Patient Electronics System + CardioMEMS Website Merlin.net

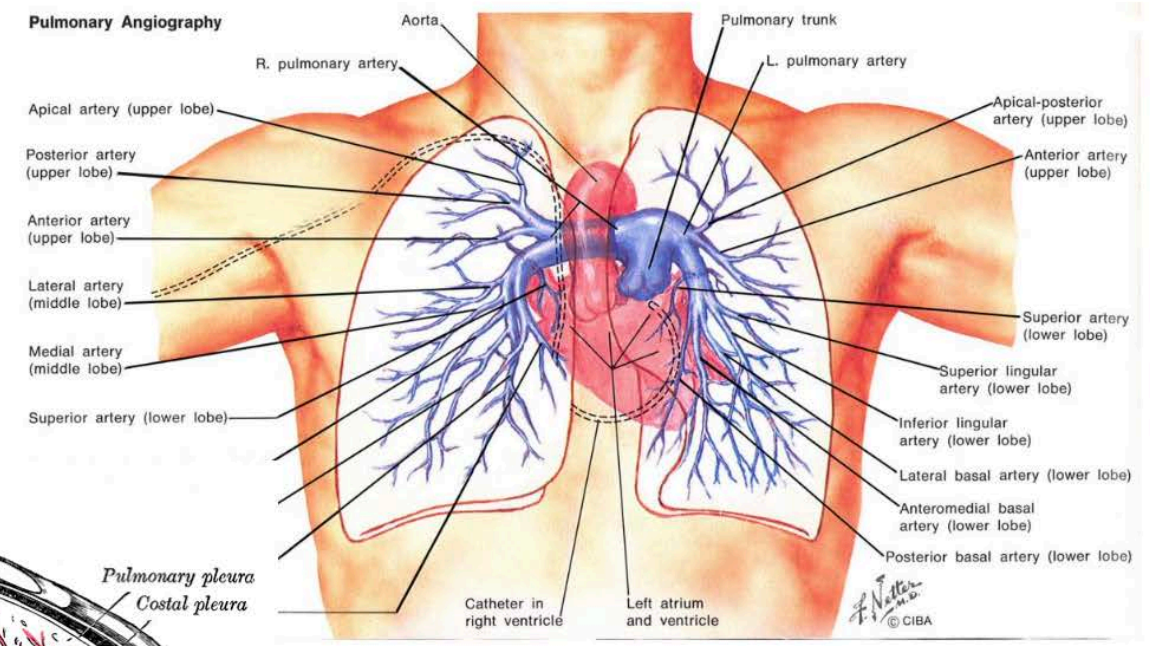


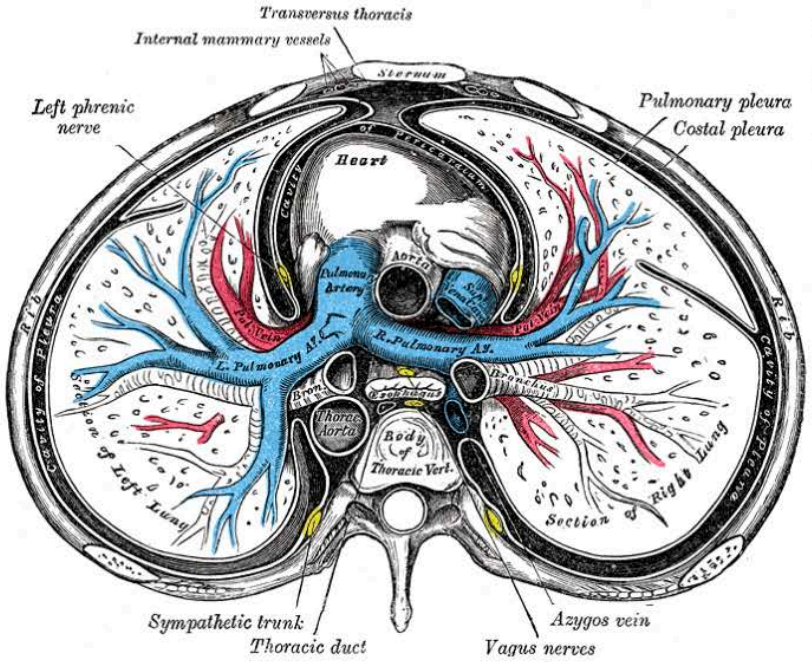
Sensor Characteristics

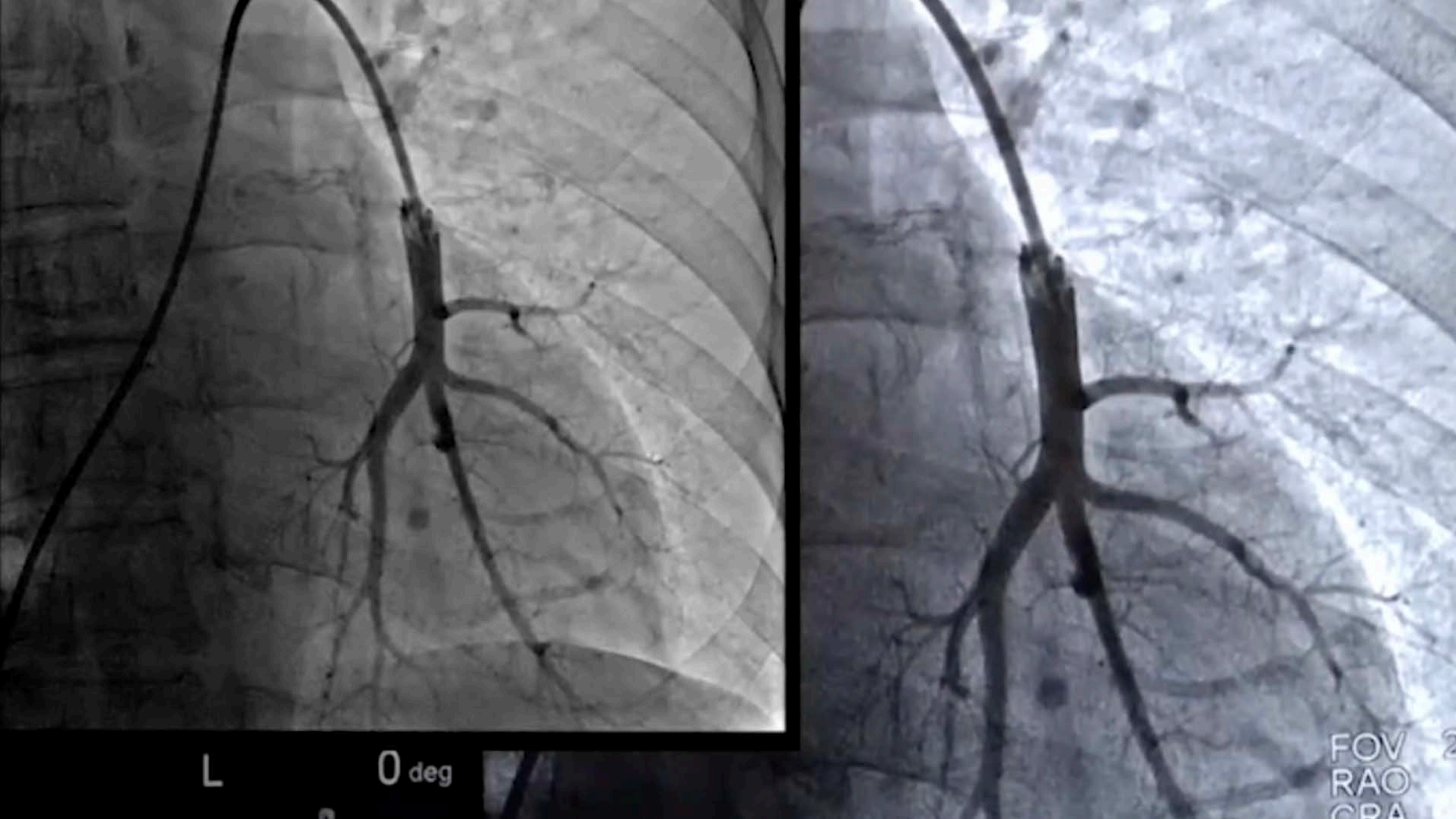
nitinol wire loops
- maintain alignment with vessel
- prevent distal embolization

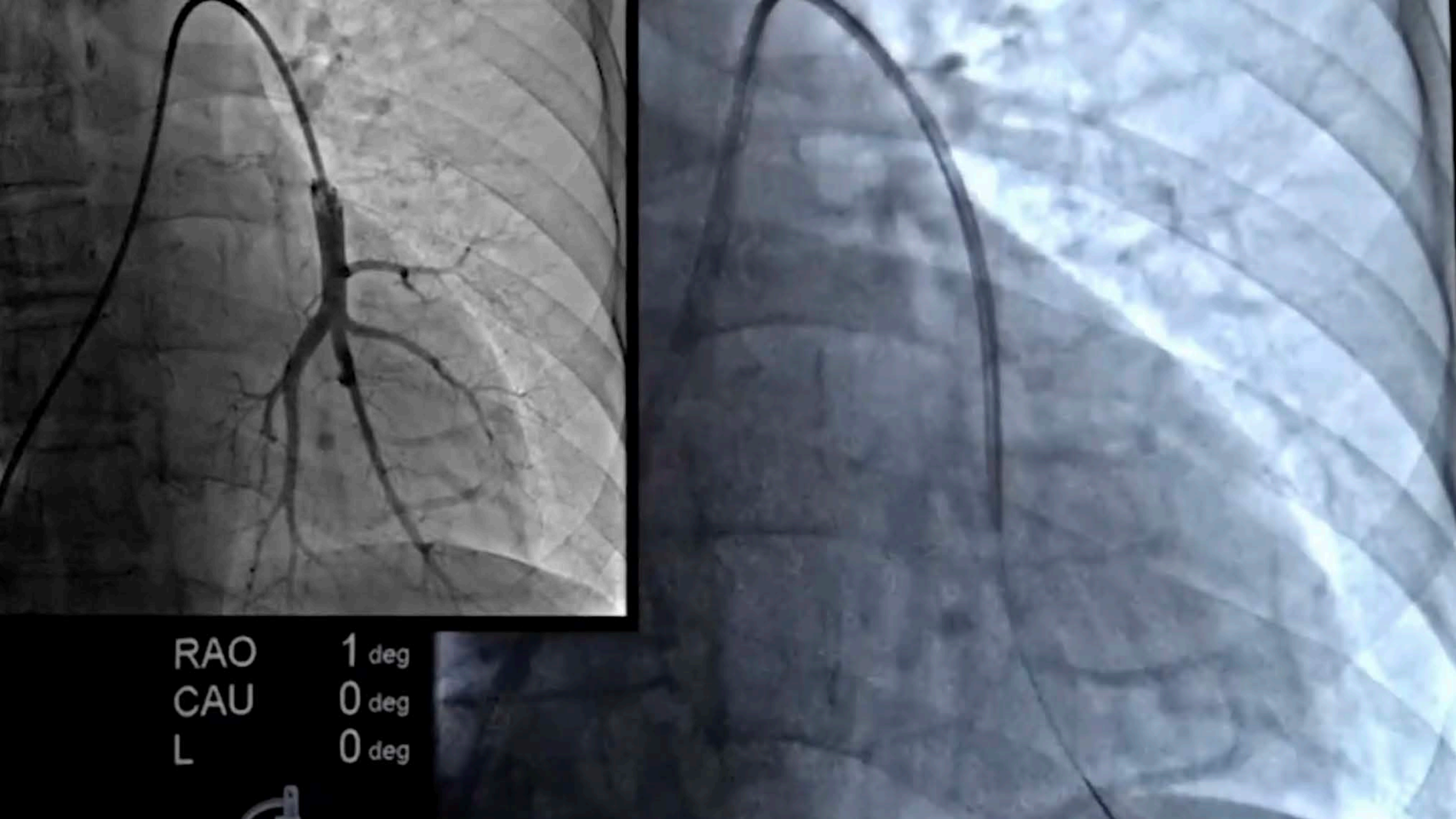


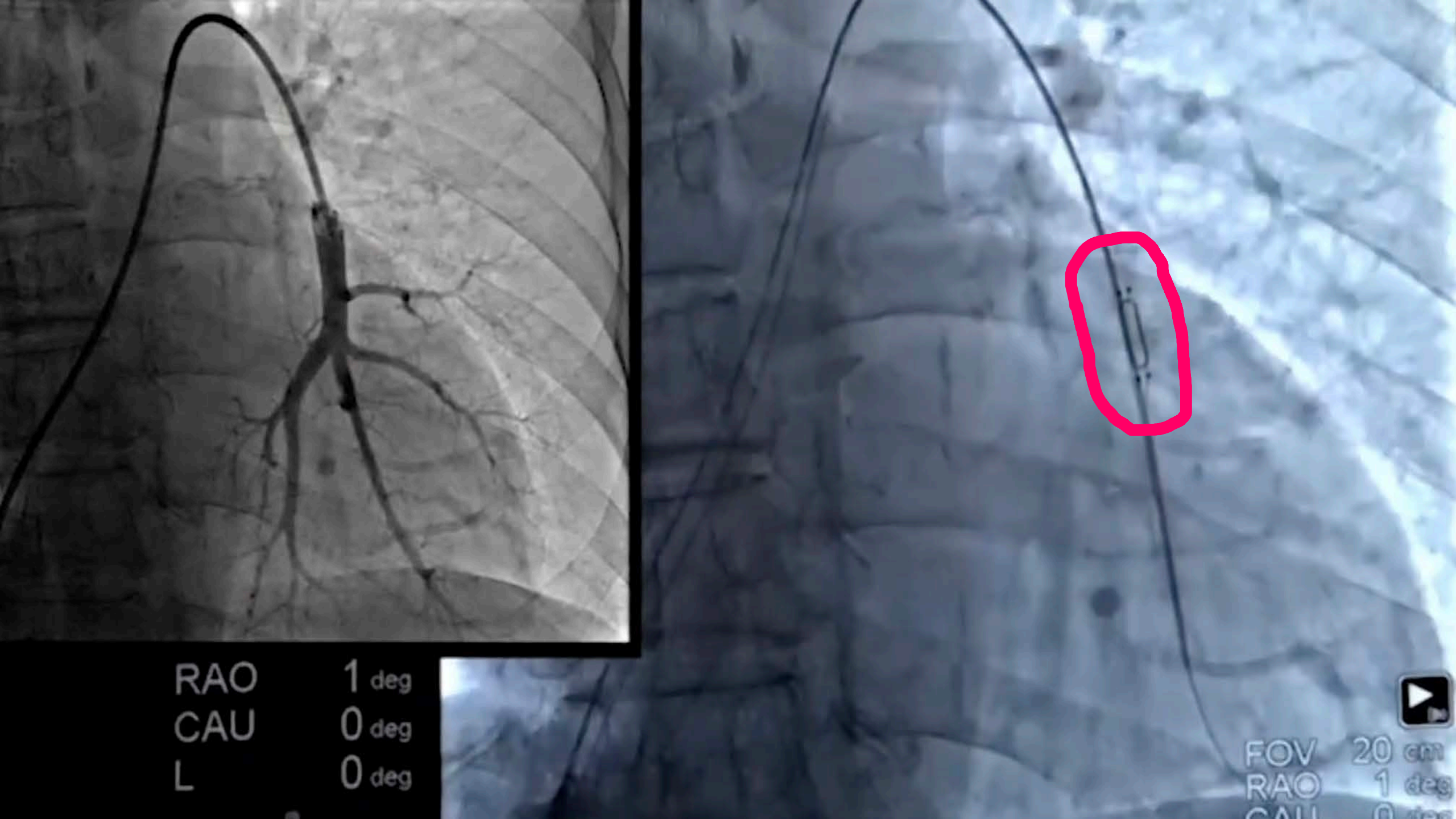
Implant Target Zone



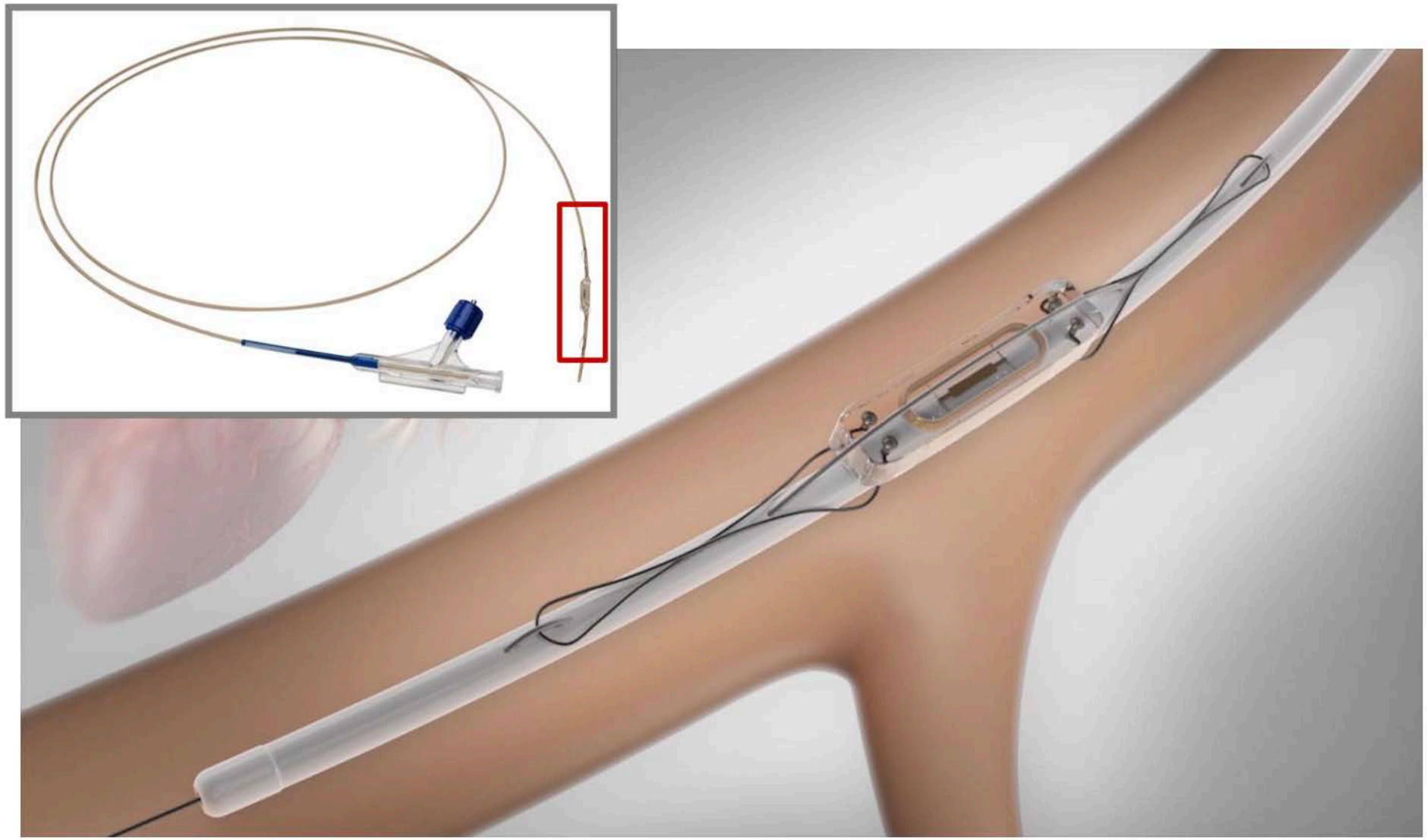



L
0 deg
FOV
RAO
CRA


RAO 1 deg
CAU 0 deg
L 0 deg

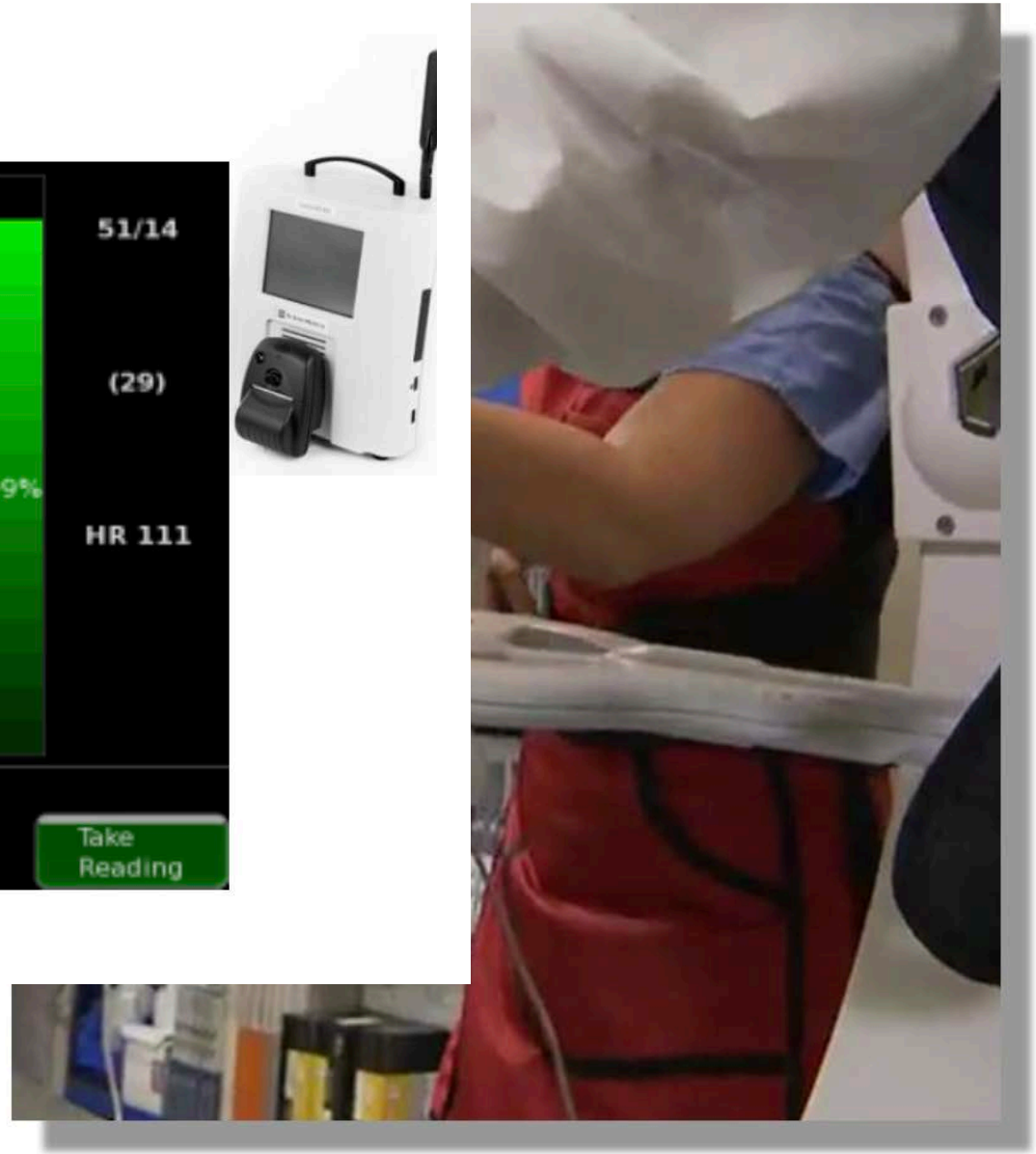

RAO 1 deg
CAU 0 deg
L 0 deg
FOV 20 cm
RAO 1 deg

Sensor Release

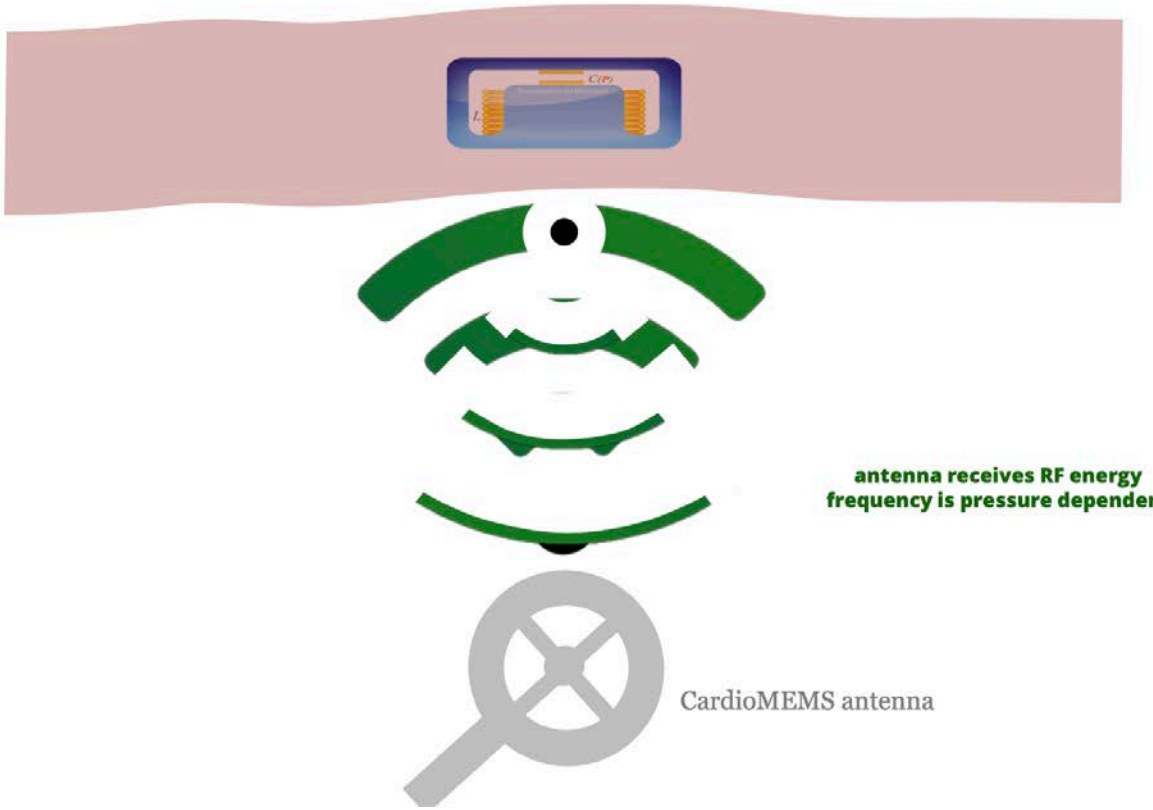


Hospital Electronics Unit (CM3000)

Hospital Electronics Unit



Taking a PAP Reading



antenna receives RF energy
frequency is pressure dependent

CardioMEMS antenna

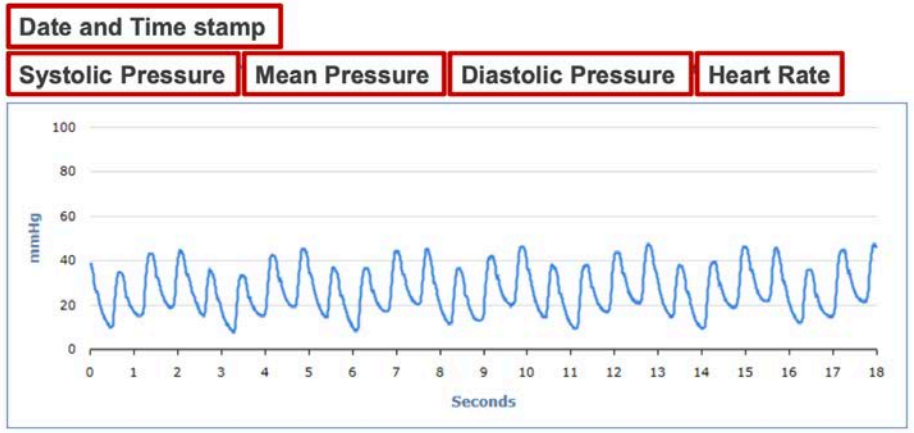
Patient Electronics Unit

Patient Electronics Unit

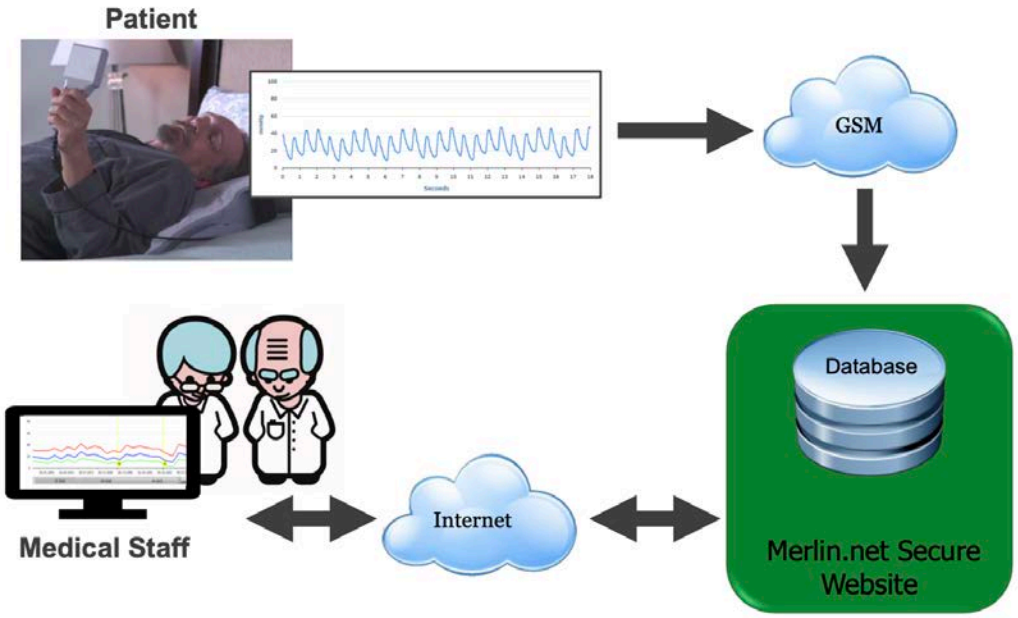
- **Handheld display shows relevant information e.g.**

- **The Patient Electronics Unit provides spoken instructions in local language**
- **After the implant the patient is trained how to use of the PEU at home**

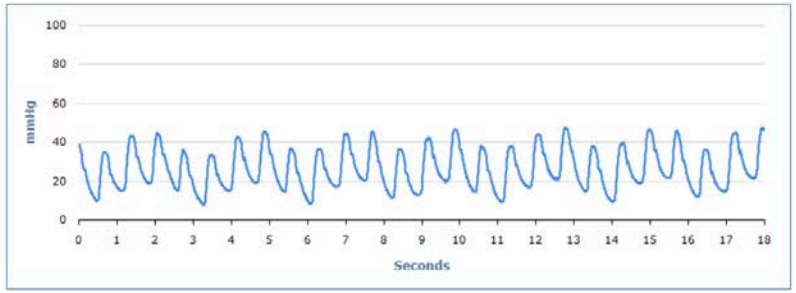
Daily PAP Waveform



CardioMEMS Data Flow



Home Reading – Day 3

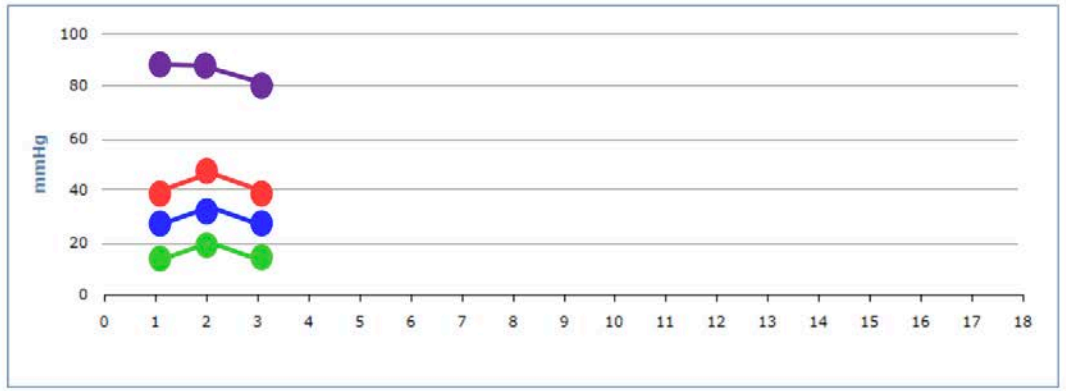


PA systolic = 40 mmHg

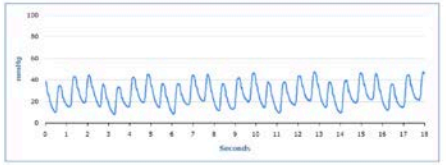
PA mean = 31 mmHg

PA diastolic = 19 mmHg

Heart rate = 80 bpm



Home Reading – Day 1

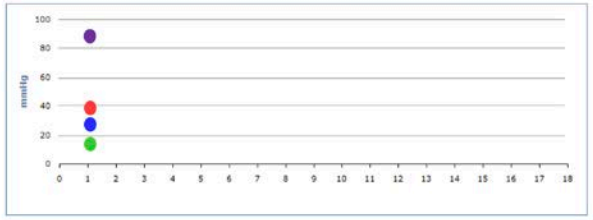


PA systolic = 40 mmHg

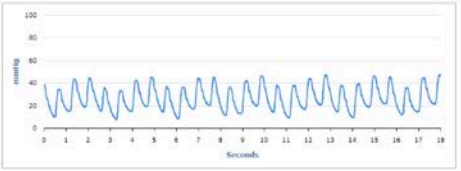
PA mean = 25 mmHg

PA diastolic = 15 mmHg

Heart rate = 90 bpm



Home Reading – Day 2

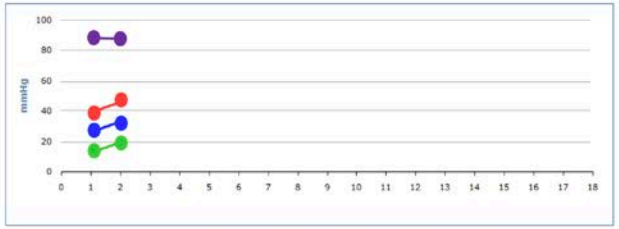


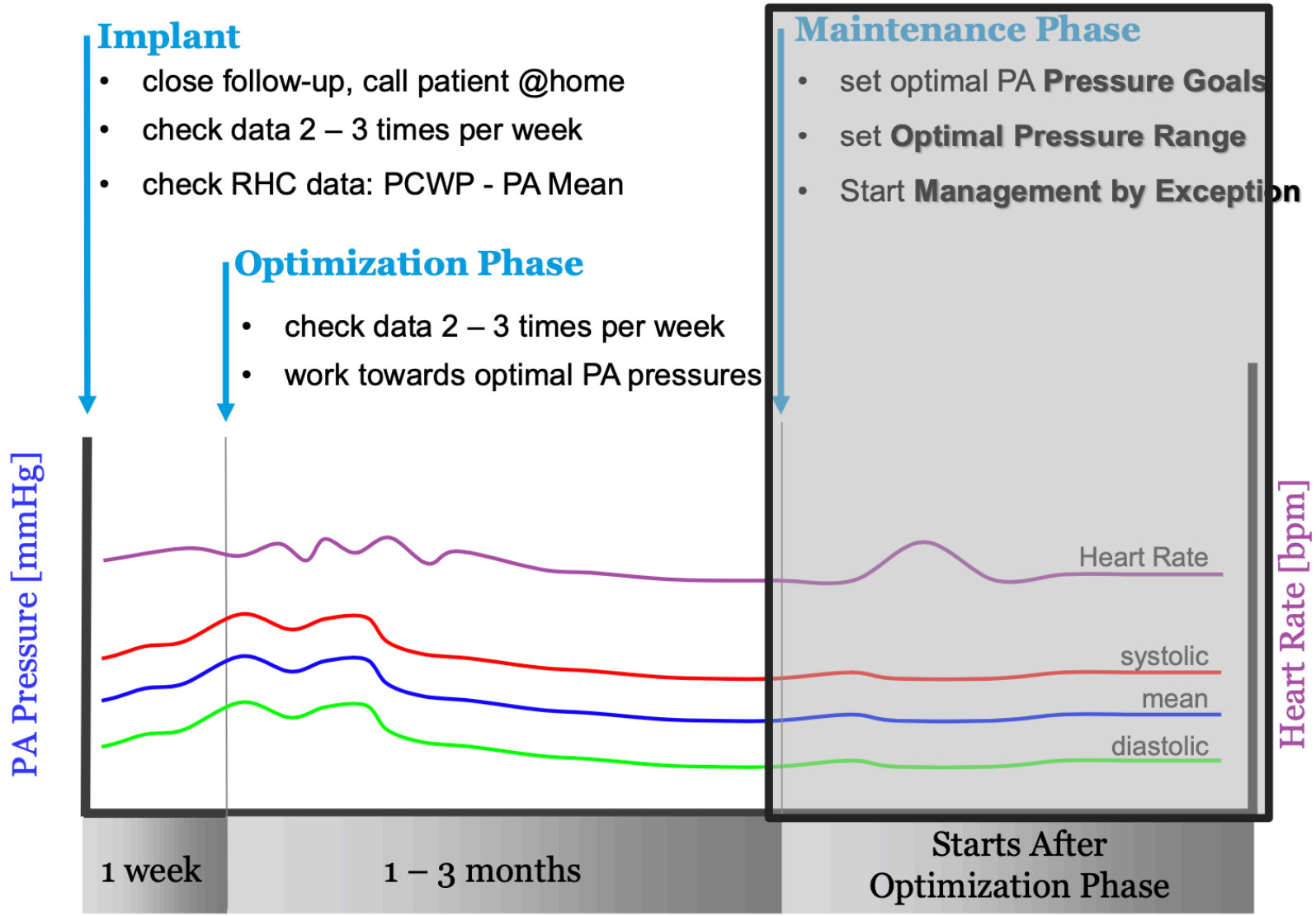
PA systolic = 45 mmHg

PA mean = 30 mmHg

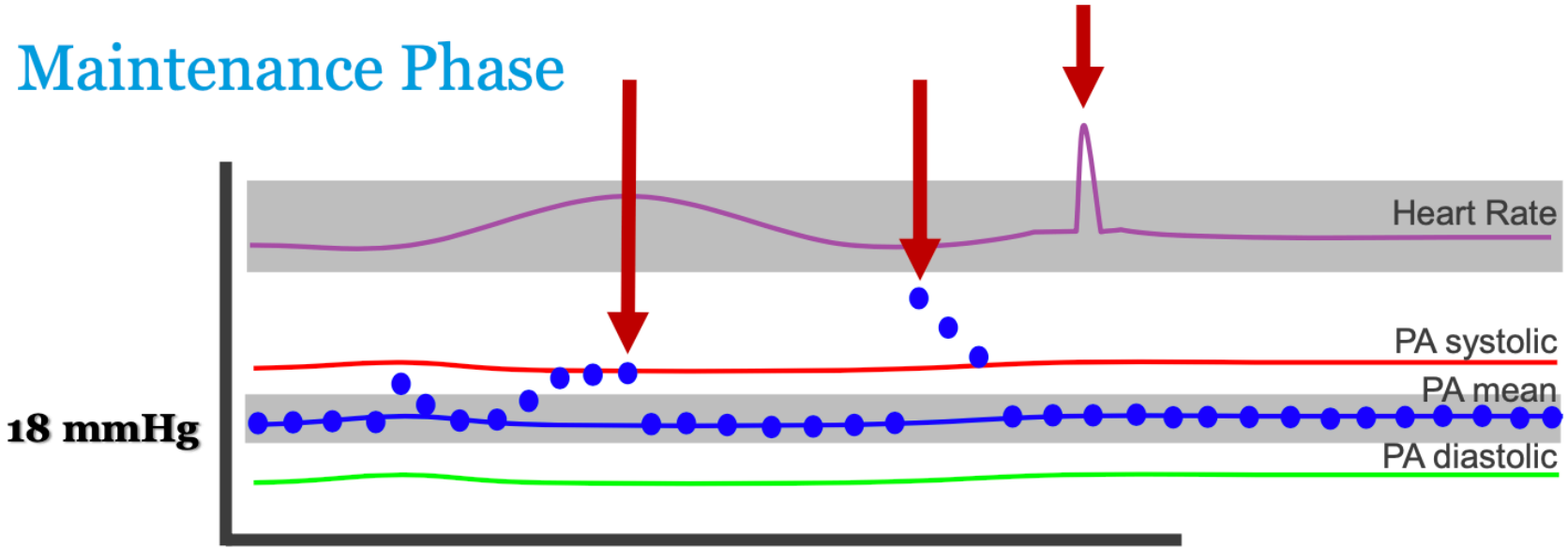
PA diastolic = 20 mmHg

Heart rate = 90 bpm




Implant
• close follow-up, call patient @home
• check data 2 – 3 times per week
• check RHC data: PCWP - PA Mean
Optimization Phase
• check data 2 – 3 times per week
• work towards optimal PA pressures
Maintenance Phase
• set optimal PA Pressure Goals
• set Optimal Pressure Range
• Start Management by Exception
PA Pressure [mmHg]
Heart Rate [bpm]
Heart Rate
systolic
mean
diastolic
1 week
1 – 3 months
Starts After
Optimization Phase

Maintenance Phase



Set **Primary Metric** and PA **Pressure Goal** and : e.g. PA mean - 18 mmHg

Set **Optimal Range**: e.g. 10 – 25 mmHg

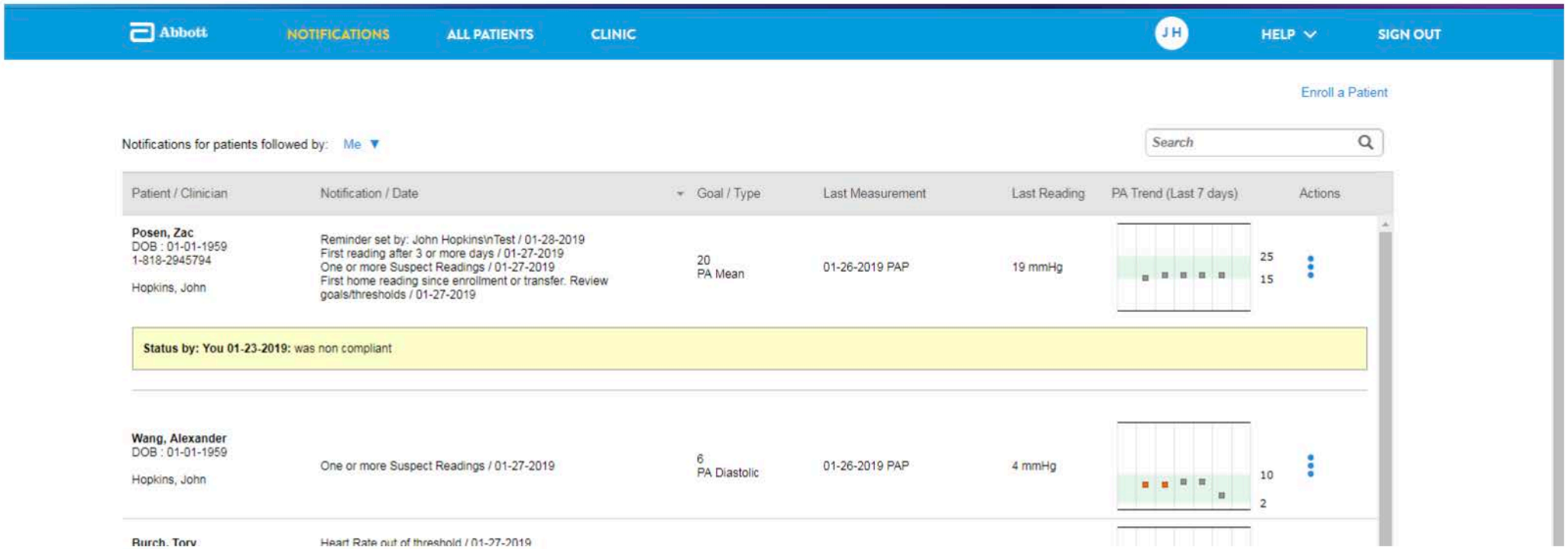
Set **Consecutive Readings** outside Optimal Range: e.g. 3 days

Set **Range** for Heart Rates: e.g. 50 - 90 bpm

Set window for **Patient Compliance**

Manage Patient by Exception

The Notifications List: Only The Patients Who Need My Attention



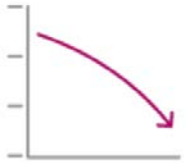
57%
HFH reduction regardless of EF

Reduction in PA Pressures

2020

US Post-Approval Study

Shavelle et al.



$13K
reduction in cost

2017

Real-World Economic Impact

Desai et al.

62%
HFH reduction

Improved Quality of Life

2020

MEMS-HF Europea Study

Angermann et al.

43%
HFH reduction with CardioMEMS & optimal GDMT

2017

act with Guideline-Directed Medical Therapy

Givertz et al.

24%
HFH reduction

30%
Mortality Reduction

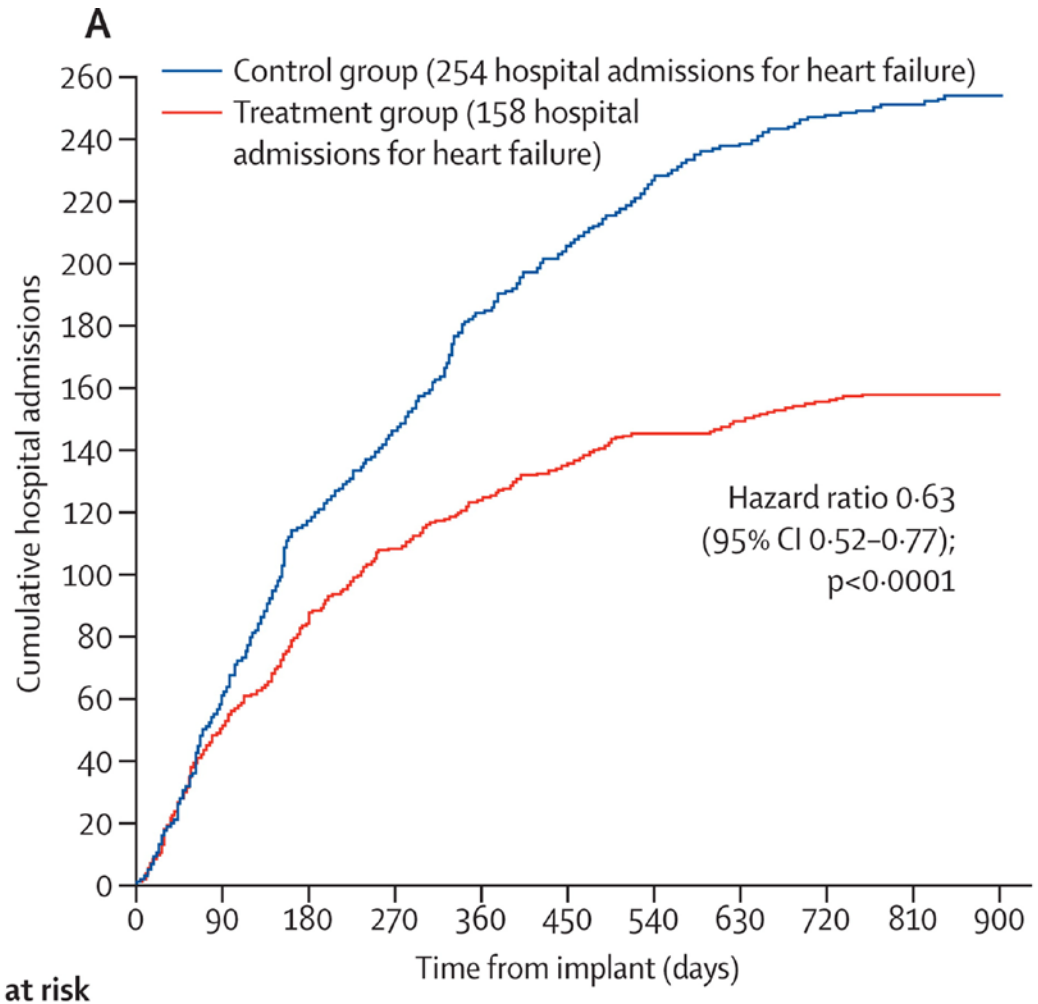
2019

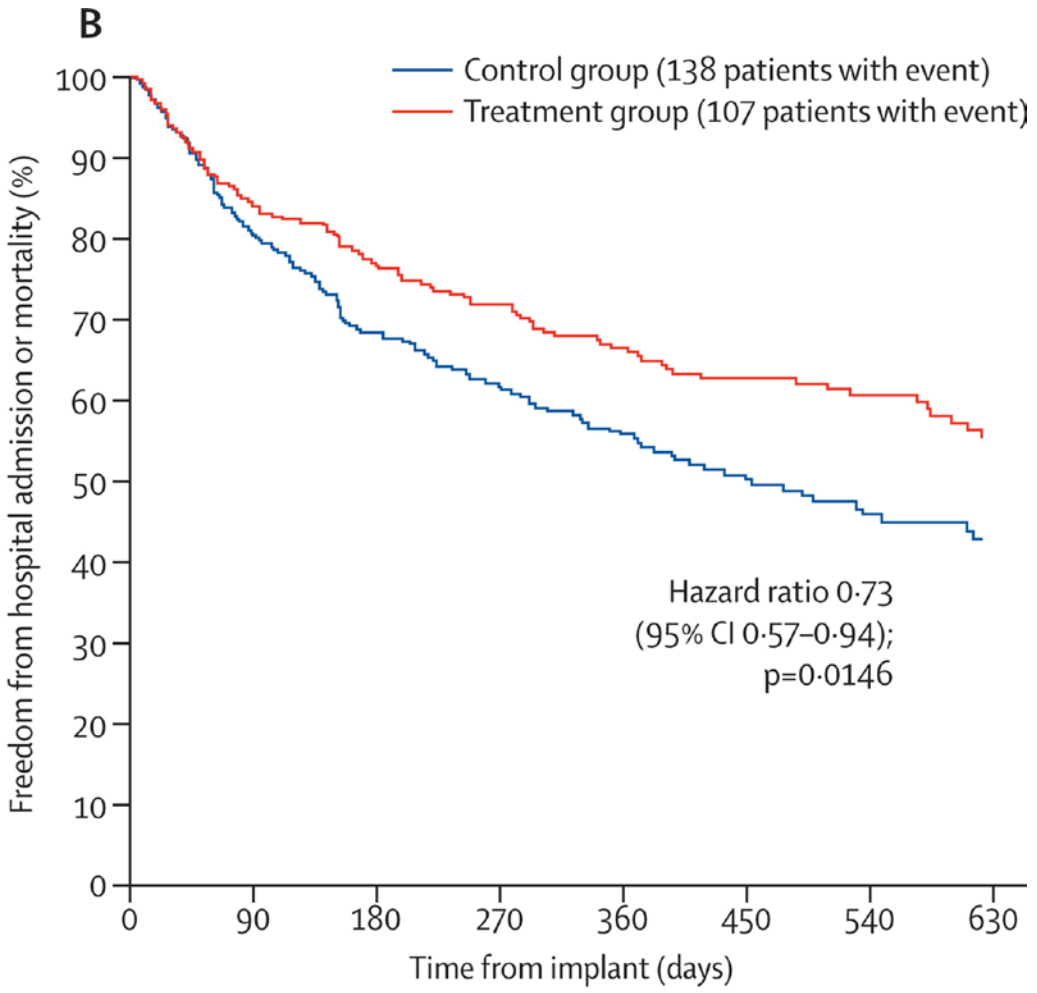
Propensity-Matched Cohort Outcomes

Abraham et al.

CardioMEMS HF System

CHAMPION


A
Control group (254 hospital admissions for heart failure)
Treatment group (158 hospital admissions for heart failure)
Cumulative hospital admissions
Hazard ratio 0·63
(95% CI 0·52–0·77);
p<0·0001
Time from implant (days)
Number at risk
Control group 280 267 252 215 179 137 105 67 25 10 0
Treatment group 270 262 244 210 169 131 108 82 29 5 1


B
Control group (138 patients with event)
Treatment group (107 patients with event)
Freedom from hospital admission or mortality (%)
Hazard ratio 0·73
(95% CI 0·57–0·94);
p=0·0146
Time from implant (days)
280 223 186 146 113 80 57 39
270 226 202 169 130 104 84 62

Remote haemodynamic monitoring of pulmonary artery pressures in patients with chronic heart failure (MONITOR-HF): a randomised clinical trial

Jasper J Brugts, Sumant P Radhoe*, Pascal R D Clephas†, Dilan Aydin†, Marco W F van Gent, Mariusz K Szymanski, Michiel Rienstra, Mieke H van den Heuvel, Carlos A da Fonseca, Gerard C M Linssen, C Jan Willem Borleffs, Eric Boersma, Folkert W Asselbergs, Arend Mosterd, Hans-Peter Brunner-La Rocca, Rudolf A de Boer for the MONITOR-HF investigators*

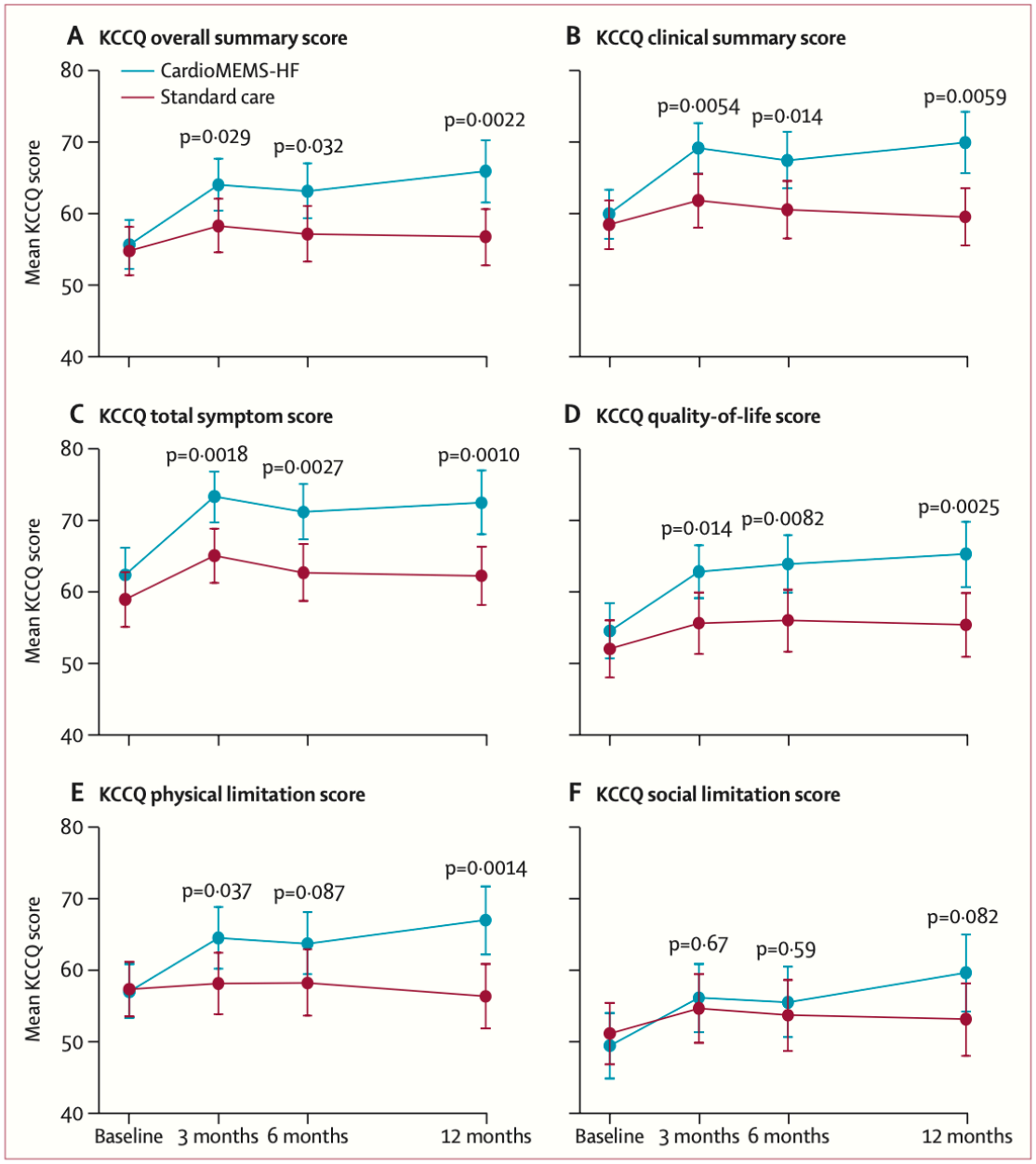


Figure 2: **Mean KCCQ score domains during follow-up**
p values are presented at each timepoint for the difference between groups. The KCCQ contains six domains with plotted mean values of both treatment groups. KCCQ=Kansas City Cardiomyopathy Questionnaire.

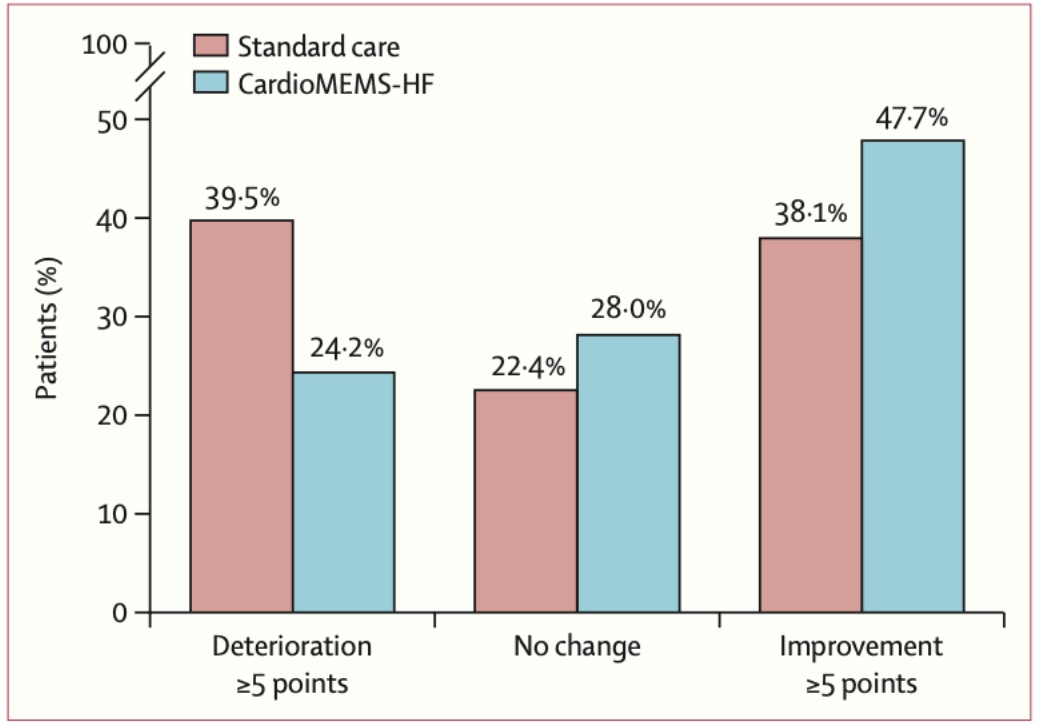


Figure 3: **Proportions of patients with improvement or deterioration in quality of life as measured by the change in KCCQ overall summary score at 12 months**
χ^2 p=0·022 for the difference between groups in the three quality-of-life change categories.

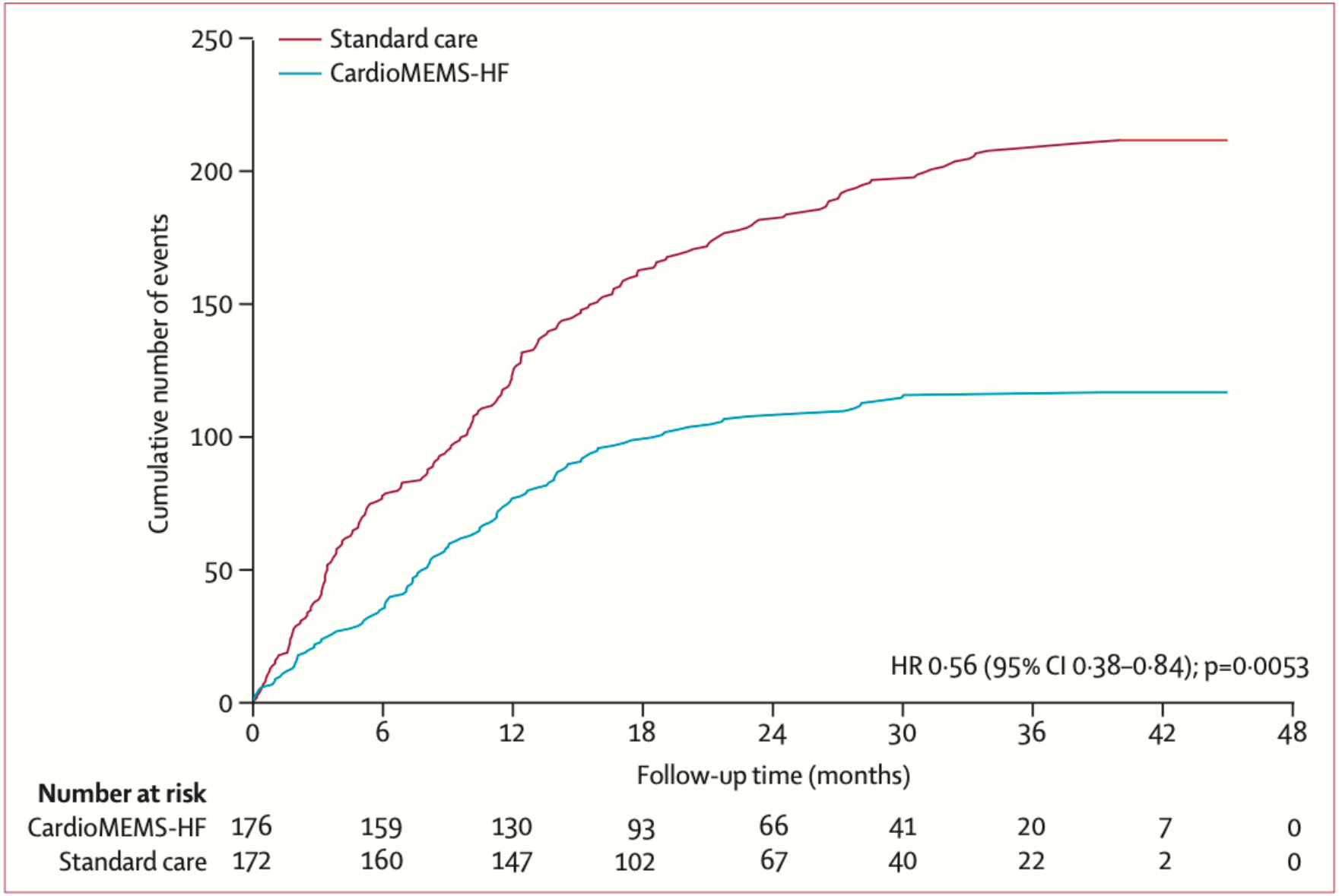
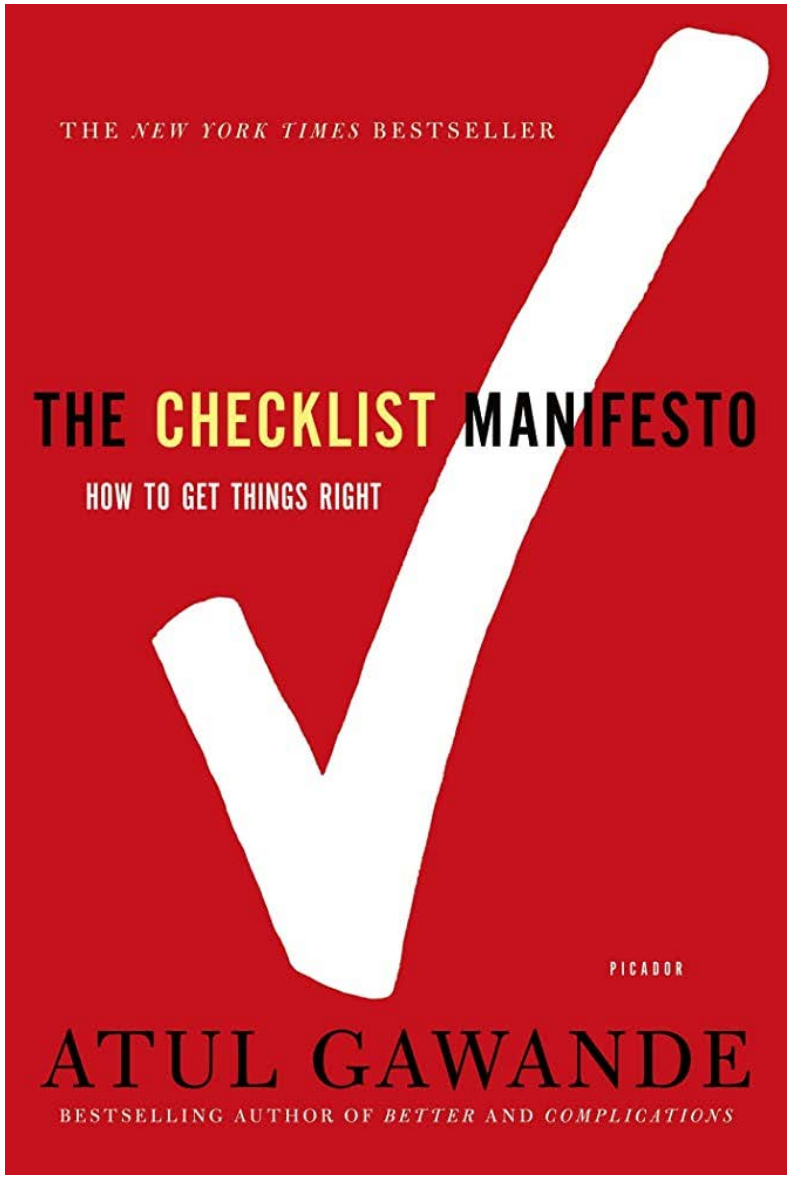


Figure 4: **Cumulative number of total heart failure hospitalisations (heart failure hospitalisations and urgent visits with necessity of iv diuretics) during entire follow-up**



Effect of handwashing on child health: a randomised controlled trial

Stephen P Luby, Mubina Agboatwalla, Daniel R Feikin, John Painter, Ward Billhimer MS, Arshad Altaf, Robert M Hoekstra

Summary

Background More than 3·5 million children aged less than 5 years die from diarrhoea and acute lower respiratory-tract infection every year. We undertook a randomised controlled trial to assess the effect of handwashing promotion with soap on the incidence of acute respiratory infection, impetigo, and diarrhoea.

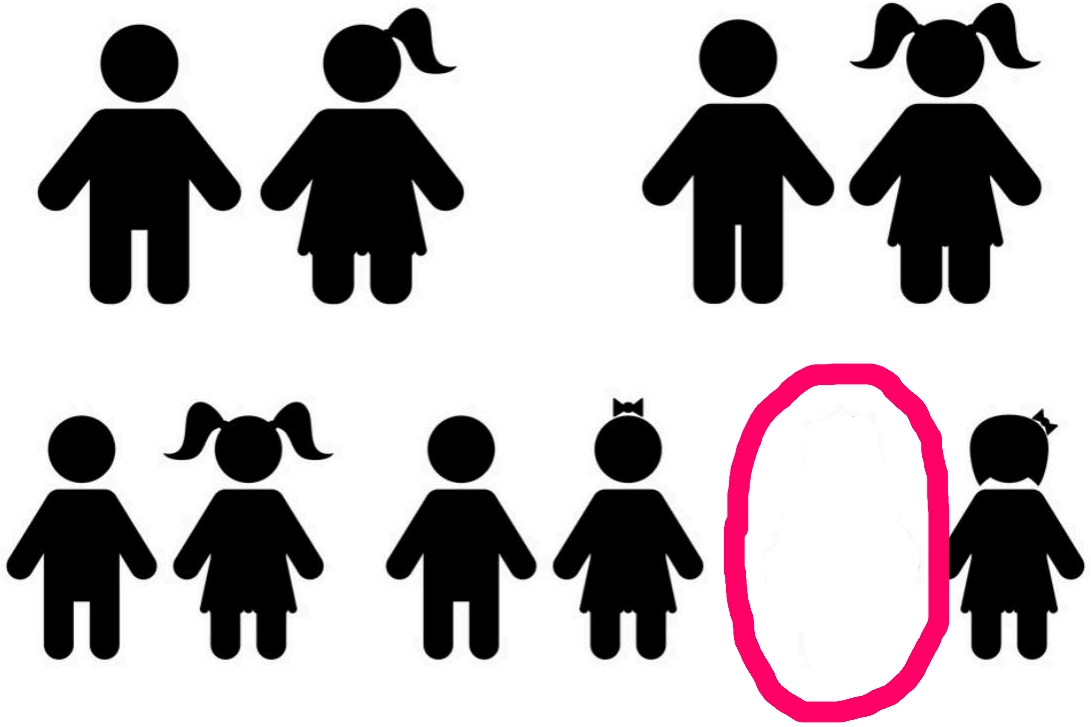
Methods In adjoining squatter settlements in Karachi, Pakistan, we randomly assigned 25 neighbourhoods to handwashing promotion; 11 neighbourhoods (306 households) were randomised as controls. In neighbourhoods with handwashing promotion, 300 households each were assigned to antibacterial soap containing 1·2% triclocarban and to plain soap. Fieldworkers visited households weekly for 1 year to encourage handwashing by residents in soap households and to record symptoms in all households. Primary study outcomes were diarrhoea, impetigo, and acute respiratory-tract infections (ie, the number of new episodes of illness per person-weeks at risk). Pneumonia was defined according to the WHO clinical case definition. Analysis was by intention to treat.

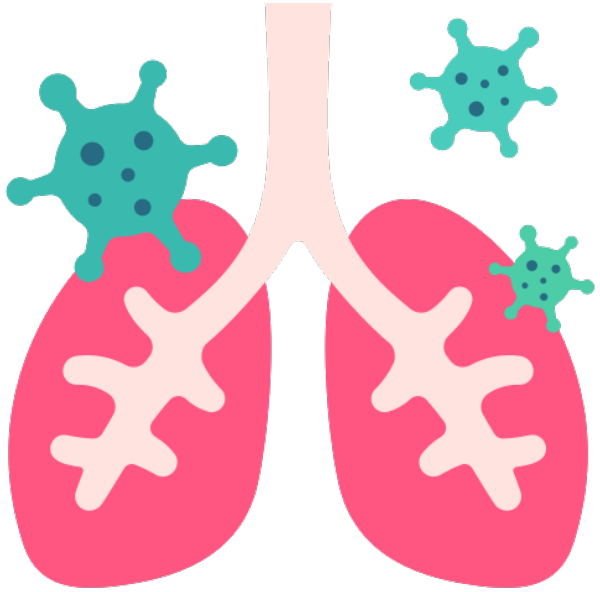
Findings Children younger than 5 years in households that received plain soap and handwashing promotion had a 50% lower incidence of pneumonia than controls (95% CI −65% to −34%). Also compared with controls, children younger than 15 years in households with plain soap had a 53% lower incidence of diarrhoea (−65% to −41%) and a 34% lower incidence of impetigo (−52% to −16%). Incidence of disease did not differ significantly between households given plain soap compared with those given antibacterial soap.

Interpretation Handwashing with soap prevents the two clinical syndromes that cause the largest number of childhood deaths globally—namely, diarrhoea and acute lower respiratory infections. Handwashing with daily bathing also prevents impetigo.

Lancet 2005; 366: 225–33
See Comment page 185

Division of Bacterial and Mycotic Diseases, National Centers for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA 30333, USA (S P Luby MD, D R Feikin MD, J Painter DVM, R M Hoekstra PhD); Health Oriented Preventive Education, Karachi, Pakistan (M Agboatwalla MBBS); Community Health Sciences, Aga Khan University, Karachi, Pakistan (A Altaf MBBS); and The Procter and Gamble Company, Cincinnati, OH, USA (W Billhimer MS)
Correspondence to:
Dr Stephen P Luby
sluby@icddrb.org






New+
Safeguard
Family Germ Protection
Pakistan's No. 1
Rated Anti-bacterial Soap*

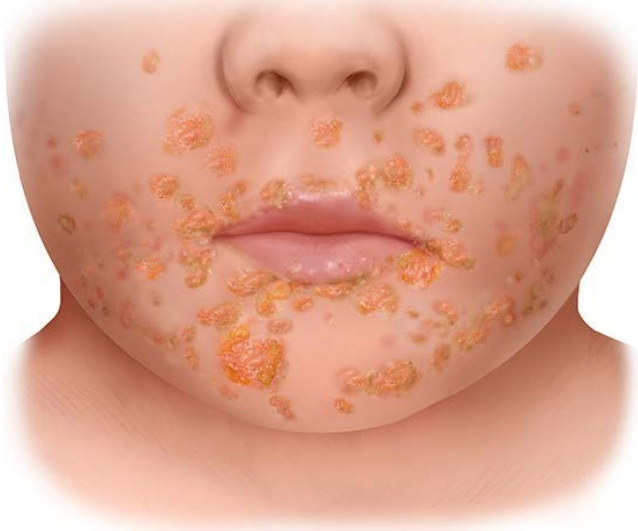

New+
Safeguard
Family Germ Protection
Pakistan's No. 1
Rated Anti-bacterial Soap*
Safeguard

Əlləri Sabunla Yuma Təlimatı

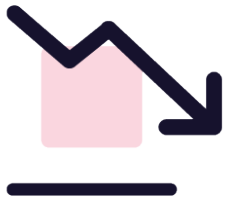
1. Gündə bir dəfə bədən yumaq
2. Tualetdən sonra hər dəfə
3. Uşağı bələyəndə hər dəfə
4. Yeməkdən əvvəl hər dəfə
5. Yemək hazırlayanda hər dəfə
6. Başqalarına yemək yedirəndə

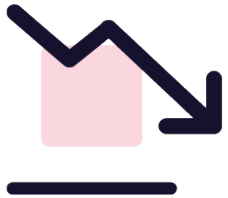
İshal

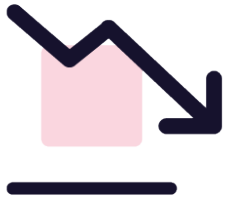
Pnevmoniya



İmpetiqo



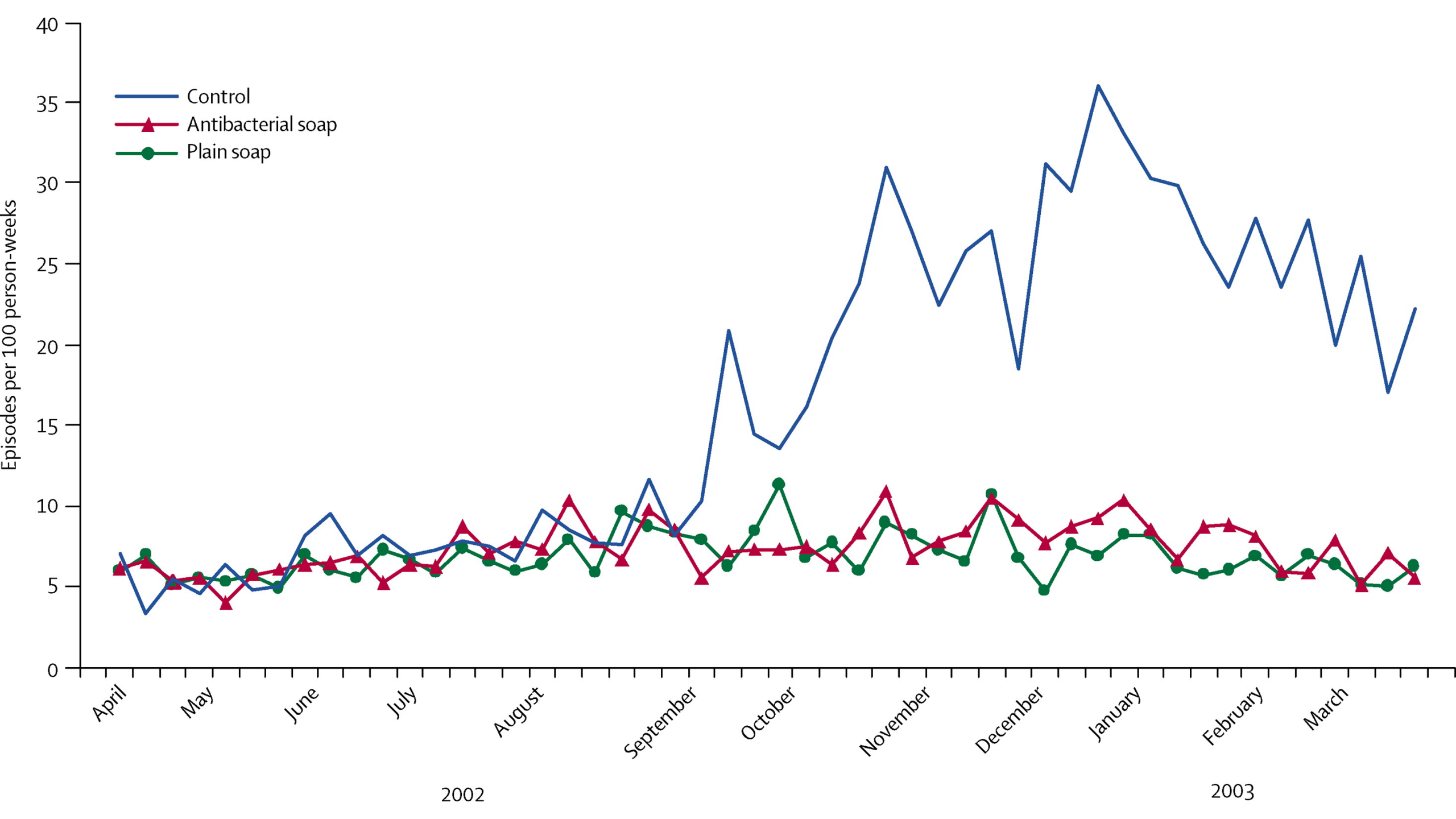




52%

48%

35%


Episodes per 100 person-weeks
0
5
10
15
20
25
30
35
40
Control
Antibacterial soap
Plain soap
April
May
June
July
August
September
October
November
December
January
February
March
2002
2003

Xəstələr təlimatlara riayət etmirlər

- Şifahi təlimatların 40-80% unudulur
- Çox sayıda çap edilmiş təlimatlar

Həkimlər pasientlərin nəzarətsiz vəya risk altında olub-olmamasından xəbərsizdirlər

- Xəstələri evdə izləməyin asan yolu yoxdur

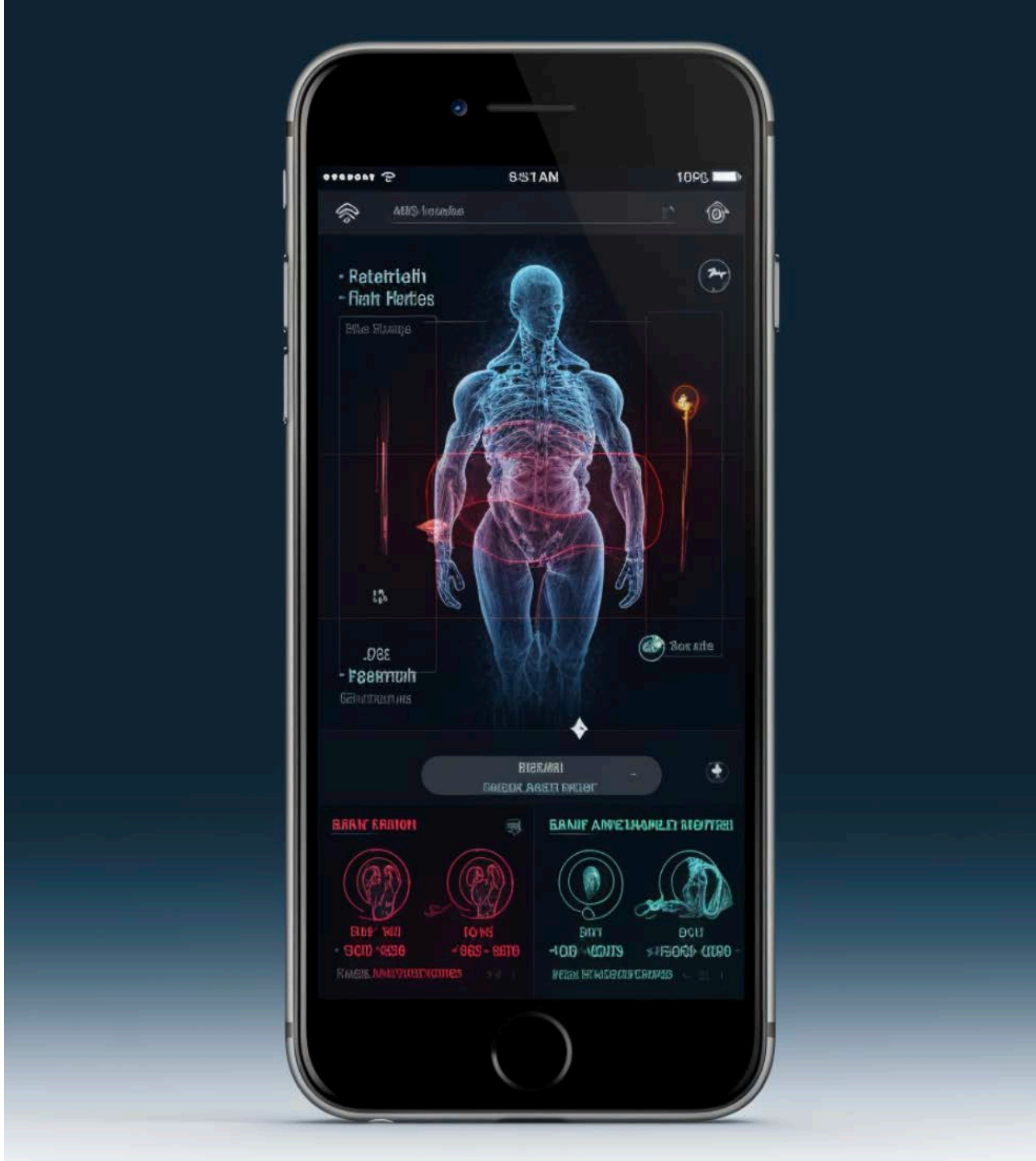
Mənfi nəticələrə və artan xərclərə səbəb olur

- ↑ yatış müddəti
- ↑ rehospitalizasiya
- ↑ TY müraciətləri
- ↑ məsrəflər

Çıxış Yolu: Uzaqdan Xəstə Təqibi

colleagues,[14] “to master heart failure, first master congestion”; no invasive tool will improve patients without acting on pressures. Clearly, remote monitoring triggered this interaction between patient and caregiver as reflected in the number of drug changes that primarily targeted fluid status and the decline in mean pulmonary artery pressure and natriuretic peptide concentration. Most changes were made in diuretics, which could be in both directions, up-titration in case of hypervolaemia and down-titrations in case of hypovolaemia in a safe and controlled way.

Our results might support the heart failure community to embrace e-health, digital technology, and telemonitoring to reduce the burden on our hospitals.

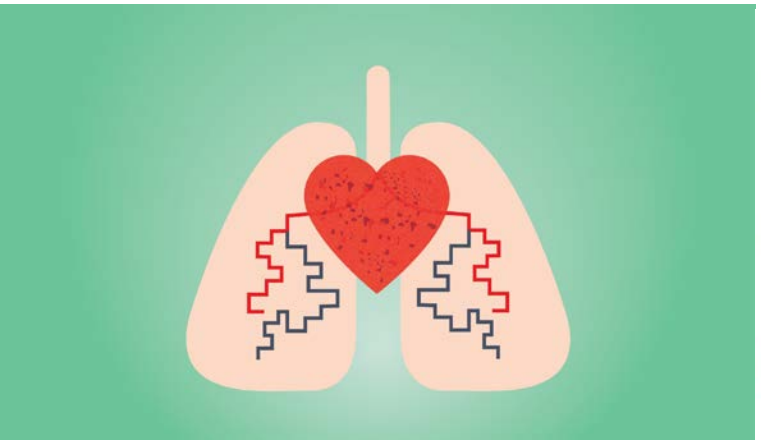


Süni İntellekt Alqoritmləri

Teletibb platformu

Pasientlərin özlərini idarə edilməsi

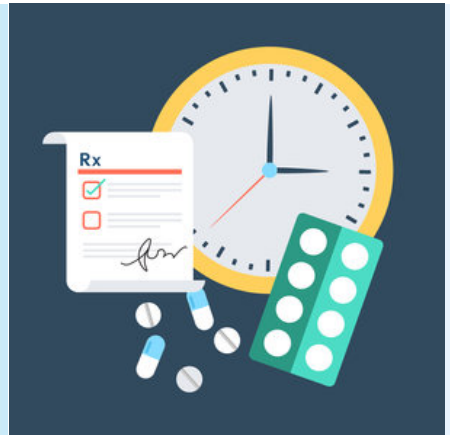
Pulmonar arteriya təzyiqi



Həyat tərzi

Maye balansı

Dərman uyumu



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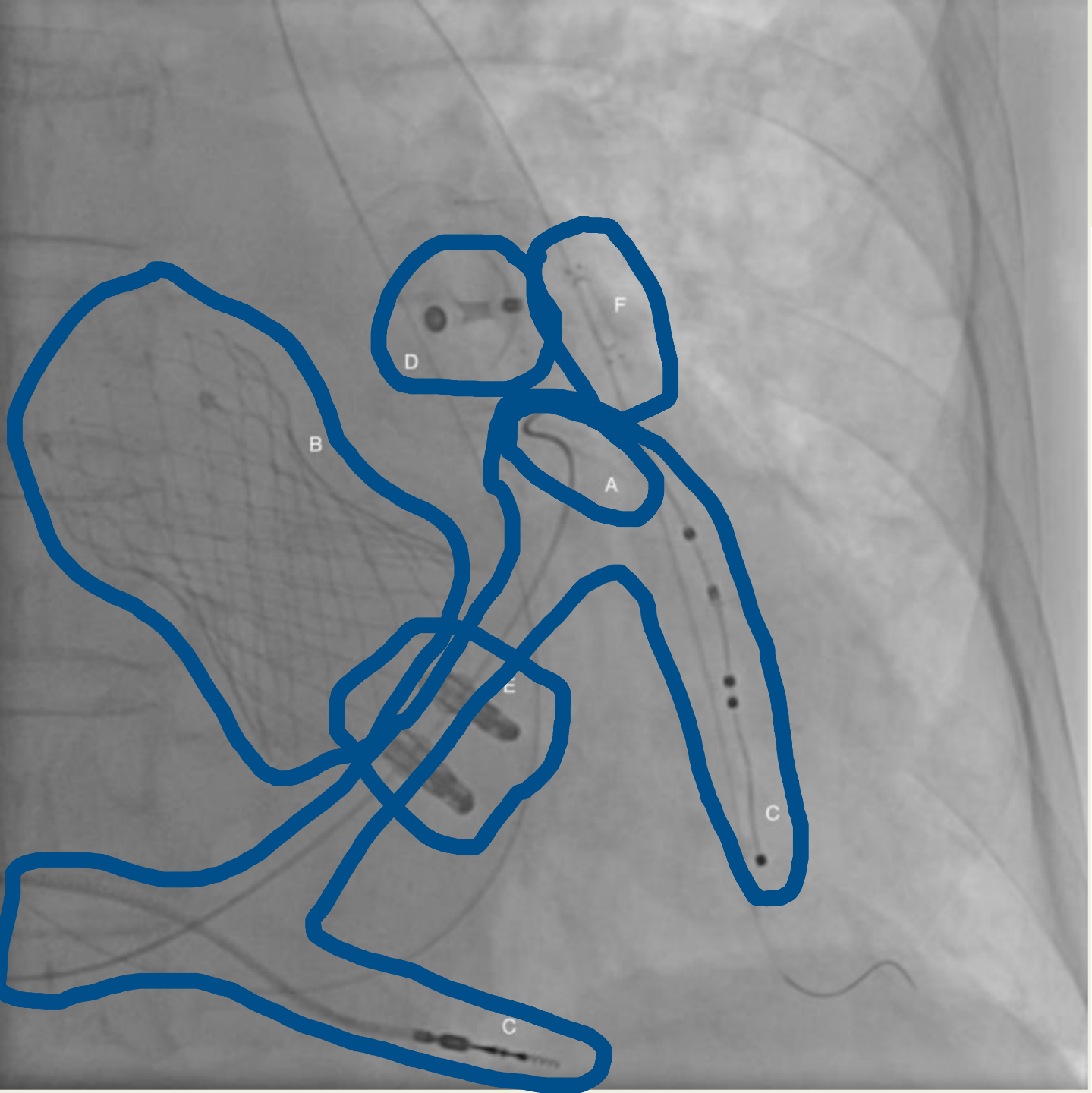

The glorious era of interventional cardiology

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86 yaş
EF 38%

Perm AF, ÜİX, Aortal Stenoz, İkincili MÇ

A- LAD və RCA DES

B- TAVI-CoreValve™ Evolut 34 mm

C- CRT-P Medtronic™ Percepta Quad

D- LAAC Amplatzer™ Amulet ™ 28 mm

E- MitraClip ™ G4 NTW

F- CardioMEMS™

If the only tool you have is a hammer, **you tend to see every problem as a nail**

Abraham Maslow

Əlinizdə olan yeganə alət çəkicdirsə, **hər problemə mismar kimi baxırsınız**

TƏŞƏKKÜRLƏR