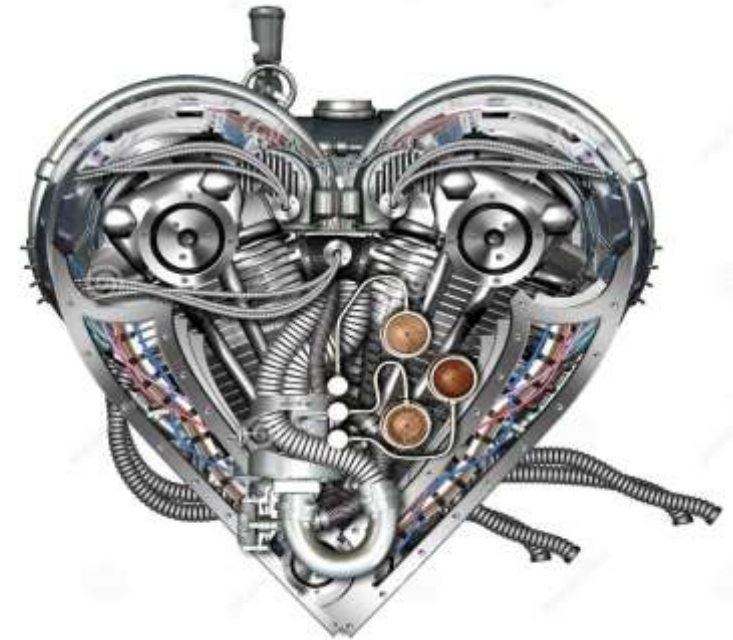


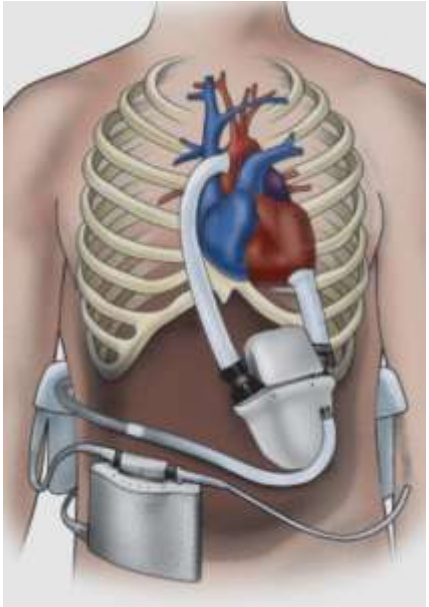


## LVAD as Destination Therapy or Bridge to Heart Transplantation: To whom and when?

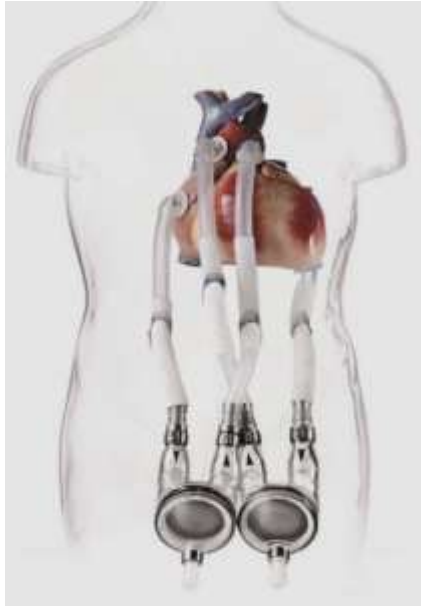
Heart and Diabetes Center  
North Rhine Westphalia  
Bad Oeynhausen

**Dr. R. Khankishiyev**

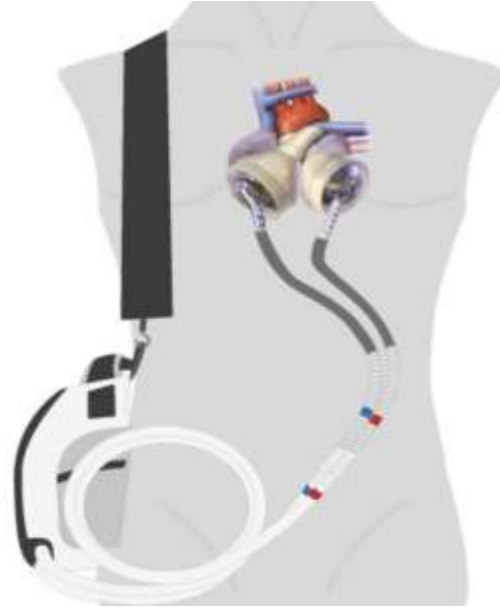




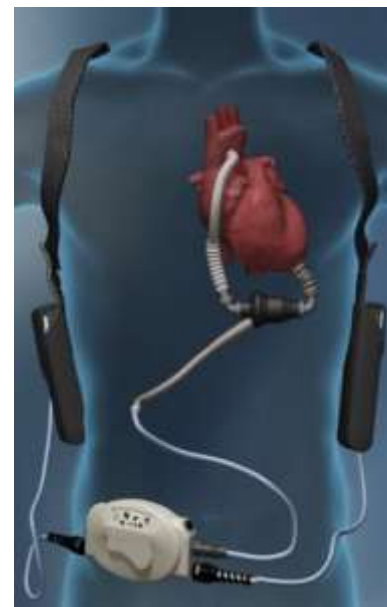
**Novacor**



**Berlinheart**



**Syncardia  
(TAH)**



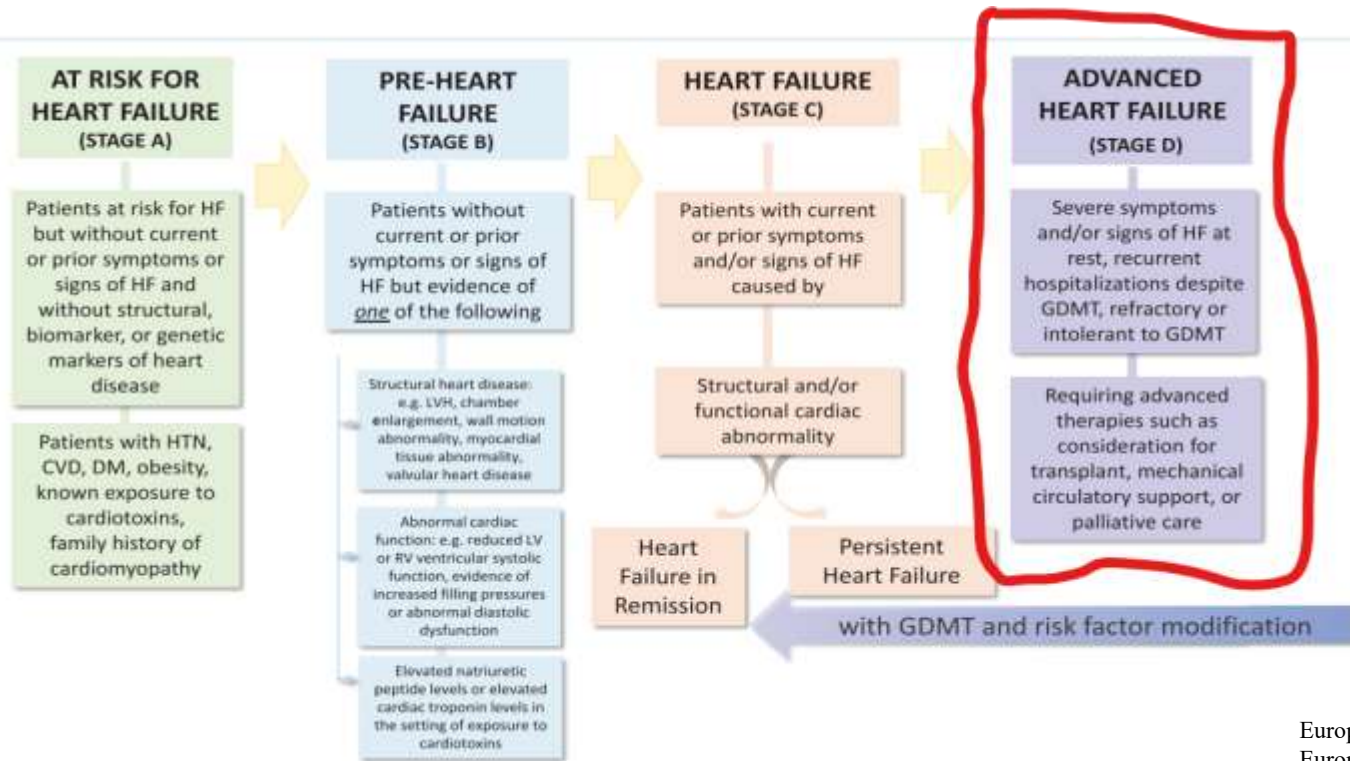
**HeartMate II**



**HeartMate III**

Type of HF		HFrEF	HFmrEF	HFpEF
CRITERIA	1	Symptoms ± Signs <sup>a</sup>	Symptoms ± Signs <sup>a</sup>	Symptoms ± Signs <sup>a</sup>
	2	LVEF ≤40%	LVEF 41–49% <sup>b</sup>	LVEF ≥50%
	3	–	–	Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides <sup>c</sup>

© ESC 2021



European Journal of Heart Failure (2021) 23, 352–380. doi:10.1002/ejhf.2115  
 European Heart Journal (2021) 42, 3599–3726, doi:10.1093/eurheartj/ehab368

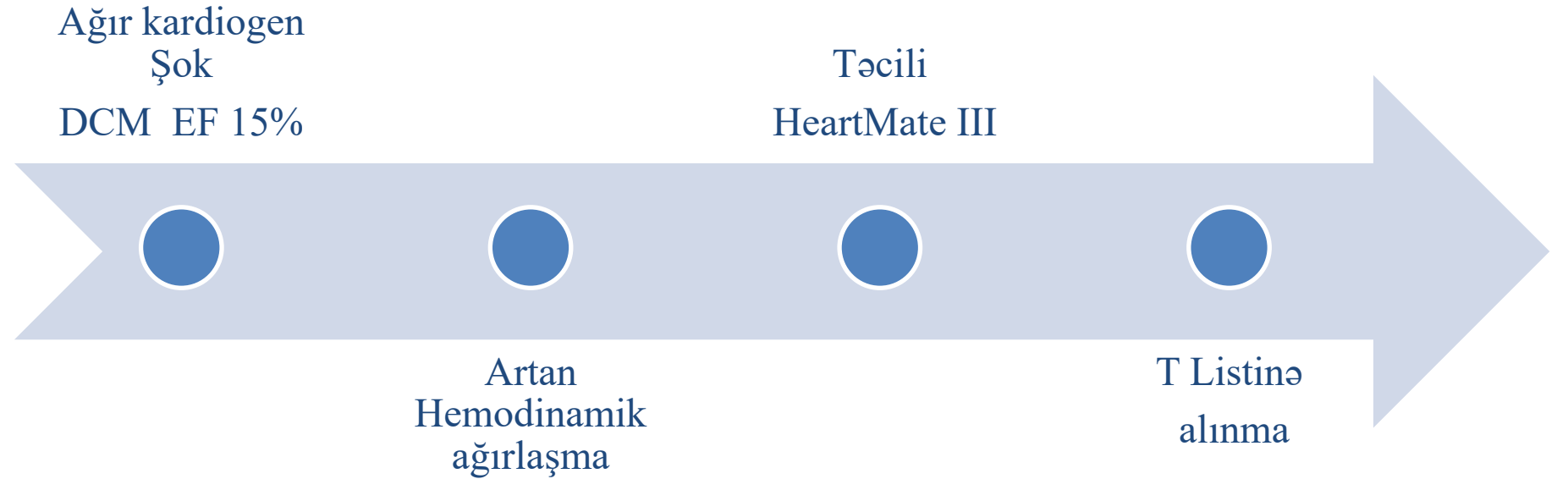
# LVAD-in təyinat istiqamətləri

<b>Bridge to decision (BTD)/ Bridge to bridge (BTB)</b>	Use of short-term MCS (ECMO or Impella) in patients with cardiogenic shock until haemodynamics and end-organ perfusion are stabilized, contraindications for long-term MCS are excluded (brain damage after resuscitation) and additional therapeutic options including long-term VAD therapy or heart transplant can be evaluated.
<b>Bridge to candidacy (BTC)</b>	Use of MCS (usually LVAD) to improve end-organ function and/or to make an ineligible patient eligible for heart transplantation.
<b>Bridge to transplantation (BTT)</b>	Use of MCS (LVAD, BiVAD or TAH) to keep a patient alive who is otherwise at high risk of death before transplantation until a donor organ becomes available.
<b>Bridge to recovery (BTR)</b>	Use of MCS (short-term or long-term) to keep a patient alive until cardiac function recovers sufficiently to remove MCS.
<b>Destination therapy (DT)</b>	Long-term use of MCS (LVAD) as an alternative to transplantation in patients with end-stage HF ineligible for transplantation.

BiVAD = biventricular assist device; ECMO = extracorporeal membrane oxygenation; HF = heart failure; LVAD = left ventricular assist device; MCS = mechanical circulatory support; TAH = total artificial heart; VAD = ventricular assist device.

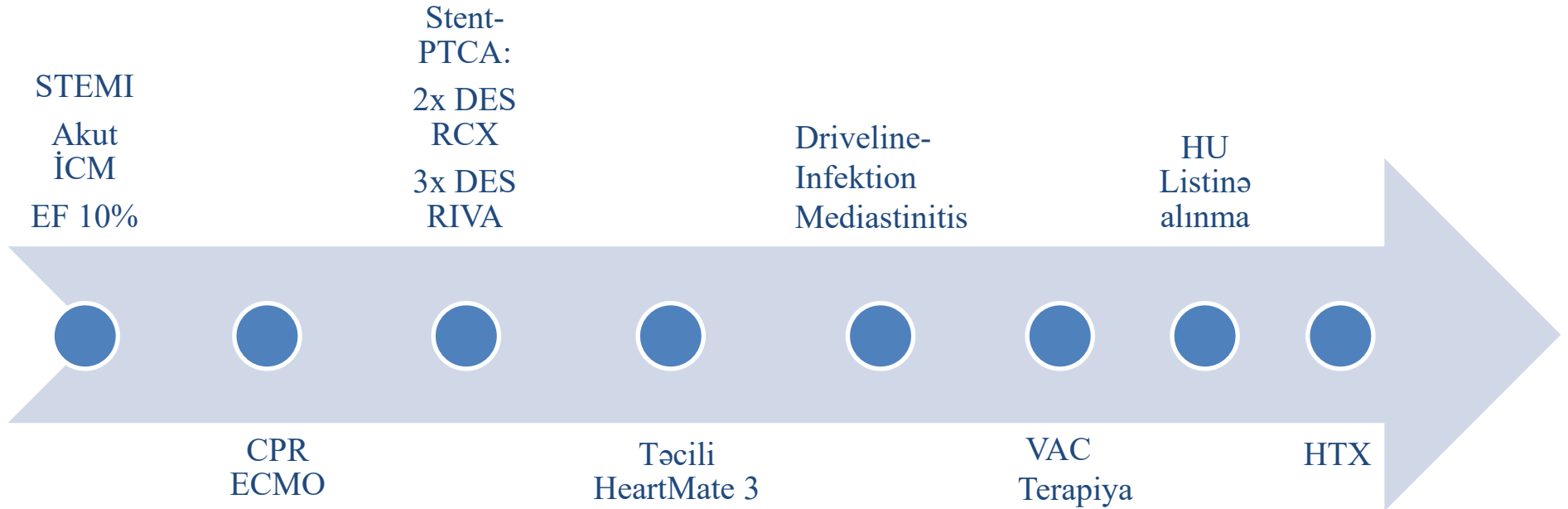
# Case 1 BTC – Bridge to candidacy

- Yaş: 68
- Çəki: 78 kg
- Boy: 192 cm
- BMI: 21,2 kg/m<sup>2</sup>
- kişi



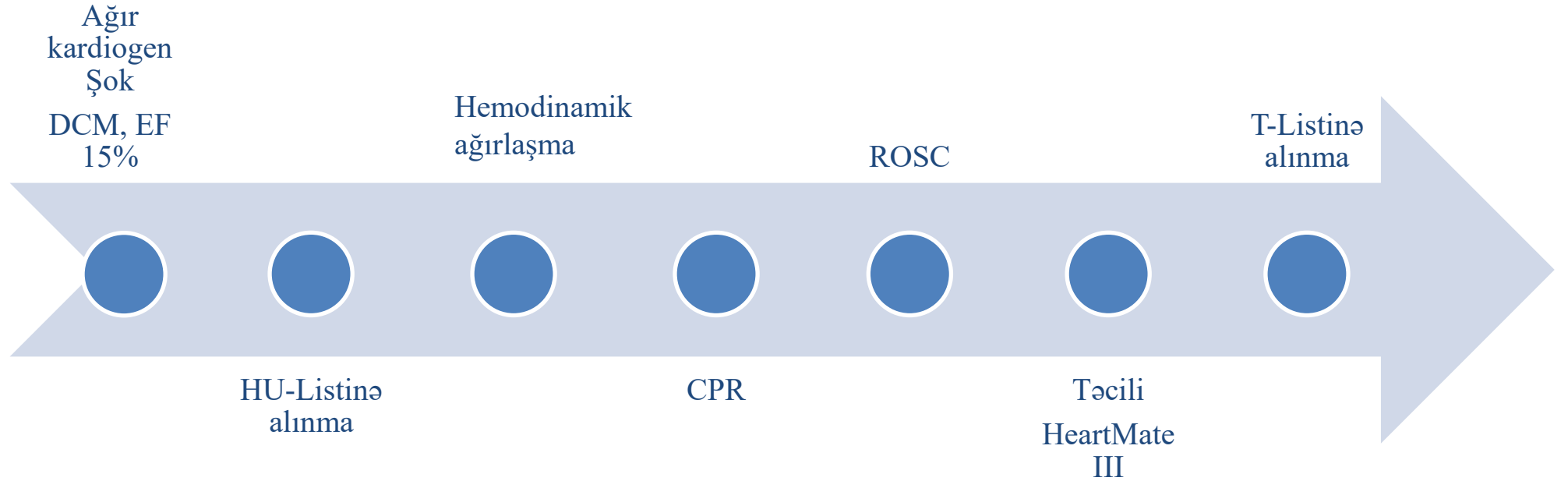
## Case 2 BTC – Bridge to candidacy

- Yaş: 53
- Çəki: 58 kg
- Boy: 180 cm
- BMI: 17,9 kg/m<sup>2</sup>
- qadın



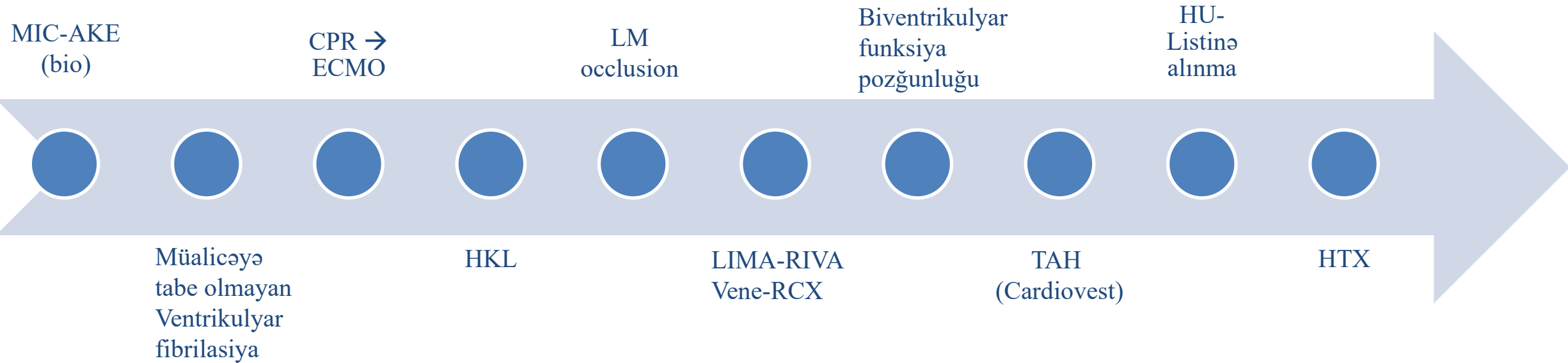
## Case 3 BTT – Bridge to transplantation

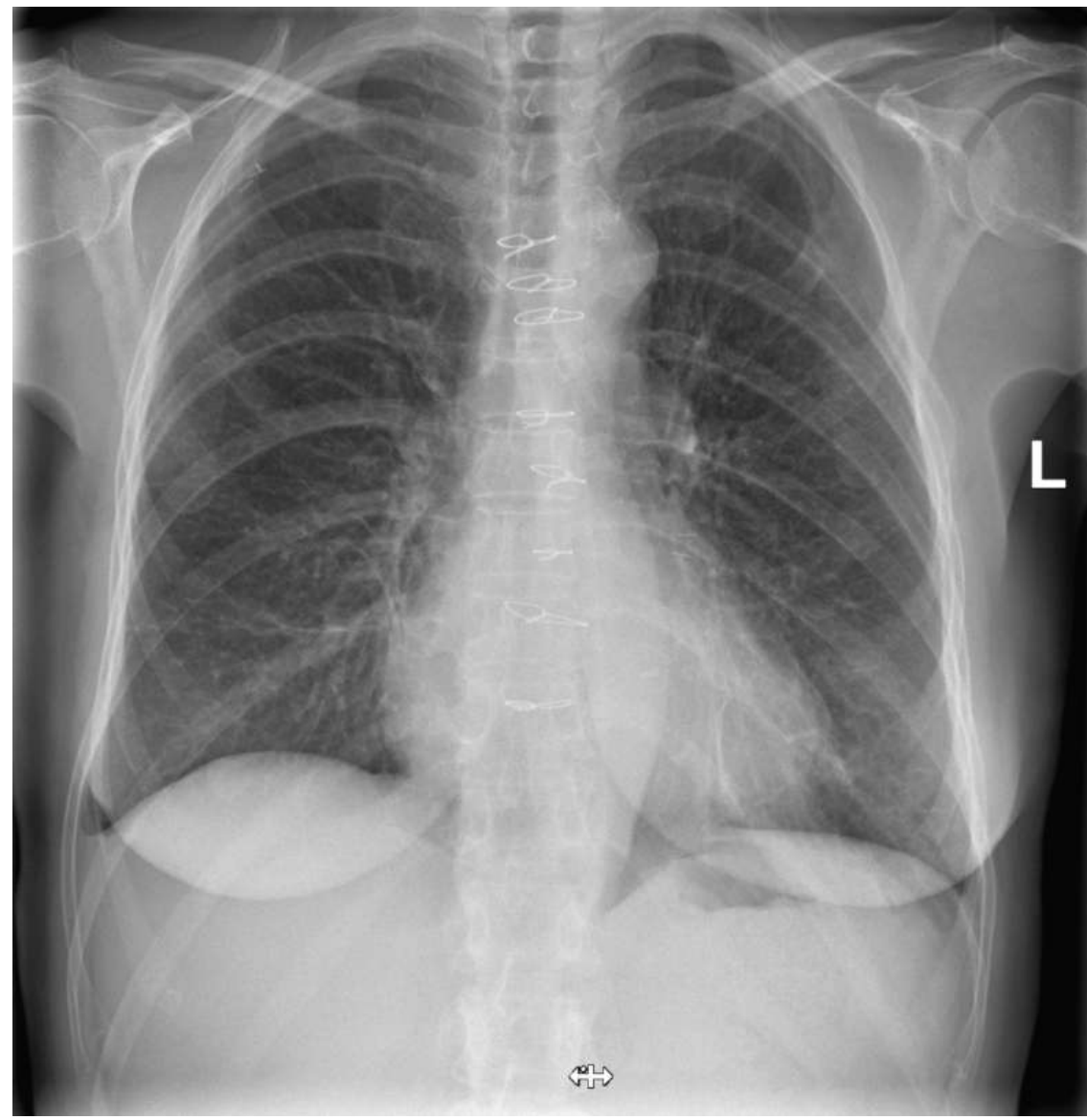
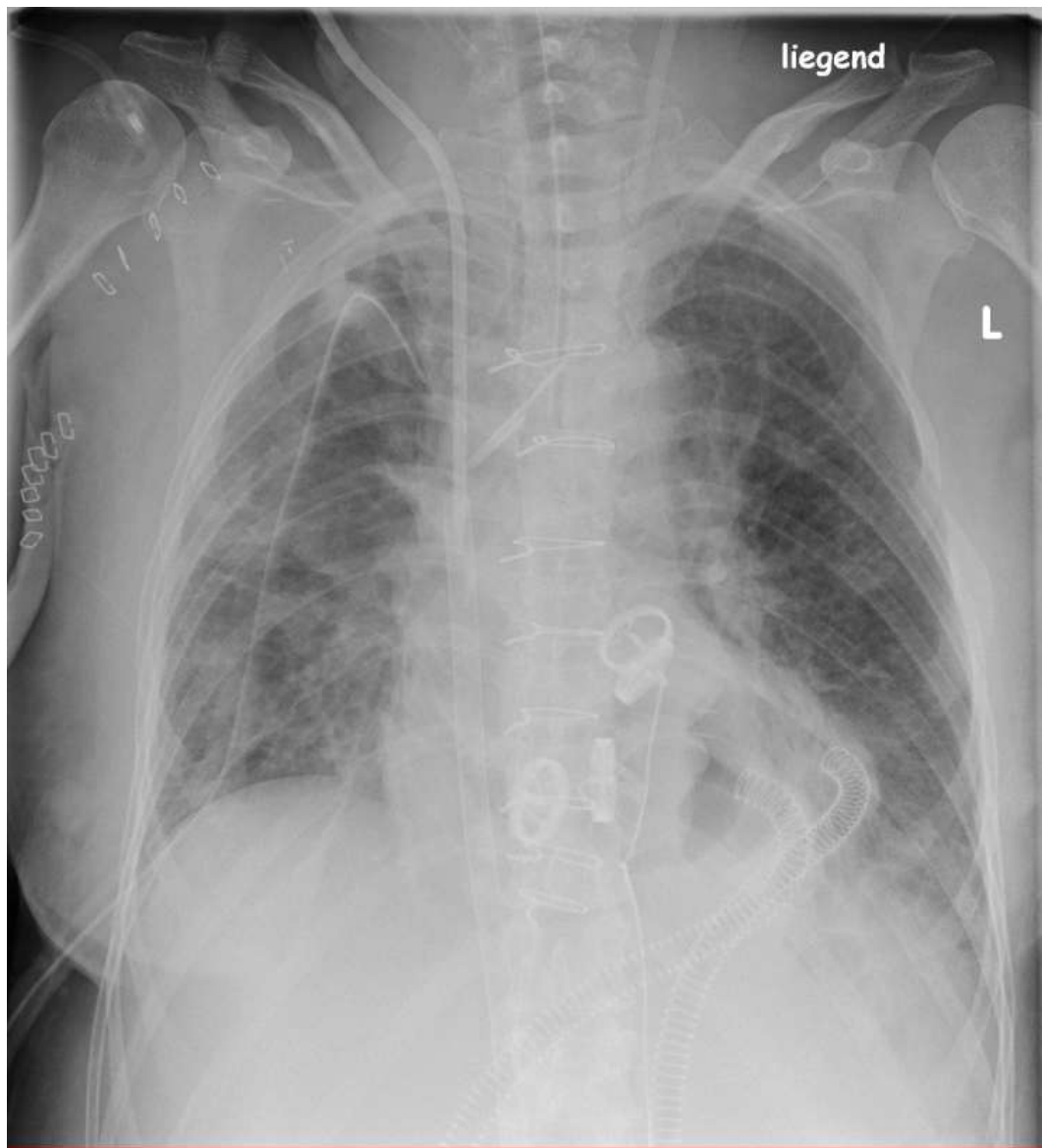
- Yaş: 31
- Çeki: 85 kg
- Boy: 188 cm
- BMI: 24 kg/m<sup>2</sup>
- kişi

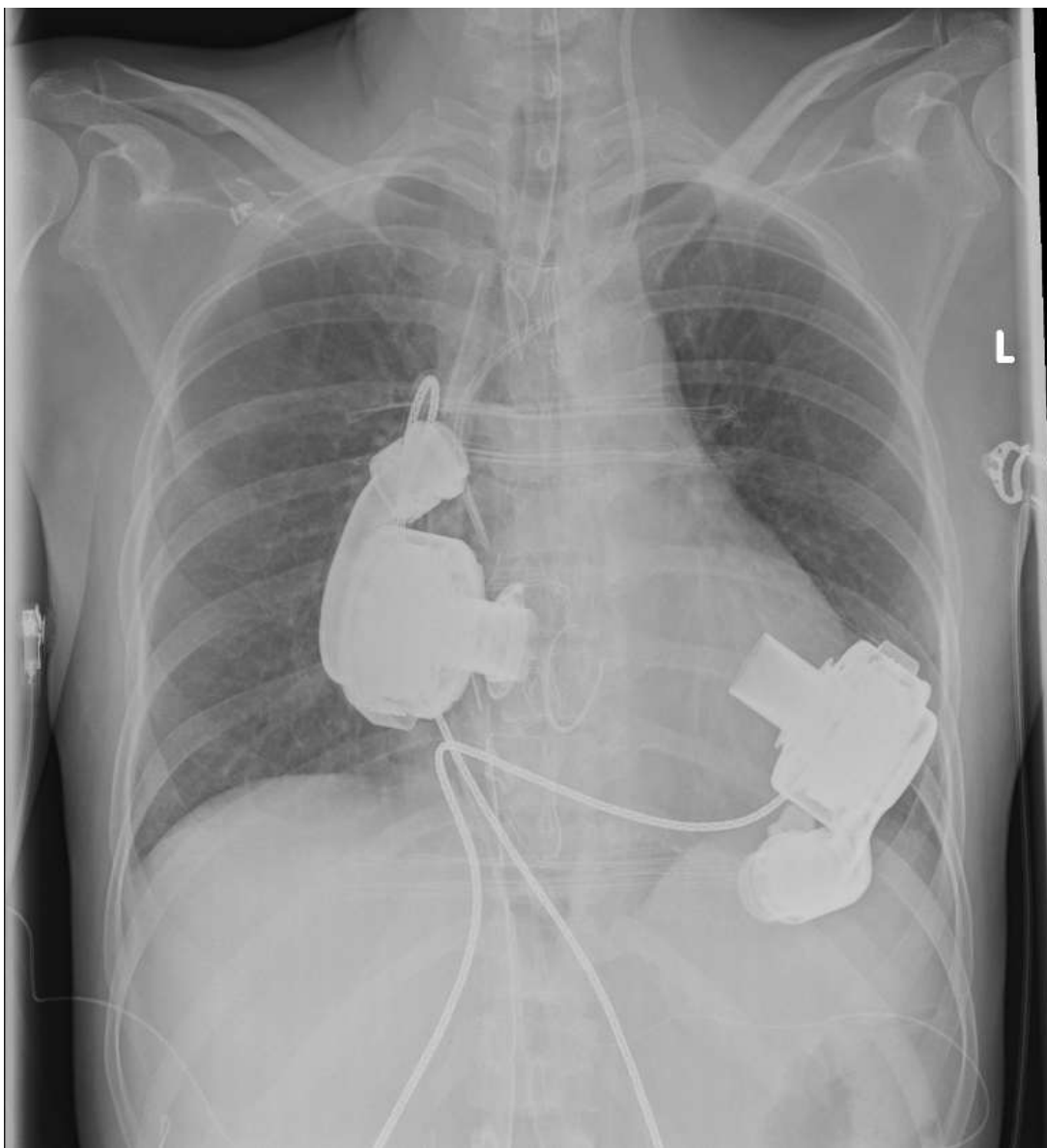


# Case 4 BTT – Bridge to transplantation

- Yaş: 58
- Çəki: 47kg
- Boy: 151 cm
- BMI: 20,61 kg/m<sup>2</sup>
- qadın







- Yaş: 38
- Myokardit
- Biventrikulyar funksiya pozğunluğu
- Heartmate 3 implantasiyası
- Davam edən sağ mədəcik çatışmazlığı
- Uğursuz Transplantasiya screening'i
- RVAD (Heartmate 3) implantasiyası
- T-Listinə alınma
- 1 il sonra uğulu Ürək transplantasiyası

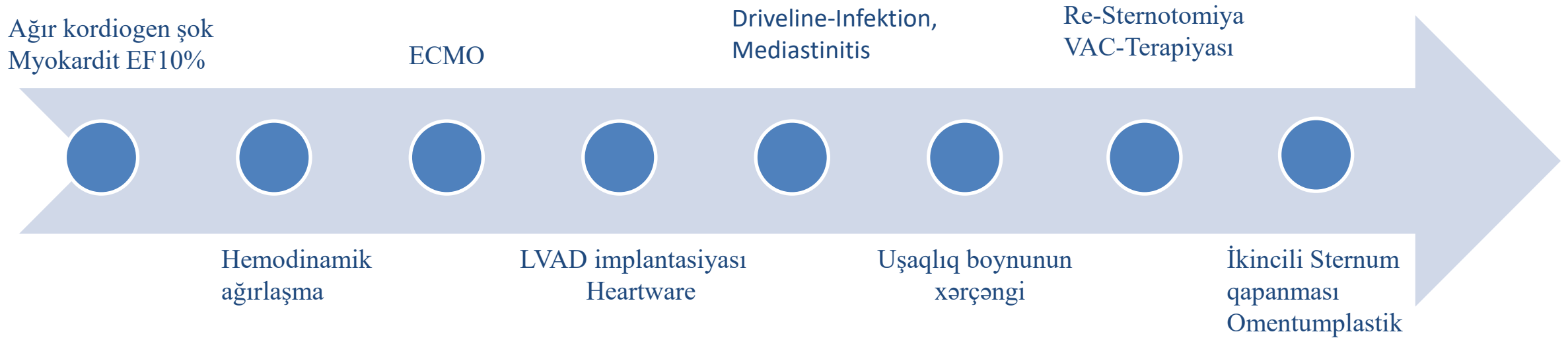
## Case 5 BTR – Bridge to recovery

- Yaş: 61
- Çəki: 57 kg
- Boy: 170 cm
- BMI: 19.7 kg/m<sup>2</sup>
- qadın



## Case 6 DT – Destination Therapy

- Yaş: 71
- Çəki: 100 kg
- Boy: 165 cm
- BMI 36,7 kg/m<sup>2</sup>
- qadın



# Case 7 DT – Destination Therapy

- Yaş: 63
- Çəki: 77 kg
- Boy: 175 cm
- BMI 25,1 kg/m<sup>2</sup>
- kişi

AKE (mexaniki qapaq )  
LIMA-LAD

Mex.-AKE → bio-AKE

ICM  
EF 10%

LVAD HeartMate 3

## Case 8 LVAD-a imtina

- Yaş: 36
- Çəki 89 kg
- Boy 186 cm
- BMI 25,7 kg/m<sup>2</sup>
- kişi

- DCM (LVEF 15 %)
- Mitral- və Trikuspidalqapaq çatışmazlığı
- subkutan-ICD
- Pulmonal Hypertoniya

- Kəskin Böyrək yetməzliyi
- A. cerebri anterior anevrizması
- Hypothyreose
- Amphetamin asıllılığı
- Alkohol asıllılığı
- Nikotin asıllılığı



# INTERMACS Profilləri

## Profile

### Profile 1. Critical cardiogenic shock

Patient with life-threatening hypotension despite rapidly escalating inotropic support, critical organ hypoperfusion, often confirmed by worsening acidosis and/or lactate levels. "Crash and burn."

### Profile 2. Progressive decline

Patient with declining function despite i.v. inotropic support, may be manifest by worsening renal function, nutritional depletion, inability to restore volume balance. "Sliding on inotropes." Also describes declining status in patients unable to tolerate inotropic therapy.

### Profile 3. Stable on inotrope or inotrope-dependent

Patient with stable blood pressure, organ function, nutrition, and symptoms on continuous i.v. inotropic support (or a temporary circulatory support device or both) but demonstrating repeated failure to wean from support due to recurrent symptomatic hypotension or renal dysfunction. "Dependent stability."

### Profile 4. Frequent Flyer

Patient can be stabilized close to normal volume status but experiences daily symptoms of congestion at rest or during activities of daily living. Doses of diuretics generally fluctuate at very high levels. More intensive management and surveillance strategies should be considered, which may in some cases reveal poor compliance that would compromise outcomes with any therapy. Some patients may shuttle between 4 and 5.

### Profile 5. Housebound

Comfortable at rest and with activities of daily living but unable to engage in any other activity, living predominantly within the house. Patients are comfortable at rest without congestive symptoms, but may have underlying refractory elevated volume status, often with renal dysfunction. If underlying nutritional status and organ function are marginal, patients may be more at risk than INTERMACS 4, and require definitive intervention.

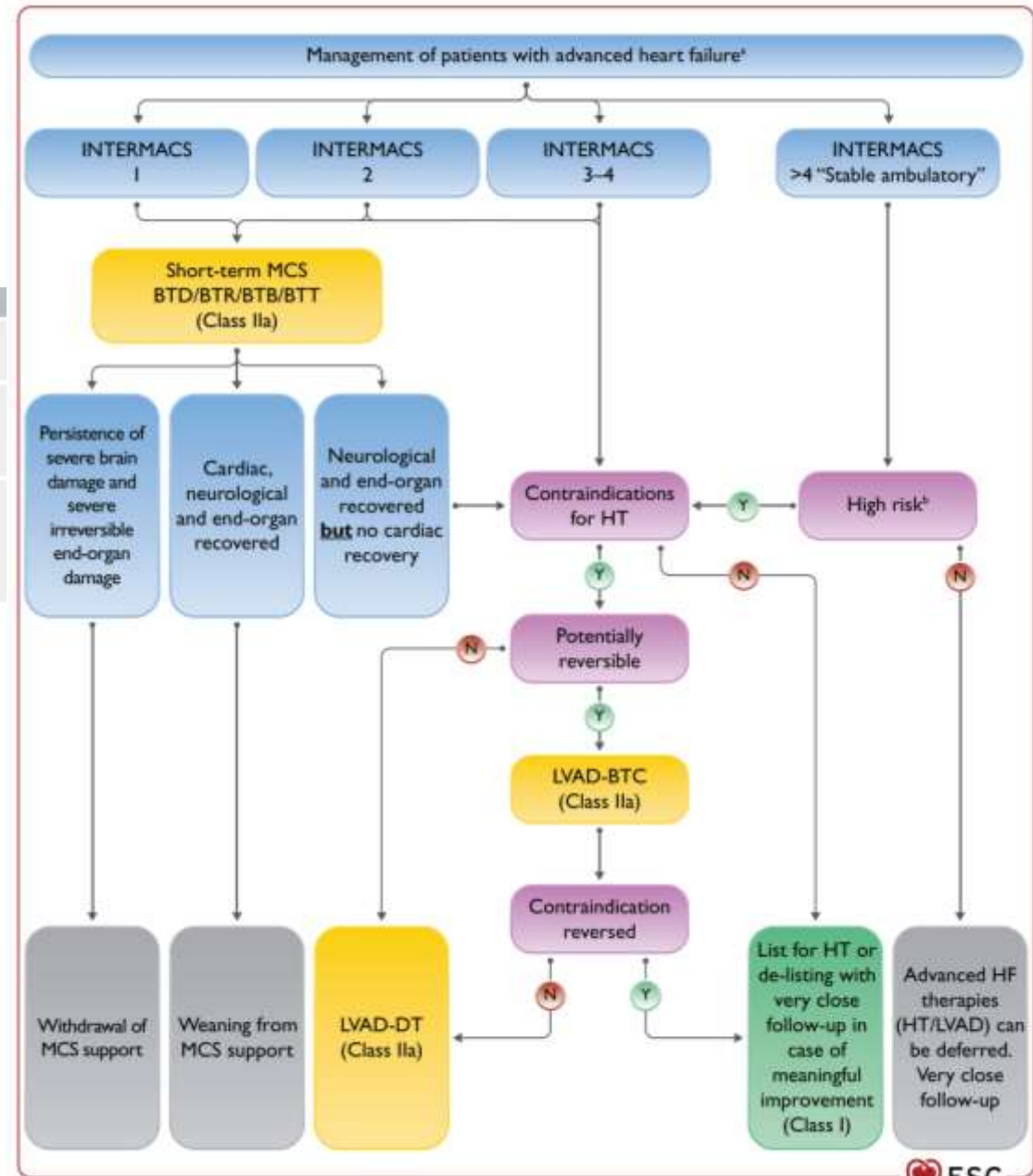
### Profile 6. Exertion limited

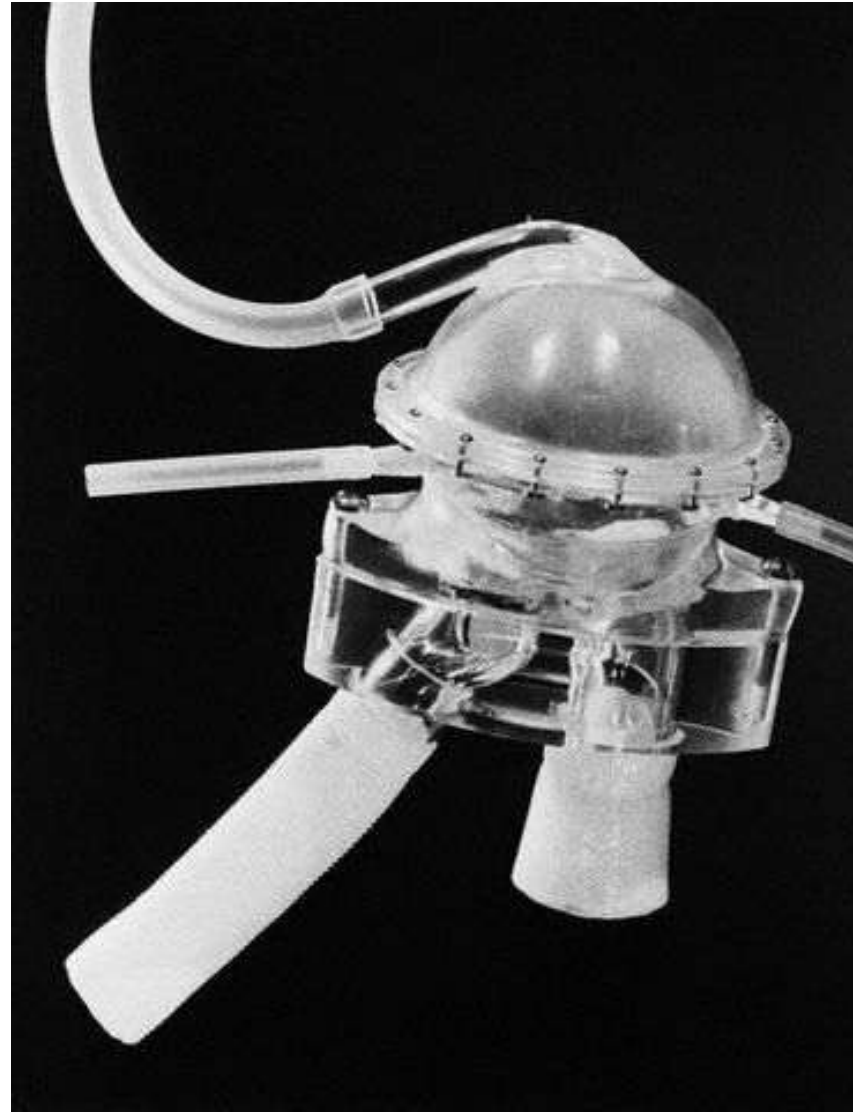
Patient without evidence of fluid overload, comfortable at rest and with activities of daily living and minor activities outside the home but fatigues after the first few minutes of any meaningful activity. Attribution to cardiac limitation requires careful measurement of peak oxygen consumption, in some cases with haemodynamic monitoring, to confirm severity of cardiac impairment. "Walking wounded."

### Profile 7. Advanced NYHA class III symptoms

Patient without current or recent episodes of unstable fluid balance, living comfortably with meaningful activity limited to mild physical exertion.

Modifiers for profiles	Possible profiles that can be modified
Temporary MCS can modify profile only in hospitalized patients. They include IABP, ECMO, TandemHeart, LVAD, Impella.	1, 2, 3
Arrhythmia can modify any profile. They include recurrent ventricular tachyarrhythmias that have recently contributed substantially to clinical compromise, frequent ICD shocks or requirement for external defibrillation, usually more than twice weekly.	1-7
Frequent episodes of HF decompensation characterize patients requiring frequent emergency visits or hospitalizations for diuretics, ultrafiltration, or temporary i.v. vaso-active therapy. Frequent episodes may be considered as at least two emergency visits/ admissions in the past 3 months or three in the past 6 months.	3 if at home, 4, 5, 6. Rarely for profile 7.





**Liotta-DeBakey-LVAD**  
**19 İyul 1966**

37 yaşlı qadın  
AKE, MKE  
10 gün Weaning  
LVAD-ın eksplantasiyası



## First transplanted human heart beats

CAPE TOWN, South Africa (AP) — A South African man continued in satisfactory condition today with the heart of a 25-year-old girl pumping his blood after the medical breakthrough Sunday of a human heart transplant.

Louis Washkansky, 55, a Lithuanian-born businessman, was in the critical postoperative period of what Groote Schuur Hospital called the first successful human heart transplant.

He was being fed intracardiac agents to prevent blood clotting. Dr. Berger said that without the transplant Washkansky would have been dead within a few days because his heart's muscle was worn down.

The landmark operation was supervised by Dr. Jan. H. Louw, the hospital's chief surgeon, with Prof. Chris Barnard performing the main surgery.

Surgeons removed the heart from Miss Darvall's body first and kept it going by a mechanical pump. Dr. Berger said that within half an hour after death occurs at Stanford.

Dr. Shumway predicted that within 10 years doctors will be transplanting hearts with the same frequency they now transplant kidneys. About 800 persons throughout the world were living with transplanted kidneys as of last February.

Dr. Michael DeBakey, who led the development of the heart pump, said in Houston the



Denise Darvell

3 Dekabr 1967

Dr. Cristiaan Barnard

Cənubi Afrika:

- Groote Schuur Hospital

Patient:

- Louis Washkansky
- 54 yaş

18 gün sonra Ağciyər infeksiyasından həyatını dəyişib.

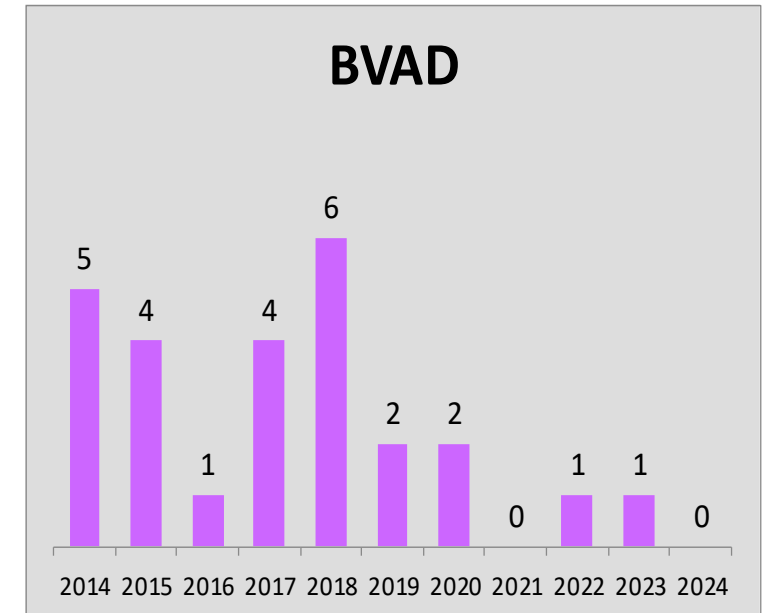
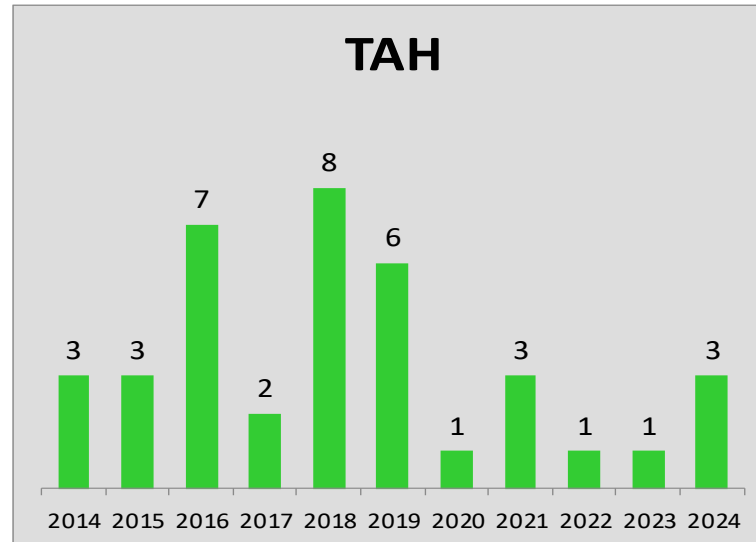
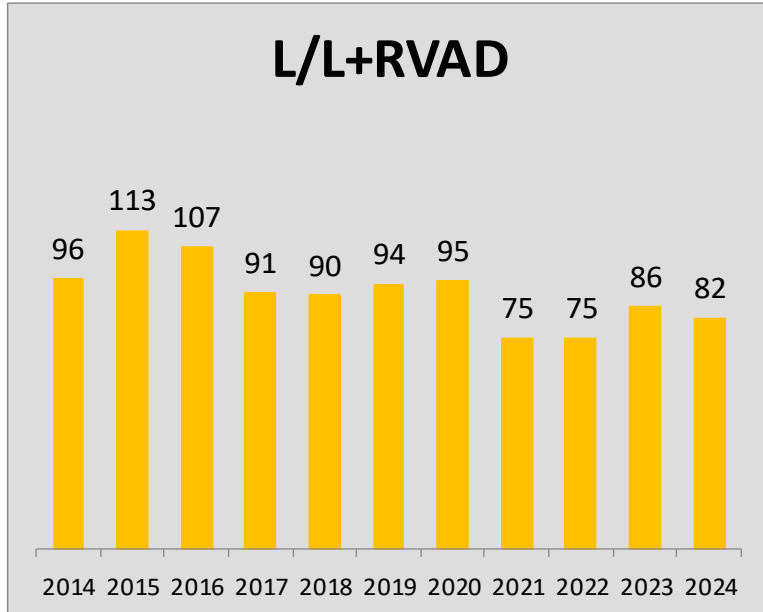
## HDZ NRW-də bəzi VAD-ların ilk implantasiya tarixləri

Device Brand	First Implant
Thoratec (pVAD/iVAD)	03/1992
Novacor	03/1993
CardioWest	02/2001
HeartMate II 1. gen.	03/2001
HeartMate II (2. gen.)	09/2006
HeartWare	08/2009
HeartMate 3	07/2014

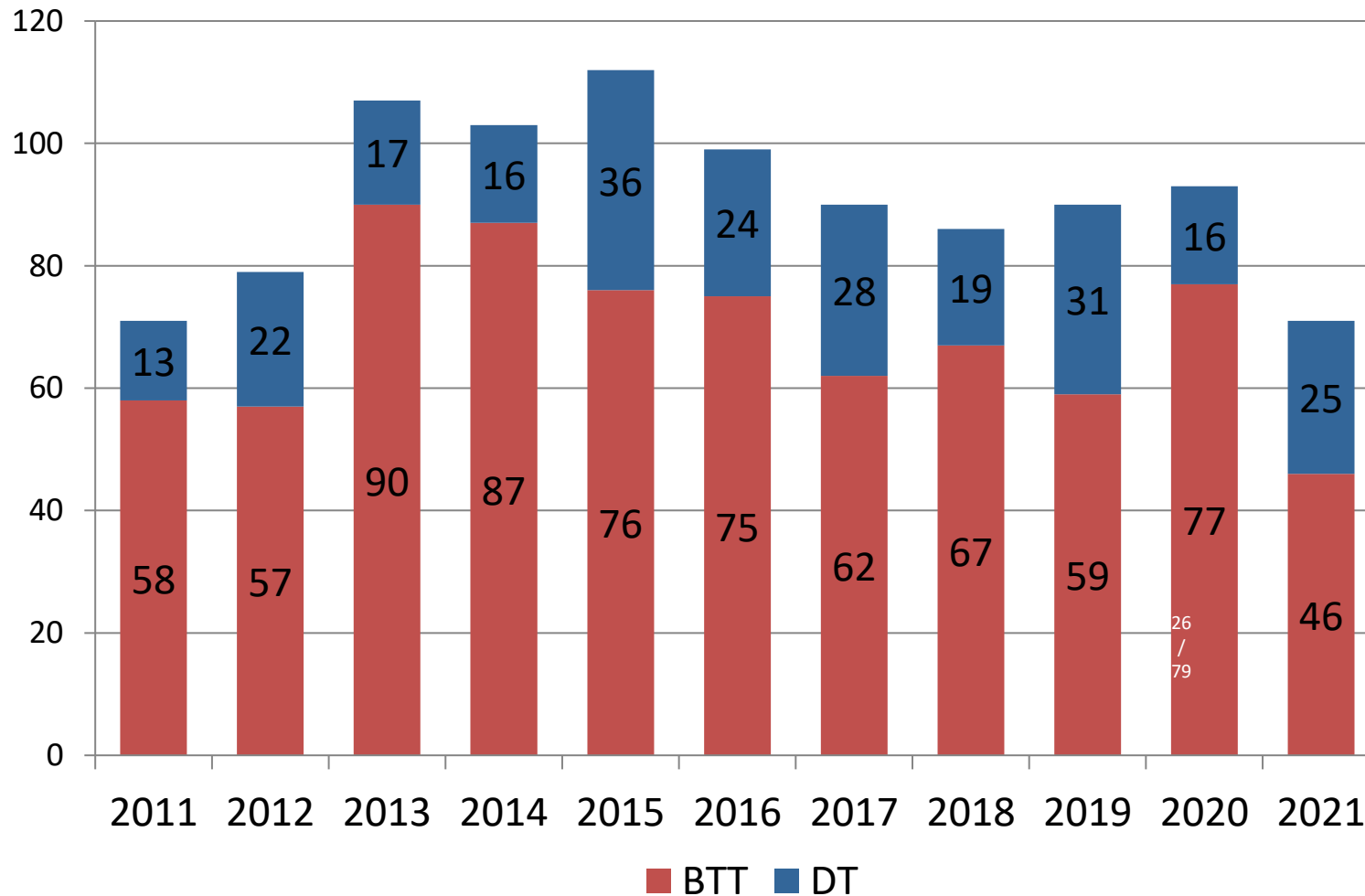
**Qeyd:** Bugünə qədər 18 fərqli VAD implantasiya olunub



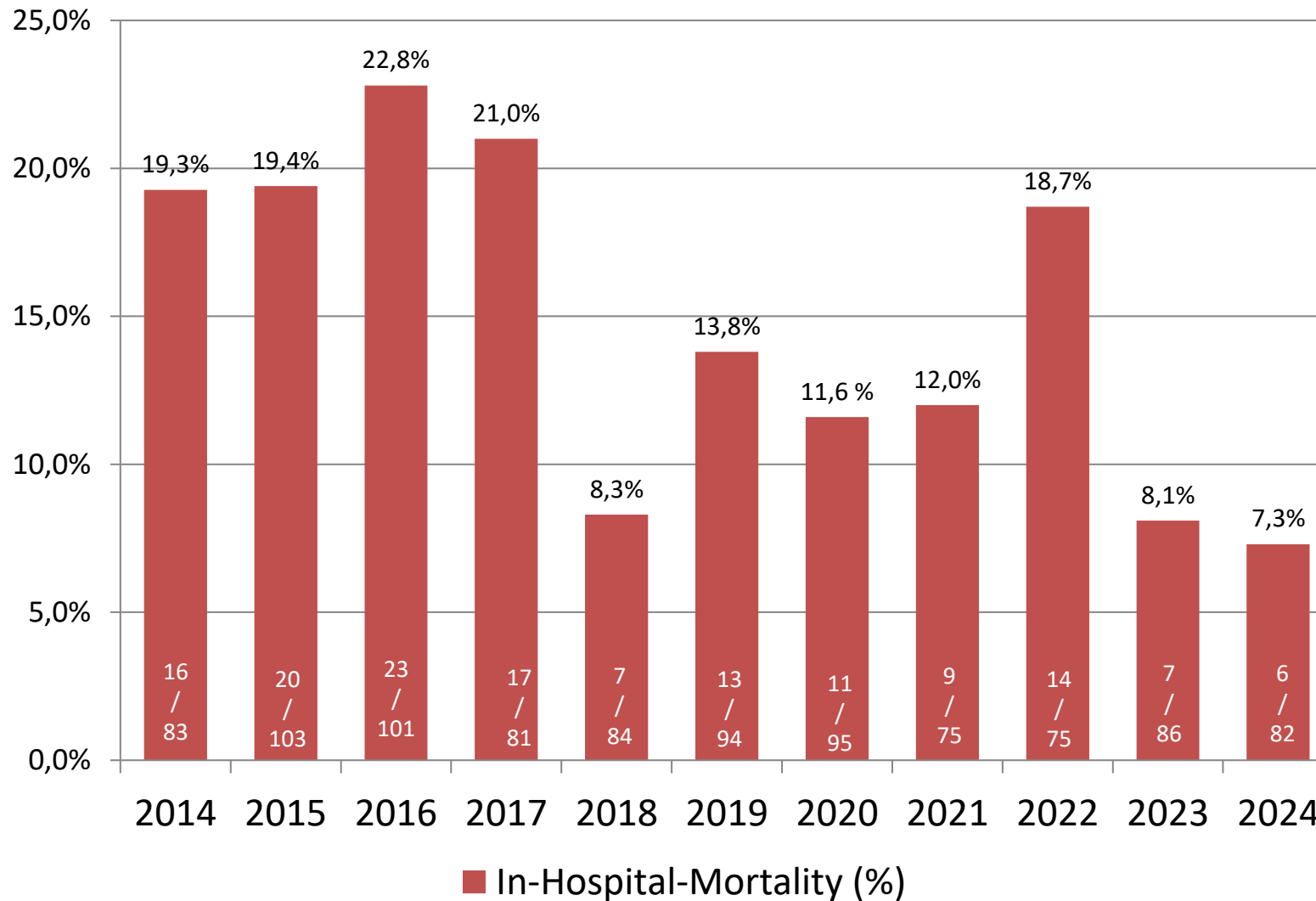
# Bad Oeynhausen 2014 - 2024



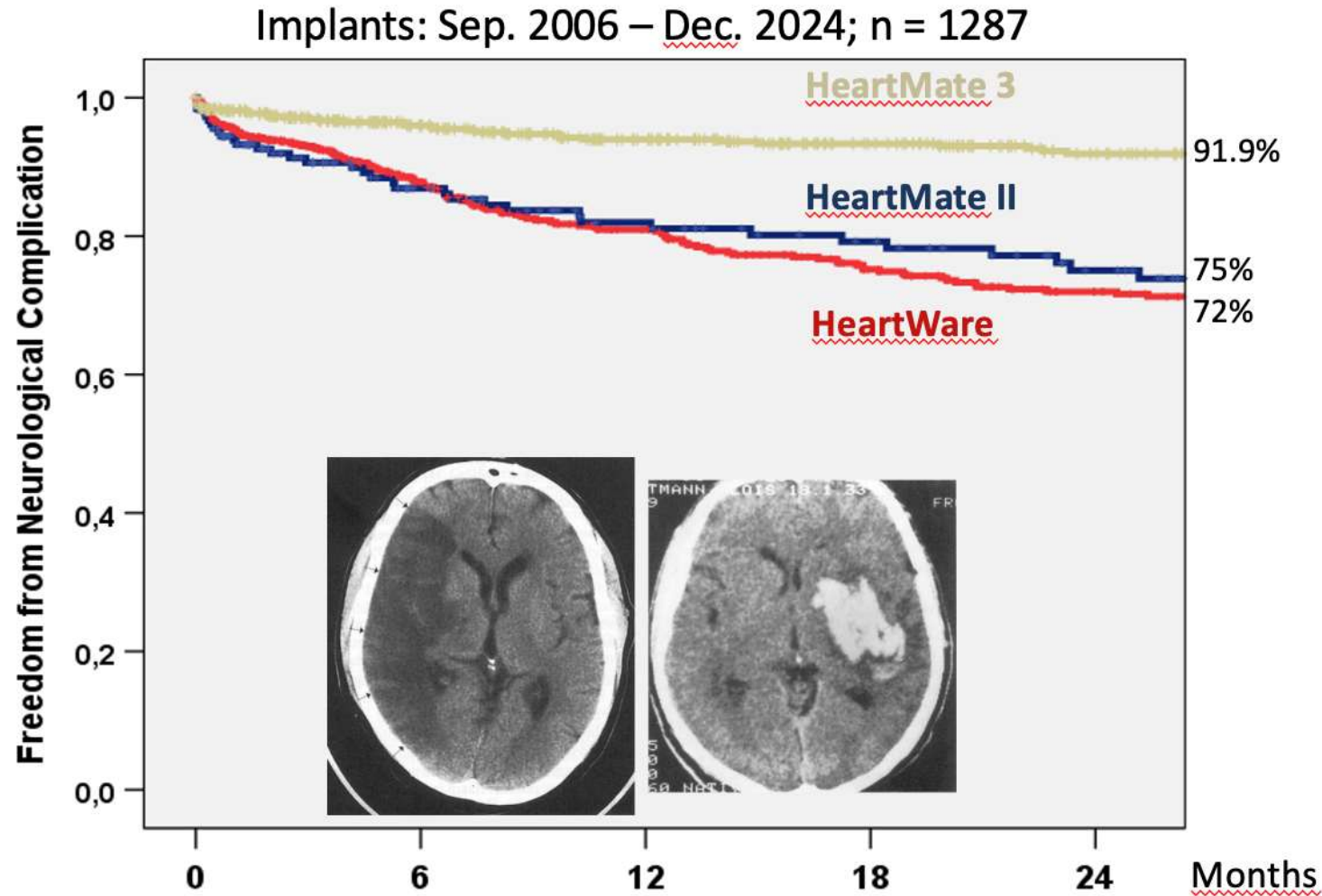
## Destination Therapy in LVAD-Patients: HeartMate II, HeartMate III and HeartWare 2011 - 2021



## LVAD: In-Hospital-Mortality 2014 - 2024



# Freedom from Stroke (Embolism or Bleeding) in Patients with LVAD Implants (HMII+III/HW)



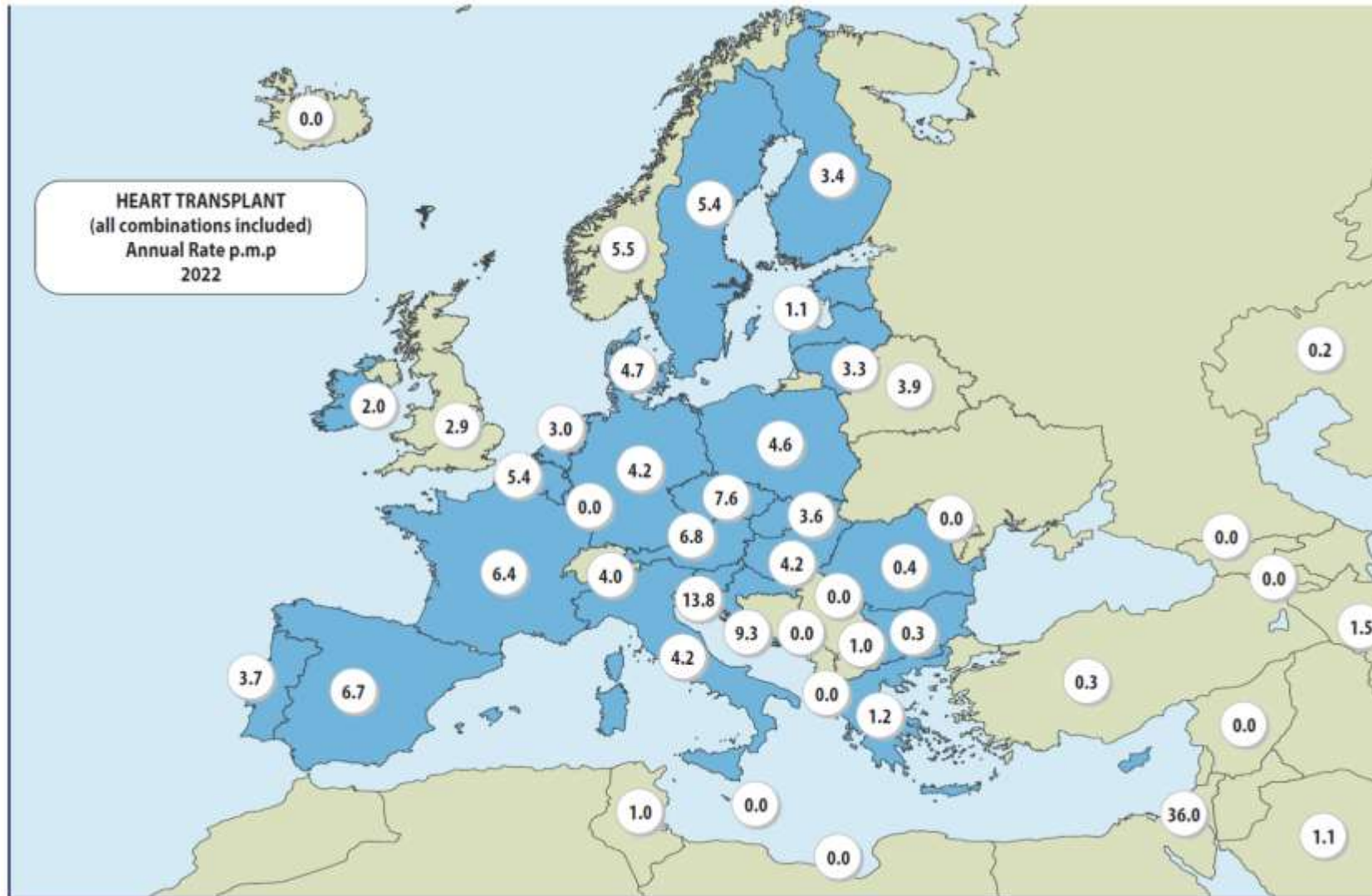
## **LVAD sayəsində əldə olunanlar:**

- Daha uzun yaşaya bilmək imkanı
- Daha yaxşı həyat keyfiyyəti
- Daha az ölüm sayı və ya daha çox həyatda qalma

## **Üzərində işləməli mövzular:**

- BiVAD/TAH hal-hazırda LVAD kimi uzun müddət üçün mümkün deyil

# Azərbaycan üçün PMP (per million population) indeksi: 0,2



**Diqqətiniz üçün təşəkkür edirəm!**

