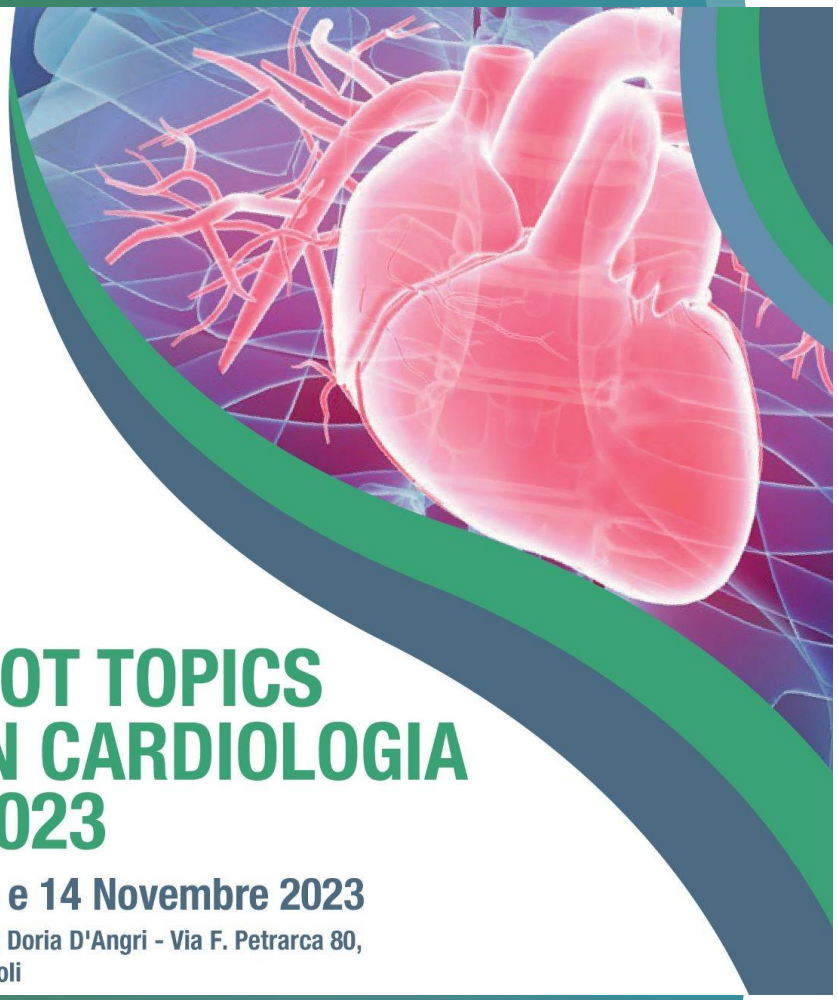


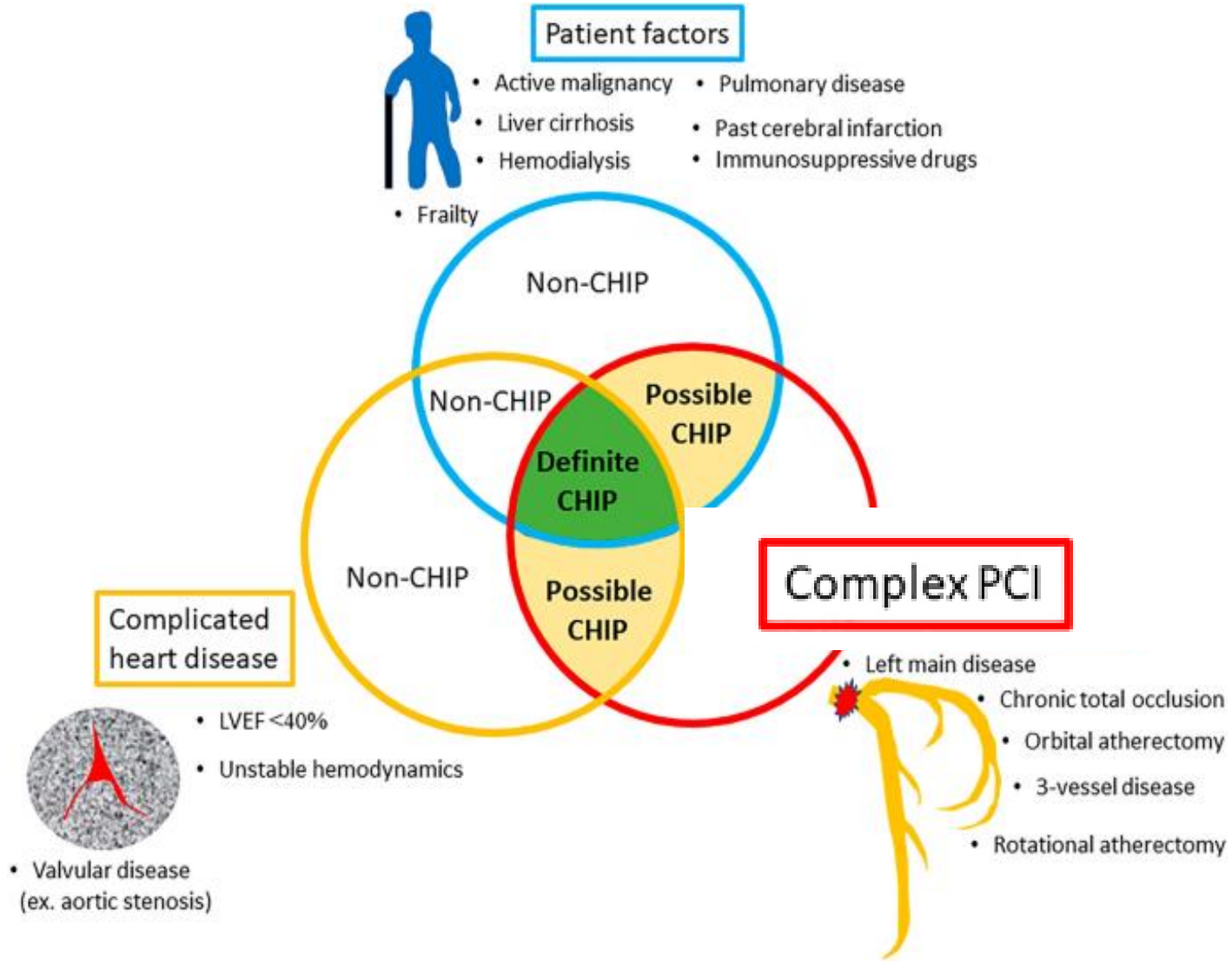
HOT TOPICS IN CARDIOLOGIA 2023

13 e 14 Novembre 2023

Villa Doria D'Angri - Via F. Petrarca 80,
Napoli

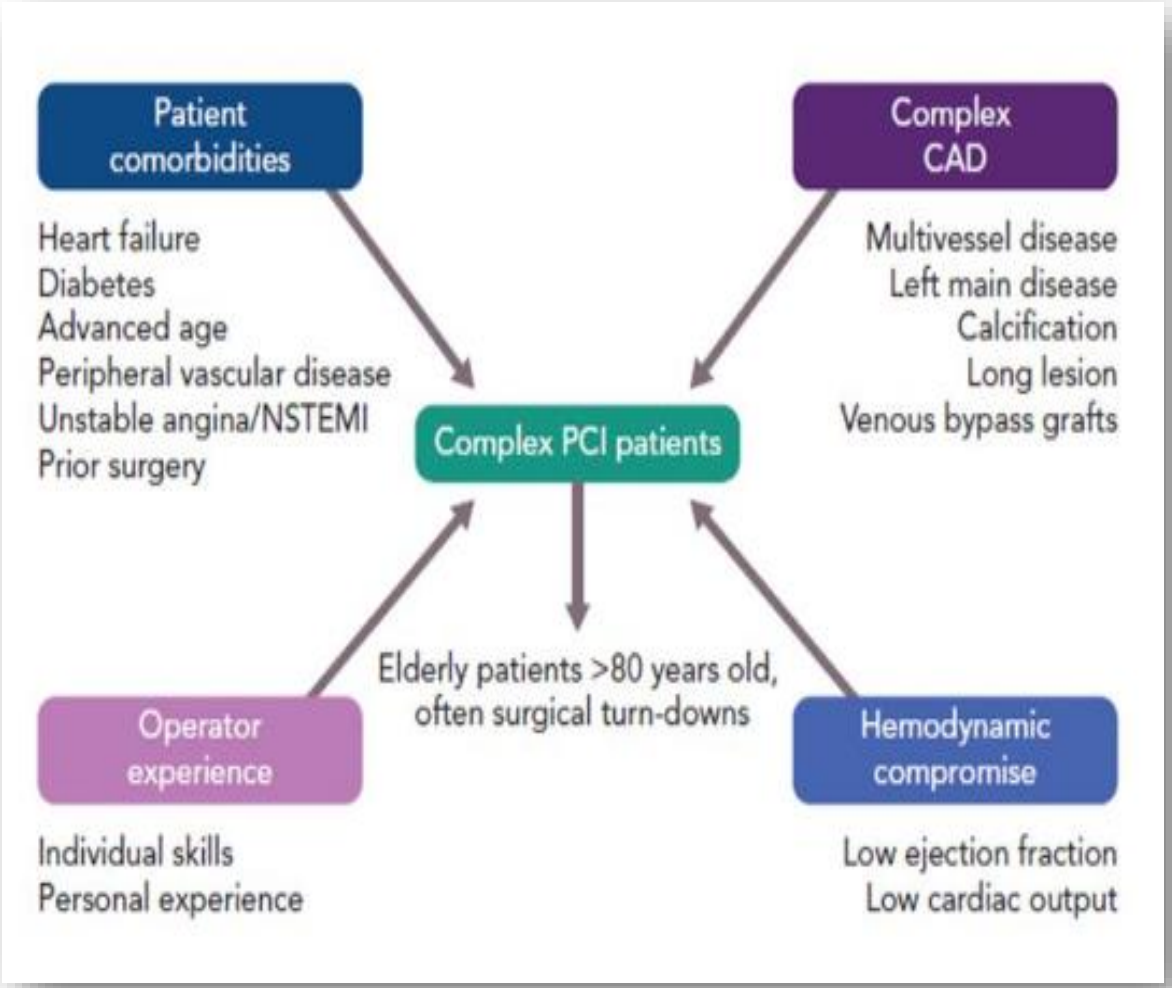
PCI COMPLESSA NEL PAZIENTE CHIP

Gerardo Carpinella MD, MSc
Cardiologia UTIC
AORN A. Cardarelli


Patient factors
• Active malignancy
• Liver cirrhosis
• Hemodialysis
• Pulmonary disease
• Past cerebral infarction
• Immunosuppressive drugs
• Frailty
Non-CHIP
Non-CHIP
Possible CHIP
Definite CHIP
Non-CHIP
Possible CHIP
Complex PCI
• Left main disease
• Chronic total occlusion
• Orbital atherectomy
• 3-vessel disease
• Rotational atherectomy
Complicated heart disease
• LVEF <40%
• Unstable hemodynamics
• Valvular disease (ex. aortic stenosis)

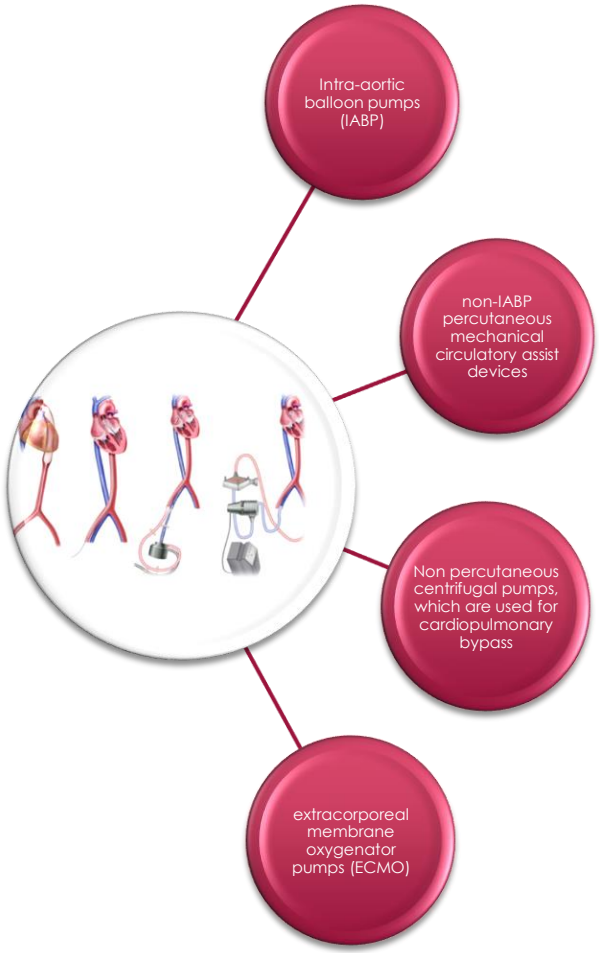
Types of PCI and what constitutes high-risk PCI?

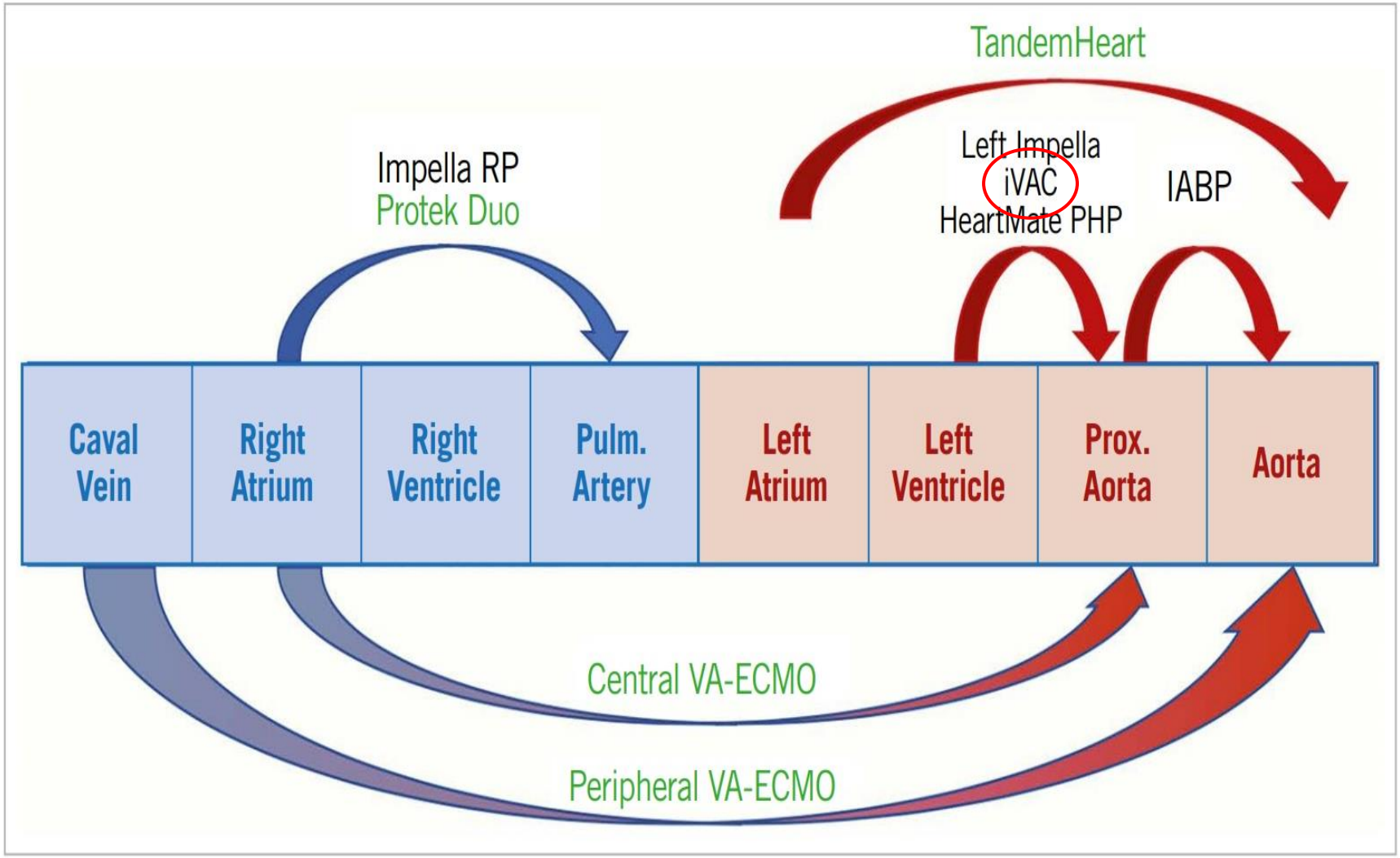
- ✓ CTO angioplasty
- ✓ Laser angioplasty
- ✓ Rotational atherectomy
- ✓ LM angioplasty
- ✓ MCS-supported PCI



Background to Short Term Mechanical Circulatory Devices

- Short-term mechanical circulatory assist devices are designed to provide hemodynamic support for a wide range of clinical conditions
- These devices provides circulatory support by performing work for a failing left or right ventricle or both
- There has been a significant increase in the use of short-term percutaneous ventricular assist devices (pVADs) as acute circulatory support in cardiogenic shock and to provide hemodynamic support during interventional procedures, including high-risk PCI

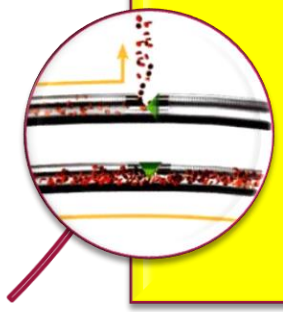



TandemHeart
Impella RP
Protek Duo
Left Impella
iVAC
HeartMate PHP
IABP
Caval Vein
Right Atrium
Right Ventricle
Pulm. Artery
Left Atrium
Left Ventricle
Prox. Aorta
Aorta
Central VA-ECMO
Peripheral VA-ECMO

iVAC 2L

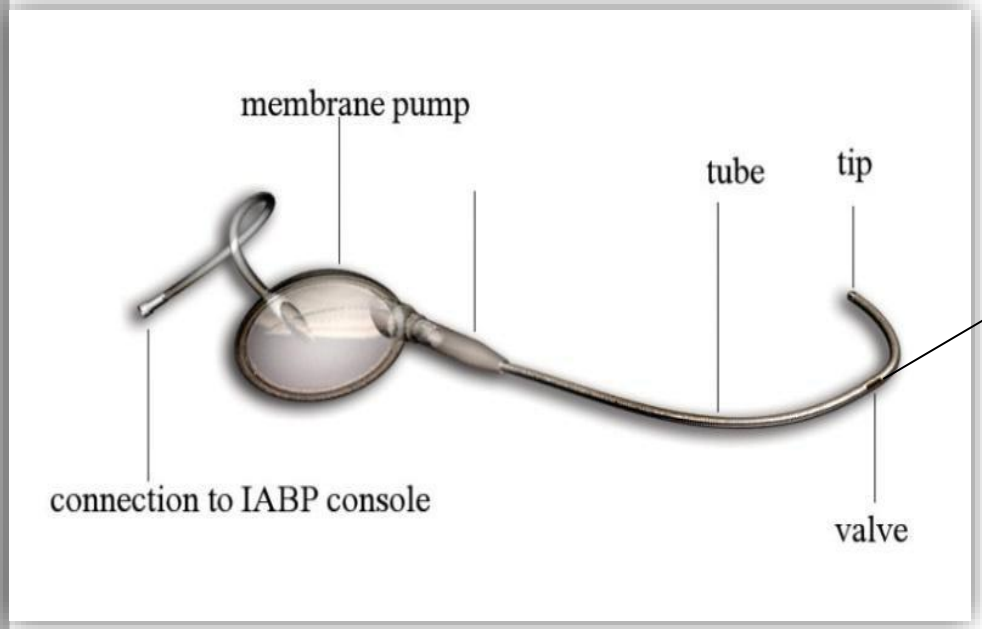
iVAC 2L is a short term Pulsatile Mechanical Circulatory Support System in the form of a pVAD (Percutaneous Ventricular Assist Device) that effectively generates blood flow of up to 2 liters per minute

It works by actively unloading the left ventricle to provide critical hemodynamic support for patients being treated for acute myocardial infarction and cardiogenic shock



Its application as hemodynamical backup may also result in more extensive treatment of the coronary lesions and improved long-term clinical outcomes and improve myocardial perfusion and optimize the cardiac workload, thus reducing the likelihood of peri- and post-procedural adverse events

Characteristics



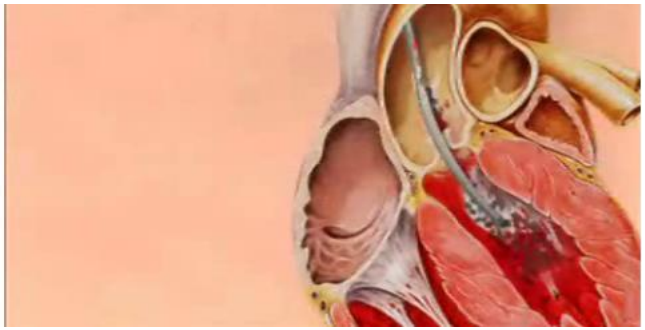
- 17Fr flexible thin-walled catheter
- Bi directional valve
- Single port 40cc membrane pump
- Run by an IABP console

Indications

- ✓ Protected high-risk PCI
- ✓ Cardiogenic shock

Contra indications

- ✓ Femoral artery diameter < 6 mm
- ✓ Severe Aortic stenosis
- ✓ Thrombus in LV
- ✓ Presence of mechanical aortic valve



IVAC 2L
BENEFITS – ADVANTAGES

BENEFITS

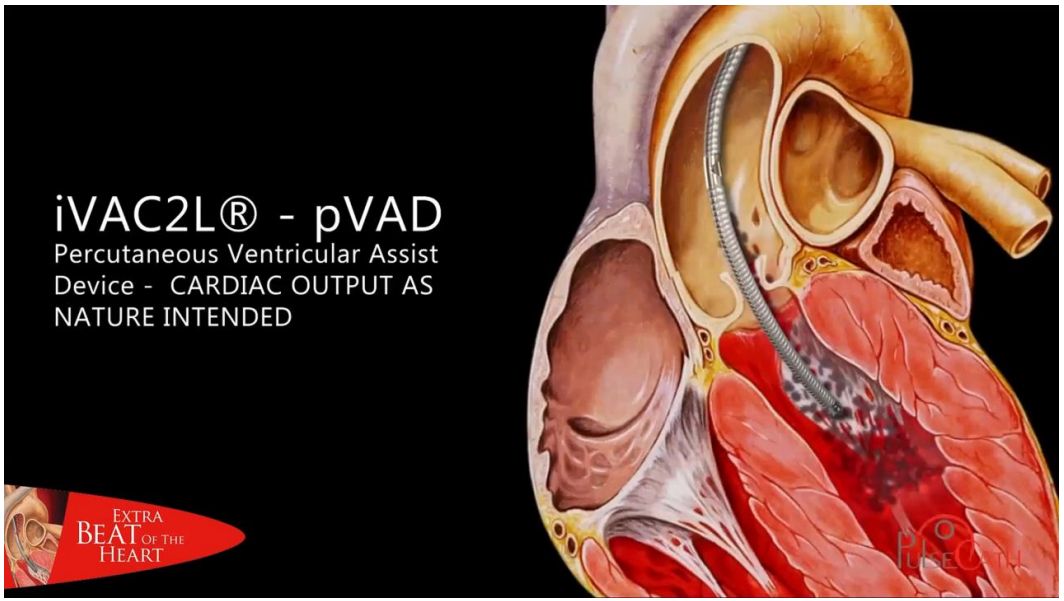
- **Ease of use, short learning curve**
- **Reduced strain on heart muscle**
- **Improvement in hemodynamic parameters that effect the organs**
- **Unloading of the LV reducing afterload aortic pressure**
- **Improves cardiac output**

ADVANTAGES

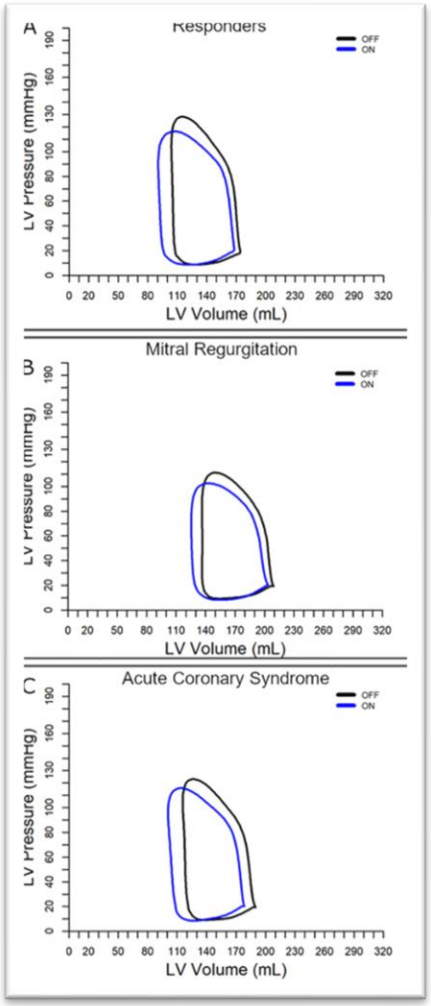
- **Swift percutaneous approach, also in emergency situations**
- **Reduce ventricular volume and pressure**
- **Non-significant hemolysis**
- **Standard transfemoral, percutaneous approach that follows routine procedure**
- **Improves coronary artery and end-organ perfusion**

How does it work?

- The iVAC 2L is activated by standard IABP console that is triggered by ECG /AP
- The helium from IABP console is “pushing and pulling” the iVAC 2L membrane pump synchronized with heart beats
- During aspiration, blood enters the catheter through its tip located at the left ventricular and is aspirated into the membrane pump
- The membrane pump pushes the blood back in the catheter, the valve at the side hole opens, and ejects the blood out sideways to aorta during diastole



Effect of next generation pulsatile mechanical circulatory support on cardiac mechanics – The PULSE trial



- ✓ Mechanical circulatory support with PulseCath iVAC 2L in high-risk percutaneous coronary interventions offers LV unloading and reduces myocardial oxygen consumption particularly in patients with acute coronary syndrome or concomitant mitral regurgitation
- ✓ The mean age was 74 (IQR: 70–81) years and the mean SYNTAX score was 31 ± 8.3
- ✓ Left ventricular unloading with iVAC 2L MCS was demonstrated in 82% of patients with complete PV studies
- ✓ 90% of Patients with moderate or severe mitral regurgitation or presenting with acute coronary syndrome (ACS) were most responsive to iVAC 2L unloading
- ✓ In 81% of patients significant reductions in afterload (Ea: −19%) with increases in stroke volume (+11%) and cardiac output (+11%)

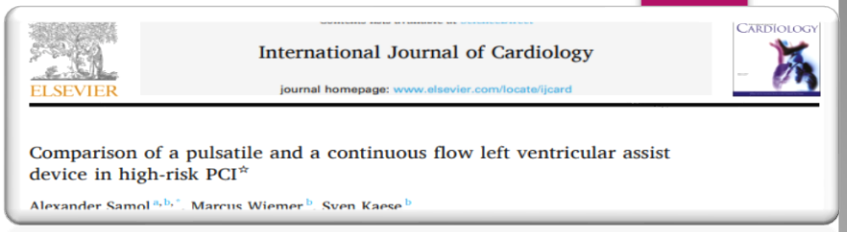
CLINICAL OUTCOME PULSE TRIAL

- ✓ PCI was feasible with iVAC 2L MCS in patients with advanced coronary artery disease and very high to prohibitive operative risks
- ✓ Procedural success in 91% of cases
- ✓ 30-day mortality 6.9%; comparable to PROTECT II outcomes: IABP 6.2% and Impella 6.9%
- ✓ PULSE patients were at higher risk than in PROTECT II

COMPARISON OF IVAC 2L TO IMPELLA CP

- ✓ Different functions – Pulsatile support Vs Continuous flow
- ✓ iVAC 2L although a smaller pump generates equivalent results to Impella CP
- ✓ Works with the heart
- ✓ No significant hemolysis in comparison to Impella CP
- ✓ Easy to operate and time efficient
- ✓ Cost effective

iVAC 2L vs Impella 2.5


International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

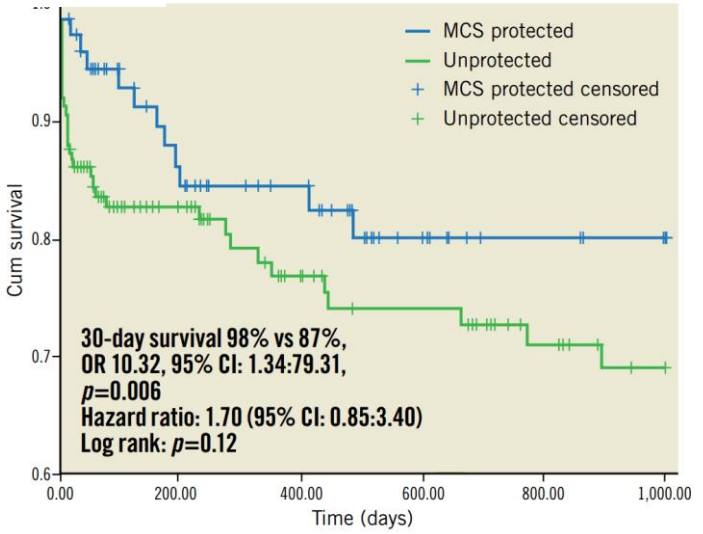
Comparison of a pulsatile and a continuous flow left ventricular assist device in high-risk PCI☆

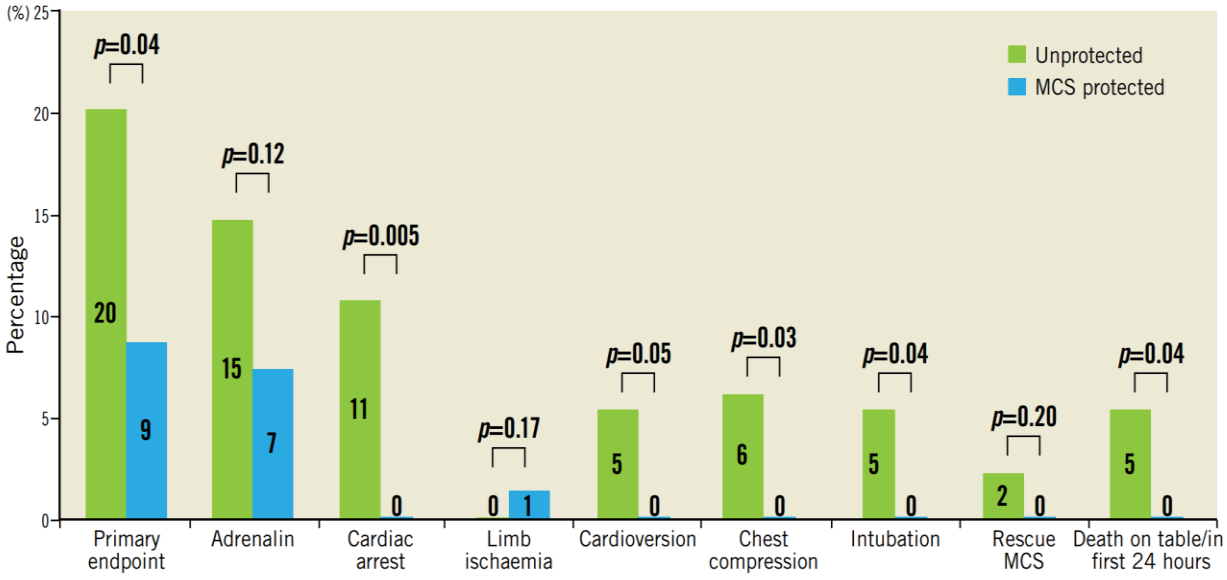
Alexander Samol[a,b,*], Marcus Wiemer[b], Sven Kaese[b]

- ✓ **40 patients iVAC 2L vs Impella 2.5 during protected high-risk PCI (LVEF 33%)**
- ✓ **PCI Success in 98% of cases**
- ✓ **Both devices led to a significant increase in aortic pressure**
- ✓ **Both devices ensured stable hemodynamic conditions for performing successful high-risk PCI**
- ✓ **Complication rates by use of both devices seem acceptable**
- ✓ **Signs of potential hemolysis were only present under Impella 2.5**
- ✓ **High-risk PCI's under mechanical circulatory support by the pulsatile iVAC 2L or the continuous flow Impella 2.5 device are feasible and safe**

New-generation mechanical circulatory support during high-risk PCI: a cross-sectional analysis

"In a consecutive real-world cohort of high-risk PCI patients, protection with new-generation MCS resulted in better procedural outcomes despite worse EF and more complex coronary artery disease at baseline"

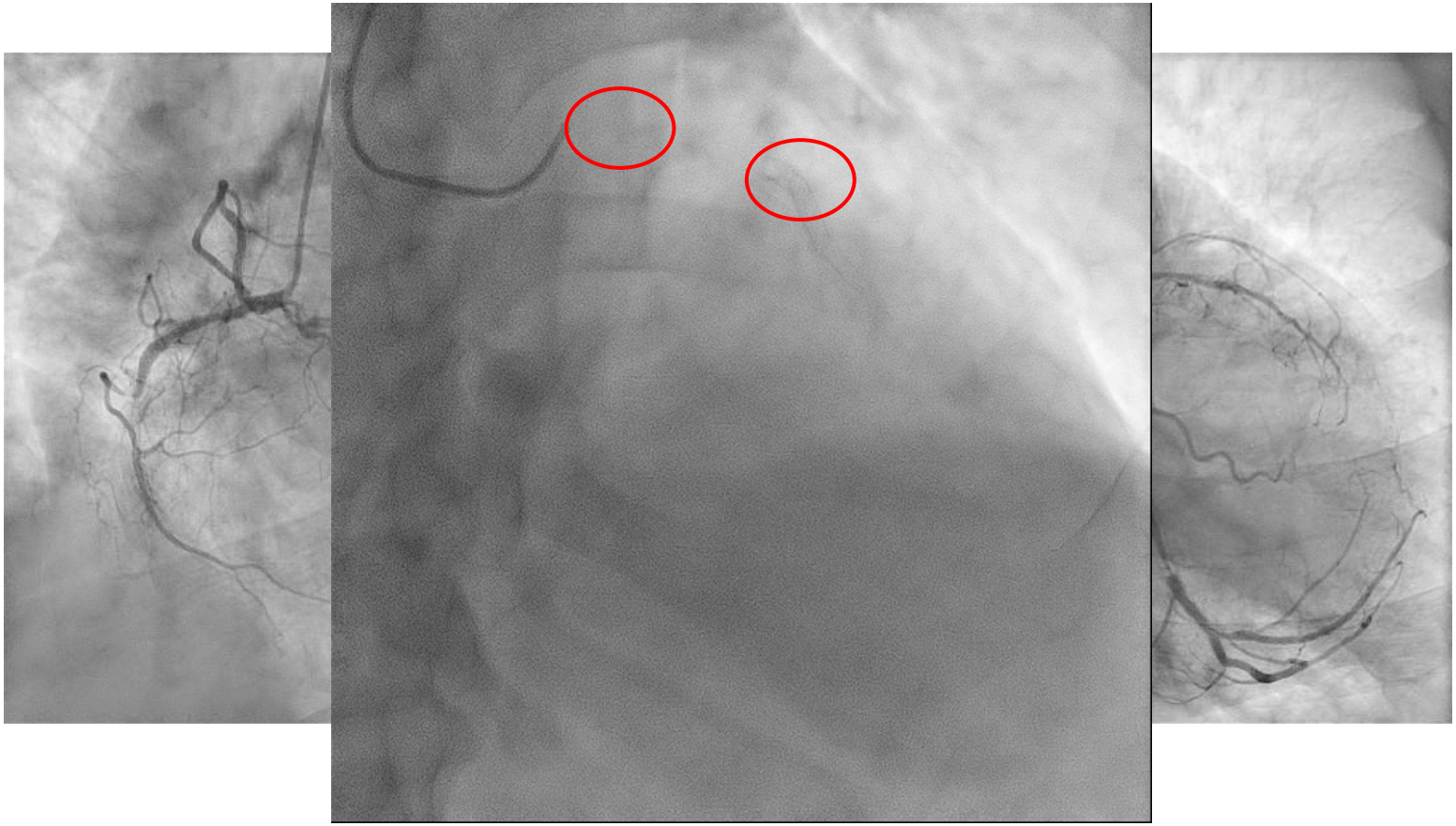




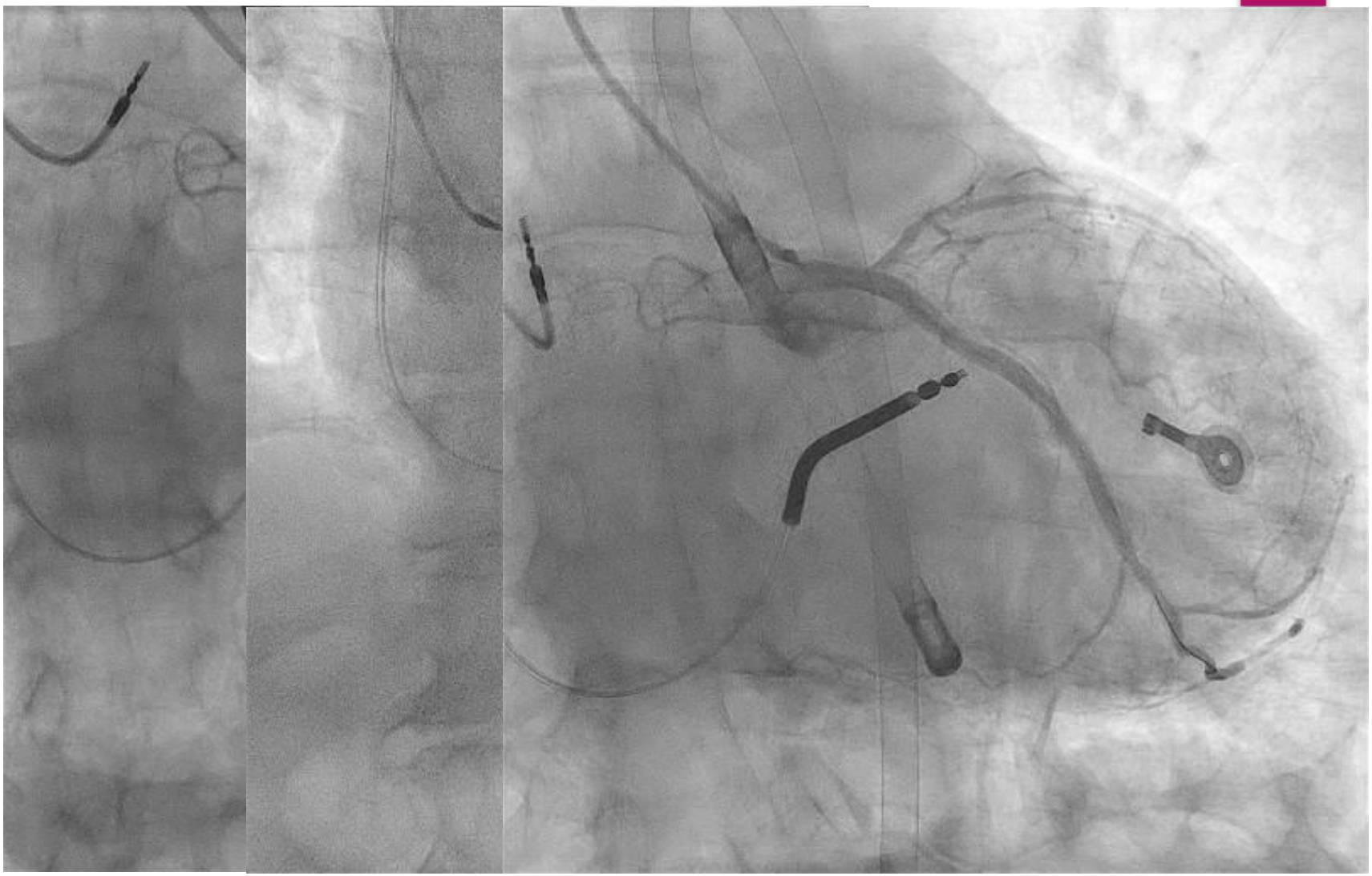
CASO CLINICO

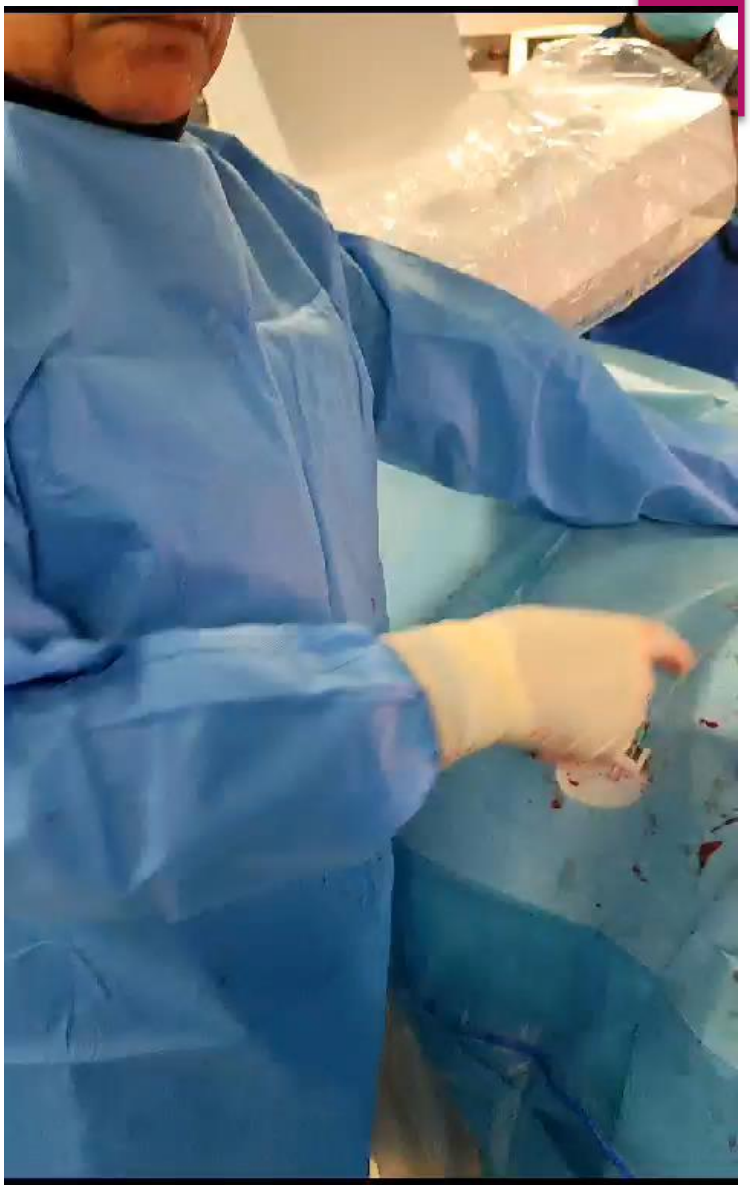
- ✓ Uomo, anni 65
- ✓ DM 2 in terapia mista, dislipidemia, ipertensione arteriosa, IRC
- ✓ CAD – nota CTO IVA, pregressa PCI + DES su coronaria dx e ramo circonflesso nel 2021 per STEMI IPL
- ✓ Ricovero in Luglio 2023 per NSTEMI con associato stato settico
- ✓ Ecocardio: FE 30%, IM moderato-severa, acinesia e fibrosi di apice e parete inferiore
- ✓ Impianto di ICD bicamerale alla risoluzione della sepsi

CORONAROGRAFIA



PCI






Thanks!
FOR YOUR
ATTENTION