

# PLACE



PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

**ROMA**

Centro Congressi  
di Confindustria

**Auditorium  
della Tecnica**

**9ª Edizione**

**30 Settembre**

**1 Ottobre**

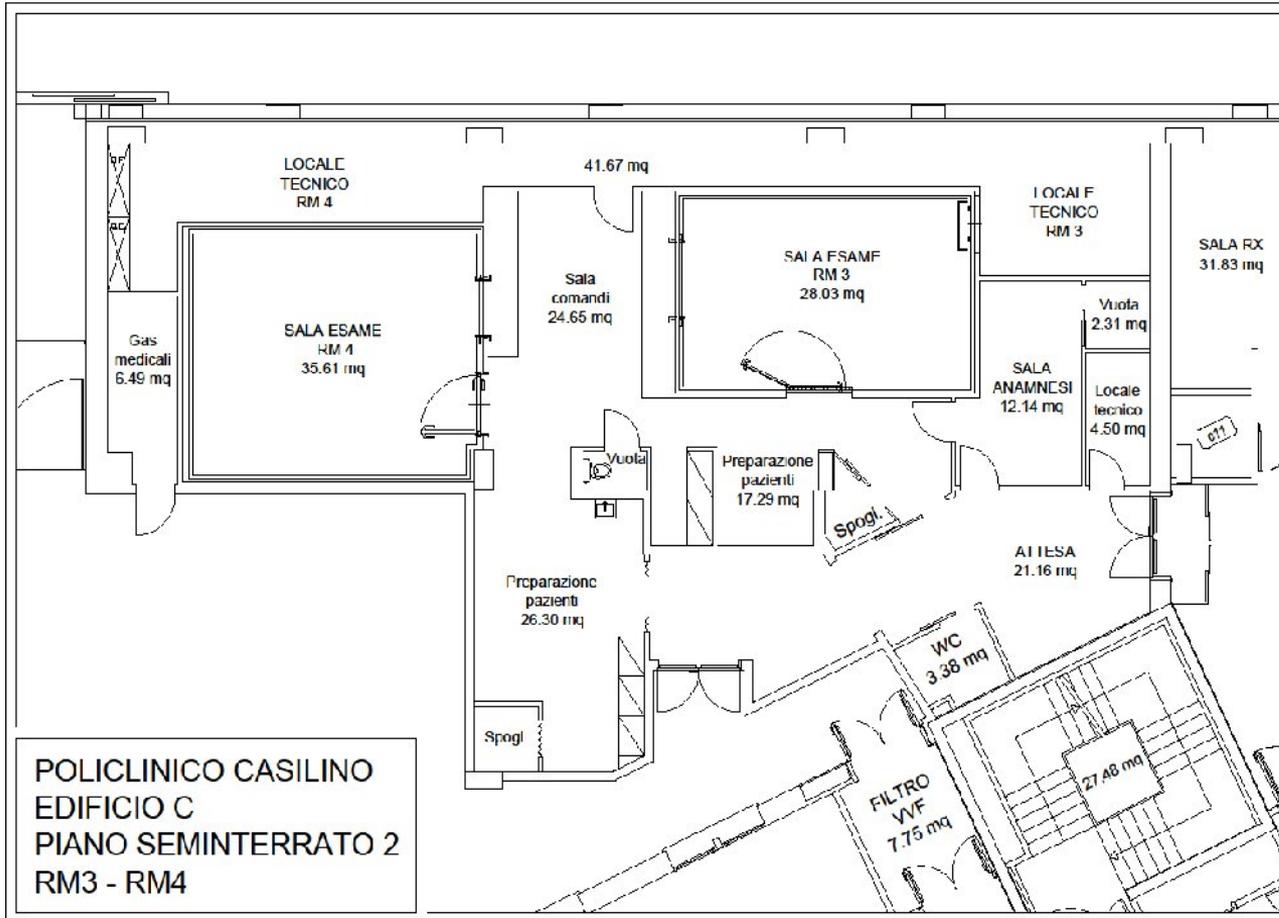
**2022**



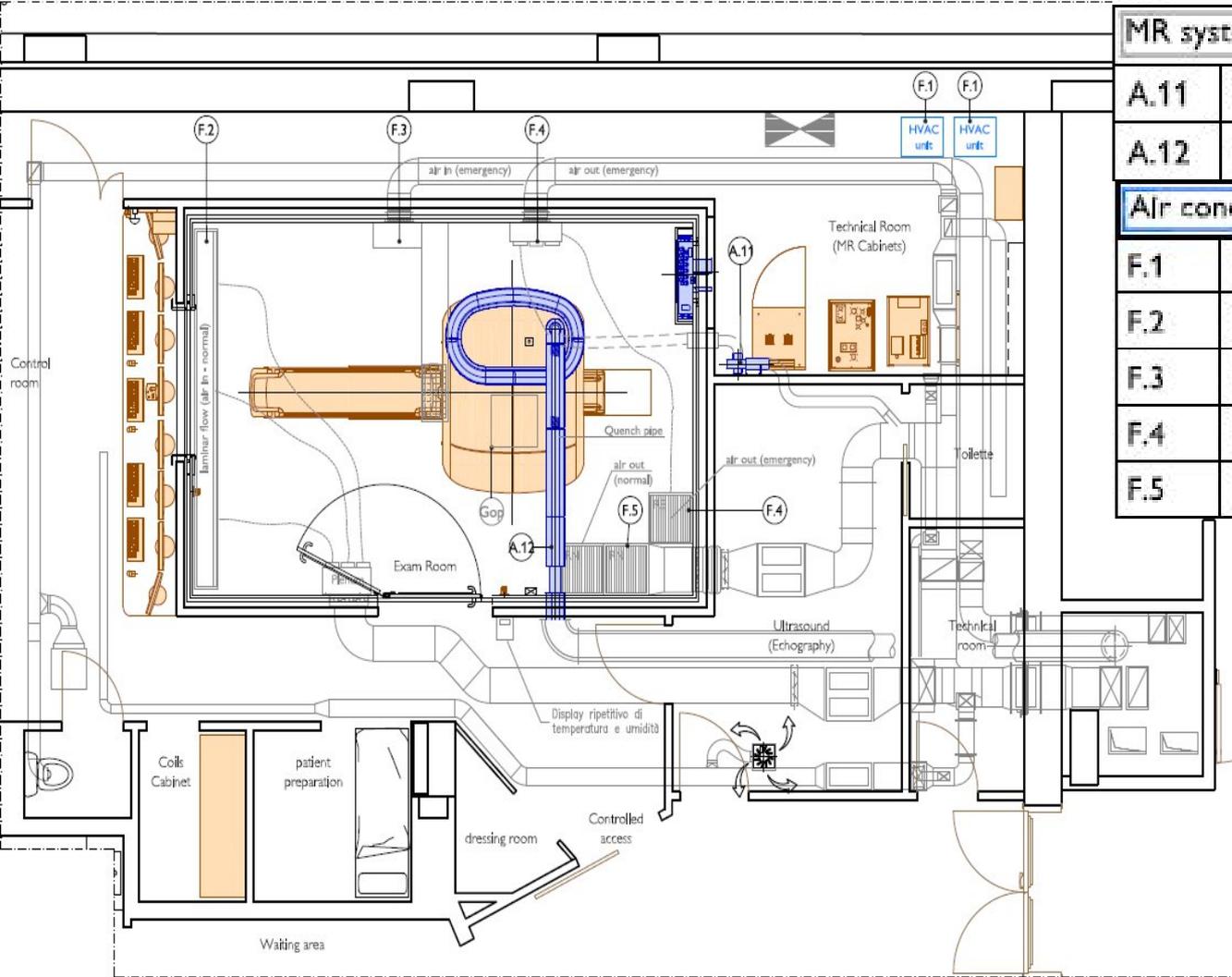
## **IMAGING CARDIOVASCOLARE: OLTRE LA VISIONE**

# **RISONANZA MAGNETICA CARDIACA E CARDIOLOGIA INTERVENTISTICA**

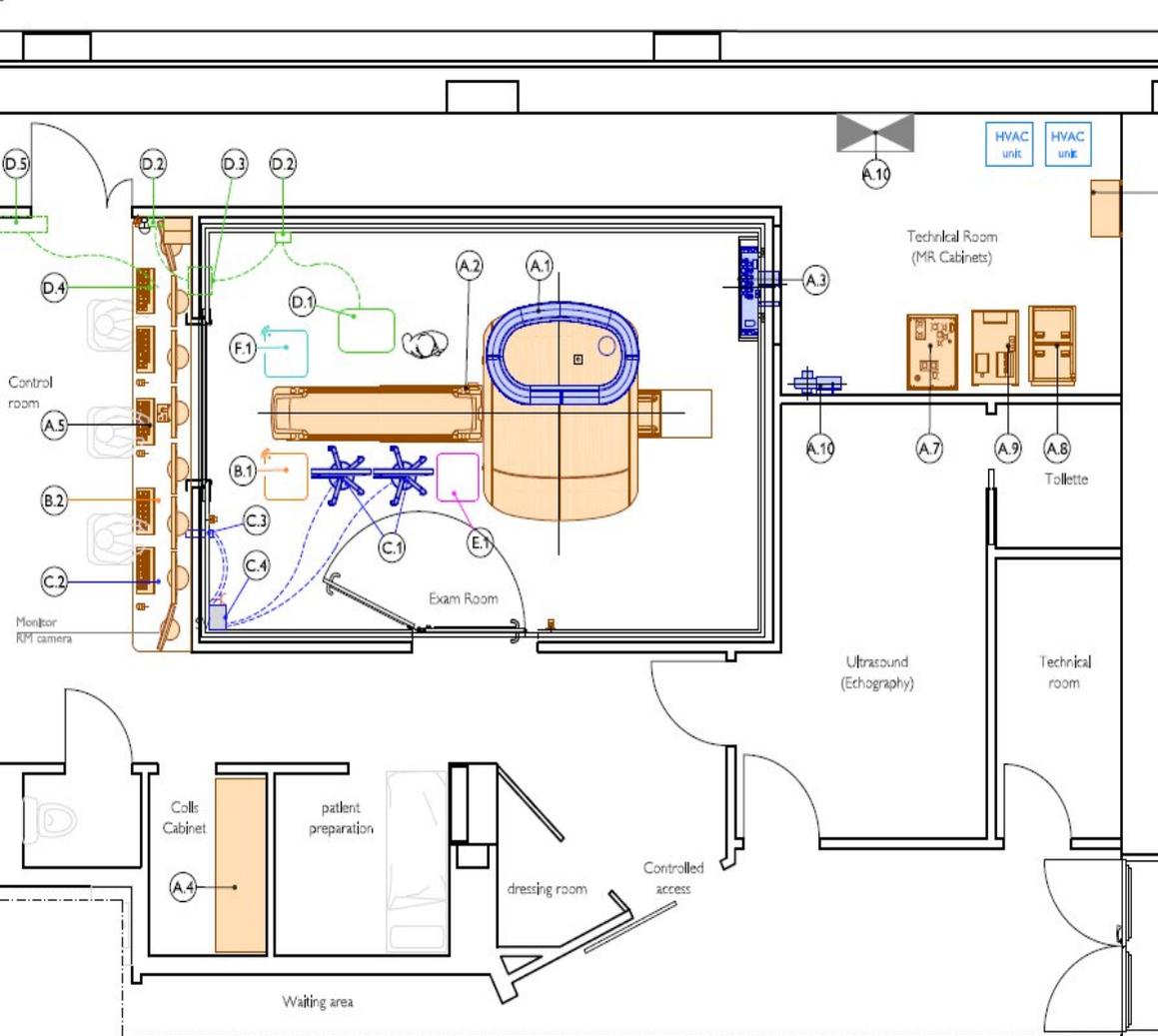
**Giovanni Simonetti**







MR system	
A.11	SACU - MR Cooling unit
A.12	Quench pipe
Air conditioning systems	
F.1	HVAC unit
F.2	Normal air in (laminar flow)
F.3	Emergency air intake
F.4	Emergency air outtake
F.5	Normal air outtake



MR system	
A.1	MR Gantry 1,5 T
A.2	Patient support system
A.3	RF filter
A.4	Coils cabinet storage
A.5	Operator console
A.6	MDU - Power distribution cabinet
A.7	LCC Cabinet (cooling system for Cryo - G.C. e G.A.)
A.8	DACC Cabinet - data acquisition
A.9	GA787 - Gradient amplifier cabinet
A.10	Electrical main panel

**Expression MR400**

B.1	MR400 trolley
B.2	Expression MR400 monitor

**SensaVue**

C.1	SensaVue display
C.2	SensaVue host computer
C.3	Wave guide
C.4	Junction box

**Visual Ice**

D.1	Mobile connection panel
D.2	Junction box
D.3	Filter
D.4	Visual-Ice control
D.5	Gas panel

**Anesthesia**

E.1	Anesthesia trolley
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**Imricor**

F.1	Sistema Imricor
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9<sup>a</sup> Edizione

# Overview of interventional sites with iSuite



**KING'S**  
College  
LONDON



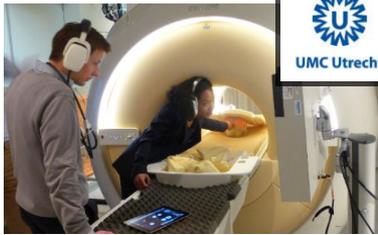
**OTTO VON GUERICKE**  
UNIVERSITÄT  
MAGDEBURG



*Heinrich Heine*  
**HEINRICH HEINE**  
UNIVERSITÄT DÜSSELDORF



**UNIVERSITÄT LEIPZIG**  
HERZZENTRUM



**U**  
UMC Utrecht



**children's**  
MEDICAL CENTER  
children'shealth<sup>®</sup>



**UKM**  
Universitätsklinikum  
Münster



**HDZ NRW**  
UK RUB UNIVERSITÄT DUISBURG ESSEN  
UNIVERSITÄT DUISBURG



**Maastricht UMC+**



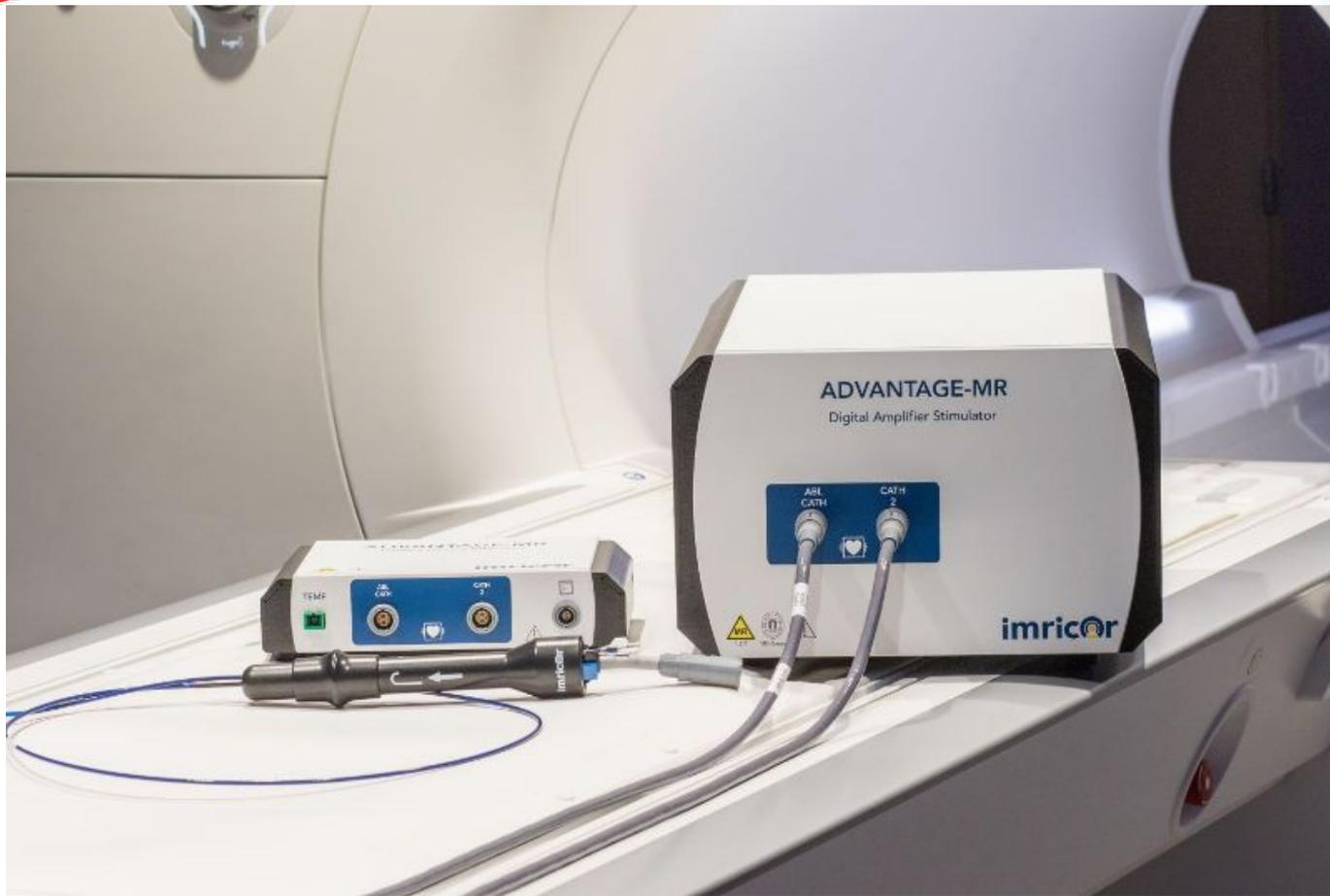
**MAYO CLINIC**



**Amsterdam UMC**  
Universitair Medisch Centrum



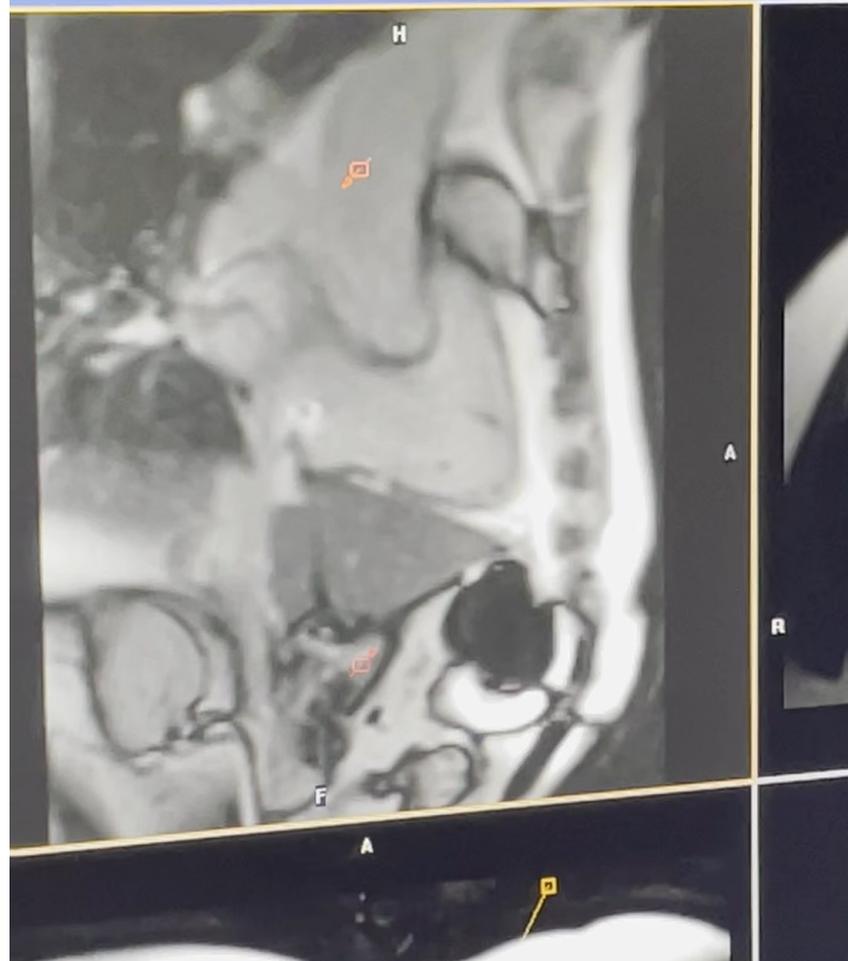
**POLICLINICO**  
CASILINO  
ROME



In conjunction with the MRI scanner, Imricor Advantage-MR provides real-time imaging guidance of the Vision-MR Catheters during cardiac ablation procedures in the iCMR. This technique is called Active Catheter Imaging (ACI)

Here's how it works:

- 2 integrated MR-receive coils reside in the tip of the Vision-MR Catheter (distal coil is 8mm from catheter tip)
- MR fields interact with these coils to provide real-time guidance and confirmation of location
- The RF energy absorbed by the coils is seen on-screen, real-time, and is depicted as two bright circles when in the scan plane





## PRE - ABLATION



## POST - ABLATION



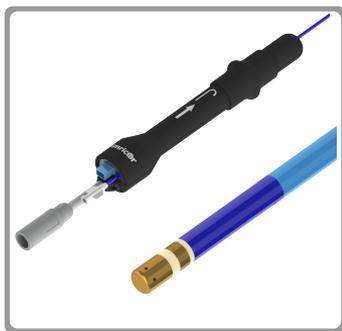


- Thought leaders and pioneers are utilizing to Active Catheter Imaging for AFL ablations in the iCMR.
- ACI, when done properly, provides exceptional imaging, guidance, and lesion visualization to effectively perform AFL ablations today.
- It's important to know that ACI is a skill that requires practice. For the safety of the patient and the effectiveness of the procedure, mastering these imaging techniques is the first step towards
- 3D mapping systems integrated with MR imaging are coming- and today will be required for complex procedures- like the evolution of ablations in the EP lab.



# Imricor iCMR Products

Imricor's iCMR family of products are designed with patented technology to meet the needs of physicians and CVD patients around the world.



## Vision-MR™ Ablation Catheter

Designed to look, feel and function like a traditional ablation catheter



## Advantage-MR™ EP Recorder / Stimulator

Both a conventional EP recording system and a cardiac stimulator within the iCMR environment



## Vision-MR™ Dispersive Electrode

Designed to minimize eddy currents induced on the device's conductive pads during MR scanning



# Imricor Vision-MR™ Ablation Catheter



## First and Only

Only commercially available ablation catheter for the iCMR



## MR Conditional

Proven safe in the iCMR (1.5T)



## Familiar

Traditional handle feel



## Approved

CE Mark in 2020  
Ministero della Salute il  
30/06/2022

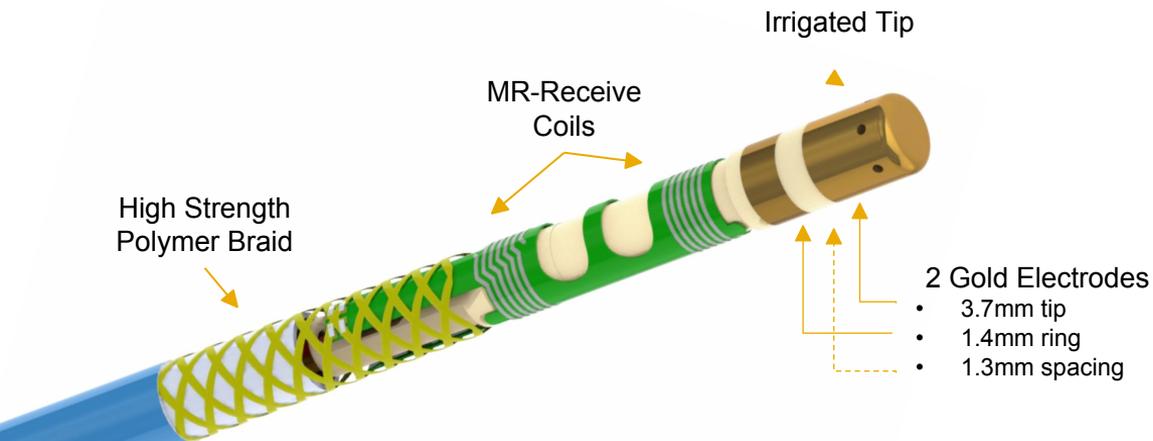
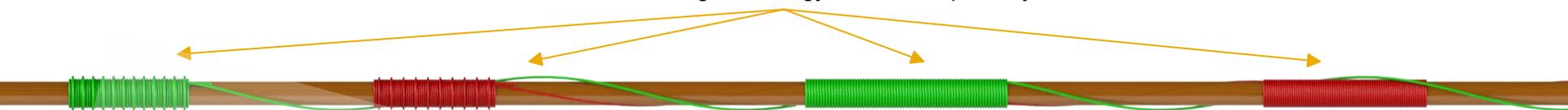




# Imricor Vision-MR™ Ablation Catheter

Single-use, radiofrequency (RF) ablation

Patented winding technology for MR compatibility



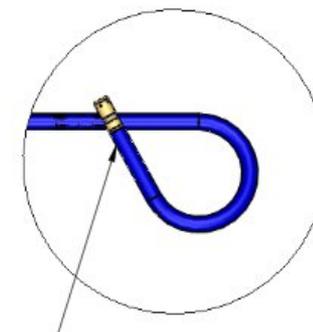
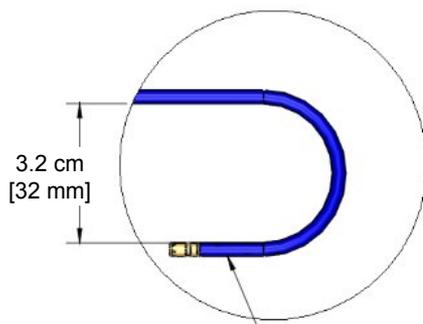
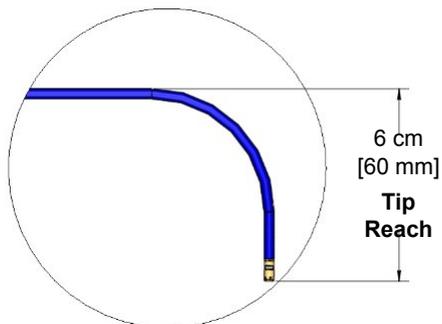
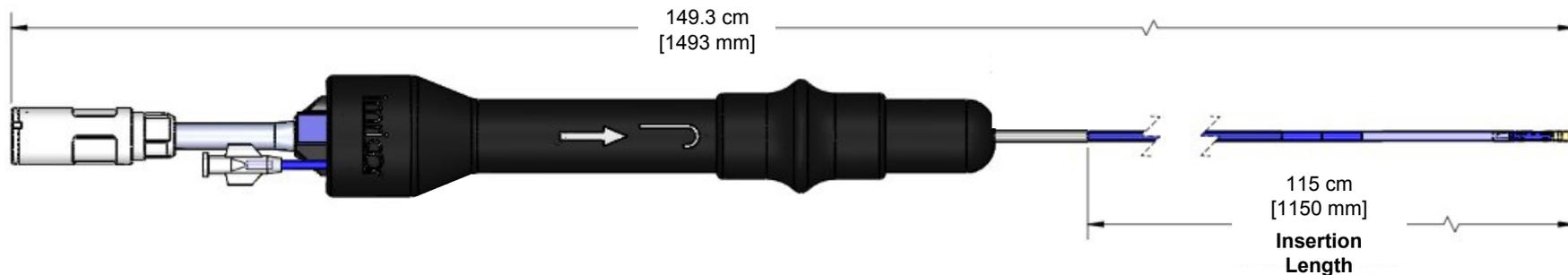
## Other Features

- **9F diameter**
- **Uni-directional, deflectable tip**
- **Fiber optic temperature sensing tip**
- **High strength polymer pull-wire**



# Imricor Vision-MR™ Ablation Catheter

## Measurements and curvature



*\*Curvature is between a BWI D & F curve, closer to a D curve*



# Traditional Lab

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## Limitation

Soft-tissue is not visible

Unintentional gaps in ablation lines are not visible

Ionizing radiation exposure to patient and staff

Heavy lead protective garments worn for hours every day

1 purpose

# iCMR

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## Solution

Visualization of cardiac structure and disease progression

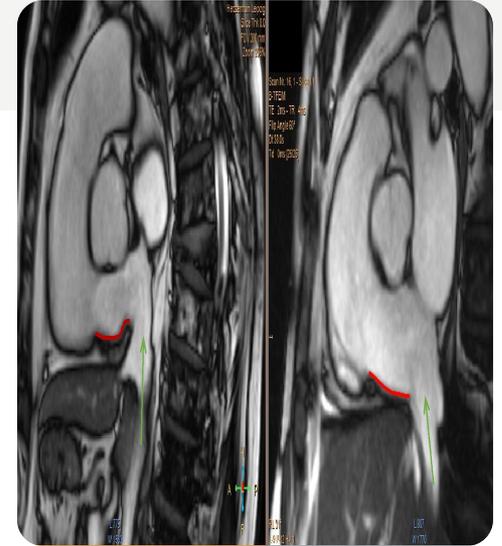
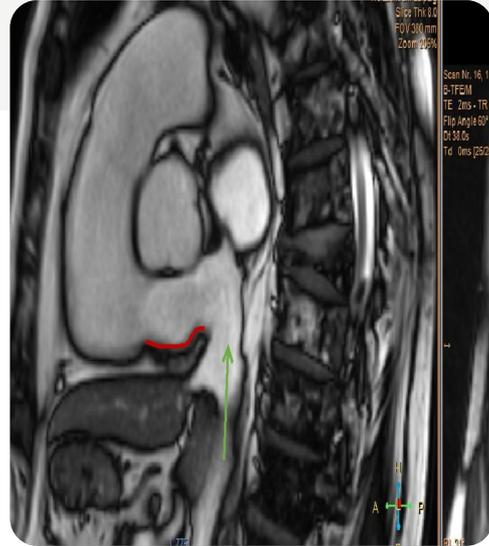
Lesion visualization in real-time to help fill missed gaps

MRI generates no ionizing radiation

No radiation = no requirement for lead protective garments

Use as a diagnostic lab in *addition* to interventions

# Real-Time Visibility



**See the structure and orientation of the myocardium and anatomical abnormalities, in real-time**



# Real-Time Visibility

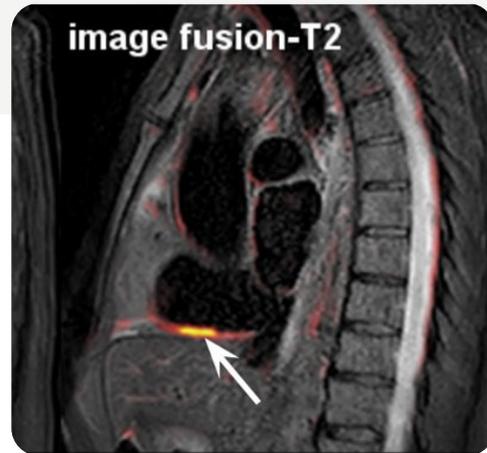
Tailor treatment to your Patient with improved lesion visualization



**Pre-  
Ablation**



**Post-  
Ablation**



**Image  
Fusion**

Real-time MRI guidance allows you to assess lesion quality and fill gaps in the ablation during the initial procedure

# Occupational Benefits

Your **Health**, Your Team's **Health**

- A major workplace concern for interventional cardiologists and cath lab staff is their daily **exposure to ionizing radiation** from the angiographic X-ray systems that are central to their procedures<sup>2</sup>
- In addition to increased cancer risks and developing cataracts, they are also worried about orthopedic issues caused by wearing heavy radiation protection aprons, which takes a toll on the spine and can **lead to chronic back problems**<sup>2</sup>
- Among occupationally **exposed healthcare workers**, interventional cardiologists and clinical electrophysiologists are among the most highly exposed, and there is potential for exposure to support personnel as well<sup>3</sup>





## Procedure MRI in EP

Background: In elettrofisiologia alcune procedure vengono eseguite creando una mappa tridimensionale del cuore tramite un sistema di navigazione con triangolazione gps ed impedenzimetria. Una volta identificate le aree di interesse si può procedere ad una ablazione con energia a RF o cryo energia per generare una lesione. I segnali elettrofisiologici endocavitari guidano la ricerca delle aree d'interesse.

### Vantaggi

Segnali multipolari delle aree di interesse con elettrocateri multipolari

Aree realmente raggiungibili con l'elettrocatero disponibile

Visualizzazione real time

Feedback di contatto ed orientamento del contatto

Bassa o quasi nulla esposizione RX

Permette di trattare anatomie complesse

### Limiti

Materiali costosi e plurimi approcci vascolari

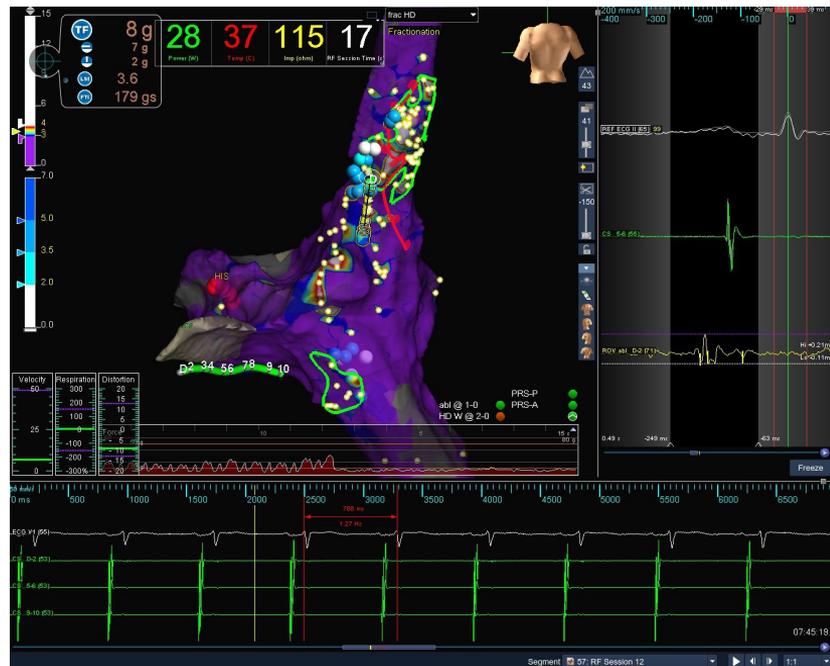
Si ricostruisce solo ciò con cui si è a contatto, il resto risulta interpolato e non reale

Gating non sempre perfetto con respiro, la mappa può spostarsi se il paziente si muove

Il contatto necessita uno zeroing, non sempre il feedback è ottimale

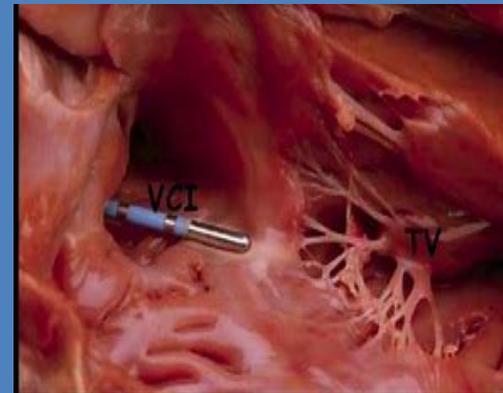
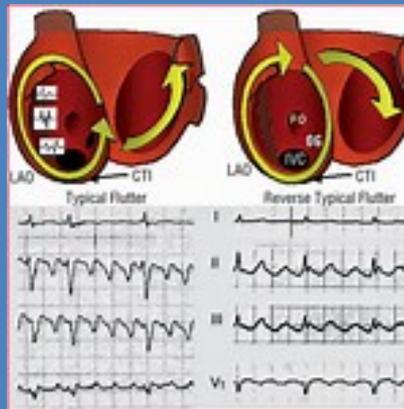
Talvolta elevati tempi di esecuzione

Non sempre possono essere ricostruite tutte le aree



## Procedure MRI in EP

- Attualmente la metodica permette di eseguire solo procedure semplici nelle quali verosimilmente il mappaggio 3 D è strettamente necessario. In Europa pochi Centri hanno eseguito procedure di ablazione MRI.
- Nelle prime serie sono state eseguite ablazioni di flutter atriali in atrio destro con ottimi risultati. Naturalmente essendo le prime si stanno ancora eseguendo speculazioni su quali parametri utilizzare, come evidenziare la lesione.
- **L'utilizzo del Software I-SUITE con l'active tracking risulta essere davvero utile.**



### Vantaggi

Ricostruzione 3 D real time di tutte le aree

Informazioni sul tessuto

Nessuna esposizione di Raggi X

Visualizzazione della lesione real time

Visualizzazione di strutture extracardiache sensibili

Vantaggio in anatomie difficili e strutture non visualizzabili con elettrocateri

### Limiti

Mappe time consuming

Non disponibili informazioni sul contatto

Limitata disponibilità di materiali compreso defibrillatore esterno

Dopo il gadolinio tempo di attesa per rivalutazione DE

Costi elevati

Personale altamente specializzato

## Il meglio deve ancora arrivare



Cosa ci aspetta nel futuro delle ablazioni MRI

- Materiali polifunzionali
- Defibrillatore esterno
- Materiali per transettale ed accesso in atrio sinistro o per via transaortica retrograda
- Mappaggio elettroanatomico in tempo reale

Cosa ci aspetta a breve:

Ablazione delle tachicardie/Extrasistoli ventricolari destre, lesion assesment e forza di contatto.

Ablazione in atrio sinistro e fibrillazione atriale



28 Luglio 2022

Prima procedura in Italia di ablazione di flutter sotto guida MRI ottimo esempio di collaborazione in **CARDIORADIOLOGIA Interventistica**

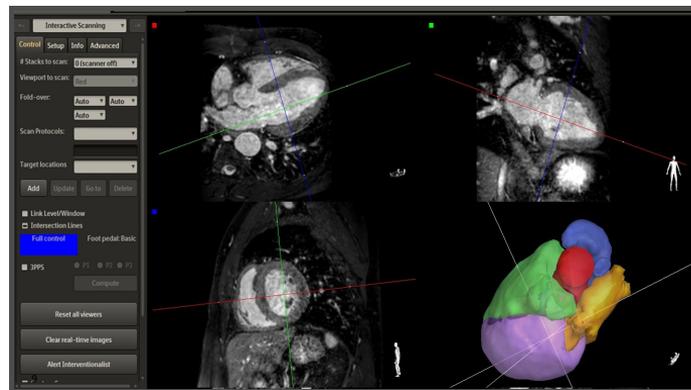




# iCMR – Philips “iSuite” Interventional MRI Suite

## Main Features

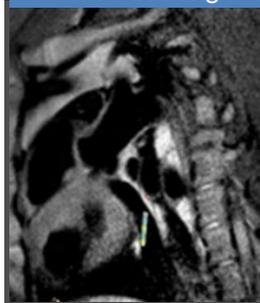
- 4 Viewports (2x2 or 1+3)
- MR Fluoroscopy
- 3D auto-segmented roadmaps
- Bookmark targets for planning access
- Easy switching between Geometries
- Store images and associated data
- Store entire procedure



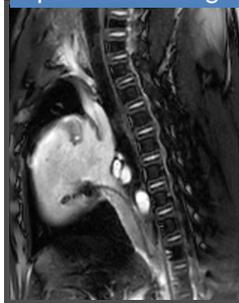
White blood  
active tracking



Black blood  
active tracking



White blood  
passive tracking



### Interventional MRI sequences

- Active tracking
- On-the-fly switching of MRI sequences
- Every scan sequence is available by design



# Interventional MR Onco Suite

1. **Decide** location of pathology and identify surrounding anatomy
2. **Guide** the **applicator** in real-time to the exact location
3. **Treat** under **real-time temperature** mapping
4. **Confirm** success of the treatment immediately

