

# **How to Optimize Workflow in AF Ablation Procedure?**

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# Strategies of AF Ablation

## 2017 HRS/EHRA/ECAS/APHRS/SOLAECE Expert Consensus

	Recommendation	Class	LOE
PV isolation by catheter ablation	Electrical isolation of the PVs is recommended during all AF ablation procedures.	I	A
	Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.	I	B-R
	Monitoring for PV reconnection for 20 minutes following initial PV isolation is reasonable.	IIa	B-R
	Administration of adenosine 20 minutes following initial PV isolation using RF energy with reablation if PV reconnection might be considered.	IIb	B-R
	Use of a pace-capture (pacing along the ablation line) ablation strategy may be considered.	IIb	B-R
	Demonstration of exit block may be considered.	IIb	B-NR

# Strategies of AF Ablation

## 2017 HRS/EHRA/ECAS/APHRS/SOLAECE Expert Consensus

	Recommendation	Class	LOE
Ablation strategies to be considered for use in conjunction with PV isolation	If a patient has a history of typical atrial flutter or typical atrial flutter is induced at the time of AF ablation, delivery of a cavotricuspid isthmus linear lesion is recommended.	I	B-R
	If linear ablation lesions are applied, operators should use mapping and pacing maneuvers to assess for line completeness.	I	C-LD
	If a reproducible focal trigger that initiates AF is identified outside the PV ostia at the time of an AF ablation procedure, ablation of the focal trigger should be considered.	IIa	C-LD
	When performing AF ablation with a force-sensing RF ablation catheter, a minimal targeted contact force of 5 to 10 grams is reasonable.	IIa	C-LD

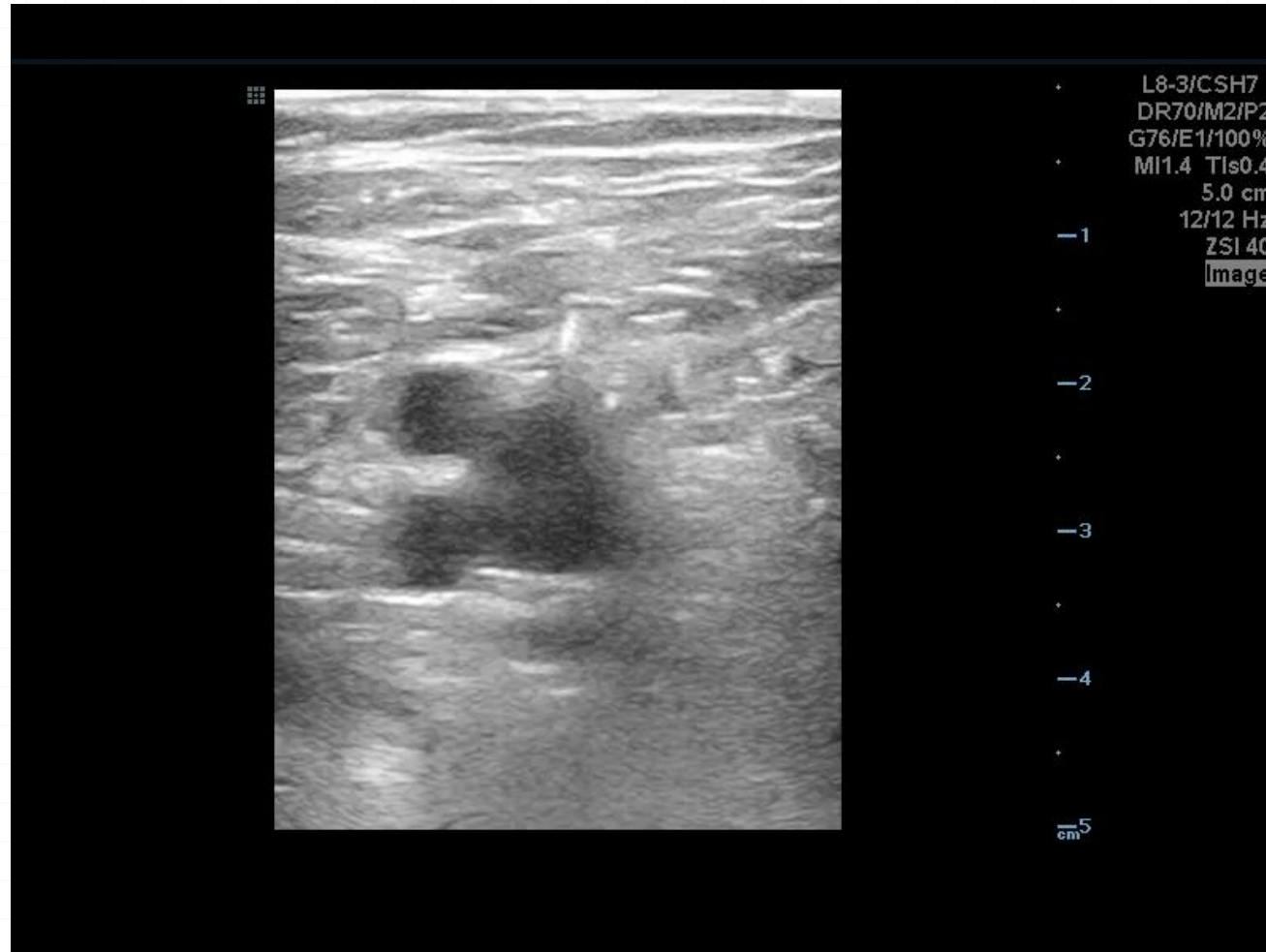
# My Current Strategy for AF Ablation

1. Fluoroless (Zero fluoroscopy) procedure guided by ICE and 3D Mapping
2. Conscious sedation with remifentanyl (without esophageal temperature probe).
3. High-Power Short Duration Ablation guided by Ablation or Lesion Size Index
4. CFAE guided Ablation (Persistent AF)
5. CARTOFINDER guided ablation (Persistent AF, Non-PV trigger)
6. Additional linear ablation if needed

# AF Ablation Workflow – Paroxysmal AF

1. Femoral venous access – US guided
2. Baseline ICE check – LAA thrombus, pericardial effusion
3. Diagnostic catheter positioning
4. 1st trans-septal puncture (SL1) -> Heparin (100 IU per kg)
5. 2nd trans-septal puncture (SL1) -> switched to Agilis small curve sheath
6. AF induction : Isoproterenol 20ug/min -> Adenosine 24mg
7. PV Isolation
8. Post PVI AF induction : Isoproterenol 20ug/min -> Adenosine 24mg
9. Burst A pacing -> atrial flutter induction -> CTI ablation if needed
10. Reassess PV isolation 30min after the initial PV isolation
11. Final ICE check : confirm absence of pericardial effusion

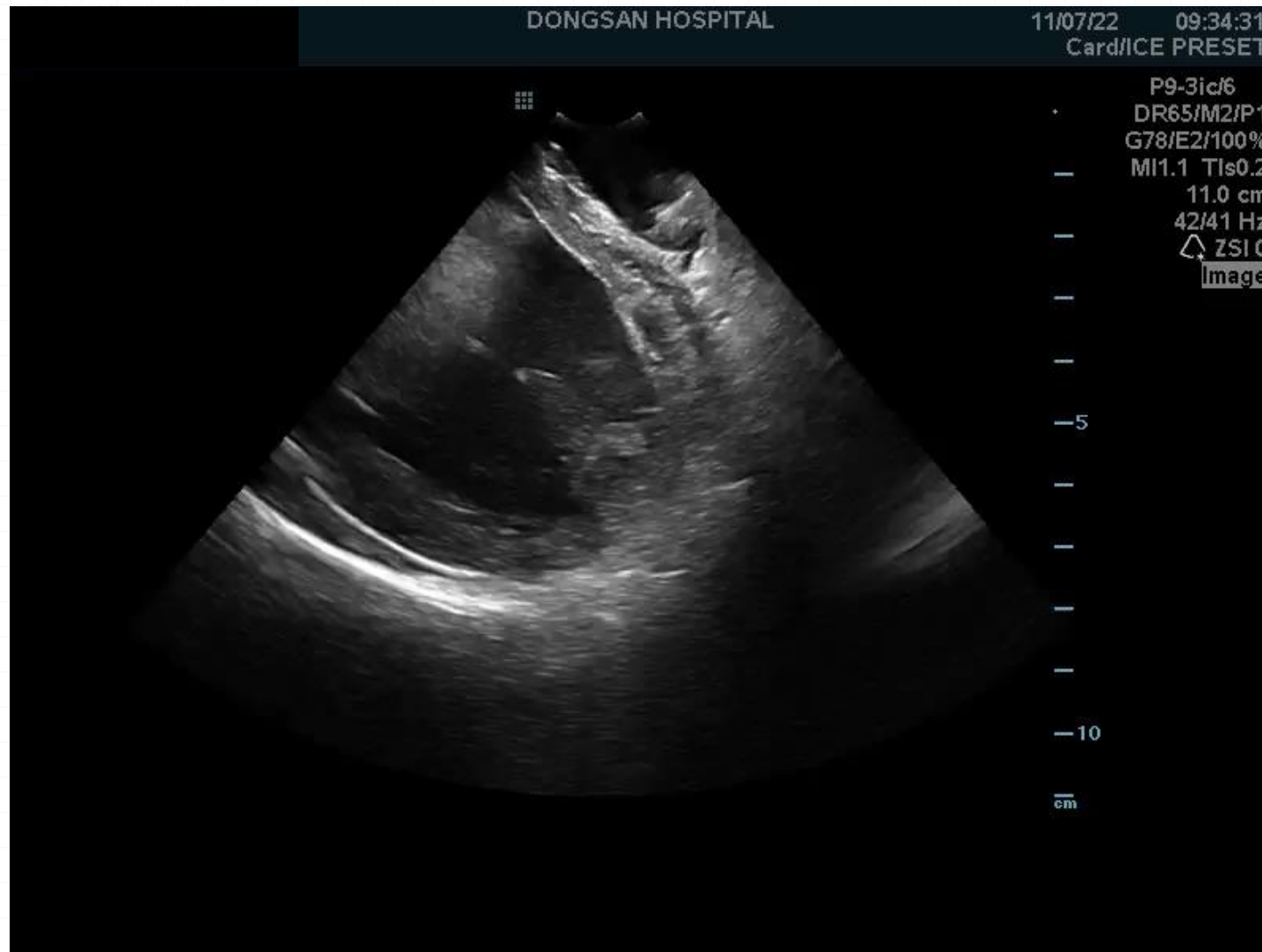
# Ultrasound-Guided Femoral Venous Access



# Long-Sheath (23cm) for the Femoreal Venous Access

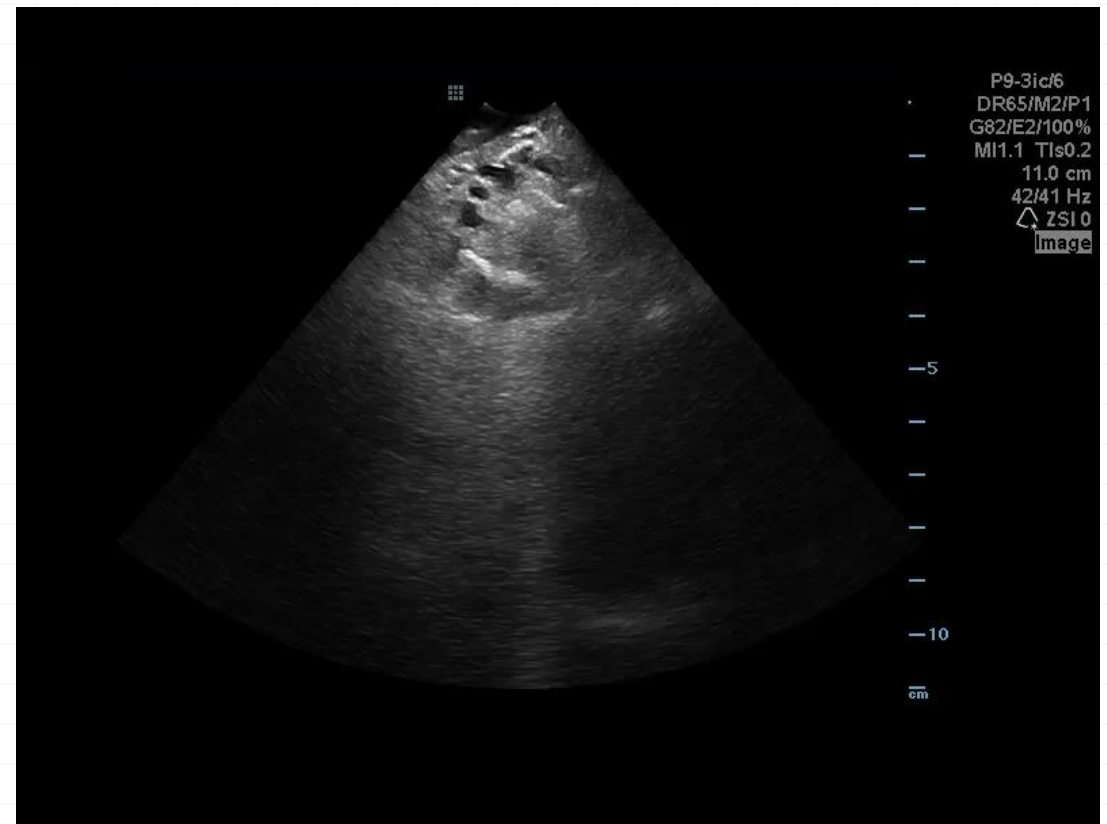


# ICE: Check Baseline Pericardial Effusion

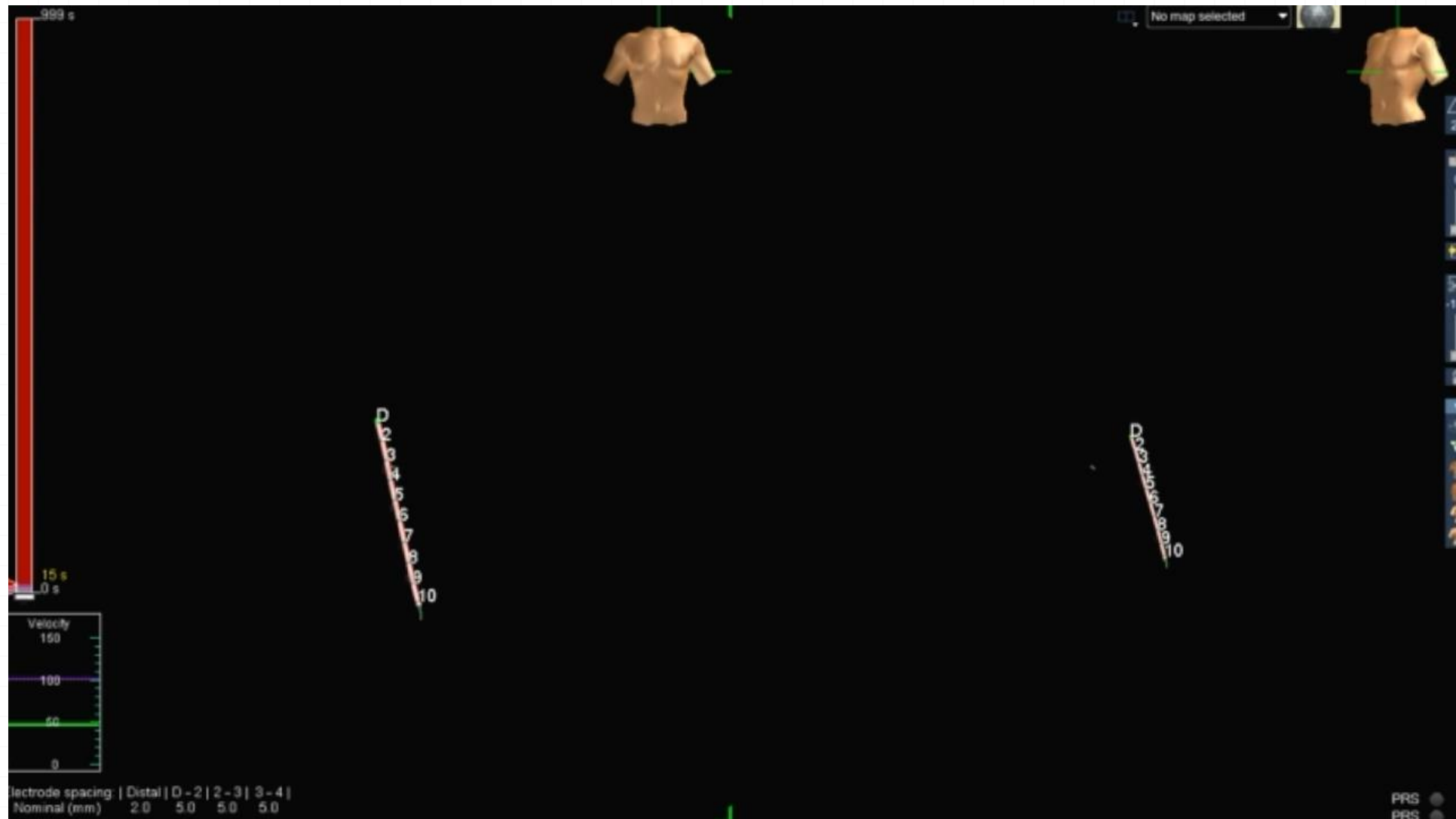




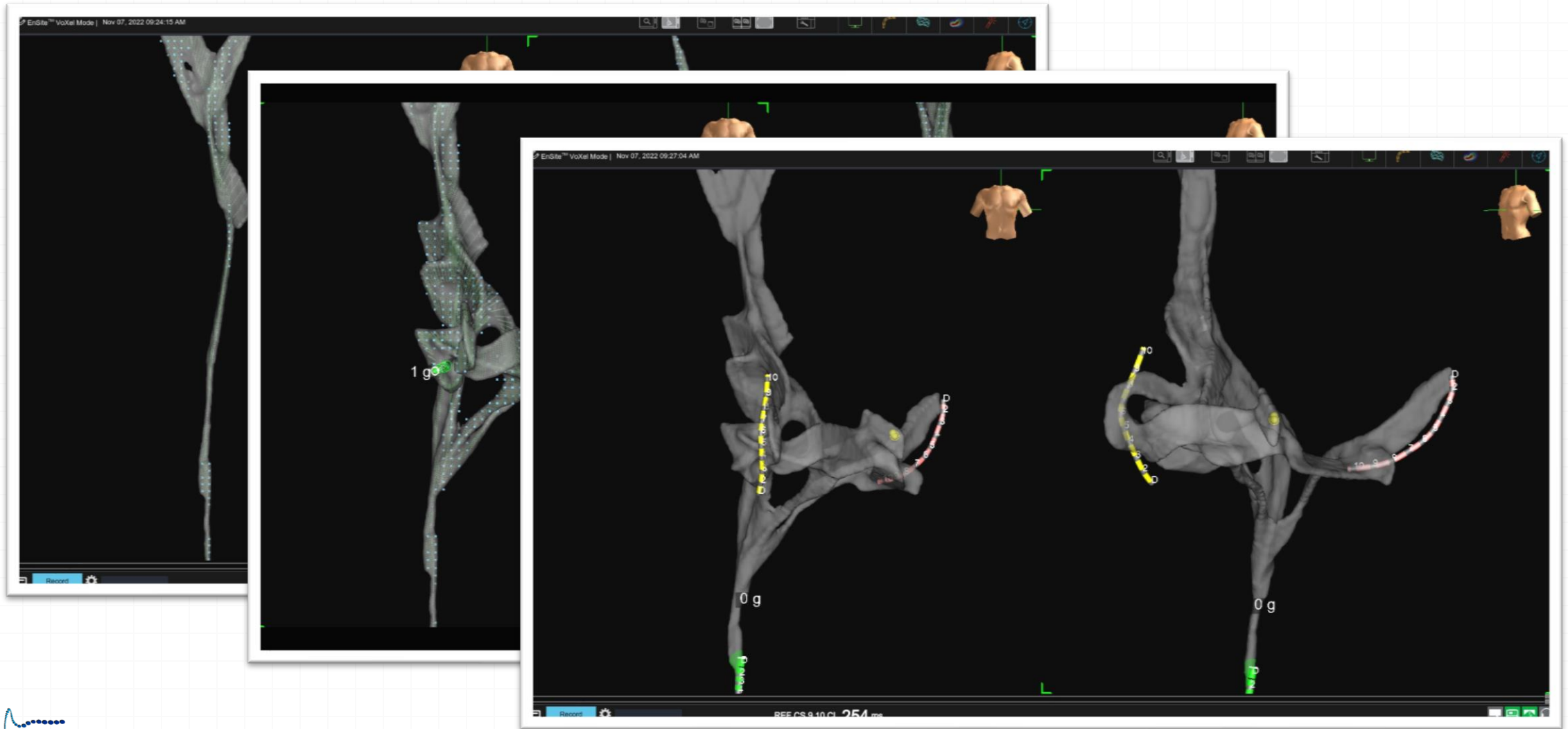
# LAA visulation from PA



# Fluoroleless Catheter Ablation – Catheter Positioning



# Catheter Positioning for Zero Fluoroscopy Procedure with Ensite X System



# Baseline Cartosound Images and EP Catheter Positioning

**Applications** Presets PHILIPS

**Rhythmia / Carto**

**X-ray disabled**

**FD** 30 cm

**WARNING: IQ possibly affected by active EP mapping filter**

**Exposure** 3.75 Low

**Time Left** 893 min

**Total K** 0 mGy

**DAP** 0.0000 Gy/cm<sup>2</sup>

**Total Fluoro** 0:00:00

**01:51 PM**

**Respiration Gating**

**Mesh Transparency**

**Tags**

- End of Signal
- Engaged Signal
- JLA
- Isolation Only
- Pacing Site
- CPA
- CL
- HO
- MAK
- PLATIN
- PV
- ISOVA
- EXCHV
- THAL

**bard Live**

Page 2, Protocol: BASELINE

HR 52 bpm 1150 ms

Amplifier Connected

**bard Review**

DONG GUK, KWAK - PHIS-CARTO

WorkMate Carto™ v.1.1.1 Software

Used: 00:27 Views: Save: 00/14/2023

Free: 182:38 Help: Recall: 13:51:28

Review Page: 7, Protocol: BASELINE 13:50:42.313

1170 1160

HR 3.4

CS 9.10

CS 7.8

CS 5.6

CS 3.4

CS 1.2

CARTO

Replay 150 mm/sec 13:50:42

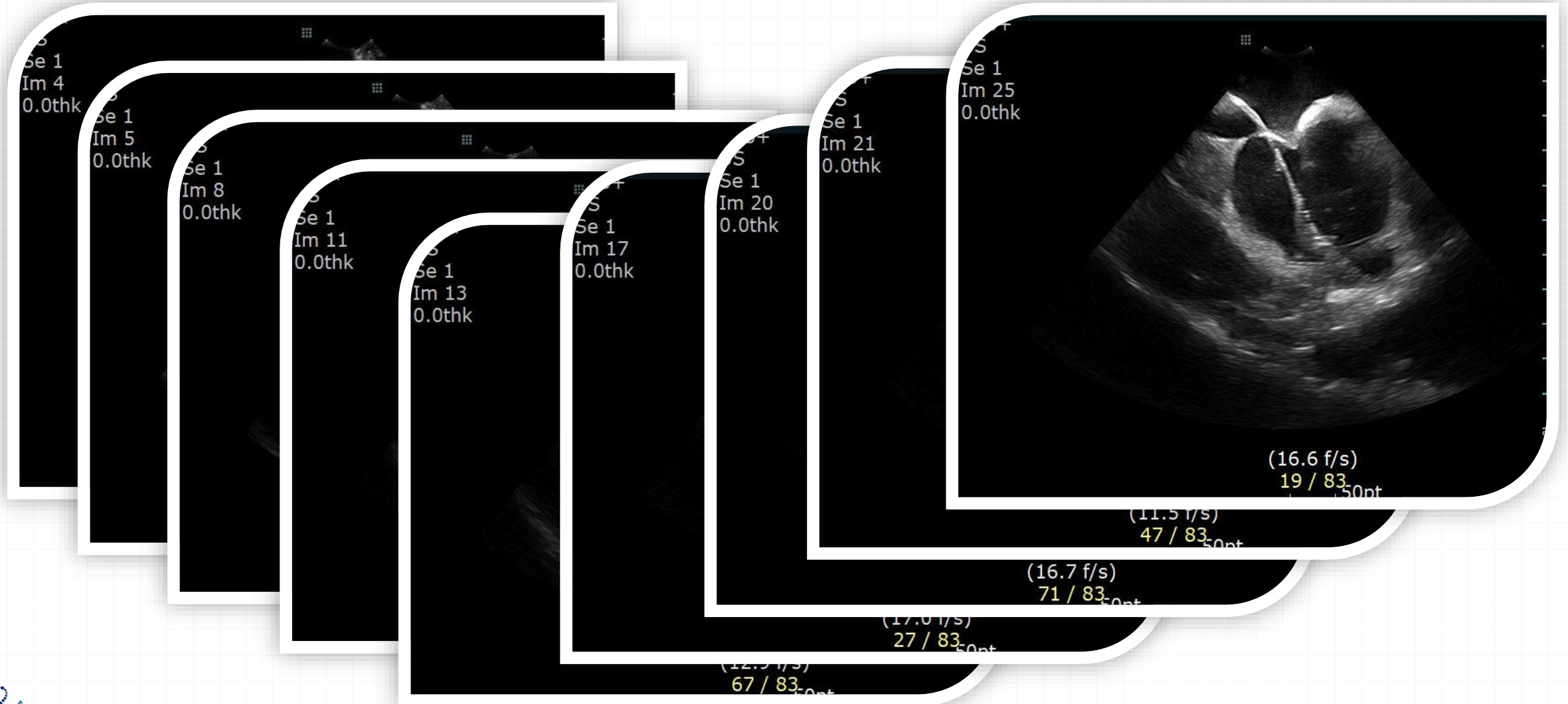
Log

Time	Description
13:23:25	START RECORD-BASELINE

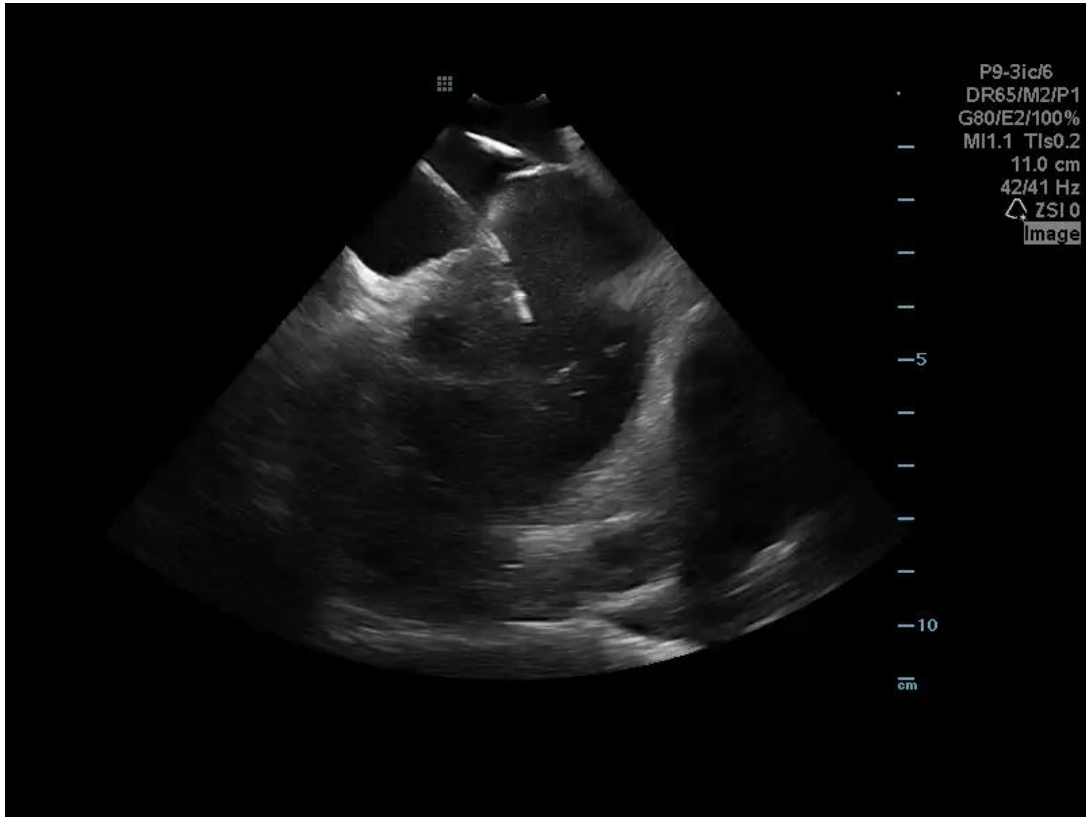
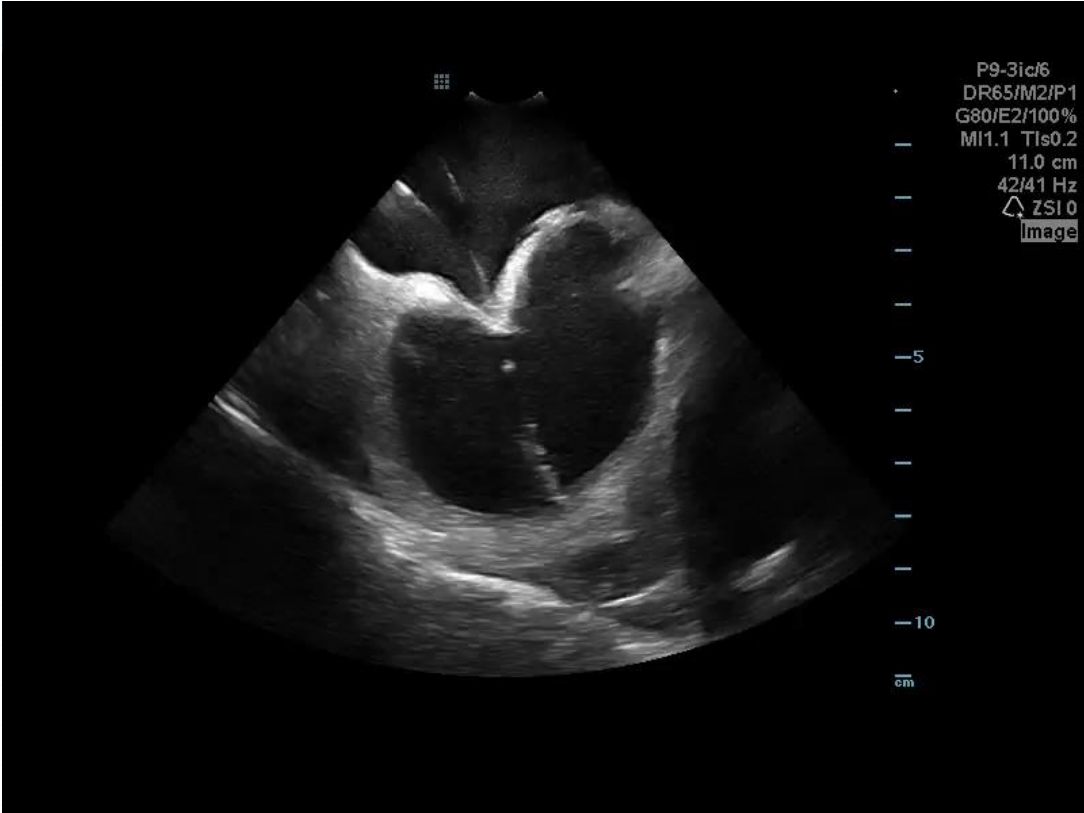
Select All Delete Filter

1 CARTO 51.52 2 HRA 1.2 78.77 3 1, 1 4 1, 1

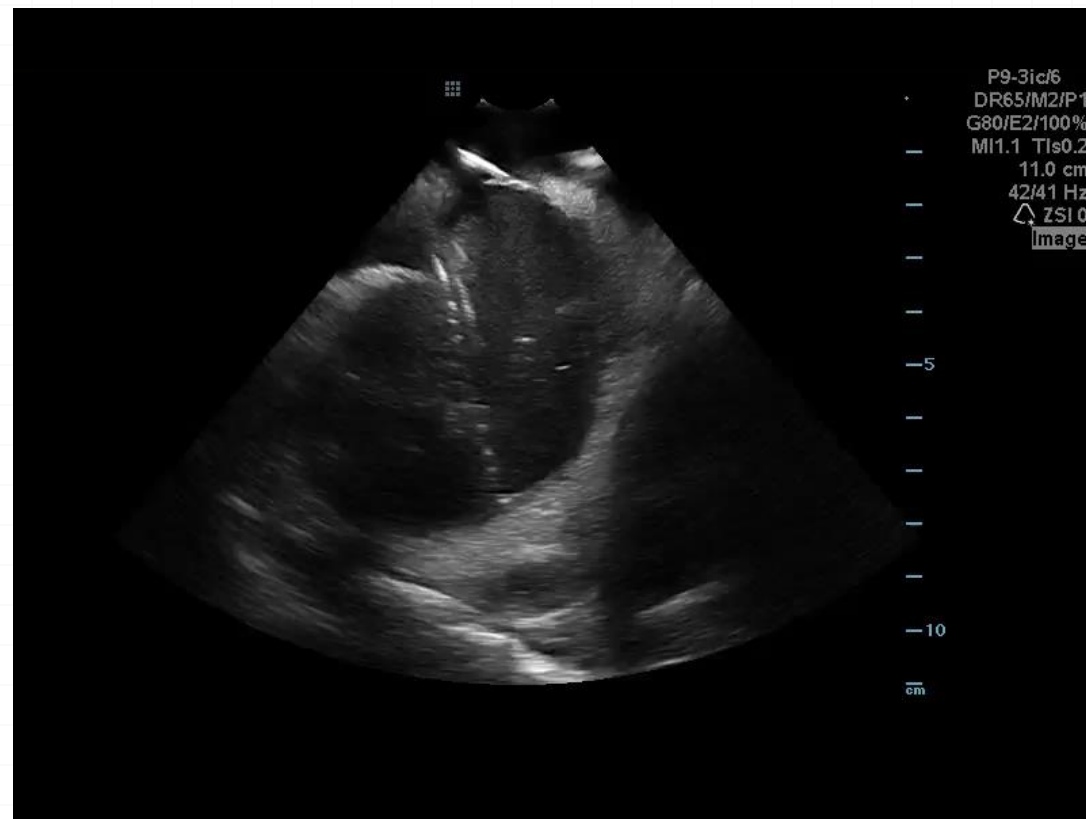
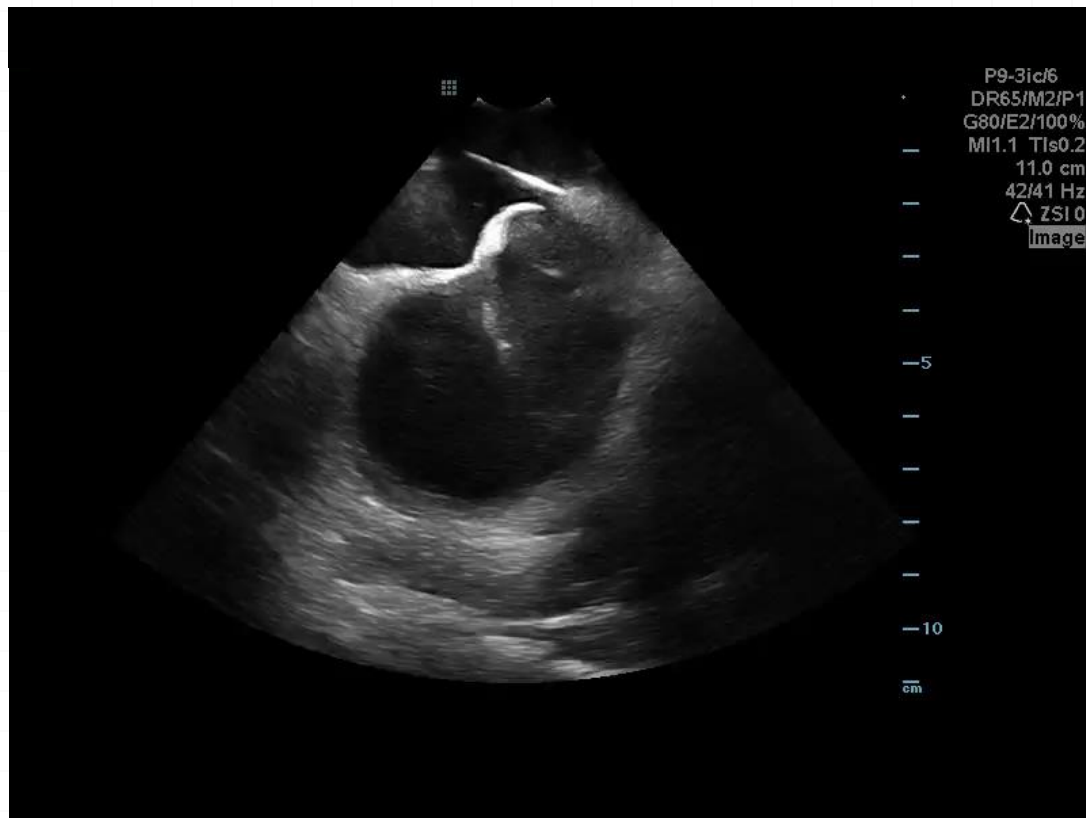
# Septal Puncture without Fluoroscopy



# Second Septal Puncture -> Change to Agilis Sheath



# Second Septal Puncture -> Switch to Agilis Sheath



# Isoproterenol 20ug/min -> AF induction -> Voltage and Anatomical Map

Applications Presets

X-ray disabled

FD 30 cm

-2 39 0

WARNING: IQ possibly affected by active EP mapping filter

Exposure 3.75

Low

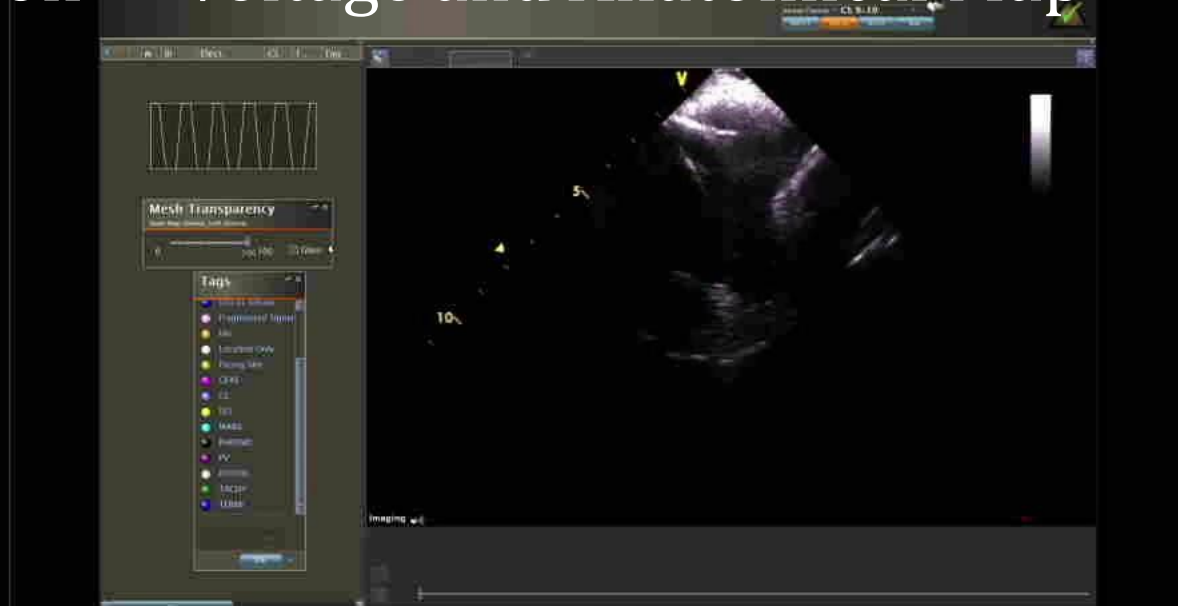
Time Left 893

Total K 0

DAP 0.0000

Total Fluoro 0:00:00

02:08 PM





# Ablation Parameters

- Carto
  - SmartTouch SF Ablation Catheter
  - Contact force : 5-15g
  - 45W ablation
  - Visitag tagging
  - Ablation index : 400-450 for ant. wall, 300-350 for post wall
- Ensite X
  - TactiCath Ablation Catheter
  - Contact force : 5-15g
  - 35W ablation for ant. wall and roof area
  - 45W ablation for post. wall
  - Autotag tagging
  - Lesion size index : 4-4.5 for ant. wall, 3-3.5 for post. wall

# Right PV Circumferential Isolation

Applications Presets

Rhythmia / Carto

X-ray disabled

FD 30 cm

-2 39 0

WARNING: IQ possibly affected by active EP mapping filter

Exposure 3.75 Low

Time Left 893 min

Total K 0

EAP 0.0000

Total Fluoro 0:00:00

02:19 PM

HR 100 bpm 600 ms Power 46 Temp. 27 Imp. 115 Time 3 Amplifier Connected

POWER

IMPED

Label	Power	Temp	Imped	Time	Proc
HRA 9.10	40	25	122	01:27	low Dp
HRA 7.8	40	25	118	01:27	unimmi
HRA 5.8	40	25	118	01:27	unimmi
HRA 3.4	40	25	118	01:27	unimmi
HRA 1.2	40	25	118	01:27	unimmi
AM 1.4	40	25	118	01:27	unimmi
AM 1.6	40	25	118	01:27	unimmi
QA 3.4	40	25	118	01:27	unimmi
QA 1.2	40	25	118	01:27	unimmi
OB 3.4	40	25	118	01:27	unimmi
OB 1.2	40	25	118	01:27	unimmi
OC 3.4	40	25	118	01:27	unimmi
OC 1.2	40	25	118	01:27	unimmi
OD 3.4	40	25	118	01:27	unimmi
OD 1.2	40	25	118	01:27	unimmi
OE 3.4	40	25	118	01:27	unimmi
OE 1.2	40	25	118	01:27	unimmi
OF 3.4	40	25	118	01:27	unimmi
OF 1.2	40	25	118	01:27	unimmi
OG 3.4	40	25	118	01:27	unimmi
OG 1.2	40	25	118	01:27	unimmi
OH 3.4	40	25	118	01:27	unimmi
OH 1.2	40	25	118	01:27	unimmi
CI 3.10	40	25	118	01:27	unimmi
CS 7.8	40	25	118	01:27	unimmi
CS 8.8	40	25	118	01:27	unimmi
CS 3.4	40	25	118	01:27	unimmi
CS 1.2	40	25	118	01:27	unimmi
CARTO	40	25	118	01:27	unimmi

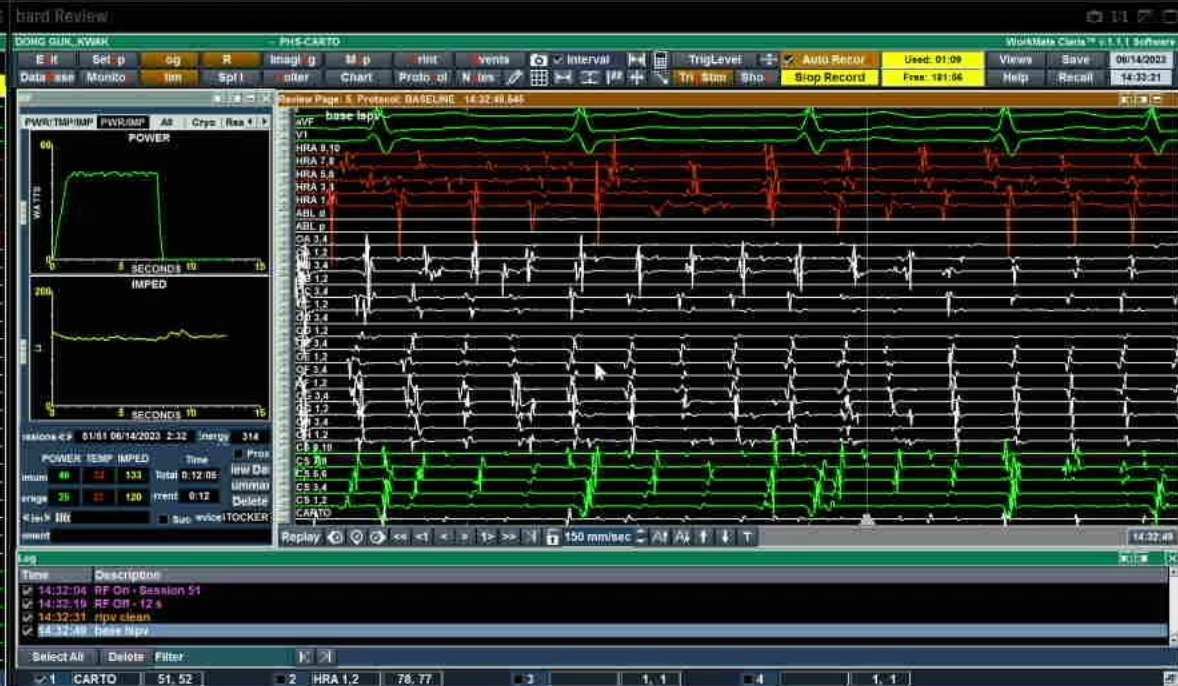
# Left PV Circumferential Isolation

X-ray disabled  
FD 30 cm  
-2 39 0

WARNING: IQ possibly affected by active EP mapping filter

Exposure 3.75 Low  
Time Left 893 min  
Total K 0 mAs  
DAP 0.0000  
Total Fluoro 0:00:00

02:34 PM

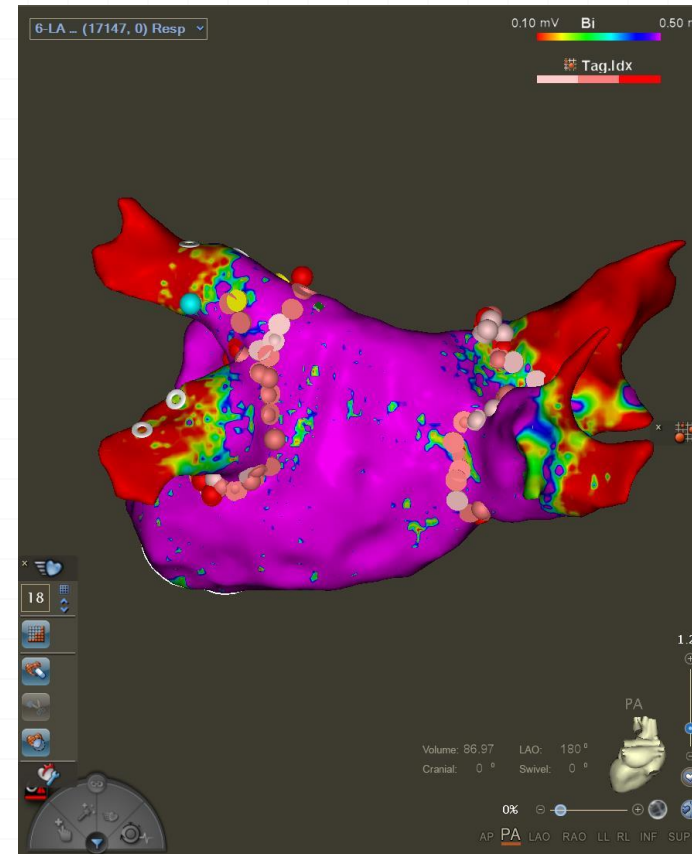
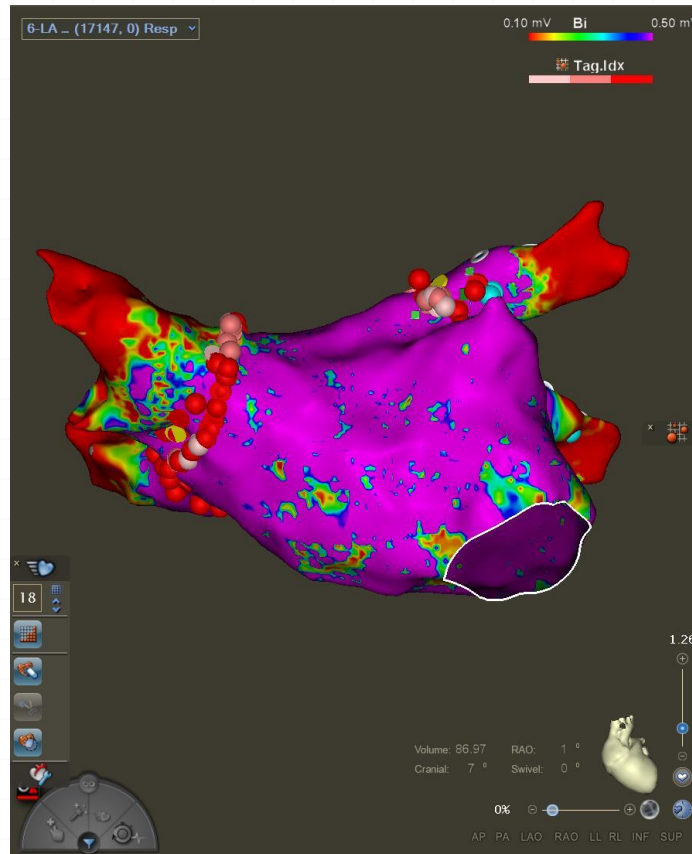


# Post PVI - Isoproterenol 20ug/min

The image displays the Philips CARTO EP software interface, divided into several functional areas:

- Top Left:** System status and navigation. Includes "Applications", "Presets", "X-ray disabled", "FD 30 cm", and "WARNING: IQ possibly affected by active EP mapping filter".
- Top Center:** Anatomical maps of the heart. Shows a 3D model of the heart with catheters and a color-coded activation map. The text "Rhythmia / Carto" is visible.
- Top Right:** A detailed view of a catheter tip or ablation site, showing a grid and various parameters.
- Bottom Left:** ECG traces. Shows multiple leads (aVR, aVL, aVF, V1, V2, V3, V4, V5, V6, etc.) with a heart rate of 143 bpm and a cycle length of 420 ms. A yellow bar at the top indicates "Amplifier Connected".
- Bottom Center:** A graph showing "POWER" and "IMPEDANCE" over time. The power graph shows a step increase from approximately 40W to 120W. The impedance graph shows a corresponding decrease.
- Bottom Right:** A detailed ECG trace with a time scale of 150 mm/sec. Includes a "Log" window with a list of events: "14:55:25 RF Off - 17 s", "14:55:38 A PACING CARTO S1+500", "14:55:47 A PACING CARTO S1+500", and "14:55:47 npv claim".

# Procedure Summary



- Procedure time : 100 min
- Ablation time : 1194 sec
- Fluoroscopy time : Zero

# My Personally Optimized Workflow for Paroxysmal AF Ablation

1. Femoral access -> Septal Puncture -> AF induction -> 3D mapping : 30-40 min
2. PV Isolation : 20-30 min
3. AF reinduction -> AFL induction (CTI ablation if needed)-> Reassess PVI : 30-40 min

# Take-Home Message

- The purpose of optimizing the workflow for AF ablation is to enhance the efficiency, effectiveness, and safety of the procedure.
- By implementing a highly standardized workflow, it is possible to reduce procedural variability.
- An optimized workflow has the potential to result in consistently shorter procedure and fluoroscopy times, while achieving favorable clinical outcomes.



**Thanks for your attention !!**