



Fusion Imaging in Cath lab

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What information of anatomy can I give you with the imaging techniques?

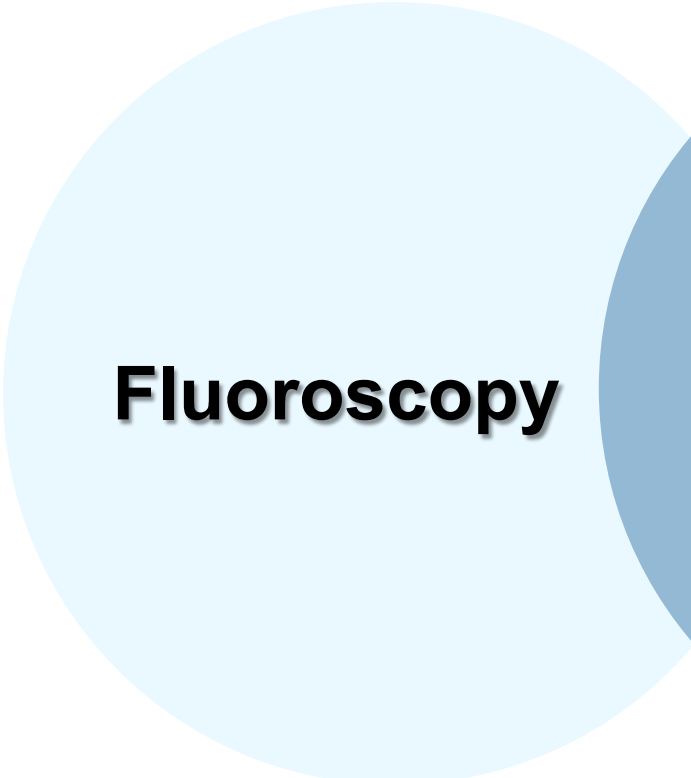
- 
- Patients selection

- 
- Guiding the procedure

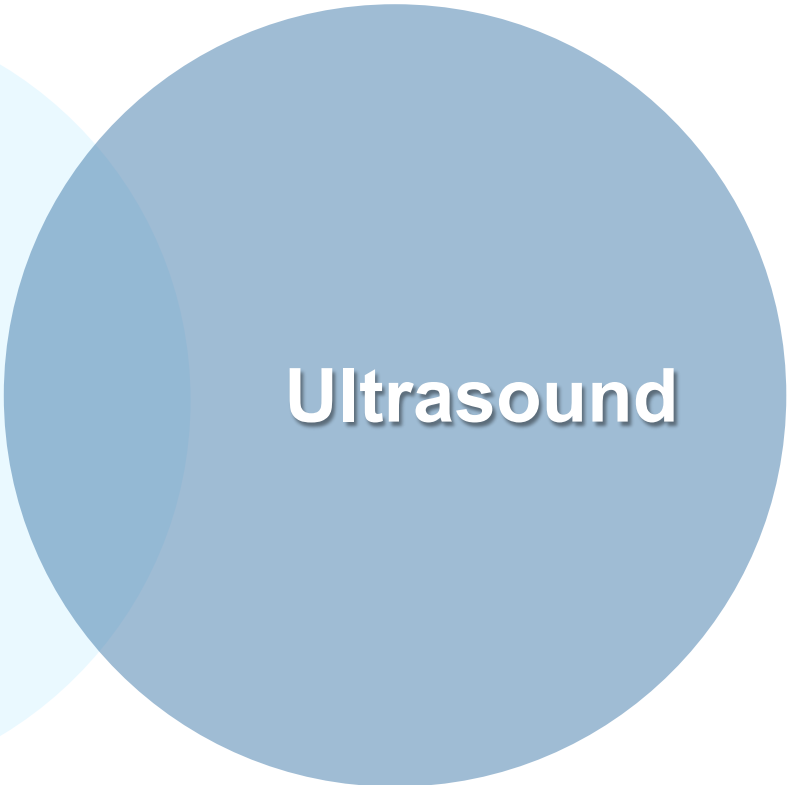
- 
- Evaluation of success and complications



FUSION ???



Fluoroscopy



Ultrasound



WHY FUSION ?

Fluoroscopy

Advantages

- Images interventionalists are familiar with
- Good definition
 - Catheters and wires
 - Devices
 - Calcified and metallic structures

Limitations

- Poor anatomical definition
- Single plane
- Radiation exposure
- Contrast use



Why Fusion ?

Ultrasound

Advantages

- Good definition of anatomy
- Visualize the same structure in different planes
- 3D images
- Minimizes radiation exposure
- Increases safety

Limitations

- Interventionalists are not used to echo perspectives.
- Look back and forth
- Worse definition of intracardiac catheters

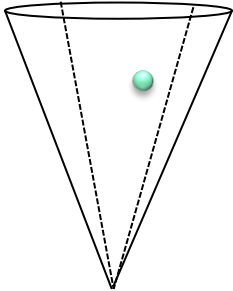
A New Concept: X-RAY AND ECHO IMAGE FUSION

- Combines live X-ray and live Echo images for structural heart disease procedures.
- Assisting interventionalists with Echo image guidance.

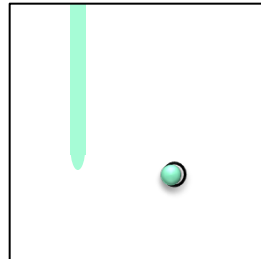


EchoNavigator

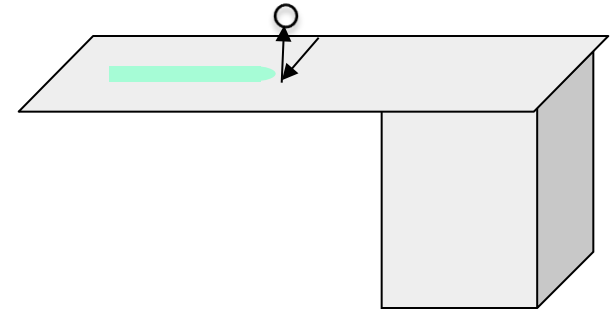
Echo space



X-ray space



Patient's space



How does it work?

- Step 1: mark structure in echo view. The system automatically shows this point in the X-ray view (faded).
- Step 2: make sure the echo probe registered.
- Step 3: Accept marker, the marker will appear on X-ray view (solid) and real cardiac structure.

Selec. disposición ?

Seleccionar vista ?

C-arm

Free

Echo

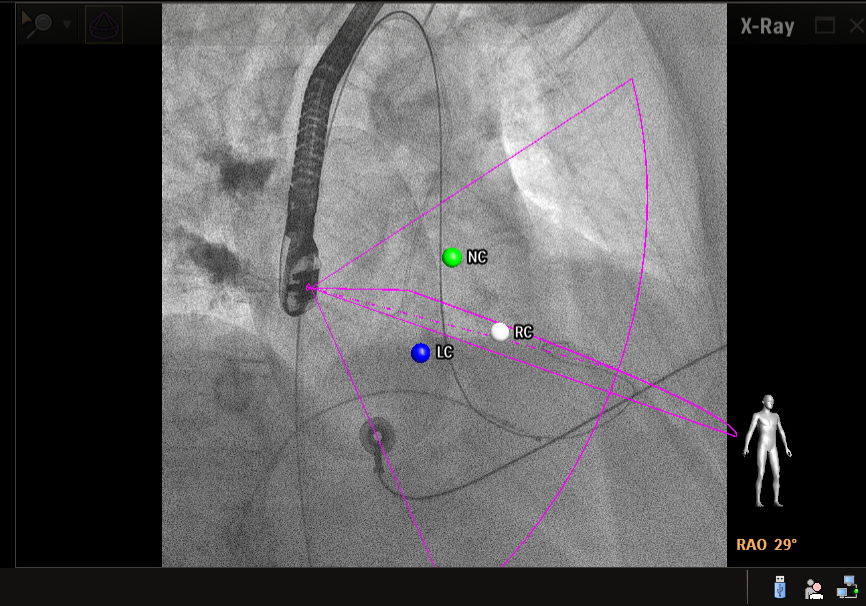
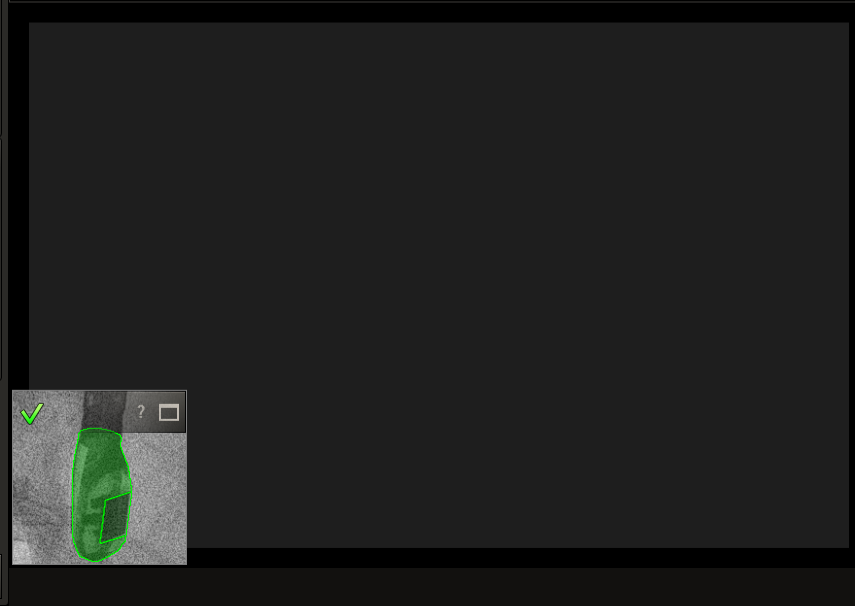
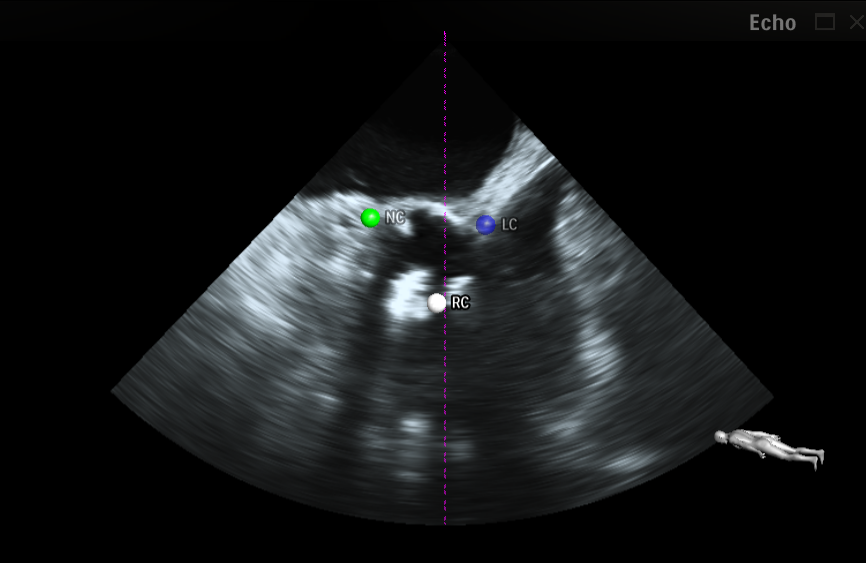
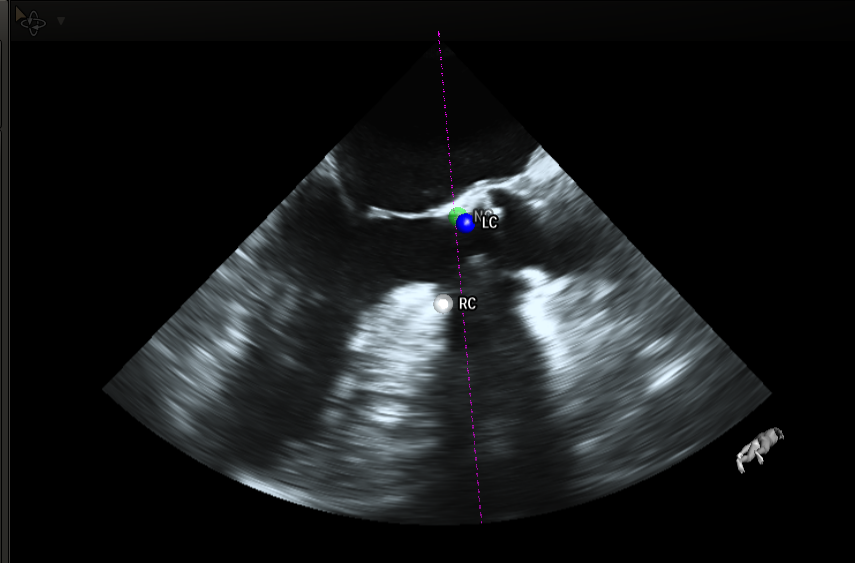
X-Ray

Marcado ?

Agregar Borrar

Nombre	Color
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<input checked="" type="checkbox"/> NC	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> LC	<input checked="" type="checkbox"/>

?



The OLD DAYS in...2014



Sistema Ayuda PHILIPS Echo

Selec. disposición ?

Seleccionar vista ?

C-arm

Free

Echo

X-Ray

Marcado ?

Agregar Borrar

Nombre	Color
Marcador 1	●
Marcador 2	●
Marcador 3	●

Capturar pantalla en USB (F12)

CRAN 11° LAO 41°

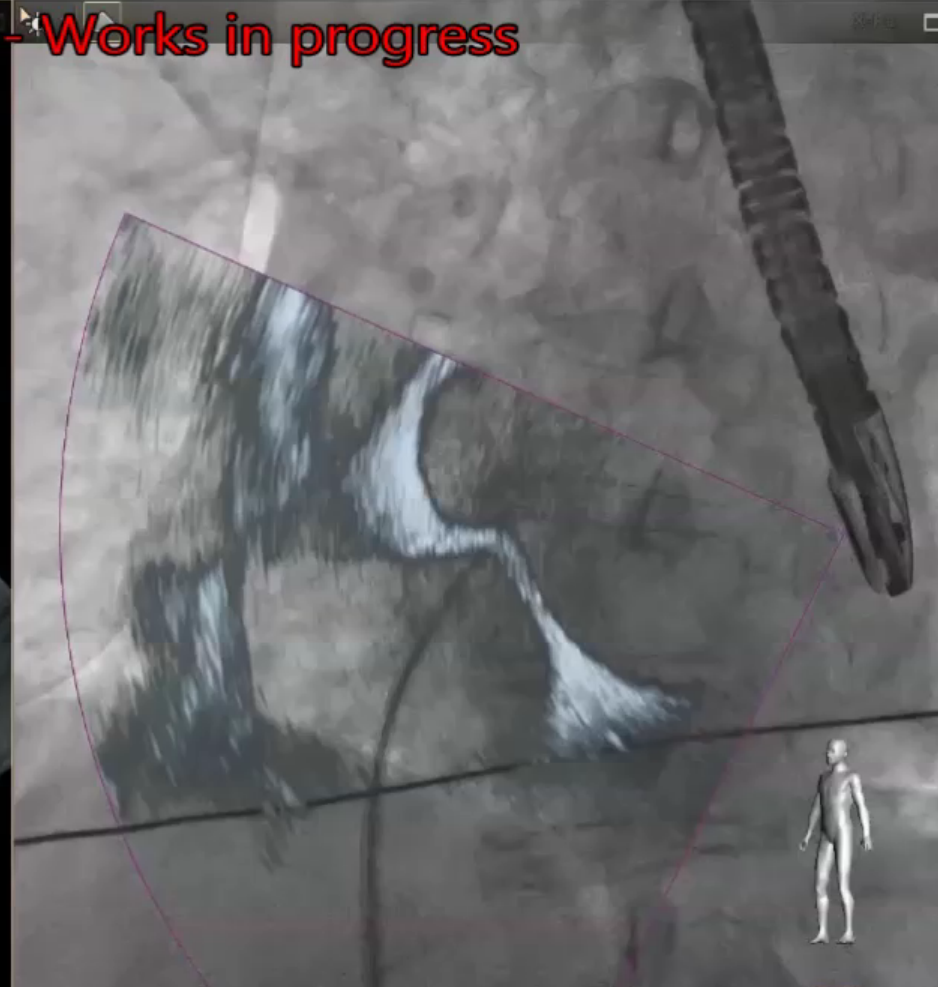
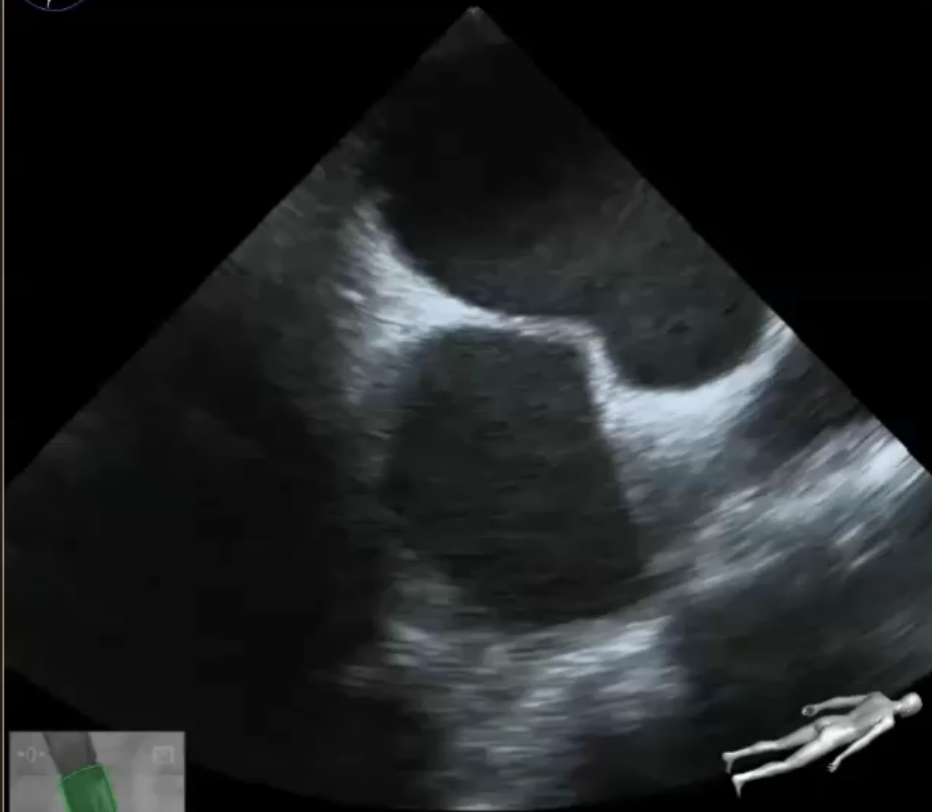
CRAN 11° LAO 41°

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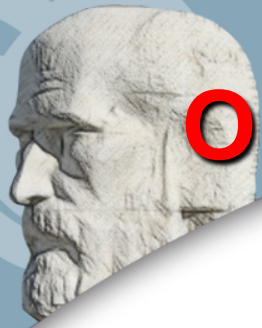


The NEW DAYS

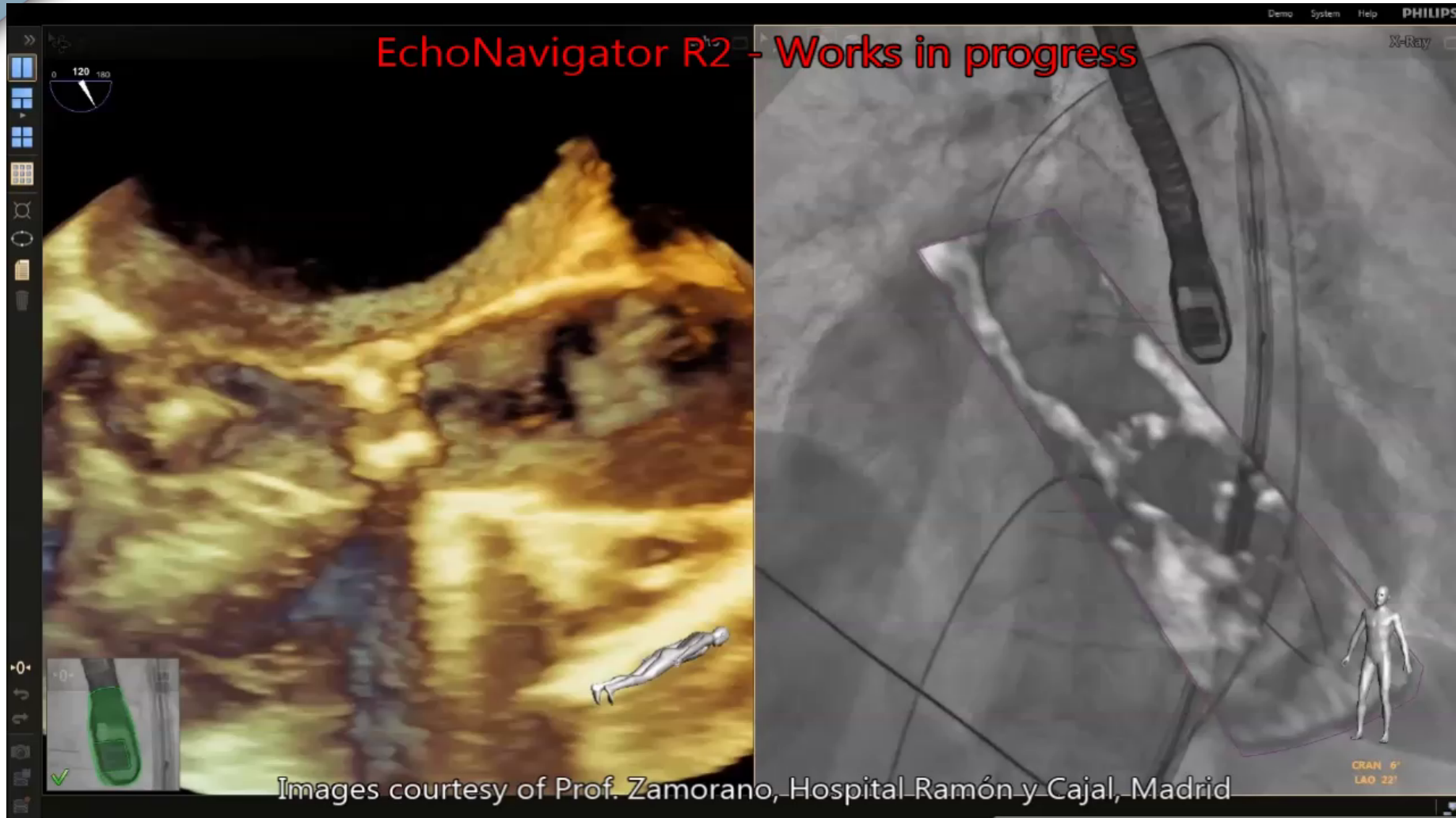
EchoNavigator R2 - Works in progress



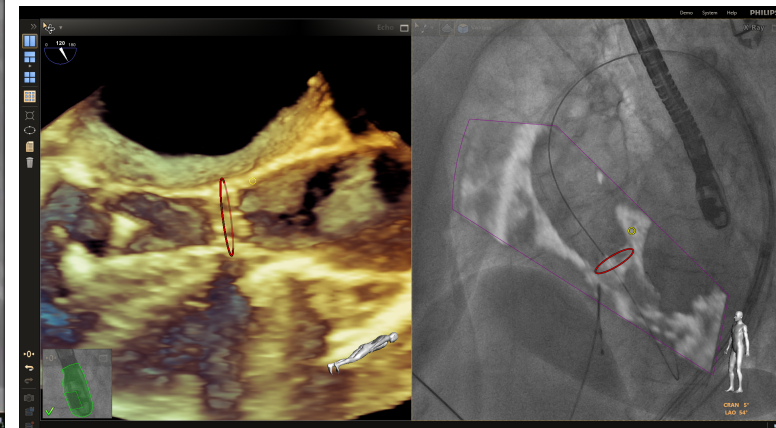
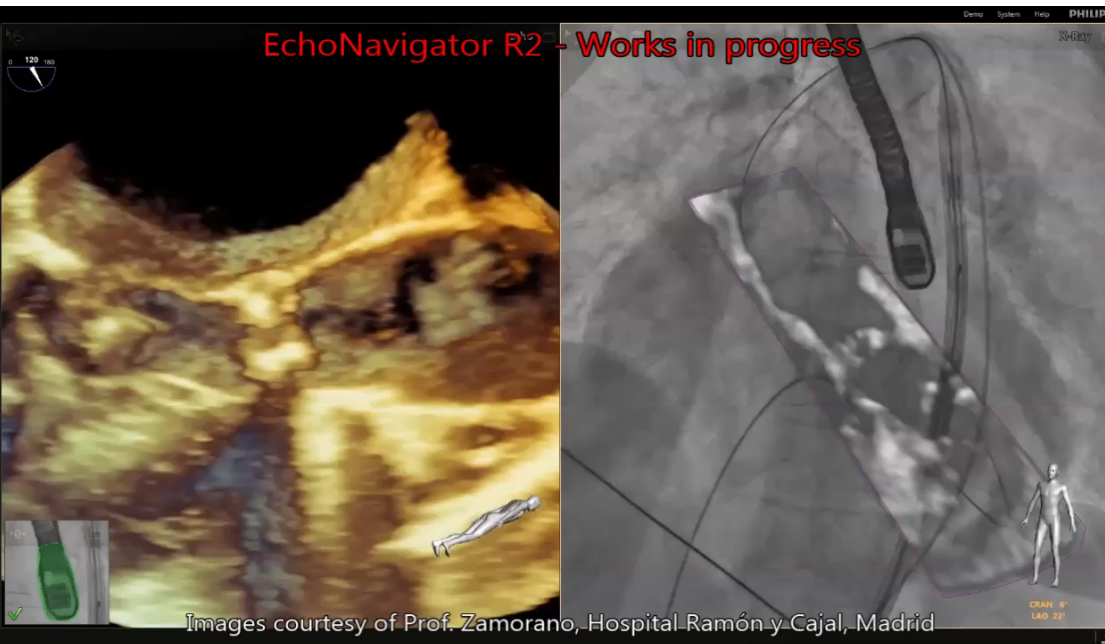
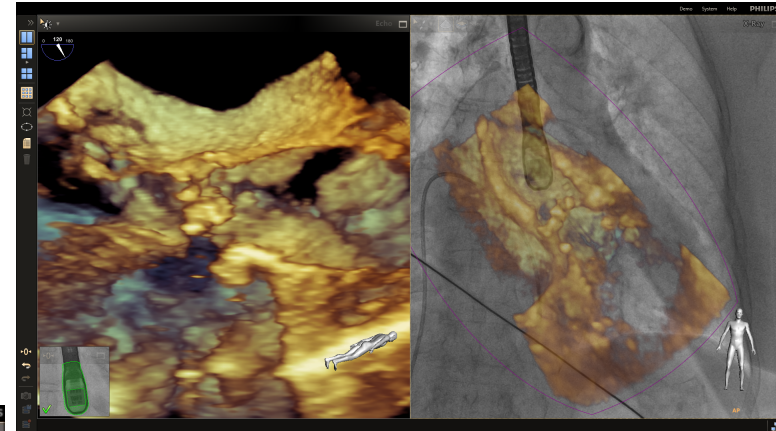
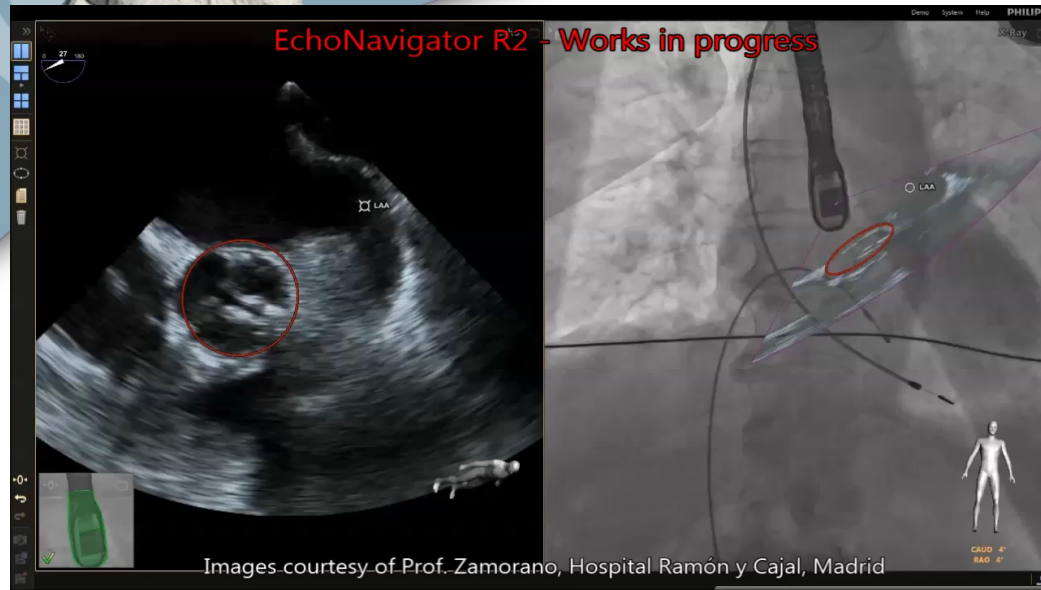
Images courtesy of Prof. Zamorano, Hospital Ramón y Cajal, Madrid



One Image more than 1000 words

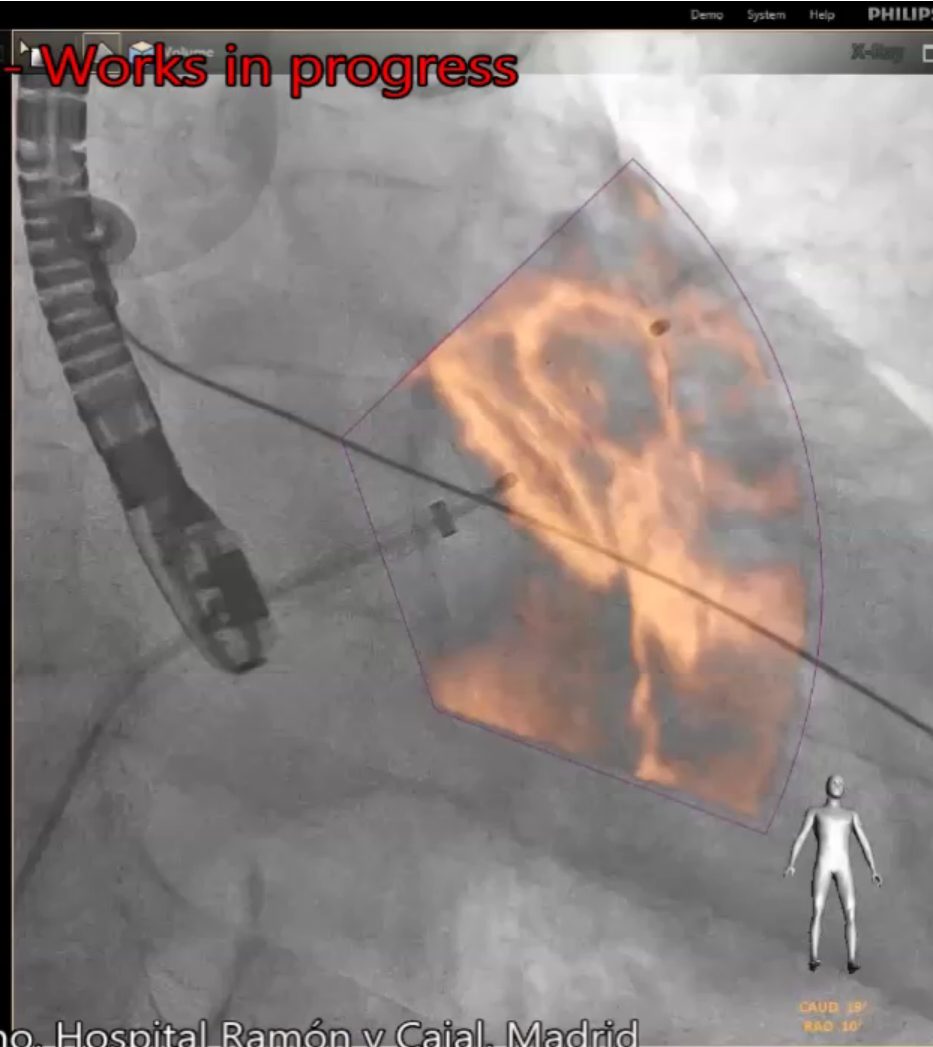
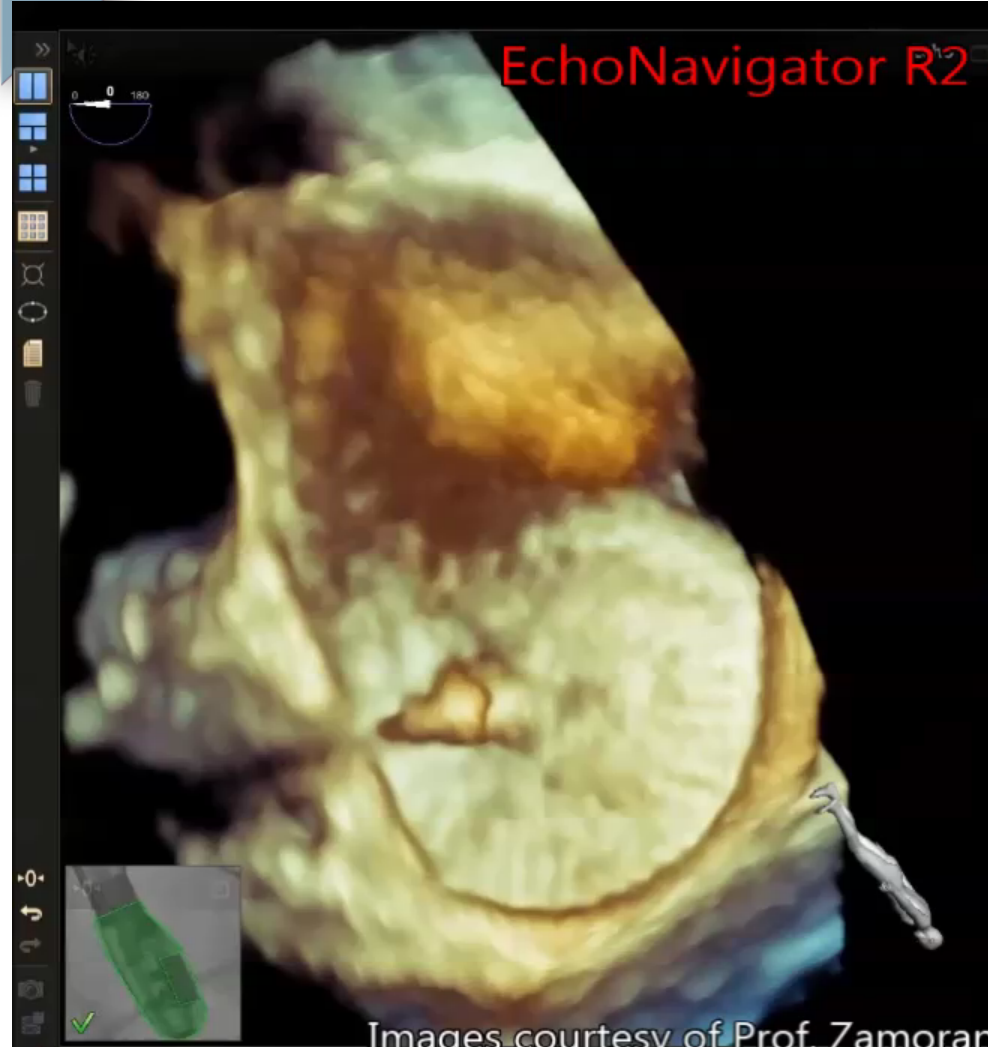


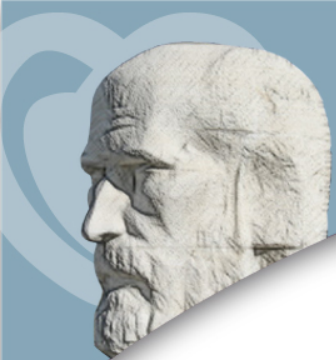
Where are we going ?





EchoNavigator R2 - Works in progress





PHILIPS Echo

Selec. disposición

Seleccionar vista

- Crunch
- Free
- Echocardiografía
- X-Ray

Anotación

Nombre	Color
SEPTO	Yellow
VPSI	Red
IM	White

Mostrar nombres

X-Ray

60 180

CAUD 1°
RAO 4°

Grabación ... 00:09 (02:00)

PHILIPS Echo

Selec. disposición

Seleccionar vista

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FUSION INSIDE CATH LAB

Advantages

- Avoids confusion of different perspectives of two different imaging modalities. Fusion of Echo and X-Ray images
- Improves communication between echocardiographer and interventionalist
- One-screen view



FUSION INSIDE CATH LAB

Advantages

- Better understanding of anatomy, placement, and post-release evaluation.
- Facilitates catheter guidance and sizing.
- Useful for difficult locations and multiple holes.
- Minimizes fluoroscopy time.
- Increases safety for patient and interventionalist.
- More efficient procedure.



- **So...how can it helps
in CLINICS ?**



CONCLUSIONS

- **Integrates imaging modalities**
- **Guide for interventionalists**
- **Safer and more efficient procedure**