Combining multimodality information to optimize planning, guidance and verification of TAVI

J. Koolen M.D.
Catharina Hospital Eindhoven,
the Netherlands

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Disclosure Statement of Financial Interest

I, Jacques Koolen DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

Content

- Introduction
- Case example
- Outlook
- Conclusion

TAVI in the Catharina Hospital
200 TAVI procedures since June 2008
Corvalve and Sapiens
Femoral/subclavian/transapical approach

Imaging for TAVI

What do we need?

- Correct diagnosis
- Optimal treatment options
- Risk assessment
- Optimal procedure guidance
- Follow-up

What do we have, how to use?

- TTE: severity stenosis , LV function, follow-up
- (3D-)TEE: Choice of valve, periprocedural guidance
- Angiography: risk stratification, choice of approach, choice of valve
- CT: peripheral vasculature, periprocedural guidance

Why is correct (exact) positioning mandatory?

Too low:
- Aortic incompetence
- Interference with mitral valve

Too high:
- Unstable
- Interference with coronary arteries

Why is correct positioning difficult?

1. Visualization
2. Calcifications
3. Self-expanding system (Corevalve)
4. Combination of 2+3

Planning

CT Data evaluation: diagnosis and treatment options / sizing of aortic root

Planning

CT Data evaluation: slice view is not enough!

- Aortic root is a 3 dimensional structure
- Device choice should be considered in 3 dimensions
- Does not provide information on optimal view to be used during intervention

Planning

HeartNavigator: CT based optimal view planning

Automatic Segmentation of Aortic root

Automatic segmentation of valve plane

Optimal X-ray view in line with valve plane
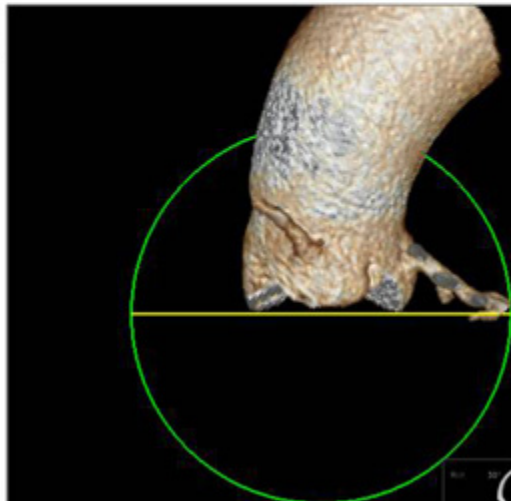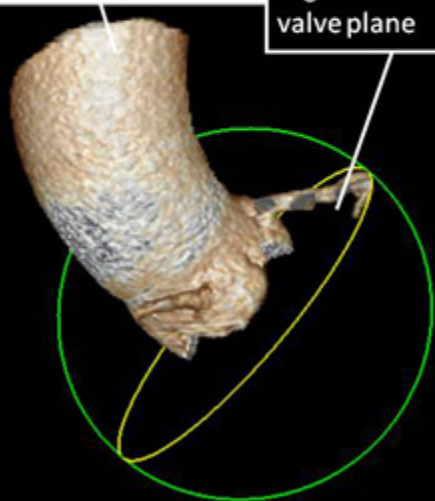
Planning
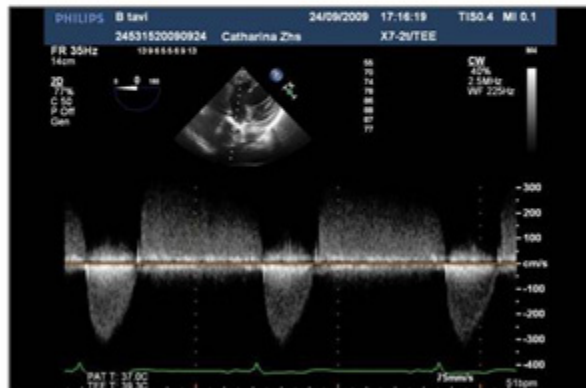## HeartNavigator: CT based measurements

Planning
HeartNavigator: device planning
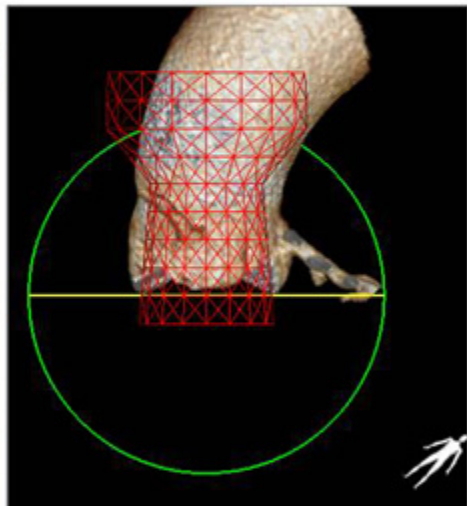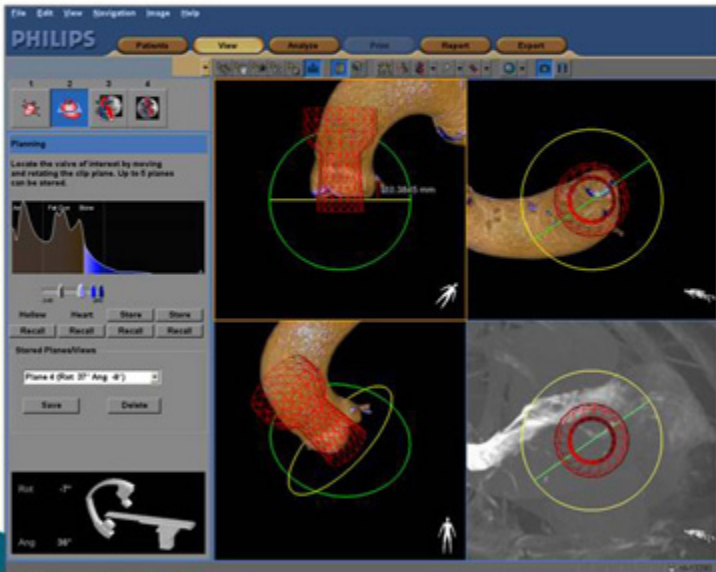
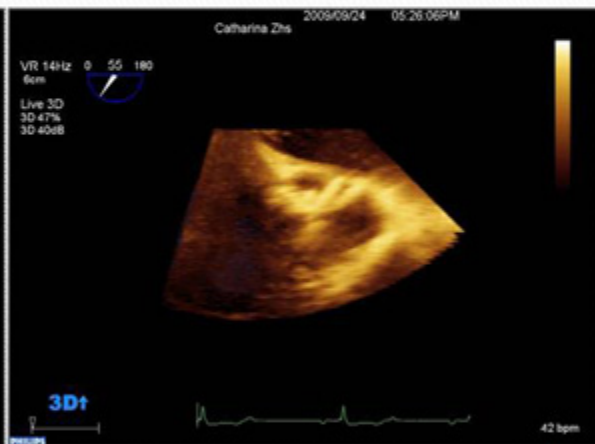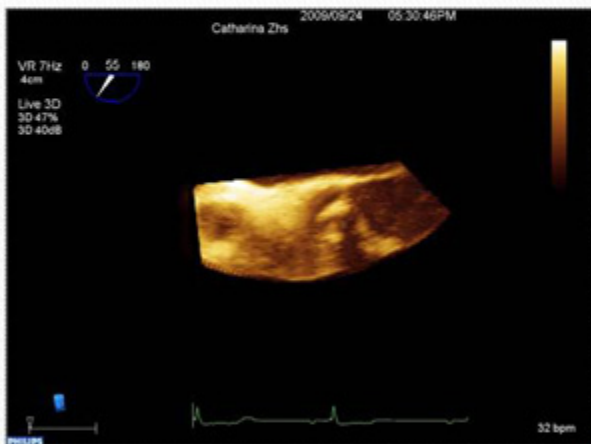# Planning
TEE: diagnosis and risk assessment

Planning
3D-TEE: diagnosis aortic valve
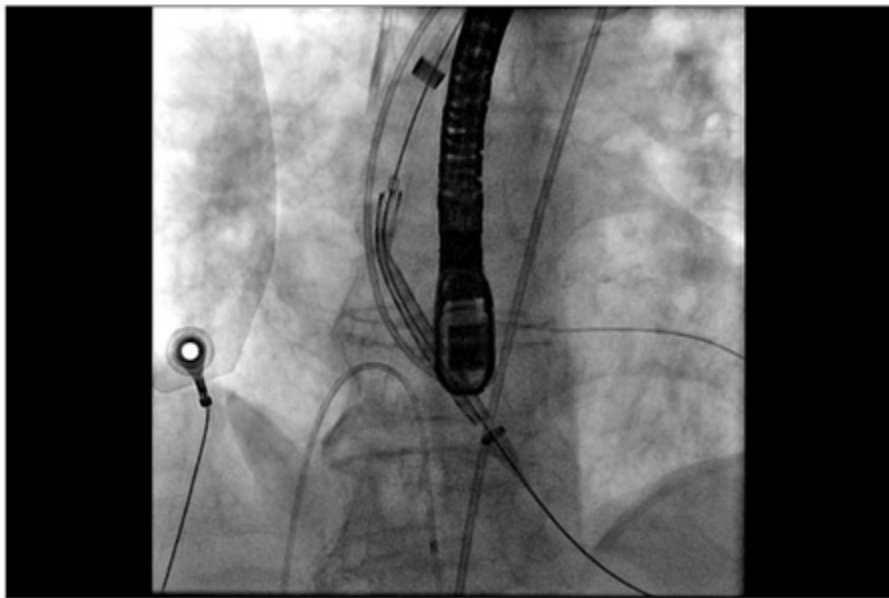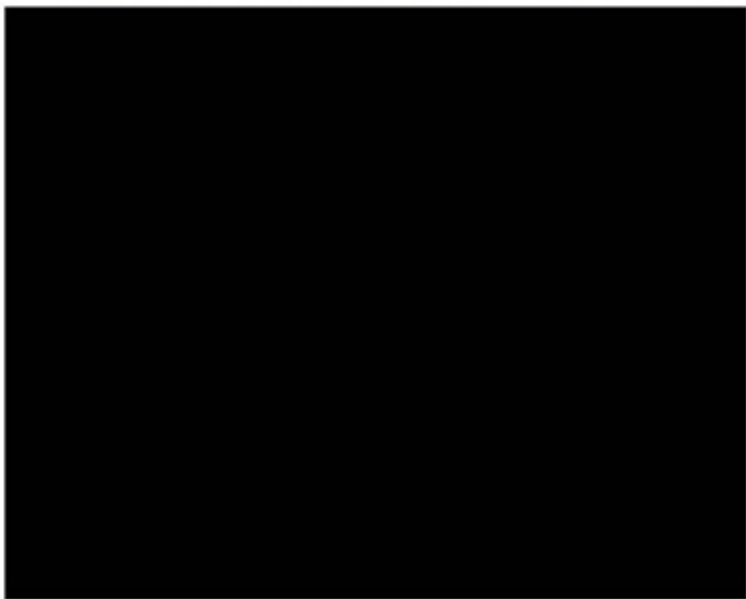
Guidance
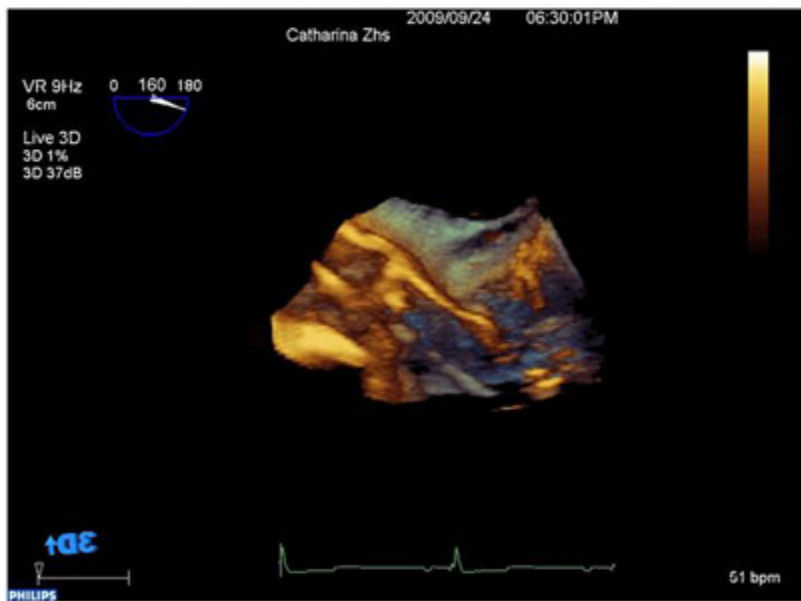Angio: positioning of CoreValve

Guidance
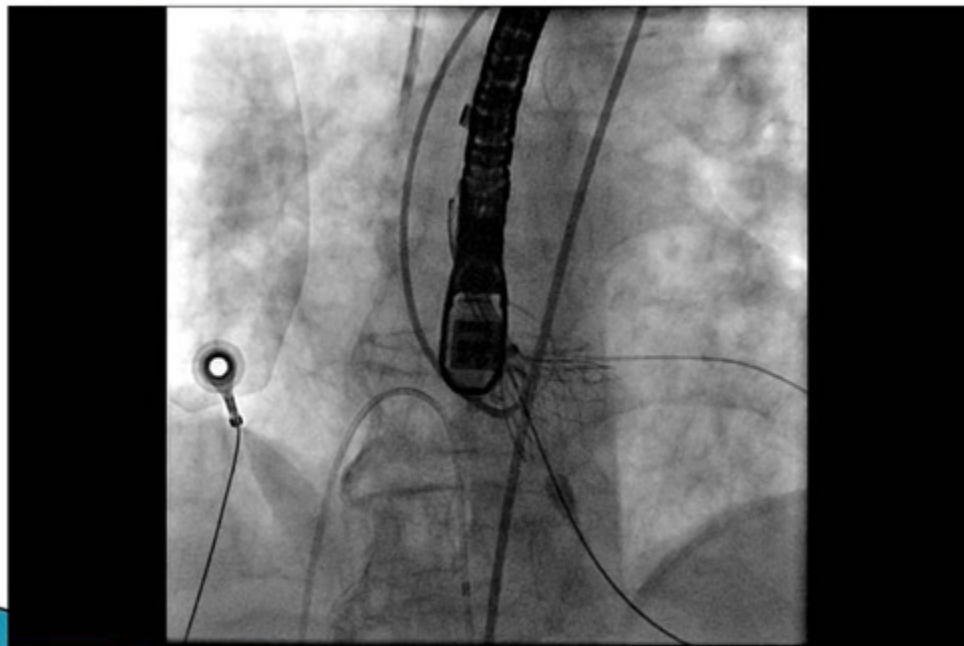## *HeartNavigator: CT overlay on live fluoro*

Guidance
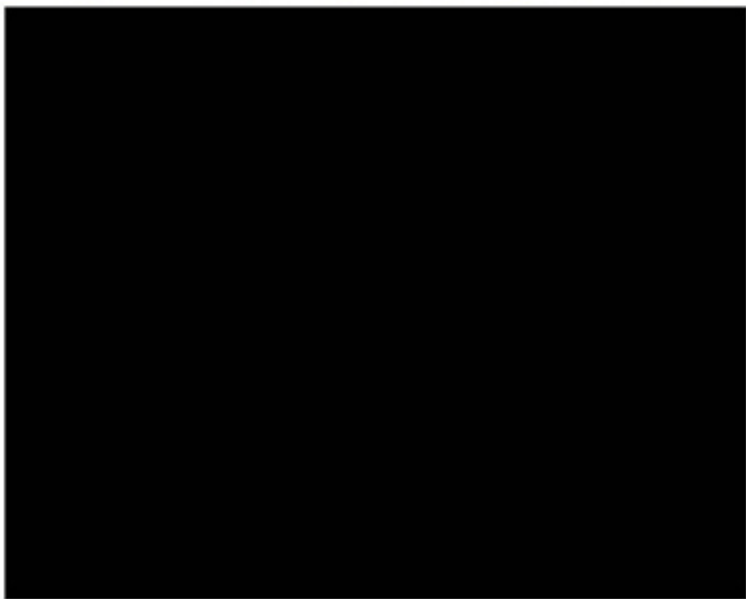## 3D-TEE: position CoreValve and monitoring

Guidance
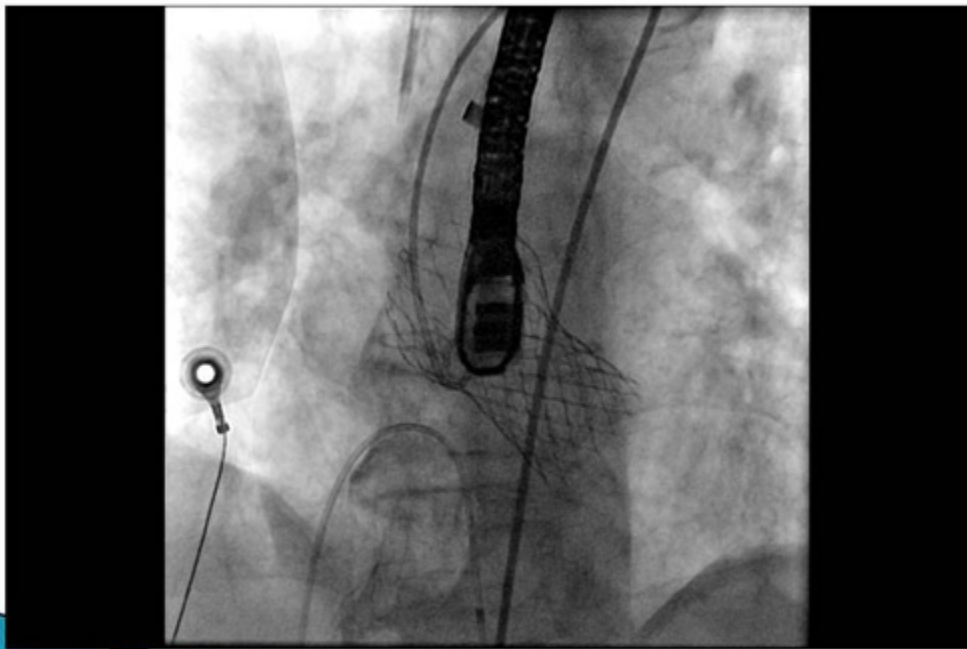## *Angio: partial release of CoreValve*

Guidance
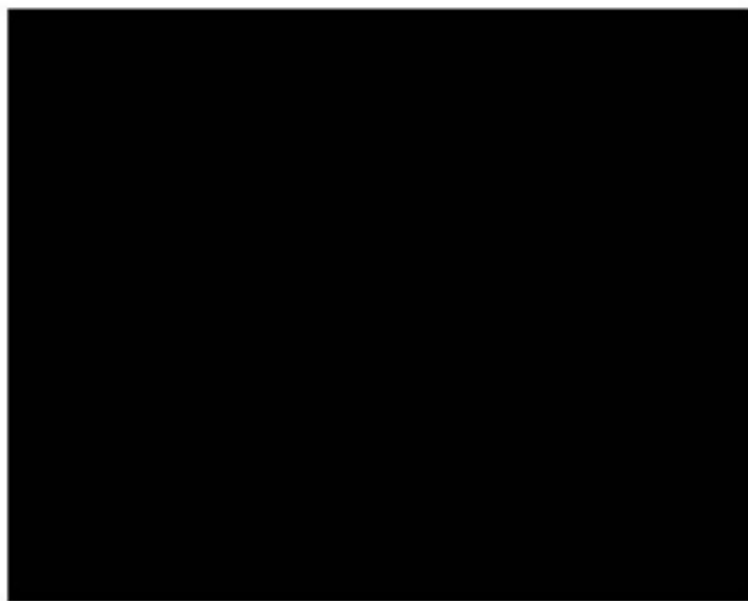## *HeartNavigator: partly deployed valve*

Verification
Angio: deployment and regurgitation

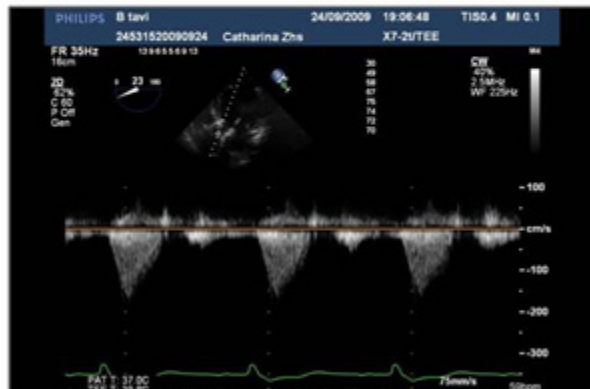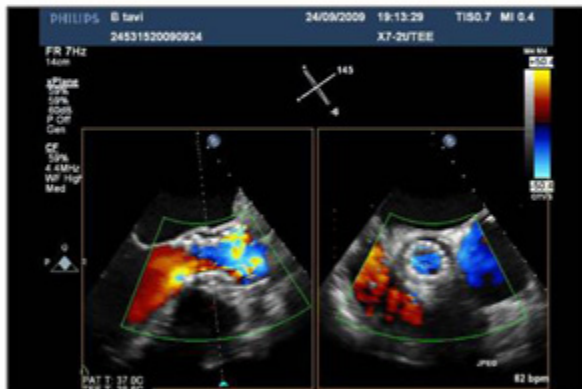# Verification

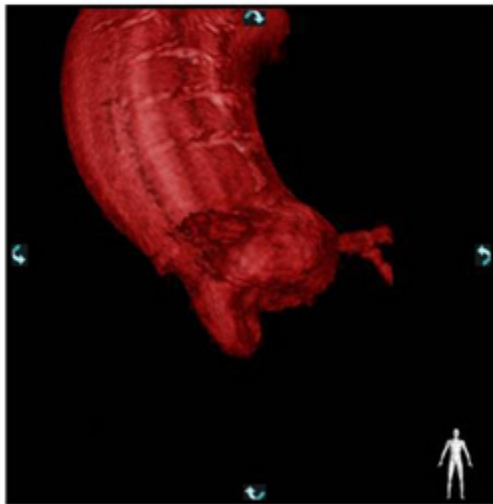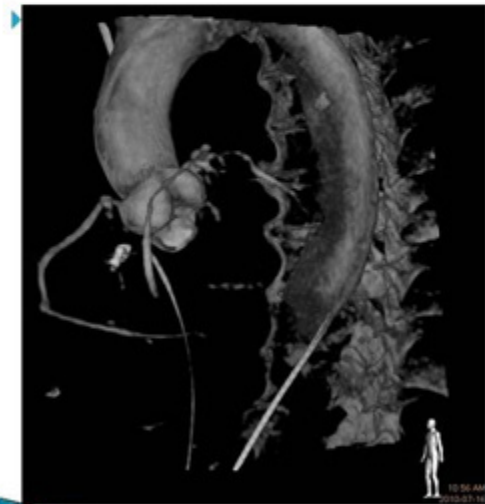## HeartNavigator: deployed valve, regurgitation, position

Verification
3D TEE: MV and regurgitation

Outlook
Avoid need for pre-procedural CT

Conclusion
Multimodality information for TAVI

- Images and data integration are needed for:
  - optimizing the pre-peri-post procedural guidance
  - risk stratification
  - surveillance of procedure
  - follow-up

- What are the preconditions
  - an experienced multidisciplinary team
  - well equipped sterile cathlab → hybrid room