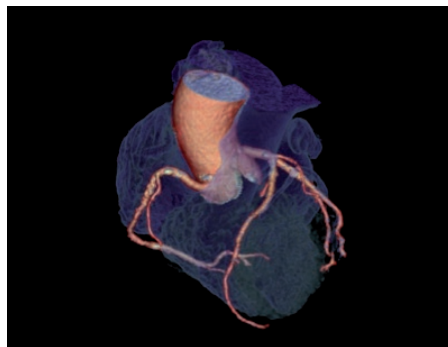
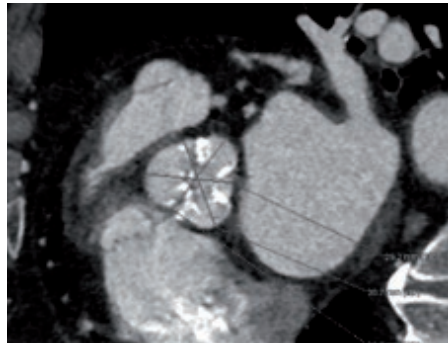


Case study

# Rapid and precise TAVI planning with Revolution\* CT



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# Rapid and precise TAVI planning with Revolution CT

TAVI/TAVR planning requires many detailed measurements including valve plane diameter, ascending and descending aorta diameter, valve sinuses diameters and the distance from valve plane to coronary Ostia. These can all be complete using CT imaging. CT can also help provide a detailed morphological analysis of the aorta and detect common pathologies like aneurysms and dissections.

## Patient history

- A woman in her 80's with hip prosthesis was referred to CT for transcatheter aortic valve implantation (TAVI) planning.
- **The mean heart rate of the patient was 101 BPM and no beta blocker was used** because the main purpose of the study was to assess the whole aorta and provide detailed measurements for the TAVI procedure with no specific request for coronary artery assessment.
- The physician decided to perform a single exam combining two gated axial acquisitions to image the thoracic aorta and heart, followed by a non-gated helical acquisition from the aorta through the iliac arteries, all within a single contrast injection.

## Acquisition

### Mixed axial gated and helical non-gated acquisition:

- Axial scanning with ECG gating:
  - **Smart coverage** to automatically select anatomy specific collimations required to scan the prescribed area
  - **kV Assist & SmartmA** to tailor dose to patient's morphology
  - **ASiR\*-V<sup>1</sup>** to lower dose
  - 0.28 sec rotation speed
  - **Heat rate 101 BPM**
- Helical scanning without ECG gating
  - **kV Assist & SmartmA** to tailor dose to patient's morphology
  - **ASiR-V** to lower dose
  - 0.28 sec rotation speed
  - **80 mm collimation**
  - **300 mm/s table speed** at a pitch of 1
  - **Total dose: DLP = 580 mGy-cm**
  - **Total acquisition time: 6.8 sec**

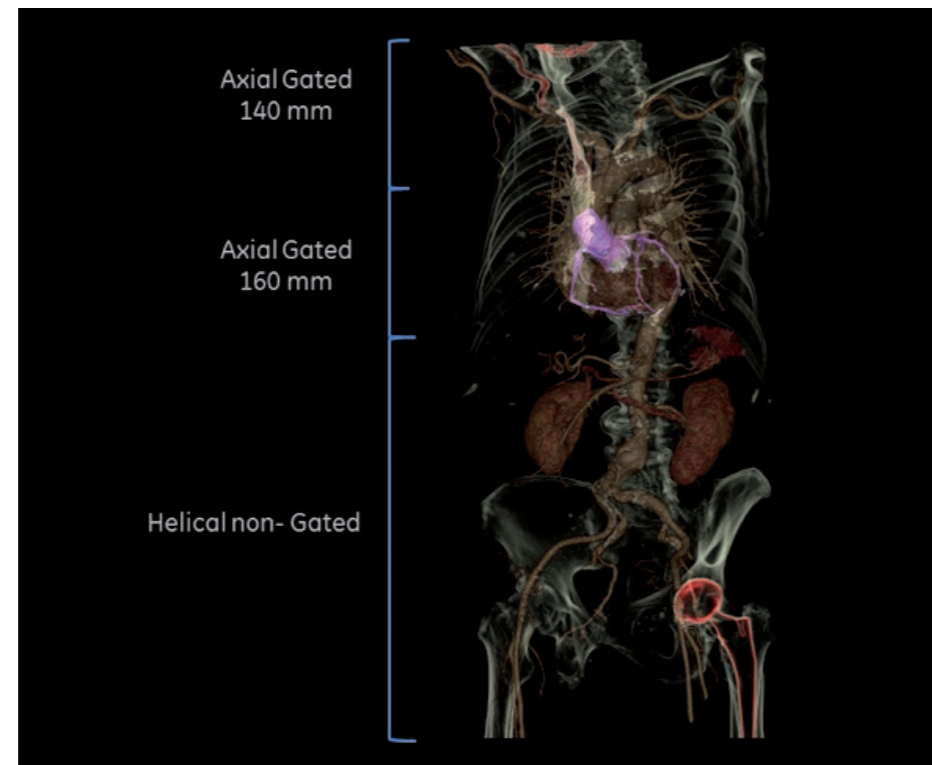
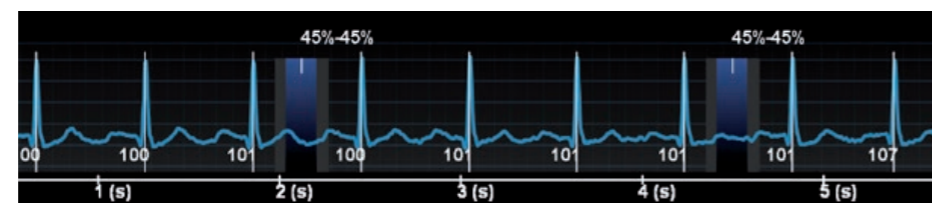
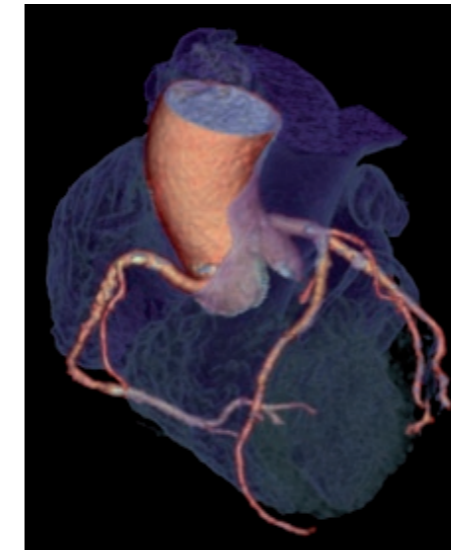


Illustration of acquisition

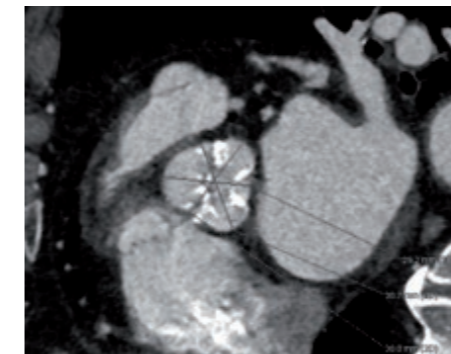


Patient's ECG trace during acquisition

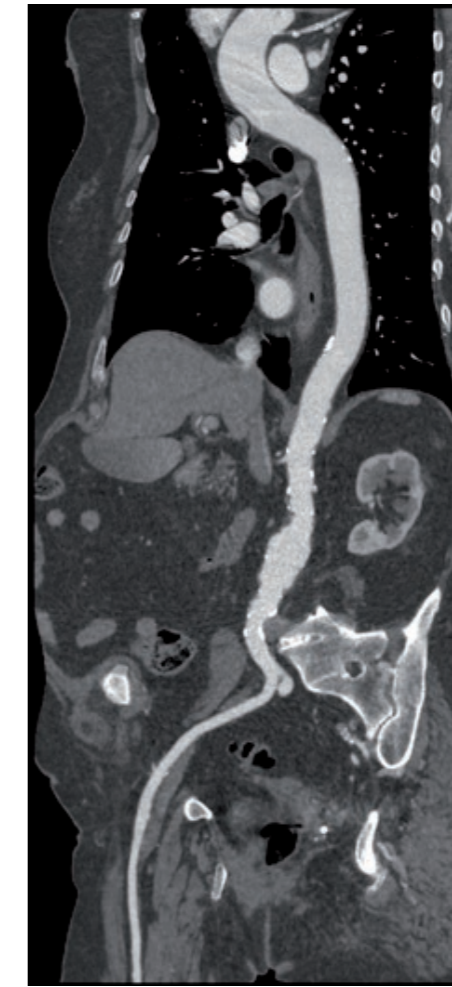
## Results



3D - coronary tree  
One beat cardiac at 101 BPM



Aortic valve measurements



Curved view of aorta and femoral artery

## Conclusion

With Revolution CT, you can make TAVI planning examinations robust, reproducible and low dose. In your hands, the combination of several key technologies makes this possible: fast rotation speed, intelligent motion correction, 160 mm whole-organ detector coverage, flexible acquisition modes and the latest generation of iteration reconstruction, ASiR-V.

## Technology

- Revolution CT is capable of **switching between multi-volume gated axial scanning and fast non-gated helical scanning at 300 mm/sec in less than 1 sec**, enabling the imaging of large anatomy such as the whole aorta in one contrast injection, with a short breath hold.
- With 0.28 sec rotation speed available in both gated and non-gated acquisition modes, and **whole heart coverage in one beat**, the system can adapt the scanning technique to easily handle challenging patients with high heart rates. This results in **high-definition image quality with motion-free coronaries** to help provide the interventional cardiologist with the relevant measurements and anatomical information to support TAVI planning.
- Revolution CT features **MMAR (Multi Material Artifact Reduction)** to reduce beam hardening and optimize vessel visualization in the presence of metal implants
- Revolution CT features the **next generation of iterative reconstruction, ASiR-V**, and delivers **up to 160 mm of multi-volume axial scanning**, enabling high definition image quality at lower dose.

“ I was impressed by the quality and the dose of this TAVI planning examination, given the patient's heart rate (101 BPM) and the presence of the hip prosthesis. **Revolution CT is a unique system that can deliver robust and reproducible techniques to image all kinds of patients, even the most challenging ones** ”

Jean-Louis Sablayrolles, M.D.



## About GE Healthcare

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## GE imagination at work

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<sup>1</sup>In clinical practice, the use of ASiR may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice.

A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

Legal Mentions : The system is intended to produce cross-sectional images of the body by computer reconstruction of x-ray transmission projection data from the same axial plane taken at different angles. The system has the capability to image whole organs in a single rotation. Whole organs include but are not limited to brain, heart, liver, kidney, pancreas, etc..

The system may acquire data using Axial, Cine, Helical, Cardiac, and Gated CT scan techniques from patients of all ages. These images may be obtained either with or without contrast. This device may include signal analysis and display equipment, patient and equipment supports, components and accessories.

Class: IIb - Manufacturer: GE Medical Systems LLC, USA - LNE/G-MED #37618.

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