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Individualized LV lead placement – Why and how ?

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Presenter Disclosure

C. Piorkowski has the following disclosures:

Lecture honoraria: SJM, Biotronik, Biosense

Advisory board member: SJM, Siemens, Imricor

Research support: SJM, Biotronik, Imricor, Biosense

Improvement of CRT – Where is the need ?

- CRT indications according to current guidelines:
  - EF < 35%, LVEDD > 55 mm
  - NYHA III/IV despite optimal medical therapy
  - QRS > 150 ms or
  - QRS > 120 ms + Echo-Asynchrony (AEP, ΔPEP, SPWMD)

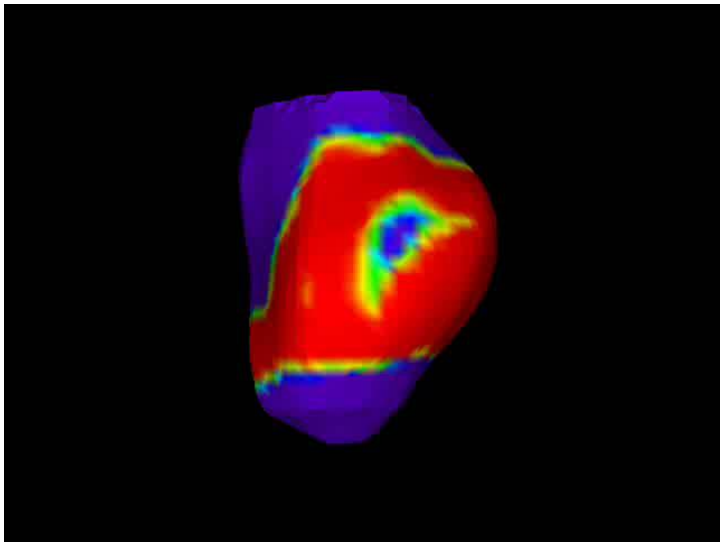
Cleland et al.; CARE-HF; N Engl J Med 2005

- „Non-Responder“ rate across different centers 25-30%

- factors possibly influencing „Response/Non-Response“:
  - LV dyssynchrony, LV scar

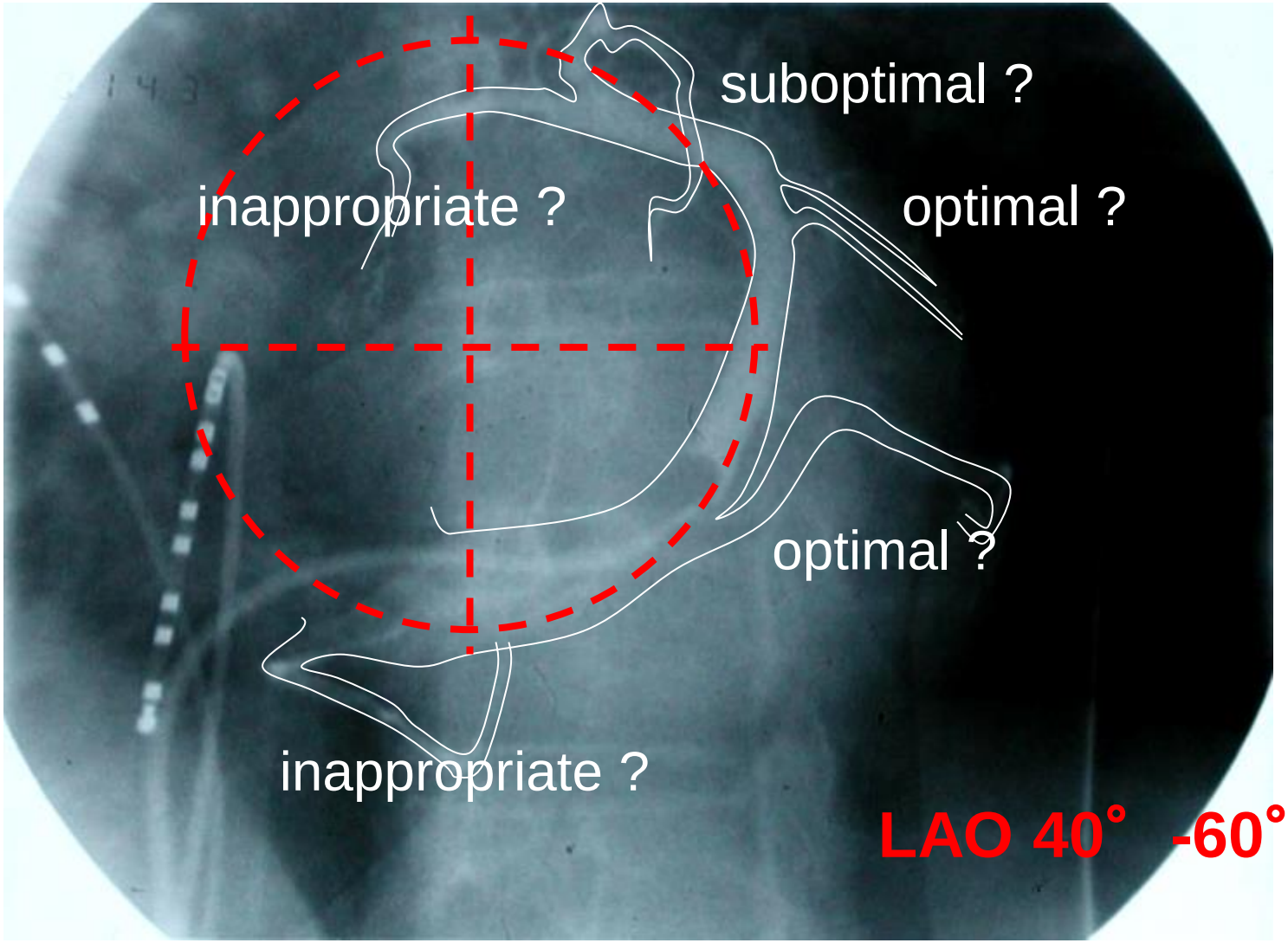
Dyssynchrony and scar – What is the role in CRT ?

- Dyssynchrony certainly has an effect of CRT efficacy
- Scars certainly have and effect on CRT efficacy
- But, both criteria are not useful to select pts. and predict response
- They can, however, help to understand the overall disease process



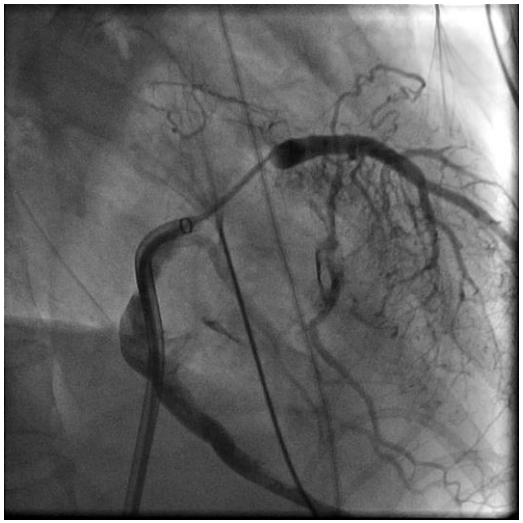
- That impacts delivery of CRT – where to pace / place the lead

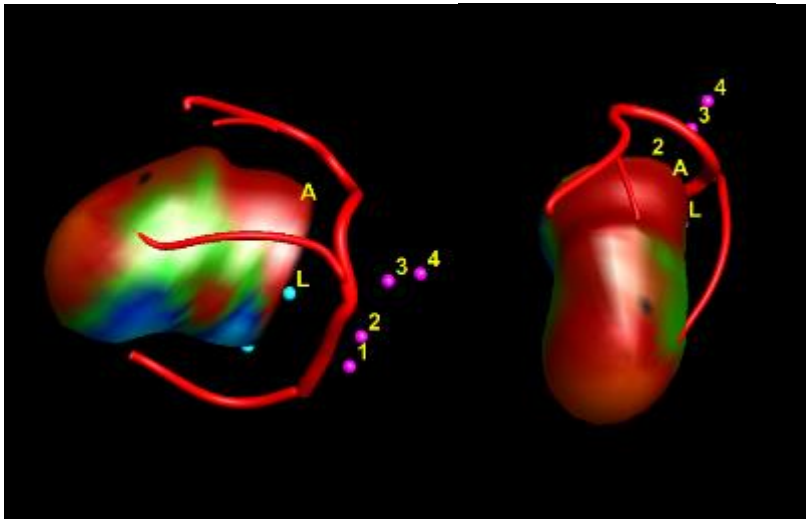
How do we place LV leads today ?

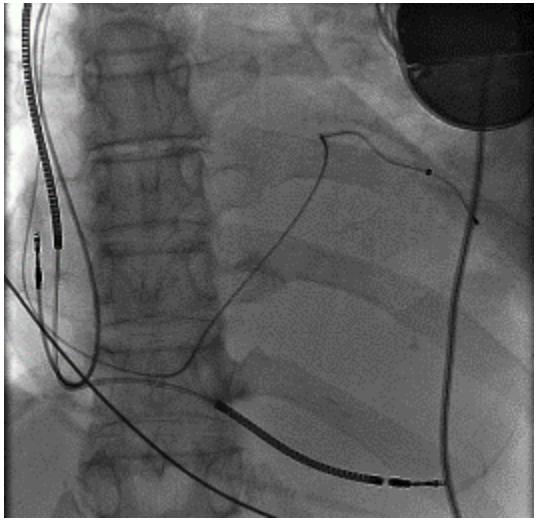


Individualized LV lead placement: Case example

63 years, EF 17%, DCM, SR, NYHA IV, BNP 2350 ng/l, LBBB 140 ms



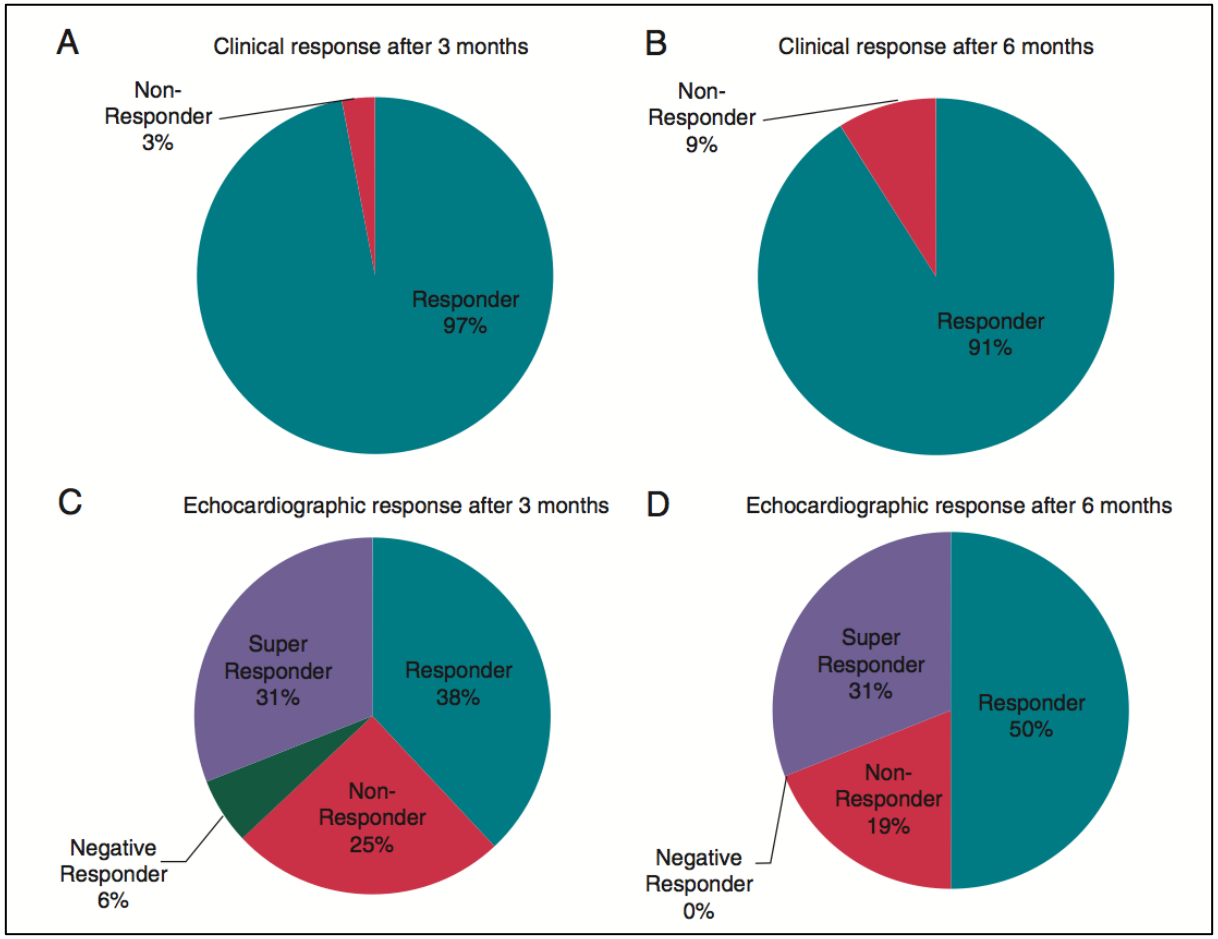




3 months follow-up: NYHA II, BNP 66 ng/l, VO_2max 14 ml/min/kg

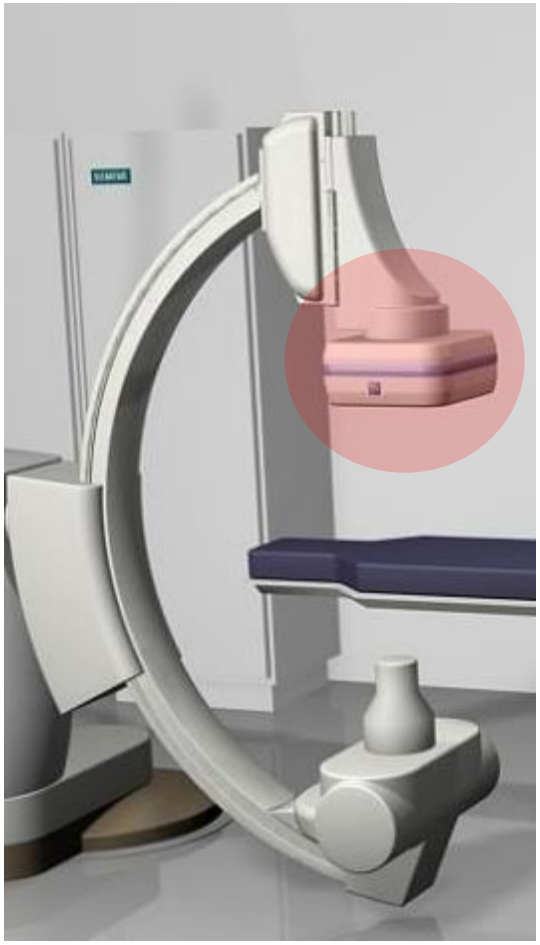
Döring et al, Europace 2013

Individualized LV lead placement: Outcome

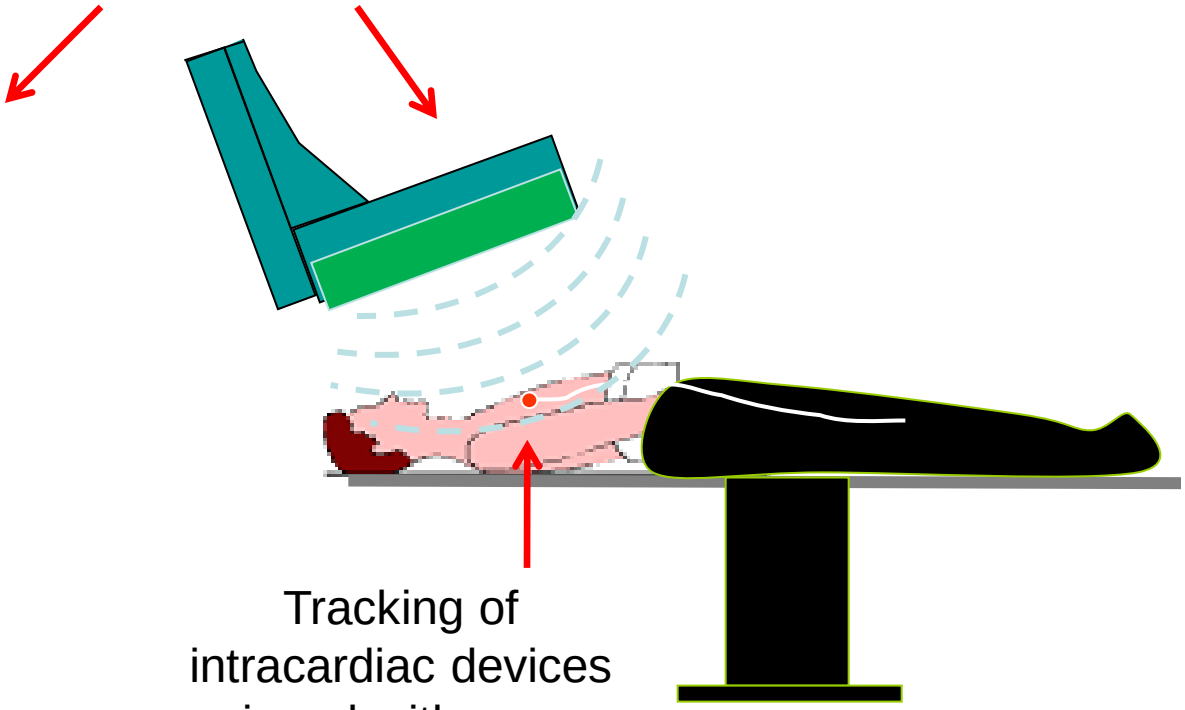


Döring et al, Europace 2013

Search for technological approaches to assess diseased LV mechanics

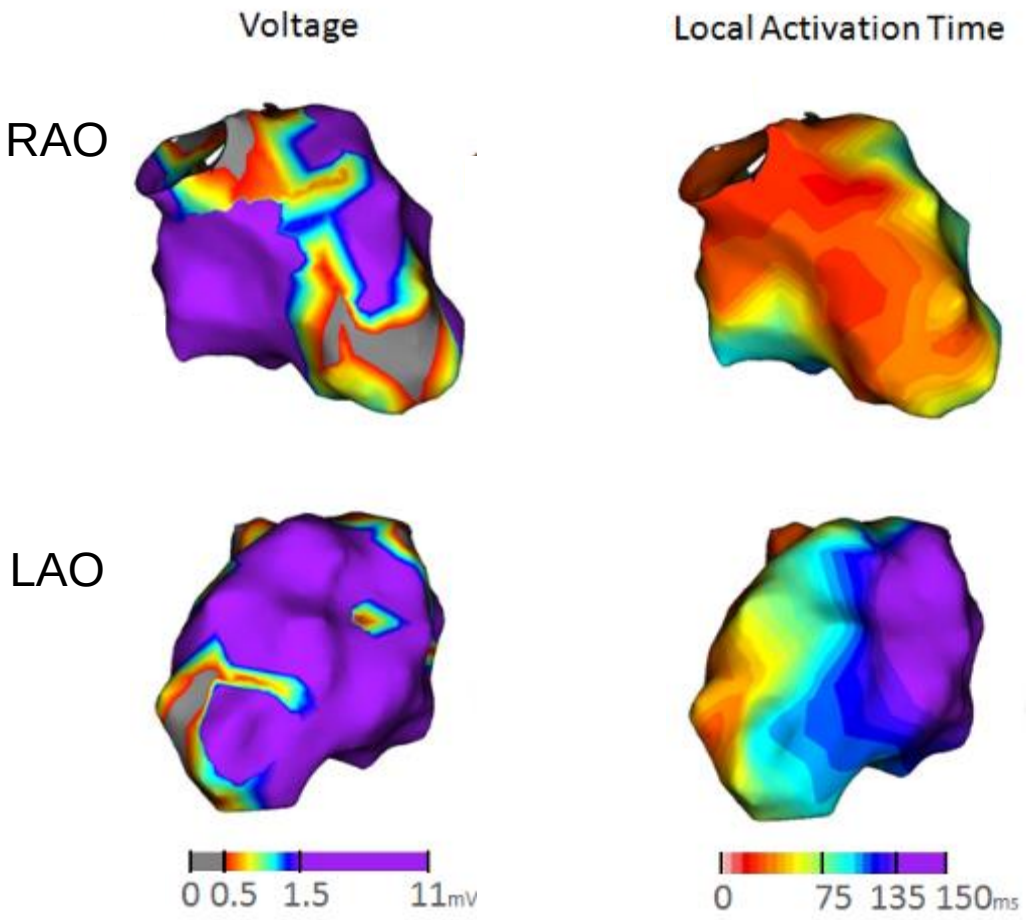


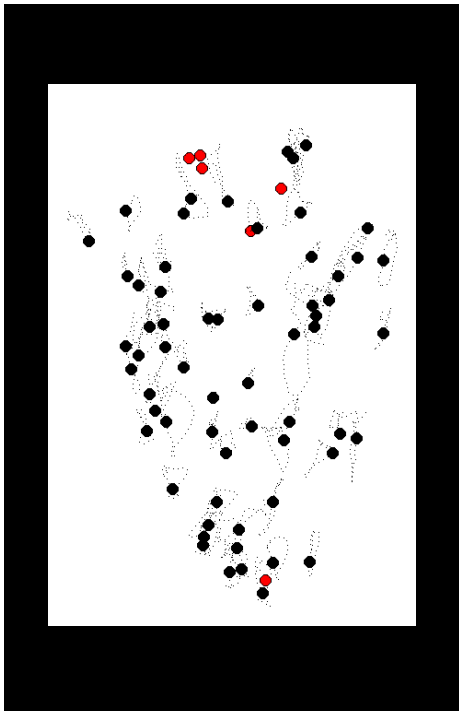
3D electromagnetic field emitters integrated into X-ray detector



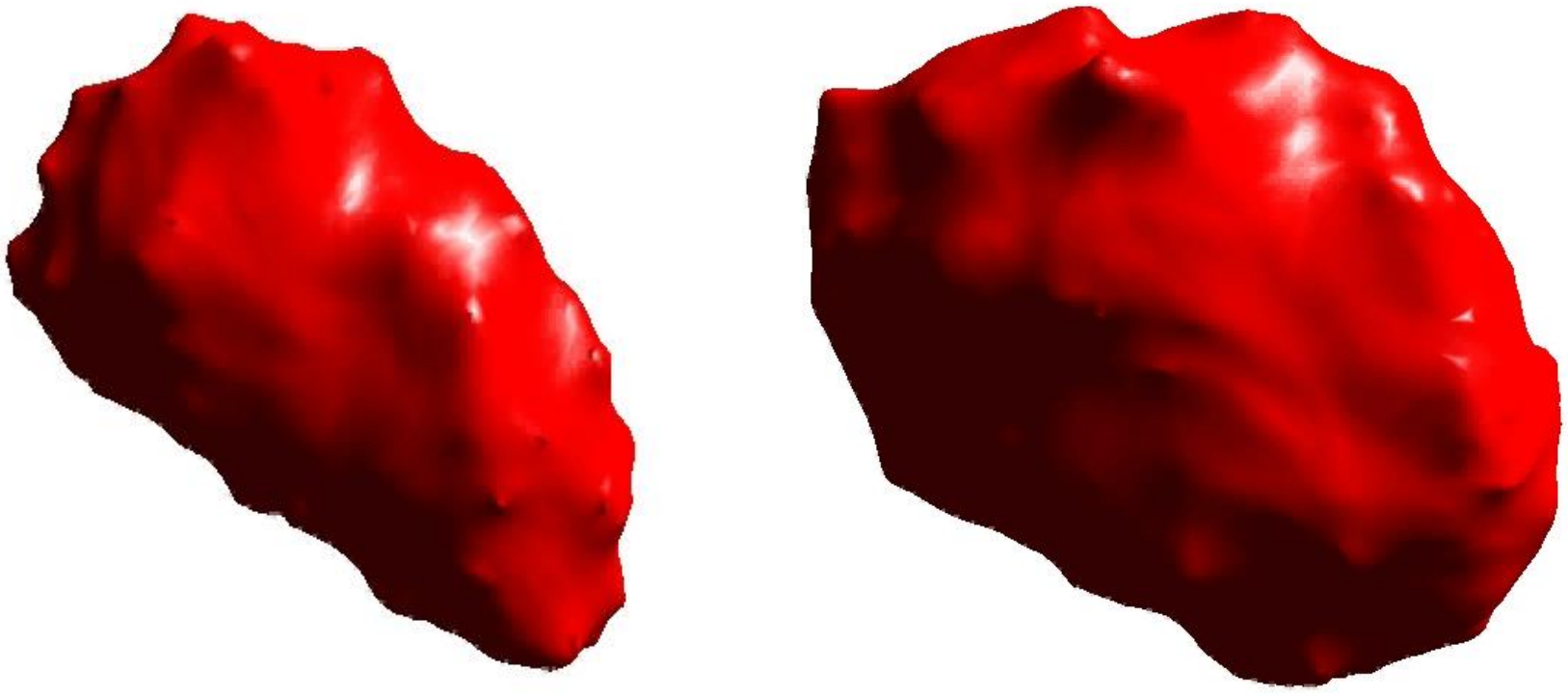
Tracking of intracardiac devices equipped with sensors

Study on Mediguide enabled LV assessment

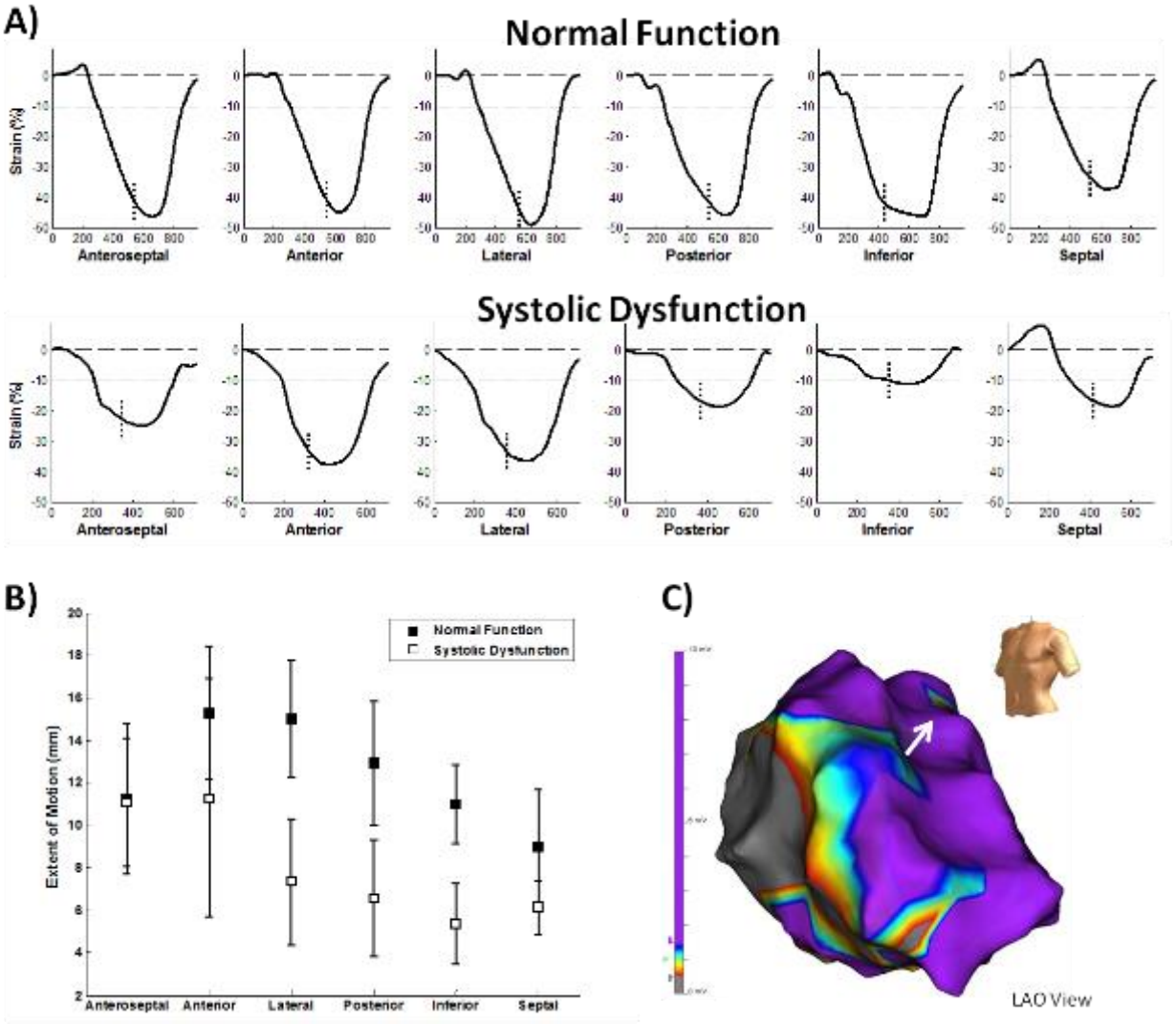




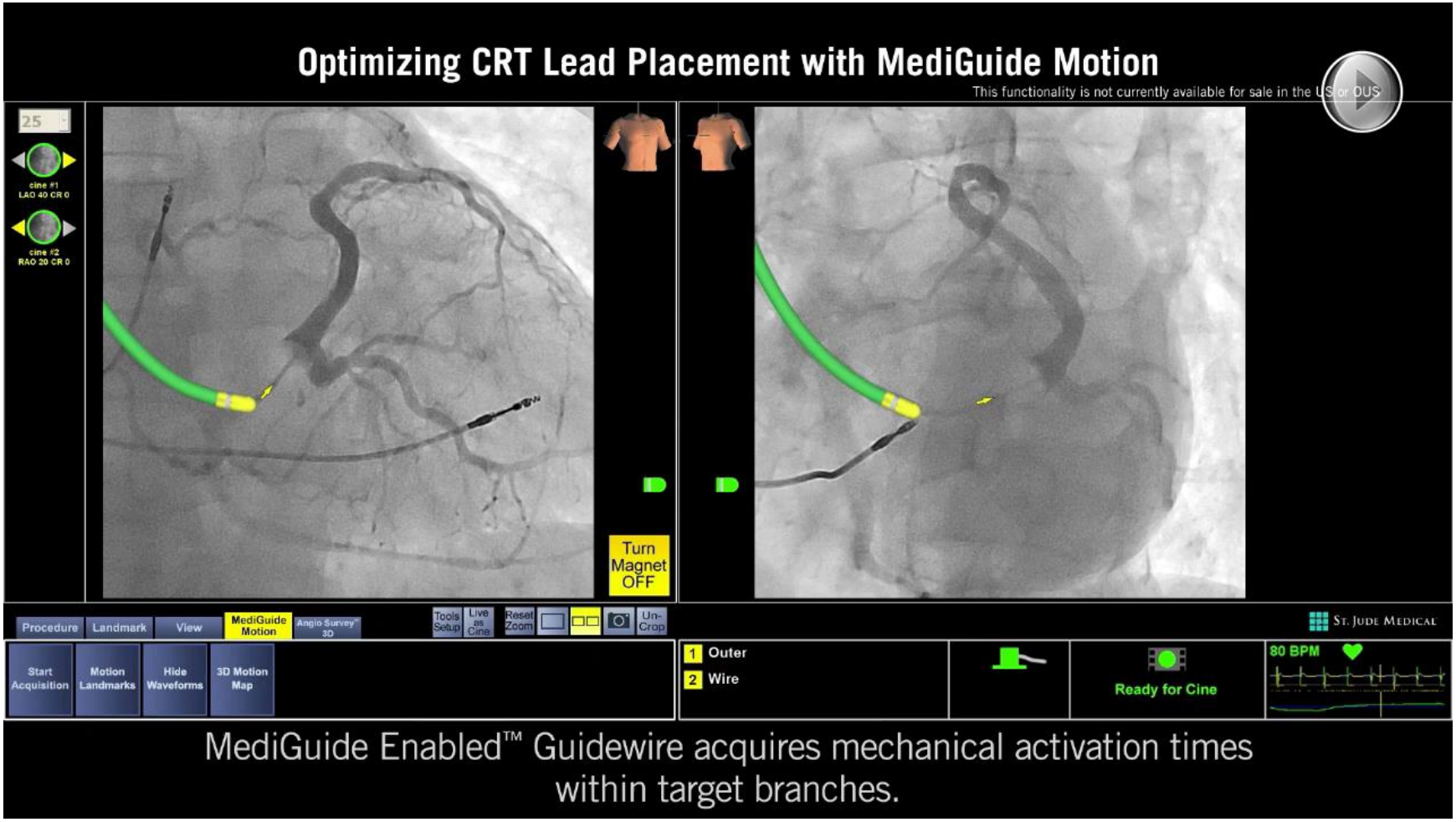
Study on Mediguide enabled LV assessment



Study on Mediguide enabled LV assessment



Clinical tool for tailored LV lead placement



Summary

- Standardized LV lead placement (eg. at the lateral wall) disregards individual pattern of LV dyssynchrony and LV scars
- Individually tailored LV positions have the potential to overcome that limitation, optimize CRT and reduce Non-Response
- Description/Imaging/Mapping of dyssynchrony and scar is needed
- However, our current methodologies are limited
- Mediguide allows quantitativ assessment of cardiac motion due to highly precise intracardiac device tracking (eg. wires, catheters)
- On site utilization of such information during implant maybe helpful to achieve optimized LV lead positions and CRT response rates