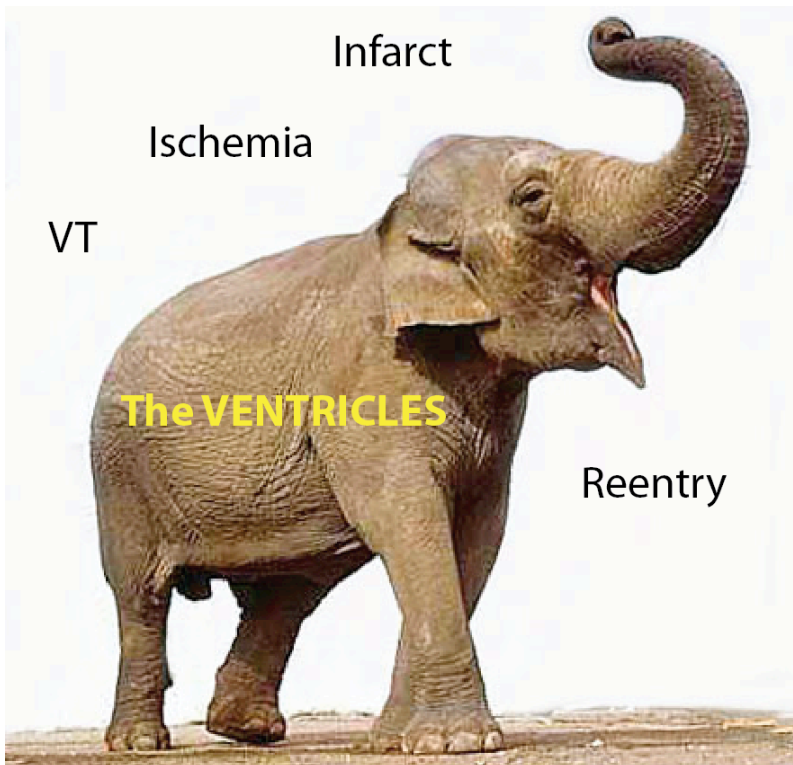


Imaging Based Analysis of Patients with Atrial Fibrillation

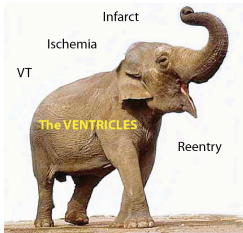
Rob MacLeod, University of Utah
CARMA Center, SCI Institute, CVRTI
Bioengineering Department



1



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CARMA

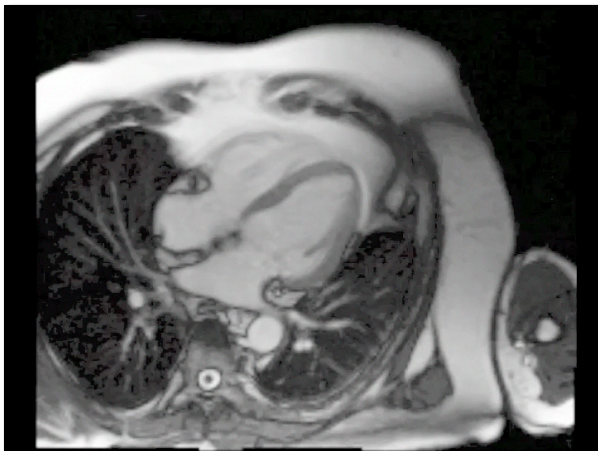


What is Atrial Fibrillation? = Afib = AF

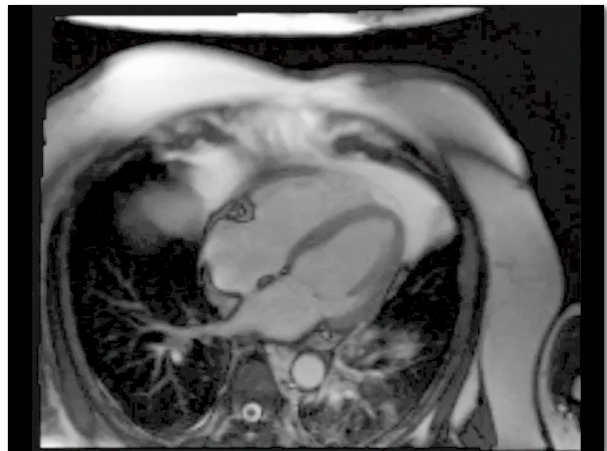


5

Normal Contraction

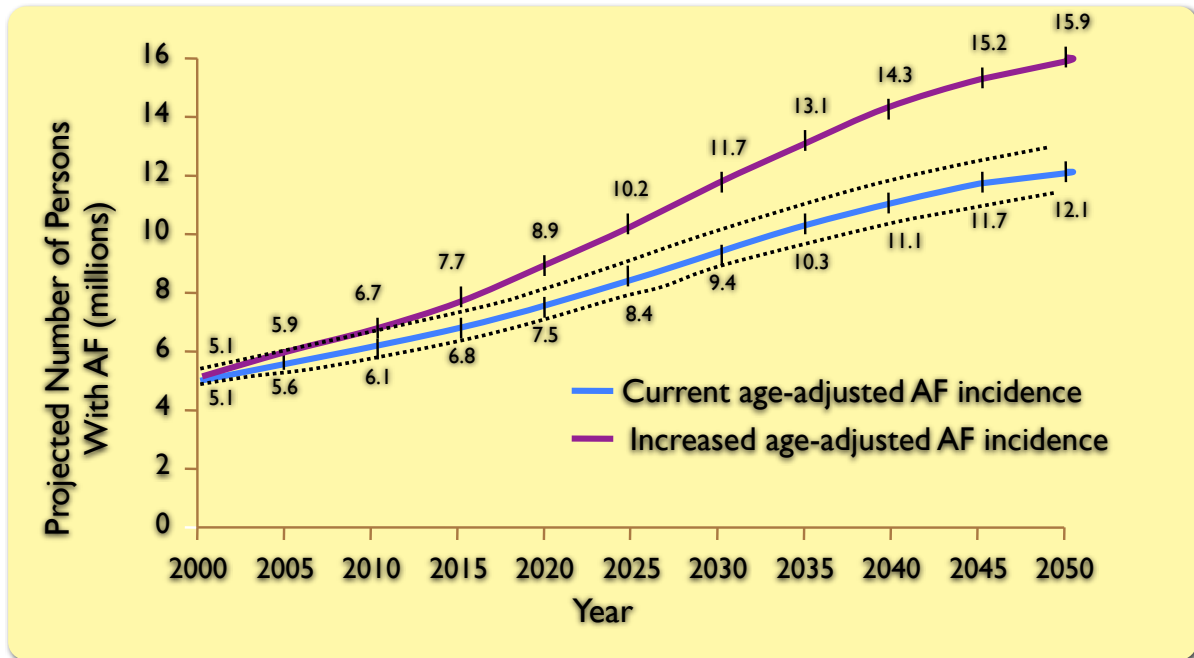


Atrial Fibrillation



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AF Prevalence

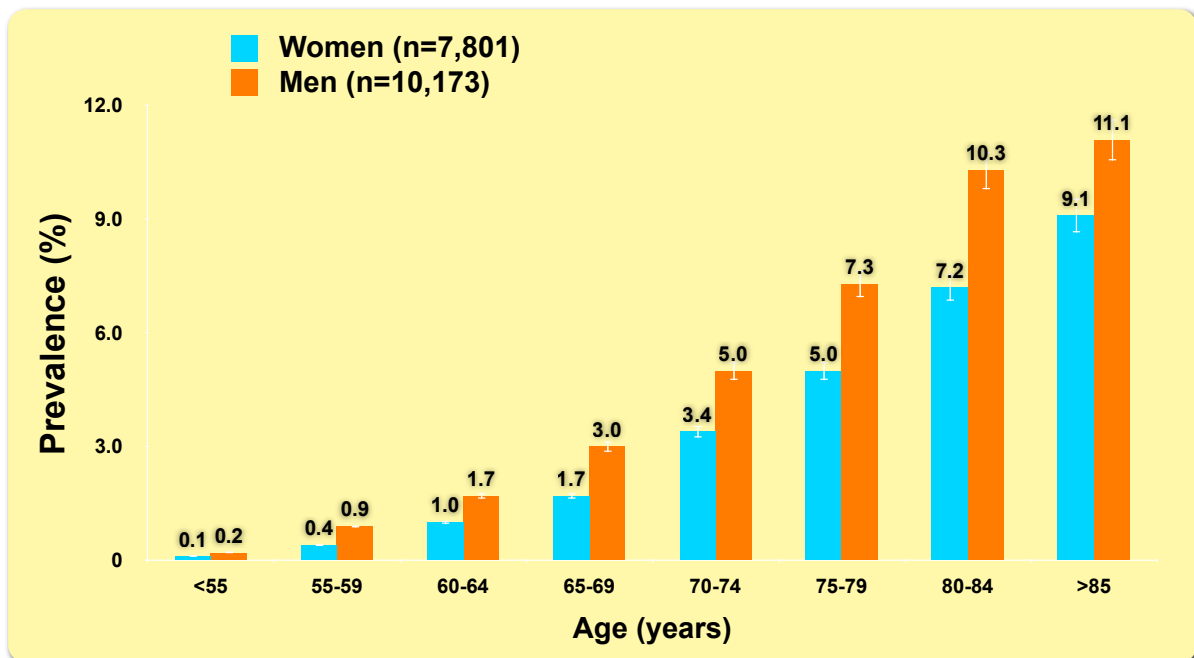


Miyasaka et al. *Circulation*. 2006;114:119-125.



7

We All Get Older



Go AS, et al. *JAMA*. 2001;285:2370-2375.



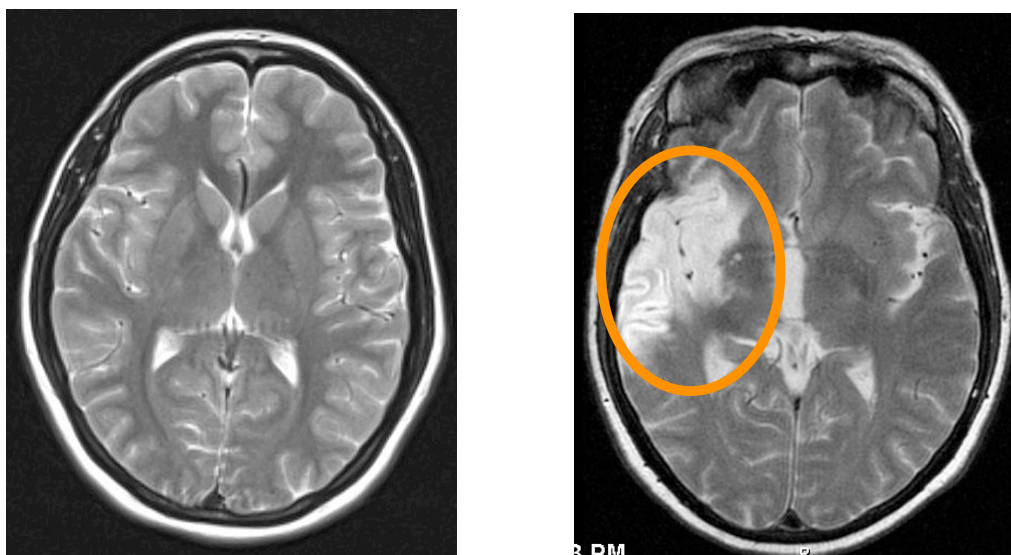
8

So What?



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20% of Strokes



\$20 billion/year



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What Causes AFib?



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Substrate

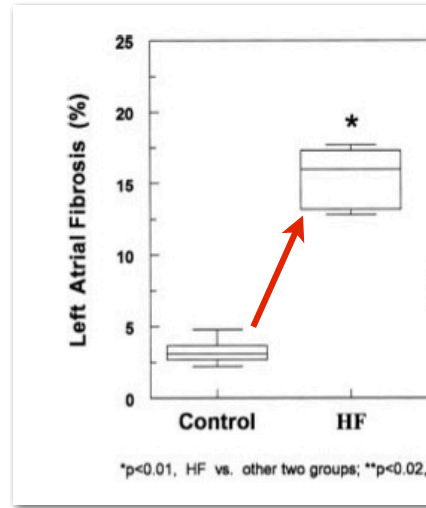
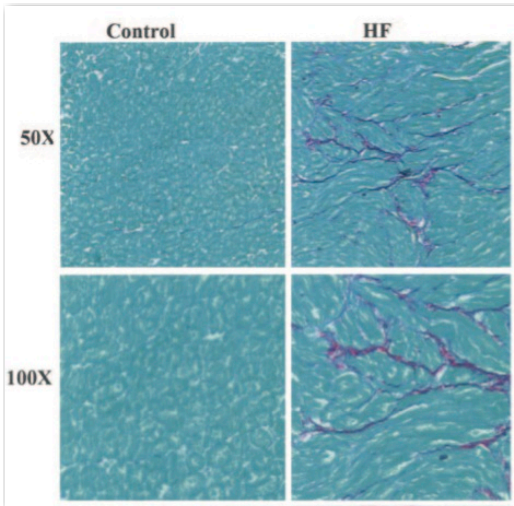
+

Trigger



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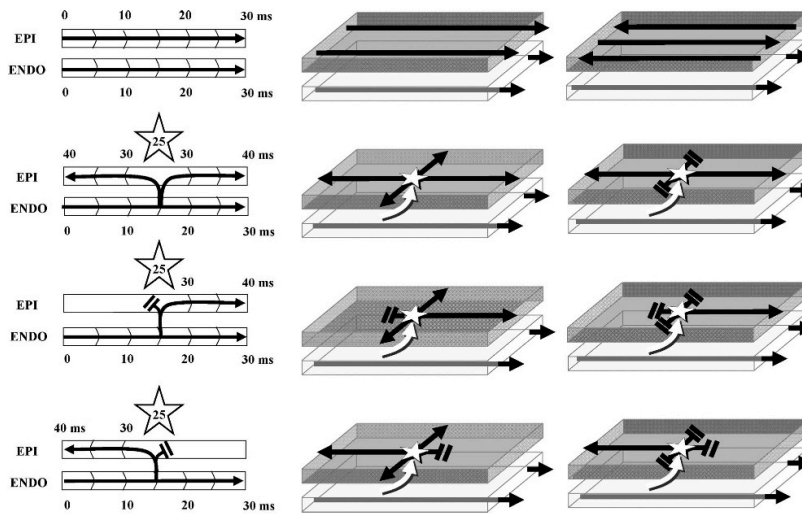
Substrate:Fibrosis



Lee KW, et al. Circ. 2006: 1703-1712.



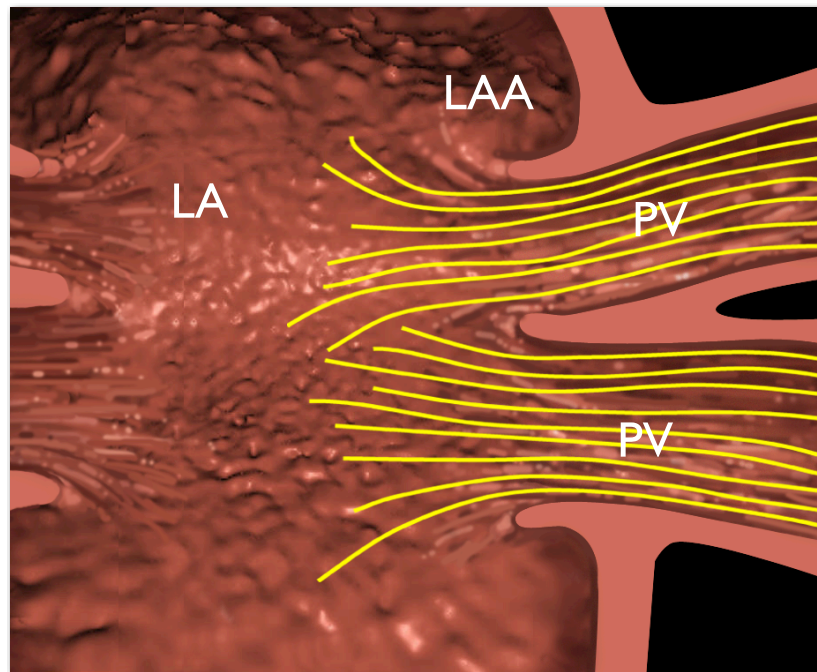
Complex Propagation



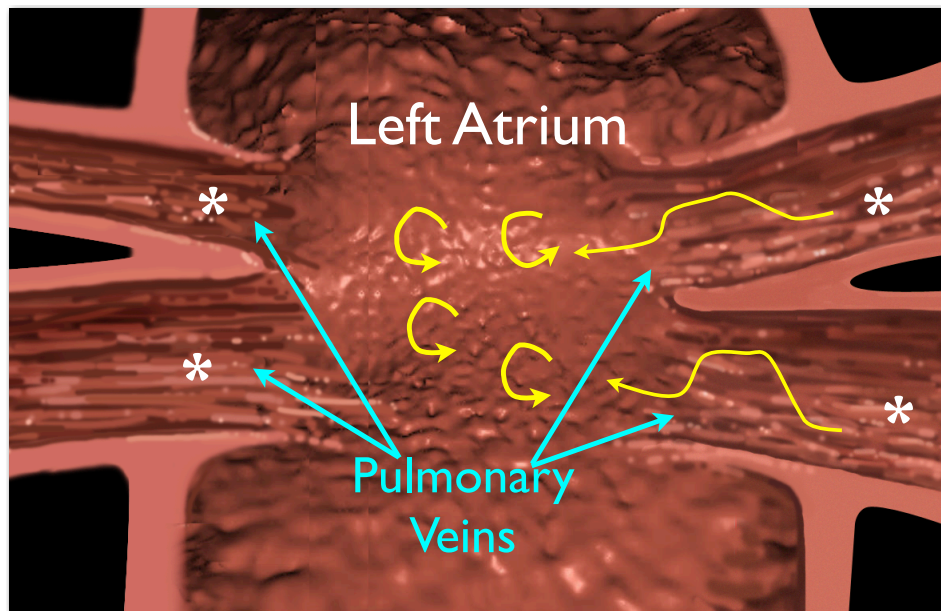
de Groot, Allesie MA. Circ. 2010: 1674-1682.



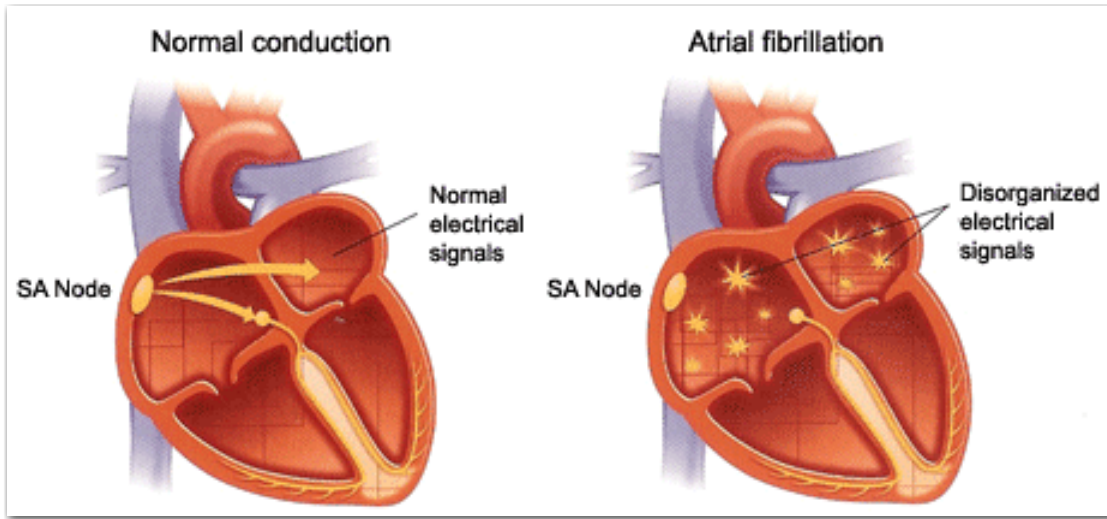
Substrate: Extension of muscle sleeves



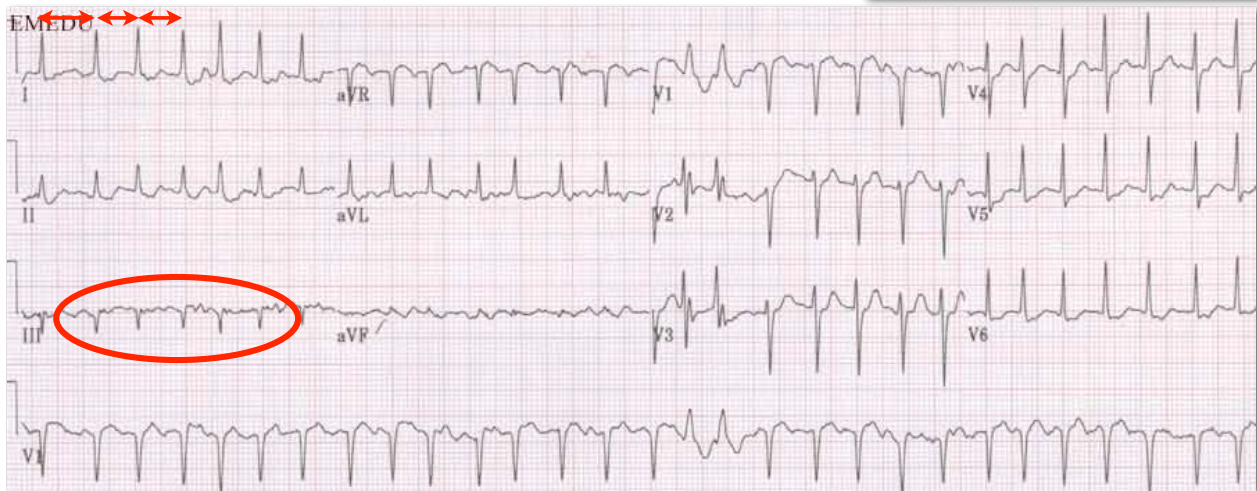
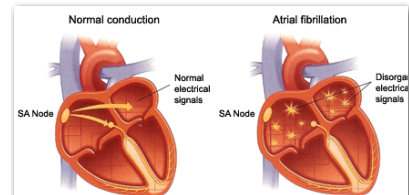
Triggers



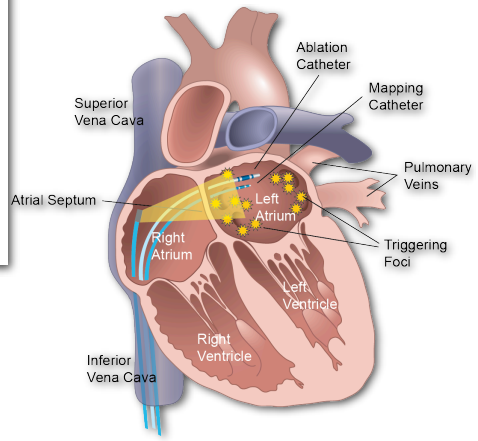
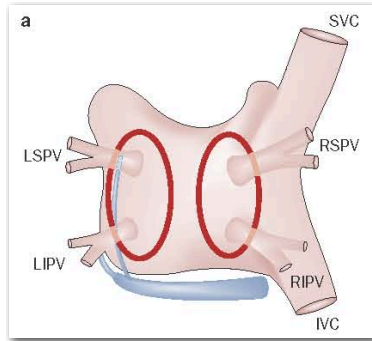
Clinical Result



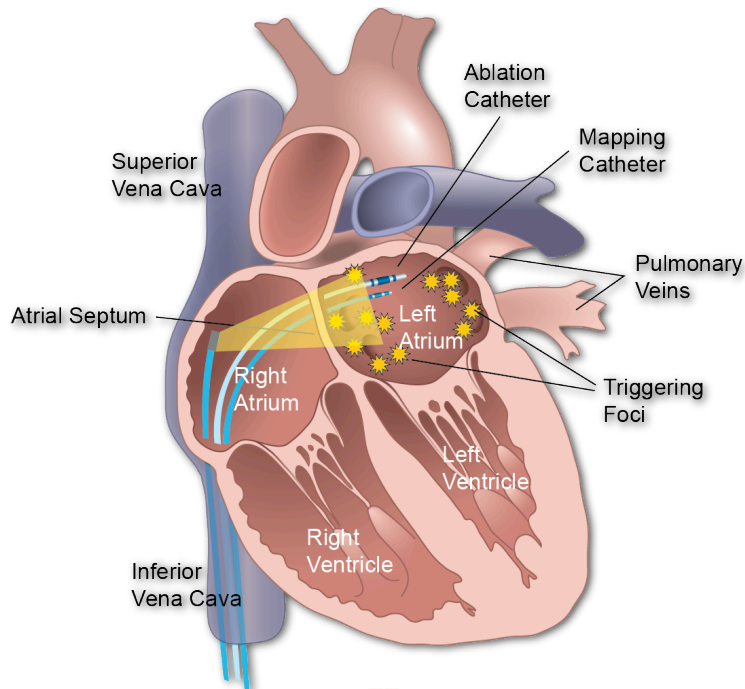
Clinical Result



Treatment?



Catheter Ablation

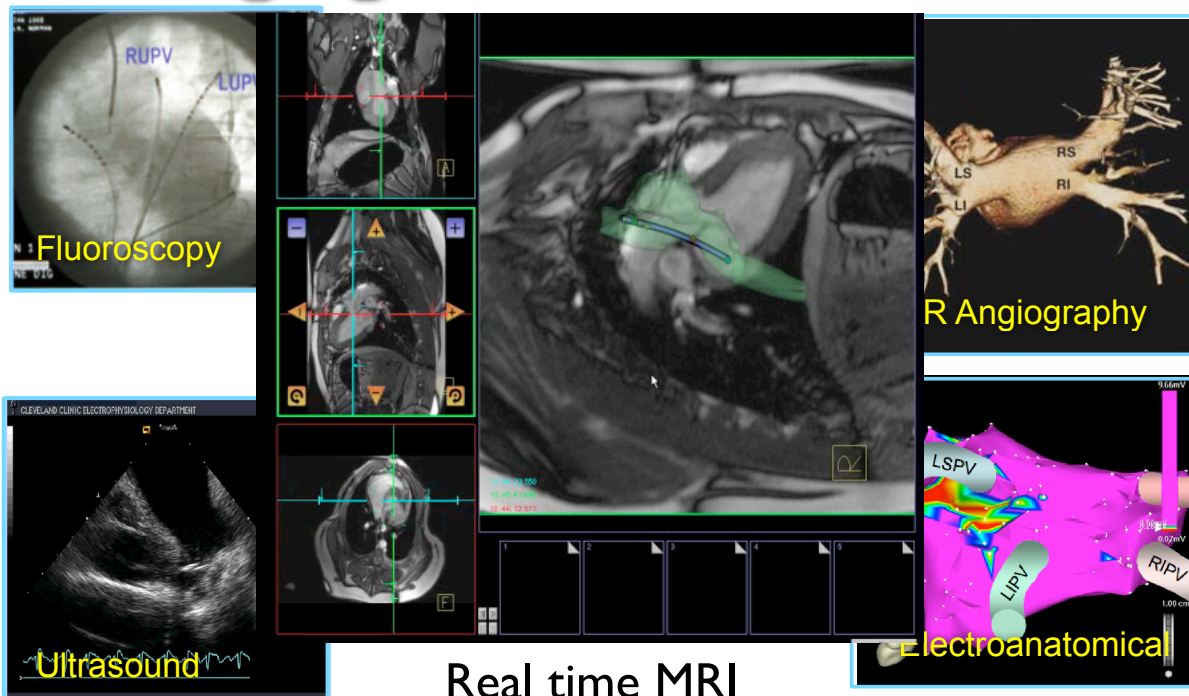


Imaging in AF



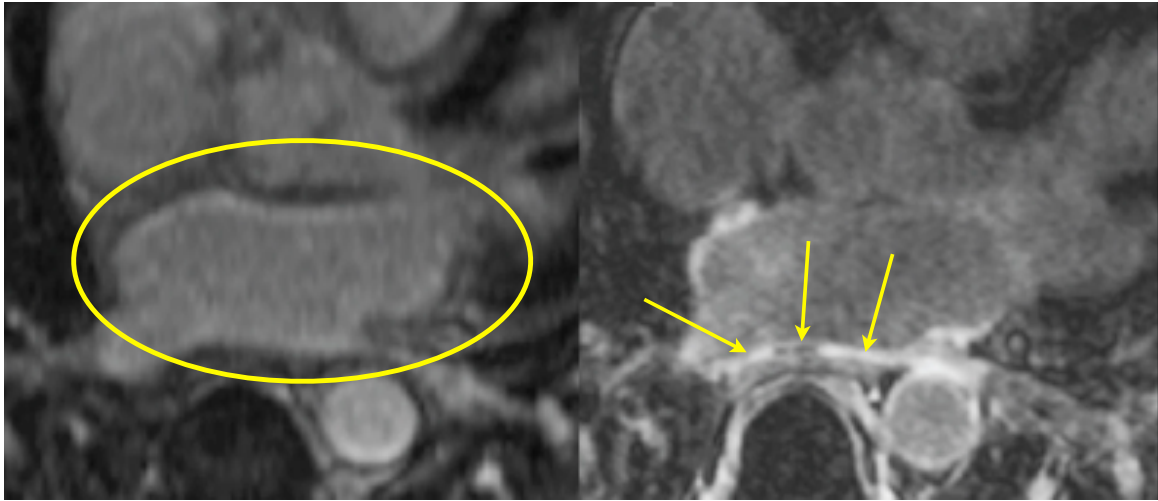
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Imaging Modalities in AF



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Late Gadolinium Enhancement



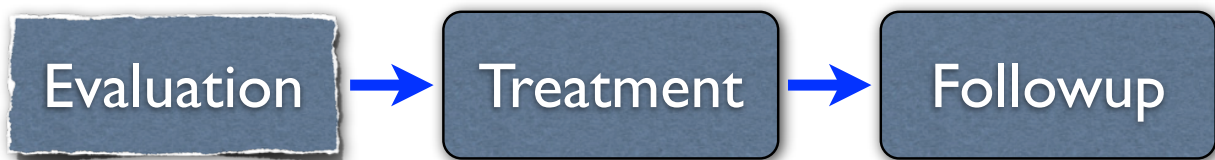
Pre-treatment

3 month Post



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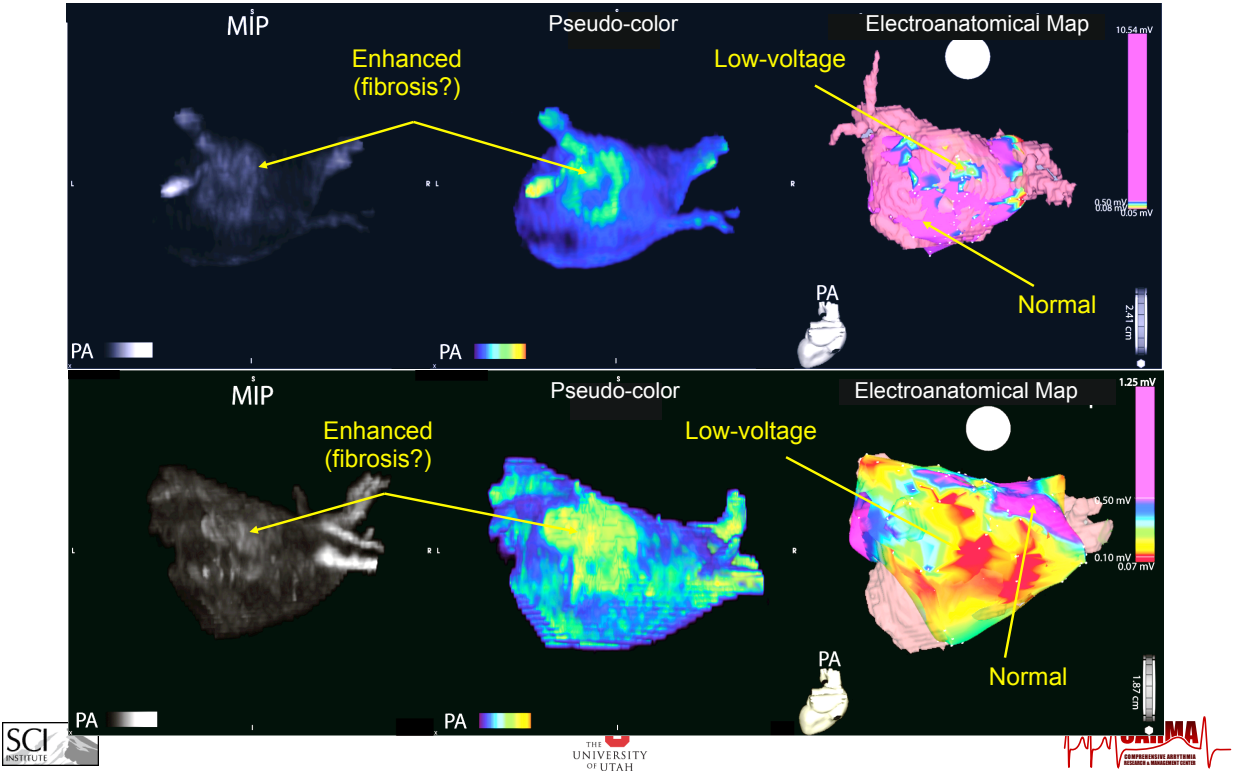
Patient Workflow



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Fibrosis and Outcome

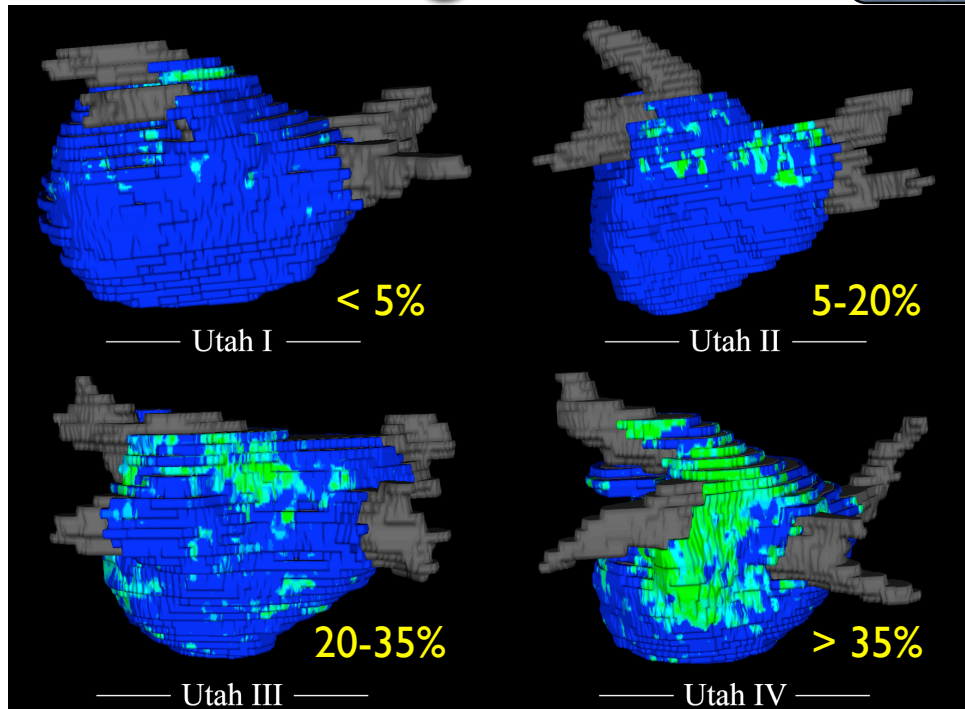
Evaluation



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Utah Scoring Scheme

Evaluation

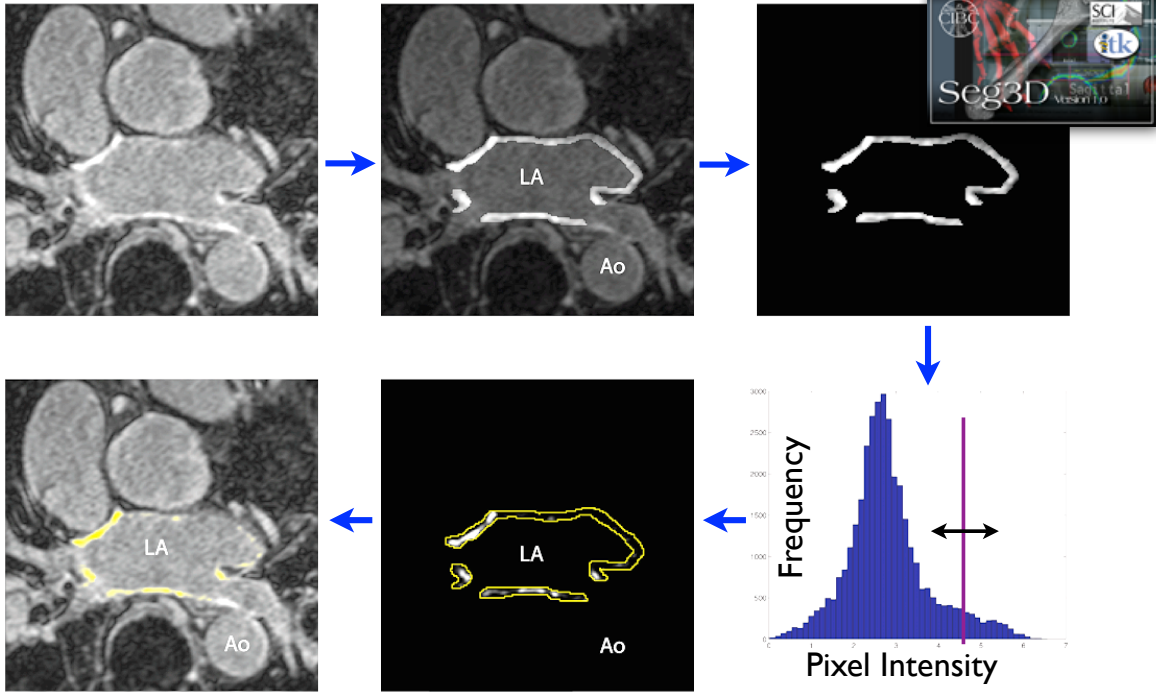


Akoum et al. J Cardiovasc Electrophysiol, 22:16-22, 2011

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Fibrosis Image Analysis

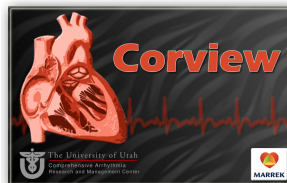
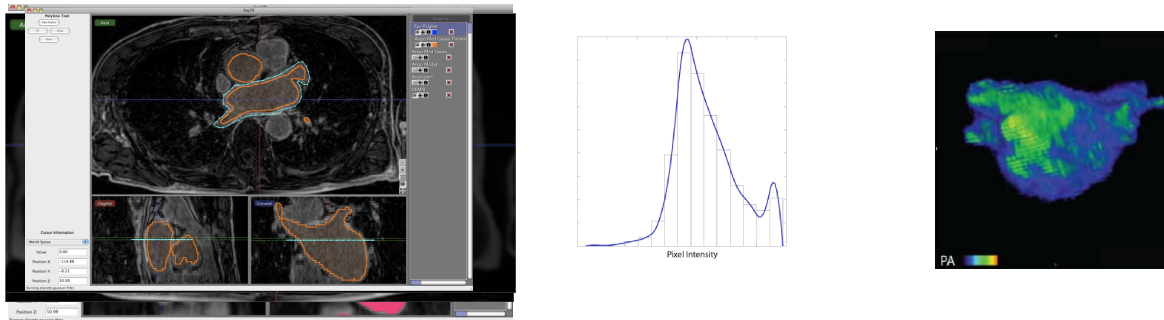
Evaluation



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Past Workflow

Evaluation

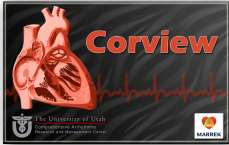
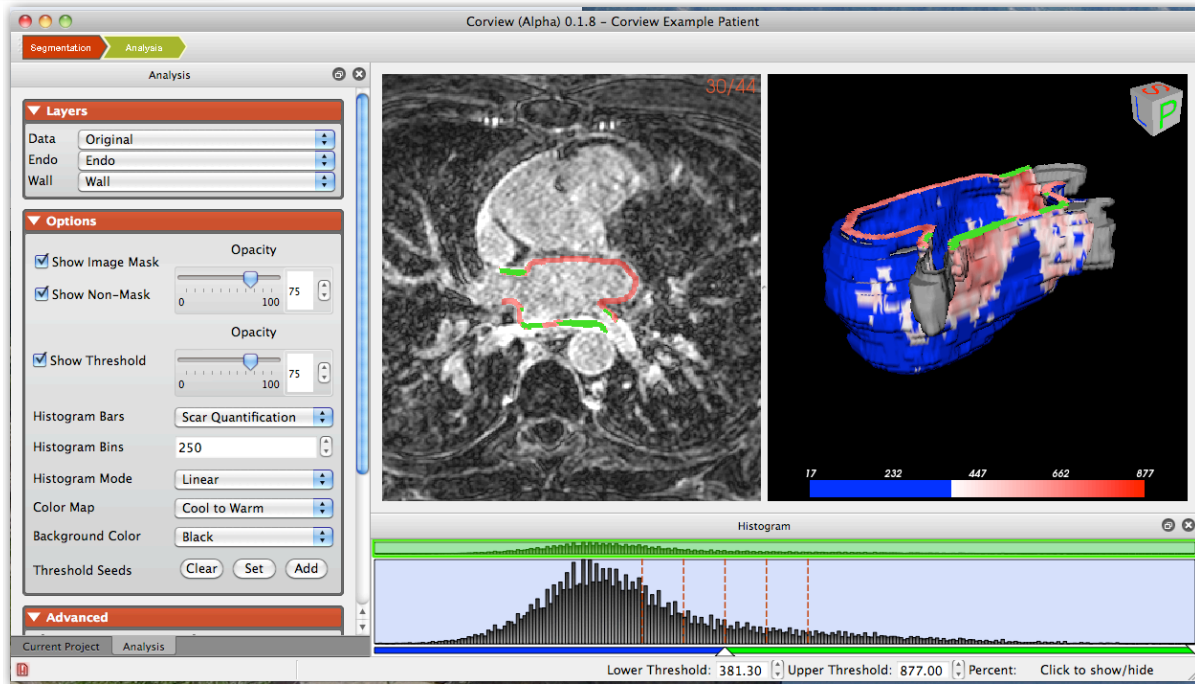


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Corview

Evaluation



Corview

