New Technology in Arrhythmia Management: The Pioneer Spirit

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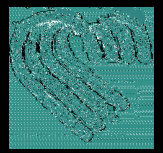
Disclosures

- Research/Grant Support/Consulting:
  - Biosense Webster
  - St Jude Medical
  - Boston Scientific
  - Medtronic
- Discussing Non-FDA Approved Technology
  - Cardiofocus Laser Balloon
  - VytronUS
  - Iowa Approach



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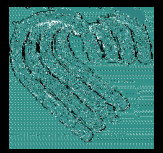
Outline

- Brief Review of AF Mechanisms
- Current Ablation Techniques
- Mechanisms of Recurrence
- Future Directions



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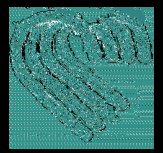
True or False Question

- Atrial Fibrillation is likely to happen in one of the following over the course of their lifetime
  - David Sandler MD
  - Sean Mazer MD
  - Jared Bunch MD
  - Shephal Doshi MD



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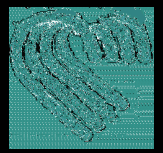
Lifetime Risk of Atrial Fibrillation

- Lloyd-Jones D et al, *Circulation* 110:1042 (2004)
  - All Framingham Heart Study participants free of AF at index age ≥ 40
    - 3999 men & 4726 women from 1968-1999
  - Estimated lifetime risk of AF/AFL to age 95
    - 936 developed AF
    - 2621 died without prior AF
  - Lifetime risks for AF:
    - At age 40: 26% men & 23% women
    - At age 80: 23% men & 22% women
  - In patients w/o prior CHF/MI, lifetime risk of AF was 16%

➔ Lifetime risk of AF:

➔ 1 in 4 for individuals ≥ 40

➔ 1 in 6 for those without prior CHF or MI



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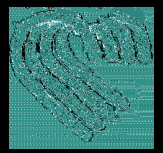
Lifetime Risk

- Atrial Fibrillation
  - 1 in 4 for individuals ≥ 40
  - 1 in 6 for those without prior CHF or MI
- Breast Cancer
  - 1 in 8 at age 40
- Hip Fracture
  - 1 in 6 at age 50



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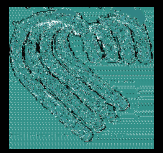
Atrial Fibrillation
Mechanism and Pathogenesis



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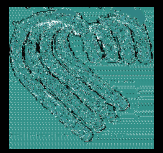
Physiology

- First described in 1903
- Electrical wavelets propagating in different directions causing disorganized atrial depolarizations without organized contractions



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Classical Viewpoint: "Multiple Wavelet Hypothesis"

Gordon Moe, 1959

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The "MAZE" Procedure

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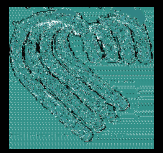
Volume 339(10) 3 September 1998 pp 659-666

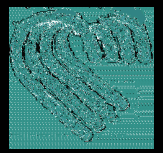
Spontaneous Initiation of Atrial Fibrillation by Ectopic Beats Originating in the Pulmonary Veins

[Original Articles]

Haissaguerre, Michel; Jais, Pierre; Shah, Dipen C.; Takahashi, Atsushi; Hocini, Meleze; Quiniou, Gilles; Garrigue, Stephane; Le Mouroux, Alain; Metayer, Philippe Le; Clementy, Jacques.



How can the Pulmonary Veins Generate and Conduct Electrical Impulse?



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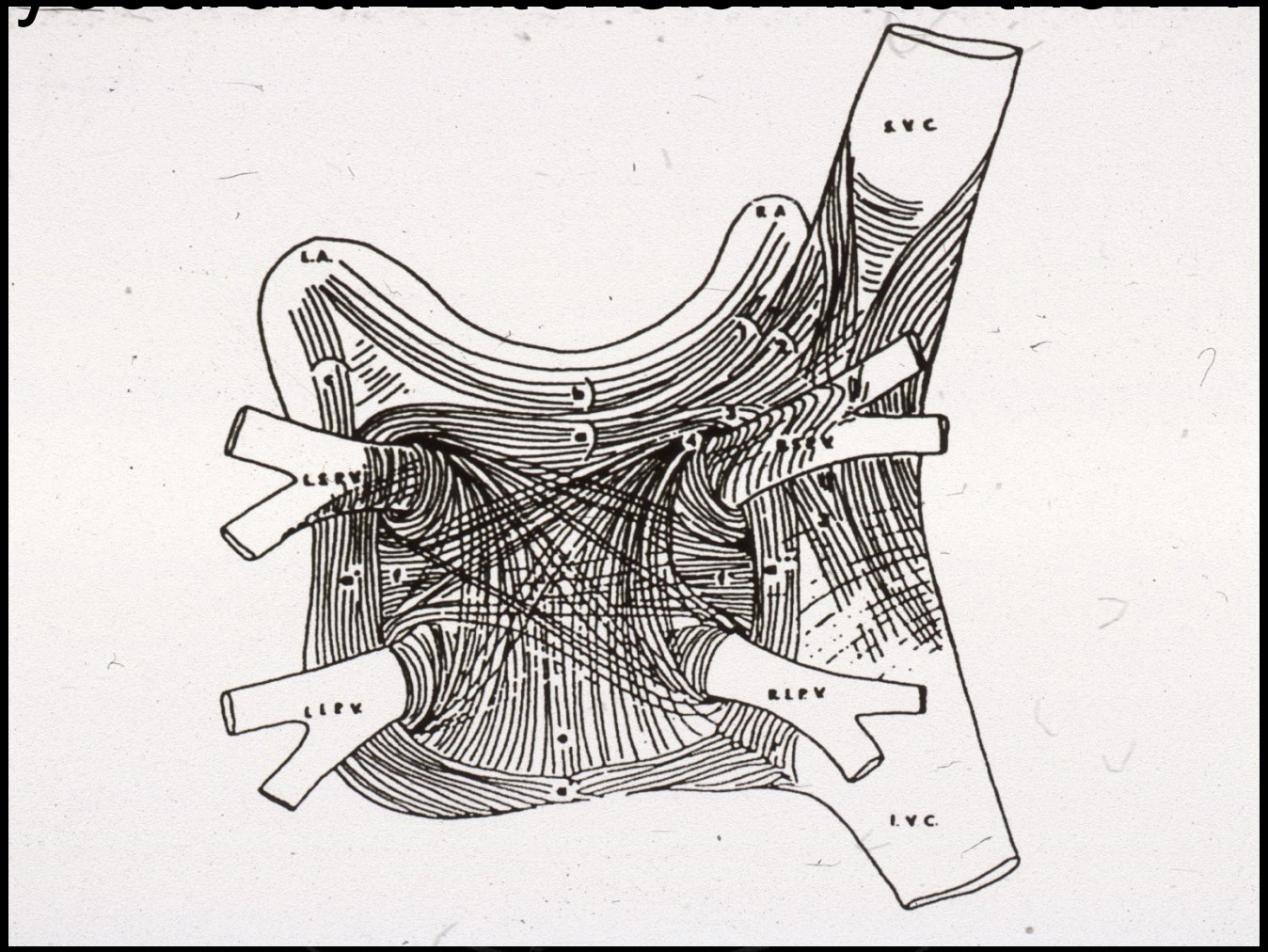

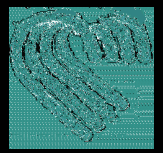

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