

# Modern day ablation

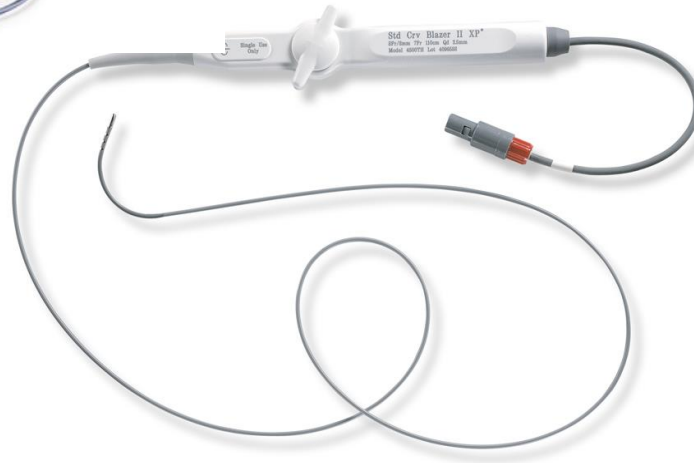
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# What is ablation?

- Targeted destruction of tissue (usually to treat an arrhythmia)
- Uses a variety of modalities to induce cell damage / stress
  - Most involve delivering energy (heat, radiofrequency, electrical current, laser)
  - Also achieved by cooling to low temperature (cryoablation)
- First technologies not very targeted (eg DC ablation), now highly selective

# Ablation catheters



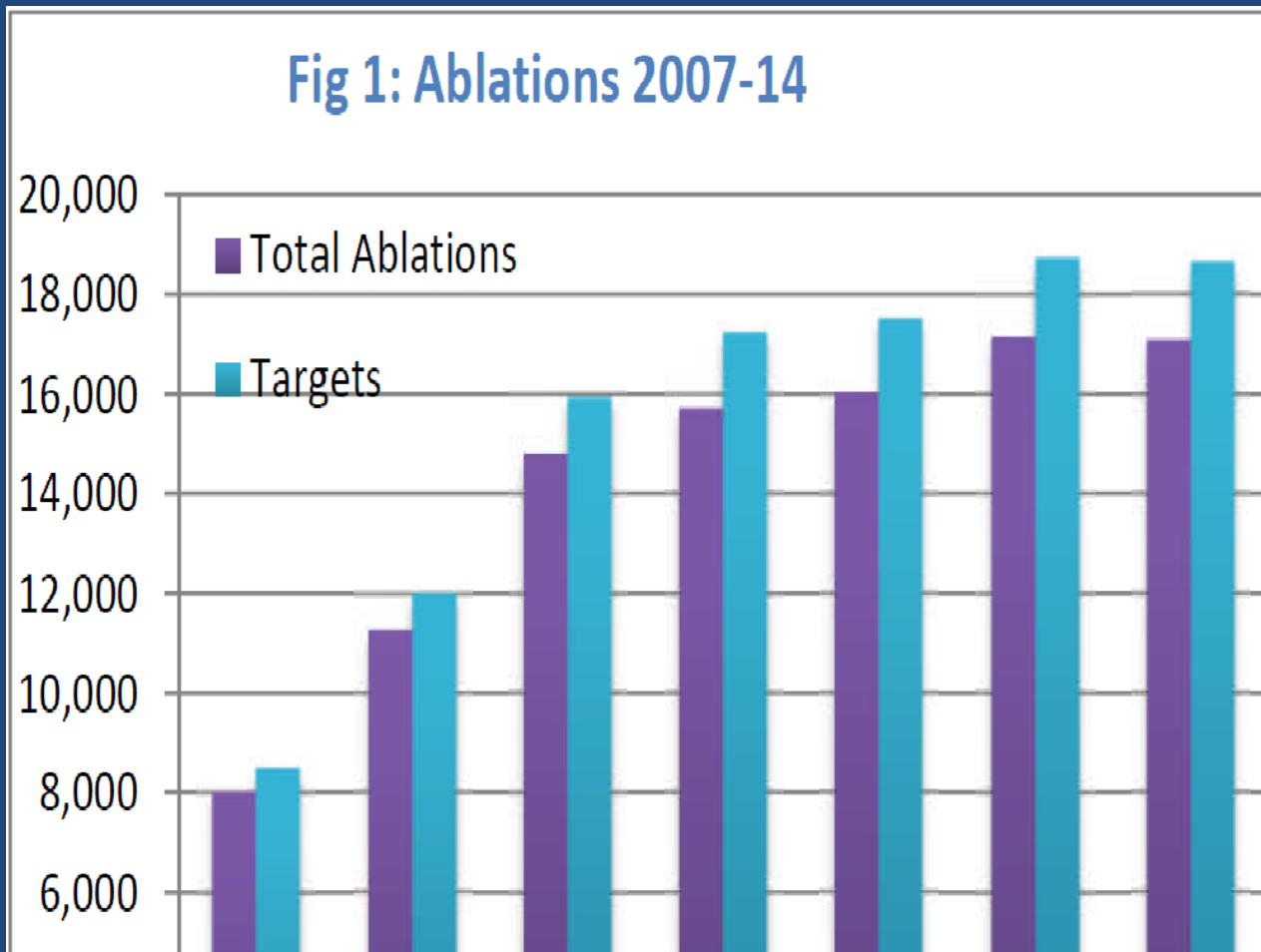
# Who needs an ablation?

- Patients with arrhythmias requiring control where creating lesions will achieve that
- There are risks so patient selection is important
  - Dangerous arrhythmias
  - Highly symptomatic arrhythmias
  - Less symptomatic arrhythmias but still unpleasant
  - Not dangerous and asymptomatic arrhythmias with other benefits to rhythm control

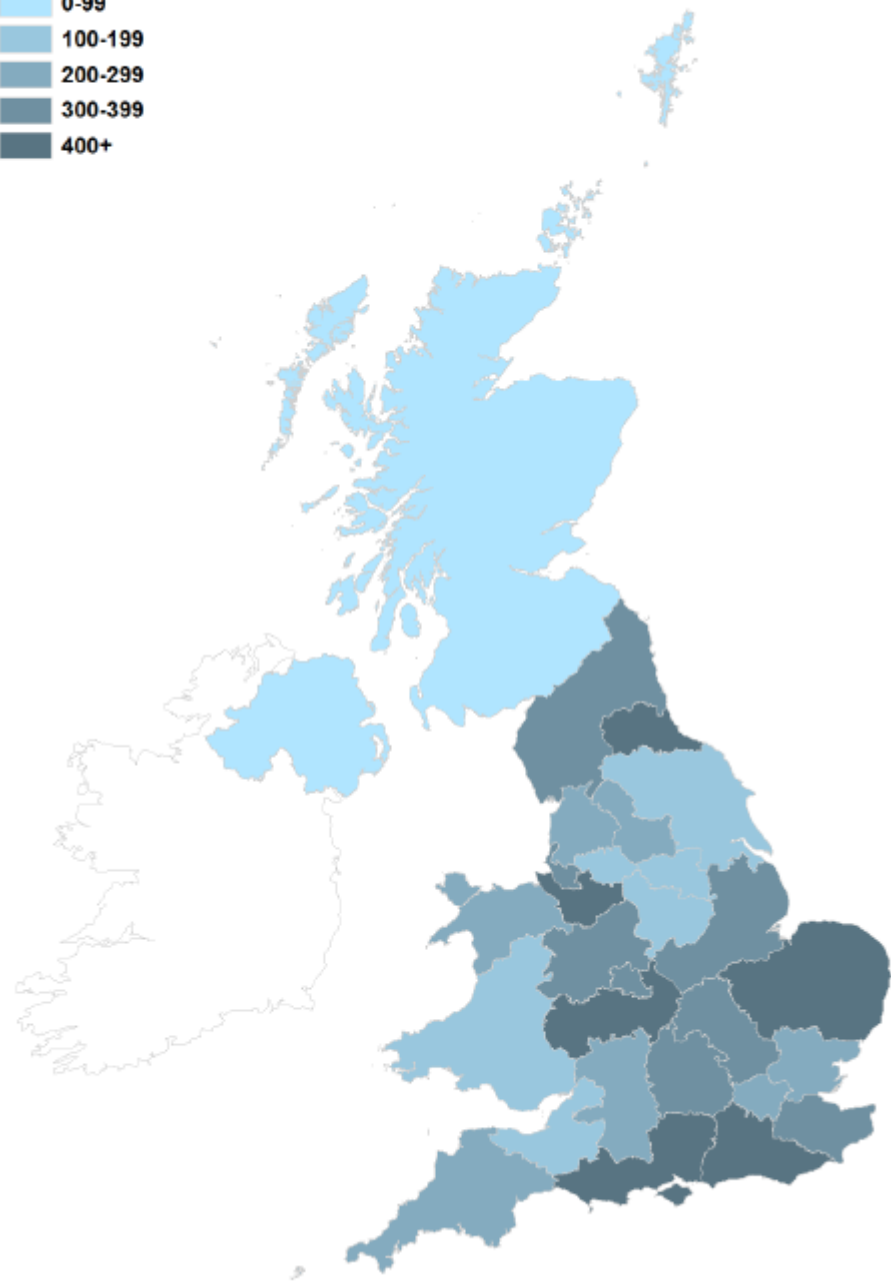
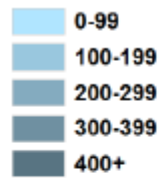
# Access to ablation

- UK access to most cardiac treatments lags behind other developed nations
- Access to specialised cardiac services has historically been particularly poor
- Large regional variations; even the regional breakdowns don't show the full picture

# UK ablations 2007-2014



Total Ablations, pmp, 2013



# Benefits of local services

- Patients have much better access to the service
  - Numbers go up
  - Waiting times go down
- Less travel for patients
- Added benefits – eg pacemakers, local expertise, better management
- Local hospital financial stability
- Professional pride
- Develop other staff groups



# Disadvantages of local services

- Harder to maintain quality in a smaller centre
  - Safety concerns
  - Compliance with national standards
  - Less resourcing, eg out of hours care
- The solution – as always – is collaboration

# Types of ablation

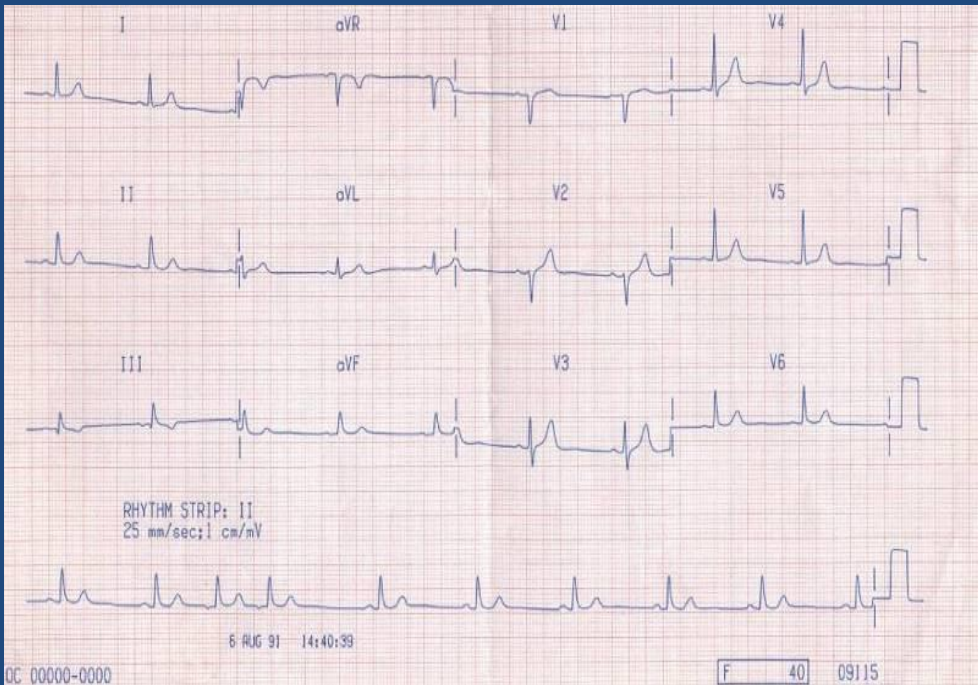
- For SVTs, the vast majority of operators will use a single 'point-by-point' catheter to ablate the target – eg slow pathway, accessory pathway, cavotricuspid isthmus
- For AF, there are 2 types of procedure – 'point-by-point' using 3D mapping systems, and using larger catheters designed to ablate a wider area of tissue with each application
- For other complex arrhythmias, 3D mapping / point by point is the main method

# Outcomes for standard ablations

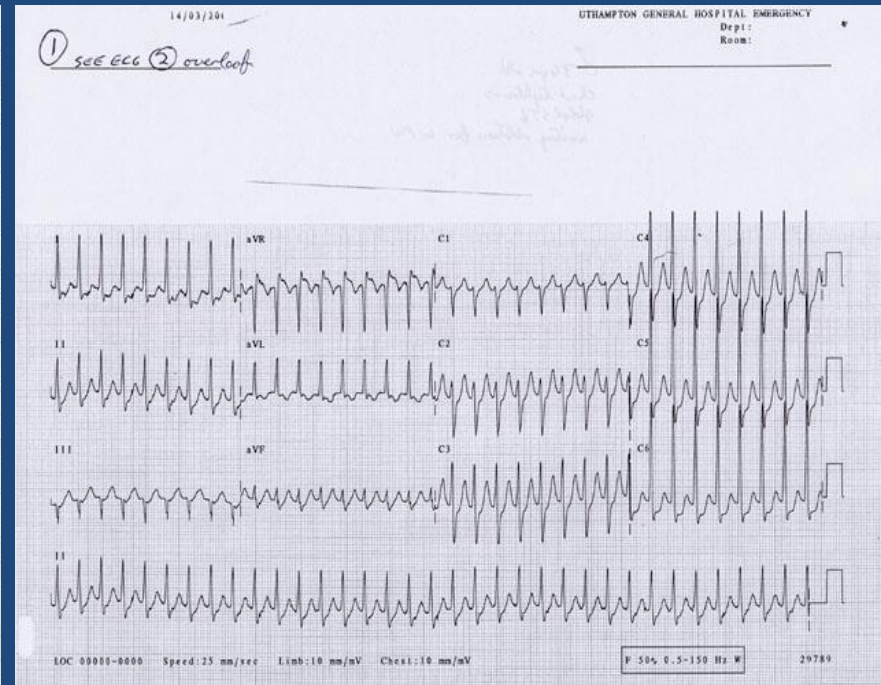
- For most 'SVTs', the arrhythmia is cured with a single low-risk procedure (eg 95% cured, 1% complication rate)
- For AF, the success rates vary from around 50% to up to 80% but a substantial minority of patients require more than one procedure and there are higher risks (eg 3-4%)
- *Most patients with SVTs or atrial flutter should be offered an ablation*
- *Most patients with AF should try medication first*

# SVTs

## Normal



## SVT

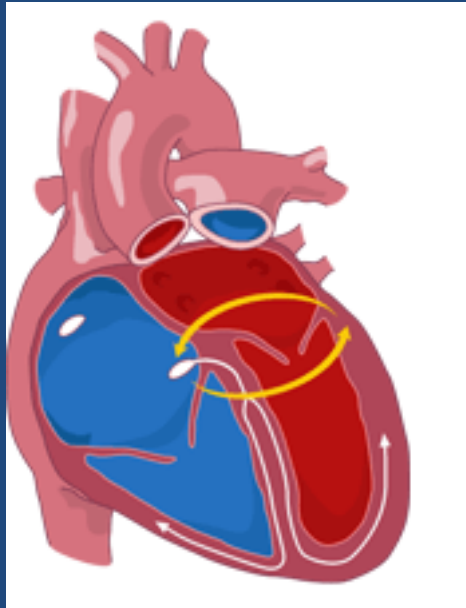


# SVT ablations

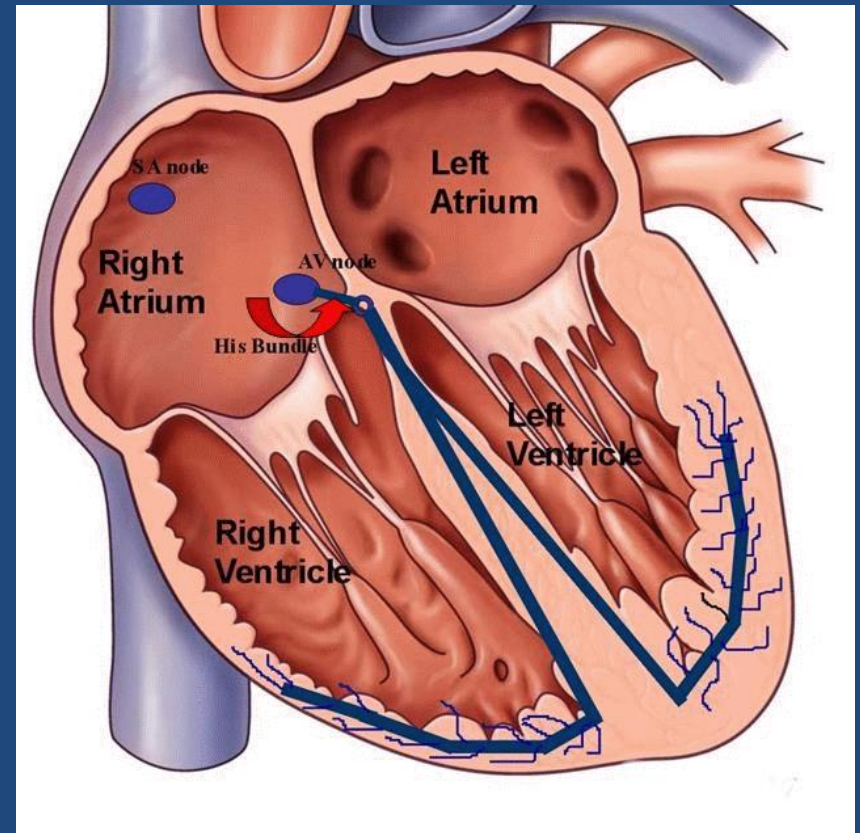
- Most are 'AV node re-entry' or accessory pathways
- Ablation involves Xray screening to show where the catheters are, combined with interpretation of the electrical signals to map the target for ablation.
- Typically takes about 1 – 2 hours to do
- Now done as a day case procedure in the vast majority of cases / centres

# Types of SVT

## Accessory pathway



## AVNRT



# Atrial fibrillation

- Most AF originates within pulmonary veins draining into the left atrium
- Electrical isolation of those veins can prevent AF
- Burning or freezing around those veins is the target of ablation

# Cryoballoon





# 3D mapping of AF

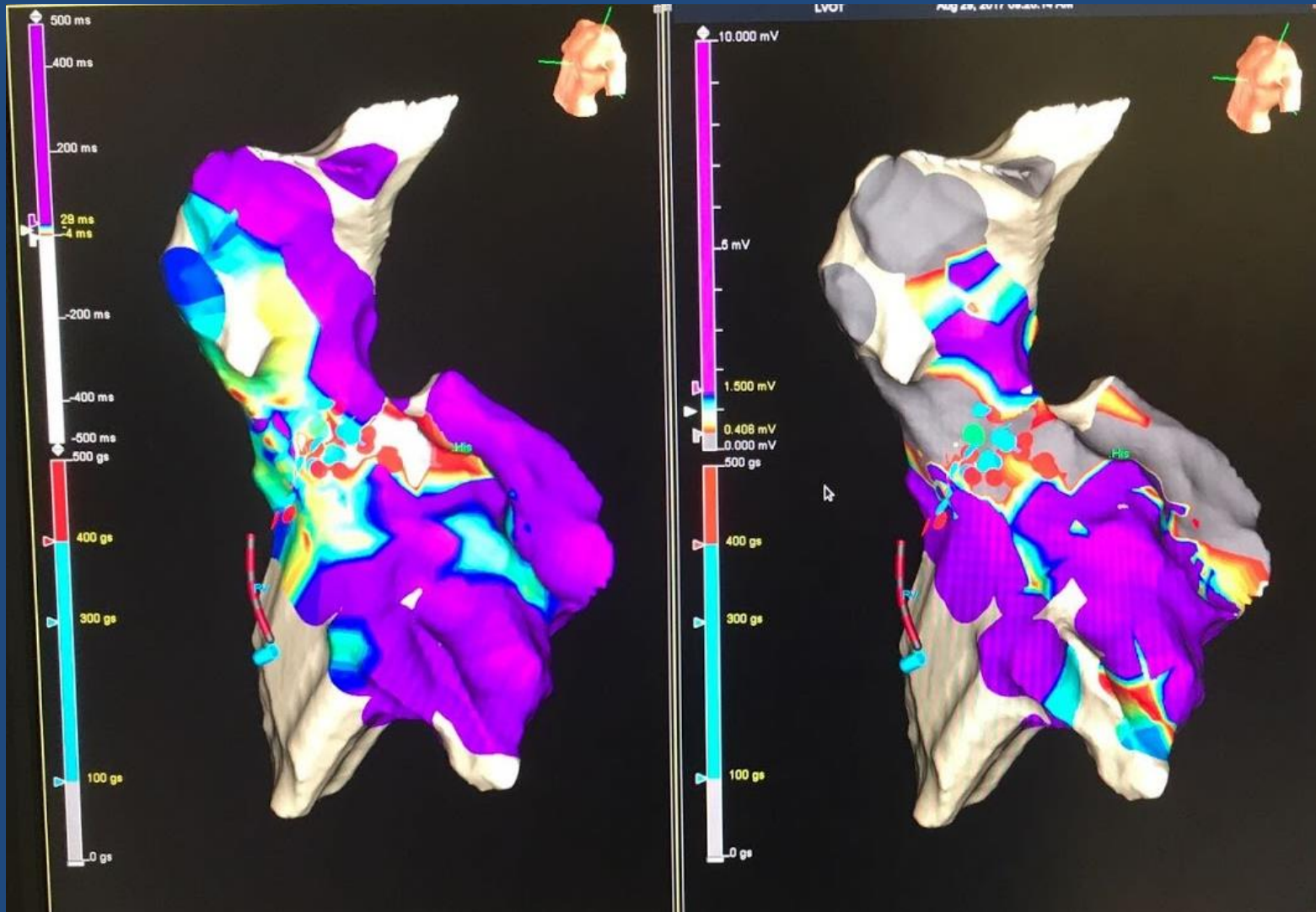


# Other arrhythmias

- Complex atrial tachycardias
- Ventricular tachycardia
- 3D mapping systems can now show the 'substrate' – ie the condition of the underlying heart cells; the activation pattern – ie the timing of the points in the circuit; and can annotate structures and where we have ablated

- Ablation catheters now give lots of information ... the electrical signals underneath, temperature achieved, contact force, and the direction of that force
- Complex arrhythmias are complex ... They require a sophisticated mapping system, expertise and patience ... Ablations can take many hours

# More 3D mapping



# Conclusions (1)

- We now have a huge variety of technologies available
  - Diagnostic catheters
  - Ablation catheters including contact force, irrigation, temperature regulation
  - 3D mapping systems
  - Macro catheters
- Ablation still requires patience and expertise

## Conclusions (2)

- Local ablation services are vital for improving access and quality of care for our patients
- Catheter ablation is usually a good option for most SVTs
- Ablation is a good option for many AF patients
- Catheter ablation can be useful for more complex arrhythmias
- Our threshold for intervention is falling as new technologies and our experience develop

Thank you for listening!

Any questions?