Right Ventricular Outflow Tract (RVOT) Best Practices for Navigant®

EPOCH

Essential elements to increase efficient use of remote magnetic navigation

Use in conjunction with established best practices in EP ablation to evaluate outcomes

RVOT Ablation Procedures

Set Up

- Placing an 8.5F SR0 sheath at the IVC/RA junction allows maximum catheter maneuverability within the ventricle or outflow tract.
- Apply a Navigant® Tricuspid Valve 3 o'clock Preset and advance the magnetic catheter into the ventricle. Next, apply a *Navigant* Pulmonic Valve Preset and advance the catheter up to the pulmonic valve.

Mapping

- Regardless of the type mapping, begin acquiring map data at the pulmonic valve using the *Navigant* Bulls Eye feature and a 2mm CAS step size. Retract the catheter each time a full circle is completed to obtain the geometry of the outflow tract while monitoring the earliest activation areas on the map. Bulls Eye settings which provide sufficient time at each catheter location to collect timing points are listed below. Adjust Bulls Eye parameters as PVC frequency and anatomy dictates.
  - Circular
  - 8 points
  - 15 deg
  - 2 sec at each position
- Many physicians employ point-by-point mapping with activation timing if the patient is experiencing frequent PVCs.
- Similarly, many physicians create FAM geometry of the outflow tract and PV location if the patient is experiencing fewer or no PVCs.
- As activation timing points are recorded, focusing on creating the most detailed anatomy in the area of interest increases automation capability during the treatment phase of the procedure.
- A CARTO® 3 system FAM resolution of 16 or 17 will help define the RVOT anatomy areas of interest.
- Similar to a manual approach, if broad areas of similar activation occur, consider widening the scope of mapping locations in an attempt to locate the site of earliest activation.

Treatment

- Ablation is delivered once the earliest activation location or best pacemap match has been defined. Consider saving sinus rhythm location with the *CARTO 3* system prior to moving the catheter away from the ablation area.

- Physicians experiencing results equivalent to their manual approaches report using power settings in a range between 25 and 35 Watts on the free wall and 35 to 50 Watts on the septum.

Confirm Treatment Effect

- Confirm acute endpoint according to standard EP practice. Ablation History data in *Navigant* and the magnetic catheter tip can assist in this process.

- If further treatment is required, the *Navigant* Click-and-Go feature will allow for easier return to previous locations if needed.

- Should it be necessary to navigate the magnetic catheter to the left side, consider the following guidance:

    - Use the transseptal approach with a large curved sheath that is extended to the mitral annulus. This provides the stability necessary to position the catheter tip in the LVOT. As well, the catheter can be advanced through the aortic valve, turned 180° in the ascending arch to allow coronary cusp mapping.

- A retrograde approach can impede stability of the magnetic catheter shaft, resulting in possible difficulty maintaining catheter location in the aorto-septal, aorto-basal or mitral-annular areas. Additionally, catheter advancement and retraction can become less responsive due to proximal catheter prolapse caused by significant catheter length outside of the sheath.

- If retrograde approach must be used, extending a long sheath close to the aortic valve can reduce limitations caused by sheath tip position.

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Mastering Micro-movements with Magnetic Catheters

If more than two vector moves are employed without associated tip response, remove the vector input(s) to eliminate high amounts of stored energy. Subsequently, retract the catheter until the attitude of the tip changes, and then re-apply the desired vector.

If more than two CAS moves are employed without associated tip response retract CAS inputs until the attitude of the tip changes, and then adjust vector to regain tip control.

CARTO 3 System FAM Mapping Resolution Settings with Magnetic Catheters

Physicians who are expert in the use of the *CARTO* 3 system with magnetic catheters and FAM mapping state that they prefer a FAM resolution of 16 or 17. Resolutions lower than 16 produce excessive interpolation between independent catheter positions resulting in a map that looks complete but lacks sufficient fidelity. Conversely, resolutions greater than 17 produce a high fidelity map but display many holes in the map surface unless additional time is taken to ensure all independent catheter positions are close enough to each other to fill holes. Thus, selecting a FAM resolution of 16 or 17 best supports efficiently creating a high fidelity map.

Variables Influencing Efficient Ablation with a NaviStar® RMT ThermoCool® Catheter (power, time, force)

- When using a magnetic catheter, the amount of force applied to the tissue remains relatively constant throughout the cardiac cycle at a median level of approximately 10 grams[1].
- With this relatively constant level of force, the remaining variables that can be adjusted are power and time. Increasing power (rather than time) is the most efficient way to heat tissue to desired temperature levels.
- During manual ablations, physicians have the ability to increase force if initial RF energy applications result in rising edema. Physicians who are expert in magnetic catheter ablation minimize risk of edema by increasing power during the ***initial*** delivery of RF energy.
- With more than 75,000 Stereotaxis magnetic procedures completed to date, increasing power is common best practice of physicians.

[1]Nakagawa et al., 2014 AF Symposium