MultiPoint™ LV Pacing

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Rhythm congress 2015
43% of CRT patients classified as non-responders or negative-responders by LVESV after 6 months (N=302)

Ypenburg et al. JACC 2009.
Addressing CRT Non-responders with MultiPoint™ Pacing (MPP)

MPP addresses the challenge of CRT non-responders by:
- Providing a method to capture a larger area
- Improving transventricular activation time\(^1\)
- Improving hemodynamics\(^2\)
- Delivering resynchronization throughout the LV\(^3\)
- Allowing for pace timing adjusted to patient needs\(^3\)

MPP may be beneficial in further increasing the number of patients that respond to CRT\(^4\)

MultiPoint™ Pacing (MPP) Flexible Programming Options
Pacing Sequences and Delays

LV First

Delay 1
5-80 ms

Delay 2
5-50 ms

LV1 → LV2 → RV
LVd → LVp → RV
LVp → LVd → RV

RV First

RV → LV1 → LV2
RV → LVd → LVp
RV → LVp → LVd
Patient from last Friday!
(1 month FU)

NHYA III→II

BNP 1500→330

EF 19% → 32%
Clinical Evidence
Clinical Experience MultiPoint™ Pacing

- 20 publications
- Demonstrated acute contractility, dyssynchrony improvement
- Started evaluation of long-term outcome: 1-mo, 3-mo, 12-mo

**single-center acute dP/dtMax assessment** (n=19)\(^1\)

**multi-center 1-mo f/u Echo LVOT VTI assessment** (10 EU centers, n=59)\(^2\)

**multi-center acute Echo dyssynchrony assessment** (7 EU centers, n=53)\(^3\)

**single-center 12-mo f/u PV Loop and echo assessment** (n=44)\(^4\)

**4 feasibility studies**\(^1-4\)
- 1 manuscript and 20 abstracts so far

2. Gutleben et al. Multisite Left Ventricular Pacing is Safe and Improves Cardiac Hemodynamic in Heart Failure Patients - Results from a 1-month Follow-up Study. Abstract HRS 2012.
Improving cardiac resynchronization therapy response with multipoint left ventricular pacing: Twelve-month follow-up study

Carlo Pappone, MD, PhD, Žarko Ćalović, MD, Gabriele Vicedomini, MD, Amarild Cuko, MD, Luke C. McSpadden, PhD, Kyungmoo Ryu, PhD, Caroline D. Jordan, PhD, Enrico Romano, BEng, Mario Baldi, MD, Massimo Saviano, MD, Alessia Pappone, MD, Raffaele Vitale, MD, Concetto Catalano, MD, Cristiano Ciaccio, MD, Luigi Giannelli, MD, Bogdan Ionescu, MD, Andrea Petretta, MD, Nikolaos Fragakis, MD, PhD, Angelica Fundaliotis, MD, Luigi Tavazzi, MD, Vincenzo Santinelli, MD

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A: LV ESV

- Graph showing % change from baseline for LV ESV for MPP and CONV.
- MPP shows a wider range of values compared to CONV.
- P-value: 0.03

B: LV EF

- Graph showing percentage point change from baseline for LV EF for MPP and CONV.
- MPP has a peak at 45% with a smaller range compared to CONV, which shows a broader distribution.
- P-value: < 0.001

C: NYHA Class Change

- Bar chart showing % patients for MPP and CONV.
- MPP has a higher % of patients in the +1 class compared to CONV.
- CONV has a higher % of patients in the -2 classes.
- Different shades indicate changes in NYHA class:
  - White: +1 class
  - Light gray: No change
  - Dark gray: -1 class
  - Black: -2 classes
What’s new?
Revolutionizing CRT Pacing Options

4 electrodes and 10 pacing configurations offer more patient management options

<table>
<thead>
<tr>
<th>Vector</th>
<th>Cathode to Anode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vector 1</td>
<td>Distal 1 to Mid 2</td>
</tr>
<tr>
<td>Vector 2</td>
<td>Distal 1 to Proximal 4</td>
</tr>
<tr>
<td>Vector 3</td>
<td>Distal 1 to RV Coil</td>
</tr>
<tr>
<td>Vector 4</td>
<td>Mid 2 to Proximal 4</td>
</tr>
<tr>
<td>Vector 5</td>
<td>Mid 2 to RV Coil</td>
</tr>
<tr>
<td>Vector 6</td>
<td>Mid 3 to Mid 2</td>
</tr>
<tr>
<td>Vector 7</td>
<td>Mid 3 to Proximal 4</td>
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<tr>
<td>Vector 8</td>
<td>Mid 3 to RV Coil</td>
</tr>
<tr>
<td>Vector 9</td>
<td>Proximal 4 to Mid 2</td>
</tr>
<tr>
<td>Vector 10</td>
<td>Proximal 4 to RV Coil</td>
</tr>
</tbody>
</table>
Step 1: Choose “Perform MPP Auto VectSelect”
RV-LV Conduction Test

Step 2: Press “Perform Measurements”
Capture Threshold Test

Step 3: Press “Measure LV Thresholds”

The RV Coil vector for each electrode is automatically selected for testing (Cap Confirm test).

User can edit vector selection.
Capture Tests in progress

Shown below: User presses the “Skip Current Vector” button when test for M3 – RVC was ongoing because PNS was noticed.

User pressed the button (ex. for PNS). It puts “Skipped” for that vector & test moves to the next vector.
Final Step: Select “Widest Spacing” and “Program” Settings
Conclusion

• Multipoint pacing has shown acute hemodynamic benefit (Increases dP/dT)

• Automatic device optimization programming

• First randomized study shows improvement of LV function over conventionnal BiV pacing

• Further larger studies are needed to confirm these results