

1 **WHAT IS CLAIMED IS:**

2 1. A multidirectional balloon tipped catheter system for conducting His bundle sensing and
3 pacing, comprising:

4 a multidirectional catheter body having a proximal end and a distal end and including a
5 plurality of curls and flexion points for multidirectional deflections, wherein the catheter body
6 includes a plurality of lumens comprising:

7 a pacing lead lumen including an exit port at the distal end; and

8 at least one balloon lumen including a balloon port near the distal end;

9 an anchor balloon mounted to near the distal end of the catheter body, wherein the anchor
10 balloon is in fluid communication with the balloon port and wherein the anchor balloon overhangs
11 the distal end of the catheter body by a predetermined distance when the anchor balloon is inflated;

12 one or more mapping electrodes mounted to the distal end portion of the catheter body,
13 wherein the one or more mapping electrodes are configured to sense His bundle potential; and

14 a pacing lead placed in the pacing lead lumen, wherein the pacing lead is configured to
15 protrude beyond the distal end of the catheter body when the pacing lead is in use.

16 2. The multidirectional balloon tipped catheter system of claim 1 wherein the anchor balloon
17 is inflated with a fluid including air, saline, or contrast.

18 3. The multidirectional balloon tipped catheter system of claim 1 wherein the anchor balloon
19 is configured to be inflated in various sizes.

20 4. The multidirectional balloon tipped catheter system of claim 1 wherein the anchor balloon
21 is configured to expose the one or more mapping electrodes when the anchor balloon is deflated.

22 5. The multidirectional balloon tipped catheter system of claim 1 wherein the anchor balloon
23 overhangs the distal end of the catheter body by two to three millimeters when the anchor balloon
24 is inflated

25 6. The multidirectional balloon tipped catheter system of claim 1 wherein the one or more
26 mapping electrodes comprises:

27 a first mapping electrode disposed at the distal end of the catheter body; and

28 a second mapping electrode disposed on the catheter body and spaced apart from the first
29 mapping electrode, wherein the first and second mapping electrodes form a bipolar sensor.

30 7. The multidirectional balloon tipped catheter system of claim 1 wherein a diameter of the
31 pacing lead lumen is equal to or greater than 0.91 mm.

- 1 8. The multidirectional balloon tipped catheter system of claim 1 wherein a distance of a distal
2 end of the anchor balloon from the distal end of the catheter body is in a range of 10 mm to 20
3 mm when the anchor balloon is deflated.
- 4 9. The multidirectional balloon tipped catheter system of claim 1 wherein the pacing lead
5 includes a screw helix.
- 6 10. The multidirectional balloon tipped catheter system of claim 1 wherein the anchor balloon
7 is a hydrophilic balloon.
- 8 11. The multidirectional balloon tipped catheter system of claim 1 wherein the catheter body
9 is configured to be insertable into a subclavian vein or other vascular access to approach His bundle.
- 10 12. The multidirectional balloon tipped catheter system of claim 1 wherein the plurality of
11 lumens further comprises one or more wiring lumens that house electrical wires connected to the
12 one or more mapping electrodes.
- 13 13. A method for conducting His bundle sensing and pacing with a multidirectional balloon
14 tipped catheter system comprising a multidirectional catheter body, comprising:
15 inserting the catheter system into a subclavian vein or vascular access;
16 guiding the catheter system towards His bundle;
17 sensing His bundle potential with one or more mapping electrodes disposed near the distal
18 end of the catheter body;
19 positioning a distal end of the catheter body at a location of the His bundle that is
20 determined to be appropriate for pacing;
21 anchoring the distal end of the catheter body at the appropriate location with inflated anchor
22 balloon, wherein the catheter system includes the anchor balloon mounted to the distal end portion
23 of the catheter body, and wherein the anchor balloon is inflated with a fluid supplied through at
24 least one balloon lumen formed in the catheter body; and
25 implanting a pacing lead into the appropriate location of the His bundle, wherein the pacing
26 lead is disposed in a pacing lead lumen formed in the catheter body and advances beyond the distal
27 end of the catheter body while being implanted into the appropriate location of the His bundle.
- 28 14. The method of claim 13 further comprising removing the catheter body while the pacing
29 lead is implanted in the His bundle.
- 30 15. The method of claim 13 wherein the anchor balloon is inflated with a fluid including air,
31 saline, or contrast.

- 1 16. The method of claim 13 wherein the anchor balloon is configured to expose the one or
2 more mapping electrodes when the anchor balloon is deflated.
- 3 17. The method of claim 13 wherein the anchor balloon overhangs the distal end of the catheter
4 body by two to three millimeters when the anchor balloon is inflated
- 5 18. The method of claim 13 wherein the one or more mapping electrodes comprises:
6 a first mapping electrode disposed at the distal end of the catheter body; and
7 a second mapping electrode disposed on the catheter body and spaced apart from the first
8 mapping electrode, wherein the first and second mapping electrodes form a bipolar sensor.
- 9 19. The method of claim 13 wherein the pacing lead includes a screw helix.
- 10 20. The method of claim 13 wherein the anchor balloon is a hydrophilic balloon.
- 11 21. The method of claim 13 wherein the catheter body include a plurality of curls and flexion
12 points for multidirectional deflections.