

CLAIMS

What is claimed is:

1. A device for vascular denervation comprising:

a catheter for insertion into a vessel;

at least one elongated catheter arm comprising alternating regions of flexible joints and rigid blocks along the at least one catheter arm, wherein each of the at least one elongated catheter arm comprises:

two or more sensors disposed on each of the at least one catheter arm, the two or more sensors comprising at least one tactile sensor and at least one temperature sensor;

at least one electrode disposed on each of the at least one catheter arm for nerve ablation; and

electrical circuitry disposed on each of the at least one catheter arm and coupled to inputs and outputs of the at least one electrode and the two or more sensors;

a tab-slot structure disposed towards at least one end of the at least one elongated catheter arm, the tab-slot structure arranged transverse to the at least one elongated catheter arm; and

at least one linkage connected to all of the at least one elongated catheter arm at substantially an end of the at least one elongated catheter arm for wrapping all of the at least one catheter arm around the catheter, wherein the linkage is formed to have a ring structure and all of the at least one catheter arm are formed radially around the ring structure of the linkage at a first end thereof such that the device is assembled by inserting the catheter through the ring structure and wrapping the at least one

catheter arm around the catheter and securing all of the at least one catheter arm to each other, at a second end distal to the first end, via the tab-slot structure.

2. The device in accordance with Claim 1 wherein each of the at least one catheter arm comprises:

at least five rigid block regions; and

at least four flexible joint regions, each of the at least five rigid block regions being separated from other ones of the at least five rigid block regions by one of the at least four flexible joint regions,

wherein each of the at least one catheter arm bends at each of the at least four flexible joint regions such that at least a central one of the at least five rigid block regions is displaced towards a wall of the vessel into which the device is inserted.

3. The device in accordance with Claim 2 wherein the sensors and electrodes are disposed on one or more of the at least five rigid block regions.

4. The device in accordance with Claim 2 wherein one of the at least one catheter arm has one or more of the at least four flexible joint regions located different lengths from an end thereof with respect to other ones of the at least one catheter arm.

5. The device in accordance with Claim 1 wherein the the at least one electrode comprises radio frequency (RF) electrodes or heaters.

6. The device in accordance with Claim 1 wherein the electrical circuitry comprises at least a multiplexer coupled by the electrical circuitry to outputs of the

two or more sensors and/or the at least one electrode for selection and forwarding an output thereof.

7. The device in accordance with Claim 3 wherein each of the at least one tactile sensor disposed on the one or more of the at least five rigid block regions comprises an impedance change element configured to use force and/or pressure sensing to detect contact with the wall of the vessel for nerve ablation at the wall by one of the at least one electrode.

8. The device in accordance with Claim 2 wherein the at least one tactile sensor is configured to detect contact with the wall of the vessel for nerve ablation at the wall in response to an extent of bending of one of the at least four flexible joint regions on which the at least one tactile sensor is disposed.

9. The device in accordance with Claim 8 wherein the at least one tactile sensor comprises an impedance change element, and wherein the at least one impedance change element is configured to detect the contact with the wall of the vessel for nerve ablation at the wall in response to the extent of bending of the one of the at least four flexible joint regions on which the at least one tactile sensor is disposed.

10. The device in accordance with Claim 1 wherein one of the at least one electrode comprises a radio frequency electrode or heater.

11. The device in accordance with any one of Claims 1 to 10, wherein the at least one elongated catheter arm comprises at least two elongated catheter arms.