WHAT IS CLAIMED IS:

1. A method of decreasing blood glucose levels within a subject, comprising:

inserting a radiofrequency (RF) ablation catheter into vasculature of the subject;

advancing the RF ablation catheter to a location of the proper hepatic artery; and

causing a therapeutically effective amount of RF energy to thermally inhibit neural communication within sympathetic nerves of a hepatic plexus surrounding the proper hepatic artery to be delivered intravascularly by the ablation catheter to the inner wall of the proper hepatic artery, thereby decreasing blood glucose levels within the subject,

wherein the RF ablation catheter comprises at least one ablation electrode, and

wherein the RF ablation catheter is configured to maintain sufficient contact pressure of the at least one electrode against the inner wall of the proper hepatic artery while the RF energy is being delivered.

2. The method of Claim 1, wherein the ablation catheter comprises a balloon catheter configured to maintain sufficient contact pressure of the at least one electrode against the inner wall of the proper hepatic artery.

3. The method of Claim 1, wherein the ablation catheter comprises a steerable distal tip configured to maintain sufficient contact pressure of the at least one electrode against the inner wall of the proper hepatic artery.

4. The method of Claim 3, wherein the steerable distal tip comprises a pre-formed shape memory configuration.

5. The method of any one of Claims 1-4, wherein the sufficient contact pressure is between about 5 g/mm^2 and about 100 g/mm^2.

6. The method of any one of Claims 1-4, wherein the sufficient contact pressure is between about 0.1 g/mm^2 and about 10 g/mm^2.

7. The method of any one of Claims 1-4, wherein the therapeutically effective amount of RF energy is in the range of between about 100 J and about 1 kJ.

8. The method of any of Claims 1-4, wherein the therapeutically effective amount of RF energy has a power level between about 0.1 W and about 10 W.

9. The method of any one of Claims 1-4, wherein the RF energy has a power level between about 3 W and about 8 W.

10. The method of any one of Claims 1-4, wherein the step of inserting the RF ablation catheter into vasculature of the subject comprises forming an incision in a femoral artery and inserting the distal end of the RF ablation catheter within the femoral artery.

11. A method of treating a subject having diabetes or symptoms associated with diabetes, comprising:

delivering a radiofrequency (RF) ablation catheter to a vicinity of a hepatic plexus within a hepatic artery branch, the RF ablation catheter comprising at least one electrode;

positioning the at least one electrode in contact with an inner wall of the hepatic artery branch; and

disrupting neural communication of sympathetic nerves of the hepatic plexus surrounding the hepatic artery branch by applying an electric signal to the at least one electrode, thereby causing thermal energy to be delivered by the at least one electrode to heat the inner wall of the hepatic artery branch.

12. The method of Claim 11, wherein the hepatic artery branch is the proper hepatic artery.

13. The method of Claim 11, wherein the hepatic artery branch is the common hepatic artery.

14. The method of any one of Claims 11-13, wherein the step of disrupting neural communication comprises permanently disabling neural communication of sympathetic nerves of the hepatic plexus.

15. The method of any one of Claims 11-13, wherein the step of disrupting neural communication comprises temporarily inhibiting or reducing neural communication along of sympathetic nerves of the hepatic plexus.

16. The method of any one of Claims 11-13, further comprising positioning the RF ablation catheter in the vicinity of the celiac plexus of the subject and disrupting neural

communication along sympathetic nerves of the celiac plexus by causing RF energy to be emitted from the at least one electrode of the RF ablation catheter.

17. The method of any one of Claims 11-13, further comprising positioning the RF ablation catheter in the vicinity of sympathetic nerve fibers that innervate the pancreas and disrupting neural communication along the sympathetic nerve fibers by causing RF energy to be emitted from the at least one electrode of the RF ablation catheter.

18. The method of any one of Claims 11-13, further comprising positioning the RF ablation catheter in the vicinity of sympathetic nerve fibers that innervate the stomach and disrupting neural communication along the sympathetic nerve fibers by causing RF energy to be emitted from the at least one electrode of the RF ablation catheter.

19. The method of any one of Claims 11-13, further comprising positioning the RF ablation catheter in the vicinity of sympathetic nerve fibers that innervate the duodenum and disrupting neural communication along the sympathetic nerve fibers by causing RF energy to be emitted from the at least one electrode of the RF ablation catheter.

20. A method of treating a subject having diabetes or symptoms associated with diabetes, comprising:

delivering a neuromodulation catheter within a hepatic artery to a vicinity of a hepatic plexus of a subject; and

modulating nerves of the hepatic plexus by causing RF energy to be emitted from one or more electrodes of the RF ablation catheter.

21. The method of Claim 20, wherein modulating the nerves of the hepatic plexus comprises denervating sympathetic nerves of the hepatic plexus.

22. The method of Claim 20, wherein modulating the nerves of the hepatic plexus comprises stimulating parasympathetic nerves of the hepatic plexus.

23. The method of Claim 20, wherein modulating the nerves of the hepatic plexus comprises denervating sympathetic nerves of the hepatic plexus and stimulating parasympathetic nerves of the hepatic plexus.

24. The method of Claim 23, wherein the step of denervating the sympathetic nerves and the step of stimulating the parasympathetic nerves are performed simultaneously.

25. The method of Claim 23, wherein the step of denervating the sympathetic nerves and the step of stimulating the parasympathetic nerves are performed sequentially.

26. An apparatus configured for hepatic neuromodulation, the apparatus comprising:

a balloon catheter configured for intravascular placement within a hepatic artery branch,

wherein the balloon catheter comprises at least one expandable balloon and a bipolar electrode pair,

wherein at least one of the bipolar electrode pair is configured to be positioned to be expanded into contact with an inner wall of the hepatic artery branch upon expansion of the at least one expandable balloon,

wherein the bipolar electrode pair is configured to deliver a thermal dose of energy configured to achieve hepatic denervation, and

wherein the dose of energy configured to be delivered to the inner wall of the hepatic artery branch is between about 100 J and 1 kJ.

27. The apparatus of Claim 26, wherein the at least one expandable balloon is configured to maintain sufficient contact pressure between the at least one electrode of the bipolar electrode pair and the inner wall of the hepatic artery branch.

28. The apparatus of Claim 27, wherein the sufficient contact pressure is between about 0.1 g/mm^2 and about 10 g/mm^2.

29. The apparatus of Claim 27, wherein the balloon catheter comprises two expandable balloons each having one electrode of the bipolar electrode pair disposed thereon.

30. The apparatus of Claim 27, wherein the balloon catheter comprises a single expandable balloon, and wherein the bipolar electrode pair is disposed on the expandable balloon.

31. The apparatus of any one of Claims 26-30, wherein the balloon comprises a cooling fluid within a lumen of the balloon.

32. An apparatus configured for hepatic neuromodulation, the apparatus comprising:

a catheter comprising a lumen and an open distal end; and

a steerable shaft configured to be slidably received within the lumen of the catheter,

wherein at least a distal portion of the steerable shaft comprises a shape memory material having a pre-formed shape configured to cause the distal portion of the steerable shaft to bend to contact a vessel wall upon advancement of the distal portion of the steerable shaft out of the open distal end of the catheter,

wherein a distal end of the steerable shaft comprises at least one electrode,

wherein the electrode is configured to be activated to deliver a thermal dose of energy configured to achieve denervation of a branch of a hepatic artery,

wherein the dose of energy configured to be delivered to the inner wall of the hepatic artery branch is between about 100 J and 1 kJ, and

wherein the shape memory material of the steerable shaft is sufficiently resilient to maintain sufficient contact pressure between the at least one electrode and an inner wall of the branch of the hepatic artery during a hepatic denervation procedure.

33. The apparatus of Claim 32, wherein the sufficient contact pressure is between about 0.1 g/mm^2 and about 10 g/mm^2.

34. The apparatus of Claim 32, wherein the outside diameter at a distal end of the catheter is smaller than the outside diameter at a proximal end of the catheter.

35. The apparatus of any one of Claims 32-34, wherein the outside diameter at the distal end of the catheter is between about 1 mm and about 4 mm.

36. The apparatus of any one of Claims 32-34, wherein the at least one electrode comprises a coating having one or more windows.

37. A method of using the apparatus of any one of Claims 26-36 to modulate nerves surrounding a branch of the hepatic artery.

38. A method of using the apparatus of any one of Claims 26-36 to treat symptoms associated with diabetes.

89. A neuromodulation kit, comprising:

a neuromodulation catheter configured to be inserted within a vessel of the hepatic system for modulating nerves surrounding the hepatic artery, the neuromodulation catheter comprising a lumen; and

a plurality of energy delivery devices configured to be inserted within the lumen of the neuromodulation catheter, each of the energy delivery devices comprising at least one modulation element at or near a distal end of the energy delivery device and each of the energy delivery devices comprising a distal portion comprising a different pre-formed shape memory configuration,

wherein the at least one modulation element is configured to be activated to modulate at least a portion of the nerves surrounding the hepatic artery to treat symptoms associated with diabetes.

What is claimed is:

1. A hepatic neuromodulation system, comprising:

an energy delivery device having a proximal end and a distal end and a lumen extending from the proximal end to the distal end, wherein the distal end of the energy delivery device is configured to facilitate navigation of hepatic arterial vasculature that is highly variable and tortuous;

a shaft configured to be advanced through the lumen of the energy delivery device comprising a proximal end and a distal end, the distal end of the shaft comprising at least one electrode, wherein the distal end of the shaft is configured to be advanced out of the distal end of the energy delivery device and positioned within a portion of a hepatic artery, wherein a distal portion of the shaft comprises a shape memory material having a pre-formed shape configured to cause the distal end of the shaft to contact an inner wall of the hepatic artery upon advancement of the distal portion of the shaft out of the distal end of the energy delivery device, wherein the shape memory material is sufficiently resilient to maintain contact between the at least one electrode and the inner wall of the hepatic artery, and wherein the at least one electrode is configured to be activated to deliver energy sufficient to modulate one or more sympathetic nerves within an adventitial layer of or surrounding the hepatic artery.

2. The system of claim 1, wherein the energy is delivered at a frequency in the range of 50 kHz to 5 MHz, and wherein the energy is delivered to heat the one or more sympathetic nerves to a temperature of up to 90 degrees Celsius and sufficient to cause ablation of the one or more sympathetic nerves.

3. The system of claim 1, further comprising a generator configured to provide power to the at least one electrode.

4. The system of claim 1, wherein said modulation comprises ablation.

5. The system of claim 1, wherein said modulation comprises denervation.

6. The system of claim 1, wherein the at least one electrode comprises a plurality of electrodes.

7. A hepatic neuromodulation system, comprising:

an energy delivery device having a body, a proximal end and a distal end;

a flexible portion at the distal end of the body configured to facilitate navigation of hepatic arterial vasculature that is highly variable and tortuous;

a pull wire configured to cause deflection of at least a portion of the distal end of the body;

at least one electrode positioned at the distal end of the body, wherein the at least one electrode is configured to be activated to deliver energy sufficient to denervate one or more sympathetic nerves within or surrounding a hepatic artery, and wherein the pull wire is configured to cause the at least one electrode to maintain continuous contact with an inner arterial wall of the hepatic artery at a target site.

8. The system of claim 7, wherein the energy delivery device comprises a catheter or a probe, and wherein the at least one electrode is a radiofrequency electrode.

9. The system of claim 7, wherein the energy is between 100 J and 1 kJ, wherein the energy has a frequency in the range of 50 kHz to 5 MHz, and wherein the energy is sufficient to cause ablation of the one or more sympathetic nerves.

10. The system of claim 7, wherein the at least one electrode comprises a bipolar electrode pair.

11. The system of claim 7, further comprising a temperature-measurement device configured to monitor temperature levels.

12. The system of claim 7, wherein the distal end of the body comprises an independently controllable bending segment configured to be deflected by the pull wire.

13. The system of claim 7, further comprising a feedback mechanism configured to facilitate confirmation of denervation of the one or more sympathetic nerves.

14. The system of claim 7, further comprising a generator configured to provide the energy to the at least one electrode.

15. A hepatic neuromodulation apparatus, comprising:

an elongate body having a proximal end and a distal end, wherein the distal end of the body comprises at least one energy delivery element, wherein the at least one energy delivery element is configured to be activated to deliver energy sufficient to achieve denervation of one or more nerves within or surrounding the portion of the hepatic artery to decrease at least one of a blood glucose level, a triglyceride level or a lipoprotein level within the subject, wherein the energy is delivered at a frequency in the range of 50 kHz to 20 MHz.

16. The apparatus of claim 15, wherein the nerves are sympathetic nerves of a hepatic plexus, and wherein the energy is delivered to heat the one or more sympathetic nerves to a temperature of up to 90 degrees Celsius and sufficient to cause ablation of the one or more sympathetic nerves.

17. The apparatus of claim 15, wherein the at least one energy delivery element comprises one or more electrodes.

18. The apparatus of claim 15, wherein the at least one energy delivery element comprises one or more ultrasound transducers.

19. The apparatus of claim 15, wherein the distal end of the body comprises a structure configured to maintain contact with an inner wall of the hepatic artery, and wherein the structure is selected from the group consisting of: a coil, a balloon, and a spring.

20. The apparatus of claim 15, wherein the distal end of the body comprises a structure configured to maintain contact with an inner wall of the hepatic artery, and wherein the structure comprises an expandable scaffold.