CLAIMS

1. A delivery device to deliver an instrument through an intravenous catheter assembly, the delivery device comprising:

a housing having a distal end and a proximal end, wherein the distal end of the housing comprises a first connector, wherein the distal end of the housing or the first connector comprises a septum to prevent fluid from flowing into the distal end of the housing; and

an instrument configured to advance distally from the housing, wherein the instrument comprises a proximal end and a distal end, wherein the distal end of the instrument comprises a fluid permeable structure, wherein the fluid permeable structure is configured to extend beyond a distal end of a catheter of the intravenous catheter assembly, wherein the instrument comprises a guidewire and a tubing, the guidewire disposed within the tubing, the tubing comprising a proximal end arranged at the proximal end of the housing, a second connector arranged at the proximal end of the tubing, and a distal end, and wherein the fluid permeable structure comprises:

an elongated core; and

a coil extending around the elongated core and coupled to the elongated core.

2. The delivery device of claim 1,

wherein the housing comprises a slot; and

wherein the delivery device further comprises:

a guidewire hub disposed within the housing, wherein the guidewire is secured to the guidewire hub, wherein the guidewire hub is configured to move along the slot to advance the guidewire in a distal direction and distal to the distal end of the housing.

3. The delivery device of claim 1, wherein the instrument comprises a rounded distal tip.

4. The delivery device of claim 1, wherein the coil is fixed to the elongated core at a plurality of positions along a length of the elongated core.

5. The delivery device of claim 1, wherein spacing between rings of the coil is generally uniform.

6. The delivery device of claim 1, wherein spacing between rings of the coil varies.

7. The delivery device of claim 1, wherein the elongated core comprises a first portion having a first outer diameter and a second portion having a second outer diameter.

8. The delivery device of claim 1, wherein the coil comprises a distal end and a proximal end, wherein the distal end of the coil is disposed distal to the distal end of the elongated core.

9. The delivery device of claim 8, wherein the distal end of the coil is open.

10. The delivery device of claim 8, wherein the distal end of the coil is closed.

11. A catheter system, comprising:

a delivery device comprising a housing having a distal end and a proximal end, wherein the distal end of the housing comprises a first connector, wherein the distal end of the housing or the first connector comprises a septum to prevent fluid from flowing into the distal end of the housing;

an instrument comprising a proximal end and a distal end, wherein the distal end of the instrument comprises a fluid permeable structure, wherein the instrument comprises a guidewire and a tubing, the guidewire disposed within the tubing, the tubing comprising a proximal end, a second connector arranged at the proximal end of the tubing, and a distal end, and wherein the fluid permeable structure comprises:

an elongated core; and

a coil extending around the elongated core and coupled to the elongated core; and

a catheter assembly coupled to the instrument, comprising:

a catheter adapter, comprising a distal end, a proximal end, a lumen extending between the distal end and the proximal end; and

a catheter secured to the catheter adapter and extending distally from the catheter adapter, wherein the catheter comprises a distal end and a proximal end,

wherein the distal end of the instrument is configured to be disposed distal to the distal end of the catheter.

12. The catheter system of claim 11, wherein the coil comprises a distal end and a proximal end, wherein the elongated core comprises a distal end and a proximal end, wherein the distal

end of the coil and the distal end of the elongated core are configured to be disposed distal to the distal end of the catheter.

13. The catheter system of claim 11, further comprising a gap between an outer diameter of the instrument and an inner diameter of the catheter.

14. A method, comprising:

coupling an instrument delivery device to an indwelling peripheral intravenous catheter at least partially disposed in a vein of a patient, the instrument delivery device comprising a housing having a proximal end and a distal end, and an instrument configured to be advanced from the housing and moved relative to the indwelling peripheral intravenous catheter, wherein the distal end of the housing comprises a first connector, wherein the distal end of the housing or the first connector comprises a septum to prevent fluid from flowing into the distal end of the housing, wherein the instrument comprises a guidewire and a tubing, the guidewire disposed within the tubing, the tubing comprising a proximal end arranged at the proximal end of the housing, a second connector arranged at the proximal end of the tubing, and a distal end, the guidewire comprising:

an elongated core; and

a coil extending around the elongated core and coupled to the elongated core.

15. The method of claim 14, further comprising:

decoupling the instrument delivery device from the indwelling peripheral intravenous catheter.