

CLAIMS

1. A catheter delivery device, comprising:

a housing, comprising a housing distal end, a housing proximal end, and a housing lumen extending through the housing distal end and the housing proximal end, wherein the housing distal end is configured to couple to a catheter assembly, wherein the housing proximal end is configured to couple to a fluid delivery device; and

a secondary catheter, comprising a secondary catheter distal end, a secondary catheter proximal end, and a secondary catheter lumen extending through the secondary catheter distal end and the secondary catheter proximal end, wherein the secondary catheter is disposed within the housing, wherein the secondary catheter is configured to move distally to an advanced position in response to a fluid pressure provided by the fluid delivery device, wherein the secondary catheter distal end is disposed distal to the housing distal end when the secondary catheter is in the advanced position, wherein the secondary catheter comprises an expanded portion, wherein a diameter of the expanded portion is greater than a diameter of a portion of the lumen, wherein the portion of the lumen contact the expanded portion when the secondary catheter is disposed in the advanced position and acts as a stop to prevent distal movement of the secondary catheter.

2. The catheter delivery device of claim 1, wherein the housing distal end comprises a male luer adapter.

3. The catheter delivery device of claim 1, wherein the housing proximal end comprises a female luer adapter.

4. The catheter delivery device of claim 1, wherein the housing comprises an extension tube.

~~5. The catheter delivery device of claim 1, wherein the secondary catheter comprises an expanded portion, wherein a diameter of the expanded portion is greater than a diameter of a portion of the lumen, wherein the portion of the lumen contacts the expanded portion when the secondary catheter is disposed in the advanced position and acts as a stop to prevent distal movement of the secondary catheter.~~

6.5. The catheter delivery device of claim 51, wherein the housing comprises an extension tube, further comprising a clamp disposed on the extension tube, wherein a position of the clamp along the extension tube is adjustable, wherein in response to placement of the clamp at the portion of the lumen, the portion of the lumen contacts the expanded portion when the secondary catheter is disposed in the advanced position and acts as a stop to prevent distal movement of the secondary catheter.

7.6. The catheter delivery device of claim 51, wherein in response to the expanded portion contacting the portion of the lumen, a seal between the expanded portion and the portion of the lumen is formed.

8.7. The catheter delivery device of claim 51, wherein an outer surface of the expanded portion comprises a first plurality of grooves or the portion of the lumen comprises a second plurality of grooves, wherein the first plurality of grooves or the second plurality of grooves are configured to allow fluid to flow from the housing proximal end through the housing distal end.

9.8. The catheter delivery device of claim 1, wherein the housing is transparent, wherein an outer surface of the secondary catheter or an outer surface of the housing comprises a plurality of markings to indicate to a clinician a position of the secondary catheter distal end.

10.9. A catheter system, comprising:
a catheter assembly, comprising:

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

a primary catheter, comprising a primary catheter distal end, a primary catheter proximal end, and a primary catheter lumen extending through the primary catheter distal end and the primary catheter proximal end, wherein the primary catheter is secured to the catheter adapter and extends distally from the catheter adapter distal end; and
a catheter delivery device, comprising:

a housing, comprising a housing distal end, a housing proximal end, and a housing lumen extending through the housing distal end and the housing proximal end, wherein the housing proximal end is configured to couple to a fluid delivery device; and

a secondary catheter, comprising a secondary catheter distal end, a secondary catheter proximal end, and a secondary catheter lumen extending through the secondary catheter distal end and secondary catheter proximal end, wherein the secondary catheter is disposed within the housing, wherein the secondary catheter is configured to move distally to an advanced position in response to a fluid pressure provided by the fluid delivery device, wherein the secondary catheter distal end is disposed distal to the primary catheter distal end when the secondary catheter is in the advanced position, wherein the primary catheter distal end comprises a distal opening that contacts an outer circumference of the secondary catheter, wherein the primary catheter distal end comprises a slit configured to be closed under normal physiological pressures or a diffuser hole.

~~11.10.~~ 11.10. The catheter system of claim ~~109~~, wherein the catheter system comprises a first fluid pathway and a second fluid pathway not in fluid communication with the first fluid pathway within the catheter system.

~~12.11.~~ 12.11. The catheter system of claim ~~110~~, wherein the catheter adapter comprises a side port, wherein the first fluid pathway extends through the side port and the primary catheter, wherein the second fluid pathway extends through the secondary catheter.

~~13.12.~~ 13.12. The catheter system of claim ~~110~~, wherein the primary catheter distal end comprises a distal opening, wherein an outer circumference of the secondary catheter is spaced apart from the

distal opening such that fluid in the first fluid pathway may flow distally between the distal opening and the secondary catheter.

~~14. The catheter system of claim 10, wherein the primary catheter distal end comprises a distal opening that contacts an outer circumference of the secondary catheter, wherein the primary catheter distal end comprises a slit configured to be closed under normal physiological pressures or a diffuser hole.~~

~~15.13.~~ The catheter system of claim ~~109~~, wherein the secondary catheter distal end comprises a slit configured to be closed under normal physiological pressures or a diffuser hole.

~~16.14.~~ The catheter system of claim ~~109~~, wherein the secondary catheter comprises a expanded portion, wherein a diameter of the expanded portion is greater than a diameter of a portion of the catheter system, wherein the portion of the catheter system contacts the expanded portion when the secondary catheter is disposed in the advanced position and acts as a stop to prevent distal movement of the secondary catheter.

~~17.15.~~ The catheter system of claim ~~109~~, wherein the secondary catheter is constructed of a softer material than the primary catheter.

~~18. A method of delivering a catheter to an indwelling catheter assembly, the method comprising:~~

~~coupling a housing to an indwelling catheter assembly, wherein the housing comprises a housing distal end, a housing proximal end, and a housing lumen extending through the housing distal end and the housing proximal end, wherein the indwelling catheter assembly comprises a catheter adapter and a primary catheter extending distally from the catheter adapter, wherein a secondary catheter is disposed within the housing; and~~

activating a fluid delivery device coupled to the housing, wherein in response to activating the fluid delivery device fluid flows in a distal direction through the housing and the indwelling catheter assembly and the fluid advances the secondary catheter through the indwelling catheter assembly.

19. — The method of claim 18, further comprising priming the housing.

20. — The method of claim 18, further comprising:

uncoupling the fluid delivery device from the housing proximal end;

coupling a blood collection device to the housing proximal end;

collecting a blood sample within the blood collection device through the secondary catheter;

uncoupling the blood collection device from the housing proximal end;

coupling another blood collection device to the housing proximal end; and

collecting another blood sample within the other blood collection device through the secondary catheter.