

CLAIMS

1. An extension set, comprising:
 - a tube, comprising a distal end, a proximal end, a lumen extending between the distal end and the proximal end, and an outer surface;
 - a distal connector coupled to the distal end of the tube;
 - a proximal connector coupled to the proximal end of the tube;
 - a patency instrument disposed within the tube; and
 - a translation handle coupled to the outer surface of the tube, wherein the translation handle is configured to move along the outer surface of the tube between a proximal position and a distal position to translate the distal end of the patency instrument between a retracted position and an advanced position, wherein in response to the distal end of the patency instrument being in the advanced position, the distal end of the patency instrument extends beyond the distal end of the tube.
2. The extension set of claim 1, wherein the patency instrument comprises a coupler element disposed within the tube, wherein the patency instrument extends distally from the coupler element, wherein the translation handle compresses a portion of the tube in between the coupler element and the translation handle, wherein the portion of the tube engages the coupler element such that movement of the translation handle along the outer surface of the tube translates the coupler element within the tube and the distal end of the patency instrument is moved between the retracted position and the advanced position.
3. The extension set of claim 2, further comprising another tube, wherein the other tube is disposed within the tube and extends through the coupler element, wherein a space

between the other tube and the tube is sealed such that fluid is prevented from entering the space, wherein the patency instrument extends through the space.

4. The extension set of claim 3, further comprising a seal adjacent the distal end of the tube, wherein the other tubing and the patency instrument extend through the seal, wherein a distal end of the space is sealed by the seal such that fluid is prevented from entering the space.
5. The extension set of claim 1, wherein the patency instrument comprises a guidewire.
6. The extension set of claim 1, wherein the translation handle comprises a plurality of ball bearings, a plurality of wheels, or a plurality of sliders to provide localized compression of the tube to engage the coupler element.
7. An extension set, comprising

a tube, comprising a distal end, a proximal end, a lumen extending between the distal end and the proximal end, and an outer surface;

a distal connector coupled to the distal end of the tube;

a proximal connector coupled to the proximal end of the tube;

a patency instrument disposed within the tube;

a translation handle coupled to the outer surface of the tube, wherein the translation handle is configured to move along the outer surface of the tube between a proximal position and a distal position to translate the distal end of the patency instrument between a retracted position and an advanced position, wherein in response to the distal end of the patency instrument being in the advanced position, the distal end of the patency instrument extends beyond the distal end of the tube; and

a fluid path disposed within a wall of the tube.

8. The extension set of claim 7, wherein the patency instrument comprises a coupler element disposed within the tube, wherein the patency instrument extends distally from the coupler element, wherein the translation handle compresses a portion of the tube in between the coupler element and the translation handle, wherein the portion of the tube engages the coupler element such that movement of the translation handle along the outer surface of the tube translates the coupler element within the tube and the distal end of the patency instrument is moved between the retracted position and the advanced position.
9. The extension set of claim 8, wherein the fluid path forms a protrusion into the lumen of the tube, wherein an outer surface of the coupler element comprises a groove aligned with the protrusion, wherein the groove extends through the coupler element.
10. The extension set of claim 8, wherein the lumen is sealed from the fluid path, wherein the patency instrument extends through the space.
11. The extension set of claim 10, further comprising a seal disposed adjacent the distal end of the tube, wherein the seal comprises a hole aligned with the fluid path, wherein the patency instrument extends through the seal, wherein the lumen is sealed from the fluid path by the seal.
12. The extension set of claim 7, wherein the patency instrument comprises a guidewire.
13. The extension set of claim 7, wherein the translation handle comprises a plurality of ball bearings or a plurality of wheels to provide localized compression of the tube to engage the coupler element.
14. The extension set of claim 7, wherein the extension set comprises a plurality of fluid paths disposed within the wall of the tube.

15. A method to provide access to a patient's vascular system, comprising:

coupling an extension set to a catheter assembly, wherein the extension set comprises:

a tube, comprising a distal end, a proximal end, a lumen extending between the distal end and the proximal end, and an outer surface;

a distal connector coupled to the distal end of the tube;

a proximal connector coupled to the proximal end of the tube;

a patency instrument disposed within the tube; and

a translation handle coupled to the outer surface of the tube, wherein the translation handle is configured to move along the outer surface of the tube between a proximal position and a distal position to translate the distal end of the patency instrument between a retracted position and an advanced position, wherein in response to the distal end of the patency instrument being in the advanced position, the distal end of the patency instrument extends beyond the distal end of the tube.

wherein coupling the extension set to the catheter assembly comprises coupling the distal end of the tube to the catheter assembly;

moving the translation handle along the tube from a proximal position to a distal position, wherein in response to the translation handle moving to the distal position, the distal end of the patency instrument extends beyond the distal end of the tube into the catheter assembly.

16. The method of claim 15, further comprising coupling a blood collection device to the proximal connector after moving the translation handle along the tube from a proximal position to a distal position.

17. The method of claim 16, further comprising after collecting blood within the blood collection device, moving the translation handle from the distal position to the proximal

position, wherein in response to moving the translation handle from the distal position to the proximal position, the distal end of the patency instrument is retracted into the tube.

18. The method of claim 15, wherein the extension set further comprises a fluid path disposed within a wall of the tube.
19. The method of claim 15, wherein the patency instrument comprises a coupler element disposed within the tube, wherein the patency instrument extends distally from the coupler element, wherein the translation handle compresses a portion of the tube in between the coupler element and the translation handle, wherein the portion of the tube engages the coupler element such that movement of the translation handle along the outer surface of the tube translates the coupler element within the tube and the distal end of the patency instrument is moved between the retracted position and the advanced position.
20. The method of claim 19, wherein the patency instrument comprises a guidewire.