CLAIMS

1. An extension set to provide access to a patient's vascular system, comprising:

a tube, comprising a proximal end, a distal end, and an outer surface;

an instrument disposed within the tube, the instrument comprising a proximal end and a distal end; 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 instrument between a retracted position and an advanced position, wherein in response to the distal end of the instrument being in the advanced position, the distal end of the instrument extends beyond the distal end of the tube,

wherein the translation handle facilitates moving of the instrument without direct contact between the translation handle and the instrument.

2. The extension set of claim 1, wherein the instrument comprises a tubing.

3. The extension set of claim 1, further comprising a fluid path assembly comprising the instrument, a proximal end, and a distal end, wherein an extension tube is coupled to the proximal end of the instrument and wherein the proximal end of the fluid path assembly comprises a proximal connector configured to connect to a blood collection device.

4. The extension set of claim 1, wherein the distal end of the tube comprises a distal connector.

5. The extension set of claim 4, wherein the distal end of the tube or the distal connector comprises a fluid seal to seal the tube.

6. The extension set of claim 1, wherein the instrument comprises a coupler element positioned within the tube, wherein the translation handle compresses a portion of the tube in between the coupler element and the translation handle in a direction orthogonal to movement of

the translation handle, wherein the portion of the tube engages with the coupler element such that movement of the translation handle along the outer surface of the tube translates the distal end of the instrument between the retracted position and the advanced position.

7. The extension set of claim 6, wherein at least one of the coupler element and the tube comprises a lubricant to facilitate translation of the instrument within the tube.

8. The extension set of claim 6, wherein the translation handle comprises at least one of a roller and a bearing to provide localized compression of the tube to engage the coupler element through the tube.

9. An extension set to provide access to a patient's vascular system, comprising:

a fluid path assembly comprising an instrument, an extension tube, and a proximal connector configured to couple to a blood collection set;

a tube comprising a proximal end, a distal end, and an outer surface, wherein a translation handle is coupled to the outer surface and configured to move between the proximal end and the distal end; and

the instrument disposed within the tube and comprising a proximal end and a distal end, wherein the proximal end of the instrument is engaged with the translation handle and configured to move between a proximal position and a distal position, wherein in response to the translation handle moving to the distal end of the tube, the distal end of the instrument extends beyond the distal end of the tube,

wherein the translation handle facilitates movement of the instrument without direct contact between the translation handle and the instrument.

10. The extension set of claim 9, wherein the instrument comprises a tubing.

11. The extension set of claim 9, wherein the fluid path assembly extends through the tube, wherein the instrument is configured to move with respect to the tube between a retracted position and an advanced position.

12. The extension set of claim 9, wherein the distal end of the tube comprises a distal connector.

13. The extension set of claim 12, wherein the distal end of the tube or the distal connector comprises a fluid seal to seal the tube.

14. The extension set of claim 9, wherein the proximal end of the instrument comprises a coupler element positioned within the tube, wherein the translation handle compresses a portion of the tube in between the coupler element and the translation handle in a direction orthogonal to movement of the translation handle, wherein the portion of the tube engages with the coupler element such that movement of the translation handle along the outer surface of the tube translates the distal end of the instrument between the retracted position and the advanced position.

15. The extension set of claim 14, wherein at least one of the coupler element and the tube comprises a lubricant to facilitate translation of the instrument within the tube.

16. The extension set of claim 14, wherein the translation handle comprises at least one of a roller and a bearing to provide localized compression of the tube to engage the coupler element through the tube.