

CLAIMS

1. A method of manufacturing a catheter assembly to prevent blood leakage through a septum of a catheter assembly when a needle is disposed within a slit of the septum, comprising providing a lubricant within a plurality of gaps disposed between an outer surface of the needle and the slit of the septum.

2. The method of claim 1, wherein the lubricant is a high viscosity lubricant having a viscosity greater than 1,000 centipoise.

3. The method of claim 1, wherein providing the lubricant within the plurality of gaps disposed between the outer surface of the needle and the slit of the septum comprises:

applying the lubricant to the outer surface of the needle prior to insertion of the needle into the slit of the septum; and

inserting the lubricated needle distally through the slit of the septum, wherein in response to insertion of the lubricated needle distally through the slit of the septum, the lubricant is deposited within the plurality of gaps.

4. The method of claim 3, wherein applying the lubricant to the outer surface of the needle prior to insertion of the needle into the slit of the septum comprises applying the lubricant to a portion of the outer surface of the needle, wherein the portion of the outer surface of the needle is configured to be disposed within the slit of the septum when the needle is in an insertion position for insertion into the patient.

5. The method of claim 1, wherein the catheter assembly comprises:

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

a catheter extending distally from the distal end of the catheter adapter;

the septum disposed within the lumen of the catheter adapter, the septum having a slit; and
a septum actuator configured to penetrate the septum in response to insertion of a medical device into the proximal end of the catheter adapter,

wherein providing the lubricant within the plurality of gaps disposed between the outer surface of the needle and the slit of the septum comprises:

applying the lubricant to a distal tip of the septum actuator prior to insertion of the septum actuator into the slit of the septum; and

inserting the lubricated septum actuator into the septum, wherein in response to inserting the lubricated septum actuator into the septum, the lubricant is deposited within the slit.

6. The method of claim 5, wherein providing the lubricant within the plurality of gaps disposed between the outer surface of the needle and the slit of the septum further comprises inserting the needle into the proximal end of the catheter adapter and through the septum actuator after inserting the lubricated septum actuator into the septum.

7. The method of claim 1, wherein providing the lubricant within the plurality of gaps disposed between the outer surface of the needle and the slit of the septum comprises dispensing the lubricant within the slit of the septum prior to insertion of the septum into the lumen of the catheter adapter.

8. The method of claim 1, wherein the slit is a Y-shaped slit, wherein the plurality of gaps includes exactly three gaps.

9. The method of claim 1, wherein the slit is a linear slit, wherein the plurality of gaps includes exactly two gaps.

10. The method of claim 1, wherein the lubricant comprises a water insoluble lubricant.

11. The method of claim 1, wherein the lubricant comprises an oil lubricant such as polydimethyl siloxane, polytrifluoropropylmethyl siloxane, or a copolymer of dimethylsiloxane and trifluoropropylmethyilsiloxane.

12. A method of operating a catheter assembly, comprising:

inserting a needle of the catheter assembly into vasculature of a patient, wherein the catheter assembly comprises:

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

a catheter extending distally from the distal end of the catheter adapter;

a septum disposed within the lumen of the catheter adapter, the septum having a slit;

the needle extending through the catheter, wherein the needle is in an insertion position for insertion into the patient, wherein a distal tip of the needle is disposed distal to a distal end of the catheter when the needle is in the insertion position; and

a lubricant disposed within a plurality of gaps disposed between an outer surface of the needle and the slit of the septum.

13. The method of claim 12, wherein in response to inserting the needle into the vasculature of the patient, blood flashback occurs between the outer surface of the needle and an inner surface of the catheter, wherein the lubricant disposed within the plurality of gaps prevents the blood flashback from penetrating the septum when the needle is disposed within the slit of the septum.

14. The method of claim 12, wherein the catheter assembly further comprises a passive needle safety mechanism, further comprising partially withdrawing the needle through the passive needle safety mechanism such that a distal tip of the needle is disposed between a distal end of the

catheter and the septum, wherein the needle extends through the septum when the needle is partially withdrawn, wherein the lubricant disposed within the plurality of gaps prevents blood disposed on an outer surface of the distal tip of the needle from penetrating the septum.

15. The method of claim 12, wherein the lubricant is a high viscosity lubricant having a viscosity greater than 1,000 centipoise.

16. The method of claim 12, wherein the lubricant comprises a water insoluble lubricant.

17. A catheter assembly, comprising:
a catheter adapter having a distal end, a proximal end, and a lumen extending between the distal end and the proximal end;
a catheter extending distally from the distal end of the catheter adapter;
a septum disposed within the lumen of the catheter adapter, the septum having a slit;
a needle extending through the catheter and the septum, wherein a distal tip of the needle is disposed distal to a distal end of the catheter when the needle is in an insertion position; and
a lubricant disposed within a plurality of gaps disposed between an outer surface of the needle and the slit of the septum, wherein the lubricant is a high viscosity lubricant having a viscosity greater than 1,000 centipoise.

18. The catheter assembly of claim 17, further comprising a passive needle safety mechanism coupled to the catheter adapter, wherein the passive needle safety mechanism allows partial withdrawal of the needle in a proximal direction with respect to the catheter adapter such that the distal tip of the needle is disposed proximal to the distal end of the catheter and distal to the septum, wherein the lubricant prevents blood leakage through the slit of the septum when the needle is partially withdrawn.

19. A catheter assembly, comprising:

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

a catheter extending distally from the distal end of the catheter adapter;

a septum disposed within the lumen of the catheter adapter, the septum having a slit;

a needle extending through the catheter and the septum, wherein a distal tip of the needle is disposed distal to a distal end of the catheter, wherein an outer surface of the needle comprises a lubricant distal to the septum, wherein the lubricant is a high viscosity lubricant having a viscosity greater than 1,000 centipoise, wherein the lubricant is absent from a plurality of gaps disposed between the outer surface of the needle and the slit of the septum.

20. The catheter assembly of claim 19, further comprising a passive needle safety mechanism coupled to the catheter adapter, wherein the passive needle safety mechanism allows partial withdrawal of the needle in a proximal direction with respect to the catheter adapter such that the distal tip of the needle is disposed proximal to the distal end of the catheter and distal to the septum, wherein the lubricant is applied to the plurality of gaps in response to the needle being partially withdrawn.

ABSTRACT OF THE DISCLOSURE

[0064] A method of preventing blood leakage through a septum of a catheter assembly when a needle is disposed within a slit of the septum may include providing a lubricant within multiple gaps disposed between an outer surface of the needle and the slit. The lubricant may include a viscosity greater than 1,000 centipoise. Providing the lubricant within the multiple gaps may include applying the lubricant to the outer surface of the needle, and inserting the lubricated needle distally through the slit of the septum. Providing the lubricant within the multiple gaps may include applying the lubricant to a tip of a septum actuator of the catheter assembly, and penetrating the septum with the lubricated septum actuator. Providing the lubricant within the plurality of gaps may include dispensing the lubricant within the slit of the septum prior to insertion of the septum into the lumen of the catheter adapter.