**WHAT IS CLAIMED IS:**

1. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip, a diameter, and a change in profile positioned adjacent to a needle tip,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within an open area or open space or a tip holding space; and

wherein the length and width of the angled distal end section are larger than the needle diameter and dimensioned so as to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle shaft,

wherein the width is from about 150% to about 300% greater than the needle diameter, and

wherein the needle guard further comprises a metal insert incorporated to the bore of the needle guard to allow contact between the metal insert and the change in profile in a protected position.

2. The safety catheter assembly of Claim 1, wherein the needle tip is prevented from moving beyond the first side edge or the second side edge by the cooperation between the length and width of the angled distal end section, the bore length and the bore diameter.

3. The needle assembly of Claim 1, wherein the metallic insert minimizes needle pivoting.

4. The safety catheter assembly of Claim 1, wherein the metallic insert is a metallic plate or sheet comprising an opening attached to the non-metallic base portion.

5. The safety catheter assembly of Claim 1, wherein the metallic insert is a metal sleeve or tube.

6. The needle assembly of Claim 1, wherein the metallic insert increases the pull off strength, detachment force, or separation force to separate the needle from the needle guard.

7. The needle assembly of Claim 6, wherein the pull off strength, detachment force, or separation force to separate the needle from the needle guard is at least 100% greater than a comparable safety IVC having a needle guard made only of the non-metallic material of the base portion.

8. The needle assembly of Claim 6 or 7, wherein the increase of pulling force allows for reduction of the size of the change in profile.

9. The needle assembly of Claim 1, wherein the change in profile is smaller than a comparable safety IVC having a needle guard made only of the non-metallic material of the base portion.

10. The needle assembly of Claim 1, wherein the change in profile is a crimp, a sleeve, a bulge or combinations thereof.

11. The safety catheter assembly of Claim 1, further comprising a tensioning member for biasing the first arm and the second toward one another.

12. The safety catheter assembly of Claim 1, further comprising a shield member made from a different material than the non-metallic material of the base portion located at the angled distal end section.

13. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip and a diameter,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within the open area or open space or needle tip holding space;

and wherein the length and width of the angled distal end section are larger than the needle diameter and, wherein the bore diameter has a close fit ratio versus the outside diameter of the needle shaft or the bore length is utilized in combination with the bore diameter to minimize the amount of pivoting and/or turning of the needle guard on the needle to retain the needle tip within the open area or open space or needle tip holding space.

14. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface;

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion; the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm and the second arm comprising a distal end most surface comprising a length and a width;

a metallic plate comprising an opening attached to the non-metallic base portion;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip and a diameter,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within an open area or open space or tip holding space; and

wherein the width of the angled distal end section of the first arm is greater than the width of the second free end between a fraction of to about 50% greater than the width of the second free end to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle.

15. The safety catheter assembly of claim 14, wherein the metallic plate is co-molded, insert molded, bonded, or laser attached to the non-metallic base portion.

16. The safety catheter assembly of claim 14, further comprising a catheter hub with an interior cavity and wherein the non-metallic base portion, the first arm and the second arm are disposed, at least in part, inside the interior cavity of the first hub.

17. The safety catheter assembly of claim 15, wherein the needle is attached to a needle hub.

18. The safety catheter assembly of claim 17, wherein the non-metallic base, the first arm and the second arm define a needle guard and wherein the catheter hub has a guard engagement section and the needle guard has a hub engagement section and wherein the two engagement sections are removably engaged to one another inside the catheter hub.

19. The safety catheter assembly of claim 14, wherein the needle comprises a change in profile near the needle tip for engaging the metallic plate.

20. The needle assembly of claim 14, wherein the metallic plate minimizes or prevents needle pivoting.

21. The safety catheter assembly of claim 14, further comprising an insert positioned in or on the angled end section of the first arm to prevent penetration through the angled end section by the needle.

22. The safety catheter assembly of claim 14, further comprising a tensioning member to bias the first arm and the second arm together.

23. A safety catheter assembly comprising:

a catheter hub with an interior cavity and having a catheter tube attached thereto;

a needle hub with a needle attached thereto projecting through the catheter hub and the catheter tube;

a needle guard disposed, at least in part, inside the interior cavity of the catheter hub, said needle guard comprising:

a non-metallic base portion comprising a wall having a bore, a proximally facing surface, and a distally facing surface;

a first arm including a first free end and a second arm including a second free end extending generally axially from the base portion in a distal direction, the first free end extending beyond the second free end and including an angled end section that extends toward the second arm,

wherein the angled distal end section comprises a length and a width sized and shaped to retain a needle having a needle diameter within an open area or open space or tip holding space as the needle guard pivots and/or turns on the needle;

wherein the length and width of the angled distal end section are larger than the needle diameter; and

wherein the width of the angled distal end section is greater than a width of the second free end and at least 125% greater than a diameter of the needle to confine the needle tip within the open area or open space or needle tip holding space.

24. The safety catheter assembly of claim 23, further comprising an insert located at the non-metallic base portion of the needle guard.

25. The safety catheter assembly of claim 24, wherein the insert is a sleeve or a plate made from a material that is harder than that used to make the needle guard.

26. The safety catheter assembly of claim 24, further comprising a crimp for engaging the insert.

27. The safety catheter assembly of claim 23, wherein the angled distal end section is at least 1.5 times larger than the width of the second free end.

28. The safety catheter assembly of claim 23, further comprising a tensioning member mounted to the needle guard, said tensioning member configured to bias the first arm and the second arm together.

29. The safety catheter assembly of claim 23, further comprising a side port located on the catheter hub.

30. A method for assembling a safety catheter assembly comprising:

providing a needle having a needle shaft, a needle tip, and a change in profile near the needle tip on a needle hub;

placing a needle guard slidably about the needle shaft; said needle guard comprising:

a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm and the second arm comprising a distal end most surface comprising a length and a width;

an open area or open space or a needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

wherein the width of the angled distal end section is greater than the width of the second free end between a fraction of to about 50% greater than the width of the second free end and cooperates with the a metallic plate located on the non-metallic base to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle; and

moving the needle guard to a proximal position on the needle shaft so that the angled end section is biased by the needle shaft and spaced from the needle tip.

31. The method of claim 30, further comprising placing the needle guard at least in part inside an interior cavity of a catheter hub, which has a catheter tube attached thereto.

32. The method of claim 30, wherein the needle shaft comprises a change in profile for engaging the metallic plate.

33. The method of claim 30, further comprising placing a tensioning member on the needle guard to bias the first arm and the second arm together.

34. The method of claim 30, further comprising an insert positioned in or on the angled end section of the first arm to prevent penetration through the angled end section by the needle.

**WHAT IS CLAIMED IS:**

1. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip, a diameter, and a change in profile positioned adjacent to a needle tip,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within an open area or open space or a tip holding space; and

wherein the length and width of the angled distal end section are larger than the needle diameter and dimensioned so as to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle shaft,

wherein the width is from about 150% to about 300% greater than the needle diameter, and

wherein the needle guard further comprises a metal insert incorporated to the bore of the needle guard to allow contact between the metal insert and the change in profile in a protected position.

2. The safety catheter assembly of Claim 1, wherein the needle tip is prevented from moving beyond the first side edge or the second side edge by the cooperation between the length and width of the angled distal end section, the bore length and the bore diameter.

3. The safety catheter assembly of Claim 1, wherein the metallic insert minimizes needle pivoting.

4. The safety catheter assembly of Claim 1, wherein the metallic insert is a metallic plate or sheet comprising an opening attached to the non-metallic base portion.

5. The safety catheter assembly of Claim 1, wherein the metallic insert is a metal sleeve or tube.

6. The safety catheter assembly of Claim 1, wherein the metallic insert increases the pull off strength, detachment force, or separation force to separate the needle from the needle guard.

7. The safety catheter assembly of Claim 6, wherein the pull off strength, detachment force, or separation force to separate the needle from the needle guard is at least 100% greater than a comparable safety IVC having a needle guard made only of the non-metallic material of the base portion.

8. The safety catheter assembly of Claim 6 or 7, wherein the increase of pulling force allows for reduction of the size of the change in profile.

9. The safety catheter assembly of Claim 1, wherein the change in profile is smaller than a comparable safety IVC having a needle guard made only of the non-metallic material of the base portion.

10. The safety catheter assembly of Claim 1, wherein the change in profile is a crimp, a sleeve, a bulge or combinations thereof.

11. The safety catheter assembly of Claim 1, further comprising a tensioning member for biasing the first arm and the second toward one another.

12. The safety catheter assembly of Claim 1, further comprising a shield member made from a different material than the non-metallic material of the base portion located at the angled distal end section.

13. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip and a diameter,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within the open area or open space or needle tip holding space;

and wherein the length and width of the angled distal end section are larger than the needle diameter and, wherein the bore diameter has a close fit ratio versus the outside diameter of the needle shaft or the bore length is utilized in combination with the bore diameter to minimize the amount of pivoting and/or turning of the needle guard on the needle to retain the needle tip within the open area or open space or needle tip holding space, and

wherein the needle guard further comprises a metal insert incorporated to the bore of the needle guard.

14. A safety catheter assembly comprising:

a needle guard having a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface;

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion; the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm and the second arm comprising a distal end most surface comprising a length and a width;

a metallic plate comprising an opening attached to the non-metallic base portion;

an open area or open space or needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

a needle having a tip and a diameter,

wherein the first arm and the second arm are biased so as to move between a ready position in which the angled end section abuts the needle and a protected position in which the needle tip is confined within an open area or open space or tip holding space; and

wherein the width of the angled distal end section of the first arm is greater than the width of the second free end between a fraction of to about 50% greater than the width of the second free end to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle.

15. The safety catheter assembly of claim 14, wherein the metallic plate is co-molded, insert molded, bonded, or laser attached to the non-metallic base portion.

16. The safety catheter assembly of claim 14, further comprising a catheter hub with an interior cavity and wherein the non-metallic base portion, the first arm and the second arm are disposed, at least in part, inside the interior cavity of the catheter hub.

17. The safety catheter assembly of claim 15, wherein the needle is attached to a needle hub.

18. The safety catheter assembly of claim 17, wherein the non-metallic base, the first arm and the second arm define a needle guard and wherein the catheter hub has a guard engagement section and the needle guard has a hub engagement section and wherein the two engagement sections are removably engaged to one another inside the catheter hub.

19. The safety catheter assembly of claim 14, wherein the needle comprises a change in profile near the needle tip for engaging the metallic plate.

20. The safety catheter assembly of claim 14, wherein the metallic plate minimizes or prevents needle pivoting.

21. The safety catheter assembly of claim 14, further comprising an insert positioned in or on the angled end section of the first arm to prevent penetration through the angled end section by the needle.

22. The safety catheter assembly of claim 14, further comprising a tensioning member to bias the first arm and the second arm together.

23. A safety catheter assembly comprising:

a catheter hub with an interior cavity and having a catheter tube attached thereto;

a needle hub with a needle attached thereto projecting through the catheter hub and the catheter tube;

a needle guard disposed, at least in part, inside the interior cavity of the catheter hub, said needle guard comprising:

a non-metallic base portion comprising a wall having a bore, a proximally facing surface, and a distally facing surface;

a first arm including a first free end and a second arm including a second free end extending generally axially from the base portion in a distal direction, the first free end extending beyond the second free end and including an angled end section that extends toward the second arm, and

an insert located at the non-metallic base portion of the needle guard;

wherein the angled distal end section comprises a length and a width sized and shaped to retain a needle having a needle diameter within an open area or open space or tip holding space as the needle guard pivots and/or turns on the needle;

wherein the length and width of the angled distal end section are larger than the needle diameter; and

wherein the width of the angled distal end section is greater than a width of the second free end and at least 125% greater than a diameter of the needle to confine the needle tip within the open area or open space or needle tip holding space.

24. The safety catheter assembly of claim 23, wherein the insert is a sleeve or a plate made from a material that is harder than that used to make the needle guard.

25. The safety catheter assembly of claim 23, further comprising a crimp for engaging the insert.

26. The safety catheter assembly of claim 23, wherein the angled distal end section is at least 1.5 times larger than the width of the second free end.

27. The safety catheter assembly of claim 23, further comprising a tensioning member mounted to the needle guard, said tensioning member configured to bias the first arm and the second arm together.

28. The safety catheter assembly of claim 23, further comprising a side port located on the catheter hub.

29. A method for assembling a safety catheter assembly comprising:

providing a needle having a needle shaft, a needle tip, and a change in profile near the needle tip on a needle hub;

placing a needle guard slidably about the needle shaft; said needle guard comprising:

a non-metallic base portion comprising a wall having a bore, a bore length, a bore diameter, a proximally facing surface, and a distally facing surface; and

a first arm including a first free end and a second arm including a second free end extending generally axially in a distal direction from the base portion, the first free end extending beyond the second free end and including an angled end section comprising a first side edge, a second side edge, a length, and a width; the angled end section extends toward the second arm and the second arm comprising a distal end most surface comprising a length and a width;

an open area or open space or a needle tip holding space defined at least in part by the base portion, the first arm, the second arm, and the angled end section;

wherein the width of the angled distal end section is greater than the width of the second free end between a fraction of to about 50% greater than the width of the second free end and cooperates with a metallic plate located on the non-metallic base to confine the needle tip within the open area or open space or needle tip holding space as the needle guard pivots and/or turns on the needle; and

moving the needle guard to a proximal position on the needle shaft so that the angled end section is biased by the needle shaft and spaced from the needle tip.

30. The method of claim 29, further comprising placing the needle guard at least in part inside an interior cavity of a catheter hub, which has a catheter tube attached thereto.

31. The method of claim 29, wherein the needle shaft comprises a change in profile for engaging the metallic plate.

32. The method of claim 29, further comprising placing a tensioning member on the needle guard to bias the first arm and the second arm together.

33 The method of claim 29, further comprising an insert positioned in or on the angled end section of the first arm to prevent penetration through the angled end section by the needle.