

CLAIMS:

1. A catheter insertion assembly comprising:
 - a) a transparent tubular member having an open proximal end and an open distal end;
 - b) a plunger assembly having a proximal end and a distal end, said plunger assembly slidable within said transparent tubular member, and said plunger assembly having a continuous tubular chamber and a vent at the distal end of the plunger assembly;
 - c) at least a partially transparent chamber needle base and a sealing member on the proximal end of the plunger assembly, said sealing member in slidable contact with a circumference of an interior surface of the transparent tubular member;
 - d) an elongated tubular needle embedded within said partially transparent chamber needle base and extending therefrom with said needle in fluid communication with said partially transparent chamber needle base through an opening in said sealing member, said needle operable to receive blood flow through the tubular needle and into the partially transparent chamber needle base;
 - e) a catheter assembly including a transparent cannula having a cannula tip, and a transparent hub attached to the proximal end of the transparent tubular member with said tubular needle operable to pass longitudinally through said cannula;
 - f) the plunger assembly having a neutral position wherein the needle base and sealing member are in contact with the proximal end of the transparent tubular member and wherein the needle is threaded through the cannula so that a needle tip extends outside of the cannula tip;
 - g) the plunger assembly having a retracted position wherein the needle tip is retracted a distance interior of the cannula tip; and
 - h) a fluid passage formed in a space between said needle and said cannula when the needle is threaded through the cannula so that when the plunger assembly is retracted, a vacuum is established within the fluid passage, and a suction is applied on the cannula tip, wherein blood is drawn into the transparent cannula starting at the cannula tip and through the fluid passage into the open proximal end of the transparent tubular member visible through the transparent hub of the cannula, so that a user can identify blood flow within the cannula before it becomes visible through the transparent hub of the cannula of the catheter assembly, the blood in the cannula

providing visible verification of proper placement of the cannula tip in a blood vessel, even in instances of low blood pressure or dehydration.

2. The catheter insertion assembly according to claim 1 wherein said transparent tubular member further comprises external ridges for gripping said transparent tubular member at the proximal end and a distal flange at the distal end.

3 The catheter insertion assembly according to claim 1 wherein the transparent tubular member comprises:

- a) lateral external ridges of descending height for gripping the tubular member; and
- b) a flanged distal end.

4. The catheter insertion assembly according to claim 1 wherein said continuous tubular chamber within the plunger assembly is vented to atmosphere through said distal end.

5. The catheter insertion assembly according to claim 1 wherein said tubular needle is threaded through a lumen of said transparent cannula.

6. The catheter insertion assembly according to claim 1 wherein displacement of said plunger assembly within said transparent tubular member defines a void between said transparent tubular member and said needle base, wherein said void pulls a suction on the cannula tip and the space between the transparent cannula and the tubular needle.

7. The catheter insertion assembly according to claim 1 wherein said plunger assembly is operable to be rotated after insertion in the blood vessel, enabling change of a rotational orientation of the tubular needle relative to said transparent tubular member.

8. A catheter insertion assembly comprising:
- a) a transparent tubular member open at each end with one mammillated proximal first end and one flanged open distal second end;
 - b) a plunger assembly slidable within said transparent tubular member, the plunger

assembly having a continuous transparent chamber, and the plunger assembly having a finger paddle and a control knob at a distal end of the plunger assembly;

c) said continuous transparent chamber of the plunger assembly in fluid communication with said control knob at the distal end of the plunger assembly;

d) a needle base and an air-tight sealing member at a proximal end of the continuous transparent chamber;

e) an elongated beveled tubular needle embedded within said needle base and extending therefrom with said needle in fluid communication with said continuous transparent chamber;

f) a catheter assembly comprising a transparent cannula with a cannula tip and a transparent hub, the transparent hub attached to said mammillated proximal first end of the transparent tubular member with said tubular needle operable to pass longitudinally through said cannula;

g) the plunger assembly operable to move within the transparent tubular member between a neutral position and one or more retracted positions, wherein in the neutral position the sealing member and needle base are in contact with the mammillated first proximal end of the transparent tubular member and the tubular needle passes longitudinally through said transparent cannula and through said cannula tip, and wherein in the one or more retracted positions the sealing member and needle base are not in contact with the mammillated proximal first end of the transparent tubular member;

h) a fluid passage formed in a space between said needle and said transparent cannula when the needle passes longitudinally through said transparent cannula; and

i) the plunger assembly operable to create a suction on the cannula tip when retracted to a said one or more retracted position, said suction drawing blood through the fluid passage and into the mammillated proximal first end, which is visible through the transparent hub of the transparent cannula as a vacuum is established within the fluid passage via retraction of the plunger assembly with the air-tight sealing member in contact with an interior surface of the tubular member, enabling a user to verify that the transparent cannula has entered a blood vessel by identifying blood flow first within the transparent cannula and then within the mammillated first proximal end visible through the transparent hub of the cannula of the catheter assembly.

9. The catheter insertion assembly according to claim 8 wherein said sealing member is in sliding contact with a circumference of the interior of said transparent tubular member.

10. The catheter insertion assembly according to claim 8 wherein displacement of said plunger assembly from said neutral position, can be done by pulling on either the finger paddle of the plunger assembly or the control knob, which retracts said tubular needle to within said cannula and defines a void between said sealing member and said mammillated end, and said void can fill with blood or fluid.

11. The catheter insertion assembly according to claim 8 wherein said continuous transparent chamber ends and is open in the control knob.

12. The catheter insertion assembly according to claim 9, wherein said continuous transparent chamber is within said plunger assembly which has at its terminal end, both the plunger assembly finger paddle and control knob, which are separated by finger grips, and wherein the both plunger finger paddle is in juxtaposition with said tubular member flanged open distal second end.

13. A catheter insertion assembly comprising:
- a) a tubular member having a first proximal end and a second distal end, and wherein the first proximal end and second distal end are open;
 - b) a plunger assembly slidable within said tubular member;
 - c) wherein the plunger assembly includes an at least partially transparent chamber, and wherein a proximal end of the plunger assembly includes a needle base and a sealing member slidable contact with a circumference of an inner surface of the tubular member;
 - d) an elongated beveled tubular needle embedded within said needle base and extending therefrom with said needle in fluid communication with said partially transparent chamber;
 - e) a catheter assembly including a cannula and hub attached to said first proximal end of the tubular member with said tubular needle operable to pass longitudinally through said cannula; and

f) a fluid passage formed between said needle and said cannula when said needle is threaded through said cannula for drawing blood flow through the fluid passage into the cannula and then into the first proximal end of the tubular member, which is visible through the hub, when a vacuum is established within the fluid passage as said plunger assembly is retracted within the tubular member so that a user can identify blood flow first in the cannula even if there is low blood pressure.

14. A method of operating an improved catheter assembly using one hand, the improved catheter assembly of the type having a plunger assembly wherein operation of the plunger assembly provides information on whether a cannula of the catheter assembly is appropriately placed in a vein, the method comprising the following steps:

- a) positioning an index finger and thumb on an exterior wall of a tubular member of the assembly, or optionally positioning said index finger on the exterior wall of the tubular member and said thumb on a flange at a distal end of the tubular member, said index finger and thumb positioned on the assembly for advancing said catheter assembly in a forward direction for insertion of the cannula in the vein;
- b) positioning a third finger on a plunger paddle portion of a plunger; and
- c) advancing the catheter assembly using the index finger and the thumb and pushing the plunger paddle portion with the third finger to cause withdrawal of the plunger in a reverse direction, thereby allowing for one handed insertion of the cannula of the catheter assembly, while at the same time and with the same hand, withdrawing the plunger of the catheter assembly for verification of proper placement of the cannula.

15. The method in claim 14, wherein a user would alternatively position the thumb dorsal on an oval tubular flange of the catheter assembly, position the index finger ventral under the tubular member and position a third finger ventral on a control knob of the catheter assembly, and then push with the thumb and pull with the third finger to withdraw the plunger from the catheter assembly.

16. The method in claim 14, wherein a rotational orientation of a beveled needle relative to the tubular member can be changed by rotating the plunger clockwise or counterclockwise.

17. A catheter insertion apparatus, of the type having a needle assembly, the needle assembly comprising;

- a) a retractable plunger assembly having a continuous tubular chamber and a vent at a distal end of the plunger assembly and having at least a partially transparent chamber needle base and a sealing member at a proximal end of the plunger assembly;
- b) a transparent tubular member open at each end;
- c) the retractable plunger assembly slidable within said tubular member;
- d) at least a partially transparent chamber needle base and sealing member on a second end of the plunger assembly, said sealing member in slidable contact with an interior wall of the transparent tubular member;
- e) an elongated tubular needle embedded within said needle base and extending therefrom with said needle in fluid communication with said transparent chamber through an opening in said sealing member; and
- f) the retractable plunger assembly retractable a sufficient distance within the tubular member so that a proximal point of the needle is shielded by the tubular member to avoid human contact.

18. The catheter insertion assembly in claim 1, wherein after use of the catheter insertion assembly, the plunger assembly is retractable a sufficient distance within the transparent tubular member so that a proximal point of the tubular needle is shielded by the transparent tubular member to avoid human contact.