

CLAIMS

1. A catheter assembly for insertion into vasculature of a patient, comprising
an over-the-needle catheter, comprising:
 - a distal tip constructed of a first material having a first durometer;
 - a first annular stepped surface having a rigid or semi-rigid first distal surface with a first uniform inner diameter, a first proximal surface with a second uniform inner diameter greater than the first uniform diameter, and a rigid or semi-rigid first transition surface disposed between the first distal surface and the first proximal surface, wherein at least the first distal surface and the first transition surface of the first annular stepped surface are part of the distal tip and constructed of the first material; and
 - an elongate tubular portion proximate and coupled to the distal tip, wherein the tubular portion is constructed of a second material, wherein a durometer of the first material is harder than a durometer of the second material, the distal tip and the tubular portion having a catheter lumen extending therethrough, wherein the first annular stepped surface is disposed within the catheter lumen; and
 - an introducer needle comprising a needle feature having a second annular stepped surface, wherein the second annular stepped surface comprises a second distal surface, a second proximal surface, and a second transition surface disposed between the second distal surface and the second proximal surface, wherein when the introducer needle is in an insertion position, the second distal surface abuts the first distal surface, the second proximal surface abuts the first proximal surface, and the second transition surface abuts the first transition surface such that proximal movement of the distal tip relative to the introducer needle is inhibited.
2. The catheter assembly of claim 1, wherein an outer surface of the distal tip is tapered.

3. The catheter assembly of claim 1, wherein the first material comprises a first plastic, wherein the second material comprises a second plastic.
4. The catheter assembly of claim 1, wherein the second proximal surface is generally cylindrical and comprises at least a portion of a groove or flat portion, further comprising a flashback pathway disposed within the catheter lumen, wherein the flashback pathway comprises the groove.
5. The catheter assembly of claim 4, wherein the second proximal surface comprises at least the portion of the groove, wherein the groove extends through the second transition surface and the second distal surface through a distal tip of the introducer needle.
6. The catheter assembly of claim 4, wherein the groove comprises a notch providing access to a needle lumen.
7. The catheter assembly of claim 1, wherein the second proximal surface is generally cylindrical, wherein the second proximal surface comprises a notch providing access to a needle lumen.
8. The catheter assembly of claim 1, wherein the second proximal surface is generally cylindrical, wherein the introducer needle further comprises a notch disposed proximal to the second proximal surface, the notch providing access to a needle lumen.
9. The catheter assembly of claim 1, wherein the second proximal surface is generally cylindrical, wherein the second proximal surface extends through a proximal end of the catheter when the introducer needle is in the insertion position.
10. The catheter assembly of claim 1, wherein the introducer needle further comprises a wall defining a needle lumen, wherein the second distal surface, the second transition surface,

the second proximal surface, and the wall of the introducer needle are monolithically formed as a single piece.

11. The catheter assembly of claim 1, wherein the introducer needle further comprises a wall defining a needle lumen, wherein the needle feature is bonded to the wall of the introducer needle to form the second transition surface and the second proximal surface.

12. The catheter assembly of claim 1, wherein the first distal surface, the first transition surface, and the first proximal surface of the first annular stepped surface are part of the distal tip and constructed of the first material.

13. An over-the-needle catheter for insertion into vasculature of a patient, comprising:

 a distal tip constructed of a first material having a first durometer;

 an annular stepped surface having a rigid or semi-rigid distal surface with a first uniform inner diameter, a proximal surface with a second uniform inner diameter greater than the first uniform diameter, and a rigid or semi-rigid transition surface disposed between the distal surface and the proximal surface, wherein at least the distal surface and the transition surface of the annular stepped surface are part of the distal tip and constructed of the first material; and

 an elongate tubular portion proximate and coupled to the distal tip, wherein the tubular portion is constructed of a second material, wherein a durometer of the first material is harder than a durometer of the second material, the distal tip and the tubular portion having a catheter lumen extending therethrough, wherein the annular stepped surface is disposed within the catheter lumen.

14. The catheter of claim 13, wherein the distal surface, the transition surface, and the proximal surface are part of the distal tip and constructed of the first material.

15. The catheter of claim 13, wherein the transition surface is disposed proximate the second material.
16. An introducer needle for insertion into vasculature of a patient, comprising:
a needle feature having an annular stepped surface, wherein the annular stepped surface comprises a distal surface, a proximal surface, and a transition surface disposed between the distal surface and the proximal surface, wherein the proximal surface is generally cylindrical.
17. The introducer needle of claim 16, wherein the proximal surface comprises at least a portion of a groove or flat portion defining a flashback pathway.
18. The introducer needle of claim 16, wherein the groove extends through the transition surface and the distal surface through a distal tip of the introducer needle or the groove comprises a notch providing access to a needle lumen.
19. The introducer needle of claim 16, wherein the proximal surface comprises a notch providing access to a needle lumen.
20. The introducer needle of claim 16, wherein the introducer needle further comprises a notch disposed proximal to the proximal surface, the notch providing access to a needle lumen.