

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.~~

CLAIMS

1. A catheter assembly for insertion into vasculature of a patient, comprising,
an over-the-needle catheter, comprising:
a first annular stepped surface having a first distal surface with a first uniform inner diameter, a first proximal surface with a second uniform inner diameter greater than the first uniform inner diameter, and a first shoulder proximate the first proximal surface and disposed between the first distal surface and the first proximal surface and perpendicular to a longitudinal axis of the catheter assembly; and
an elongate tubular portion proximate the first annular stepped surface and having the second uniform inner diameter of the first proximal surface, wherein the first shoulder, the first proximal surface, and the first distal surface are constructed of a first material with a harder durometer than a second material of the tubular portion, the over-the-needle catheter having a catheter lumen extending therethrough, wherein the first annular stepped surface is disposed within the catheter lumen; and
an introducer needle comprising a second annular stepped surface forming a distal end of a cylindrical needle feature, wherein the second annular stepped surface comprises a second distal surface, a second proximal surface, and a second shoulder disposed proximate the second proximal surface, between the second distal surface and the second proximal surface, and perpendicular to the longitudinal axis of the catheter assembly, wherein when the introducer needle is in an insertion position, the second distal surface contacts the first material of the first distal surface, the second proximal surface contacts the first material of the first proximal surface and the second material of the tubular portion, and the second shoulder contacts the first material of the first shoulder such that proximal movement of the over-the-needle catheter relative to the introducer needle is inhibited.
2. The catheter assembly of claim 1, wherein an outer surface of the first distal surface, the first shoulder, and the first proximal surface 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 comprises a groove, wherein a distal end of the groove is spaced apart from the second shoulder, wherein a proximal

end of the groove is disposed distal to a proximal end of the cylindrical needle feature, wherein the distal end of the groove contacts the second material.

5. The catheter assembly of claim 1, wherein the second proximal surface comprises a groove, wherein the groove extends through the second shoulder, through the second distal surface, and 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 introducer needle further comprises a notch disposed proximal to the cylindrical needle feature, the notch providing access to a needle lumen.

8. The catheter assembly of claim 1, wherein the second proximal surface and the cylindrical needle feature extend through a proximal end of the over-the-needle catheter when the introducer needle is in the insertion position with a sharp distal tip of the introducer needle disposed distal to the over-the-needle catheter.

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

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

11. The catheter system of claim 1, wherein the second material extends proximal to the cylindrical needle feature.

12. The catheter system of claim 4, further comprising a needle hub, wherein the cylindrical needle feature extends to the needle hub.