

CLAIMS

1. A catheter system to reduce a risk of transfixing a blood vessel, the catheter system comprising:
a catheter adapter comprising a proximal end, a distal end, and a lumen extending therebetween;
a catheter extending distally from the distal end of the catheter adapter; and
an introducer needle extending through the catheter, the introducer needle comprising:
a sharp distal tip; and
a primary bevel extending from an outer edge of the introducer needle to the sharp distal tip, wherein the outer edge is parallel to a central axis of the introducer needle and aligned with the sharp distal tip, wherein the primary bevel comprises a primary bevel angle with respect to the central axis, wherein the primary bevel angle is between 20° and 33°.
2. The catheter system of claim 1, wherein the primary bevel angle is 22.2°.
3. The catheter system of claim 1, wherein the introducer needle further comprises:
a first cut and a second cut each extending proximally from the primary bevel to an opposing outer edge directly opposing the outer edge, wherein the opposing outer edge is parallel to the central axis and the outer edge.
4. The catheter system of claim 3, wherein the secondary angle is between 18° and 26°.
5. The catheter system of claim 3, wherein the secondary angle is 22°.
6. The catheter system of claim 5, wherein the primary bevel angle is 22.2°.
7. The catheter system of claim 1, wherein the first cut is planar and the second cut is planar.

8. An introducer needle, comprising:
 - a sharp distal tip; and
 - a primary bevel extending from an outer edge of the introducer needle to the sharp distal tip, wherein the outer edge is parallel to a central axis of the introducer needle and aligned with the sharp distal tip, wherein the primary bevel comprises a primary bevel angle with respect to the central axis, wherein the primary bevel angle is between 20° and 33° .
9. The introducer needle of claim 8, wherein the primary bevel angle is 22.2° .
10. The introducer needle of claim 8, further comprising a first cut and a second cut extending proximally from the primary bevel to an opposing outer edge directly opposing the outer edge, wherein the opposing outer edge is parallel to the central axis and the outer edge.
11. The introducer needle of claim 10, wherein the secondary angle is between 18° and 26° .
12. The introducer needle of claim 10, wherein the secondary angle is 22° .
13. The introducer needle of claim 12, wherein the primary bevel angle is 22.2° .
14. The introducer needle of claim 8, wherein the first cut is planar and the second cut is planar.
15. A method for reducing a risk of blood vessel transfixion, comprising:
 - inserting an introducer needle of a catheter system into vasculature of a patient, wherein the catheter system comprises:
 - a catheter adapter comprising a proximal end, a distal end, and a lumen extending therebetween;

a catheter extending distally from the distal end of the catheter adapter; and
an introducer needle extending through the catheter, the introducer needle
comprising:

a sharp distal tip; and

a primary bevel extending from an outer edge of the introducer needle to
the sharp distal tip, wherein the outer edge is parallel to a central axis of the
introducer needle and aligned with the sharp distal tip, wherein the primary bevel
comprises a primary bevel angle with respect to the central axis, wherein the
primary bevel angle is between 20° and 33°; and

in response to the introducer needle being inserted into the vasculature, withdrawing the
introducer needle from the catheter system.

16. The method of claim 15, wherein the primary bevel angle is 22.2°.

17. The method of claim 15, wherein the introducer needle further comprises:

a first cut and a second cut extending proximally from the primary bevel to an opposing
outer edge directly opposing the outer edge, wherein the opposing outer edge is parallel to the
central axis and the outer edge.

18. The method of claim 17, wherein the secondary angle is between 18° and 26°.

19. The method of claim 17, wherein the secondary angle is 22°.

20. The method of claim 19, wherein the primary bevel angle is 22.2°.