CLAIMS

1. A bi-directional method for deploying a prosthesis, said method comprising:

providing a delivery catheter comprising a prosthesis having a proximal end and a distal end, the prosthesis in a collapsed configuration and disposed on the delivery catheter;

selecting a deployment direction for the prosthesis, wherein the deployment direction comprises radially expanding the prosthesis from the proximal end thereof to the distal end thereof, and radially expanding the prosthesis from the distal end thereof to the proximal end thereof;

removing a constraint from the prosthesis thereby permitting the prosthesis to radially expand in the selected deployment direction;

radially expanding the prosthesis from the collapsed configuration to an expanded configuration in the selected deployment direction, the expanded prosthesis being able to engage tissue of a patient when so deployed; and

withdrawing the delivery catheter to leave the prosthesis in its deployed position.

2. The method of claim 1, wherein the prosthesis comprises a first stent.

3. The method of claim 1, wherein the prosthesis comprises a second stent unattached and axially separated from the first stent by a gap.

4. The method of claim 1, wherein the delivery catheter has a proximal end, a distal end, and a lumen therebetween, and delivering the prosthesis comprises slidably advancing the delivery catheter over a guidewire disposed in the lumen.

5. The method of claim 1, wherein the prosthesis is adapted to be delievered in a vein.

6. The method of claim 5, wherein the vein comprises the iliac vein.

7. The method of claim 1, wherein the delivery catheter comprises an inner elongate shaft and a shuttle sheath disposed over the prosthesis, and selecting the deployment direction for the prosthesis comprises:

coupling the inner elongate shaft with the shuttle sheath;

distally advancing the inner elongate shaft distally thereby advancing the shuttle sheath distally away from the prosthesis; and

radially expanding the prosthesis from the proximal end thereof to the distal end thereof.

8. The method of claim 7, wherein coupling the inner elongate shaft with the shuttle sheath comprises threadably engaging the inner elongate shaft with the shuttle sheath.

9. The method of claim 7, wherein coupling the inner elongate shaft with the shuttle sheath comprises helically engaging the inner elongate shaft with the shuttle sheath.

10. The method of claim 7, wherein coupling comprises coupling the inner elongate shaft and the shuttle sheath with a bayonet coupling.

11. The method of claim 7, wherein the delivery catheter further comprises an outer elongate shaft, and selecting the deployment direction further comprises:

decoupling the outer elongate shaft from the shuttle sheath.

12. The method of claim 11, wherein decoupling the outer elongate shaft from the shuttle sheath comprise threadably disengaging the outer elongate shaft from the shuttle sheath.

13. The method of claim 11, wherein decoupling the outer elongate shaft from the shuttle sheath comprise helically disengaging the outer elongate shaft from the shuttle sheath.

14. The method of claim 11, wherein decoupling comprises releasing a bayonet coupling between the outer elongate shaft and the shuttle sheath.

15. The method of claim 1, wherein the delivery catheter comprises an outer elongate shaft and a shuttle sheath disposed over the prosthesis, and selecting the deployment direction for the prosthesis comprises:

coupling the outer elongate shaft with the shuttle sheath;

proximally retracting the outer elongate shaft thereby retracting the shuttle sheath proximally away from the prosthesis; and

radially expanding the prosthesis from the distal end thereof to the proximal end thereof.

16. The method of claim 15, wherein coupling the outer elongate shaft with the shuttle sheath comprises threadably engaging the outer elongate shaft with the shuttle sheath.

17. The method of claim 15, wherein coupling the outer elongate shaft with the shuttle sheath comprises helically engaging the outer elongate shaft with the shuttle sheath.

18. The method of claim 15, wherein coupling comprises coupling the outer elongate shaft and the shuttle sheath with a bayonet coupling.

19. The method of claim 15, wherein the delivery catheter further comprises an inner elongate shaft, and selecting the deployment direction further comprises:

decoupling the inner elongate shaft from the shuttle sheath.

20. The method of claim 19, wherein decoupling the inner elongate shaft from the shuttle sheath comprises threadably decoupling the inner elongate shaft from the shuttle sheath.

21. The method of claim 19, wherein decoupling the inner elongate shaft from the shuttle sheath comprises helically decoupling the inner elongate shaft from the shuttle sheath.

22. The method of claim 19, wherein decoupling comprises releasing a bayonet coupling between the inner elongate shaft and the shuttle sheath.

23. The method of claim 1, wherein the delivery catheter comprises a shuttle sheath disposed over the prosthesis, and removing the constraint comprises distally advancing the shuttle sheath away from the prosthesis so that the prosthesis is unconstrained from radial expansion in a direction extending from the proximal end of the prosthesis to the distal end of the prosthesis.

24. The method of claim 1, wherein the delivery catheter comprises a shuttle sheath disposed over the prosthesis, and removing the constraint comprises proximally retracting the shuttle sheath away from the prosthesis so that the prosthesis is unconstrained from radial expansion in a direction extending from the distal end of the prosthesis to the proximal end of the prosthesis.

25. The method of claim 1, wherein radially expanding the prosthesis comprises self-expanding a stent.

26. The method of claim 1, wherein the prosthesis comprises two prostheses, the method comprising:

selecting a first deployment direction for the first prosthesis;

radially expanding the first prosthesis in the first deployment direction; and

radially expanding the second prosthesis in a second deployment direction opposite of the first deployment direction.

27. The method of claim 1, further comprising visualizing the expanded prosthesis.

28. The method of claim 27, wherein visualizing comprises observing the expanded prosthesis with ultrasound or fluoroscopy.

29. The method of claim 1, further comprising retracting the radially expanded prosthesis into a shuttle sheath;

repositioning the prosthesis; and

radially expanding the prosthesis.

30. The method of claim 1, further comprising dilating the radially expanded prosthesis with an expandable member.