WHAT IS CLAIMED IS:

1. A catheter coupler, comprising:

a housing having a catheter connection lumen, a plurality of passages, and an outer circumferential channel, wherein the plurality of passages each connect the catheter connection lumen to the outer circumferential channel;

a cap rotatably coupled to the housing, wherein the cap has an outlet port in fluid communication with the outer circumferential passage; and

one or more seals that provide seals between the housing and the cap that direct fluid flow from the outer circumferential passage to the outlet port;

wherein the cap is rotatable to position the outlet port a vertical orientation without rotating the housing.

2. The catheter coupler of claim 1, wherein the outlet port is coupled to a pressure sensor.

3. The catheter coupler of any of claims 1 and 2, wherein the one or more sealing members comprise a first sealing member and a second sealing member that are positioned at least partially within grooves on the housing.

4. The catheter coupler of claim 3, wherein the first sealing member is positioned next to the outer circumferential channel on a first side, and wherein the second sealing member is positioned next to the outer circumferential channel on a second side.

5. A method of flushing a catheter coupler, comprising:

fixing a catheter to a housing;

rotating a cap while keeping the position of the housing stationary to position an outlet port of the cap in top-dead-center position;

applying a vacuum to the outlet port.

6. A delivery system comprising:

a first catheter coupler comprising:

a housing having a first catheter connection lumen, a plurality of passages, and an outer circumferential channel, wherein the plurality of passages each connect the first catheter connection lumen to the outer circumferential channel;

a cap rotatably coupled to the housing, wherein the cap has an outlet port in fluid communication with the outer circumferential passage; and

one or more seals that provide seals between the housing and the cap that direct fluid flow from the outer circumferential passage to the outlet port;

wherein the cap is rotatable to position the outlet port in a vertical orientation without rotating the housing;

a first catheter connected to the first catheter connection lumen of the first catheter coupler;

a second catheter coupler comprising:

a housing having a second catheter connection lumen, a plurality of passages, and an outer circumferential channel, wherein the plurality of passages each connect the second catheter connection lumen to the outer circumferential channel;

a cap rotatably coupled to the housing, wherein the cap has an outlet port in fluid communication with the outer circumferential passage; and

one or more seals that provide seals between the housing and the cap that direct fluid flow from the outer circumferential passage to the outlet port;

wherein the cap is rotatable to position the outlet port in a vertical orientation without rotating the housing;

a second catheter connected to the second catheter connection lumen of the second catheter coupler;

wherein the second catheter extends through the first catheter coupler and the first catheter.

7. The delivery system of claim 6 further comprising a pusher element positioned within the second catheter.

8. The delivery system of claim 7 wherein a valve implant or repair device is detachably connected to the pusher element.

9. The delivery system of any of claims 6-8 wherein the outlet port of the first catheter coupler is coupled to a pressure sensor.

10. The delivery system of any of claims 6-9 wherein the outlet port of the second catheter coupler is coupled to a pressure sensor.

11. The delivery system of any of claims 6-10, wherein the at least one seal of the first catheter coupler comprises a first sealing member and a second sealing member disposed between the housing and the cap.

12. The delivery system of claim 11, wherein the first sealing member and the second sealing member are positioned at least partially within grooves on the housing of the first catheter coupler.

13. The delivery system of any of claims 11-12, wherein the first sealing member is positioned next to the outer circumferential channel on a first side, and wherein the second sealing member is positioned next to the outer circumferential channel on a second side.

14. The delivery system of any of claims 6-13 wherein the first catheter includes a radially inwardly extending projection that maintains a flow path between the first catheter and the second catheter.

15. The delivery system of claim 14 wherein the radially inwardly extending projection contains a catheter steering wire.

16. A catheter coupler, comprising:

a catheter connection lumen;

an outer circumferential passage;

a plurality of connecting passages that each connect the catheter connection lumen to the outer circumferential passage;

an outlet port in fluid communication with the outer circumferential passage; and

wherein the outer circumferential passage and the plurality of connecting passages are sized such that when:

the outlet port is oriented in a direction that is not vertically upward;

upper ones of the connecting passages contain air; and

lower ones of the connecting passages contain liquid;

the air is drawn out of the outlet port.

17. The catheter coupler of claim 16, wherein the outlet port is coupled to a pressure sensor.

18. A delivery system comprising:

a first catheter coupler comprising:

a first catheter connection lumen;

an outer circumferential passage;

a plurality of connecting passages that each connect the catheter connection lumen to the outer circumferential passage;

an outlet port in fluid communication with the outer circumferential passage; and

wherein the outer circumferential passage and the plurality of connecting passages are sized such that when:

the outlet port is oriented in a direction not vertically upward;

upper ones of the connecting passages contain air; and

lower ones of the connecting passages contain liquid;

the air is drawn out of the outlet port. a first catheter connected to the first catheter connection lumen of the first catheter coupler;

a first catheter connected to the first catheter connection lumen of the first catheter coupler;

a second catheter coupler comprising:

a second catheter connection lumen;

an outer circumferential passage;

a plurality of connecting passages that each connect the catheter connection lumen to the outer circumferential passage;

an outlet port in fluid communication with the outer circumferential passage; and

wherein the outer circumferential passage and the plurality of connecting passages are sized such that when:

the outlet port is oriented in a direction not vertically upward;

upper ones of the connecting passages contain air; and

lower ones of the connecting passages contain liquid;

the air is drawn out of the outlet port. a first catheter connected to the first catheter connection lumen of the first catheter coupler;

a second catheter connected to the second catheter connection lumen of the second catheter coupler;

wherein the second catheter extends through the first catheter coupler and the first catheter.

19. The delivery system of claim 18 further comprising a pusher element positioned within the second catheter.

20. The delivery system of claim 19 wherein a valve implant or repair device is detachably connected to the pusher element.

21. The delivery system of any of claims 18-20 wherein the outlet port of the first catheter coupler is coupled to a pressure sensor.

22. The delivery system of any of claims 18-21 wherein the outlet port of the second catheter coupler is coupled to a pressure sensor.

23. The delivery system of any of claims 18-22 wherein the first catheter includes a radially inwardly extending projection that maintains a flow path between the first catheter and the second catheter.

24. The delivery system of claim 23 wherein the radially inwardly extending projection contains a catheter steering wire.