CLAIMS

1. A catheter assembly comprising:

a catheter;

a needle having a sharp distal tip; and

a catheter hub connected to the catheter having the needle passing therethrough, the catheter hub including:

a valve having a preformed opening that selectively permits or blocks a flow of fluid through the catheter;

a first inner diameter that closes the valve; and

a second inner diameter larger than the first inner diameter, the second inner diameter opening the valve; wherein

the valve is in a freely open position when the valve is axially compressed into engagement with the second inner diameter of the catheter hub and the preformed opening is unencumbered; and

the valve is in a closed position when the valve is released to engage the first inner diameter of the catheter hub and constrict the preformed opening.

2. The catheter assembly of claim 1, wherein the preformed opening comprises a molded-open slit.

3. The catheter assembly of claim 1, wherein the valve includes a bellows that moves the valve from the open position to the closed position.

4. The catheter assembly of claim 3, wherein:

the valve includes a plurality of preformed holes; and

the plurality of preformed holes is disposed between the bellows and the preformed opening.

5. The catheter assembly of claim 1, wherein the catheter hub further includes a side port.

6. The catheter assembly of claim 5, wherein an angle between a centerline of the side port and a centerline of the catheter hub is less than 90 degrees.

7. The catheter assembly of claim 5, wherein the valve engages the side port to selectively permit or block a flow of fluid through the side port.

8. The catheter assembly of claim 5, wherein the valve selectively permits or blocks a flow of fluid from the catheter and the side port independently.

9. The catheter assembly of claim 1, wherein the valve includes a plurality of axial flow channels.

10. The catheter assembly of claim 1, further comprising a compression ring that compresses the valve to the catheter hub to prevent a flow of fluid from leaking out of the catheter hub.

11. The catheter assembly of claim 1, further comprising an O-ring that seals the valve to the catheter hub to prevent a flow of fluid from leaking out of the catheter hub.

12. The catheter assembly of claim 1, wherein a portion of an inner diameter at a proximal end of the catheter hub does not contact the valve to allow a connector to be centered in the catheter assembly upon engagement with the valve.

13. The catheter assembly of claim 1, wherein:
the needle includes a reduced diameter; and
the reduced diameter of the needle engages the preformed opening of the valve during storage to minimize compression setting of the valve.

14. A catheter assembly comprising:

a catheter;

a needle having a sharp distal tip;

a catheter hub connected to the catheter having the needle passing therethrough, the catheter hub including:

a valve having a preformed opening that selectively permits or blocks a flow of fluid through the catheter,

a first inner diameter that closes the valve, and

a second inner diameter larger than the first inner diameter, the second inner diameter opening the valve, and

a needle shield that houses the needle; wherein

the valve is in an open position upon engaging the needle shield to the catheter hub and axially compressing the valve into the second inner diameter of the catheter hub; and

the valve is in a closed position upon disengaging the needle shield from the catheter assembly, thus releasing the valve to engage the first inner diameter of the catheter hub.

15. The catheter assembly of claim 14, wherein:

the needle includes a reduced diameter; and

the reduced diameter of the needle engages the preformed opening of the valve during storage to minimize compression setting of the valve.

16. The catheter assembly of claim 14, wherein the needle shield includes a tab that engages with the catheter hub when the valve is in the open position.

17. The catheter assembly of claim 16, wherein the tab of the needle shield disengages from the catheter hub when the needle is removed.

18. The catheter assembly of claim 1, wherein
the first inner diameter closes the opening in the valve; and
the second inner diameter opens the opening in the valve.

19. The catheter assembly of claim 14, wherein
the first inner diameter closes the opening in the valve; and
the second inner diameter opens the opening in the valve.