CLAIMS

1. A catheter system, comprising:

a catheter assembly, comprising:

a catheter adapter, comprising a distal end, a proximal end, an inner surface forming a lumen, the lumen extending through the distal end and the proximal end, and a side port disposed between the distal end and the proximal end;

an annular valve disposed within the lumen and aligned with the side port, wherein the annular valve seals a fluid pathway from the side port to the lumen;

a retainer ring disposed proximal and proximate the annular valve within the lumen; and

a catheter extending distally from the distal end of the catheter adapter.

2. The catheter system of claim 1, wherein the inner surface comprises an undercut, wherein the retainer ring is disposed within the undercut.
3. The catheter system of claim 1, wherein the annular valve comprises silicon.
4. The catheter system of claim 1, wherein the annular valve is cylindrical.
5. The catheter system of claim 1, wherein the retainer ring is formed by molding.
6. The catheter system of claim 1, wherein the retainer ring is plastic.
7. The catheter system of claim 1, further comprising a needle assembly, wherein the needle assembly comprises a needle hub and an introducer needle extending distally from the needle hub and through the retainer ring, the annular valve, and the catheter.
8. The catheter system of claim 1, wherein the side port extends from a top of the catheter adapter.
9. The catheter system of claim 1, wherein the side port is configured to receive a syringe.

10. The catheter system of claim 1, wherein the retainer ring is configured to reduce proximal movement of the annular valve in response to fluid infusion through the side port that opens the annular valve.