CLAIMS

We claim:

1. A blood collection system, comprising:

a needle configured to receive an evacuated blood collection tube;

an adapter configured to couple to a catheter assembly; and

a flow regulator disposed between the needle and the adapter and configured to regulate flow through a fluid pathway extending between the needle and the adapter, wherein the flow regulator changes a diameter of a portion of the fluid pathway to a non-zero amount such that all fluid must flow through the portion of the fluid pathway where the diameter has been changed.

2. The blood collection system of claim 1, wherein the flow regulator comprises a rotary element, wherein in response to the rotary element being in a first position, a portion of the fluid pathway of the blood collection system extends through the rotary element, wherein in response to rotation of the rotary element from the first position to a second position, the diameter of the portion of the fluid pathway extending through the rotary element changes.

3. The blood collection system of claim 2, wherein the rotary element comprises a plurality of holes configured to align with the fluid pathway of the blood collection system, wherein each of the plurality of holes has a different diameter.

4. The blood collection system of claim 2, wherein the rotary element comprises a curved slot extending through the rotary element, wherein an entirety of the curved slot is configured to align with the fluid pathway of the blood collection system,

wherein a width of the curved slot continuously increases such that fluid flow through the rotary element continuously changes as the rotary element is rotated.

5. The blood collection system of claim 1, further comprising tubing extending between the adapter and the needle, wherein the flow regulator comprises a clamp disposed on the tubing.

6. The blood collection system of claim 5, wherein an inner surface of the tubing comprises a plurality of ribs extending generally parallel to a longitudinal axis of the tubing.

7. The blood collection system of claim 5, wherein the clamp comprises a roller clamp.

8. The blood collection system of claim 5, wherein the clamp comprises a slide clamp.

9. The blood collection system of claim 8, wherein the slide clamp comprises:

a housing, comprising a slot;

a body extending through the slot and slidable with respect to the housing between a first position and a second position, wherein a bottom of the body comprises a first surface, a second surface, and a third surface disposed between the first surface and the second surface, wherein the first surface and the second surface are generally parallel to a longitudinal axis of the tubing, wherein the third surface is angled with respect to the longitudinal axis of the tubing, wherein the second surface is closer to the tubing than the first surface; and

a roller pin disposed between the body and the tubing, wherein in response to the body being in the first position, the roller pin contacts the first surface and the tubing, wherein in response to the body sliding from the first position to the

second position, the roller pin moves from the first surface along the third surface to the second surface and decreases fluid flow through the tubing.

10. The blood collection system of claim 1, wherein the flow regulator comprises a slide valve, wherein the slide valve comprises a housing and a body slidable with respect to the housing between a first position and a second position, wherein the housing comprises a first end, a second end, and a lumen extending through the first end and the second end, wherein the first end of the housing comprises an opening, wherein an outer surface of the body comprises a plurality of channels, wherein in response to the body being in the first position, fluid is configured to flow through a gap between an outer surface of the body and the housing and through the opening, wherein in response to the housing being in the second position, fluid is configured to flow through at least one of the plurality of channels and through the opening but does not flow through the gap.

11. The blood collection system of claim 1, wherein the flow regulator comprises a stopcock.

12. The blood collection system of claim 1, wherein the flow regulator comprises a squeeze valve.

13. The blood collection system of claim 1, further comprising a blood collection tube receptacle, wherein the blood collection tube receptacle surrounds the needle.

14. The blood collection system of claim 1, further comprising the catheter assembly, wherein the catheter assembly comprises:

a catheter adapter, comprising a distal end, a proximal end, and a lumen extending through the distal end of the catheter adapter and the proximal end of the catheter adapter; and

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