CLAIMS

We claim:

1. A vacuum tube receiver comprising:

a housing having a proximal end and a distal end and forming a hollow interior, the proximal end forming a proximal opening for receiving a vacuum tube into the hollow interior, the distal end forming an adapter for coupling the vacuum tube receiver to an intravenous system; ~~and~~

a spike that extends proximally into the hollow interior, the spike including an opening and forming a blood flow path; and

an insertion depth control component that includes a stop member, the insertion depth control component being coupled to the housing and being configured to move between a withdrawn position and an inserted position, wherein, when the insertion depth control component is in the inserted position, the stop member limits insertion of the vacuum tube into the hollow interior.

2. The vacuum tube receiver of claim 1, wherein the opening is an elongated opening having a constant width.

3. The vacuum tube receiver of claim 1, wherein the opening is an elongated opening that includes a proximal portion having a distally increasing width and a distal portion.

4. The vacuum tube receiver of claim 3, wherein the distal portion has a constant width that matches a maximum width of the proximal portion.

5. The vacuum tube receiver of claim 3, wherein, when the insertion depth control component is in the inserted position, the stop member causes at least an initial length of the proximal portion to extend beyond a septum of the vacuum tube that is positioned against the stop member but prevents the distal portion from extending beyond the septum.

6. The vacuum tube receiver of claim 5, wherein the inserted position is a first inserted position in which the stop member causes only the initial length of the proximal portion to extend beyond the septum, and wherein the insertion depth control component is also configured to move between a second inserted position, wherein, when the insertion depth control component is in the second inserted position, the stop member causes an additional length of the proximal portion to extend beyond the septum of the vacuum tube that is positioned against the stop member but prevents the distal portion from extending beyond the septum.

7. The vacuum tube receiver of claim 1, wherein the spike further includes a second opening that is spaced distally from the opening.

8. The vacuum tube receiver of claim 7, wherein, when the insertion depth control component is in the inserted position, the stop member limits insertion of a vacuum tube into the hollow interior so that only the opening of the spike extends beyond a septum of the vacuum tube, whereas, when the insertion depth control component is in the withdrawn position, the stop member does not limit insertion of the vacuum tube into the hollow interior so that both the opening and the second opening of the spike extend beyond the septum of the vacuum tube.

9. The vacuum tube receiver of claim 1, further comprising:

a flow control component having a shaft that inserts into a distal end of the spike and a head that is positioned overtop the distal end of the spike, the head forming channels through which blood flows to enter the spike.

10. The vacuum tube receiver of claim 9, wherein the head is formed of a flexible material to thereby enable the head to flex in a proximal direction overtop the distal end of the spike when the spike pierces a vacuum tube, wherein, as the head flexes in the proximal direction, an effective size of the channels is reduced to thereby limit the flow of blood into the spike.

11. The vacuum tube receiver of claim 1, wherein the blood flow path that the spike forms is a primary blood flow path, the vacuum tube receiver further comprising:

a secondary blood flow path; and

a stopper that is configured to move from an initial position in which the stopper blocks the secondary blood flow path to a subsequent position in which the stopper does not block the secondary blood flow path, wherein the primary blood flow path is configured to cause the stopper to move from the initial position to the subsequent position.

12. The vacuum tube receiver of claim 11, further comprising:

a second spike that forms the secondary blood flow path.

13. The vacuum tube receiver of claim 1, further comprising:

a vacuum tube having a septum forming a vacuum seal at a distal end of the vacuum tube and one or more additional septums that are proximally spaced from the septum, each additional septum forming a vacuum seal within the vacuum tube;

wherein a length of the spike is sufficient to pass through the septum and each of the one or more additional septums when the vacuum tube is inserted into the hollow interior of the housing.

14. The vacuum tube receiver of claim 1, wherein the spike extends proximally a first distance into the hollow interior, the vacuum tube receiver further comprising:

a second spike that extends proximally a second distance into the hollow interior, the first distance being greater than the second distance, the second spike also forming a blood flow path.

15. A vacuum tube receiver comprising:

a housing having a proximal end and a distal end and forming a hollow interior, the proximal end forming a proximal opening for receiving a vacuum tube into the hollow interior, the distal end forming an adapter for coupling the vacuum tube receiver to an intravenous system; and

a first spike that extends proximally into the hollow interior, the first spike forming a first blood flow path;

a second spike that extends proximally into the hollow interior, the second spike forming a second blood flow path; and

an insertion depth control component that includes a stop member, the insertion depth control component being coupled to the housing and being configured to move between a

withdrawn position and an inserted position, wherein, when the insertion depth control component is in the inserted position, the stop member limits insertion of the vacuum tube into the hollow interior.

16. The vacuum tube receiver of claim 15, wherein the first spike extends proximally a first distance into the hollow interior and the second spike extends proximally a second distance into the hollow interior, the first distance being greater than the second distance.

17. The vacuum tube receiver of claim 16, wherein, when the insertion depth control component is in the inserted position, the stop member causes the first spike to extend beyond a septum of the vacuum tube that is positioned against the stop member but prevents the second spike from extending beyond the septum.

18. The vacuum tube receiver of claim 15, further comprising:

a stopper that is configured to move from an initial position in which the stopper blocks the second blood flow path to a subsequent position in which the stopper does not block the second blood flow path, wherein the first spike includes an opening that causes vacuum pressure within the first blood flow path to pull the stopper from the initial position to the subsequent position.

19. A vacuum tube receiver comprising:

a housing having a proximal end and a distal end and forming a hollow interior, the proximal end forming a proximal opening for receiving a vacuum tube into the hollow interior, the distal end forming an adapter for coupling the vacuum tube receiver to an intravenous system;

a spike that extends proximally into the hollow interior, the spike including an elongated opening that extends along an outer surface of the spike, the elongated opening having a proximal portion and a distal portion; and

an insertion depth control component that includes a stop member, the insertion depth control component being coupled to the housing and being configured to move between a withdrawn position and an inserted position, wherein, when the insertion depth control component is in the inserted position, the stop member limits insertion of the vacuum tube into the hollow interior.

20. The vacuum tube receiver of claim 19, wherein, when the insertion depth control component is in the inserted position, the stop member limits insertion of a vacuum tube into the hollow interior so that the distal portion of the slotted opening does not extend beyond a septum of the vacuum tube.