

Claims:

1. A volume indicator for a syringe, the syringe comprising a syringe body and a plunger received in the syringe body, the volume indicator comprising:

an indicator body configured to receive the syringe body;

a window portion extending through a thickness of the indicator body such that a portion of the syringe plunger in the syringe body is visible through the window portion, the indicator body comprising inflation indicia disposed adjacent the window portion; and

one or more engagement elements configured to engage corresponding elements extending radially from an outer surface of the syringe body to restrain the volume indicator from rotational and axial movement relative to the syringe body, the one or more engagement elements arranged on the indicator body such that the indicator body can be coupled to the syringe body in only one orientation, the one or more engagement elements comprising deflectable arms configured to form a snap fit at least partially around the corresponding elements on the syringe body; and

wherein the indicator body is configured to removably clip onto the syringe body.

~~2. The volume indicator of claim 1, further comprising inflation indicia adjacent the window portion.~~

~~32.~~ The volume indicator of claim ~~21~~, wherein the inflation indicia comprise protrusions extending at least partially across the window portion.

~~43.~~ The volume indicator of claim ~~21~~, wherein the inflation indicia comprise bands extending across the window portion.

~~54.~~ The volume indicator of any preceding claim, wherein the indicator body is at least partially opaque.

~~65.~~ The volume indicator of any preceding claim, wherein the window portion is positioned between a first end of the indicator body and a second end of the indicator body and extends less than the full length of the indicator body.

6. The volume indicator of claim 1, wherein the one or more engagement elements are disposed on a longitudinal edge of the indicator body.

7. The volume indicator of claim 1, wherein the one or more engagement elements comprise first, second, and third engagement elements spaced axially apart from one another along a longitudinal edge of the indicator body, and wherein the distance between the first and second engagement elements is different than the distance between the second and third engagement elements such that the volume indicator can be disposed on the syringe body only in a selected orientation.

8. The volume indicator of claim 1, wherein the indicator body is configured to removably clip onto the syringe body by urging the syringe body through the opening such that the indicator body deflects to allow the syringe body to pass through, and wherein the one or more engagement elements are configured to removably clip onto the corresponding elements by urging a respective corresponding element through a respective pair of deflectable arms.

9. The volume indicator of claim 1, further comprising a gripping portion disposed on the indicator body.

10. A volume indicator for a syringe, the syringe comprising a syringe body and a plunger received in the syringe body, the volume indicator comprising:

an indicator body having a curved C-shape in cross-section defining an opening;
a window portion extending through a thickness of the indicator body such that a portion of the plunger in the syringe body is visible through the window portion;

a plurality of engagement elements comprising first, second, and third engagement elements disposed axially along a length of the indicator body, the distance between the first and second engagement elements being different than the distance between the second and third engagement elements such that the engagement elements are configured to engage corresponding elements on the syringe body such that the volume indicator can be disposed

on the syringe body only in a selected axial orientation, the plurality of engagement elements being disposed on first and second opposing longitudinal edges of the indicator body; and wherein the indicator body is configured to removably clip onto the syringe body by urging the syringe body through the opening such that the indicator body deflects around the syringe body before returning to its original shape.

11. The volume indicator of claim 10, wherein the plurality of engagement elements comprise deflectable arms configured to form a snap fit connection at least partially around the corresponding elements on the syringe body.

12 The volume indicator of claim 10, wherein the first, second, and third engagement elements each comprise a pair of engagement elements each of which is disposed on a respective longitudinal edge of the indicator body.

13. The volume indicator of claim 37, further comprising a gripping portion comprising one or more ridges extending from the indicator body.

14. A volume indicator for a syringe, the syringe comprising a syringe body and a plunger received in the syringe body, the volume indicator comprising:

an indicator body having a curved C-shape in cross-section defining an opening, the indicator body comprising inflation indicia configured to correspond to a selected volume of fluid within the syringe when the plunger is aligned with a respective indicia;

a window portion extending through a thickness of the indicator body such that a portion of the plunger in the syringe body is visible through the window portion, the inflation indicia being disposed adjacent the window portion;

an engagement element configured to engage a corresponding element extending from a surface of the syringe body such that the volume indicator can be disposed on the syringe body only in a selected orientation, the engagement element comprising a circular opening extending through a thickness of the indicator body and configured to be disposed fully around the corresponding element to form a friction fit; and

wherein the indicator body is configured to removably clip onto the syringe body by urging the syringe body through the opening such that the indicator body deflects around the syringe body before returning to its original shape.

15. The volume indicator of claim 14, wherein the engagement element is a first engagement element and the volume indicator further comprises a second engagement element comprising a U-shaped cutout extending through the thickness of the indicator body, the second engagement element configured to restrain the first end portion of the indicator body against rotational motion relative to the syringe body.

~~7. — An assembly, comprising:
a syringe comprising a syringe body and a plunger, the syringe body having one or more first engagement elements;
a volume indicator comprising an indicator body and a window portion having inflation indicia along a length thereof;
the indicator body comprising one or more second engagement elements configured to engage the first engagement elements.~~

~~8. — The assembly of claim 7, wherein the window portion is configured such that a portion of the plunger within the syringe body is visible through the window portion.~~

~~9. — The assembly of claim 7 or 8, wherein the one or more first and second engagement elements are arranged on the syringe body and the indicator body such that the volume indicator can be coupled to the syringe in only one orientation.~~

~~10. — The assembly of any one of claims 7-9, wherein the one or more first engagement elements are posts having tapered sides configured to form an interference fit with the one or more second engagement elements.~~

~~11. — The assembly of any one of claims 7-10, wherein the volume indicator is configured to removably clip onto the syringe body.~~

~~12. The assembly of any one of claims 7-11, wherein the one or more first engagement elements are configured to engage the one or more second engagement elements to prevent rotational movement of the volume indicator relative to the syringe.~~

~~13. The assembly of claim 12, wherein the one or more first engagement elements are protrusions extending from an external surface of the syringe body and the one or more second engagement elements are notches sized to engage the first engagement elements.~~

~~14. A method, comprising:~~

~~placing a volume indicator on a syringe, the syringe comprising a syringe body and a plunger received in the syringe body and the volume indicator comprising an indicator body and volume indicia on the indicator body;~~

~~filling the syringe body with an amount of fluid corresponding to one of the volume indicia on the indicator body; and~~

~~fluidly connecting the syringe to a delivery apparatus for a prosthetic valve.~~

~~15. The method of claim 14, wherein the act of placing the volume indicator on the syringe comprises engaging one or more first engagement elements on the syringe body with one or more second engagement elements on the indicator body.~~

~~16. The method of any of claims 14-15, wherein the volume indicia on the indicator body are not aligned with volume indicia on the syringe body when the volume indicator is placed on the syringe.~~

~~17. The method of any of claims 14-16, wherein the volume indicator is selected from a kit of volume indicators.~~

~~18. The method of claim 17, wherein each volume indicator in the kit corresponds to a different nominal valve size.~~

~~19.—The method claim 17 or 18, wherein the kit comprises a first volume indicator corresponding to a prosthetic heart valve having a nominal size of 20 mm, a second volume indicator corresponding to a prosthetic heart valve having a nominal size of 23 mm, a third volume indicator corresponding to a prosthetic heart valve having a nominal size of 26 mm, and a fourth volume indicator corresponding to a prosthetic heart valve having a nominal size of 29 mm.~~

~~20.—An assembly, comprising:
a removable volume indicator for mounting on a syringe comprising an indicator body and inflation indicia spaced along a length thereof; and
a delivery apparatus for implanting a prosthetic heart valve, the apparatus comprising a balloon mounted on a distal portion thereof.~~

~~21.—The assembly of claim 20, further comprising a prosthetic heart valve that is expandable to an expanded functional diameter within a range of expanded diameters, wherein the inflation indicia correspond to expanded diameters of the range.~~

~~22.—A kit, comprising:
at least first and second removable volume indicators for mounting on the same syringe, each volume indicator comprising an indicator body and inflation indicia spaced along a length thereof; and
wherein the inflation indicia of the first volume indicator correspond to a range of expanded diameters of a first prosthetic valve and the inflation indicia of the second volume indicator correspond to a range of expanded diameters of a second prosthetic valve that is larger than the first prosthetic valve.~~

~~23.—The kit of claim 22, wherein the kit further comprises a third volume indicator, and a fourth volume indicator.~~

~~24. The kit of claim 22 or 23, further comprising a delivery apparatus that can be used to implant the first prosthetic heart valve and the second prosthetic heart valve, the apparatus comprising a balloon mounted on a distal portion thereof.~~

~~25. The kit of any of claims 22-24, further comprising the first prosthetic heart valve or the second prosthetic heart valve.~~