WHAT IS CLAIMED IS:

1. A system for packaging a dry tissue heart valve and its delivery system, comprising:

a dry tissue heart valve coupled to its valve delivery system;

a primary container sized to receive the dry tissue heart valve coupled to its delivery system, the primary container having a gas-permeable seal; and

a secondary container sized to receive the primary container, the secondary container made of a gas-impermeable material and having a dual seal including a gas-permeable seal and a gas-impermeable seal.

2. The system of claim 1, wherein the primary container comprises a flexible pouch.

3. The system of claim 2, wherein the secondary container comprises a flexible pouch.

4. The system of claim 1, wherein the primary container comprises a relatively rigid tray.

5. The system of claim 4, wherein the secondary container comprises a relatively rigid tray.

6. The system of claim 4, wherein the secondary container comprises a flexible pouch.

7. The system of claim 1, wherein the delivery system includes a collapsible handle.

8. The system of claim 7, wherein the collapsible handle includes telescoping sections.

9. The system of claim 8, wherein the telescoping sections include gas flow apertures open to interior lumens.

10. A system for handling a heart valve, comprising:

a prosthetic heart valve;

a heart valve delivery system having a collapsible handle with a series of concentric telescoping sections, the handle having a collapsed state and an elongated state, and a distal telescoping section of the handle having a locking head projecting in a distal direction; and

a valve holder removably secured to the prosthetic heart valve, the holder including a handle coupler extending in a proximal direction and having structure sized and shaped to mate with the locking head of the handle so that the prosthetic heart valve extends distally from the distal telescoping section of the handle.

11. The system of claim 10, wherein the telescoping sections are generally tubular and gradually enlarge in diameter from the distal telescoping section to a proximal telescoping section.

12. The system of claim 10, wherein the telescoping sections include interfering lips that prevent any one section from passing completely within another section and that prevent the sections from disengaging past the elongated state.

13. The system of claim 10, further including elastomeric seals provided between adjacent telescoping sections to provide frictional tightness between the telescoping sections.

14. The system of claim 10, wherein the locking head is elastomeric and the structure on the handle coupler sized and shaped to mate with the locking head comprises an internal cavity into which the elastomeric locking head closely fits.

15. The system of claim 10, wherein all but a proximal telescoping section include outwardly directed sealing sections on proximal ends thereof, and all but the distal telescoping section include an inwardly-directed lip on distal ends thereof and an inwardly-directed circular feature spaced closely from distal ends thereof, wherein converting the handle to the elongated state locks each sealing section in a region between the inwardly-directed lip and the inwardly-directed circular feature of the adjacent telescoping section.

16. The system of claim 10, wherein the prosthetic heart valve is a dry tissue valve.

17. The system of claim 10, further including storage containers for the prosthetic heart valve, heart valve delivery system, and valve holder, comprising:

a primary container sized to receive the heart valve coupled to its holder and the delivery system with the handle in its collapsed state, the primary container having a gas-permeable seal; and

a secondary container sized to receive the primary container, the secondary container being made of a gas-impermeable material and having a dual seal including a gas-permeable seal and a gas-impermeable seal.

18. A method for handling a heart valve, comprising:

procuring a sterile package containing a prosthetic heart valve removable secured to a valve holder, the holder being coupled to a heart valve delivery system having a collapsible handle with a series of concentric telescoping sections, the handle having a collapsed state with a first length and an elongated state with a second length relatively longer than the first length and the handle being contained in the sterile package in its collapsed state;

removing the valve, holder and handle from the sterile package; and