Ball in cone valve

The difference between the pressure/flow curves at a valve's opening and at its closing is called "hysteresis." Miter and diaphragm valves demonstrate a larger degree of hysteresis compared to ball-in-cone valves. Depending on individual circumstances, a valve with more or less hysteresis might be more appropriate.

Spring-loaded, ball-in-cone valves. These valves incorporate a metallic coiled or flat spring that applies a calibrated force to a ball manufactured from a synthetic ruby, located in a cone-shaped orifice. Such valves' opening pressure is defined by the properties of the spring. The size of the valve module opening changes according to DP across the mechanism: the higher the pressure differential, the larger the size of the opening. The ball moves away from the seat as DP increases, under control of the spring, thereby increasing the cross-sectional area through which CSF flows. When DP across the valve decreases, the ball moves toward the seat, reducing the cross-sectional area through which CSF flows. NMT Neuroscience produces a gravity-compensating lumboperitoneal valve (the HV Lumbar Valve) and a separate Gravity-Compensating Accessory that add resistance when an individual stands through the weight of several stainless steel balls on a ball-in-cone mechanism. Flow is not restricted when an individual is lying down. Ball-in-cone valves are less prone to the effects of the aging of materials than are miter or slit valves, and they have been demonstrated to handle higher CSF protein levels. Examples of ball-incone valves include the Hakim Valve, available from NMT Neuroscience and Codman, a Johnson & Johnson Company, and the Phoenix Accura valves, available from Phoenix Biomedical Corp.