CLAIMS

1. An apparatus which provides controlled and consistent push-pause pulsatile flow of sufficiently turbulent flushing pressure and flow within a catheter system to substantially purge a line of unwanted residue, said apparatus comprising: a source of flush fluid; a proximal connection to connect to the source of flush fluid; a container for retaining a predetermined volume of the fluid; an output port and connector for connection to the catheter system; a housing that houses the container, a pressure sensitive valve, a check valve, and a pulse reservoir chamber: the pressure sensitive valve disposed proximal to the output port and connector having an operating hysteresis that automatically opens at a first predetermined pressure which yields a sufficiently turbulent flow of the flush fluid from the container and automatically closes at a second predetermined pressure which is lower than the first predetermined pressure disposed to close the output port and connector for controllably interrupting the flush fluid flow communication between the container and the catheter system; the check valve disposed distal to the proximal connection to obstruct backflow of the flush fluid for the container and to retard inflow from the source of flush fluid to a predetermined level of flow in the housing; the pulse reservoir chamber medially disposed between the pressure sensitive valve and the check valve; an implement and a memory element disposed within the pulse reservoir chamber, the implement providing at least enough fluid force to engender the first predetermined pressure within the container necessary to open the pressure sensitive valve; and the memory element stores energy received from action of the implement and releases the stored energy upon the pressure sensitive valve opening to provide the first predetermined pressure which yields a sufficiently turbulent flow of the flush fluid from the container and flow for a period dependent upon time pressure within the container is above the second predetermined pressure.

2. The apparatus according to claim 1 wherein: said source comprises a flush fluid receptacle upstream from a pressure providing device, which provides the flush fluid dispensed at the first predetermined pressure and flow; said container comprises a vessel which communicates with said pressure providing device through a flow restrictor and with said catheter system through the pressure sensitive valve; said check valve comprises a valve opening action at the first predetermined pressure and which comprises a valve closing action at the second predetermined pressure; said implement comprising the pressure providing device, which provides the flush fluid dispensed at the first predetermined pressure and flow, acting through said flow restrictor to fill said container and raise pressure within the container to the first predetermined pressure; and said memory element comprising a compressible element disposed proximal to a plunger element which is displaced by pressure and flow from the pressure providing through the flow restrictor to accrue controlled and consistent pressure and volume to thereby provide a desired pressure pulse for purging the catheter system.

3. The apparatus according to claim 2 wherein said pressure providing device comprises a pump.

4. A method for providing controlled push-pause pulsatile flow of sufficiently turbulent flushing pressure and flow within a catheter system to purge a line of unwanted residue comprising the steps of: providing an apparatus of claim 1; filling the container with the flush fluid from the source; providing force via the implement to create a fluid opening pressure within the container thereby opening the pressure sensitive valve at the first predetermined pressure; dispensing the flush fluid having predetermined turbulent pressure and flow for a predetermined period into the catheter system; and closing the pressure sensitive valve when pressure within the container is reduced to a level below the first predetermined pressure.

5. The method according to claim 4 comprising: wherein: said source comprises a fluid receptacle upstream from a pump; said container comprises a vessel which communicates with said pump through a flow restrictor and with an IV line through the pressure sensitive valve; said implement comprising the pump acting through said flow restrictor to fill said container and raise pressure within the container to the predetermined pressure; and said memory element comprises a compressible element disposed proximal to a plunger element which is displaced by pressure and flow from the pump through the flow restrictor to accrue controlled and consistent pressure and volume to provide a desired pressure pulse for purging the catheter system; affixing the container to the catheter system; initiating pumping to fill the container at a rate dependent upon pump output pressure and resistance of the restrictor to fill the vessel until the first predetermined pressure is reached; opening the pressure sensitive valve upon reaching the first predetermined pressure to dispense the flush fluid into the catheter system at a pressure and flow rate which purges the IV line of undesired residue with a pressure pulse having a duration ended by closing of pressure sensitive valve at the second predetermined pressure; and successively repeating the steps of initiating pumping and opening the pressure sensitive valve upon reaching the first predetermined pressure until a desired number of pressure pulses has been delivered to the catheter system.