# CATHETER SYSTEM

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is for a catheter, and more particularly, pertains to a catheter system including a catheter and a safety tube assembly.

This catheter needle is used in healthcare fields where IV catheterization is required to facilitate patient care (i.e., pre-hospital (ambulance) setting; in-hospital setting; clinic setting). Specifically, the catheter is used any place a peripheral IV site is needed in order to facilitate patient treatment using fluids and/or IV drug therapy.

All current IV catheters have to have a "Heparin Lock" attachment added to catheter hub after IV start. If this is not done quickly and correctly, there is a serious risk of blood exposure.

Some "safety catheters," while providing protection from needle punctures, have manufactured catheter packaging that is to long to fit in restrictive IV needle storage compartments (drug boxes, crash carts, etc.).

As is by now plainly evident, the current state of IV needle and blood protection is woefully inadequate; in fact, quite dangerous. The health care industry is long overdue for the enhancements found in this catheter. There is no needle currently manufactured that addresses all the dangers and deficiencies outlined above. The catheter system of the present invention either solves or eliminates all of the above mentioned deficiencies.

2. Description of the Prior Art

The standard method to start an IV is to insert the catheter into the vein, then quickly pull the needle out and discard it before one pokes himself with it, then even more quickly insert IV line into end of the catheter hub before too much blood can spill out, contaminating oneself and the patient area. The disadvantages of this old method our obvious—a high probability of sticking oneself or the patient with needle and/or exposing and contaminating oneself (AIDS, Hepatitis, hemorrhagic fevers, etc.) to blood from site. This unsafe procedure has been the standard method almost since the IV needle was first invented. This is a very dangerous technique, and has to be eliminated and replaced with a safer method due to the prevalence of deadly infectious diseases faced by healthcare professionals today.

The current method of drug injection is injecting the drug up to eight inches further back from the IV catheter (the first med port can be eight inches up the IV line), which can make or break the effectiveness of time sensitive and/or concentration sensitive drugs. Emergency medications like Adenosine (time sensitive), are less effective when injected further from the site if IV.

All other IV needles have the "blood flash chamber" located to far back on needle (where your hand screens your line of sight) resulting in concealed visualization of flash. Ones fingers and hand partially and/or totally obscure old flash chamber. This means user has to reposition hands to see if they are in the vein, this manipulation can cause the needle tip to pull out of vein and precipitate an unsuccessful IV attempt.

Many current style IV catheters do not provide any automatic protection from needle punctures. One has to manually "re-cap" needle, risking a needle stick, or set needle aside until you finish IV start, hoping one does not forget to dispose of it and/or sticking oneself prior to safe disposal. Other "safety" needles require one to manually



retract needle all the way back until needle locks into protective tube. Many times, people forget to fully retract needle into locked position, allowing the needle to slip out of safety tube, again risking exposure to needle stick. Some "safety needle" designs adequately protect the user from needle punctures, but have residual blood dispersed all over proximal end of safety tube where hub seal (blood stopper) is located. All are either inadequate or unsafe designs to completely protect the user.

The newer "safety IV catheters" do not allow access to draw blood (needed for blood sample and/or blood sugar analysis) after insertion. So, in order to collect blood for analysis, one has to stick patient again and re-expose yourself and patient to the same risks associated with the first stick (blood spillage and/or needle puncture).

Current catheters do not provide an adequately designed "push flange" used for insertion of IV needle into vein after initial blood flash-back. Most are either nonexistent or too small/short/smooth to be effective, thereby reducing chances of successful catheter insertion.

All current catheters do not provide any protection from blood regurgitation up IV line when IV bag is set/dropped down. This usually causes the blood to clot and clogs the IV forcing user to discontinue IV, necessitating another IV start.

No IV currently provides a safe and blood-free method to change-out IV lines. Many times IV lines need to be replaced for various reasons, when old line is disconnected it will leak/flow blood until new line is attached. If this is not done quickly and correctly, there is a serious risk of blood exposure.

All current IV catheters do not provide any built-in protection from blood exposure if IV line is accidentally or purposefully (violent/psychotic patient) disconnected from IV catheter. If this occurs, there is a very serious blood contamination problem, as large amounts of blood can exsanguinate from patient before IV line can be either reconnected or discontinued.

## SUMMARY OF THE INVENTION

The general purpose of the present invention is a catheter system with a plastic secondary lumen port (Y-port) with a rubber check valve built into its lumen. This catheter allows user to start an IV minimizing or negating exposure to blood and needle punctures. This port has seven main functions:

1. The rubber check valve is integral for effectively venting flash chamber during IV start, then sealing the chamber afterwards. This rubber valve (check valve) is used to prevent blood from exiting the catheter before and after the line is attached; it operates when the piercing needle is inserted into vein, blood then flows back through needle lumen, then out needle vent hole into flash chamber finally pushing into check valve. This blood fluid pressure pushes valve up against the valve seat, effectively closing lumen. When IV line is attached and fluid started, the hydraulic pressure of IV fluid will open check valve. The IV fluid flows around rubber valve and into the hub chamber, then into patient;

2. The check valve also, prevents back-flow of blood into IV line during standard IV use;

3. Prevents bleeding if IV line gets separated from hub;

4. Allows for safe IV line substitution;

5. The Y-port opening is positioned to point at patient. The advantages being no need to loop IV line around catheter after IV placement. This prevents the IV line from catching and/or kinking on anything and either pulling IV out or ending normal flow; and,