

chosen for illustration has the tubular, depressible valve stem 52 therein, although it will be appreciated that the solid valve stem 52a could alternatively be provided. The injection port 80 has an internal anti-backflow check valve of suitable design as previously discussed.

FIGS. 9 through 13 are illustrations of prior art quick-attach coupling components. As illustrated in FIG. 9 and FIG. 10 in particular, the prior male coupling component 100 included a rigid, tubular cannula 102 which projected outwardly beyond the endmost extremity 104 of an annular collar 106 circumscribing the cannula 102 in spaced, concentric relationship therewith. Consequently, the cannula 102, once unsheathed from a protective wrapper or the like, was exposed to contamination by contact with environmental surfaces, including but not limited to the practitioner's own hands and fingers.

The female component 108 of the prior art as shown particularly in FIGS. 11 and 12, included an annular outer wall 110 defining an internal, cylindrical socket 112 for reception of the cannula 102 associated with the male component 100. The prior art female component 108 could also be integrated with a valve body 114 containing a suitable anti-back flow check valve actuated by a tubular, open ended, depressible valve stem 116 situated axially within the socket 112 in disposition for depressible actuation by the cannula 102 when the components 100 and 108 were coupled together in the manner illustrated in FIG. 13. Intermeshing threads 118 and 120 on the interior wall of the collar 106 and the exposed outermost end of the wall 110 of the female component 108 served as structure for holding the components 100 and 108 releasably connected together.

It is contemplated that the quick-connect coupling components of the present invention may be manufactured from a suitable plastic such as a polystyrene material. In this manner, the components are readily manufacturable at a relatively reasonable cost and can be treated as disposable components. They may also form a part of a completely needleless intravenous infusion system so that the risk of needle stick injuries, especially when the practitioners are in a hurry, can be almost completely eliminated.

It will be appreciated that current therapy techniques utilizing needles present a number of significant risks directly associated with the needles. If a sharpened needle is to be used to puncture a rubberized injection port, such port must first be cleansed with alcohol/betadine to ensure sterility prior to the puncture.

After unsheathing the needle, the needle must be maintained as a sterile device throughout puncturing of the port, the injection of the medication, and the subsequent removal of the needle from the port. Then, the needle must be safely discarded without contaminating anything in the environment.

Of course during discard of the needle-bearing syringes or the needles themselves, there is a likelihood that they will accidentally puncture the care giver or ancillary staff responsible for carrying out their disposal. This is made all the more serious by the fact that once the needles have been used with the patient, they are contaminated with the body fluids of the patient and are therefore hazardous carriers of potentially lethal pathogens for all persons who may be accidentally punctured by them. Applying a protective cap or sheath to the needle after use and prior to disposal is desirable yet risky because the extra operation presents an extra opportunity for needle stick.

Furthermore, it is quite possible with needles and current plastic fluid access spikes to accidentally puncture the fluid

volume devices such as bags or containers typically utilized to hold a medicinal liquid to be administered to a patient. When an erroneous puncture occurs, the entire fluid volume is contaminated. Moreover, a leak point is produced which potentially exposes the care giver and others to potentially toxic substances.

Even in prior systems having non-metal spikes and the like for puncturing sealing membranes or other structures, such puncturing devices are still exposed to contamination by environmental surfaces. Absolutely meticulous adherence to aseptic techniques throughout the puncturing and medicinal administration process must be ensured.

Accordingly, it should be apparent that the present invention provides a significant advancement in this art by eliminating serious risks inherent in present systems while maintaining user friendly components at a reasonable cost.

Although preferred forms of the invention have been described above, it is to be recognized that such disclosure is by way of illustration only, and should not be utilized in a limiting sense in interpreting the scope of the present invention. Obvious modifications to the exemplary embodiments, as hereinabove set forth, could be readily made by those skilled in the art without departing from the spirit of the present invention.

The inventor hereby states his intent to rely on the Doctrine of Equivalents to determine and assess the reasonably fair scope of his invention as pertains to any apparatus not materially departing from but outside the liberal scope of the invention as set out in the following claims.

I claim:

1. An improved, needleless secondary access port for use in a needleless IV infusion system as a site that provides secondary access to a patient's vascular system, said port comprising:

a generally Y-shaped, hollow body having a pair of generally mutually converging inlets and a single outlet communicating internally of the body with both of said inlets,

one of said inlets being adapted for permanent connection with one segment of a supply line from a source of supply of liquid, and said outlet being adapted for permanent connection with another segment of the supply line leading to a patient;

a normally closed check valve associated with the other of said inlets for maintaining said other inlet closed unless intentionally opened by a device that has become detachably secured to the body; and

releasable locking structure on the body at said other inlet for detachably securing a device to the body in a manner to open said check valve,

said locking structure on the body comprising a female luer lock end permanently secured to the body and including a generally cylindrical, annular wall having external threads disposed for meshing engagement with internal threads on the device to be attached to the female luer end,

said check valve including a one-piece, resilient poppet yieldably biased into a closed position an having actuating stem that projects axially into surrounded relationship with the wall of the female luer end for opening depression by the device attached to the secondary inlet.