

DOUBLE LUMEN CANNULA

BACKGROUND

1. Field of the Invention

The present invention relates to a cannula for medical use and more particularly to a double lumen cannula for independently conducting fluids into and out of a venipuncture site through two separate passageways.

2. The Prior Art

Double lumen cannulae are well known in the art. The best known advantage offered by double lumen cannulae is the ability to separately inject fluids into a blood vessel and withdraw fluids from a blood vessel through a single venipuncture.

The most common double lumen cannulae consist of a single tube with a horizontal division of the tube which places the lumens of the cannulae in immediate juxtaposition. Unfortunately, however, the construction of such double lumen cannulae is expensive, time consuming and unreliable.

The least expensive and most reliable construction of the double lumen cannulae is in the form of concentric lumens disposed telescopically one within the other. Especially in using the cannulae for single needle dialysis, it is preferred to have one of the cannula lumen project substantially beyond the other. The problems with such telescopic construction are apparent, however, when it is observed that both cannula must be used to penetrate the skin during venipuncture. Unless there is a smooth contour between the interior and exterior cannula, the venipuncture is both difficult and painful. On the other hand, if the telescoping cannulae present an exteriorly smooth surface for venipuncture, there is insufficient passageway for fluid to flow easily between the lumen. Accordingly, until this present invention, the construction of a safe, effective and comparatively painless double lumen cannula having telescoping lumen has not been known.

BRIEF SUMMARY AND OBJECTS OF THE INVENTION

The present invention comprises a series of telescoping members presenting an efficient venipuncture device. After venipuncture, by simple removal of a stylet needle and a bushing, an effective double lumen cannula is found in proper location within a patient's vein.

It is, therefore, a primary object of the present invention to provide an improved double lumen cannula.

It is another object of the present invention to provide a novel double lumen cannula assembly which has one lumen projecting beyond the other and which is safely and easily inserted into the cardiovascular system during venipuncture.

Another primary object of the present invention is to provide a double lumen cannula assembly having a contoured gasket which is used to facilitate introduction of the cannula assembly into the cardiovascular system during venipuncture and which can be removed to open a passageway between cannula lumen.

These and other objects and features of the present invention will become more fully apparent from the following description and appended claims taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a longitudinal cross section of one presently preferred double lumen cannula assembly with stylet needle and gasket in initial position.

FIG. 2 is a longitudinal cross section of the cannula embodiment of FIG. 1 with the stylet needle removed and the bushing in a partially removed position.

FIG. 3 is a perspective illustration of the cannula embodiment of FIG. 2 illustrating the bushing in its partially removed position.

FIG. 4 is an exploded cross-sectional view of another presently preferred double lumen cannulae embodiment fragmentarily illustrating the stylet needle and bushing in the completely removed configuration.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to the drawing wherein like parts are designated with like numerals throughout. Referring more particularly to FIGS. 1-3, a cannula assembly generally designated 10 comprises a hub 12 having an axial bore 14 therethrough. The bore 14 is diametrically enlarged at 16 and opens at the trailing end 18 of the hub 12. The diametrically enlarged portion 16 forms a female coupling for conventional intravenous sets and the like. The leading end 20 of the hub 12 also has a diametrically enlarged bore 22 which defines an upwardly directed ramp surface 24.

The hub 12 presents an angularly directed branch 26 defining a hollow 28. The hollow 28 opens at the trailing end 30 of the branch 26 and also opens directly into the enlarged bore 22 near the leading end 20 of the hub 12. The hollow 28 of the branch 26 is sized and configured so as to intersect the bore 22 at the ramp surface 24. Thus, a bifurcated passageway consisting of the bore 22, hollow 28 and bore 14 is defined by the hub 12 and angularly directed branch 26.

It should be observed that while the branch 26, in the illustrated embodiment, is oriented at approximately 45° with respect to the horizontal axis of the hub 12, any suitable angular orientation could be used.

As best shown in FIG. 2, the assembly 10 includes an interior cannula 32 which is mounted within the hub 12 at the location of the bore 14. The cannula 32 opens into the diametrically enlarged bore 16 so that open fluid communication can exist between the hollow of the interior cannula 32 and any infusion set (not shown) coupled at the trailing end 18 of the hub 12.

An exterior cannula 34 is mounted upon the hub 12 at the bore 22 so as to be forward of the branch 26. The exterior cannula 34 is coaxial with the interior cannula 32 and has an inside dimension which is diametrically enlarged over the outside dimension of the interior cannula 32. Thus, a passageway 36 normally exists between the exterior cannula 34 and the interior cannula 32. The passageway 36 opens at the trailing end 38 of the cannula 34 directly into the hollow 28 of the branch 26. It can thus be observed that the hollow 28 and the bore 22 communicate directly with the passageway 36. When an infusion set is coupled to the trailing end 30 of the branch 26, a direct fluid path exists along the hollow 28, bore 22 and passageway 36. Observe that this fluid path is completely separate and distinct from the fluid path through the hollow of cannula 32.

The length of the interior cannula 32 is selected to project noticeably beyond the leading end of the exterior cannula 34. Accordingly, when the cannula assem-