PLACEMENT APPARATUS FOR POSITIONING AN ELONGATED ELEMENT IN A BODY LUMEN

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3,459,184 8/1969 Ring.......................... 128/214.4
3,220,411 11/1965 Czorny.......................... 128/214.4

3,438,373 4/1969 Pannier, Jr....................... 128/214.4

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ABSTRACT

A placement apparatus or unit for positioning an elongated element in a body lumen, and a method of using the same. The elongated element may be a catheter, piezoelectric transducer means carried in a catheter, a coaxial cable, or other sensing means, which may or may not have a lumen therethrough, but which may be connected to apparatus for indicating or recording central arterial pulse wave-forms and other heart actions. The element is encased in a sheath to which the proximal end of the element is removably connected, and the element is advanced relatively to a needle into a body lumen by pulling or pushing the sheath through an opening in the needle hub. The method involves monitoring venous or arterial pressure from the point of entry into a body lumen to the thoracic cavity at or adjacent the heart.

17 Claims, 13 Drawing Figures
PLACEMENT APPARATUS FOR POSITIONING AN ELONGATED ELEMENT IN A BODY LUMEN

CROSS-REFERENCE TO A RELATED APPLICATION

This application is a continuation-in-part of our pending application entitled "Catheter Placement Unit," filed Dec. 17, 1969, Ser. No. 885,803, now abandoned and discloses and claims subject matter disclosed in the aforesaid pending application, and some additional subject matter.

SUMMARY OF THE INVENTION

Heretofore, catheter placement units for advancing a catheter into a body lumen have been developed so that the catheter may be connected to an infusion system before the body puncture is made, and then the catheter is advanced relatively to the needle through a protective sheath having a longitudinal slit therein, whereby no sterile field of operation is necessary. Such an arrangement may be found in the W. H. Ring U. S. Letters Patent No. 3,185,152, issued May 25, 1965. With such a placement unit, the protective sheath must be substantially as long as the catheter, and the catheter was advanced through the sheath by grasping a fitting secured to the proximal end of the catheter and by means of which the catheter is connected to the infusion system. That type of unit was highly satisfactory for short or medium length catheters, but for monitoring pressure in the thoracic cavity of a patient, a catheter or other sensing means up to forty inches in length is necessary, and for placing such an element in the body lumen, the hand of the surgeon advancing the element was objectionably far away from the hand holding the needle in place in the body of a patient. Most physicians and surgeons, when advancing an element into a body lumen, desire their hands to be closely adjacent the needle so that the needle can adequately be held with one hand and the physician has the "feel" to a greater extent than otherwise to determine if the element is entering the body lumen in the proper manner. This desirable feel is considerably augmented by the fact that the element and the sheath move together. Such feel cannot be obtained to the desired degree with a long element in a flexible sheath if all the advancing is done from the end farthest from the needle, and especially where the sheath remains stationary and the element moves relatively to the sheath, as was the case heretofore.

In a Karl A. Pannier, Jr. U. S. Pat. No. 3,438,373, issued Apr. 15, 1969, there is shown locking means to prevent retraction of a catheter relatively to a needle once advancement of the catheter into a body lumen has begun. Such locking means are for the purpose of avoiding the risk of cutting the catheter on the sharp end of the needle. Further, it is now deemed desirable to monitor venous or arterial pressure from the point of entrance of the catheter or other element to the central or thoracic region during advancement of the element, but such, insofar as we know, has not heretofore been done.

The instant invention solves the problems mentioned above in the provision of an element placement unit wherein the element may be of any length desired and encased within a sterile sheath having a longitudinal slit, with one end of the sheath indirectly and removably connected to a proximal portion of the element and the distal end slightly projecting through the opening in the hub of a cannulated needle. The placement means are substantially the same, whether the element is a catheter or other sensing means for monitoring purposes. The element is advanced relatively to the needle into a body lumen by pulling on the projecting end of the sheath or by pushing the sheath adjacent the needle hub permitting both hands of the operator to be closely adjacent the needle hub at all times. Improved automatic locking means are provided to prevent retraction of a catheter relatively to the needle after advancement has begun, and also to maintain the sheath indirectly connected with the proximal portion of an element until the element has been fully advanced when the sheath is released for removal. The instant placement unit may also be used to monitor venous or arterial pressure, or both if two units are employed at the same time, from the point of body entry of the element to the thoracic cavity while the element is being advanced, and the method of so monitoring is also a part of this invention.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of certain preferred embodiments thereof when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary central vertical sectional view through the cannulated needle and its hub, and an element hub, the element and sheath being eliminated for purposes of clarity;

FIG. 2 is a fragmentary vertical sectional view of the structure of FIG. 1 but showing the element and sheath associated with that structure, prior to full advance of the element;

FIG. 3 is also a central vertical sectional view of the structure of FIG. 2 but with the element fully advanced and the two hubs locked together;

FIG. 4 is a fragmentary central vertical sectional view of an element placement unit of somewhat different construction but also embodying principles of the instant invention;

FIG. 5 is a view similar to FIG. 4 but showing the element fully advanced and the sheath released for removal;

FIG. 6 is a central vertical sectional view of an element placement unit of still different construction but embodying principles of this invention;

FIG. 7 is a view of the structure of FIG. 6 showing the element fully advanced and the sheath released for removal;

FIG. 8 is a diagrammatic view illustrating our method of monitoring venous pressure from the point of entry to the thoracic cavity;

FIG. 9 is a fragmentary diagrammatic view illustrating our method of so monitoring arterial pressure;

FIG. 10 is a fragmentary vertical sectional view of an element placement unit of substantially the same character as the right-hand portion of FIG. 4, greatly enlarged, but with which no catheter is associated and the placement unit is utilized to advance a coaxial cable directly into the body lumen;

FIG. 11 is a central vertical sectional view of the complemental part of the placement portion shown in
FIG. 10, this view being substantially similar to the showing in FIG. 5:

FIG. 12 is a still further enlarged vertical sectional view taken substantially as indicated by the line XII—XII of FIG. 10; and

FIG. 13 is a diagrammatic disclosure with parts eliminated of a part of an advancing unit in which a different form of element is disclosed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The instant invention may be made in substantially any size to accommodate any desired length of element. FIGS. 1 to 7 of the drawings, greatly exaggerated for purposes of clarity, disclose placement units for positioning catheters in a body lumen. However, the same general apparatus may be utilized for the placement of other elongated elements, such as transducers, coaxial cables, etc., for monitoring purposes, and to that end FIGS. 10 to 13 inclusive, even further enlarged, disclose substantially the same apparatus with such sensing devices advanced directly into a vein.

Looking at the first embodiment of the instant invention, seen in FIGS. 1, 2 and 3, there is shown a catheter hub, generally indicated by numeral 1, may, for convenience in molding, be made of two initially separate pieces which are firmly secured together as by adhesion, fusion, or in any other suitable manner. The hub includes a generally cylindrical barrel 2 in which the passage therethrough is reduced at the inner end of the barrel to provide an interior annular shoulder 3. The hub also includes an adaptor 4 having an integral inwardly extending hollow nipple 5 in which the proximal end of a catheter 6 is firmly anchored, as seen in FIGS. 2 and 3. The outer hollow portion of the adaptor forms a socket for the reception of a catheter extension tube, diagrammatically shown at 7 in FIGS. 2 and 3, which in turn may be connected to an infusion system. Also, within the barrel 2 and around the nipple 5, are locking means in the form of a floating washer 8 and a narrow stop member 8a which causes a tilting of the washer to a proper locking angle, as will later appear. The needle hub, generally indicated by numeral 9, is securely attached to a hollow needle 10 having a sharp point 11 on the end that projects outside the hub. The inner portion of the body 12 of the hub 9 is solid around the shaft of the needle except for a slot 13 in the upper portion thereof, this slot having an inclined bottom 14. The outer portion of the body 12 is hollow as indicated at 15, and in this hollow is another locking member in the form of a washer 16 disposed around the blunt end portion of the needle shaft. A short cylinder 17 is also inserted in the hollow 15 and secured firmly to the body 12 in any suitable manner, this cylindrical portion having an oblique inner end 18. The portion of the cylinder projecting outside the hollow or cavity 15 is slotted as indicated at 19 to provide a plurality of resilient latching fingers 20, four being shown in the illustrated instance. Each finger 20 is provided with a locking shoulder 21 thereon, the finger sloping outwardly to provide such shoulder.

As seen best in FIGS. 2 and 3, the catheter 6 is encased in a sheath 22 which maintains the catheter sterile during its placement in the body of a patient. This sheath eliminates the need of any sterile field of operation when the catheter is advanced into a body lumen. The sheath is made of a relatively soft and flexible plastic, such as extruded polyethylene, for example. The sheath is provided with a slit 23 extending lengthwise thereof on the under side, the resiliency of the sheath maintaining the slit closed until it is forcibly opened when the sheath is removed.

FIG. 11 shows another catheter 6, if used in a vein, could be polyvinyl chloride, or the fluoroplastics such as polytetrafluoroethylene and fluorinated ethylene-propylene. When used for monitoring arterial pressure, polytetrafluoroethylene is usually preferred because the catheter itself then will not pulsate along with the more powerful arterial pulsations, since this material has properties allowing smaller internal diameters for blood flow without clotting and thus permit greater wall thickness, is easier to advance through a lumen because of its lubricative characteristic, and an accurate reading of the pressure may be obtained.

When the structure of FIG. 2 is assembled, the sheath is placed over the catheter and entered into the catheter hub over the nipple 5 but through the aperture in the washer 8 and then retracted slightly causing the washer to tilt, as shown in FIG. 2, abut the stop 8a at one point and to the proper angle to lock the sheath to the nipple of the catheter hub and indirectly to the catheter adjacent the proximal end thereof. The other end of the sheath is passed into the needle hub over a portion of the needle, the catheter, of course, being entered into the needle until it contacts the incline 14 and is pressed upwardly so that a small portion of the sheath projects through the slot 13 in the needle hub accessible to the fingers of the operator. The incline 13 facilitates disruption of the sheath at the slit 23 as the lower side of the sheath contacts the needle. It will also be noted that the sheath, when placed over the needle, passes through the aperture in the washer 16 in the needle hub, and as long as the washer is normal to the axis of the needle, as seen in FIGS. 2 and 3, the sheath may be pulled in a direction to advance the catheter through the needle, but if any attempt is made to retract the catheter after it is partially advanced, the washer 16 will assume the oblique position seen in FIG. 1 and prevent any retraction of the catheter, the sloping end 18 on the cylinder 17 facilitating the tipping of the washer.

In operation, the instant invention is extremely efficacious. It is simply necessary for the attending physician, surgeon, or other operator to remove the placement unit from its sterile wrapping, remove the customarily needle guard, and by holding the needle hub, make the body puncture, entering the needle into the desired body lumen. Then, holding the needle hub in one hand, the catheter may be advanced into the body lumen merely by pulling the catheter sheath 22 outwardly through the slot 13 in the needle hub or by pushing the sheath adjacent the needle hub. If the catheter is a long one, it is a simple expedient to pull or push the sheath a few inches at a time, slide the hand back and pull or push again, thereby maintaining both the operator's hands immediately adjacent the needle. Thus, the operator has the proper "feel" while advancing the catheter, and the advancing operation is extremely simple and positive owing to the structure and stability of the parts of the placement unit, particularly as distinguished from endeavoring to advance a catheter through a flimsy envelope. During the operation, there can be no retraction of the catheter relatively to the needle at any time because of the lock washer 16. When the catheter is fully advanced, the latching fingers 20 on the needle hub are entered into the catheter.
hub where the shoulders 21 automatically latch behind the shoulder 3 in the catheter hub thereby firmly locking the two hubs together. The fingers 20 also abut the locking washer 8 and move it to the position normal to the axis of the catheter, as seen in FIG. 3, thereby releasing the sheath from the nipple 5 and allowing complete removal and discarding of the sheath, the stop 8a being sufficiently narrow to be received in one of the slots 19 between adjacent fingers 20. The needle withdrawn from the body puncture can be placed in a protective guard and it and the connected hubs can readily be taped to the body of the patient.

The structure of FIGS. 4 and 5 is illustrative of the fact that the latching fingers may be carried by the catheter hub while the barrel having the locking shoulder therein may be carried by the needle hub. In this instance, there is a generally cylindrical catheter hub 24 in which a cylindrical sleeve 25 is secured. Integral with this sleeve and extending out of the hub are latching fingers 26 of the same character above described. Extending inside the sleeve 25 is a floating taper 27 over which the outer end of the sheath 22 is expanded and a slight forward movement of the taper causes a bind between the sheath and the inner end of the sleeve 25, thereby removable anchoring the sheath to the taper. The catheter 6 extends centrally into the taper and is firmly secured thereto.

The needle hub carries a barrel 28 thereon having an annular locking shoulder 29 therein. The other parts of the placement unit are the same as above described in connection with FIGS. 1, 2 and 3.

The advancement of the catheter into a body lumen with the placement unit of FIGS. 4 and 5 is the same as previously described. When the catheter is fully advanced, the fingers 26 are pressed into the barrel 28 are automatically locked behind the shoulder 29, thus coupling the two hubs firmly together. At the same time, the blunt end of the needle contacts the end of the taper 27 and forces it outwardly sufficiently to release the catheter sheath and permit its total withdrawal.

In FIGS. 6 and 7 we have shown a still different manner of removably securing the proximal end of the catheter sheath 22 to the nipple 5 in the catheter hub, the other parts of the placement unit being the same as described in connection with FIGS. 1, 2 and 3. In this instance, the catheter sheath is connected to the nipple 5 by means of an elastic sleeve 30 which is partially stretched over the outer end of the sheath, as seen in FIG. 6. The sleeve 30 may be made of any suitable material, such as a substance containing polymeric silicones having the general property of rubber. Such a substance is commonly used in medical and surgical prosthetic devices. After the catheter 6 has been advanced into a body lumen in the manner above described and the two hubs joined together as seen in FIG. 7, the sheath may be completely withdrawn by virtue of the latching fingers 20 on the needle hub making endwise contact with the elastic sleeve 30 and pushing it off the sheath.

In FIGS. 8 and 9 we have illustrated the desirability and method of utilizing the present invention for the purpose of monitoring venous or arterial pressure, or both, if such seems to be indicated. Of course, two element placement units would be utilized if both venous and arterial pressure is monitored at the same time. With the instant invention, the catheter or other sensing element may be easily and accurately located in the central or thoracic cavity at or adjacent the heart and monitoring may be obtained during the placement of the element as well as thereafter. Monitoring while the element is being placed aids materially in accurately positioning the element and also gives the surgeon valuable information as to the condition of the patient.

For monitoring venous pressure an arrangement such as diagrammatically shown in FIG. 8 may well be utilized. A customary hospital stand 31 may be positioned adjacent a patient 32, and a manometer 33 may be mounted on the stand at such a level that the zero point on the manometer is at the same level as the patient's heart, as indicated by the dotted line 34. The manometer is connected by way of a tube 35 leading to one arm of a Y fitting 36 to the leg of which the catheter extension tube 7 is connected. Also suspended from the stand 31 is a container 37 for infusion liquid and a tube 38 leads from that container to the other arm of the Y fitting 36, flow through this tube being controlled by a valve or clamp 39, and flow through any of the other tubes outside the patient's body may be similarly controlled.

At the outset, the catheter is flushed out with sterile liquid, such as infusion liquid, to eliminate sterilization residue and air, as well as fill the catheter and associated tubing with liquid. Flow of infusion liquid is then cut off and venipuncture is made with the needle, frequently in the Basilic vein, or one connecting therewith, in the arm. With the flow of infusion liquid cut off, the liquid level in the manometer tube will drop until it reaches a level equaling the back pressure created by the blood pressure in the vein and the relationship of this new level to the zero mark on the manometer scale indicates the venous pressure. Since the cardio vascular system pulsates with each heart beat, there will be a pulsation of fluid level in the manometer and those pulsations will vary as the catheter is advanced toward the superior vena cava or other location within the chest which gives the attending surgeon an indication of the venous pressure at each location during advancement of the catheter from the peripheral veins to the central vein, keeping the doctor fully aware of the patient's condition, and aiding in the advancement of the catheter, since a sudden drop of pulsation will indicate that the catheter tip is obstructed or in contact with the wall of the vein and adjustments may immediately be made before there is any injury to the patient.

In the case of monitoring arterial pressure with a catheter when it is to be advanced, one arm of the Y fitting 36 is connected by way of a tube 40 to a pressure transducer 41 which transforms the fluid impulses to electrical impulses, and by way of a line 42 establishes an impulse pattern on the screen of an oscilloscope 43. The method of advancing the catheter is substantially the same as that above described, flushing, filling with liquid, shutting off any infusion flow, making an arterial puncture frequently in the Radial artery in the arm, and advancing the catheter up to a point near the heart. Arterial pressure will be noted all during the advancement of the catheter in variations made apparent by the amplitude of the oscilloscope pattern giving the attending surgeon valuable patient information as well as aiding in the proper positioning of the catheter.

If the element inserted in the body lumen is in the form of a coaxial cable, a transducer, or some similar sensing device, it may be directly connected to any suit-
able amplification means and recording means for later usage on a computer, and the oscilloscope, all in a known manner and utilizing available equipment. Therby a recording of the patient's condition may be had and the various parameters may be obtained from the central pulse contour. Thus, a record may be kept for future reference as well as have the pulse contour visible to the attending physician or surgeon to watch during an operation or while attending the patient in other ways.

In either case, vein or artery, a skilled technician may accurately place the catheter or element tip in its ultimate desired location by watching either the pulsations in the manometer or the variations in amplitude of the impulse wave on the oscilloscope screen; or since the amount of sheath projecting from the needle hub is of approximately the same length as that of the advanced portion of the element, that projecting portion of the sheath may be used to measure or determine the position of the element tip in the body lumen. Insofar as we are aware, monitoring of venous or arterial pressure from the point of body puncture to a point in the thoracic cavity, during advancement of the element, was not considered practical heretofore.

It should also be noted that for some usages the instant placement unit, in any of its described embodiments, need not have a sharp pointed cannulated needle extending outwardly from the needle hub, although the needle hub would be retained in order to facilitate stripping the sheath from the element. Such a structure would be substantially the same as though a protruding portion of the needle would be cut off at the point 44, as indicated in FIGS. 3, 5 and 7. Leaving a tubular portion of rigid material inside the hub through which the element would be advanced and by means of which the sheath would be stripped from the element. In use of the placement unit without a pointed needle protruding from the hub 12, the hub 12 would be inserted into the exposed end of previously placed means establishing a cannulated entry into the body of a patient. The hub so held in one hand leaves the other hand free for pulling or pushing upon the sheath and thus advancing the element while at the same time removing the sheath. By way of examples, and not by way of limitation, the unit without a pointed needle could be utilized in conjunction with a Eustachian catheter for injecting medications into the inner ear by way of Eustachian tube; also the needleless unit could be used for dialysis within the peritoneal cavity in conjunction with an already cannulated entry; and for monitoring, the element could be advanced into a vein or artery through a previously placed short catheter of sufficient diameter to accommodate the element. Other uses of the unit without a pointed needle will be apparent to those skilled in the art.

In FIGS. 10, 11 and 12 we have illustrated the instant placement unit in operative association with a coaxial cable, generally indicated by numeral 45, which cable may be advanced into a body lumen instead of a catheter. In this instance, by way of example, we have used the same needle hub arrangement as well as the hub 24 with a slight change in structure, as are shown in FIGS. 4 and 5, although it will be understood that the structures of FIGS. 1 - 3 inclusive, and of FIGS. 6 and 7, may also be utilized for this purpose. Accordingly, the same reference numerals for like parts as were used in connection with FIGS. 4 and 5 are utilized in connection with FIGS. 10, 11 and 12. The slight changes in hub 24 reside in a larger inside diameter for the floating taper 27, the omission of the socket at the proximal end thereof, and the hub 24 itself is thickened at the proximal end and extends inwardly, as indicated at 46 to intimately fit the diameter of the cable 45 extending therethrough, and a proximal portion of the cable is secured to the part 46 of the hub in the region 47. Otherwise the hub assemblies are the same as shown in FIGS. 4 and 5. The floating washer 16 utilized in the needle hub assembly in FIGS. 4 and 5 has been eliminated because there is little danger of the outer layer of the coaxial cable 45 being injured by the needle point in the event of a reverse movement of the cable relatively to the needle. Of course, if the structure of the element being advanced into the body lumen might be injured by the needle point, such a washer may be utilized.

The coaxial cable 45, which has no open lumen therein, and which per se does not form a part of this invention, is kept sterile while being advanced into the body lumen by means of the above described sheath 22 having the slit 23 in the lower portion thereof, which slit, for purposes of clarity, is shown slightly open in FIG. 12 but, as stated above, that opening will remain closed until the slit is deliberately opened as the sheath is removed through the needle assembly. The coaxial cable 45 comprises a central conductive core 48 having a probe tip 48a, seen in FIG. 11. The core is surrounded by an inner insulation layer 49 which in turn is surrounded by a conductive sleeve 50 which, in turn is surrounded by an outer insulation layer 51. As seen best in FIG. 11, the conductive tube 50 terminates rearwardly of the probe tip 48a and the outer insulation layer 51 terminates a little rearwardly of the conductive sleeve 50 whereby, when the cable enters a body lumen, the body fluid such as blood will close a circuit between the probe tip 48a and the conductive sleeve 50.

The coaxial cable is advanced into a body lumen in the same manner as above described by either pulling or pushing upon the protective sheath 22 adjacent the needle hub and when advancement is complete, and the needle hub and hub 24, to which the proximal portion of the cable is anchored, are locked together as above described the needle will move back the floating taper and release the trailing end of the sheath for complete removal. The portion of the cable 45 extending out of the hub 24 may be connected to an oscilloscope or other indicating or recording means in a known manner to provide the parameters of information desired, and the monitoring may be accomplished from the time of entry into the body lumen of the cable until it reaches its destination which may be at or near the heart of the patient and, of course, thereafter as long as desired.

In FIG. 13 we have diagrammatically illustrated a catheter 52 which carries therein a sensing device in the form of a transducer, generally indicated by the numeral 53 and which is of a known construction. The catheter may be advanced into a body lumen by any of the embodiments of the placing means herein described.

From the foregoing it will be apparent that the placement apparatus herein described in several embodiments may be used for the purpose of positioning a catheter alone, a catheter carrying a sensing device therein, or a sensing device alone, in a body lumen.
Although various minor modifications might be suggested by those versed in the art, it should be understood that we wish to embody within the scope of the patent granted hereon all such modifications as reasonably and properly come within the scope of our contribution to the art.

The invention claimed is:

1. A placement unit embodying a needle and an elongated element telescopically associated therewith for positioning the element in a body lumen, wherein the improvement comprises:
   a. a hollow hub in which a portion of the element is secured, and
   b. a protective disruptible sheath around said element and removably connected at one end to said hub, the other end of said sheath being free and disposed adjacent said needle, means associated with said needle to disrupt said sheath for removal from around said element during advancement of the element into a body lumen relatively to said needle and disrupt means by pulling said sheath in generally the advancing direction of the element, regardless of length and flexibility of the sheath and element, said disrupt means remaining spaced from the hub in a final position of the hub relative to the disrupt means so that continued pull in the same direction will effect removal of the sheath from the hub.

2. The placement unit of claim 1, wherein said element is a catheter.

3. The placement unit of claim 1, including means associated with said needle to automatically release the connection between said sheath and the hollow hub after the element is advanced.

4. The placement unit of claim 1, including a hollow hub secured around the outer portion of said needle, said needle hub having a slot therein through which the free end of said sheath extends and the sheath is withdrawn as the element advances.

5. The placement unit of claim 4, including interlocking means carried by said hubs for coupling the hubs together after advancement of the element.

6. The placement unit of claim 5, including means carried by one of said hubs to automatically release the connection between the sheath and element hub when the hubs are coupled.

7. The placement unit of claim 4, including means carried by the needle hub to prevent retraction of the element relatively to the needle after advancement of the element has started.

8. The placement unit of claim 1, including a hub on said needle, one of said hubs having a recess therein, an annular shoulder in said recess, and resilient fingers on the other said hub having means thereon to enter said recess and latch behind said shoulder.

9. A placement unit embodying a needle and an elongated element telescopically associated therewith for positioning the element in a body lumen, wherein the improvement comprises:
   a. a hollow hub in which a portion of the element is secured, and
   b. a protective disruptible sheath around said element and removably connected at one end to said hub, the other end of said sheath being free and disposed adjacent said needle, means associated with said needle to disrupt said sheath for removal from around said element, whereby said element can be advanced into a body lumen relatively to said needle by moving said sheath adjacent the free end thereof, regardless of the length and flexibility of the sheath and element, said hub including a nipple, said sheath being telescoped over said nipple, a washer holding said sheath secured to said nipple when tilted and releasing said sheath when disposed normal to the axis of the element, and means in said hub to retain said washer tilted during advancement of the element.

10. A placement unit embodying a needle and an elongated element telescopically associated therewith for positioning the element in a body lumen, wherein the improvement comprises:
   a. a hollow hub in which a portion of the element is secured, and
   b. a protective disruptible sheath around said element and removably connected at one end to said hub, the other end of said sheath being free and disposed adjacent said needle, means associated with said needle to disrupt said sheath for removal from around said element, whereby said element can be advanced into a body lumen relatively to said needle by moving said sheath adjacent the free end thereof, regardless of the length and flexibility of the sheath and element, a floating taper in said element hub over which said sheath is disposed and said taper diminishing in the direction of extension of the sheath therefrom, and a sleeve in said element hub carrying interlocking means and said sheath being gripped between said taper and the inner edge of said sleeve until the taper is pushed back by the blunt end of said needle when said hubs are coupled.

11. In combination in a placement unit including an elongated element to be positioned in a body lumen: a hollow hub; said element having an end portion thereof secured in said hub; a protective disruptible sheath around said element and removably connected at one end to said hub, the other end of said sheath being free; means adjacent the free end of said sheath to disrupt the same; said means remaining outside of the body lumen and providing a handhold relative to which the element and sheath can be advanced; whereby said element may be advanced through a previously established cannulated entry into the body of a patient by moving the free end portion of said sheath in generally the advancing direction of the element and divergently relative to the element so that the advancing sheath remains outside the body lumen as the sheath progressively disrupts and diverts from the element while advancing the element in the lumen; said disrupt means remaining spaced from the hub in a final position of the hub relative to the disrupt means so that continued pulling in the same direction will effect removal of the sheath from the hub.

12. The unit of claim 11, wherein said disrupt means comprise
a second hollow hub having a side opening through which the free end of said sheath projects, said element being advanced axially through said second hub as the sheath is forced through said opening.

13. The unit of claim 12, including cooperative means carried by said hubs for interlocking said hubs together after advancement of the element and releasing the connection between said sheath and element hub.

14. The unit of claim 12, including a rigid tubular member disposed axially in said second hub through which the element is advanced and which is positioned to disrupt said sheath as the same is withdrawn.

15. A placement unit for positioning an elongated element in a body lumen:
including a hollow hub;
an element having a portion thereof secured in said hub;
a protective disruptible sheath around said element and removably connected at one end to said hub; the other end of said sheath being free;
means adjacent the free end of said sheath to disrupt the same;
whereby said element may be advanced through a previously established cannulated entry into the body of a patient by moving the free portion of said sheath; a nipple in said hub;
a floating washer around said nipple;
said sheath having its end portion disposed over said nipple and through said washer, and
a stop member in said hub disposed to contact said washer at a point adjacent the circumference thereof and tilt the washer to exert a gripping action on the sheath when an advancing movement is exerted on said sheath.

16. The unit of claim 15, including a second hub through which the element is advanced and out of which the sheath is withdrawn, interengaging means carried by said hubs, and means carried by said second hub to abut said washer and move it to a position normal to said nipple and release said sheath when said hubs are engaged.

17. A placement unit embodying a needle and an elongated element telescopically associated therewith for positioning the element in a body lumen, wherein the improvement comprises:
a hollow hub in which a portion of the element is secured, and
a protective disruptible sheath around said element and removably connected at one end to said hub, the other end of said sheath being free and disposed adjacent said needle, means associated with said needle to disrupt said sheath for removal from around said element, whereby said element can be advanced into a body lumen relatively to said needle by moving said sheath adjacent the free end thereof, regardless of the length and flexibility of the sheath and element, a nipple in said hub, an elastic sleeve holding the end of said sheath on said nipple, said disrupt means comprising a hub on said needle, and means carried by said needle hub to push said sleeve off said sheath after the catheter is advanced.

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