Abstract: An intravenous start kit is used by a medical professional to start an intravenous line into a patient to introduce medications and/or fluids directly into the patient or to withdraw fluids from the patient. The intravenous start kit includes a flexible housing foldable between at least a closed configuration and an open configuration. The housing can include a plurality of receiving spaces configured to receive medical articles and/or equipment used to start an intravenous line. The receiving spaces can also receive and store waste material, for example, used medical articles or the packaging for medical articles. The housing can also include one or more straps operable to releasably attach the housing to a fixed structure, for example, a gurney. Also disclosed is a method of starting an intravenous line in a patient using an intravenous start kit.
INTRAVENOUS START KIT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Application No. 61/249,219, filed October 6, 2009, entitled "Intravenous Start Kit," which is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] This invention relates to an intravenous start kit used to arrange and co-locate at least a plurality of the components used to start an intravenous medical line into a patient.

Description of the Related Art

[0003] It is common for medical professionals to start intravenous ("I.V.") lines to introduce fluids and medications directly into a patient or to withdraw fluids from the patient. Depending on where they are employed, healthcare professionals may be tasked with starting dozens of I.V. lines on any given day.

[0004] Before starting an I.V. line, a healthcare professional is required to assemble all of the instruments, supplies, medications, and other materials that may be required for a procedure and arrange them on or near a procedure tray so that they are accessible during the procedure. Separately storing equipment used to start I.V. lines poses serious logistical problems for tracking inventory and/or ordering new supplies. Accordingly, healthcare providers may be required to make several time consuming stops before they are able to locate all of the equipment necessary for a given procedure.

[0005] For the same reasons, it can be difficult to locate additional equipment once a procedure has started, especially when emergencies occur. Therefore, items must be gathered for the procedure even if the healthcare provider is not certain they will be required. Furthermore, different I.V. lines require different combinations of equipment and it can be difficult and time consuming for a healthcare provider to gather different combinations of equipment throughout the day. The time spent gathering equipment used to start an I.V. line
can be stressful for both patients and healthcare providers. For example, in emergency situations, any time used to gather I.V. line start equipment can pose serious risks for the patient.

[0006] After equipment for starting an I.V. line has been gathered, it must remain clean and organized until the procedure has been completed. It equipment is laid out too far ahead of time, it can become contaminated and must be replaced with sterile items. Thus, it is often desirable to gather the equipment necessary to start an I.V. line close to the time of the procedure. Also, trays used to hold I.V. line equipment can become disorganized and cluttered once the procedure is underway. Moreover, once the procedure has commenced, the prevalence of blood borne diseases makes the proper disposal of bio-waste created during the procedure essential to protect the health of patients and healthcare providers.

[0007] Accordingly, there is a need for an improved I.V. start kit for use in starting an I.V. line in a patient.

SUMMARY OF THE INVENTION

[0008] The devices and methods of the present invention have several features, no single one of which is solely responsible for its desirable attributes. Without limiting the scope of this invention as expressed by the claims which follow, its more prominent features will now be discussed briefly. After considering this discussion, and particularly after reading the section entitled "Detailed Description of Certain Embodiments," one will understand how the features of this invention provide several advantages over other I.V. start kits.

[0009] One aspect of the present invention is a housing for a kit used to start an intravenous line into a patient. The housing includes a body foldable between a closed configuration and an open configuration and a plurality of receiving spaces supported by the body. The receiving spaces are configured for storing a plurality of medical articles and are accessible at least when the body is in the open configuration.

[0010] Another aspect of the present invention is a kit used to start an intravenous line into a patient. The kit includes a housing configured to fold between a closed configuration and an open configuration, a plurality of receiving spaces supported by the
housing, and at least one medical article disposed within at least one of the receiving spaces. The receiving spaces are accessible at least when the housing is in the open configuration and the at least one medical article is configured to be used in starting the intravenous line.

[0011] Yet another aspect of the present invention is a method for starting an intravenous line in a patient. The method includes receiving a kit including a housing configured to fold between a closed configuration and an open configuration, a plurality of receiving spaces supported by the housing, the plurality of receiving spaces being accessible at least when the housing is in the open configuration, and at least one medical article disposed within at least one of the receiving spaces, the at least one medical article configured to be used in starting the intravenous line, wherein the kit is received in the closed configuration. The method also includes unfolding the housing to the open configuration, removing the at least one medical article from the housing, and starting an intravenous line in the patient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIGURE 1 is a perspective view of one embodiment of an intravenous start kit folded in a closed position.

[0013] FIGURE 2 is a perspective view of the intravenous start kit of FIGURE 1 as the start kit is beginning to be partially unfolded.

[0014] FIGURE 3 is a perspective view of the intravenous start kit of FIGURE 2 further unfolded.

[0015] FIGURE 4 is a perspective view of the intravenous start kit of FIGURE 3 further unfolded.

[0016] FIGURE 5 is a perspective view of the intravenous start kit of FIGURE 4 further unfolded.

[0017] FIGURE 6 is a perspective of the intravenous start kit of FIGURE 5 entirely unfolded and secured to a fixed structure.
DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0018] The following description and the accompanying figures, which describe and show the preferred embodiments, are made to demonstrate several possible configurations that an I.V. start kit can take to include various aspects and features of the invention. Those of skill in the art will recognize that the disclosed aspects and features of the invention are not limited to any particular embodiment of an intravenous start kit, which can include one or more of the inventive aspects and features herein described, and can be designed for use with a variety of medical articles for a variety of medical procedures.

[0019] The preferred embodiments of the present invention advantageously provide an I.V. start kit for starting an I.V. line into a patient and methods for using an I.V. start kit. The I.V. start kit can include most or all the equipment necessary to perform an I.V. start procedure, including one or more catheters, one or more extension sets, one or more catheter securement devices, and/or any other equipment or medical article used to start an I.V. line. Additionally, the kit can include a housing used to house or store all of the equipment necessary to start an I.V. line. The housing can also include one or more areas or receiving spaces configured to receive and subsequently house or store waste, for example, bio-waste produced during an I.V. line start procedure. The housing can be formed of a foldable material so as to be foldable between a closed position and an open position. The foldability of the housing allows the start kit to be stackably stored when in the closed position and further protects the contents of the kit when the housing is folded in the closed position.

[0020] To facilitate a complete understanding of the preferred embodiments, the remainder of the detailed description describes I.V. start kits and methods of using the same with reference to the figures, wherein like elements among embodiments are referenced with like numerals throughout the following description. To assist with the description of the I.V. start kits, the following coordinate terms are used (see FIGURE 1). A "longitudinal axis" is generally parallel to a portion of the start kit housing. A "lateral axis" is normal to the longitudinal axis. A "transverse axis" extends normal to both the longitudinal and lateral axes. In addition, as used herein, "the longitudinal direction" refers to a direction substantially parallel to the longitudinal axis; "the lateral direction" refers to a direction...
substantially parallel to the lateral axis; and "the transverse direction" refers to a direction substantially parallel to the transverse axis. Also, the terms "proximal" and "distal", which are used to describe the present medical article, are used consistently with the description of the exemplary applications (e.g., the illustrative examples of the use applications).

I.V. Start Kit

[0021] FIGURE 1 shows an I.V. start kit 100 which includes a housing 102. The housing 102 is folded in a closed or stored position. As shown in FIGURES 1-5, the body of the housing 102 can be unfolded at least between the closed position and an open position along one or more fold-lines 110. When unfolding the housing 102, a first portion of the housing 102 disposed on one side of a fold-line 110 can be bent at the fold-line 110 away from a second portion of the housing 102 that is disposed on an opposite side of the fold-line 110. When folding the housing 102, a first portion of the housing 102 disposed on one side of a fold line 110 can be bent at the fold-line toward a second portion of the housing 102 that is disposed on an opposite side of the fold-line 110.

[0022] In the illustrated embodiment, the housing 102 can be unfolded along a plurality of predetermined fold-lines 110 or guide lines between the closed position and the open position. Those of skill in the art will understand that the housing 102 can also be folded along the plurality of fold-lines 110 between the open position and the closed position and/or the housing 102 can be folded between two positions without using any predetermined or established fold-lines 110.

[0023] The fold-lines 110 can include various structures configured to allow a first surface of the housing 102 to be moved toward or away from a second surface of the housing 102. In one embodiment, a fold-line 110 has a wall thickness that is less than the wall thickness of portions of the housing 102 that are disposed on opposite sides of the fold-line 110. The thinned region along the fold-line 100 facilitates folding or manipulating the portions relative to one another across the fold-line 110. In some embodiments, a fold-line 110 can include structure that biases or predisposes a first portion of the housing 102 relative to a second portion of the housing 102 (e.g., that biases the first portion toward or away from the second portion). In other embodiments, a fold-line 110 can include perforations, one or more scored line segments, and/or a hinge configured to facilitate the folding of the housing.
102 along the fold-line 110. A fold-line 110 can comprise the same material as portions of
the housing 102 that are disposed adjacent to the fold-line 110 or different material(s).

[0024] The housing 102 can include any number of fold-lines 110. The number and placement of fold-lines 110 can vary from embodiment to embodiment. In embodiments with multiple fold-lines 110, fold-lines 110 can be disposed parallel to one another or at an angle relative to one another. In one embodiment, the housing 102 includes five fold-lines 110 with two of the fold-lines 110 being disposed generally perpendicular to the other three fold-lines. In such an embodiment, the housing 102 can be tri-folded in one direction (e.g., in the transverse direction) and the tri-fold can be folded twice in a second direction (e.g., in the longitudinal direction. Thus, the housing 102 may be folded and/or unfolded in more than one direction.

[0025] In some embodiments, a housing 102 can include fold-lines 110 configured to provide a clearance or receiving space between two portions of the housing 102. For example, a housing 102 can include two fold-lines 110 with a first portion of the housing 102 disposed adjacent to a first fold-line 110, a second portion of the housing 102 disposed between the first fold-line 110 and a second fold-line 110 such that the first fold-line is between the first portion and the second portion, and a third portion of the housing 102 disposed adjacent to the second fold-line 110 such that the second fold-line 110 is disposed between the second portion of the housing and the third portion of the housing. In this example, the first fold-line 110 can be configured to allow the second portion to fold for 90 degrees relative to the first portion such that the first and second portions are disposed normal to one another. Additionally, the second fold-line 110 can be configured to allow the third portion to fold for 90 degrees relative to the second portion such that the second and third portions are disposed normal to one another. This arrangement results in the first and third portions being disposed parallel to one another. In this way, a receiving space can be formed between the first and third portions. The distance between the first and third portions or offset therebetween is determined at least in part by the distance between the two fold-lines 110. Thus, fold-lines 110 can be configured to allow a first portion of a housing 102 to fold relative to a second housing 102 between 0° and 180°, including 90°.
[0026] The kit 100 can be configured to be stackable with other kits and/or other objects when in the closed or stored position. For example, several kits 100 can be stacked on top of each other in a storage space when the kits are in the closed position. To facilitate the stacking of multiple kits 100 in a confined volume, the kits have a low profile when in the closed position by positioning the fold-lines 110 as discussed above. The kit 100 can include one or more external identifiers or indicia (not shown) when in the closed position to identify the contents and/or purpose of the kit 100. For example, a label can be disposed on a surface of the housing 102 that is exposed when the kit is in the closed position. Further, the kit 100 may be stored in an outer bag or other enclosure before use.

[0027] Housing 102 can be formed of any flexible material capable of being folded. For example, housing 102 can be formed of mesh, fabric, cloth, paper, textiles, and/or other flexible materials. In some embodiments, housing 102 comprises more than one flexible material. For example, housing 102 may be formed of cloth and plastic mesh. In embodiments where the fold-lines 110 comprise hinge structures, the housing 102 can be formed of more rigid materials, for example, polymers, plastics, rubbers, or foams. Housing 102 can be formed of material that is easy to sterilize, for example, plastic. In some embodiments, the material that forms housing 102 is chosen based on its strength and or density.

[0028] As shown in FIGURES 2-5, housing 102 can include one or more securement structures for attaching the kit 100 to a support structure. For example, the securement structure can be straps 106 that extend from the body of the housing 102. The securement structure can be one or more magnets, adhesives, or hook/loop fasteners disposed on a back surface of the housing 102 and which are brought into contact with the support structure.

[0029] The straps 106 can be foldable along one or more fold-lines 110. The straps 106 can be sized and/or configured to releasably attach the housing 102 to a support structure, for example, a guraey. In some embodiments, straps 106 include hook and loop fasteners to releasably attach the housing 102 to the support structure. In other embodiments, the straps 106 may releasably attach the housing 102 to a structure using other means, for example, buckles, buttons, pins, or zippers, or they can be releasably tied to the fixed
structure. The housing 102 can be reinforced at the point where the straps 106 meet the body of the housing to ensure the straps do not tear or separate from the rest of the housing 102 during use.

[0030] As shown in FIGURE 5, housing 102 includes a plurality of receiving spaces 105(a)-(d) on one or more sides of the housing 102. The receiving spaces 105 can include pockets, openings, and/or slots 104(a)-(d) formed in the housing 102 to receive and store certain items. The pockets, openings, and/or slots 104 can be integral formed with the housing 102 or separately manufactured and secured to the housing 102.

[0031] In some embodiments, receiving spaces 105 are defined between folded portions of the housing 102. For example, a receiving space 105 may be defined between a first portion of the housing 102 and a second portion of the housing that is disposed on an opposite side of a fold-line 110 from the first portion. Receiving spaces 105 can be defined between folded portions of the housing 102 and also include pockets, openings, and/or slots 104 formed in the housing 102. For example, a receiving space 105(a) can be configured to receive and store a medical article while a slot 104(a) within the same receiving space 105(a) can be configured to receive and store a portion of that same medical article. Receiving spaces 105 can be configured to receive and store multiple medical articles per receiving space 105 or can be configured to receive and store a single medical article or item separate from the other receiving spaces 105.

[0032] The receiving spaces 105 can be configured to receive various medical articles 202(a)-(d) or other equipment used to start an I.V. line into a patient. Such medical articles can be or include, for example, but without limitation, connector fittings, catheters, catheter hubs, catheter adaptors, fluid supply lines, and/or other similar articles. Other equipment, for example, disinfecting wipes, cotton balls, and/or tape, can also be received and stored within the receiving spaces 105. Furthermore, one or more of the receiving spaces 105 can be configured to receive and store waste, including bio-waste and other waste. For example, receiving spaces 105(a)-(b) can be configured to receive and store the disposable packaging for medical articles and/or medical articles that were used to perform a medical procedure.
[0033] The quantity, size, and location of receiving spaces 105 can vary depending on the medical procedure the kit is intended for. In some embodiments, a kit 100 includes four equally sized receiving spaces 105 disposed near a lower edge of the housing 102. In other embodiments, a kit can include a plurality of receiving spaces with at least one receiving space being differently sized from at least one other receiving space. The receiving spaces in a particular housing 102 may or may not be aligned with each other. For example, the receiving spaces 105 may be arranged in a 2-dimensional array across a portion of the housing 102. The housing 102 can include multiple rows of receiving spaces 105 extending longitudinally with the receiving spaces 105 in each row being offset longitudinally from receiving spaces in other rows. With the receiving spaces 105 offset from each other, when folded, a receiving space in one row would not overlap a receiving space in another row. Such an arrangement would provide a lower profile for the start kit 100 when in the closed position.

[0034] The receiving spaces 105 can be sized to generally match the size of the object 202 intended to be stored within the receiving space while allowing the object 202 to be easily retrieved from the space 105. For example, a receiving space 105 can be sized to generally match the size of a package containing a catheter such that movement of the packaging relative to the housing 102 is moderately inhibited when stored within the receiving space 105. That is to say, the receiving spaces 105 can be configured to conform to the shapes of the received objects 202.

[0035] Objects 202 can include one or more medical articles or equipment that may be utilized to perform a given step in starting an I.V. line. For example, object 202a can include a catheter and an iodine swab required to perform the first step in starting an I.V. line. In some embodiments, objects 202 can include only a single item that may be used to perform an I.V. start procedure.

[0036] Objects 202 stored within receiving spaces 105 can be placed in the housing 102 in a certain order. For example, the first object 202(a) used to start an I.V. line can be placed in the left-most receiving space 105(a) and the next object used in the procedure 202(b) can be placed in an adjacent receiving space 105(b) etc. Kits 100 can be
provided to a healthcare provider with one or more empty receiving spaces 105 configured to receive waste created during a medical procedure.

Method of Use

[0037] The following method of use will be with reference principally to FIGURES 5 and 6, and will be in the context of starting an I.V. line using an I.V. start kit. This discussion of one embodiment of a method of use is meant to augment the description of the invention above and both should be read together.

[0038] In starting an I.V. line, the healthcare provider begins by receiving kit 100 in the closed position. The healthcare provider unfolds the kit 100 and uses straps 106 to releasably attach the kit 100 to a fixed structure 600, for example, to a gurney rail near the patient. The healthcare provider then removes a first medical article 202(a), a catheter, from receiving space 105(a) and inserts the distal end of the catheter into the patient's vasculature using known procedures. For example, prior to insertion, a needle, stylus, or trocar can be slidably received within portion of the catheter and then removed after the catheter has been inserted into the patient's vasculature. In some embodiments, the catheter is primed with sterile fluid to ensure the flow of fluid through the system.

[0039] After inserting the catheter, the healthcare provider removes a second medical article 202(b), an extension set, from a receiving space 105(b). The healthcare provider uses the extension set to connect the catheter to a fluid supply line. A filter can be stored in the kit 100 and disposed between the fluid supply tube and extension set if desired or deemed necessary.

[0040] With the catheter inserted and connected to the fluid supply line, the healthcare provider removes a third medical article 202©, a securement device (e.g., a Statlock® device available commercially from C.R. Bard., Inc. located in Georgia), from a receiving space 105(c). The healthcare provider then uses the removed securement device to secure the catheter and/or extension set relative to the patient.

[0041] After the I.V. line has been started and the catheter has been secured relative to the patient, the healthcare provider places any waste in a fourth receiving space 105(d). For example, the healthcare provider can place a used stylus or trocar containing bio-waste within a receiving space 105. The healthcare provider can also place other waste, for
example, the packaging for used medical articles, within a receiving space 105. The healthcare provider can then remove the housing 102 from the fixed structure and dispose of the kit 100. In some embodiments, the healthcare provider disposes of the kit after the I.V. line has been started. In some embodiments, the healthcare provider places the used catheter and/or extension set in a receiving space 105 after the catheter has been removed and then disposes of the kit 100.

[0042] The healthcare provider can dispose of the kit 100 in the folded or unfolded position. However, whenever a healthcare provider transports a kit 100 that is housing waste, it may be desirable to transport the kit 100 in the closed position before disposing of the housing 102 and its contents.

[0043] The various embodiments of I.V start kits and techniques described above thus provide a number of ways to start I.V. lines in a safe and organized fashion. In addition, although discussed in the context of starting an I.V. line, the techniques described may be broadly applied for use with a variety of medical procedures.

[0044] Of course, it is to be understood that not necessarily all such objectives or advantages may be achieved in accordance with any particular embodiment using the systems described herein. Thus, for example, those skilled in the art will recognize that the systems may be developed in a manner that achieves or optimizes one advantage or group of advantages as taught herein without necessarily achieving other objectives or advantages as may be taught or suggested herein.

[0045] Furthermore, the skilled artisan will recognize the interchangeability of various features from different embodiments. Although these techniques and systems have been disclosed in the context of certain embodiments and examples, it will be understood by those skilled in the art that these techniques and systems may be extended beyond the specifically disclosed embodiments to other embodiments and/or uses and obvious modifications and equivalents thereof. Additionally, it is contemplated that various aspects and features of the invention described can be practiced separately, combined together, or substituted for one another, and that a variety of combination and subcombinations of the features and aspects can be made and still fall within the scope of the invention. Thus, it is
intended that the scope of the systems disclosed herein disclosed should not be limited by the particular disclosed embodiments described above.
WHAT IS CLAIMED IS:

1. A housing for a kit used to start an intravenous line into a patient, the housing comprising:
   a body foldable between a closed configuration and an open configuration;
   and
   a plurality of receiving spaces supported by the body for storing a plurality of medical articles, the plurality of receiving spaces being accessible at least when the body is in the open configuration.

2. The housing of Claim 1 further comprising at least one securement structure supporting the body and configured to releasably attach to a support member so as to allow a medical provider to access the plurality of receiving spaces.

3. The housing of Claim 2, wherein the securement structure is a strap.

4. The housing of Claim 1, wherein at least one of the plurality of receiving spaces is configured to receive a waste material formed while starting an intravenous line.

5. The housing of Claim 1, wherein the housing comprises four receiving spaces.

6. The housing of Claim 5, wherein a first receiving space is configured to receive a catheter.

7. The housing of Claim 6, wherein a second receiving space is configured to receive a medical article securement device.

8. The housing of Claim 7, wherein a third receiving space is configured to receive a catheter extension set.

9. The housing of Claim 8, wherein a fourth receiving space is configured to receive waste material.

10. The housing of Claim 1, wherein the housing is configured to fold along at least two fold-lines.

11. The housing of Claim 10, wherein at least one fold-line comprises a hinge.

12. The housing of Claim 10, wherein at least one fold-line biases a first portion of the body relative to a second portion of the body.

13. The housing of Claim 10, wherein at least one fold-line is disposed generally normal to at least two other fold-lines.
14. A kit used to start an intravenous line into a patient, the kit comprising:
   a housing configured to fold between a closed configuration and an open
   configuration;
   a plurality of receiving spaces supported by the housing, the plurality of
   receiving spaces being accessible at least when the housing is in the open
   configuration; and
   at least one medical article disposed within at least one of the receiving
   spaces, the at least one medical article configured to be used in starting the
   intravenous line.

15. The kit of Claim 14, wherein at least one of the plurality of receiving spaces is
    defined at least partially between a first portion of the housing and a second portion of the
    housing.

16. The kit of Claim 14, wherein at least one of the plurality of receiving spaces
    comprises a slot configured to receive at least a portion of an item.

17. The kit of Claim 16 wherein at least a portion of the at least one of the
    plurality of receiving spaces is disposed outside the slot, the portion being configured to
    receive at least a portion of the item.

18. The kit of Claim 14, wherein the plurality of receiving spaces are arranged in a
    plurality of rows.

19. The kit of Claim 18, wherein none of the receiving spaces in one of the
    plurality of rows is aligned with the receiving spaces in another one of the plurality of rows
    so that the plurality of receiving spaces do not overlap when the kit is in the closed
    configuration.

20. A method for starting an intravenous line in a patient, the method comprising:
    receiving a kit comprising
    a housing configured to fold between a closed configuration and an
    open configuration,
    a plurality of receiving spaces supported by the housing, the plurality
    of receiving spaces being accessible at least when the housing is in the open
    configuration, and
at least one medical article disposed within at least one of the receiving spaces, the at least one medical article configured to be used in starting the intravenous line, wherein the kit is received in the closed configuration; unfolding the housing to the open configuration; removing the at least one medical article from the housing; and starting an intravenous line in the patient.
INTERNATIONAL SEARCH REPORT

A CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 19/02 (2010.01)

USPC - 206/438

According to International Patent Classification (IPC) or to both national classification and IPC

B. CLASSIFICATION OF SUBJECT MATTER

USPC - 19/02

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>

Further documents are listed in the continuation of Box C.

* "A" document defining the general state of the art which is not considered to be of particular relevance
* "B" earlier application or patent but published on or after the international filing date
* "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered obvious or cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

& document member of the same patent family

Date of the actual completion of the international search: 11 November 2010

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