

CLAIMS

What is claimed is:

1. A rapidly insertable central catheter (“RICC”) assembly, comprising:
a RICC including:
a catheter tube including:
a first section formed of a first material having a first durometer;
a second section formed of a second material having a second durometer less than the first durometer; and
a side aperture through a side of the catheter tube in a distal-end portion thereof but proximal of the first section of the catheter tube, the side aperture opening into an introducing lumen of the catheter tube that extends from at least the side aperture to a distal end of the RICC;
a catheter hub coupled to a proximal-end portion of the catheter tube; and
one or more extension legs, each extension leg of the one-or-more extension legs coupled to the catheter hub by a distal-end portion thereof;
an introducer including an introducer needle having a cannula extending through the distal end of the RICC when the RICC assembly is in at least a ready-to-deploy state of the RICC assembly; and
a coupling system configured to couple the RICC and the introducer together, the coupling system including a distal coupler slidably attached to the catheter tube proximal of the side aperture.
2. The RICC assembly of claim 1, wherein the cannula further extends through a longitudinal through hole of the distal coupler, through the side aperture of the catheter tube, and along the introducing lumen of the catheter tube before exiting through the distal end of the RICC when the RICC assembly is in at least the ready-to-deploy state thereof.
3. The RICC assembly of either claim 1 or 2, the distal coupler including a tab configured to allow a clinician to single handedly advance the RICC off the cannula with a single finger of a hand while holding the introducer between a thumb and another finger or fingers of the hand.

4. The RICC assembly of any claim of claims 1-3, the introducer further including:
a syringe having a syringe tip coupled to a needle hub of the introducer needle;
and
an access guidewire disposed in an access-guidewire lumen formed of at least a
plunger lumen of a plunger of the syringe and a needle lumen of the
introducer needle, the access guidewire having a length sufficient for
extension of the access guidewire through the distal end of the RICC.
5. The RICC assembly of claim 4, wherein the plunger includes a sealing
mechanism in a proximal-end portion of the plunger for sealing off the access-guidewire
lumen, the sealing mechanism configured to prevent blood from discharging through a
proximal end of the plunger during a venipuncture or while withdrawing the access guidewire
from a blood-vessel lumen of a patient.
6. The RICC assembly of claim 5, wherein the access guidewire is captively
disposed in the introducer by a stop about a proximal-end portion of the access guidewire and
a closed end of an access-guidewire sterile barrier of a fixed length coupled to the proximal
end of the plunger, the stop providing a distal limit to advancing the access guidewire and the
closed end of the access-guidewire sterile barrier around the access guidewire providing a
proximal limit to withdrawing the access guidewire.
7. The RICC assembly of any claim of claims 4-6, the introducer further including
a fluid-pressure indicator extending from a side arm of the needle hub, the fluid-pressure
indicator fluidly coupled to the needle lumen of the introducer needle by way of a side-arm
lumen of the side arm for observing blood flashback.
8. The RICC assembly of any claim of claims 4-7, the coupling system further
including a proximal coupler slidably attached to the catheter hub and removably attached to
the syringe in the ready-to-deploy state of the RICC assembly, the coupling system configured
to allow the RICC to slide relative to the introducer.
9. The RICC assembly of claim 8, wherein the proximal coupler includes a
catheter-hub clip from which the RICC is configured to suspend by the catheter hub in at least
the ready-to-deploy state of the RICC assembly or the one-or-more extension legs when the
proximal coupler is advanced thereover in an operating state of the RICC assembly.

10. The RICC assembly of claim 9, wherein the proximal coupler includes a syringe clip within which the introducer is configured to rest by a distal-end portion of a barrel of the syringe in at least the ready-to-deploy state of the RICC assembly.

11. The RICC assembly of any claim of claims 8-10, the RICC further including a collapsible catheter-tube sterile barrier over the catheter tube between the catheter hub and the distal coupler to which distal coupler the catheter-tube sterile barrier is coupled, the catheter-tube sterile barrier configured to split apart when a sterile-barrier tab of the catheter-tube sterile barrier is removed from the catheter-hub clip and the catheter-tube sterile barrier is pulled away from the catheter tube by the sterile-barrier tab.

12. The RICC assembly of claim 11, wherein the catheter-tube sterile barrier has sufficient tensile strength to pull the distal coupler off the catheter tube without breaking when the sterile barrier splits down to the distal coupler while being pulled away from the catheter tube.

13. The RICC assembly of any claim of claims 1-12, wherein the RICC includes a set of three lumens including a distal lumen, a medial lumen, and a proximal lumen formed of fluidly connected portions of three catheter-tube lumens, three hub lumens, and three extension-leg lumens, the introducing lumen of the catheter tube coincident with a distal-end portion of the distal lumen.

14. The RICC assembly of claim 13, wherein the distal lumen has a distal-lumen aperture in a distal end of the RICC, the medial lumen has a medial-lumen aperture in the side of the catheter tube distal of the side aperture, and the proximal lumen has a proximal-lumen aperture in the side of the catheter tube distal of the side aperture but proximal of the medial-lumen aperture.

15. The RICC assembly of any claim of claims 1-14, the RICC further including a maneuver guidewire disposed in the distal lumen having a length sufficient for extension of the maneuver guidewire to a lower $\frac{1}{3}$ of a superior vena cava of a heart, the maneuver guidewire captively disposed in the RICC by a stop about a proximal-end portion of the maneuver guidewire and a closed end of a maneuver-guidewire sterile barrier of a fixed length coupled to a Luer connector, the stop providing a distal limit to advancing the maneuver guidewire and the closed end of the maneuver-guidewire sterile barrier around the maneuver guidewire providing a proximal limit to withdrawing the maneuver guidewire.

16. A method for inserting a rapidly insertable central catheter ("RICC") into a blood-vessel lumen of a patient, comprising:

obtaining a RICC assembly including the RICC, an introducer including a syringe coupled to an introducer needle, and a coupling system including a distal coupler that couples the RICC and the introducer together by distal-end portions thereof in at least a ready-to-deploy state of the RICC assembly;

establishing a needle tract from an area of skin to the blood-vessel lumen of the patient with a cannula of the introducer needle while holding a distal-end portion of a barrel of the syringe, the cannula extending through a longitudinal through hole of the distal coupler, through a side aperture in a distal-end portion of a catheter tube of the RICC, along an introducing lumen of the catheter tube, and out a distal end of the RICC for establishing the needle tract;

advancing a distal-end portion of the catheter tube into the blood-vessel lumen over the cannula; and

withdrawing the cannula from the introducing lumen by way of the side aperture of the catheter tube.

17. The method of claim 16, further comprising aspirating blood with the syringe before withdrawing the cannula from the introducing lumen, thereby confirming the cannula is disposed in the blood-vessel lumen of the patient.

18. The method of either claim 16 or 17, wherein establishing the needle tract includes ensuring blood flashes back into a needle hub of the introducer needle, a side arm of the needle hub, or a fluid-pressure indicator extending from the side arm of the needle hub.

19. The method of any claim of claims 16-18, wherein establishing the needle tract while holding the distal-end portion of the barrel of the syringe includes holding the barrel by a syringe clip around the distal-end portion of the barrel, the syringe clip part of a proximal coupler of the coupling system.

20. The method of claim 19, wherein advancing the distal-end portion of the catheter tube into the blood-vessel lumen includes advancing the catheter tube into the blood-vessel lumen with a single finger of a hand while holding the barrel of the syringe by the syringe

clip between a thumb and another finger or fingers of the hand, the distal coupler including a tab configured for advancing the catheter tube into the blood-vessel lumen with the single finger.

21. The method of either claim 19 or 20, wherein advancing the distal-end portion of the catheter tube into the blood-vessel lumen includes advancing a catheter hub of the RICC from a catheter-hub clip of the proximal coupler and, thereafter, one or more extension legs of the RICC within the catheter-hub clip, the RICC configured to suspend from the coupling system until at least withdrawing the cannula from both the introducing lumen and the longitudinal through hole of the distal coupler.

22. The method of any claim of claims 16-21, further comprising advancing an access guidewire disposed in an access-guidewire lumen formed of at least a plunger lumen of a plunger of the syringe and a needle lumen of the introducer needle into the blood-vessel lumen beyond a distal end of the cannula before advancing the distal-end portion of the catheter tube into the blood-vessel lumen over the cannula.

23. The method of claim 22, further comprising advancing a maneuver guidewire into the blood-vessel lumen by way of a distal lumen having a distal-lumen aperture in the distal end of the RICC, the introducing lumen of the catheter tube coincident with a distal-end portion of the distal lumen, thereby mandating withdrawing the cannula from the introducing lumen before advancing the maneuver guidewire into the blood-vessel lumen.

24. The method of claim 23, further comprising advancing the distal-end portion of the catheter tube farther into the blood-vessel lumen over the maneuver guidewire and concomitantly sliding the distal coupler proximally toward a proximal-end portion of the catheter tube to uncover the catheter tube, the catheter tube covered by a collapsible sterile barrier between the proximal-end portion of the catheter tube and the distal coupler in at least the ready-to-deploy state of the RICC assembly.

25. The method of claim 24, further comprising removing the sterile barrier and the distal coupler from the RICC by pulling a sterile-barrier tab of the sterile barrier opposite the distal coupler away from the catheter tube to split the sterile barrier apart, then pulling the distal coupler from the catheter tube by the sterile barrier to which the distal coupler is slidably attached.

26. The method of any claim of claims 23-25, wherein the catheter tube includes a first section formed of a first material having a first durometer and a second section proximal of the first section formed of a second material having a second durometer less than the first durometer, the first section of the catheter tube configured with a column strength for advancing the catheter tube into the blood-vessel lumen over the access guidewire or the maneuver guidewire.