LEARNING MODULE FOR SPECIAL LINES
CC 80-030

1. Percutaneous Sheath Introducer: Care, Maintenance and Removal (Cordis)
2. Care and Removal of the Single Lumen Catheter (SLIC) (ICU/BURN UNIT/PACU/CCU/CVICU Only)
3. Care and Removal of the Companion Kit (Double and Triple Lumen catheters inserted through the Percutaneous Introducer)
4. Care and Removal of the AVA Catheter (ICU and approved units including 6A and 6B)
5. Care and Removal of the Heparin Coated Single Lumen Peripherally Inserted Central Line (PICL) (ICU/BURN UNIT/PACU Only)

Revised by: Debbie White
Date: August 2011.

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PURPOSE:

This learning module provides the Registered Nurse (RN) with the theory and practice necessary to care for the patient with:

- a percutaneous sheath introducer (Cordis),
- the single lumen catheter (SLIC),
- the peripherally inserted central line (PICL)
- the companion kit
- AVA kit

After completing the learning objectives, the RN will demonstrate competency according to the proficiency standards.

LEARNING OBJECTIVES for all “Special Lines”

Following completion of this learning module, the registered nurse will be able to:

1. Explain the rationale for use as a therapeutic intervention.
2. List the rationale for care
3. List the risks and complications associated with the care and removal
4. Demonstrate using the Proficiency Standards Checklist the procedure for removal and be signed off by an RN competent in this procedure.

METHOD for all “Special Lines”:

1. Review the policy for content
2. Observe an RN certified in this procedure, performing the procedure.
3. Complete the written test.
4. Perform the procedure according to the proficiency standards with the supervision of a certified RN.

THEORY:

Please refer to policy for additional information

POSITIONING FOR INSERTION AND REMOVAL OF THE PERCUTANEOUS INTRODUCER

Patients should be supine with HOB elevated for special line removal unless contraindicated for that patient. Trendelenburg position should not be used. It initially increases venous return but has little or no effect on cardiac output and blood pressure. Pulmonary gas exchange is impaired in this position with effects being more pronounced in obese patients. Gravitational movement of mucus and gastric secretions may increase aspiration potential. Patients who are ventilated should never have their head of bed (HOB) lower than 10 degrees. Positioning
with towels and flannels placed under the shoulder may help with patient position for insertion of a subclavian or jugular central line.

**Risks and Complications Associated With the Care and Removal of the Percutaneous Introducer (including AVA catheter)**

**Air Embolus** - An introducer is a large bore non-tunneled central venous catheter. Air Embolus is one of the most serious complications of central venous cannulation. This complication occurs most commonly either at the time of venous puncture, during insertion or with catheter disconnection. Embolization of air is also possible through a residual track after removal of the catheter.

While the sheath is in place in the vein a subcutaneous track forms which increases the risk of an air entry point. Embolization of air through a patent catheter track generally occurs within the first hour after catheter removal. Patients with air embolism commonly have cardiac, pulmonary or neurologic sequelae. The spectrum varies from mild nausea, dizziness, dyspnea, and confusion to chest pain, tachycardia, tachypnea, and localized neurologic deficit. A frequent observation is a "whistle" of air through the patent track upon deep inspiration. The optimal treatment is prevention.

If an air embolism occurs, notify physician, administer 100% oxygen and place the patient in the left lateral head-down position. When 10-20 mL of air is trapped in the vein, it is carried quickly to the right ventricle. Here it blocks the flow of blood from the ventricles into the pulmonary arteries. Thus the right heart overfills. The right ventricle forcefully contracts in an attempt to eject the blood. However, this causes the air bubble to break into smaller air bubbles that cause more obstruction and pulmonary hypoxia. Pulmonary hypoxia causes vasoconstriction in the lung. This leads to an even greater workload for the right ventricle. Eventually, left ventricular filling is a reduced and cardiac output drop, shock and death rapidly occurs.

{Adapted from Policy and Procedure *Care of the Non-Tunnelled Central Venous Catheter (multilumen) CH 80-015.*}

**Infection** - As with any invasive line there is a potential risk of infection. Aseptic technique should be used when accessing the catheter. The sterile introducer cap (blue cap) should be inserted on the end of the introducer sheath as soon as the PA catheter is removed. *(There is a special obturator cap for the AVA catheter).* An occlusive dressing should cover the insertion point as well as the end of the introducer sheath where the blue cap has been inserted. Risk of infection increases with a catheter, which has been insitu for five days or longer. Patient should be monitored for signs of infection, elevated temperature, elevated WBCs or signs of infection at the insertion site. Notify physician if the infection is suspected. At this time inform physician of length of time catheter is in place.

**Hemorrhage** - To prevent risk of hemorrhage all connections must be routinely examined and tightly secured.
Upon removal of introducer sheath, apply pressure to the venipuncture site for 5-10 minutes or until hemostasis occurs. To occlude the site, apply sterile Vaseline petroleum gauze followed by a transparent dressing. This should remain in place for 24 to 72 hours.

Refer to the policy for the Sheath Removal procedure; also refer to the Proficiency Standard Skills Checklist

Note: Vaseline petrolatum gauze 3” by 9” dressings are available from Stores.

SLIC AND PICL (ICU/BURN UNIT ONLY)
Refer to policy

COMPANION KITS
Only in areas approved to have Percutaneous Introducers.

AVA Catheter
In approved areas only.

REFERENCES:

 Arrow, (1996), Percutaneous Sheath Introducer Product with Arrow Raulerson Syringe. (Product Insert)
 Arrow, (1999), Single Lumen Infusion Catheter (Product Insert)
 Makic, M.B.,(2011) Evidence –based practice habits: putting more sacred cows out to pasture, Critical Care Nurse. 31(2) 39-38-62

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TEST (Percutaneous Introducer)

1) If TPN is infusing into the percutaneous introducer and the nurse requires an IV line for medications:
   a) Designate the line TPN only
   b) Use the same line for TPN and meds
   c) The patient should have a peripheral IV line inserted for medications
   d) All of the above

2) The appropriate guidelines to follow for the Care of the Patient with a Percutaneous Sheath Introducer include:
   a) The PA-port valve should be sealed with the sterile blue obturator cap
   b) The percutaneous introducer side port can be saline locked
   c) A sterile transparent dressing should be applied to cover the insertion site and side port
   d) All of the above

3) The most appropriate dressing immediately following removal of a percutaneous sheath introducer is:
   a) Gauze and transparent dressing
   b) Vaseline petroleum gauze followed by a transparent dressing to remain in place for up at least 24 hours
   c) Telfa and tape
   d) Band-Aid

4) Careful inspection of a removed percutaneous sheath introducer should reveal:
   a) A catheter 20cm in length
   b) A tapered end
   c) A blunt end, 10 cm in length
   d) A catheter 5 cm in length

5) It is recommended that the percutaneous sheath introducer be removed as soon as possible because:
   a) The risk of infection increases with the length of time in site
   b) It is a large bore central line
   c) It is not needed for an infusion
   d) The formation of the subcutaneous tract increases with the length of time left in
   e) All of the above

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6) Signs and symptoms of an air embolus in the central circulation may include:

   a) air hunger
   b) fast pulse and elevated BP
   c) Patient becomes noticeably distressed
   d) Skin becomes cyanotic/mottled
   e) all of the above
TEST (SLIC AND PICL and AVA catheter)

1) Caring for the SLIC includes:
   a) Keeping an IV running into the CLC 2000 which is attached to the SLIC
   b) Removal of the SLIC prior to transfer from designated units
   c) Application of an obturator cap to the rubber valve when SLIC removed
   d) Never heplocking or dead-ending a SLIC
   e) All of the above

2) Caring for a PICL includes
   a) Recognizing that the PICL may migrate further in to the heart
   b) Infusion of inotropes into the peripheral portion of the PICL
   c) Removal of the entire PICL 2 piece set-up when the order is written to remove
   d) Saline locking the side port
   e) All of the above

3) Caring for the AVA catheter includes
   a) using the white special cap to plug the rubber valve if nothing is in place in this port(percutaneous introducer port)
   b) adding CLC 2000 connections to the multilumen lines
   c) checking PT/PTT/INR values as indicated before attempting removal
   d) utilizing this line for dialysis
ANSWERS – Percutaneous Sheath

1. a and c
2. d
3. b
4. c
5. e
6. e

ANSWERS - SLIC AND PICL and AVA catheter

1. e
2. e
3. a, b and c

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# CAPITAL HEALTH CLINICAL SERVICES DIVISION

## PROFICIENCY STANDARD SKILLS CHECKLIST

**TITLE:** Percutaneous Sheath Introducer: Removal (Cordis)

### Name/Nursing Unit: ________________________________

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PROFICIENCY STANDARD SKILLS CHECKLIST

TITLE: SLIC Removal

Name/Nursing Unit: ____________________________________________

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<thead>
<tr>
<th>Step Description</th>
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<tbody>
<tr>
<td>1. Checks for order to remove</td>
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<tr>
<td>2. Removes transparent occlusive dressing.</td>
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<td>3. Unlocks SLIC from locking apparatus</td>
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<td>4. Withdraws SLIC in one continuous motion</td>
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<td>5. Places gloved finger over rubber valve</td>
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<td>6. Applies obturator cap</td>
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<td>7. Inspects SLIC to make sure entire length has been withdrawn.</td>
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<td>8. Covers entire site (cordis and obturator cap) with sterile transparent dressing.</td>
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## CAPITAL HEALTH CLINICAL SERVICES DIVISION

### PROFICIENCY STANDARD SKILLS CHECKLIST

**TITLE:** Companion Kit REMOVAL

**Name/Nursing Unit:** ________________________________

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<thead>
<tr>
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<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1. Checks for order to remove</td>
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<tr>
<td>2. Removes transparent occlusive dressing (suture if present) if taking out both parts</td>
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<td>3. Place the patient in the supine position with HOB no lower than 10 degrees</td>
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<td>4. Unlocks companion kit from percutaneous introducer</td>
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<td>5. Remove companion kit from percutaneous introducer</td>
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<td>6. Use blue obturator to cap rubber hemostasis valve.</td>
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<td>7.</td>
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<td>8. If removing both companion kit and percutaneous introducer, remove the companion kit followed by percutaneous introducer or both at once</td>
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<td>9. If removing percutaneous introducer - Apply pressure using a gauze and hold until bleeding has stopped</td>
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<td>10. Apply occlusive dressing using Vaseline gauze, dry dressing and transparent dressing to the site.</td>
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</table>

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# CAPITAL HEALTH CLINICAL SERVICES DIVISION

## PROFICIENCY STANDARD SKILLS CHECKLIST

**TITLE:** PICL REMOVAL

**Name/Nursing Unit:** ___________________________________________________

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
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<tbody>
<tr>
<td>1. Checks for order to remove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Removes transparent occlusive dressing.(suture if present)</td>
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<td></td>
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<tr>
<td>3. Unlocks sleeve from peripheral cordis</td>
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<tr>
<td>4. Place the patient in the supine position or Trendelenberg position if not contraindicated.</td>
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<tr>
<td>5. Remove entire 2 piece set-up - peripheral cordis and central lumen (If the central lumen is removed first use gloved finger to occlude rubber valve on peripheral cordis)</td>
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<tr>
<td>6. Apply pressure using a 2 by 2 gauze and hold until bleeding has stopped</td>
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<td>7. Apply band-aid to the site</td>
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### CAPITAL HEALTH CLINICAL SERVICES DIVISION

PROFICIENCY STANDARD SKILLS CHECKLIST

**TITLE:** AVA Catheter REMOVAL

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Checks for order to remove</td>
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</tr>
<tr>
<td>2. Places the patient in the supine position  HOB no lower than 10 degrees</td>
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<tr>
<td>3. Removes transparent occlusive dressing.</td>
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<td>4. Removes sutures</td>
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<tr>
<td>5. Instructs patient to perform Valsalva manoeuvre if conscious or at end expiration</td>
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<td>6. Withdraws sheath.</td>
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<tr>
<td>7. Inspects sheath to make sure entire length has been withdrawn.</td>
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<tr>
<td>8. Applies pressure over a gauze dressing for 5-10 minutes or longer as required. This is a large bore IV and may require a prolonged period of time holding site to achieve hemostasis.</td>
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