Is it Necessary to Verify Blood Return in Monthly Port Flushes?

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Background

• Nurses in our outpatient infusion center see patients with implanted ports requiring routine monthly flushes for maintenance only
• Nurses were often encountering partial withdrawal occlusions from implanted ports during routine monthly port flushes
• Partial withdrawal occlusion – the ability to flush easily but inability to aspirate blood
• Nurses questioned the necessity of a thrombolytic agent to establish blood return when no therapy was ordered

Method

A literature search was conducted to accomplish the research aims:

- Data Bases: Google Scholar, CINHAL, and PubMed
- Keywords: Monthly flush, blood return, fibrin sheath, implanted port, withdrawal occlusion
- Inclusion Criteria: Adult population, implanted port, malfunctioning port, recommendations for treatment

Research Aims

We had four overall research aims:

1. To determine the necessity of obtaining blood return during monthly implanted port flushes for patients with non-utilized ports
2. To determine appropriate assessment criteria
3. To identify causes of central venous access device (CVAD) occlusion.
4. To state complications caused by CVAD occlusions

Results

• Sixteen articles met inclusion criteria
• Fifteen articles were selected for review

- Articles provided evidence supporting establishing blood return during monthly port flush
- Search of WaveNet revealed an established policy, providing an assessment tool and subsequent interventions in the setting of an occluded CVAD

Conclusions

1. It is necessary to establish blood return during a routine monthly port flush
2. Assessment includes multiple pathways for determining causes of occlusion (see chart 1)
3. Major causes of occlusion include mechanical, non-thrombotic, and thrombotic (see chart 2)
4. Major complications include infection, infiltration, etc. (see chart 3)

Implications For Practice

• Blood return must be verified prior to any therapy via an implanted port, including monthly port flushes
• "Thorough assessment of the patient and the CVAD for the potential cause of an occlusion will be performed, and the appropriate intervention will be performed to restore catheter patency (INS, 96)"
• Nurses should be educated about the importance of the ability to aspirate blood from a CVAD prior to use
Assessment of Central Line Catheter Occlusion
Chart 1

Complete (unable to flush or aspirate blood)

Partial occlusion (negative blood aspiration)

Partial (negative blood aspiration)

Complete (unable to flush or aspirate blood)

Contact Interventional Radiology to assess

Assess for external mechanical causes

Assess for non thrombotic causes

Assess for thrombotic causes

Per protocol, instill catheter clearance agent

Positive blood return, proceed with catheter use
Types of central venous catheter occlusion

**Mechanical**
- External:
  - Clamped or kinked IV tubing
  - Tight suture at catheter exit site
  - Non-coring needle dislodgement and misplacement
- Internal:
  - Improper catheter tip placement
  - Catheter kinking or compression

**Non-thrombotic**
- Drug precipitates
- Crystallization of total parenteral nutrition admixtures
- Drug-to-drug incompatibilities
- Drug-to-solution incompatibilities

**Thrombotic**
- Deposits of fibrin and blood components
- Intraluminal
- Fibrin Sheath
- Fibrin Tail
- Mural Thrombus
- Irritation from catheter rubbing against the intima of the vessel wall
- Portal Reservoir Occlusion

Chart showing percentages: 42% non-thrombotic, 58% thrombotic.
### Central line occlusions compromise patient care

<table>
<thead>
<tr>
<th>Complications Associated with Central Line Occlusions</th>
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<tbody>
<tr>
<td><strong>Risk for Infection</strong></td>
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<tr>
<td>• Formation of fibrin deposits and biofilm is a natural response that can start upon catheter placement</td>
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<tr>
<td>• Attracts, encloses, and protects bacteria and other microorganisms</td>
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<tr>
<td>• Microorganisms can be released into the bloodstream causing central line associated infection</td>
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<tr>
<td><strong>Infiltration or Extravasation</strong></td>
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<tr>
<td>• Infiltration causes pain, discoloration, and swelling</td>
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<tr>
<td>• Extravasation is more severe, and can result in pain, edema, and tissue necrosis</td>
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<tr>
<td><strong>Thrombosis</strong></td>
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<tr>
<td>• A thrombus between the catheter and the cell wall can lead to complete blockage of the vein</td>
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<tr>
<td>• This can be a life-threatening condition with potential complications, such as pulmonary embolism</td>
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<td><strong>Delay in treatment</strong></td>
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<tr>
<td>• Canceled or delayed procedures</td>
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<tr>
<td>• Increased length of stay (LOS)</td>
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<tr>
<td>• Interruption in administration of medications and solutions, especially vesicants</td>
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References


