TaurolockHep100® prophylactic lock for central venous access devices

Scope (Staff): Clinical Staff – Medical, Nursing, Pharmacy
Scope (Area): Perth Children’s Hospital

This document should be read in conjunction with this DISCLAIMER

**Taurolock/Hep100® must not be flushed**

### Aim

This guideline provides an evidence-based framework for the use of TaurolockHep100®. This is for the prevention of central line related blood stream infection (CLABSI) in children and adolescents who have a central venous access device (CVAD) inserted at Perth Children’s Hospital (PCH).

### Background

Children with a CVAD in situ are at risk of central line associated blood stream infection (CLABSI). Infection risk increases particularly in children less than 2 years of age and if the child has an underlying chronic disease. The main population groups include haematology/oncology (1.3 – 4.7 CLABSi/1000 patient days at risk) \(^{(1,2)}\) and gastroenterology patients who are Total Parenteral Nutrition (TPN) dependent with a risk of ~10 CLABSi/1000 patient days at risk.\(^{(3)}\) Other children with difficult venous access who require ongoing therapy may also have a CVAD in situ e.g. seizures, chronic medical conditions and are at risk of CLABSI but quantification of this risk in a diverse patient group is difficult.

TaurolockHep100® is a catheter lock solution containing 1% taurolidine (a derivative of the amino acid taurine) which has broad spectrum antibacterial and antifungal properties, 4% citrate and heparin 100units/mL. Due to the anti-adherence properties of taurolidine, as well as the anti-clotting and chelating activities of both compounds, this lock solution can disrupt bacterial surface adherence and subsequent biofilm production. \(^{(3)}\)

Prospective cohort studies in children with cancer\(^{(4)}\) and receiving parenteral nutrition \(^{(5)}\), as well as two randomised controlled trials in children with cancer\(^{(6,7)}\) have shown a significant decrease in the rate of blood stream infections when using Taurolock® as a standard catheter lock solution.

In children at high risk of a line related blood stream infection, the use of Taurolock® as a lock solution immediately after insertion of the line is likely to reduce the risk of a blood stream infection by up to 53% (RR 0.47, 95% CI 0.25 – 0.89).\(^{(3)}\) Despite theoretical benefits in the prevention of line occlusion using Taurolock®, concerns have been raised about an increased risk of thrombosis in adults, RR 2.10 (95% CI 1.16 – 3.78).\(^{(3)}\) Due to this theoretical risk of line occlusion, although there are no studies in children of
TaurolockHep100®, we have added this product to our formulary to mitigate the risk of line occlusion.

**Definitions**

**Permanent (or long-term) central venous access device (pCVAD):** A surgically implanted, permanent venous access device. This includes Infusaport®, Hickman’s or Broviac catheters. Examples used at PCH include the BARD Broviac, Hickman’s and implanted infusaport devices.

**Temporary central venous access device (tCVAD):** A non-surgically inserted central venous access device that is usually temporary in nature, either medium-term (weeks-months) e.g. peripherally inserted central catheters (PICC lines), or short-term (days-weeks) e.g. central venous catheter (CVC). Examples used at PCH include Cook Turbo Jet PICC and VYGON, Arrow or Cook CVC.

**Central line associated blood stream infection (CLABSI)** may occur in any child with a central venous line *in situ*. A CLABSI is diagnosed when a child with a central venous line *in situ* has positive blood cultures and symptoms consistent with a line infection e.g. fevers, rigors. CLABSIs result in increased morbidity, mortality, length of stay and health care related costs.\(^1\)

**Biofilm:** This is a slimy matrix of host proteins (e.g. fibrin, albumin, platelets) that forms on the internal lumen of a catheter (foreign body), within which micro-organisms adhere and are protected from antibiotics.\(^8\) Formation of an intraluminal biofilm plays a significant role in the development of CLABSI and may occur within 24 hours of catheter insertion.\(^3\)

**Lock Therapy:** When CVADs are not in use, it is usual practice to instil heparin-saline to prevent line occlusion. TaurolockHep100® is an alternative lock solution that has both antimicrobial (broad spectrum activity against bacteria and fungi) and biofilm disruption properties.\(^3\) Heparin-saline does not have these same properties. Randomised controlled trials have demonstrated superiority in the prevention of line related infections in both paediatric oncology\(^6,7\) and gastroenterology populations.\(^9\)

**Key Points**

**Indication:**
- TaurolockHep100® can be used instead of standard heparin-saline lock solutions in children with CVADs inserted who are at increased risk of CLABSI.
- TaurolockHep100® may be commenced upon insertion of a new CVAD (preferable) or commenced in a child with an existing CVAD.
- TaurolockHep100® requires a minimum dwell time of 2 hours with administration only occurring once in 24 hours.

**Approvals Required:**
- TaurolockHep100® has been approved by the Drugs and Therapeutics Committee for use at Perth Children’s Hospital.
- TaurolockHep100® is an orange (monitored) drug on the ChAMP formulary.
• Consent to use TaurolockHep100® should be documented for each patient, after a discussion with the family about the known side effects and likely benefits.

**Side Effects:**

• Short lived altered or unpleasant taste sensation has consistently been reported.
• In adults on haemodialysis, Taurolock® was associated with an increase in line occlusion, however this has not been demonstrated in children.\(^3\)

**Process**

<table>
<thead>
<tr>
<th>Steps</th>
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<tbody>
<tr>
<td>1. To prescribe TaurolockHep100®, use the device appropriate volumes found in Table 1 below.</td>
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<tr>
<td>2. Check the approximate dwell time by confirming other uses of the line. Dwell time ranges from 2 hours – 7 days (when dwell time is 2hrs, administration must be no more than once in 24hrs). Contact Infectious Diseases if a longer dwell time is needed.</td>
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<td>3. Prescribe TaurolockHep100® with the appropriate volume and dwell time on the medication chart.</td>
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<td>4. Before commencing, flush the CVAD with 10mL of 0.9% saline using the pulsatile ‘push-pause’ technique. If fluid-restricted, use &lt;10mL as per Central Venous Access Device (CVAD) and Midline Management.</td>
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<tr>
<td>5. Instil the required volume of TaurolockHep100® solution for size and type of CVAD as per Central Venous Access Device (CVAD) and Midline Management. TaurolockHep100® should not be administered more rapidly than 1mL/second in children over 1 year old and 0.2mL/second in infants &lt;1 year old.</td>
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<tr>
<td>6. Allow to dwell for a minimum of 2 hours (with administration once in 24 hours) but up to a maximum of 7 days as prescribed by the doctor.</td>
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<tr>
<td>7. Ensure that the line is not flushed accidentally during this time. On a Hickmans or Broviac line with lumens external to the patient, label each lumen containing TaurolockHep100® by writing TaurolockHep100® on the white Medicine label and attaching this as per the hospital policy.</td>
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<tr>
<td>8. Before utilising the line for administration of medication, aspirate the TaurolockHep100® volume added to each lumen. If in the event of line occlusion, discussion of the need to flush the line with the treating team should occur prior to flushing.</td>
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<td>9. Flush the line with 10mL of normal saline before instilling next TaurolockHep100® (or next treatment) using the pulsatile ‘push-pause’ technique. If fluid-restricted, use &lt;10mL as per Central Venous Access Device (CVAD) and Midline Management.</td>
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<td>10. Document any reported taste disturbance or line occlusions or any other potential adverse events on the CVAD Nursing Management Record and notify the ChAMP pharmacist if these occur.</td>
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Table 1: Volume of TaurolockHep100® to prescribe and instil by device type.

<table>
<thead>
<tr>
<th>Device</th>
<th>Volume of TaurolockHep100® to prescribe per lumen</th>
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<tbody>
<tr>
<td>Tunnelled cuffed central venous access device e.g Broviac, Hickmans, or Infusaport</td>
<td>2mL</td>
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<tr>
<td>Peripherally inserted central catheter (PICC)</td>
<td>1mL</td>
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</tbody>
</table>

Compatibility Information

- There is currently limited published compatibility information for TaurolockHep100® with other medications, intravenous fluids or parenteral nutrition.

Related internal policies, procedures and guidelines

- **Aseptic non-touch technique**
- **Central Venous Access Device (CVAD) and Midline Management**
- **Labelling of Injectable Medications and Fluids**
- **TaurolockHep100**
- **Taurolock Patient information leaflet**

References

References


