GUIDELINE	
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 CLABSIs/1000 patient days at risk) [1, 2] and gastroenterology patients who are Total Parenteral Nutrition (TPN) dependent with a risk of ~10 CLABSIs/1000 patient days at risk.[1] 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

Steps
1. To prescribe TaurolockHep100®, use the device appropriate volumes found in Table1 below.
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.
3. Prescribe TaurolockHep100® with the appropriate volume and dwell time on the medication chart.
4. Before commencing, flush the CVAD with 10mL of 0.9% saline using the pulsatile 'push-pause' technique. If fluid-restricted, use <10mL as per Central Venous Access Device (CVAD) and Midline Management
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 <1 year old.
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.
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.
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.
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 <10mL as per Central Venous Access Device (CVAD) and Midline Management.
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.

Table 1: Volume of TaurolockHep100® to prescribe and instil by device type.

Device	Volume of TaurolockHep100® to prescribe per lumen
Tunnelled cuffed central venous access device e.g Broviac, Hickmans,or Infusaport	2mL
Peripherally inserted central catheter (PICC)	1mL

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

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