

<p>Title:</p> <p style="text-align: center;"><b>Tapping Ventricular Access Device and Implementation of CSF Drainage Procedure (Paediatrics)</b></p> <p style="text-align: center;">Version: 3</p>			
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## Change Record

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# Tapping Ventricular Access Device and Implementation of CSF Drainage Procedure

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## 1.0 Aim of Procedure

This procedure details the competency required in order to safely 'tap' a ventricular access device (VAD) using strict aseptic, non-touch technique (ANTT); the ability to measure intracranial pressure (ICP) and the collection of cerebrospinal fluid (CSF) samples. This skill should be expected of all the doctors who may come in contact with paediatric neurosciences patients with a ventricular access device who may need an urgent 'tap'. It is envisaged that all Clinical Coordinators/Senior Nurse Practitioners/senior nurses on the Paediatric Neurosciences ward also become competent in this procedure.

## 2.0 Scope of Procedure

The cohort of patients under the Paediatric Neuroscience services (e.g. hydrocephalus), Royal Hospital for Sick Children, Edinburgh. Relevant consultants, doctors in training and relevant senior nurses.

## 3.0 Clinical Reference/s

Bettina et al (2002) Treatment of Staphylococcal Ventriculitis associated with external cerebrospinal fluid drains: a prospective randomised trial of intravenous compared with intraventricular vancomycin therapy. *Journal of Neurosurgery*. Vol 98/May 2003.

External inquiry into the adverse incident that occurred at Queens Medical Centre, Nottingham, 4<sup>th</sup> January 2001. Professor Brian Toft 19<sup>th</sup> April 2001.

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<http://www.hps.scot.nhs.uk/haic/sshaip/resourcedetail.aspx?id=827>

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P R Reynolds, S Banerjee, J H Meek. Alcohol burns in extremely low birthweight infants: still occurring. *Arch Dis Child Fetal Neonatal Ed*. 2005 Jan;90(1):F10

Sathiyamurthy S, Banerjee J, Godambe SV. Antiseptic use in the neonatal intensive care unit - a dilemma in clinical practice: An evidence based review. *World J Clin Pediatr* 2016 May 8; 5(2): 159-171

Zabramski et al (2003) Efficacy of antimicrobial-impregnated external ventricular drain catheters: a prospective randomised controlled trial. *Journal of Neurosurgery* 98:725-730, 2003.

Protocol for the safe handling of Intrathecal and Intraventricular Injections. RHSC Edinburgh

## 4.0 Procedure

### Equipment required for the procedure

- Dressing pack
- ChloroPrep<sup>®</sup> 2%, 3ml applicators (Chlorhexidine Gluconate 20mg/ml / Isopropyl Alcohol 0.70 ml/ml) x 3 for cleansing the VAD site.
- HUBER needle –winged Infusion set (available on Paediatric Neurosciences Ward). This is a curved needle ordered specifically for this procedure. Shortest and thinnest possible needle should be considered depending on the clinical indication (comes in different gauges and lengths).
- Three-way tap
- 1x 2ml syringe
- 2 x sterile surgeon's gloves
- Sterile scissors
- Occlusive dressing
- CSF manometer
- 1 universal container, CSF sampling container (fluoride for glucose, EDTA for Cytospin, plain for Microbiology/Virology/Biochemistry – protein)
- External ventricular drainage set, if required

### Procedure

Under sterile conditions with the patient lying flat and procedure explained;

1. Put on an apron, wash hands thoroughly with chlorhexidine or betadine scrub, dry hands and apply first pair of sterile gloves (as for performing Lumbar Puncture)

2. Assemble manometer

3. Attach the three-way tap to Huber needle

4. Locate and clean the skin over the VAD with ChloroPrep<sup>®</sup> 2% (x 3).

1<sup>st</sup> clean: Clockwise over VAD for 30 seconds flowed by 30 seconds drying time.

2<sup>nd</sup> clean: Anticlockwise cleaning for 30 seconds flowed by 30 seconds drying time.

3<sup>rd</sup> clean: Clockwise over VAD for 30 seconds flowed by 30 seconds drying time.

*Note: Under certain circumstances, for example, premature baby, or small date baby, or skin sensitivity, a preparation containing chlorhexidine of lesser concentration (e.g. 0.5%*

*with or without alcohol) or iodine may be used in place of Chloraprep. This decision has to be made at the discretion of the supervising/lead consultant.*

5. Remove gloves and apply alcohol rub to hands. Allow hands to dry before applying second pair of gloves.
6. Insert Huber needle into VAD ensuring end port is below the insertion site (this prevents air passage into the device). Open the three way tap to ensure that the CSF flows freely (may need to aspirate with syringe gently to ensure patency of VAD in some cases). Close the three-way tap and attach a CSF manometer and use the level of the external auditory meatus as a zero reference point (this is the world standard reference point for CSF pressure measurements). Wait for the CSF to climb in to the manometer. This can take longer than you think. When it has reached its maximum level take note of the pressure. Close the three way tap and disconnect manometer.
7. Drain 2ml of CSF into a sterile container and for various samples (again may need to attach the syringe to the three-way tap and aspirate 2ml of CSF in some situations if the flow is not spontaneous). Close the three-way tap and remove syringe and send CSF for microscopy, culture and sensitivity, cell count (plain sterile container), biochemistry (fluoride – yellow container for glucose and plain container for protein) and cytopsin (EDTA – pink container for cell differential).
8. Give intrathecal drugs at this point if required (Refer to administration of Intrathecal antibiotics).
9. If external drainage is required, attach drain. Ensure drain remains switched off until properly secured and set at correct level. Secure the Huber needle with sterile swab/Tegaderm dressing and attach to drain port site. If drainage is not required remove needle, spray Cavilon™ (no sting barrier film) at the site of puncture and cover wound with dry dressing.
10. The level at which External Ventricular drainage opening pressure is set depends on the age of the child and rarely other factors. The external ventricular drainage system should be set at a level that has been decided by the senior doctor or the consultant. The level may vary and likely to be lower in younger children. **IF IN DOUBT - ASK.** The zero level of the system must be level with the external auditory meatus.
11. Dispose of clinical waste in accordance with LUHD policy.
12. Start a CSF loss/fluid input chart (available on the Paediatric Neurosciences ward).
13. CSF loss must be replaced by 0.9% NaCl (or Hartmann's or Plasma-Lyte solution) ml for ml in paediatric patients, unless otherwise stated.
14. Document procedure in the case notes including measured CSF pressure in mmH<sub>2</sub>O or cm H<sub>2</sub>O and height of drainage.
15. Start a CSF results sheet (complete with patient's name and CHI number) and place it at the bottom of the bed with the prescription chart.
16. Advise nursing staff of outcome.

## Competency certificate Stage 1

### Training programme for tapping the device

Procedure carried out on the mannequin: Procedure carried out competently.

	<b>Print name</b>	<b>Sign</b>
<b>Trainee/Practitioner</b>		
<b>Trainer</b>		
<b>Date</b>		

### Observation of the procedure in a patient

	<b>Print name</b>	<b>Sign</b>
<b>Trainee/Practitioner</b>		
<b>Trainer</b>		
<b>Date</b>		

I have undergone the above training and I have successfully completed training on Tapping of Ventricular Access Devices on mannequin and observed the procedure in a patient. I am familiar with the procedure and local protocols and I feel competent to undertake this procedure in a safe and skilled manner under supervision.

**Signature of trainee/practitioner:**

**Date:**

## Competency certificate Stage 2

### Tapping of the Ventricular Access Device (VAD):

Procedure on real patient (minimum of 1): Must be performed competently.

	<b>Print name</b>	<b>Sign</b>
<b>Trainee/Practitioner</b>		
<b>Supervisor</b>		
<b>Date</b>		

I have undergone the above training and I have successfully completed procedure to the exact expected standard for Tapping of Ventricular access devices. I am familiar with the procedure and local protocols and I feel competent to undertake this procedure in a safe and skilled manner without supervision.

This competency is subject to annual peer review using the OSCE.

**Signature of trainee/practitioner:**

**Date:**