URINARY CATHETERISATION AND MANAGEMENT – GCNIC - CHW

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- Urinary catheterisation is an invasive two person procedure.
- Feeding tubes are not recommended for use as indwelling catheters due to the risk of knotting and urethral injury.
- Always position catheter drainage bags below the level of the infant's bladder to avoid backflow and ensure there is no traction or kinking of the tubing.
- During insertion the catheter is to be inserted all the way to the Y junction before the balloon is inflated to reduce the risk of inadvertent urethral injuries
- Aqueous Chlorhexidine 0.1% is recommended for cleaning the genitalia prior to catheterisation.
- Indwelling catheters increase the risk of ascending urinary tract infections, and their need should be reviewed on ongoing basis.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st January 2021	**Review Period**: 3 years
Team Leader:	Nurse Educator	**Area/Dept**: GCNC CHW

CHANGE SUMMARY

- Title change. Previous title being *Urinary Care for Neonates – GCNC* Policy number 2007-0007 v4.
- Updated content.
- Included information on bladder scanning procedure.

READ ACKNOWLEDGEMENT

- Clinicians working in Grace Centre for Newborn Care are required to read this document.

TABLE OF CONTENTS

Introduction

Urinary catheterisation is an invasive procedure which has risks to the patient. Non-invasive interventions should be considered in consultation with the medical and Nurse Practitioner (NP) team before deciding on urinary catheterisation.

Urine Output Calculations

The expected urine output for an infant is 2-4ml/kg/hr.

Urine output should be calculated on a daily or 24 basis (from midnight to midnight). The total urinary output for the 24 hours is divided by the infants weight and then by 24 hrs.

Total Urine volume in 24 hrs / Infants weight = mLs/kg then mLs/kg / 24 hrs = mL/kg/hr

For example: 3kg with 160mL Urine Output in 24 hours
160 / 3kg = 58.3mL/kg then 58.3 / 24hrs = 2.2mL/kg/hr

If urine output has increased or decreased and you are required to calculate the output over a shorter period of time utilise the formula below.

Total Urine volume in time period (i.e. 4 hours) / Infants weight = mLs/kg then mLs/kg / 4 hrs = mL/kg/hr

For example: 3kg with 70mL Urine Output in 4 hours
70 / 3kg = 28.3mL/kg then 28.3 / 4hrs = 5.8mL/kg/hr

When changes to the infant's status occur i.e. sepsis, surgery or general deterioration in their condition, measurement of the urine output may be assessed over a shorter period of time.

The method of calculation used should be recorded in the electronic medical record i.e. mlL/kg/hr or mL/kg/Day.

Urinary Catheterisation

Urinary catheterisation is used to assess urine output, decrease bladder pressure and to relieve urinary retention. The catheter may be placed intermittently or be left indwelling. Intermittent catheterisation is performed on infants who are unable to pass urine independently, for example those with neurological disorders. It may also be performed for urinary retention or to collect a clean urine specimen.

The following sized catheters are recommended in GCNIC:

Preterm infant or Small for gestational age	5FG
Term infant	6FG
Older Infant	6FG – 8FG

Patient and Carer Safety

- Catheterisation is a two person procedure. This assists in maintaining an aseptic technique, enables correct positioning of the catheter and allows comfort for the infant.
- Female catheterisation can be performed by all nursing staff.
- Male catheterisation is performed by a nurse that has completed the NSAP skills package, a NP or a doctor.
- If the infant has undergone genitourinary surgery a catheter is placed intra-operatively. If further catheterisation is required the relevant surgical team are notified.
- Administer sucrose immediately prior and throughout the procedure if required.
- If the urethral opening cannot be visualized ask for a review by the medial or NP team.
- Strict aseptic technique is required for insertion.

Patient Safety

*To minimise the risk of urethral injuries during insertion the catheter is to be inserted as far as possible i.e. to the **y junction** of the catheter prior to inflation of the balloon.*

Equipment

Collect equipment prior to preparing the infant including:

- Dressing Pack
- Indwelling catheter of appropriate size (consider having two available if catheterising a female)
- Sterile gloves (1 pair)
- Single pack water based lubricant
- Aqueous chlorhexidine 0.1%
- Urinary drainage bag
- Ampoule of sterile water
- 5ml syringe
- Tapes for securing catheter
- Protective eye wear
- Specimen jar

Procedure

Component	Rationale or information for noting
Universal precautions are used throughout the procedure, including eye protection and gloves.	
1. Gather equipment. Set-up a sterile field.	Ensure hand hygiene is undertaken prior to commencing procedure
2. Open a dressing pack on to a trolley with a sterile drape and place the urinary catheter, syringe, aqueous lubricating gel and sterile gloves onto the sterile field.	
3. Pour aqueous Chlorhexidine 0.1% into the gallipot and soak the gauze.	
4. The assistant places the infant in the supine position with the help of the assistant.	Position the infant's legs to enable a clear view of perineal area and for ease of insertion of the catheter.
5. Wash hands for the required two minutes, dry and don sterile gloves.	
6. The assistant helps to draw up the correct volume of sterile water required for the inflation of catheter balloon.	The volume is specified on the catheter and the catheter packaging. Assistant to place a bluey under the patient.
7. Place the sterile dressing towel from the pack under the infant's buttocks	
8. Swab the infant's genitalia using aqueous chlorhexidine with gentle movement from front to back. If using forceps ensure no undue pressure is applied	After cleaning area, make a small hole in the sterile dressing towel. Place the opening over the infants genitalia
Assistant to administer sucrose (or breast milk) immediately prior to insertion of catheter or when infant demonstrates signs of discomfort.	

The specific approach for male versus female catheterisation is outlined in the following table.

Male Catheterisation	Female Catheterisation
1. The penis is held with the non-dominant hand using the gauze square from the dressing pack. It is held at a 90 degree angle to the infant's abdomen.	The non-dominant hand is used to open the labia to expose the urethral opening. The labia can be held apart with the gauze swabs or with fingers from the non-dominant hand as long as there is no cross contamination from the non-dominant hand to the clean /aseptic areas.
2. The foreskin is retracted slightly. It should not be forced back to reveal the urethral opening. Once the opening is visualised the area is then swabbed with the Aqueous Chlorhexidine 0.1%.	The genitalia are swabbed with Aqueous Chlorhexidine 0.1% in a downward motion from the inner labia outward. A clean swab is used for each downward motion.
3. Tear off end of catheter plastic wrapping to expose the catheter tip – avoid touching the tip. Continue to hold the catheter in your dominant hand in the remainder of the plastic wrapping and lubricate the catheter tip.	
4. Tear sterile wrap lengthways along the perforation to allow insertion of the catheter without obstruction	
5. Whilst still holding the penis the catheter is inserted gently with the dominant hand until urine begins to drain and advance until the **Y junction** of the catheter. Apply constant gentle pressure. The catheter is inserted slowly and should not be forced.	Insert the catheter to the **Y junction** or until passage of urine, then inflate balloon with the recommended amount of sterile water as indicated on the catheter balloon lumen. Gently withdraw catheter until resistance is felt. Re-insert a few millimetres, check catheter is still draining, then secure[4].
6. If resistance is felt the following strategies should be considered: • There may be urethral sphincter muscle spasm, it may take a few seconds for the muscle to relax wait for a short period of time before continuing with the procedure • Consider applying additional lubricant to the catheter	If it is suspected that the catheter is not in the bladder and in the vagina, the catheter is left insitu whilst re-catheterising with a new catheter (generally above the first catheter). Once the new catheter is correctly placed the first catheter can be removed.

Male Catheterisation	Female Catheterisation
• Increase traction on the penis and apply gentle pressure on the catheter • Gently rotate the catheter • If you are unable to pass the catheter notify medical staff. Do NOT use force as you may damage the urethra.	
7. Once you have confirmed passage of urine, then inflate balloon with the recommended amount of sterile water as indicated on the catheter balloon lumen. Gently withdraw catheter until resistance is felt. Re-insert a few millimetres, check catheter is still draining, then secure. Remove the remainder of the plastic wrapping. Ensure foreskin returned to a non-retracted position	Once the catheter is in place after confirmation of urine back flow, the balloon is inflated and can then be attached to a closed urinary drainage system and secured by tape to the inner aspect of the thigh. Remove remainder of plastic wrapping before connecting catheter to urinary drainage system.
8. Secure the catheter with tape preferably to the lower abdomen, or if not possible, then to the upper inner thigh. Securing catheter to lower abdomen in males reduces the risk of posterior urethra damage with traction[5]. Comfeel or griplock is applied to secure the catheter and protect the skin.	Comfeel or griplock is applied to secure the catheter and protect the skin.

Safety Precautions:

- Testing inflation of the catheter balloon prior to catheterisation is not recommended due to risk of subsequent urethral injury on insertion of a catheter balloon that does not fully deflate.
- If urethral injury is suspected with new haematuria upon insertion, the catheter should remain in situ and is not removed until urgent surgical review. If the catheter balloon was inflated, it should be deflated but still kept in place until urgent surgical review.
- If there is no urine back flow on insertion of catheter until Y junction, do not inflate balloon, and seek senior medical, NP or surgical review.
- If you are unable to pass the catheter notify senior medical staff or NP. Do NOT use force as you may damage the urethra.

Catheter bags

If a bag is used it must be kept below the level of the patient (bladder) so that urine does not flow from the bag into the patient. Catheter bags are not rested on the bed or on the floor. They should be hung on the side of the bed/crib.

Documentation

Once the procedure is complete document in the electronic medical record:

- Indication for catheterisation
- Type and size of catheter
- Volume of water used to inflate the balloon
- Outline any problems with insertion
- A description of the urine colour and volume
- Label urinary drainage bag with date and change every 7 days

Care of Infant with indwelling catheter

Urinary tract infections (UTI) are the most common complication of indwelling catheters. UTI's can result in increased risk of morbidity and mortality. The risk increases with the duration of catheters in situ. Catheter related urinary tract infections can be minimised by promoting good catheter hygiene which starts from the time of insertion. Urinary catheters should be removed when no longer clinically required. An IDC should be replaced at least every 4 weeks.

Patient Safety

- Ensure that there is no tension or discomfort to the infant, allow free flow of urine and to reduce the risk of kinking and dislodgement. When the infant is moved ensure that the catheter clip has been detached and there is no traction to the catheter.
- Disruption of the system should be kept to a minimum. Use universal precautions when emptying the urinary drainage bag.
- Micro-organisms can be found at the inlet and outlet tap. It is recommended that the outlet tap be cleaned with an alcohol swab before and after emptying the drainage bag.

Troubleshooting

Issue	Recommendations
Catheter not draining/patient oliguric:	- Check catheter and drainage tubing is not kinked - Ensure catheter is still taped in position and has not migrated out of the bladder - Discuss with medical staff consider irrigating the catheter with 2-3ml of sterile 0.9% Sodium Chloride. Do not use force to instil fluid. This is an aseptic procedure. - For additional information on catheter management refer to: CATHETERS (URINARY) MANAGEMENT Policy.
Catheter leaking:	- Review position of catheter - Check balloon is inflated - Discuss with medical staff ongoing indication for catheter. If a new catheter is required consider inserting a larger size.

Genitourinary surgery instructions

- If the infant has undergone genitourinary surgery there may be specific instructions on the operation notes for cleaning the perineal area and for the solutions to be used.
- There may also be instructions to have the catheter draining into a nappy or dressing rather than an enclosed drainage system.
- For additional information refer to Open Catheter Drainage Section in the SCHN CATHETERS (URINARY) MANAGEMENT Policy.

Removal of Indwelling Catheter

Component	Rationale/additional information
Universal precautions are used throughout the procedure. Gloves do not have to be sterile.	
1. A 2mL syringe is placed into balloon port of catheter to remove the amount of water equal to what was recorded in the patient's notes for the balloon inflation.	
2. Once the balloon is completely deflated, gentle traction is applied to the catheter with the dominant hand whilst slowly removing the catheter.	If resistance is felt and the catheter cannot be removed do not force, leave the catheter insitu and consult the medical/NP team.
3. Inspect catheter tip for intactness.	
4. Document any urine in that has collected in the drainage device that has not already been included in the FBC.	
5. Dispose of the catheter and the drainage system in the yellow contaminated waste bin.	Remove gloves and wash hands.
6. Document catheter removal in the electronic medical record.	Observe urine output post catheter removal.

Intermittent Catheterisation

Intermittent catheterisation is a procedure used frequently for infants with hypotonic/atonic bladder or bladder outflow obstruction. This is performed to ensure effective bladder emptying. It is also used on occasion as a means of collecting a "sterile" urine specimen rather than performing a bladder tap.

- Parents of infants who require regular intermittent catheterisation are taught the procedure by the GCNIC nursing team following instruction by the Spina Bifida Team.
- A short 6FG (160mm) catheter is used.
- Additional information can be found in the following policies:
  - CATHETERS (URINARY) MANAGEMENT Policy.
  - Clean Intermittent Catheterisation - Female
  - Clean Intermittent Catheterisation - Male

Bladder Scanner

An accurate determination of bladder volumes is critical in neonates with complex bladder pathology. Patients with neurogenic bladder and increased bladder pressures are at increased risk for hydronephrosis, vesicoureteral reflux, urinary tract infection and renal damage.

Bladder scanning can be used to prevent unnecessary catheterisation, assess for urinary retention and to measure pre/post void bladder volumes.

Bladder Scanner Instructions for use

Potential Complications

Insertion	• Inability to catheterize. • Urethral injury following trauma from sustained insertion or balloon inflation in the incorrect position resulting in: - Haemorrhage - False passage - Urethral strictures following damage to urethra.
Management	• Infection
After removal	• Paraphimosis: failure of the foreskin to return to the normal position following catheter insertion.

Useful resources:

CATHETERS (URINARY) MANAGEMENT PROCEDURE

References

1. Wojtulewicz, J., Levison, J. Adventitious knot formation complicating catheterization of the infant bladder Journal of Paediatric and Child Health 2004, 40:493-494.
2. Carlson, C., Mowery, B.D. Standards to Prevent Complications of Urinary Catheterization in Children: Should and Should knots. JSPN 1997, 2 (1):37-41.
3. Smith, A.B., Adams, L.L. Insertion of Indwelling Urethral Catheters in Infants and Children: A Survey of current Nursing Practice. Pediatric Nursing 1998, 24(3):229-234.
4. Pullen, R. Inserting an indwelling urinary catheter in a male patient (clinical DO's & DON'TS).Nursing 2004, 34(7):24.
5. Oddie, S., Adappa, R., Wylie, J. Measurement of urine output by weighing nappies; Archives of Disease in Childhood Fetal and Neonatal Edition 2004, 89:F180.
6. Royal Children's Hospital Melbourne: Indwelling urinary catheter clinical guidelines. https://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Indwelling_urinary_catheter_insertion_and_ongoing_care/?TB_iframe=true
7. Wyneski, Holly K., et al. "Automated bladder scan urine volumes are not reliable in complex neonatal cases." The Journal of urology 174.4 (2005): 1661-1662.