

# RENAL BIOPSY - MEDICAL AND NURSING - CHW

## PROCEDURE<sup>®</sup>

### DOCUMENT SUMMARY/KEY POINTS

- Children undergo renal biopsies of native or transplanted kidneys to determine renal diagnoses and assist with management.
- Most renal biopsies are performed with ultrasound support in the Department of Medical Imaging by the consultant paediatric nephrologists or renal fellows in training.
- Most renal biopsies are elective day stay procedures so children are admitted to Renal Treatment Centre or Turner Day Stay Ward.
- Patients requiring urgent renal biopsies are usually admitted to Clancy Ward but can be in other wards if a bed in Clancy is not available.
- The most important complication of a renal biopsy is bleeding. Usually this is minor but occasionally may be severe enough for a child to require a blood transfusion.
- This document provides information for medical and nursing staff on how to organise a renal biopsy, the investigations required pre-biopsy, the premedications, equipment required for the procedure and the post biopsy management.

### CHANGE SUMMARY

- Due for mandatory review. No major changes made. No change in practice.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

<b>Approved by:</b>	SCHN Policy, Procedure and Guideline Committee	
<b>Date Effective:</b>	1 <sup>st</sup> November 2015	<b>Review Period:</b> 3 years
<b>Team Leader:</b>	Nurse Practitioner Renal	<b>Area/Dept:</b> Renal Treatment Centre CHW

## READ ACKNOWLEDGEMENT

- CHW Medical and Nursing staff who perform renal biopsies are to read and acknowledge they understand the contents of this document.

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## Introduction

Children undergo renal biopsies for diagnosis of their renal condition, assessment of the severity of the condition and to assist in determining management. Biopsies may be carried out on native or transplanted kidneys. The most common reasons for a child to have an elective renal biopsy are:

- Systemic lupus erythematosus
- Steroid resistant nephrotic syndrome
- Henoch-Schonlein nephritis

The most common reasons for a child to have an urgent renal biopsy are:-

- Rising creatinine in a child with a renal transplant
- Acute renal failure
- Rapidly progressive glomerulonephritis

Most biopsies are performed under nitrous oxide sedation. This is administered by a member of the Pain Team or by an accredited Registered Nurse. Local anaesthetic (1% Xylocaine) is given subcutaneously at the biopsy site before the procedure. Some biopsies may need to be done under general anaesthesia particularly in small children.

## Venue for renal biopsy procedures

Most elective renal biopsies are performed under nitrous oxide sedation in the Ultrasound Department of Medical Imaging. Some biopsies are carried out in the Operating Theatres under general anaesthesia. For elective biopsies children are admitted to the Renal Treatment Centre (RTC) or Turner Day Stay Ward before biopsy and return to these wards for post biopsy recovery. Children needing urgent renal biopsies are usually already inpatients in Clancy or one of the other general wards.

Prior to biopsy being performed, appropriate time-out and documentation must occur as per MoH Clinical Procedure Safety Policy Directive.

# 1 Procedure for Renal Registrar or Resident

## 1.1 Pre-biopsy arrangements by Renal Registrar

**NOTE:** For elective biopsies, the arrangements below should be made at **least 48-72 hours before** the biopsy

- For elective biopsies, schedule admission to the Renal Treatment Centre (RTC) with the Renal Nurse Practitioner or senior renal nurse. Most elective biopsies are performed on Thursday mornings.
- For elective biopsies, if the RTC is not able to take the patient, the admission should be scheduled in Turner Day Stay Ward or Clancy Ward.
- For elective biopsies, schedule the renal biopsy procedure for 9am on the required date with the Ultrasound Department in Radiology. Submit a request form for the procedure to Ultrasound.
- Schedule the procedure with the Renal Nurse Practitioner to ascertain if RTC staff are available to perform nitrous oxide. . If no one from the RTC is able to attend, discuss arrangements for administration of nitrous oxide with the Nursing Unit Manager on Turner Day Stay Ward or Nurse Unit Manager on Clancy Ward. Finally, if no staff from these areas are available to perform Nitrous Oxide then the Pain Service Team CNC (Pager 6151) needs to be contacted to arrange Nitrous Oxide administration.
- If the patient is admitted to a ward, other than RTC, Clancy or Turner Day Stay, please make sure that an accredited nurse is available to give nitrous oxide.
- Complete a booking form and submit to the Booking Office. For urgent biopsies arrange the admission directly through the Bed Manager.
- If the patient is admitted to a ward other than Clancy, Turner Day Stay or RTC, please make sure that the ward has a copy of the Renal Biopsy Procedure.
- Ensure that the child has had clotting studies (PT, APPT, INR and platelet count) performed before the biopsy and that the results of these are normal.
- Inform Histopathology on Extension 53311 that a biopsy is to be performed and how urgently processing is required. Provide information to them on the expected date and time and on the child's name and likely diagnosis. Urgent biopsies can usually be processed on the same day if the biopsy is provided to Histopathology before 1pm.
- For elective biopsies ensure that the parents:
  - know the date of the biopsy
  - know that their child should fast from 5 am
  - know that they should arrive at 8 am
  - know that they should **not** give their child any aspirin or non-steroidal anti-inflammatory agents for 2 weeks before biopsy
  - have received a [Patient Information Sheet](#) about the biopsy (see below)

- Inform Dr Stephen Alexander (page 6563) that a biopsy is planned as he may require additional blood and urine specimens
- Order the premedication (see below) if possible on the day before biopsy

## 1.2 Arrangements for day of biopsy by Renal Registrar

- Ensure that a consent form has been signed by the parents/young person before the premedication is given.
- Ensure that premedication is administered about 30 minutes before the biopsy time:
  - Midazolam 0.3-0.5 mg/kg orally (Maximum dose 15 mg)
  - Morphine 0.5 mg/kg orally (Maximum dose 15 mg)
- Ensure that histopathology (light microscopy, immunofluorescence and electron microscopy) order forms are completed electronically or manually and accompany the patient to the ultrasound department. Please ensure on the request form you write:  
*Please store small sample of specimen for Dr Alexander.*
  - Dr Alexander may wish you to collect a sample of urine and 10mL of blood in Citrate tubes prior to the biopsy and will advise you if required. An additional consent form (available in the Renal Treatment Centre) is required if specimens are taken for research.
- Accompany the child to the biopsy to assist the consultant/Renal Fellow.
- Take the biopsy specimen to Histopathology and give to pathologist.
- Review patient on ward post biopsy when requested to by nursing staff.
- Review patient before discharge and make sure that follow up has been arranged with consultant nephrologist.
- If the child is to go home on the day of biopsy, ensure that the parents are aware that the child should not attend school on the day after biopsy, should not undertake any sporting or other major exertions for 10 days post biopsy and should report pain and/or macroscopic haematuria to medical staff.
- If the patient is going back from Ultrasound to a ward other than Clancy or Renal Treatment Centre, make sure that the post biopsy observation orders are written on the patient's chart.
- If the child remains in hospital after hours following an urgent biopsy or one performed in the Operating Suite but is not staying overnight, notify the subspecialty medical registrar on call to review the child before discharge. The patient should be appropriately handed over to the subspecialty registrar of the day, and where possible, the discharge paperwork should be completed by the daytime renal registrar to facilitate the after-hours discharge by the covering subspecialty registrar.

### 1.3 Renal biopsy under general anaesthesia

Some children require renal biopsy under general anaesthesia. For such biopsies the following needs to be done in addition to the other organisation tasks except booking the Nitrous Oxide administration.

- The patient goes on emergency operating list
- Liaise with anaesthetic consultant on call - page 6777
- Fill in appropriate booking form in operating suite
- The Operating Suite will supply the equipment required for the biopsy based on the Equipment list later in this protocol except the biopsy gun/needle and the sandbag.
- The disposable renal biopsy needle comes from the RTC and needs to be taken to the Operating Suite by the registrar.
- The child should go to the Operating Suite with a sandbag from the ward. Make sure that the sandbag returns to the ward with the patient.
- Remember to tell the patient/ward the duration of fasting time before biopsy.
- If the patient is going back from Recovery to a ward other than Clancy or RTC, make sure that the post biopsy observation orders are written on the patient's chart or that a copy of the renal biopsy protocol is provided to the ward.
- If the child remains in hospital after hours but is not staying overnight, notify the subspecialty medical registrar on call to review the child before discharge.

## 2 Procedure for Nursing Staff

### 2.1 Before renal biopsy

- Obtain equipment required for renal biopsy from ward stocks or Stores Department (see [Section 3](#))
- Measure the child's height, weight and blood pressure and obtain a urine specimen for urinalysis for blood and protein. Document observations on SPOC.
- Ensure that oral premedication is given 30 minutes before the child goes to Ultrasound for the biopsy procedure.
- Get the renal registrar to identify the biopsy site and then place local anaesthetic cream (EMLA or LMXA) on the biopsy site 1 hour before biopsy. Usually the left kidney is biopsied.
- Ensure that the consent is signed before giving the premedication.
- For post Renal transplant patients an IVC should be inserted in case IV fluids or IV medications are required post biopsy.

### 2.2 Biopsy procedure

- A registered nurse or Renal Registrar must accompany the patient to the Ultrasound Department for the renal biopsy procedure since the child has received sedation.
- An oxygen mask, oxygen cylinder, self-inflating resuscitation bag must be taken with the child to the Ultrasound Department.
- A registered nurse should take a Nitrous Oxide circuit and mask for administration of nitrous oxide if the Pain Team is not able to administer nitrous oxide
- A registered nurse should take a pulse oximeter to the Ultrasound Department for oxygen saturation monitoring during the biopsy procedure.
- A registered nurse or Renal Registrar should return to the ward with the patient.

If the pain team is not available to assist by providing the nitrous oxide for the patient, then arrangements should be made for two (2) RNs to assist with the procedures: one accredited to provide procedural nitrous oxide, and the other to assist the renal physician with the procedure itself. If this is not available then the Renal Registrar should attend the biopsy to assist the Nephrologist / Renal Fellow with the biopsy procedure.

## 2.3 After biopsy procedure

- The child should remain in bed for 6 hours post biopsy unless otherwise instructed.
- Blood pressure and pulse should be measured every 15 minutes for 1 hour.
- Then blood pressure, pulse and respiratory rate should be measured hourly for 5 hours.
- The puncture site should be checked hourly for signs of evidence of bleeding.
- All urine should be checked for haematuria with a dipstick. Urine specimens with macroscopic haematuria should be saved and shown to the medical staff.
- An accurate measure of fluid intake and urine output should be maintained.
- Ensure that the child has an adequate oral intake (wake the child and offer oral fluids after two hours if they have not already woken).
- If the child is vomiting, discuss the requirements for oral ondansetron and/or IV fluid replacement with the renal registrar.
- The nurse should **notify the Renal Registrar or Resident immediately** if:
  - Pulse rate increases by >20 beats/minute
  - BP falls by >20 mmHg systolic and/or diastolic
  - Macroscopic haematuria occurs
  - The child complains of pain
  - The child is distressed
- Following all biopsies, a small saline pack or sandbag wrapped in towel should be placed on the biopsy site as a pressure pack for 1 hour to reduce local bleeding.
- The child may be discharged 6 hours post biopsy after review by the renal registrar or resident. Before discharge the child must be at a pre sedation level of consciousness.
- The parents should be told that the biopsy dressing can be removed after 24 hours and replaced with a local adhesive dressing for a further 5 days.



### 3 Equipment required for renal biopsy

**The nursing staff on the ward to which the child has been admitted is responsible for obtaining all the equipment required for the renal biopsy procedure.**

**Aseptic technique must be maintained throughout the procedure.**

- Biopsy gun (available from Renal Treatment Centre)
- Sterile ruler and marking pen (pen, skin marking, regular tip No 504821 available from stores)
- Small gallipot
- Sandbag
- Dressing pack
- Clear disposable drape (90 cm X 120 cm) to cover dressing trolley (No 501318)
- Packs of gauze squares x 4
- Xylocaine 1% plain (4 X 5mL ampoules)
- 10mL vials of 0.9% saline for injection x 2
- 10mL vial of sodium bicarbonate for injection x 1
- 25 gauge needle x 1, 23 gauge needle x 2, 19 gauge drawing up needle x 1
- 5mL syringes x 2, 10mL syringes x 2
- No 11 disposable scalpel x 1
- Combine
- Chlorhexidine 0.5% in Alcohol 70% solution
- Povidone Iodine impregnated scrubbing brush x 2
- Sterile gowns x 2
- Sterile gloves – sizes 6 ½, 7, 7 ½, 8, 8 ½. 2 packs of each size glove
- Fenestrated drape (disposable)
- 3 inch elastoplast
- Sterile yellow topped jar x 2
- Patient labels

Other equipment may be required depending upon the Proceduralist and/or laboratory requirements.

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## Day Stay Renal Biopsy – Patient Information

A renal biopsy is a test where a tiny sample of kidney tissue is removed by a needle. The tissue is then looked at under a microscope and a diagnosis of your child's kidney condition is made.

There is a low risk of bleeding either into the urine or around the outside of the kidney. We always perform a blood test beforehand to make sure there is nothing wrong with the ability of the blood to clot. This is usually done 3-4 days before the test.

On the day of the biopsy please give your child a small drink of clear fluids at 5.00am but nothing to eat or drink after that. Please go to Renal Treatment Centre Level 2 or to Turner Day Stay Ward at 8:00am for admission papers to be processed. You will be informed which ward you should go to.

The test is done in the Ultrasound Department to ensure the needle is accurately placed. The children are given a sedative and pain killer by mouth before the biopsy and then nitrous oxide during the biopsy so that they are very relaxed throughout the test. It is only in very young children that a mild general anaesthetic may be necessary.

The children are then returned to the Renal Treatment Centre or Turner Day Stay Ward where they must remain in bed and be observed for 6 hours. If their urine is not blood stained they are allowed to go home in the late afternoon. Occasionally the urine may have some blood in it and we may need to observe the child in hospital overnight.

We suggest they not attend school the following day but should be able to return the day after that. It is recommended they not do any sport for 10 days after the biopsy.

The result is usually available the following week and we arrange to review your child and discuss the result with you at that time.

The pressure dressing applied at the time of the biopsy may be removed the following day and a band aid applied to the biopsy site.