GUIDELINE

Antenatal Renal and Urological Anomalies

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA & KEMH Postnatal Wards

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Aim

To provide an approach to the investigation and management of antenatally diagnosed abnormalities of the urinary tract.

Risk

- Abnormalities of the urinary tract, particularly renal pelvis dilatation, are common findings on antenatal ultrasound.
- Many will resolve spontaneously without sequelae but others may be associated with acute and/or chronic renal failure.
- An evidence-based approach to investigation and management is necessary to optimise outcomes in severe cases and to avoid over investigation in mild cases.

Background

Abnormalities of the fetal urinary system are identified antenatally in 3 – 4% of pregnancies and represent approximately 20% of all fetal congenital defects[1, 2]. Renal pelvis dilation is the most common finding and occurs in 1 – 2% of all pregnancies[1,2].

Abnormalities of the urinary system can be associated with other congenital abnormalities and/or genetic conditions which may impact outcomes[1-3]. In addition, urine produced by the fetal kidneys contributes significantly to amniotic fluid volumes and structural and/or functional defects can result in oligo or anhydramnios leading to pulmonary hypoplasia and other abnormalities of the developing fetus[1,2]. Clinical sequelae may range from no functional disturbance through to acute and chronic renal failure depending on the underlying cause[4,5].

The most common antenatal abnormality of the urinary system is urinary tract dilation or hydronephrosis assessed by antero-posterior diameter of the renal pelvis (APRPD)[4]. Importantly, the larger the APRPD the greater the likelihood of an underlying urological pathology, the greater the need for surgery postnatally, the lower the possibility of spontaneous resolution and the increased risk of complication with urinary tract infections[4,5].

Abnormalities of the urinary tract are common and, although in many instances are mild and resolve spontaneously, can be complex and associated with significant morbidity. Early and accurate diagnosis is therefore essential for antenatal counselling, pregnancy and delivery planning and management of the neonate following delivery.

Key Points

- Many neonates with an antenatal diagnosis of a renal or urological anomaly will have an antenatal management plan which should be carefully reviewed.
- Neonates with an antenatal diagnosis of renal pelvis dilation should be managed as described below and in figure 1.
- Other renal and urological anomalies should be discussed with a neonatal consultant or senior registrar and may require further discussion with Paediatric Nephrology and/or Urology colleagues at PCH.

Renal tract abnormalities

Renal tract abnormalities can be described by the presence or absence of pelvi-calyceal dilatation as follows[1,2]:

1. **No urinary tract dilatation**
    - Abnormalities of number including unilateral or bilateral renal agenesis.
    - Abnormalities of size, shape or position including non-fused (simple) renal ectopia, cross-fused renal ectopia (fused on the same side of the midline) and horseshoe kidney (two kidneys on either side of the midline connected by upper or, more commonly, lower poles).
2. **Urinary tract dilatation**
    - Transient / physiological dilatation of the renal pelvis which is most common.
    - Obstruction at the level of the ureteropelvic or ureterovesical junction, ureters (e.g. ureterocoele), urethra (e.g. Posterior urethral valves) or obstruction due to duplicated system.
    - Vesicoureteral reflux
    - Cystic kidney disease (multicystic dysplastic kidney and polycystic kidney disease).

Management of neonates with antenatal renal pelvis dilation

Renal pelvis dilatation is classified and managed according to the urinary tract dilation (UTD) classification system[4,5].

- **Mild renal pelvis dilation**
    - Renal pelvis diameter of **7-10mm** on antenatal ultrasound in the third trimester of pregnancy.
    - Refer to Paediatric Nephrology at PCH by e-Referral.
    - Book outpatient renal ultrasound at PCH for ~2 months of age when making the nephrology referral. Note: The nephrology team will arrange a clinic appointment if necessary. If the post-natal ultrasound is normal, parents will receive a letter from the nephrology team indicating that no appointment or follow-up is necessary.
    - There is no need to commence antibiotic prophylaxis for these babies.
- **Moderate to severe renal pelvis dilation**
    - Renal pelvis diameter of **10 – 15 mm** on antenatal ultrasound in the third trimester of pregnancy is considered moderate and **>15mm** severe.
    - The on-call surgical registrar at PCH should be contacted.
    - Commence Trimethoprim and Sulfamethoxazole (Co-trimoxazole) prophylaxis which should be continued until renal ultrasound and other investigations as well as surgical review have been completed.
    - Complete a general surgery e-Referral
    - Arrange for other investigations as requested by the surgical team which may include renal ultrasounds and MCUG at PCH. Note: urgent renal ultrasounds can generally be obtained at short notice at KEMH.
    - Some patients with moderate to severe dilation of the renal pelvis will require transfer to PCH as an inpatient. This should occur in discussion with the paediatric surgical team and the neonatal transport team (NETS).

Referral pathways

Patients should be referred by **e-Referral** if referral is required.

Indications for UROLOGY REFERRAL include:

1. Bilateral hydronephrosis > 7mm antero-posterior diameter.
2. Unilateral hydronephrosis >10mm antero-posterior diameter.
3. Dilatation of ureters, bladder anomaly e.g. ureterocoele, thick walled bladder, exstrophy.
4. Unilateral suspected multicystic dysplastic kidney
5. Complicated duplex systems with any hydronephrosis, ureteric dilatation, ureterocele.
6. Hydrocolpos.

7. Suspected disorder of sex development (DSD).
8. Genitourinary tract mass or tumour.

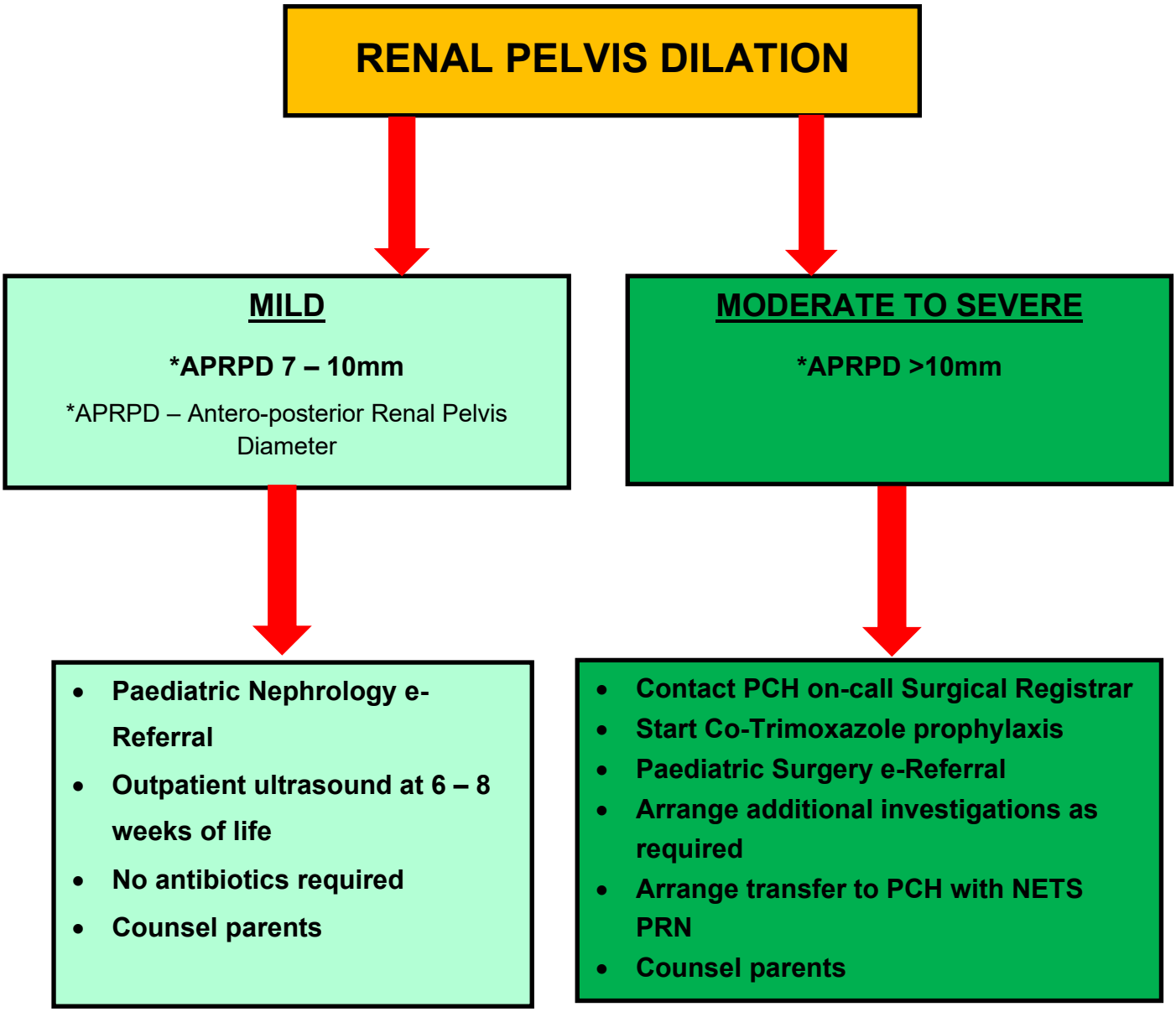
Indications for NEPHROLOGY REFERRAL include:

1. Unilateral hydronephrosis 7 -10mm antero-posterior diameter, with no ureteric dilatation or bladder anomaly. **Note** - Unilateral hydronephrosis < 7mm does not require further investigation or follow up.
2. Bilateral cystic kidney disease.
3. Simple duplex systems with no dilatation.
4. Pelvic kidney, horseshoe kidney, uncomplicated solitary kidney.
5. Any other renal abnormality.

Parent Resource

Trimethoprim/Sulfamethoxazole Liquid guide for caregivers

Figure 1: Management of Neonates with Antenatal Diagnosis of Renal Pelvis Dilation



Related CAHS internal policies, procedures and guidelines

Trimethoprim and Sulfamethoxazole (Co-trimoxazole)

Trimethoprim/Sulfamethoxazole Liquid guide for caregivers

References and related external legislation, policies, and guidelines

1. Mileto A, Itani M, Katz DS, Siebert JR, Dighe MK, Dubinsky TJ, et al. Fetal Urinary Tract Anomalies: Review of Pathophysiology, Imaging, and Management. AJR Am J Roentgenol. 2018;210(5):1010-21.
2. Dias T, Sairam S, Kumarasiri S. Ultrasound diagnosis of fetal renal abnormalities. Best Pract Res Clin Obstet Gynaecol. 2014;28(3):403-15.
3. Talati AN, Webster CM, Vora NL. Prenatal genetic considerations of congenital anomalies of the kidney and urinary tract (CAKUT). Prenat Diagn. 2019;39(9):679-92.
4. Nguyen HT, Benson CB, Bromley B, Campbell JB, Chow J, Coleman B, et al. Multidisciplinary consensus on the classification of prenatal and postnatal urinary tract dilation (UTD classification system). J Pediatr Urol. 2014;10(6):982-98.
5. Zhang H, Zhang L, Guo N. Validation of "urinary tract dilation" classification system: Correlation between fetal hydronephrosis and postnatal urological abnormalities. Medicine (Baltimore). 2020;99(2):e18707.

This document can be made available in alternative formats on request.

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