

## Peeing Issues

### Urinary Tract Infection: can present as ANY DAMN THING.

- defined as BACTERIURIA, with sample-dependent threshold;
    - ANY growth on a bladder tap specimen;
    - $10^7$  per L in a catheter specimen
    - $10^8$  for a clean catch
  - Non-specific symptoms in an infant (lethargy, failure to feed, fever)
    - these prompt a SEPTIC WORK UP.
  - **AFTER 2 years of age:** may be able to localize symptoms better;
    - might even have dysuria, loin pain, abdo pain, frequency, urgency, wetting
- THROUGHOUT CHILDHOOD, INCIDENCE OF URINARY TRACT INFECTION IS 8% FOR GIRLS AND 2% FOR BOYS

**IGNORE the BAG SPECIMEN**  
Its worthless. If there is absolutely NO growth, you can rule out a UTI, but if there's ANY GROWTH AT ALL, you need to do another sample for culture anyway.

### Investigations?

- ITS E.Coli. 80% of the time. Send it for **CULTURE+MICROSCOPY** anyway.
- **DIPSTICK** may show nitrates and leucocytes

### Short term management:

- Empiric antibiotics. **CEPHALEXIN = 1<sup>st</sup> choice**  
ORAL cephalexin, cotrimoxazole or augmentin  
INTRAVENOUS gentamicin PLUS cefotaxime or ampicillin.  
7 days usually enough.

### Why would I admit this child:

- Younger than 3 months;
- Dehydrated
- Bladder outlet is obstructed
- Electrolytes abnormal
- Renal impairment is evident
- Severely, acutely ill
- Oral antibiotics failed (by GP)

### FOLLOW-UP:

- 40% will have pyelonephritis.
- 30 % have vesicoureteric reflux.
- 1% have obstructive uropathy.
- UTI can cause lasting kidney damage, but it doesn't seem to lead to renal failure, and it does NOT seem to be prevented by prophylactic antibiotics.

### THEREFORE:

- **ULTRASOUND** at least is indicated. (! MEQ-level fact)
- If youre going to do ultrasound, **DO IT EARLY**. Prefereably as soon as UTI is confirmed.
- In reality, there doesn't seem to be any real benefit to such broad screening for tract abnormalities.
- BUT: if ultrasound shows ureter and pelvic dilatation, you want an MCU and a DMSA.

### OTHER INVESTIGATIONS:

**DMSA scan**, a nuke med perfusion study which shows renal scarring

**Micturating Cysto-Urethrogram**, a contrast study where you inject dye into the bladder and look for dye reflux ascending into the ureters.

**Bed-wetting:** affects 4-5% of kindergarten kids, at least once a week.

MOST LIKELY not pathological.

DAYTIME wetting is more likely to be UTI...

NIGHT-TIME WETTING is a bizarre childhood psychology problem, dealt with in a thoroughly Pavlovian manner, with a moisture-sensitive bed alarm which wakes the child. 60-70% success.

**Congenital Weirdness:** found in ~ 0.5% of fetuses at the 18 week antenatal ultrasound.

THE VAST MAJORITY OF THESE will be asymptomatic.

Examples or symptomatic ones: **Pyelo-ureteric junction obstruction; agenesis of ureter; agenesis of urethra; "prune belly syndrome" (no abdominal musculature)**

**When is this normal?**

-its ok to be proteinuric after exercise or with a fever.  
Exercise proteinuria goes away in 48hrs. Febrile proteinuria goes away with 7 days of resolution of the febrile illness.

**GLOMERULAR DISEASE IN CHILDHOOD:**

i.e. ... why has this child got hematuria and proteinuria?

There is such a thing as "benign postural proteinuria"... uncertain aetiology; not dangerous, persist for years...

**NEED TO KNOW:** which protein is being excreted?

Small molecules, microglobulin – it's a TUBULAR problem, or reflux nephropathy. Seek a syndrome (eg. cystinosis)

Small selective molecules, eg. only albumin- its probably **minimal change glomerulonephritis**

Poorly selective proteinuria- any damn thing; could be any of the glomerular diseases.

**URINARY PROTEIN to CREATININE RATIO:** the test of choice. Tells you how much protein is excreted for every mmol of creatinine. Normal P:C ratio is 20mg/mmol

**TYPICAL RESULTS:**

- **transient post-febrile or post-exercise proteinuria:** probably below 100mg/mmol
- **postural benign proteinuria:** recumbent urine = below 20mg/mmol; standing = over 50mg/mmol
- **Tubular or reflux nephropathy:** below 100mg/mmol
- **Any glomerulonephritis: nephrotic picture, over 350mg/mmol**

**POST-STREP GLOMERULONEPHRITIS:**

**History:** 10-14 days after a throat infection;

**INVESTIGATE** with a strep serology test...

and look for the most threatening complication:

**ACUTE NEPHRITIC SYNDROME:**

- **High potassium**
- **High creatinine and urea (duh, reduced kidney function, with glomerular disease...)**
- **Hypertensive encephalopathy**
- **Complement assay: Low C3, normal C4**
- **Usually complement recovers in 3 months**

**Heinrich-Schonlein GLOMERULONEPHRITIS:**

Presents with a characteristic vasculitic purpural rash, arthritis, abdo pain....

**Random nephritic syndromes:** rare; 1 in 100,000 of Australian children, 7-8 per 100,000 of Indian migrants.

Usually concerned parents bring the kid in with a swollen oedematous face, and you find they are albumin-depleted.

**CHRONIC RENAL FAILURE in children is very rare, but horrible.**

**Dialysis** causes growth and developmental delay. Especially bone-related problems.

A 4-year wait for a kidney donor is different for a 50 year old and a 1 year old.

10 year graft survival is about 50-60%