**URINALYSIS** – 1) specific gravity (Jan 2017), 2) pH (Feb ’17), 3) nitrates (March ’17), 4) leucocytes (April ’17) 5) blood
- Red or brown urine does not always mean blood
- High false positive rate (eg. haemoglobinuria, myoglobinuria, concentrated urine, menstrual blood in the urine sample, rigorous exercise) so dipstick positive blood needs to be looked at under the microscope to accurately diagnose haematuria
- False negative possible if specific gravity is < 1007
- Significant haematuria is defined as ≥10 red blood cells (≥3 in adults) per high-power field in a properly collected and centrifuged urine specimen
- Isolated microscopic haematuria in a well child only really needs further investigation after 3 positive samples over a period of a few months
- Concomitant proteinuria, high BP or a palpable abdominal mass should be investigated promptly
- Possible causes of haematuria in children:
  - UTI
  - Viral infections
  - Post streptococcal glomerulonephritis
  - Trauma
  - Henoch Schonlein Purpura
  - Wilm’s tumour (median age 3.5 years)

**BP measurement in babies and children is a skill which is often not done well:**

**Cuff size** – you need a range of sizes. The bladder width needs to be at least 40% of the child’s arm circumference between olecranon and acromion and 80–100% of the circumference. A small cuff leads to an erroneously high BP measurement. Take BP in the arm, not leg (both if doing 4-limb BP obviously). At birth, BP measured in the legs is often lower than in the arms, equalises at 8/52 of age and after that leg blood pressure tends to be higher than in the arm.

**Position** – the child should ideally be lying down, relaxed, their limb at the same level as their heart.

**Equipment** – centile charts are put together using auscultation and a sphygmomanometer. Mechanical oscillometric devices are easy to use (be sure to still ensure correct cuff size) but are not as accurate which is why nephrologists always insist on a “manual reading”.

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**What is PoTS? Is it an illness?**

It stands for Postural Orthostatic Tachycardia Syndrome, an autonomic disturbance leading to light-headedness, sweating, tremor, palpitations and near syncope in the upright position.

**Definition:**
- Heart rate >120 bpm on standing
- HR increase > 40 bpm after 10 minutes of standing (if aged 12-19 yrs. > 30 bpm if older)

* Despite our traditional concern with lying and standing blood pressures, it is the persistent tachycardia that characterises this health condition. Blood pressure may not change at all.
* Recognised in age group 12 – 50, female to male ratio of 5:1
* Can be primary (eg. adolescence) or secondary (eg. diabetes, hypermobility)
* Different types and some are associated with a particular gene mutation
* Can be diagnosed on tilt table or active stand test if necessary
* Reassurance, a healthy lifestyle with sufficient aerobic exercise and fluid intake will help with symptoms and most adolescents grow out of it

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**Resources:**
- http://lifeinthefastlane.com/investigations/urinalysis/
- http://labtestsonline.org.uk/understanding/analytes/urinalysis.ui-exams?start=1

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**What is chronic anaemia?**

- Iron deficiency thalassaemia

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**Mean Corpuscular Haemoglobin Concentration (MCHC)**

\[
\text{MCHC} = \left( \frac{\text{Hb}}{\text{Hct}} \right) \times 100
\]

**Normal in children is 32-34% (adults 28-36%) depending on the lab**

- *Hb*: haemoglobin
- *Hct*: haematocrit or packed cell volume