

## Kidney stone disease:

an update on its management in primary care

### WHY WAS THIS UPDATE DEVELOPED?

The incidence of kidney stone disease (urolithiasis) is rising, with a lifetime risk of 10–15%, and a recurrence rate of 50% within 10 years.<sup>1</sup> Associated complications include significant pain secondary to renal colic, urinary tract infection (UTI) and urosepsis, and chronic kidney disease. The increasing burden of urolithiasis means that optimising its management in primary care is important.

### WHEN TO REFER FOR ACUTE RENAL COLIC

Patients with suspected renal colic (colicky intermittent abdominal and/or flank pain, and haematuria), with no known history of urinary stones, should be offered urgent imaging within 24 hours.<sup>2</sup> If signs of a possible UTI are present, initial management should include empiric antibiotics, and urine should be sent for culture. Non-contrast computed tomography of the kidneys, ureters, and bladder (CT KUB) is the first-line investigation (sensitivity ~95%, specificity ~98%); however, ultrasound is indicated for children and pregnant women (sensitivity ~84%, specificity ~53%).<sup>3</sup> Patients with known urinary stones also require urgent referral if their pain is uncontrolled with oral analgesia, or if they have signs of sepsis.

For patients whose symptoms have settled, less urgent imaging can be requested, as long as there are no other clinical concerns. Renal function should also be checked.

### WHAT TO DO FOR PATIENTS BEING MANAGED CONSERVATIVELY

Stones <4 mm have a 95% chance of spontaneous passage within 40 days.<sup>4</sup> Patients with distal stones <10 mm may undergo a trial of conservative management if pain control is achieved, and there is no deterioration in renal function or evidence of sepsis.

### Optimising analgesia

Optimising analgesia is crucial.<sup>5</sup> Non-steroidal anti-inflammatory drugs (NSAIDs)

are first line. Oral and rectal routes provide equal analgesia. Suppositories may be preferred in cases of nausea and vomiting. Paracetamol and opioids are second line if NSAIDs are contraindicated or not sufficient.

No evidence supports the coadministration of antispasmodics (such as hyoscine butylbromide) or corticosteroids.

### Medical expulsive therapy

Medical expulsive therapy with  $\alpha$ -blockers, such as tamsulosin 400 mcg once daily (off-label indication), for 1 month may accelerate spontaneous passage of distal stones, particularly those >5 mm.<sup>2,6</sup> Possible side effects include postural hypotension and retrograde ejaculation.

### Patients who fail conservative management

These patients typically present with worsening pain, clinical signs of sepsis, or reduced urine output, and thus warrant urgent re-referral to urology for consideration of intervention.

### WHEN TO REFER PATIENTS WITH ASYMPTOMATIC STONES

Upper renal tract stones (and very rarely in the lower tract) may be asymptomatic. Indications for referral include:<sup>5</sup>

- stone size >5 mm (unless the patient agrees to watchful waiting after informed discussion);
- single kidney;
- chronic obstruction; and
- recurrent UTIs.

Asymptomatic stones should be monitored with active surveillance, consisting of annual follow-up and imaging (using whichever imaging modality the stone was visible on, while being mindful of radiation exposure). Intervention should be considered after 2–3 years, or earlier in the case if growth above 5 mm, obstruction, infection, or pain.<sup>5</sup>

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## Box 1. Further resources

### For patients

- British Association of Urological Surgeons (BAUS) *Dietary advice for stone formers*: [https://www.baus.org.uk/\\_userfiles/pages/files/Patients/Leaflets/Stone%20diet.pdf](https://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Stone%20diet.pdf)
- BAUS general advice on kidney stones: [http://www.baus.org.uk/patients/conditions/6/kidney\\_stones](http://www.baus.org.uk/patients/conditions/6/kidney_stones)

### For GPs

- National Institute for Health and Care Excellence guidance (updated January 2019): <https://www.nice.org.uk/guidance/ng118/chapter/Recommendations>
- Guidance/study days from the Primary Care Urology Society: <https://primarycareurologysociety.org>

## REFERENCES

1. Turney BW, Reynard JM, Noble JG, Keoghane SR. Trends in urological stone disease. *BJU Int* 2012; **109**(7): 1082–1087.
2. National Institute for Health and Care Excellence. *Renal and ureteric stones: assessment and management*. NG118. 2019. <https://www.nice.org.uk/guidance/ng118/chapter/Recommendations> (accessed 21 Feb 2020).
3. Brisbane W, Bailey MR, Sorensen MD. An overview of kidney stone imaging techniques. *Nat Rev Urol* 2016; **13**(11): 654–662.
4. Türk C, Knoll T, Petrik A, et al. *Guidelines on urolithiasis*. Arnheim: European Association of Urology, 2014. [http://uroweb.org/wp-content/uploads/22-Urolithiasis\\_LR.pdf](http://uroweb.org/wp-content/uploads/22-Urolithiasis_LR.pdf) (accessed 21 Feb 2020).
5. Ziemba JB, Matlaga BR. Guideline of guidelines: kidney stones. *BJU Int* 2015; **116**(2): 184–189.
6. Campschroer T, Zhu X, Vernooij RW, Lock MT. Alpha-blockers as medical expulsive therapy for ureteral stones. *Cochrane Database Syst Rev* 2018; **4**: CD008509.

## DIETARY ADVICE FOR RECURRENT STONE FORMERS

Different sub-types of stone have specific guidance (Box 1); however, general lifestyle advice is helpful for all stone compositions.<sup>2,5</sup>

- good hydration — adults should drink 2.5–3 L/day of water and children 1–2 L; it may be helpful to advise drinking to a level where the urine is clear, rather than targeting a specific volume if patients find this difficult;
- avoid carbonated drinks, and drink tea/coffee in moderation;
- low-sodium diet (<6 g salt for adults and 2–6 g for children);
- normal calcium intake (700–1000 mg for adults);
- avoid excess dietary protein, as this acidifies urine and promotes hyperuricosuria, predisposing to stone development; and
- prevent excess weight gain — obesity is closely related to stone formation.

## WHICH PATIENTS ARE AT HIGH RISK OF RECURRENCE?

Those at higher risk of recurrence include:<sup>4</sup>

- early-onset urolithiasis (<25 years of age);
- recurrent urolithiasis;
- nephrocalcinosis;
- disease-associated urolithiasis (such as inflammatory bowel disease and type 2 diabetes mellitus); and
- strong family history (early onset in first-degree relative).

Specialist metabolic screening should be offered to these patients.<sup>4</sup>

## WHAT INTERVENTIONS ARE OFFERED IN SECONDARY CARE?

Patients presenting with an infected, obstructed kidney require urgent decompression of the renal tract. This is typically done with either a ureteric stent, or by inserting a percutaneous nephrostomy. The nephrostomy is typically internalised with a stent prior to the patient's discharge (antegrade stenting). The obstructing stone is usually not removed simultaneously, and therefore patients typically have an indwelling stent in place until their stone is definitively treated.

There are various options for treating elective patients with renal stones,<sup>2,4</sup> and the decision is based on multiple factors including:

- patient preference;
- location and size of the stone;
- comorbidities; and
- solitary kidney.

Options for treatment include ureteroscopy (URS), extracorporeal shockwave lithotripsy (ESWL), and percutaneous nephrolithotomy (PCNL).

URS is the most commonly performed procedure and has high stone-free rates. It is an endoscopic procedure that is performed transurethally, which allows extraction and fragmentation of stones with laser techniques. Patients are usually routinely stented post-procedure to allow inflammation to settle. These are typically removed 1–2 weeks postoperatively.

In ESWL, ultrasound wave shockwaves are applied from outside the body, with the aim of fragmenting the stone into small fragments, which can be passed spontaneously and painlessly. It can require multiple procedures for a patient to become completely stone free, and some of the smaller fragments can lead to acute renal colic.

PCNL involves direct percutaneous access to the kidney via a needle and guidewire. This is associated with higher morbidity, and is usually reserved for large and/or complex stones, or when other modalities above have failed.

## WHAT PROBLEMS MIGHT PRESENT TO THE GP POSTOPERATIVELY?

Stent-related problems are common, and include haematuria, urgency, frequency, dysuria, and flank pain. Patients can be reassured unless symptoms are severe and/or persistent, or associated with systemic symptoms, urinary retention, or positive urine culture; in which case UTI or stent migration/misplacement should be suspected. A trial of  $\alpha$ -blockers and/or anticholinergics can be tried for stent colic symptoms.

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