NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Health and social care directorate

Quality standards

Briefing paper

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| Quality standard topic: Renal stones  Output: Prioritised quality improvement areas for development.  Date of Quality Standards Advisory Committee meeting: 5 September 2019 |

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1. Introduction

This briefing paper presents a structured overview of potential quality improvement areas for renal stones. It provides the committee with a basis for discussing and prioritising quality improvement areas for development into draft quality statements and measures for public consultation.

* 1. Structure

This briefing paper includes a brief description of the topic, a summary of each of the suggested quality improvement areas and supporting information.

If relevant, recommendations selected from the key development source below are included to help the committee in considering potential statements and measures.

* 1. Development source

The key development source referenced in this briefing paper is:

[Renal and ureteric stones: assessment and management](https://www.nice.org.uk/guidance/ng118) (2019) NICE guideline 118

1. Overview[[1]](#footnote-1)
   1. Focus of quality standard

This quality standard will cover assessing and managing renal and ureteric stones in children, young people and adults.

* 1. Definition

Renal and ureteric stones (stones in the kidney or ureter, also known as kidney stones and urolithiasis) are abnormal solid particles found within the urine in kidneys. Some are as small as a grain of sand; the rest range in diameter between a few millimetres and a few centimetres[[2]](#footnote-2). Renal and ureteric stones usually present as an acute episode with severe pain. Stones can cause intense pain as they move from the kidney towards the bladder and obstruct urine drainage. A ureteric stone can cause permanent kidney damage when it causes an obstruction. If there is an accompanying infection, life-threatening sepsis can develop.

* 1. Incidence and prevalence

Epidemiological data suggest that the incidence and prevalence of renal and ureteric stones is increasing. The number of hospital episodes increased by 71% over an 18-year period between 2000 and 2018, from 51,035 episodes to 87,347 episodes[[3]](#footnote-3). The lifetime prevalence of renal stone disease is 13%. Renal and ureteric stones affect about 3 in 20 men and 2 in 20 women at some stage in their lives[[4]](#footnote-4). Consequently, the direct costs of treatment are increasing as well as the indirect socioeconomic burdens of reduced quality of life, sickness leave, employment problems and medical follow-up.

* 1. Current service delivery and management

Initial diagnosis is made by taking a clinical history, conducting a clinical examination and carrying out imaging; initial management is with painkillers and treatment of any infection.

Ongoing treatment of renal and ureteric stones depends on the site and size of the stone (less than 10 mm, 10 to 20 mm, greater than 20 mm; staghorn stones). Options for treatment include:

* observation with pain relief
* surgical intervention, including shockwave lithotripsy (SWL), ureteroscopy (URS) and percutaneous stone removal (surgery).

As well as the site and size of the stone, treatment also depends on local facilities and expertise. Most centres have access to SWL, but some use a mobile machine on a sessional basis rather than a fixed site machine with easier access during the working week. The use of a mobile machine may affect options for emergency treatment, but may also add to waiting times for non-emergency treatment.

Because the incidence of stones and the rate of intervention are increasing, there is a need to reduce recurrences through patient education and lifestyle changes. Assessing dietary factors and changing lifestyle have been shown to reduce the number of episodes in people with renal stone disease.

1. Summary of suggestions
   1. Responses

In total 8 registered stakeholders responded to the 2-week engagement exercise 05/07/19–19/07/19. 5 of these registered stakeholders provided areas for quality improvement and 3 advised they had no comment to make. We also received comments from 5 specialist committee members. The responses have been merged and summarised in table 1 for further consideration by the Committee.

NHS Improvement’s patient safety division did not have any comments to submit during stakeholder engagement.

Full details of all the suggestions provided are given in appendix 2 for information.

### Table 1 Summary of suggested quality improvement areas

| Suggested area for improvement | Stakeholders |
| --- | --- |
| Diagnostic imaging | BAUS, RA, SCOR, SCM 1 |
| Pain management | SCM 1, SCM 2, SCM 3 |
| Treatment   * Stenting * Surgical treatments * Drainage of the infected obstructed kidney | * BAUS, SCM 1, SCM 2, SCM 3 * BAUS, RA, SCM 2, SCM 3, SCM 4, SCM 5 * BAUS |
| Metabolic testing and investigations | BAUS, RA, SCM 1, SCM 3, SCM 5 |
| Preventing recurrence - Dietary and lifestyle advice | BDA, RA, SCM 2, SCM 3 |
| Abbreviations:  BAUS, British Association of Urological Surgeons section of EndoUrology  BDA, British Dietetic Association  RA, Renal Association  SCOR, Society and College of Radiographers  SCM, Specialist Committee Member  Comments from the Renal Association were endorsed by the Royal College of Physicians. | |

* 1. Identification of current practice evidence

Bibliographic databases were searched to identify examples of current practice in UK health and social care settings; 207 papers were identified for renal stones. In addition, 10 papers were suggested by stakeholders at topic engagement and 1 paper internally at project scoping.

Of these papers, 6 have been included in this report and are included in the current practice sections where relevant. Appendix 1 outlines the search process.

1. Suggested improvement areas
   1. Diagnostic imaging
      1. Summary of suggestions

Stakeholders highlighted the importance of people presenting with renal colic having a CT scan as soon as possible, and within 24 hours, to prevent decline of renal function, delay in treatment and increase in pain. Availability of trained staff and not all hospitals offering urgent CT scan were raised as issues preventing this happening.

* + 1. Selected recommendations from development source

Table 2 below highlights recommendations that have been provisionally selected from the development source/sources that may support potential statement development. These are presented in full after table 2 to help inform the committee’s discussion.

### Table 2 Specific areas for quality improvement

|  |  |
| --- | --- |
| Suggested quality improvement area | Suggested source guidance recommendations |
| Diagnostic imaging | NICE NG118 Recommendations 1.1.1 to 1.1.3 |

NICE NG118

Recommendation 1.1.1

Offer urgent (within 24 hours of presentation) low-dose non-contrast CT to adults with suspected renal colic. If a woman is pregnant, offer ultrasound instead of CT.

Recommendation 1.1.2

Offer urgent (within 24 hours of presentation) ultrasound as first-line imaging for children and young people with suspected renal colic.

Recommendation 1.1.3

If there is still uncertainty about the diagnosis of renal colic after ultrasound for children and young people, consider low-dose non-contrast CT.

* + 1. Current UK practice

An audit at Torbay Hospital[[5]](#footnote-5) for patients referred to Urology with suspected ureteric calculi (stones) from June to September 2015, showed that of the 44 patients referred, 9 (20%) did not have a non-contrast CT scan for kidneys, ureters and bladder (CT KUB) within 24 hours.

* + 1. Resource impact

No resource impact was anticipated in NG118 for these recommendations.

* 1. Pain management
     1. Summary of suggestions

Stakeholders commented that non-steroidal anti-inflammatory drugs should be the first-line treatment for pain management for people with suspected renal colic, but there is varying practice nationwide, and other treatments are being used.

* + 1. Selected recommendations from development source

Table 3 below highlights recommendations that have been provisionally selected from the development source/sources that may support potential statement development. These are presented in full after table 3 to help inform the committee’s discussion.

### Table 3 Specific areas for quality improvement

|  |  |
| --- | --- |
| Suggested quality improvement area | Selected source guidance recommendations |
| Pain management | NICE NG118 Recommendations 1.2.1, and 1.2.2 |

NICE NG118

Recommendation 1.2.1

Offer a non-steroidal anti-inflammatory drug (NSAID) by any route as first-line treatment for adults, children and young people with suspected renal colic.

Recommendation 1.2.2

Offer intravenous paracetamol to adults, children and young people with suspected renal colic if NSAIDs are contraindicated or are not giving sufficient pain relief.

* + 1. Current UK practice

No current practice information identified.

* + 1. Resource impact

No resource impact was anticipated in NG118 for these recommendations.

* 1. Treatment
     1. Summary of suggestions

### Stenting

Stakeholders highlighted that ureteric stents should not be inserted before having shockwave lithotripsy (SWL) for ureteric or renal stones, or after having ureteroscopy, as they are uncomfortable and increase patient morbidity. When insertion of ureteric stents has been necessary, stakeholders commented that prompt removal (within 2 weeks of the decision to remove) is a quality improvement area to prevent increases in morbidity, reduced quality of life and infections.

### Surgical treatment

Stakeholders stated that surgical treatment should be offered within 48 hours, as early intervention improves outcomes, and that treatment should be completed within 6 weeks of initial presentation. Offering SWL to adults with renal or ureteric stones less than 10mm was also thought to be a quality improvement area, as the availability varies. Access to a paediatric urologist with experience in stone management when stone removal is needed for children was also raised.

### Drainage of the infected obstructed kidney

A stakeholder suggested that an infected obstructed kidney should be drained within 12 hours of diagnosis as it can be a life-threatening emergency. Drainage was felt to be variable across the UK, and access to interventional radiology services limited in some areas.

* + 1. Selected recommendations from development source

Table 4 below highlights recommendations that have been provisionally selected from the development source/sources that may support potential statement development. These are presented in full after table 4 to help inform the committee’s discussion.

### Table 4 Specific areas for quality improvement

|  |  |
| --- | --- |
| Suggested quality improvement area | Selected source guidance recommendations |
| Stenting | NICE NG118 Recommendations 1.4.1 and 1.6.1 |
| Surgical treatment | NICE NG118 Recommendations 1.5.2 to 1.5.4 |
| Drainage of the infected obstructed kidney | Not directly covered in NICE NG118 and no recommendations are presented |

### Stenting

NICE NG118

Recommendation 1.4.1

Do not offer pre-treatment stenting to adults having shockwave lithotripsy (SWL) for ureteric or renal stones.

Recommendation 1.6.1

Do not routinely offer post-treatment stenting to adults who have had ureteroscopy for ureteric stones less than 20 mm.

### Surgical treatment

NICE NG118

Recommendation 1.5.2

Follow the recommendations in table 5 for surgical treatment (including SWL) of renal stones in adults, children and young people.

Table 5 Surgical treatment (including SWL) of renal stones in adults, children and young people

|  |  |  |
| --- | --- | --- |
| Stone type and size | Treatment for adults (16 years and over) | Treatment for children and young people (under 16 years) |
| Renal stone less than 10 mm | Offer SWL | Consider URS or SWL  Consider PCNL if:  URS or SWL have failed **or**  for anatomical reasons, PCNL is the more favourable option |
| Renal stone 10 to 20 mm | Consider URS or SWL  Consider PCNL if URS or SWL have failed | Consider URS, SWL or PCNL1 |
| Renal stone larger than 20 mm, including staghorn stones | Renal stone larger than 20 mm, including staghorn stones | Consider URS, SWL or PCNL1 |
| Abbreviations: PCNL, percutaneous nephrolithotomy; SWL, shockwave lithotripsy; URS, ureteroscopy. | | |
| 1 Use clinical judgement when considering mini or standard PCNL.  2 Use clinical judgement when considering tubeless, mini or standard PCNL, and supine or prone positions. | | |

Recommendation 1.5.3

Follow the recommendations in table 6 for surgical treatment (including SWL) of ureteric stones in adults, children and young people.

Table 6 Surgical treatment (including SWL) of ureteric stones in adults, children and young people

|  |  |  |
| --- | --- | --- |
| Stone type and size | Treatment for adults (16 years and over) | Treatment for children and young people (under 16 years) |
| Ureteric stone less than 10 mm | Offer SWL | Consider URS or SWL |
| Ureteric stone 10 to 20 mm | Offer URS | Consider URS or SWL |
| Abbreviations: PCNL, percutaneous nephrolithotomy; SWL, shockwave lithotripsy; URS, ureteroscopy. | | |

Recommendation 1.5.4

Offer surgical treatment (including SWL) to adults with ureteric stones and renal colic within 48 hours of diagnosis or readmission, if:

* pain is ongoing and not tolerated **or**
* the stone is unlikely to pass.
  + 1. Current UK practice

### Stenting

The Getting It Right First Time (GIRFT) Urology report[[6]](#footnote-6) includes findings from 134 visits covering over 140 trusts in England providing urological care in 2016. It is the first comprehensive review of the state of provision of urological services in the NHS. The review found that (see chart 1):

* for trusts overall, the median proportion of patients treated with a ureteric stent insertion was 20%
* in a small number of trusts, ureteric stenting was the treatment given to more than half of patients receiving a procedure during an emergency admission for urinary stones – while in others, stenting was not offered at all.

The British Association of Urological Surgeons (BAUS) national ureteroscopy non-compulsory audit[[7]](#footnote-7) received data from 85 centres and 114 consultants on 3267 cases of renal and ureteric stones from April 2012 to July 2016. The data shows:

* pre-operative stents were used in 39% of elective cases and 6% of non-elective cases
* post-operative stents were used in 70% of elective cases and 69% of non-elective cases.

Updated data from the BAUS audit in 2018 on 4796 cases of renal and ureteric stones from 2012 to 2018 shows that:

* pre-operative stents were used in 37.5% of cases of stones
* pre-operative stents were used in 44% of renal stone cases, 35.2% of ureteric stone cases and 32.5% of cases with unrecorded stone site.

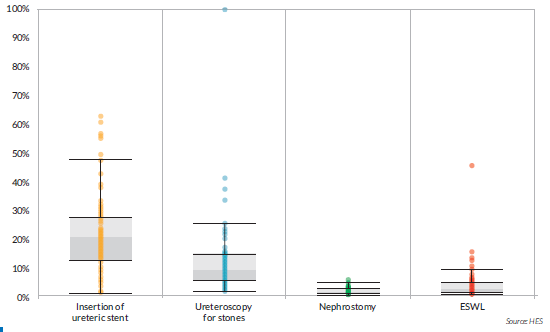
### Surgical treatment

The GIRFT Urology report[[8]](#footnote-8) found that:

* about 40% of stone patients who are admitted have a procedure carried out during their emergency admission, meaning that approximately 60% are treated conservatively (seeking to encourage the stones to pass naturally)
* intervention rates vary dramatically from hospital to hospital, with some urology departments offering no procedures, while others intervene in more than half of admissions
* only 4 providers treated more than 10% of emergency admissions with extracorporeal shock wave lithotripsy (ESWL, see chart 1 below)

The boxplot below (chart 1) shows the variation between hospitals in the use of ureteric stents and nephrostomies, and in rates of definitive stone treatment with ureteroscopy or ESWL. Each coloured dot represents a trust. The box shows the interquartile range: a horizontal line at the first quartile, where 25% of values are lower than this value, and a line at the third quartile, where 25% of values are higher than this value. The range for ureteroscopy is greater than the range for ESWL. The median is shown by the horizontal line within the box. The vertical lines go from quartile 1 to the smallest non-outlier in the data set, and from quartile 3 to the largest non-outlier. Ureteroscopy has a greater range of outliers than ESWL.

Chart 1 Boxplot of selected procedures, proportion undertaken during non-elective admissions under the care of a urologist for patients with urinary tract stones, by trust, 2016 (source: HES)



During GIRFT visits, providers were asked why they did not provide definitive stone treatment with ureteroscopy or ESWL for more of their emergency stone patients. A range of reasons were given:

* not having access to a suitable operating theatre
* a lack of staff trained to use the stone laser or assist with emergency stone procedures
* it was also clear that not all units offer emergency ESWL, even when a lithotripter is available in a neighbouring hospital.

BAUS collected data[[9]](#footnote-9) from January 2016 to December 2018 on 6877 PCNL procedures recorded from 208 consultants at 129 centres in the United Kingdom. The data shows:

* Median number of cases per consultant: 23.5 cases, ranging from 1 to 178 cases
* Median number of cases per centre: 47 cases, ranging from 1 to 307 cases.

A review of HES data from 2006/07 to 2013/14[[10]](#footnote-10) reported on changes in the type and volume of procedures for stones being performed over this 7 year period:

* the total number of SWL procedures increased by 26%
* URS increased by 86%
* there was a 149% rise in PCNL procedures.

The UK based [Therapeutic Interventions for Stones of the Ureter (TISU) study](https://w3.abdn.ac.uk/hsru/tisu/)[[11]](#footnote-11) is a multicentre randomised controlled trial of extracorporeal shockwave lithotripsy, as first treatment option, compared with direct progression to uteroscopic treatment, for ureteric stones. Data provided from the study on 247 patients allocated to a SWL pathway and 261 patients allocated to a URS pathway has shown:

* a median time to treatment for SWL of 8 days (range 2-18 days), with 93% of cases treated within 8 weeks
* median time to treatment for URS of 25 days (range 9-44 days), with 86% of cases treated within 8 weeks.

### Drainage of the infected obstructed kidney

No current practice information identified.

* + 1. Resource impact

It was anticipated in NG118 that there would be savings as a result of more people having SWL treatment instead of URS and an increase in medical expulsive therapy instead of surgery, for people with ureteric stones of less than 10mm.

* 1. Metabolic testing and investigations
     1. Summary of suggestions

Stakeholders highlighted the importance of metabolic testing of stones, in particular recurrent stones, to aid diagnosis and treatment and prevent recurrence. Interpretation and follow up of metabolic testing was considered important as stones can be a marker of cardiovascular disease. Metabolic investigations for children was also raised as a key area as underlying metabolic abnormality is more common in children. Stakeholders stated that the results of these investigations should be available to specialists with experience in stone management when children are seen for further opinion.

* + 1. Selected recommendations from development source

Table 7 below highlights recommendations that have been provisionally selected from the development source/sources that may support potential statement development. These are presented in full after table 5 to help inform the committee’s discussion.

### Table 7 Specific areas for quality improvement

|  |  |
| --- | --- |
| Suggested quality improvement area | Selected source guidance recommendations |
| Metabolic testing and investigations | NICE NG118 Recommendations 1.7.2 and 1.7.3 |

NICE NG118

Recommendation 1.7.2

Measure serum calcium for adults with ureteric or renal stones.

Recommendation 1.7.3

Consider referring children and young people with ureteric or renal stones to a paediatric nephrologist or paediatric urologist with expertise in this area for assessment and metabolic investigations.

* + 1. Current UK practice

No current practice information identified.

* + 1. Resource impact

No resource impact was anticipated in NG118 for these recommendations.

* 1. Preventing recurrence - Dietary and lifestyle advice
     1. Summary of suggestions

Stakeholders raised the variability in information about diet and lifestyle given and how telling people about high fluid intake and maintaining a healthy weight could prevent stones.

* + 1. Selected recommendations from development source

Table 8 below highlights recommendations that have been provisionally selected from the development source/sources that may support potential statement development. These are presented in full after table 6 to help inform the committee’s discussion.

### Table 8 Specific areas for quality improvement

|  |  |
| --- | --- |
| Suggested quality improvement area | Selected source guidance recommendations |
| Preventing recurrence - Dietary and lifestyle advice | NICE NG118 Recommendations 1.8.1 and 1.8.2 |

NICE NG118

Recommendation 1.8.1

Discuss diet and fluid intake with the person (and their family or carers, as appropriate), and advise:

* adults to drink 2.5 to 3 litres of water per day, and children and young people (depending on their age) 1 to 2 litres
* adding fresh lemon juice to drinking water
* avoiding carbonated drinks
* adults to have a daily salt intake of no more than 6 g, and children and young people (depending on their age) 2 to 6 g

not restricting daily calcium intake, but maintaining a normal calcium intake of 700 to 1,200 mg for adults, and 350 to 1,000 mg per day for children and young people (depending on their age).

Recommendation 1.8.2

Follow the recommendations on maintaining a healthy lifestyle in the NICE guideline on [preventing excess weight gain](https://www.nice.org.uk/guidance/ng7).

* + 1. Current UK practice

No current practice information identified.

* + 1. Resource impact

No resource impact was anticipated in NG118 for these recommendations.

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# Appendix 1: Review flowchart

Records identified through topic engagement  
[n = 10]

Records identified through IS scoping search  
[n = 1]

Records identified through ViP searching  
[n = 207]

Records excluded  
[n = 194]

Records screened  
[n = 218]

Citation searching or snowballing

[n = 0]

Full-text papers excluded  
[n = 18]

Full-text papers assessed   
[n = 24]

Current practice examples included in the briefing paper  
[n = 6]

# Appendix 2: Suggestions from stakeholder engagement exercise – registered stakeholders

| ID | Stakeholder | Suggested key area for quality improvement | Why is this important? | Why is this a key area for quality improvement? | Supporting information |
| --- | --- | --- | --- | --- | --- |
| **General** | | | | | |
| 1 | NHS Improvement Patient Safety | No suggested areas for quality improvement. | | | |
| 2 | Royal College of Nursing | This is just to let you know that there are no comments to submit on behalf of the Royal College of Nursing in relation to the stakeholder engagement exercise for the Renal Stones quality standard. | | | |
| 3 | Royal College of Physicians | The RCP is grateful for the opportunity to respond to the above consultation.    We would like to endorse the below response from the Renal Association | | | |
| 4 | Royal College of Paediatrics and Child Health | Thank you for inviting the Royal College of Paediatrics and Child Health to comment on the Renal stone’s topic engagement exercise. We have not received any responses for this consultation but are aware that BAPN responded directly. | | | |
| 5 | Royal College of Radiology | No comments. | | | |
| **Diagnostic imaging** | | | | | |
| 6 | BAUS Section of EndoUrology | Key area for quality improvement 1  ***Non contrast CT scan within 24hours of acute renal colic presentation in adults*** | There is evidence that CT is superior to ultrasound, plain film X-ray and MRI for detecting renal and ureteric stones in adults who are not pregnant. CT should be performed as soon as possible because renal function can decline quickly as a consequence of renal and ureteric stones, although could be delayed for up to 24 hours if needed to accommodate out of hours presentations. CT is recommended within NICE guidance on renal and ureteric stones NG118. Prompt CT scanning allows diagnostic accuracy and appropriate management based on size and site of the stone and the anatomical features of the patient. | Not all hospitals in the UK are offering CT scan within 24hours for patients with suspected renal colic. The consequence of missing a patient with a renal or ureteric stone includes being sent for further imaging or investigations, a delay in treatment, potentially resulting in irreversible damage to the kidney. Further additional benefits of a CT scan within 24hours is to exclude stones as a diagnosis and potentially expedite very significant alternative diagnoses. | See NICE Renal and ureteric stone guideline NG118 (2019) for guidance related to imaging for acute colic for which imaging within 24 hour timeframe was recommended. |
| 7 | Renal Association |  | Suggested key areas for QI in this area would be:  Access to urgent CT imaging for patients with acute colic:  to improve the time efficient patient centred care, by improving the CT KUB availability, ensuring a Urology follow-up plan and reducing hospital admissions |  |  |
| 8 | The Society and College of Radiographers | Key area for quality improvement 1 | As the new 2019 guidance suggests that low dose CT is the imaging investigation of choice for acute renal calculi there is nothing really to add from an ultrasound perspective.  It does seem as though the guidance is unsure what to do for children and young people (recommend ultrasound within 24 hrs 1st then possible low dose CT). |  |  |
| 9 | The Society and College of Radiographers | Key area for quality improvement 2 | Is there is any mileage in having a quality measure linked to staffing /training / access to ultrasound within 24 hours for children and young people? Might be worth adding as a suggestion, given the shortage of radiologists and sonographers. |  |  |
| 10 | SCM 1 | Key area for quality improvement 2  Timing of CT investigation for renal colic | Renal colic causes severe pain and distress and many hospitals are not well set up so that the definitive diagnostic imaging is delayed. This increases anxiety, pain, morbidity, definitive management, length of stay and is a poor use of resources | NICE guidelines recommend that CT is offered urgently, which they define as within 24 hours.  Ideally the CT scan should be done in the emergency department (<4 hours) | Renal and ureteric stones: assessment and management (2019) NICE guideline 118  British Association of Urological Surgeons standards for management of acute ureteric colic. JCU 2018;111:58-61 |
| **Pain management** | | | | | |
| 11 | SCM 1 | Key area for quality improvement 1  Analgesia choice in renal colic | Renal colic is common and often is a very severe pain resulting in severe distress to patients | NICE guidelines evidence have provided clear guidelines as to the analgesia choices to most-effectively reduce renal colic pain and minimise analgesia-related side effects.   1. NSAIDs 2. IV paracetamol 3. Opiates   I believe that knowledge of this has not reached many emergency departments and ambulance services who often are the professionals administering initial analgesia to patient with renal colic. | Renal and ureteric stones: assessment and management (2019) NICE guideline 118 |
| 12 | SCM 2 | (1)Offer a non-steroidal anti-inflammatory drug by any route as first line treatment for adults, children and young people suspected of renal colic | NICE Guideline, enabling cost and clinically effective initial treatment to be standardised | There is evidence of varying practice nationwide | NICE Guideline and background documentation |
| 13 | SCM 3 | Key area for quality improvement 4  Analgesia | Wide variation in types of analgesia used. Opiates are probably used routinely as first of second line analgesia in significant number of units | Would provide a better evidenced based pain management of renal colic |  |
| **Treatment** | | | | | |
| **Stenting** | | | | | |
| 14 | BAUS Section of EndoUrology | Key area for quality improvement 4  Removal of ureteric stent within 2 weeks of decision to remove | Ureteric stents have a negative effect on patient quality of life. Stent dwell time is related to risk of encrustation and urinary tract infection. | Stent removal should be undertaken as soon as possible following the decision for removal. Logistical factors can often prevent this and result in a reduced quality of life for the patient, but also put the patient at higher risk of urinary tract infection, stent encrustation and complex stone surgery to remove the stent from a patient. This result in added health care costs and morbidity for the patient. Prompt removal of a stent once the decision has been made to remove it will minimise these complications for the patient and improve quality of life and patient reported outcome measures. | British Association of Urological Surgeons standards for management of acute ureteric colic. JCU 2018;111:58-61  [Ureteric stents on extraction strings: a systematic review of literature.](https://www.ncbi.nlm.nih.gov/pubmed/27324264)  Oliver R, Wells H, Traxer O, Knoll T, Aboumarzouk O, Biyani CS, Somani BK; YAU Group.  Urolithiasis. 2018 Apr;46(2):129-136. |
| 15 | SCM 1 | Key area for quality improvement 3  Minimising primary stent insertion for ureteric stone where intervention is required | When an acutely presenting ureteric stone is too large to pass or when the pain is not well-controlled, emergency intervention is required. GIRFT have identified that many units insert ureteric stents in this situation, bringing the patient back for a definitive ureteroscopic stone treatment at a later date. Ureteric stents are uncomfortable and this increases patient morbidity and is a poor use of resources. Primary stent insertion is necessary in a minority of patients because of infection or failed ureteroscopic access where the ureter is too tight for primary access, but units should aim to organise acute services to allow prompt primary treatment of the stone where possible. | NICE guidelines have recommended that, when emergency intervention is required for a ureteric stone that primary definitive treatment (shockwave lithotripsy or ureteroscopy) is offered within 48 hours of diagnosis  The proportion of patients presenting with renal colic who need emergency intervention and have a stent inserted without stone removal is a key metric | Getting it Right First Time (2018) National Speciality Report: Urology  Renal and ureteric stones: assessment and management (2019) NICE guideline 118 |
| 16 | SCM 1 | Key area for quality improvement 4  Removing post-procedure ureteric stents promptly | Ureteric stents are often necessary after a ureteroscopic procedure to improve kidney drainage and reduce complications related to post-procedure ureteric oedema. Ureteric stents cause significant morbidity in a reasonably high proportion of patients, so their dwell time should be minimised. Unfortunately, capacity pressures in many units means that removal is often delayed, increasing patient morbidity | In certain circumstances ureteric stents need to be left in for longer, but where a decision to remove a ureteric stent has been made, it should be removed within 2 weeks. | British Association of Urological Surgeons standards for management of acute ureteric colic. JCU 2018;111:58-61 |
| 17 | SCM 2 | (2)Do not offer pre-treatment stenting to adults having shockwave lithotripsy (SWL) for ureteric or renal stones | NICE Guideline | Stenting causes significant discomfort to many patients and the Guideline Committee found no evidence that it was clinically effective | NICE Guideline and background documentation |
| 18 | SCM 3 | Key area for quality improvement 5  Stenting after ureteroscopy | High percentage of patients receive routine stents following ureteroscopy.  Health and economic benefits if stenting reduced as per guidelines |  | Unpublished data from BAUS ureteroscopy registry shows 70 % stenting rate |
| **Surgical treatment** | | | | | |
| 19 | BAUS Section of EndoUrology | Key area for quality improvement 2  Management and definitive treatment of acute renal colic is completed with 6 weeks of initial presentation | Stones that remain in situ in the ureter carry a risk of recurrent pain episodes and unpredictable need to access emergency services. There is also the concern for loss of ipsilateral renal function or the development of an infection in an obstructed system, which is serious and can be life threatening (see quality standard 3). Whilst a temporizing JJ stent allows drainage and relief of obstruction and may provide a more predictable treatment course, these are associated with symptoms and adversely affect quality of life. Furthermore, stents that remain in situ for longer are associated with increased risk of septic complications following definitive intervention (URS or FURS). | The time to spontaneous stone passage is variable, and although most stones (70-80% in various series) will pass without intervention (URS or ESWL), an important number of stones will need definitive urological treatment. The timing of this is variable across the NHS and providing a standard by which time stones should have either passed or been treated will benefit patients symptom control, avoid consequences such as loss of kidney function and infection, and offer greater predictability of the treatment journey for patients with ureteric stones. It would therefore be expected that this would have a beneficial effect on the quality of life of patients who present as an emergency with ureteric colic. | Patients who underwent ureteroscopy (URS)/flexible ureterorenoscopy (FURS) for stones have and overall sepsis rate of 2.8% within 48 h of surgery, but was 1.2% in unstented patients compared with 4.7% in those with a stent. Most importantly, the risk of sepsis increased sequentially with longer stent‐dwell time (2.2% at 30 days to 4.9% at 60 days, 5.5% at 90 days and 9.2% for >90 days stent duration).  [Ureteric stent dwelling time: a risk factor for post-ureteroscopy sepsis.](https://www.ncbi.nlm.nih.gov/pubmed/28145037)  Nevo A, Mano R, Baniel J, Lifshitz DA.  BJU Int. 2017 Jul;120(1):117-122.  The UK based TISU study will report treatment and quality of life outcomes and has showed a median time to treatment for lithotripsy of 8 days (range 2-18) days (93% treated within 8 weeks) and for ureteroscopy of 25 (range 9-44) days (86% treated within 8 weeks)  TISU: Extracoporeal shockwave lithotripsy as first treatment options compared with direct progression to ureterscopic treatment for ureteric stones RCT. In Press. Personal Communication from Prof. Sam McClinton 18/7/19. |
| 20 | Renal Association |  | Access to Shock wave lithotripsy (SWL) for patients with stones <10 mm and 10-20 mm in size  - there may be large geographical differences in access to SWL |  |  |
| 21 | SCM 2 | (3)For adults presenting with renal stone less than 10mm, offer SWL | NICE Guideline | The Guideline Committee found widely varying practice in this area. This treatment is the most clinically and cost effective treatment | NICE Guideline and background documentation |
| 22 | SCM 2 | (4)For adults presenting ureteric stone less than 10mm, offer SWL | NICE Guideline | The Guideline Committee found widely varying practice in this area. This treatment is the most clinically and cost effective treatment | NICE Guideline and background documentation |
| 23 | SCM 3 | Key area for quality improvement 1  Availability of SWL | Access to timely SWL is variable in England | Quality standards to encourage networking as suggested in GIRFT report | Urology GIRFT report  <https://gettingitrightfirsttime.co.uk/wp-content/uploads/2018/07/Urology-June18-M.pdf> |
| 24 | SCM 3 | Key area for quality improvement 2  Ability to offer treatment within 48 hours | NHS resources and availability to emergency theatre capacity for urologists is variable in England |  | <https://gettingitrightfirsttime.co.uk/wp-content/uploads/2018/07/Urology-June18-M.pdf> |
| 25 | SCM 4 | Emergency/Hot Ureteric stones.  Emergency Ureteroscopy availability  Are hospitals offering this? | Early intervention better chance of successfully treating the stone. | Speaking to patients they would like the stone ASAP so they can carry on with their lives and where necessary get back into their working life |  |
| 26 | SCM 5 | Key area for quality improvement 3 | Surgical renal stone services for children | If there is an indication for surgical procedure (stone removal), a designated hub centre (due to scarcity of the condition) with paediatric urologist with experience in stones management should be available within a reasonable distance. | NG118 |
| **Drainage of the infected obstructed kidney** | | | | | |
| 27 | BAUS Section of EndoUrology | Key area for quality improvement 3  Drainage of the infected obstructed kidney within 12 hours of diagnosis | A stone causing obstruction associated with infection is a life-threatening emergency. Urgent decompression of the renal collecting system is indicated as those patients not drained have a higher rate of mortality | Mode of drainage of the infected obstructed kidney is variable across the UK. The decision of which drainage mode is based on logistical factors, surgeons preference, patient and stone characteristics . Access to interventional radiology services is limited and challenging for some centres, and significant variations in accessibility are seen across the NHS. Streamlining accessibility to prompt drainage for this high risk patient population will have a reduction in the morbidity and mortality of the disease. | British Association of Urological Surgeons standards for management of acute ureteric colic. JCU 2018;111:58-61  [Surgical decompression is associated with decreased mortality in patients with sepsis and ureteral calculi.](https://www.ncbi.nlm.nih.gov/pubmed/23017519)  Borofsky MS, Walter D, Shah O, Goldfarb DS, Mues AC, Makarov DV.  J Urol. 2013 Mar;189(3):946-51. |
| **Metabolic testing** | | | | | |
| 28 | BAUS Section of EndoUrology | Additional developmental areas of emergent practice  Full metabolic assessment of recurrent calcium kidney stone formers | It is estimated that about one third of people affected by renal and ureteric stones will experience a recurrence at 5 years without treatment of the underlying cause. This rate of recurrence rises to 75% after 20 years with no treatment. Laboratory testing can define a metabolic diagnosis in stone patients and subsequent treatment can reduce the risk of recurrence of stones by modifying an individuals metabolic status accordingly. Certain stone subgroups such as uric acid and cysteine stones have established metabolic treatment pathways. The therapeutic pathway for the largest subgroup of stones, calcium stones is unclear. | Current practice is varied and it is currently unclear which metabolic tests should be done as part of a full metabolic assessment and whether testing should be done for all people with a stone or just those at high risk of developing a recurrent stone ( previous renal / ureteric stones, early onset stone disease <25yo, Metabolic and genetically determined stone disease). Calcium stones are the largest stone group and have the biggest resources implication for healthcare and we propose a “quality standard pending research”. The scientific evidence base for metabolic testing of stone disease is limited, and as part of “quality standard pending research” we would welcome engagement with clinical trials to help answer this important clinical question. Clinical research into this area could standardise the approach to the metabolic evaluation, giving equal access for this large patient group to the correct evaluation and treatment. By assessing and treating appropriately patients, we would hope to see a reduction in the incidence of recurrent stone episodes and thus a reduction in the need to access health resources, in particular, imaging, emergency service and surgery. | A specific recommendation for research into this area was made in the NICE Renal and ureteric stone guideline NG118 (2019)  Additional data can be found in Appendix J: Research recommendations – Full metabolic assessment  Information regarding risk stratification and the recommendation for metabolic screening can be found in the EAU Urolithiasis guideline 2019 – accessed via Uroweb.org 19/7/19. |
| 29 | Renal Association |  | Availability and reporting of renal stone analysis for patients with ureteric or renal stones  Interpretation and follow up of metabolic testing in renal stone patients – a renal stone event can be seen as marker of a “metabolic syndrome” and may indicate cardiovascular disease and should warrant follow up and further investigations. |  |  |
| 30 | SCM 1 | Key area for quality improvement 5  Metabolic investigations for high risk stone formers | Kidney stones are extremely common, but a proportion of patients form stones on a very frequent basis. They endure frequent and recurrent symptomatic episodes which can significantly impair their quality of life and have kidney-threatening or even life-threatening consequences. Several preventative strategies have been shown to be effective in reducing stone recurrence although the evidence base as to exactly which screening tests should be done in which patients is poor. | Preventing kidney stones should be a national priority. The European Guidelines recommend risk stratification and 24 hour urine testing on high risk stone formers. The NICE guidelines committee made no specific recommendation on this as there was no test and treat RCT available. Nevertheless, the NICE committee felt strongly that this should be a research priority and made research recommendations for such a trial. This topic should be a placeholder quality standard | European Association of Urology Guideline on Urolthiasis [www.uroweb.org](http://www.uroweb.org)  Renal and ureteric stones: assessment and management (2019) NICE guideline 118 |
| 31 | SCM 3 | Additional developmental areas of emergent practice  Use of metabolic investigations in stone patients | No evidence found to make a recommendation but research recommendation made. | Wide variation in whether tests done at all Wide variation of which patient s have tests and wide variation of which tests are done |  |
| 32 | SCM 5 | Key area for quality improvement 1 | Metabolic investigations for children presenting with renal stones | Unlike adults, 40% of children have metabolic underlying abnormality causing stones. Metabolic investigation is therefore warranted. Regional guidelines for metabolic investigation in children should be available (online) across the country to decrease the variation in practice. | NG118 |
| 33 | SCM 5 | Key area for quality improvement 2 | Tertiary nephrology/urology referrals | Children presenting with stones (which are, unlike in adults, rare in paediatrics) should be seen by specialist (nephrologist, urologist) with adequate experience in stones management for further opinion. Ideally, if child is being referred, all results of metabolic investigations should be available for specialist. | NG118 |
| **Preventing recurrence – dietary and lifestyle advice** | | | | | |
| 34 | British Dietetic Association | Key area for quality improvement 1  Advice on maintaining adequate hydration to prevent recurrence - aim to drink 2.5-3L of fluid per day or enough fluid to achieve colourless urine | An inverse relationship between high fluid intake and stone formation has been demonstrated (European Association of Urology 2014). A higher fluid intake increases diuresis and dilutes the urine, reducing the risk of crystallization | We are unclear if accurate advice on fluid intake is consistently given |  |
| 35 | British Dietetic Association | Key area for quality improvement 2  Advice on maintain a healthy weight and prevent weight gain | Obesity and weight gain (more than 15.9 kg) are associated with an increased risk of symptomatic nephrolithiasis independent of other risk factors (Taylor 2005). Maintaining and health weight and lifestyle is recommended, NICE NG118 | We believe that referral of patients to weight management services or signposting to reputable weight loss resources is variable |  |
| 36 | Renal Association |  | The provision of Dietary / lifestyle advice in patients with renal stones – who, how, when and where to give this advice, role of dieticians / primary health care physicians |  |  |
| 37 | SCM 2 | (5) Offer dietary and lifestyle advice, as per the NICE Guideline, to all patients and or parents/carers | NICE Guideline | Prevention is considerably cheaper, and more comfortable for patients, than cure | NICE Guideline and background documentation |
| 38 | SCM 3 | Key area for quality improvement 3  Standardised dietary advice | Variability of patient information about diet and lifestyle changes  Several patient myths on dietary changes | Uniform advice given by health professionals could reduce stone recurrence rates | BAUS patient information sheets  <https://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Stone%20diet.pdf> |

1. Unless referenced as from another source, the information in this section is from [Renal and ureteric stones Final Scope](https://www.nice.org.uk/guidance/ng118/history) NICE guideline NG118 (2019) [↑](#footnote-ref-1)
2. Kidney Care UK, [Kidney stones](https://www.kidneycareuk.org/about-kidney-health/conditions/kidney-stones/) (Accessed August 2019) [↑](#footnote-ref-2)
3. NHS Digital, [Hospital Admitted Patient Care Activity](https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2017-18) (Accessed August 2019) [↑](#footnote-ref-3)
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5. Atkinson J, Davies R, Bateman K et al (2018) [Access to CT-KUB within 24 hours to diagnose](https://onlinelibrary.wiley.com/doi/pdf/10.1111/iju.13752)

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7. Unpublished data received from BAUS Endourology Section. [↑](#footnote-ref-7)
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9. British Association of Urological Surgeons, [PCNL Outcomes data](https://www.baus.org.uk/patients/surgical_outcomes/pcnl/timescales.aspx) [Accessed August 2019] [↑](#footnote-ref-9)
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11. Unpublished data received from Professor Sam McClinton [↑](#footnote-ref-11)