NICE National Institute for Health and Care Excellence

Putting NICE guidance into practice

Resource impact report:
Renal and ureteric stones: assessment and management (NG118)

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Summary

This is a new guideline Renal and ureteric stones: assessment and management that covers assessing and managing renal and ureteric stones. It aims to improve the detection, clearance and prevention of stones.

The recommendations most likely to have a substantial resource impact are:

- recommendation 1.5.3 offer shockwave lithotripsy to adults with ureteric stones less than 10 mm.
- recommendation 1.5.5 consider alpha blockers as adjunctive therapy for adults having SWL for ureteric stones less than 10 mm.

The full recommendations are given in paragraphs 3.1 and 3.2.

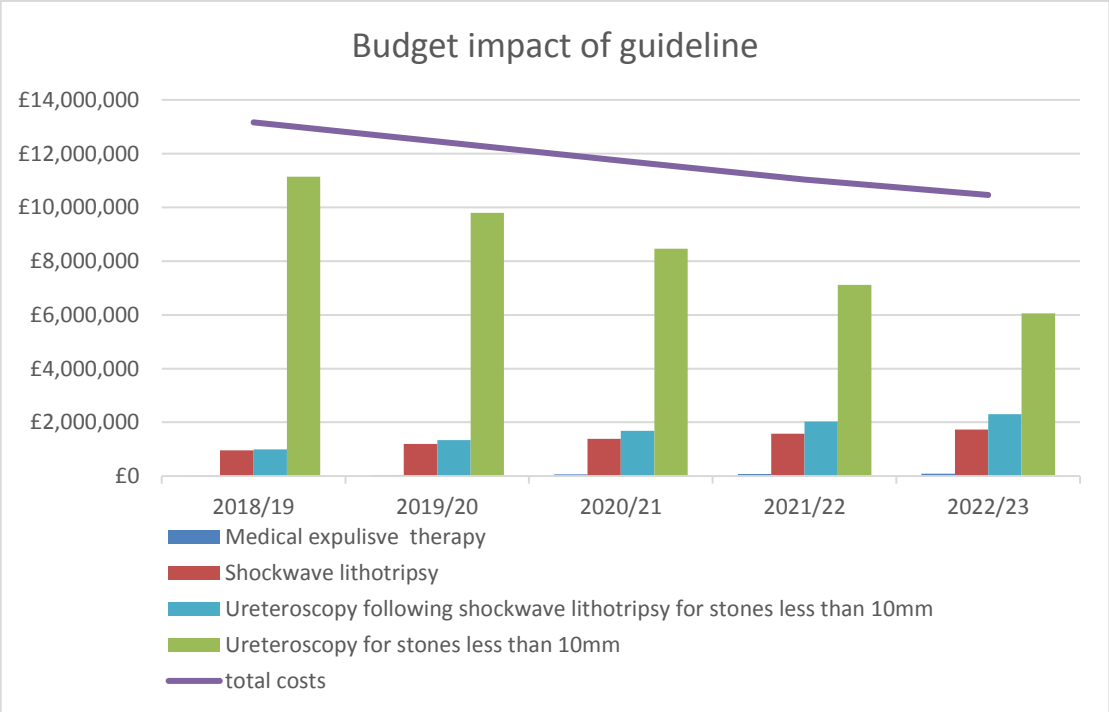
Financial impact

The estimated financial impact of implementing this guideline for England in the next 5 years is a saving of around £853,000 in 2019/20 rising to a saving of over £2.8 million in 2022/23 as set out in table 1 and the graph below. The savings result from:

- an increase in medical expulsive therapy (alpha blockers) for stones less than 10 mm and a reduction in surgical interventions
- an increase in shockwave lithotripsy (SWL) and a reduction in ureteroscopy (URS) for people with stones that are less than 10 mm and require a surgical intervention.

Table 1 Estimated budget impact of implementing the guideline

Recommendation	2018/19 (£000s)	2019/20 (£000s)	2020/21 (£000s)	2021/22 (£000s)	2022/23 (£000s)
Current costs					
Medical expulsive therapy	17	17	17	17	17
Ureteroscopy	11,408	11,408	11,408	11,408	11,408
Shockwave lithotripsy	958	958	958	958	958
Ureteroscopy following shockwave lithotripsy	922	922	922	922	922
Total costs	**13,305**	**13,305**	**13,305**	**13,305**	**13,305**
Future costs					
Medical expulsive therapy	20	38	55	73	87
Ureteroscopy for stones less than 10mm	11,140	9,801	8,461	7,121	6,050
Shockwave lithotripsy	1,012	1,277	1,542	1,808	2,020
Ureteroscopy following shockwave lithotripsy	991	1,336	1,683	2,028	2,304
Total costs	**13,163**	**12,452**	**11,741**	**11,030**	**10,461**
Savings - England	**142**	**853**	**1,564**	**2,275**	**2,844**
Savings - per 100,000 population	**0.3**	**1.5**	**2.8**	**4.1**	**5.1**



Introduction

1.1 The guideline offers best practice advice on the assessment and management of renal and ureteric stones.

1.2 This report discusses the resource impact of implementing our guideline on renal and ureteric stones: assessment and management in England. It aims to help organisations plan for the financial implications of implementing this NICE guideline.

1.3 A resource impact template accompanies this report to help with assessing the resource impact at a local level in England, Wales or Northern Ireland.

1.4 We have considered direct costs and savings to the NHS (and local authorities if applicable) and not those for the individual, the private sector or the not-for-profit sector.

1.5 Treatment for renal and ureteric stones is commissioned by clinical commissioning groups. Providers are NHS hospital trusts and private hospitals.

2 Background

2.1 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.

2.2 The lifetime prevalence of renal stone disease is 13% of the adult population of England (NICE NG118 Renal and ureteric stones Final Scope).

2.3 Expert clinical opinion is that around 85% of ureteric stones are less than 10 mm and that around 15% are greater than 10mm.

3 Significant resource impact recommendations

3.1 **Recommendation 1.5.3** For adults (16 years and over) offer SWL to treat ureteric stones less than 10 mm. Consider ureteroscopy if a previous course of shockwave lithotripsy has failed.

3.2 **Recommendation 1.5.5** Consider alpha blockers as adjunctive therapy for adults having SWL for ureteric stones less than 10 mm.

3.3 The populations that are effected by recommendations 1.5.3 and 1.5.5 overlap. Therefore the resource impact of both recommendations has been assessed together.

Background

3.3.1 Currently many health professionals do not offer alpha blockers for treating ureteric stones. However the committee reviewed evidence which showed that in adults, alpha blockers improve passage of distal ureteric stones less than 10mm and had some benefits in terms of hospital stay and pain.

3.3.2 SWL is a non-invasive technique for fragmenting renal stones. Not all providers have a lithotripter permanently on site.

3.3.3 Ureteric stones that are less than 10 mm and do not cause drainage difficulties can be left to pass naturally.

3.3.4 Around 22,000 people in England had treatment for ureteric stones in 2016/17 (NHS Digital, Hospital Episodes Statistics).

Assumptions made

3.3.5 Assumptions relating to current and future practice are based on clinical expert opinion from committee members and data from NHS Digital (Hospital Episodes Statistics). These assumptions have been summarised in table 2.

Table 2. Current and future practice assumptions for people with ureteric stones less than 10mm

Treatment	Current practice	Future practice
Non-surgical treatment	**60.0%**	**65.0%**
No treatment	83.3%	20.0%
Medical expulsive therapy	16.7%	80.0%
Surgical procedures	**40.0%**	**35.0%**
Shockwave lithotripsy with medical expulsive therapy	0.0%	40.0%
Shockwave lithotripsy without medical expulsive therapy	17.5%	10.0%
Ureteroscopy	82.5%	50.0%
People having further surgical procedures		
Shockwave lithotripsy following shockwave lithotripsy	80.0%	50.0%
Ureteroscopy following shockwave lithotripsy	40.0%	40.0%
Ureteroscopy following ureteroscopy	5.0%	5.0%

3.3.6 Clinical expert opinion is that currently people have, on average around 1.8 SWL procedures to clear a stone that is less than 10 mm. This is not always successful and it has been conservatively assumed that around 40% of people also have URS following the SWL to completely clear the stone.

3.3.7 After implementation of the guideline we assume that 80% of adults having SWL procedures will also have medical expulsive therapy, in line with recommendation 1.5.5. Clinical expert opinion is that this is expected to improve stone clearance and to reduce the

number of procedures needed, to an average of 1.5 procedures per person.

3.3.8 When the primary procedure is URS it is expected that in 5% of cases there will need to be a repeat URS procedure.

3.3.9 Table 3 summarises the estimated current and estimated future practice for people with ureteric stones less than 10 mm.

Table 3 comparison of current and estimated future practice for people with ureteric stones less than 10 mm

	Current Practice		Future Practice	
Population	**%**	**People**	**%**	**People**
Adult population of England	100	43,482,790	100	43,482,790
People who attend hospital with a diagnosis of ureteric stones	0.05	22,095	0.05	22,095
People with ureteric stones less than 10 mm	85	18,781	85	18,781
People having non-surgical treatment	60	11,268	65	12,207
People having surgical treatment	40	7,512	35	6,573
People having non-surgical treatment	**60**	**11,268**	**65**	**12,207**
People who have no further treatment	83	9,390	20	2,441
People treated with medical expulsive therapy	17	1,878	80	9,766
People having surgical treatment	**40**	**7,512**	**35**	**6,573**
People treated with shockwave lithotripsy & medical expulsive therapy	0	0	40	2,629
People treated with shockwave lithotripsy	18	1,315	10	657
People treated with ureteroscopy	82	6,198	50	3,287
People having further surgical procedures				
People requiring repeat shockwave lithotripsy	80	1,052	50	1,315
People treated with ureteroscopy following shockwave lithotripsy	40	526	40	1,315
People requiring repeat ureteroscopy	5	310	5	164
Number of procedures per person for shockwave lithotripsy		1.8		1.5

Costs

3.3.10 It is assumed that there would be no additional cost above standard care for people who do not receive any treatment.

3.3.11 The cost of alpha blockers for medical expulsive therapy is based on tamsulosin 400microgram tablets from the BNF online (accessed 05/07/2018). There may be a small additional cost associated with staff time for prescribing which should be considered locally.

3.3.12 The 2018/19 national tariff LB36Z Extracorporeal lithotripsy is used for the cost of a single SWL procedure.

3.3.13 The cost of interventions are summarised in table 4 below

Table 4 Cost of interventions

Pathway element	**£**
Medical expulsive therapy for stones less than 10 mm - tamsulosin 400 microgram 30 tablets	8.89
Ureteroscopy - Major Endoscopic, Kidney or Ureter Procedures, 19 years and over, from the 2018/19 national tariff LB65C, LB65D and LB65E weighted using 2016/17 reference cost activity	1,753
LB36Z Extracorporeal lithotripsy - national tariff 2018-19	405
Shockwave lithotripsy with medical expulsive therapy, LB36Z Extracorporeal lithotripsy - national tariff 2018-19 and Medical expulsive therapy for stones less than 10 mm - tamsulosin 400 microgram 30 tablets	413.89

3.3.14 A weighted average price is used for the cost of URS. This uses the 2018/19 national tariff for the different levels of complications and co-morbidities, weighted by the 2016/17 reference cost activity for these procedures. The cost of a repeated URS is the same as the initial treatment cost to clear a ureteric stone.

3.3.15 The savings from changes in the pathway, when forecast implementation has reached a steady state in 2022/23 are set out in table 5 (current practice) and table 6 (future practice). Further

details of financial years, prior to 2022/23, are covered in the resource impact template that supports this report

Table 5 Estimated cost of current practice

	Current Practice			
	%	Number	Unit Cost (£)	£000s
People having non-surgical treatment	**60**	**11,268**		
People who have no treatment	83	9,390	0	0
People treated with medical expulsive therapy	17	1,878	8.89	17
People having surgical treatment	**40**	**7,512**		
People treated with shockwave lithotripsy & medical expulsive therapy	0%	0	413.89	0
People treated with shockwave lithotripsy	18	1,315	405	532
People treated with ureteroscopy	82	6,198	1,753	10,865
People having further surgical procedures				
Repeat procedures for shockwave lithotripsy (1,315 x 80%)	80	1,052	405	426
People requiring a ureteroscopy following shockwave lithotripsy (1,315 x 40%)	40	526	1,753	922
People requiring a repeat ureteroscopy (6,198 x 5%)	5	310	1,753	543
Total cost of current practice				**13,305**

Table 6 Estimated cost of future practice

	Future Practice			
	%	Number	Unit Cost (£)	£000s
People having non-surgical treatment	**65**	**12,207**		
People who have no treatment	20	2,441	0	0
People treated with medical expulsive therapy	80	9,766	8.89	87
People having surgical treatment	**35**	**6,573**		
People treated with shockwave lithotripsy & medical expulsive therapy	40	2,629	413.89	1,088
People treated with shockwave lithotripsy	10	657	405	266
People treated with ureteroscopy	50	3,287	1,753	5,761
People having further surgical procedures				
Repeat procedures for Shockwave lithotripsy ((2,629 + 657) x 50%)	50	1,643	405	666
People requiring a ureteroscopy following shockwave lithotripsy ((2,629 + 657) x 40%)	40	1,315	1,753	2,305
People requiring a repeat ureteroscopy (3,287 x 5%)	5	164	1,753	288
Total cost of future practice				**10,461**

3.3.16 A comparison of current and future practice is summarised in table 7.

Table 7 Estimated annual saving of using SWL and alpha blockers to treat ureteric stones less than 10 mm and the number of people

	Current practice		Future practice		Change	
	Number	Cost £000s	Number	Cost £000s	Number	Cost £000s
People having non-surgical treatment						
People who are watch and wait	9,390	0	2,441	0	-6,949	0
People treated with medical expulsive therapy	1,878	17	9,766	87	7,888	70
Sub-total non-surgical treatment	**11,268**	**17**	**12,207**	**87**	**939**	**70**
People having surgical treatment						
People treated with Shockwave lithotripsy	1,315	532	657	266	-658	-266
People treated with Shockwave lithotripsy & medical expulsive therapy	0	0	2,629	1,088	2,629	1,088
People treated with Ureteroscopy	6,198	10,865	3,287	5,761	-2,911	-5,104
People having further surgical treatment						
Repeat procedures for Shockwave lithotripsy	1,052	426	1,643	666	591	239
People requiring a ureteroscopy following shockwave lithotripsy	526	922	1,315	2,305	789	1,383
People requiring a repeat ureteroscopy	310	543	164	288	-146	-255
Sub-total surgical treatment	**9,401**	**13,289**	**9,695**	**10,375**	**294**	**-2,914**
Grand total	**20,669**	**13,305**	**21,902**	**10,461**	**1,233**	**-2,844**

Benefits and savings

SWL is carried out using analgesia and possible sedation, unlike URS which is carried out with a general anaesthetic.

Alpha blockers are recommended as medical expulsive therapy which is expected to reduce the time to stone passage.

Other considerations

The “Getting it Right First Time” (GIRFT) urology programme has identified the need for urology departments to work together in Urology Area Networks.

If providers do not have access to an on-site shockwave lithotripter, they should use local network arrangements to ensure people receive treatment within 48 hours (GIRFT Programme National Speciality Report, NHS Improvement).

Having good referral systems may mean that additional lithotripters are not needed in all areas.

If there are additional costs needed for networks of mobile or fixed lithotripters, it may take longer for savings to be realised.

Commissioner and provider impacts

There may be additional central costs for commissioners involved in establishing the networks. This may include the capital costs for additional lithotripters where there are not currently sufficient lithotripters available. To support people having access to shockwave lithotripsy through a network may lead to additional patient transport costs for providers.

Establishing urology area networks may lead to a redistribution of activity and income between providers. Activity is expected to move from providers who are not able to provide shockwave lithotripsy to those providers who are able to provide shockwave lithotripsy, this may include private providers.

4 Resource impact over time

4.1 The estimated annual saving of implementing this guideline, based on the uptake in the resource impact assumptions is shown in table 8.

Table 8 Savings from implementing the guideline using NICE assumptions

	2018/19 £	2019/20 £	2020/21 £	2021/22 £	2022/23 £
Per population of England	142,000	853,000	1,564,000	2,275,000	2,844,000
Per 100,000 population	300	1,500	2,800	4,100	5,100

5 Implications for commissioners

5.1 Renal and ureteric stones falls under programme budgeting category 17B 'Renal Problems'.

5.2 It is expected that there will need to be network arrangements in place to ensure timely interventions for people with ureteric stones.

6 Sensitivity analysis

6.1 There are some assumptions in the model for which no empirical evidence exists, so we cannot be as certain about them. Appropriate minimum and maximum values of variables were used in the sensitivity analysis to assess which variables have the biggest impact on the net cost or saving. This enables users to identify the significant cost drivers.

Appendix A is a table listing all variables modified. The key conclusions are discussed below.

6.2 Varying the number of people who have stones less than 10mm from 80% to 90% leads to a resource impact saving from between £2.7 million and £3 million for England.

6.3 Varying the number of people who have non-surgical interventions from 60% to 70% leads to a resource impact saving from between £1.4 million and £4.3 million.

Appendix A. Results of sensitivity analysis per 100,000 population

Individual variable sensitivity				Recurrent resource impact				
	Baseline value	Minimum value	Maximum value	Baseline resource impact (£)	Minimum resource impact (£)	Maximum resource impact (£)	Change (£)	Sensitivity ratio
Number of shockwave lithotripsy procedures in future practice	1.50	1.20	1.80	-2,844	-3,243	-2,445	799	0.10
Proportion of people who have stones less than 10mm	85%	80%	90%	-2,844	-2,677	-3,011	-335	0.15
People having no treatment in future practice, adjusted against the people having medical expulsive therapy	20%	10%	30%	-2,844	-2,833	-2,855	-22	0.00
People in future practice having non-surgical treatment, adjusted against people having surgical treatment	65%	60%	70%	-2,844	-1,368	-4,319	-2,951	1.00
People having SWL in future practice, adjusted against people having ureteroscopy	50%	40%	60%	-2,844	-2,499	-3,189	-690	0.09

About this resource impact report

This resource impact report accompanies the NICE guideline on Renal and ureteric stones: assessment and management and should be read in conjunction with it. See terms and conditions on the NICE website.