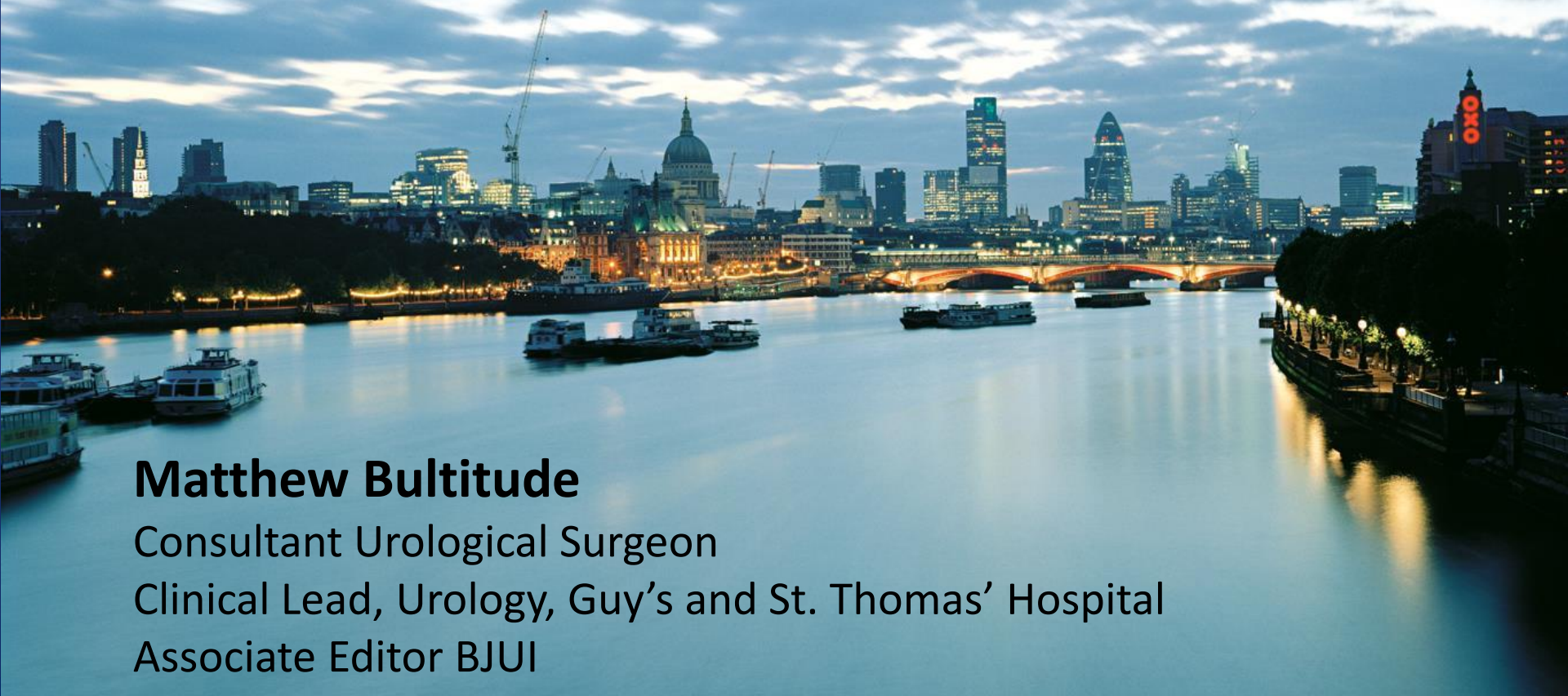


Kidney Stones – Practical Advice for Management in Primary Care



Matthew Bultitude

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Associate Editor BJUI

Disclosures

- Boston Scientific (Consultant)
- Karl Storz (Fee for teaching)
- Advicienne (Research Fee)
- BJUI Associate Editor

Outline

- History
- Prevalence of stone disease
- Imaging/ managing renal colic
- Alpha blockers
- The surgery we do
- Managing stent symptoms
- Metabolic evaluation and prevention
- Follow up
- New NICE Guidance 2019

History of Stone

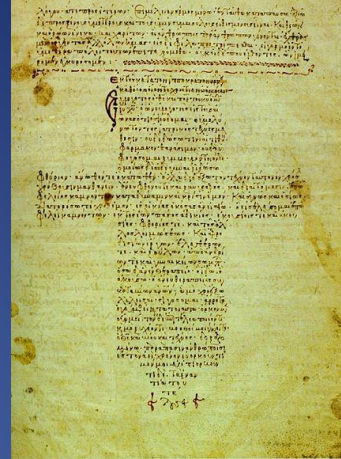
- 3 Earliest 'elective' operations known:
 - Circumcision
 - Trephination of skull
 - Cutting for stone
- Earliest Bladder Stone ~4800BC
 - Cemetery in upper Egypt
 - 16 year old boy – pure uric acid
 - Specimen at RCS Eng – destroyed in WW2



Treatment for Stone

- Ancient Greece ~4-5th Century BC
 - Hippocratic Oath
 - Describes that specialists only should treat stone !

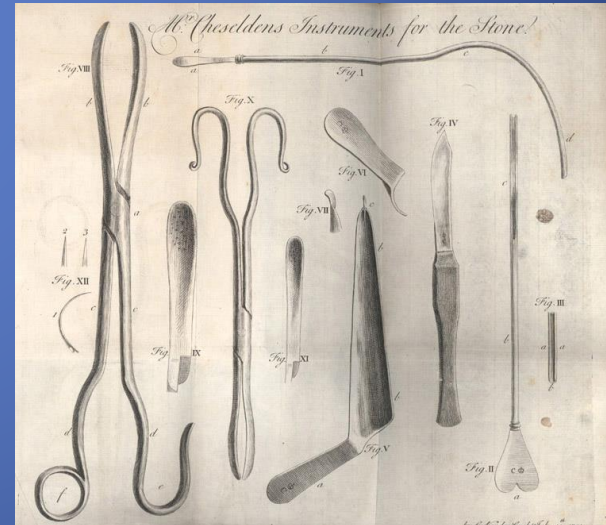
“I will not covet persons labouring under the stone, but will leave this to be done by men who are practitioners of this work”



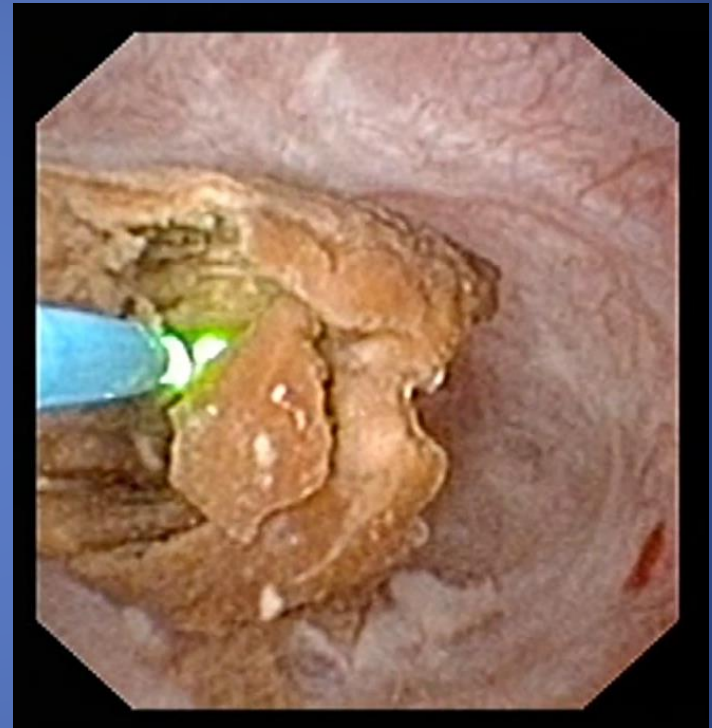
William Cheselden



- Surgeon at St. Thomas' Hospital 1718
 - Published series of 213 patients with mortality rates
- Cheselden's instruments:

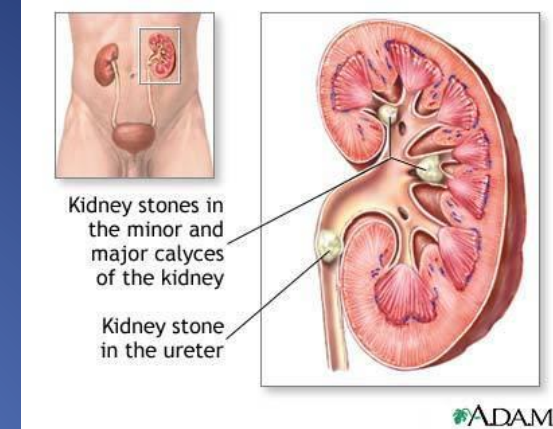


Modern stone surgery



Prevalence

- Lifetime Risk
 - Men ~ 10%
 - Women ~ 6%
 - Risk is increasing
 - Gender gap narrowing 1.7 → 1.3 : 1
- 50-80% recurrence rate
- Significant cause of morbidity
... and death

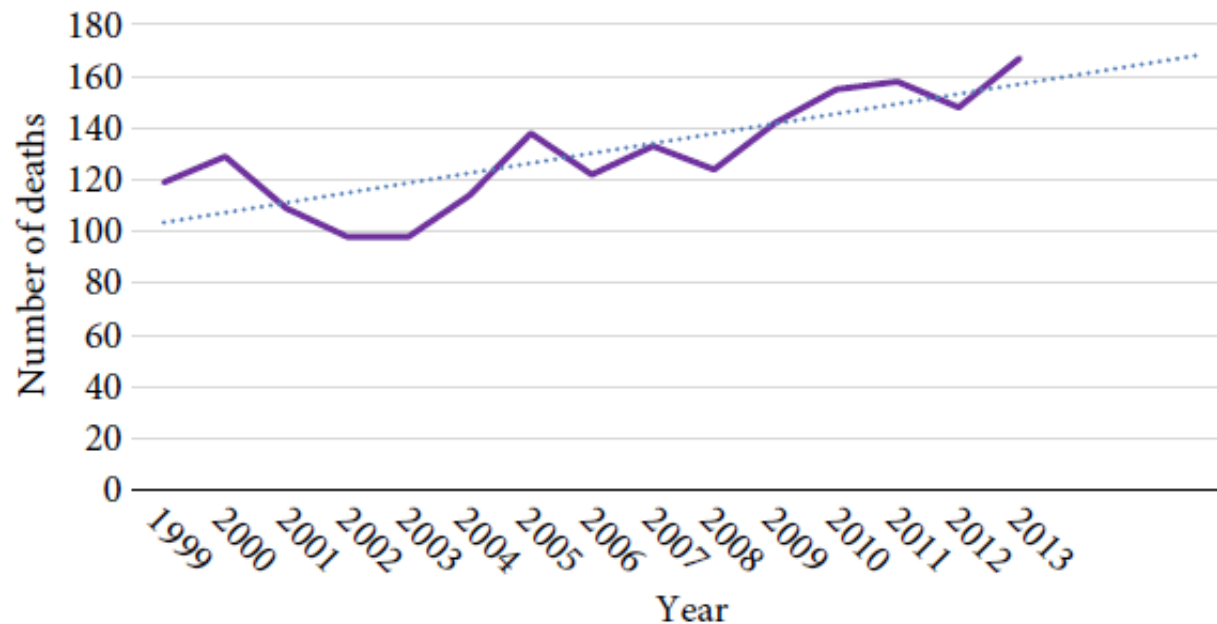


Do stones still kill? An analysis of death from stone disease 1999–2013 in England and Wales

Francesca Kum, Wasim Mahmalji, Jemma Hale, Kay Thomas, Matthew Bultitude and Jonathan Glass

Department of Urology, Guy's and St. Thomas' Hospital, London, UK

Fig. 3 Number of deaths due to urolithiasis by year, with linear trend ($R^2 = 0.65$).

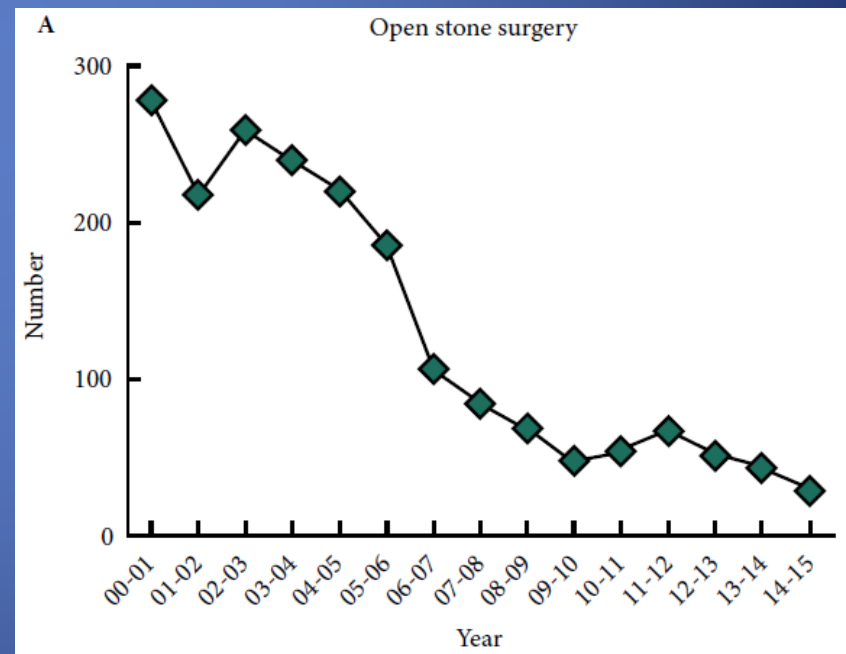
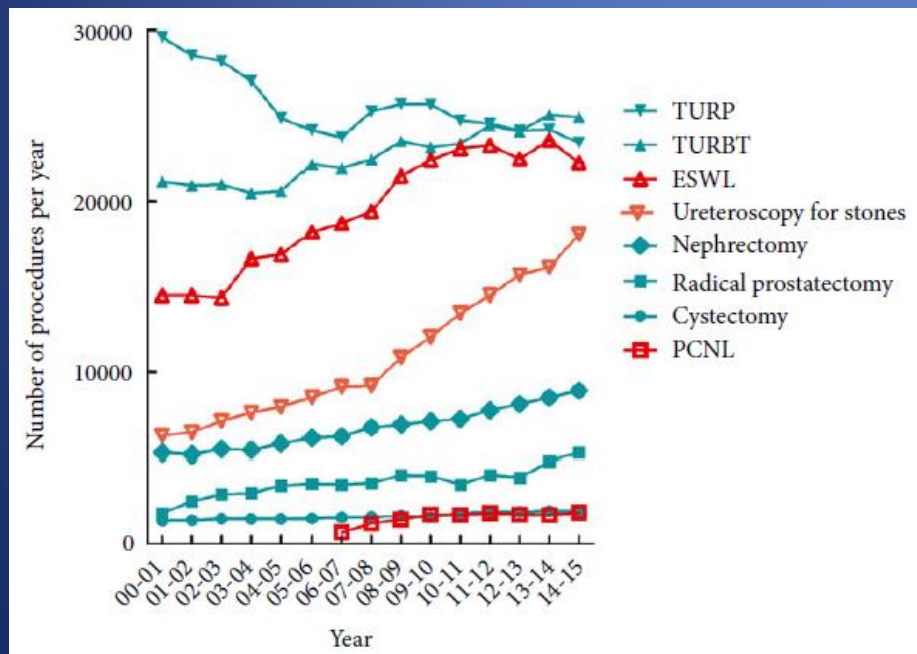
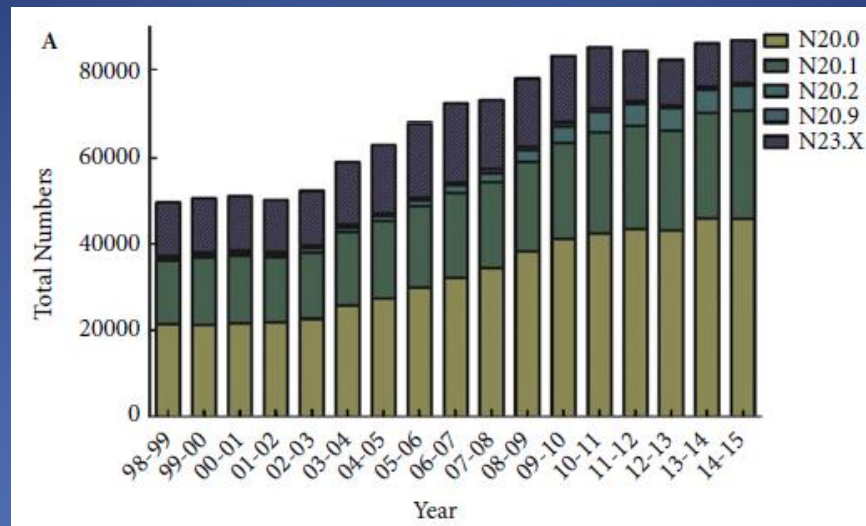


Trends in urological stone disease: a 5-year update of hospital episode statistics

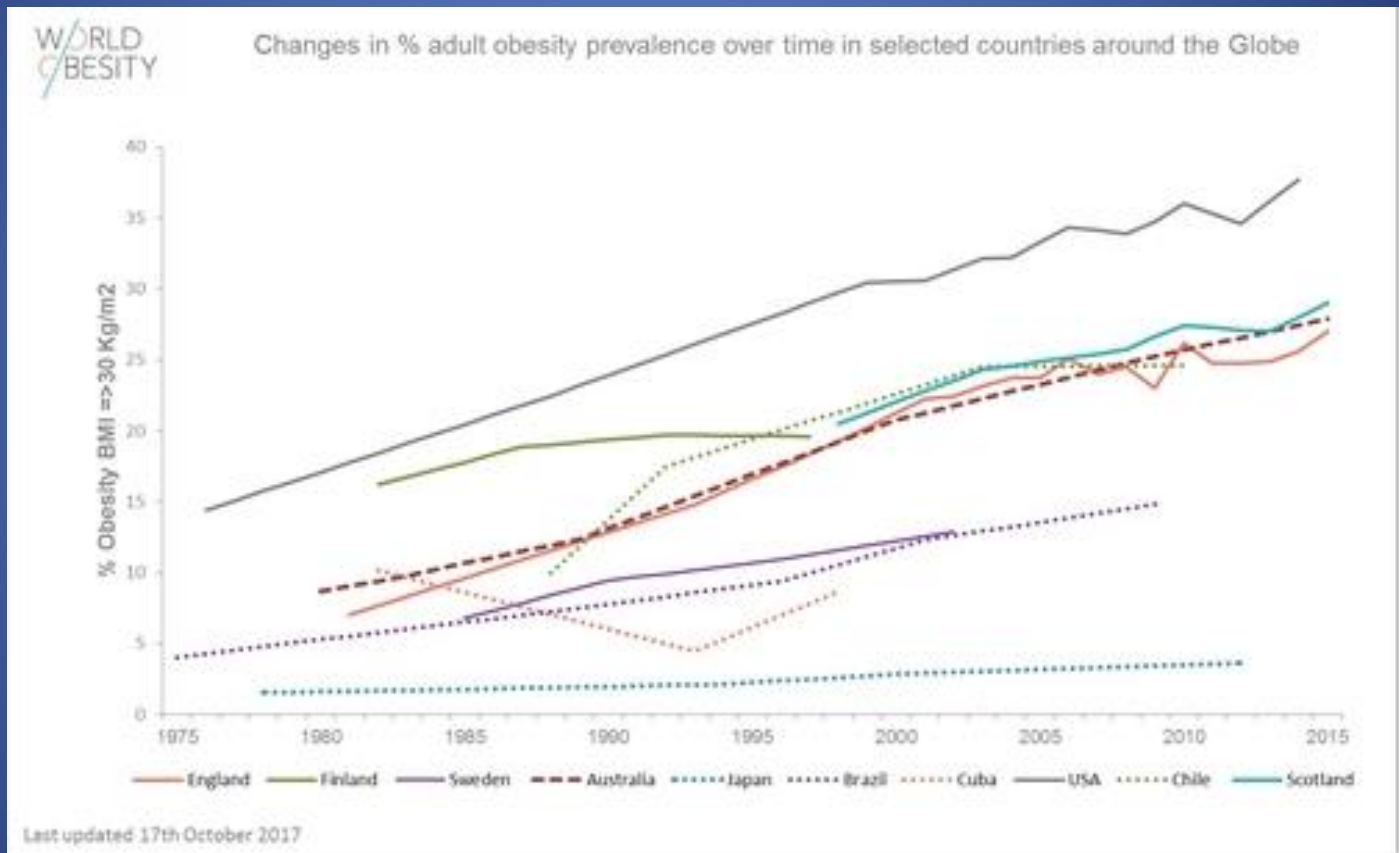
Hendrik Heers and Benjamin W. Tumey

Department of Urology, Oxford University Hospitals, Nuffield Department of Surgical Sciences, University of Oxford, Oxford, UK

- 2010-2015
 - Trends in stone disease in England
- 4.4% increase in upper tract stones
- ESWL rates remained stable
- 49.6% increase in ureteroscopy
 - 103% increase in flexible URS
- Decline in open stone cases



Obesity



Main Stone Types

- Calcium containing stones ~ 80%
 - Oxalate ~ 60%; phosphate ~ 20%
- Infection Stones ~ 7%
- Uric Acid ~ 7%
 - Radiolucent
 - 17% if overweight
 - 28% if obese

Why ?

- Supersaturation
 - Excess solutes vs. Not enough fluid vs. Lack of inhibitors
- Causes
 - Genetic e.g. Cystinuria
 - Geographical
 - Dehydration – 2 litres of urine per day
 - Familial (2.5x)
 - Anatomical causes
 - Medical disorders eg. Hyperparathroid/ diabetes/ gout
 - Chronic diarrhoeal syndromes
 - Short gut / bypass surgery / Crohn's disease

Symptoms

- Severe pain ~ child birth
- Dull ache
- Infection
- Bleeding
- Urinary symptoms



Assessment

- Full abdominal examination
 - ? Leaking AAA
- Scrotal examination
 - ? Testicular pathology

Dipstick

- 90% of stone patients +ve blood
- 40% acute flank pain + haematuria – no stone
- Nitrites / leucocytes

Mandatory in all patients
with suspected colic

Blood Analysis

- FBC
- Renal Profile
- CRP

Mandatory in a single kidney or if pyrexial

- Calcium
- Uric acid

If proven stone

- ? WBC and CRP – predictors of stone passage

Diagnosis

- Plain film
 - Sens. 44-77%
 - Spec. 80-87%



Diagnosis

- Ultrasound
 - User dependent
 - Bad for ureteric stones
 - Good as cheap screening tool



Common Scenario

- Patient – long-standing right abdo pain
- GP – USS → “small <5mm renal stone(s)”
 - Referred to stone clinic
 - Patient told found cause of pain
- VERY unlikely to be source of pain
- CT KUB is often normal with no stone seen

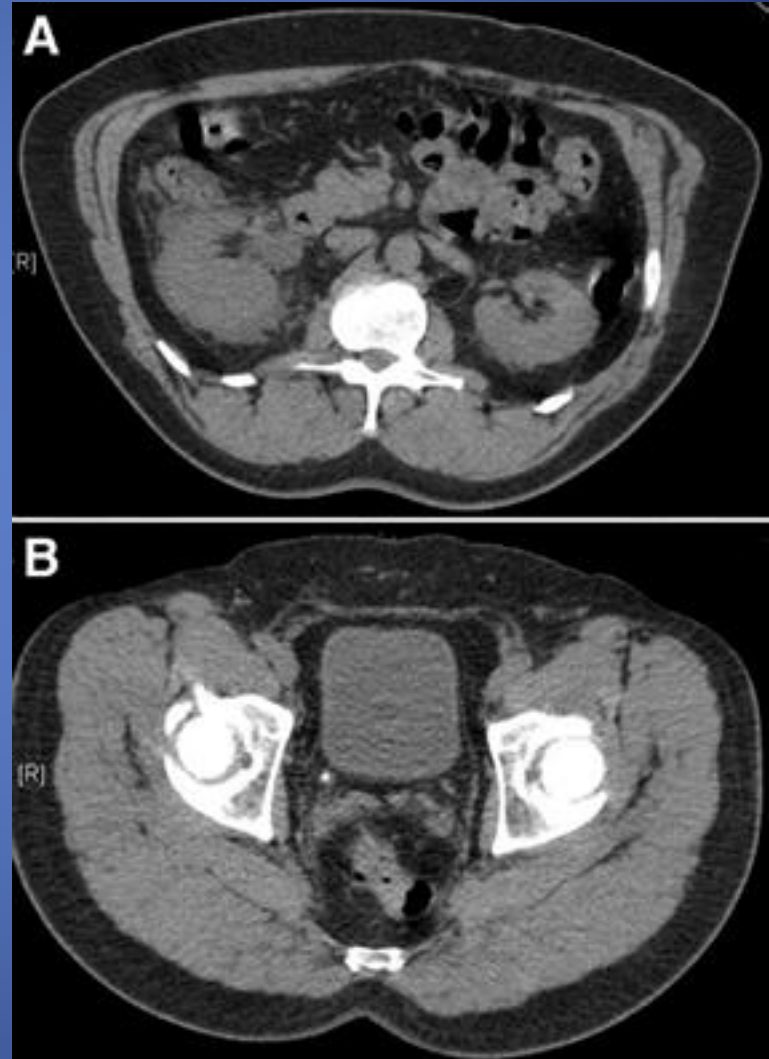
Diagnosis

- Intravenous urogram (IVP)
 - Sens. 51-87%
 - Spec. 92-100%



Diagnosis

- CT KUB (NCCT)
 - Sens. 94-100%
 - Spec. 92-100%



Controversy I

- Initial imaging for 'renal colic'

ORIGINAL ARTICLE

Ultrasonography versus Computed Tomography for Suspected Nephrolithiasis

R. Smith-Bindman, C. Aubin, J. Bailitz, R.N. Bengiamin, C.A. Camargo, Jr., J. Corbo, A.J. Dean, R.B. Goldstein, R.T. Griffey, G.D. Jay, T.L. Kang, D.R. Kriesel, O. J. Ma, M. Mallin, W. Manson, J. Melnikow, D.L. Miglioretti, S.K. Miller, L.D. Mills, J.R. Miner, M. Moghadassi, V.E. Noble, G.M. Press, M.L. Stoller, V.E. Valencia, J. Wang, R.C. Wang, and S.R. Cummings

Ultrasound vs. CT

- Multicentre RCT
 - 18-76 years
 - Presentation to ED with suspected stone

Point-of-care USS vs. Radiology USS vs. CT KUB

- “pragmatic”
 - Subsequent care and imaging at discretion of Dr.
- 2776 patients randomised

Headline Results

- 2759 patients
 - 908 vs. 893 vs. 958
- Radiation Exposure
 - 10.1mSv vs. 9.3mSv vs. 17.2mSv ($p < 0.001$)
- 6 month radiation dose USS \ll CT ($p < 0.001$)
 - But 40% of US group also got a CT
- SAE 12.4% vs. 10.8% vs. 11.2 % ($p = 0.5$)
- No difference:
 - Pain at 7 days; Return to ED; Hospitalisations

US or CT

Ultrasound first

- Quicker
 - Cheaper
 - Less radiation
 - Similar
 - Return to ED
 - Hospitalisation
 - Pain scores
 - No worse outcomes
- Thought provoking
 - Does not mean don't do CT
 - Think
 - But we want to plan surgery
 - This was a trial

CLINICAL REVIEW

When can a patient be managed in a primary care or outpatient setting?

Management

Matthew Bullock¹
urology²¹Urology Centre,
Bristol, UK

Urinary stone
risk of about
a first stone
age 40-60 y
population
their late 20
study show
period.² Pre
seasonal factors, with higher incidence
during the summer months.³

This review includes the latest information from meta-analyses, systematic reviews, randomised trials, current guidelines, and other peer reviewed evidence to provide a background on presentation, investigation, and medical and surgical management of patients with renal colic.

What are urinary stones?

Urinary stones are formed by the aggregation of crystals with a non-crystalline protein (matrix) component.³ These crystals clump together to form a stone and then move when they reach a certain size and pass down the ureter, frequently causing colic symptoms. Eighty per cent of stones contain calcium, most

Patients with first presentation of renal colic are often seen in the emergency department, owing to both the severity of the pain and anxiety as to the cause. However, for patients in whom the diagnosis is clear, adequate pain relief can be achieved, and there are no complicating factors (box 1), it may be possible for a general practitioner to diagnose and manage patients with renal colic in the community and avoid acute hospital admission. This management is especially true for recurrent stone formers.

If the decision is taken to manage the patient in a community setting, urgent imaging must be arranged to confirm the diagnosis and assess the likelihood of spontaneous stone passage.⁶ This confirmation could require liaison with radiology to ensure an appropriate timescale is achievable. Little evidence indicates what this timescale should be. Expert consensus has suggested that seven days is the maximum acceptable interval, and inability to achieve this could necessitate hospital admission.

highest risk of stone
per day substantially reduces the risk of stone episodes.⁴

What is renal colic?

Renal colic describes the pain arising from obstruction of the ureter, although ureteric colic would be a more accurate term. The pain is caused by spasm of the ureter around the stone, causing obstruction and distension of the ureter, pelvicalyceal system, and renal capsule. Although the most common cause is a stone, the term "renal colic" actually refers to a collection of symptoms attributed to the kidney and ureter. There are other

with special interest in

and Nailsea Medical Group,

primary hyperparathyroidism, liver disorders, all chronic (e.g., Crohn's disease), and gout.¹ hot environment (for example, due to dehydration.³ Previous with a 30-40% chance of five years of the initial episode.¹ a randomised trial (compared importance of fluid ss than 1 L of urine per day are at n, while producing 2 L of urine of symptoms attributed to the kidney and ureter. There are other

Indication for acute admission/ referral

- Diagnostic uncertainty
 - ? Leaking AAA – If >60 yrs – refer
- Unable to obtain adequate pain control
- Significant fever ... **Surgical emergency**
- Solitary kidney
- Worsening renal failure
- (Unable to arrange timely investigations)

Who can be managed in primary care ?

- Younger patient
 - Clear diagnosis
 - Adequate pain relief
 - (Recurrent stone former)
-
- Arrange imaging – CT KUB
 - Within 7 days

What analgesia ?

- NSAID vs. opiates
 - Level one evidence
 - Better pain relief
 - Less likely to need rescue analgesia

Guidelines:

- 1) Any NSAID – ? diclofenac PR
- 2) IV paracetamol
- 3) Opiate as 2nd line (not pethidine)

Fluid intake

- Cochrane review
 - No benefit of iv high volume (2- 3 litres over 4- 6hrs)

Personal recommendation:
2 litres / day to maintain hydration

Anti-spasmodic drugs ?

- Poor limited evidence
- One RCT – no benefit of hyoscine vs. Placebo
- Another – maybe mild benefit iv papaverine

Guidelines: Limited evidence

NICE 2019 – Do not use

Sieve the urine ?

- Obtaining stone:
 - Confirms stone passage – may avoid further imaging
 - Allows stone analysis

Guidelines: Analysis recommended
Thus sieve urine may be beneficial

What is chance of spontaneous stone passage ?

Stone size	passage	CI
< 5 mm (n = 224)	68%	(95% CI 46-85%)
> 5 mm (n = 104)	47%	(95% CI 36-58%)
< 2 mm	31 days	
2-4 mm	40 days	
> 4-6 mm	39 days	

95% of stones up to 4 mm pass within 40 days (2).

Relationship of Spontaneous Passage of Ureteral Calculi to Stone Size and Stone Location

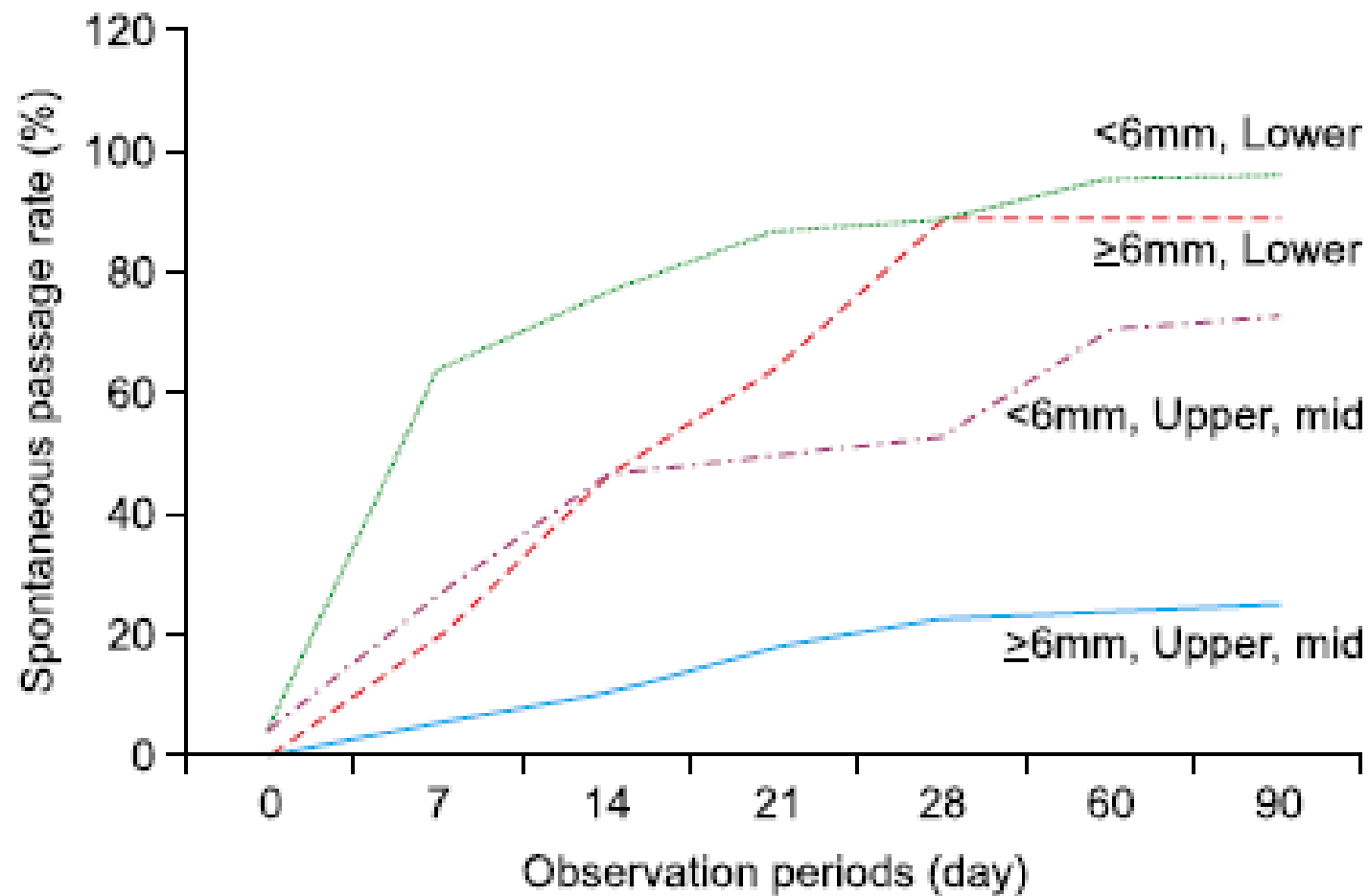
AJR:178, January 2002

Revealed by Unenhanced Helical CT

Stone Size	Passage Rates
2-4	76%
5-7	60%
7-9	48%
9-10	25%

Stone Location	Passage Rates
Proximal	48%
Mid	60%
Distal	75%
VUJ	79%

- 57 needed intervention (33%)

C

Controversy II

What about Medical Expulsive Therapy ?

- Alpha blockers or Ca Channel blockers

- Relaxation of ureteric smooth muscle

- Meta-analysis - 13

- 65% rel

- Meta-analysis (EAU/ AUA Guidelines 2007)

- 29% absolute benefit to tamsulosin

- 9% absolute benefit to nifedipine

profit from MET. The vast majority of randomised studies incorporated into the present systematic review are small, single-centre studies, limiting the strength of our conclusions. Therefore, multicentre, randomised, placebo-controlled trials are needed.

New era ... of high quality RCT

NO BENEFIT

Medical exp... therapy in adults with ureteric colic:
a multicentre, randomised, placebo-controlled trial

Robert Pickard, Robert Starr, Graeme Macdonald, T... Lam, Ruth... Jennifer Burr, Gladys McPherson, Alison McDonald,
Kenneth Anson, James... Neil Burgess, Terry Cl... Kilonzo...
Samuel McClinton



Distal Ureteric Stones: A Double-Blind,
Placebo-Controlled Randomised Multicenter Trial

Jeremy S. Furyk, MBBS MPH&TM*; Kevin Chu, MBBS MS; C... Banks... Greensla... PhD; Gerben... MBBS PhD;
Ogilvie Thom, MBBS; Tom Torpie, MBBS; C... Rajan... MBBS



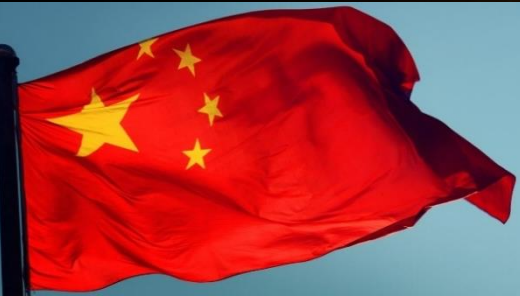
Silodosin to Facilitate Passage of Ureteral Stones:
A Multi-institutional, Randomized, Placebo-controlled Trial

Roger L. Sur^{a,*}, Neal Shore^b, James L'Esperance^c, Bo... Knudsen^d, Ma...
Ojas Shah^e



Multi-Center Study of Tamsulosin for Ureteral Stones in
Emergency Department

Meltzer, Andrew C. Burrows, Pamela Katzen
George Washington University, Washington, DC, United States



What about real-life data ?

Beyond medical expulsive therapy: evolution to supported stone passage for ureteric stones

Andrew J. Portis^{*}, Jennifer L. Portis^{*}, Michael S. Borofsky[†] and Suzanne M. Neises^{*}

- Prospective database
- Analysed data 1 year before/ after SUSPEND
- Supported stone passage (SSP)
 - Tamsulosin prescriptions 84% → 13%
 - Stone surgery 26% → 19%
- Removing tamsulosin did not impair stone passage

Medical Expulsive Therapy

- Meta-analyses continue to show benefit
- Most large RCT's show no benefit
- Recent 'real world data' shows no benefit
- Medication is cheap and well tolerated

What about Medical Expulsive Therapy ?

Guidelines:

- 1) European Association of Urology (EAU)
 - Stones >5mm in distal ureter
- 2) NICE
 - Use for stones in distal ureter

Counsel patients:

Controversial

Risks and side-effects

Off label use

Management

- If sepsis:
 - Admission; Intravenous antibiotics
 - Decompression with stent vs. nephrostomy

Management

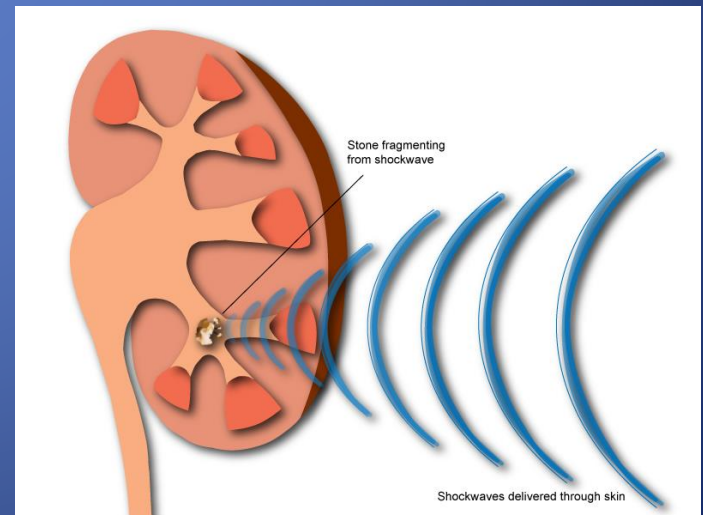
- If ongoing pain: Cystoscopy and Stent
 - But ureteroscopy/ laser to stone/ stent

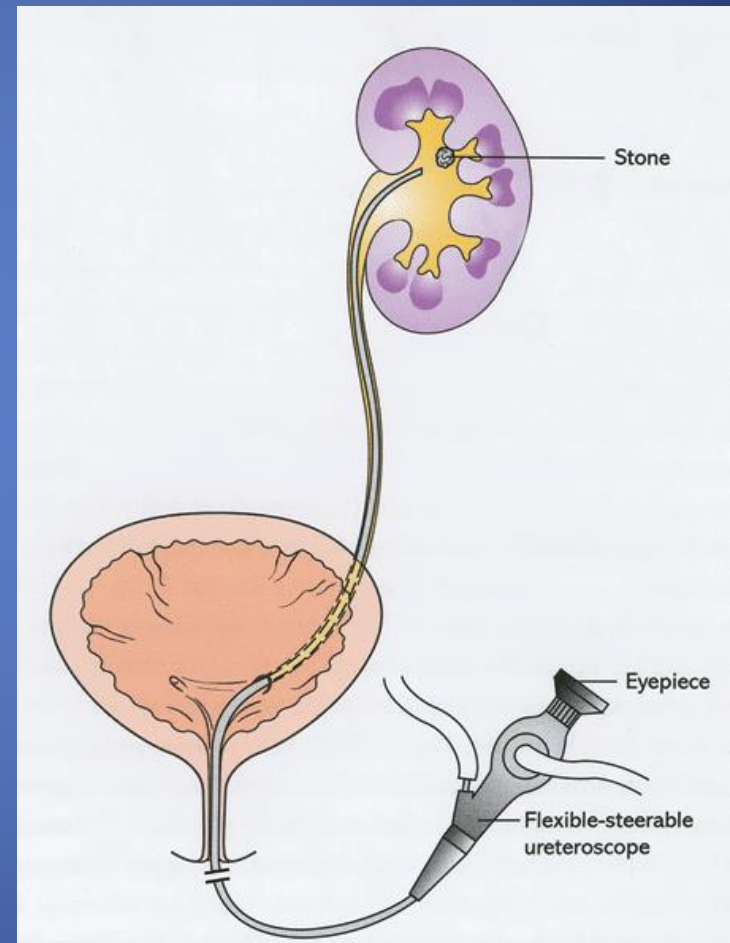
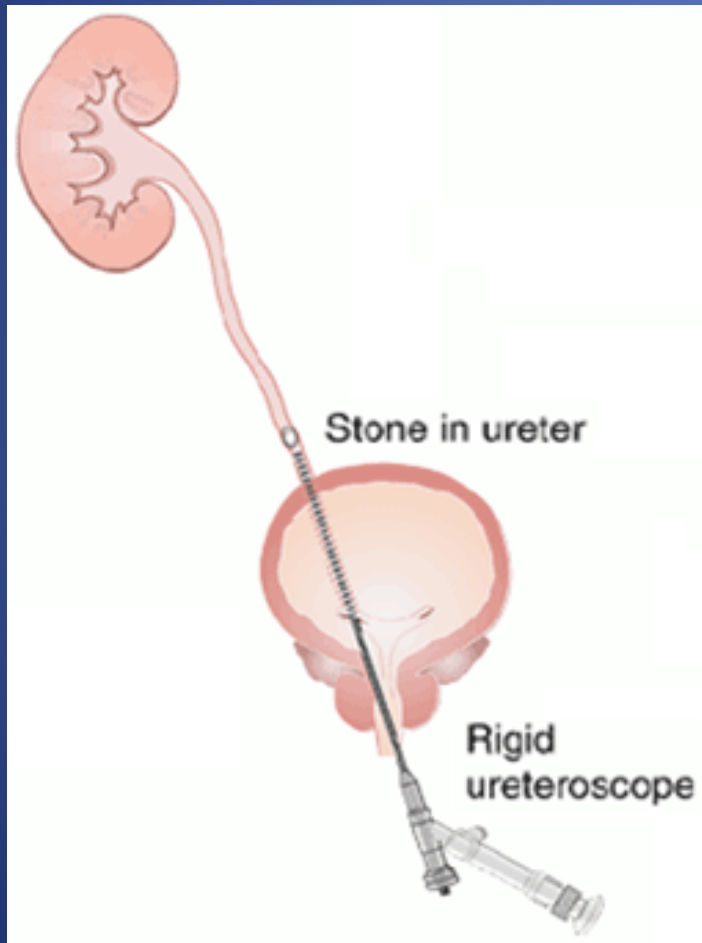
Management

- If elective:
 - Shockwave Lithotripsy vs. Ureteroscopy
 - Choice depends on:
 - Availability
 - Stone location / composition
 - Patient preference

Shockwave lithotripsy (ESWL)

- Day case
- No GA
- No 'operation'
- Can't stent at same time
- Multiple procedures
- May fail





Flexible ureteroscopy

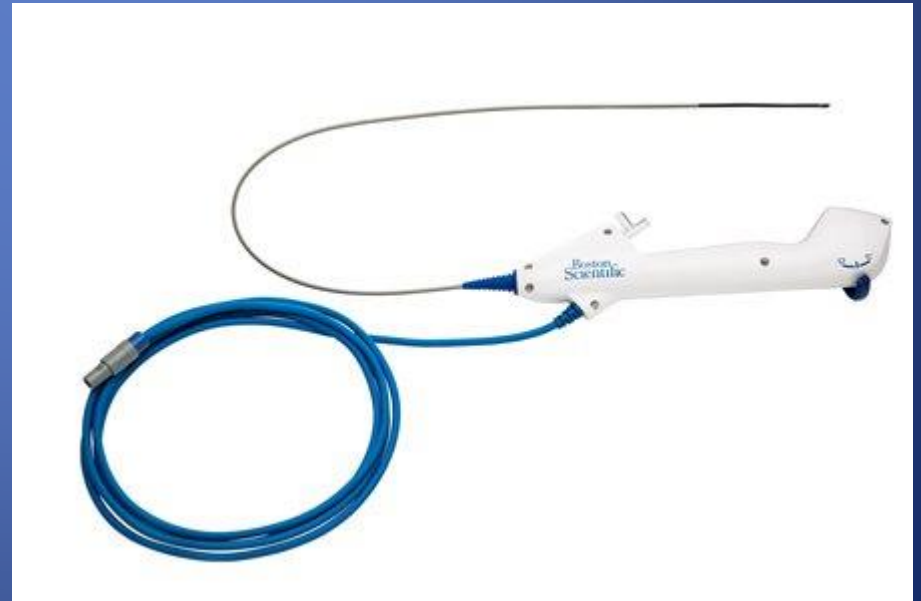


- Biggest development over last 20 years
 - Better smaller instruments
 - Holmium laser
- Indications:
 - Alternative to PCNL for larger stones 2-3cm
 - After failed ESWL
 - ? Better for anticoagulated patients
 - Primary procedure
 - Able to access all calyces
 - Patient choice to fit busy lifestyle



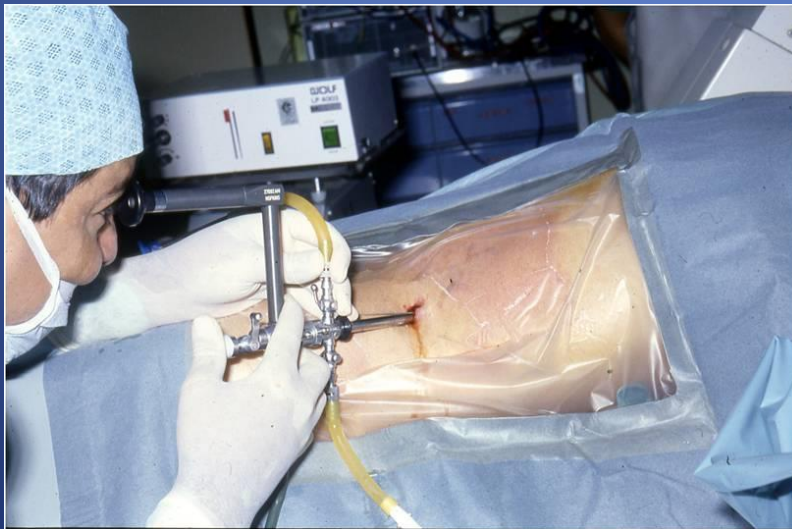
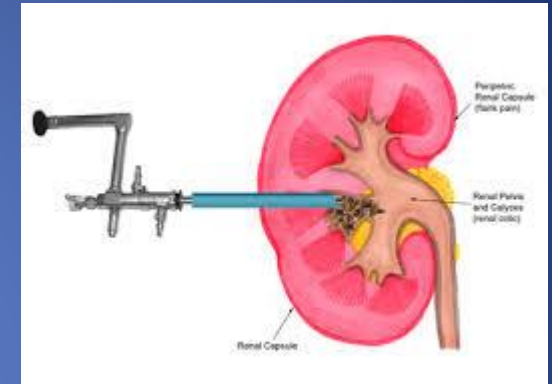
Latest: Disposable scopes

- Single use
- £800-1000 per scope
 - Reduce risk of infection



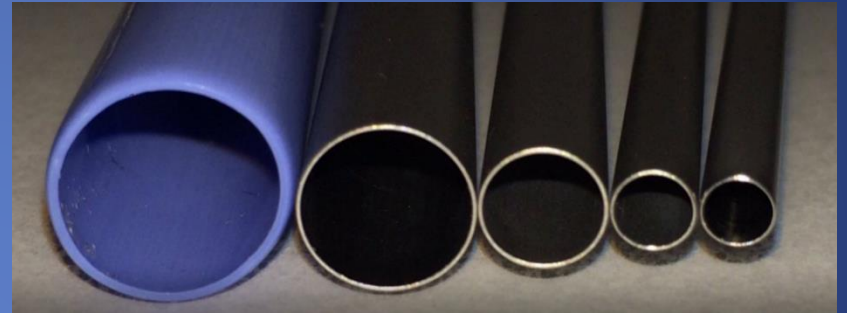
Percutaneous Nephrolithotomy

- 1st report 1976
- Modifications in 1980's
- Rapidly replaced open surgery

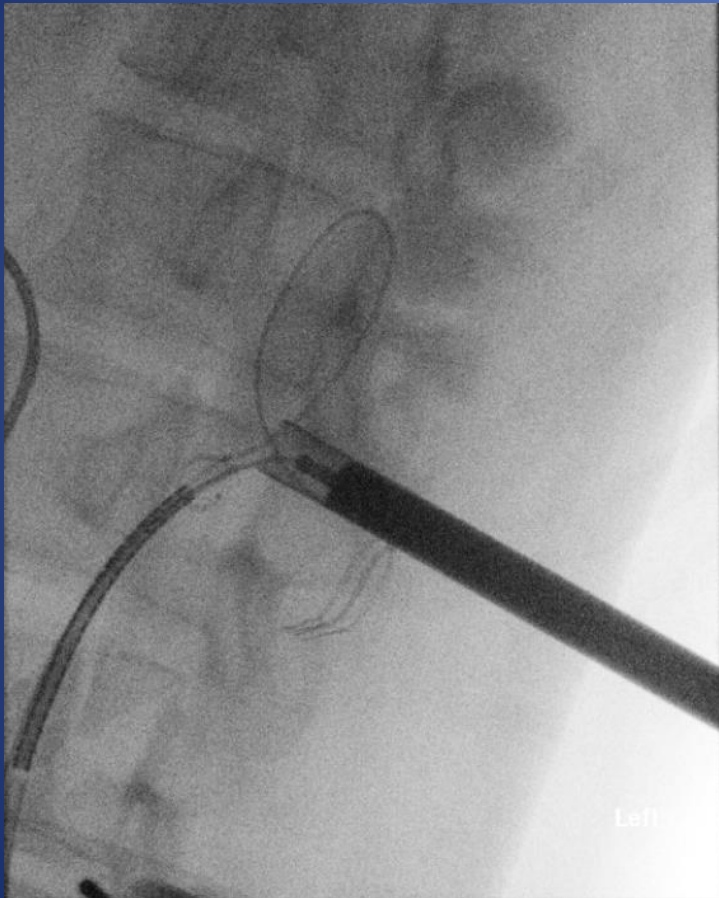


Mini PCNL

- 11-18Fr instruments
 - Less morbidity
 - Less LOS



Combined PCNL / URS (ECIRS)



Stent Symptoms

- Common
 - Haematuria
 - Frequency / urgency
 - Bladder pain
 - Kidney pain (on voiding)
- Dipsticks will always be positive
- Warning symptoms
 - Fever/ sweats

Stent Symptoms - Management

- Analgesia
 - **Paracetamol + NSAID**
 - Avoid opiates if possible
- High fluid intake
- Avoid exercise
- **Alpha blockers** (Level 1a evidence)
- Anticholinergic (if frequency / urgency bad)
- Antibiotics (only if culture positive)

Prevention

- Who needs metabolic evaluation ?
- Basic:
 - Everyone !
- Complex:
 - Recurrent stone formers
 - Age < 30
 - Bilateral stones
 - Non-calcium stones

Metabolic Analysis

- Basic
 - Stone analysis (if available)
 - Urine pH measurement
 - Serum calcium/ urate (PTH if Ca^{2+} elevated)
- Complex
 - 24 hour urine collection (not within 20 days)
 - Consider repeating

Dietary Advice

1. Lifestyle measures and fluid
2. Sodium
3. Citrate
4. Animal protein
5. Calcium
6. Fat
7. Fibre
8. Oxalate rich foods (ca oxalate stones)
9. Purine intake (uric acid stones)

Fluids: Good or Bad ?



Lifestyle and Fluid Advice

- Weight loss to achieve normal BMI
 - Regular exercise/ 'Eating healthily'
- Fluids
 - RCT shown 30% reduction in stone episodes
 - Meta-analysis shows 61% risk reduction
 - Need to produce 2 litres urine per day
 - Urine colour is a guide
 - Fluid in fruit etc
 - Avoid periods of dehydration
 - Increase fluids in summer months



Good fluids



- mineral water rich in HCO_3^-
 - \uparrow urinary pH
 - \uparrow urinary citrate
 - \downarrow relative supersaturation of ca oxalate + uric acid
- fruit juice e.g. lemon, orange
 - alkalinising
 - citraturic (lemon x5 > orange)

Bad fluids

- Beer
 - ↓ urinary pH
 - ↑ uric acid excretion
- Soft drinks acidified by phosphoric acid (rather than citric acid)



Water to prevent kidney stones: tap vs bottled; soft vs hard – does it matter?

Susan Willis*, David S. Goldfarb^{†,‡} , Kay Thomas* and Matthew Bultitude* 

**Department of Urology, Guy's and St. Thomas' NHS Foundation Trust, London, UK, [†]Nephrology Division, Department of Medicine, New York University (NYU) Langone Health, and [‡]NYU School of Medicine, New York, NY, USA*

- Hard water - Increases urinary calcium but also citrate
- **Cohort studies - No difference in stone formation**
- Calcium in hard water
 - May be useful as part of daily requirements
 - May bind oxalate in gut
- Individual patient
 - If excess calcium in diet or known hypercalciuria then softer water likely to be beneficial
- “Alkali water” – no benefit

Sodium and Fat



- Sodium
 - Causes calcium excretion and reduced citrate
 - Bad for renal health
 - restrict to 4-5g/day
 - patients with calcium oxalate stones + hypercalciuria benefit most
- Fat
 - Bad for weight control
 - Can lead to increased oxalate absorption

Animal Protein



- Causes net acid secretion
- Increases increased urinary Ca^{2+} and uric acid
 - Bad for calcium and uric acid stones
- Restrict to 0.8-1g animal protein/kg/day
 - N.B. fish = richer source of purine than red meat



Calcium

- RCT – reduced dietary Ca^{2+} increases stone risk
- Thus normal intake advised (700mg/day)
 - By diet not supplements
- Supplements increase risk of stones
 - Reduced by advising to take at meal times

Prevention of oxalate stones

- Limit oxalate in diet (note only 20% is from diet)
- Particularly high in oxalate:
 - All bran; almonds; beets; rhubarb; spinach
- Moderate:
 - Fruits - blackberries, blueberries, raspberries, strawberries, currants, kiwifruit, concord (purple) grapes, figs, tangerines, and plums
 - Vegetables - Okra, parsley, leeks
 - Nuts and seeds
 - Cocoa and chocolate
 - Soy products such as soy milk, soy cheese, tofu and soy ice-creams.

Tea/ Coffee

- Moderate oxalate content
- Caffeine ... Diuretic
- 2-3 cups / day
- Take with a glass of water

Summary

1. Normal Healthy diet
2. Regular exercise; normal weight
3. 2 + litres water per day; add citrate
4. Don't cut back on dairy
5. Have a vegetarian day
6. Consider individual factors
 - Sodium / animal protein
7. Be aware of oxalate etc but ... **ENJOY LIFE !**

Follow up of kidney stone patients

- Colic patients – important to prove passage
 - Ultrasound if small and distal
 - CT otherwise
- Guidelines: 1st time stone = Discharge
- Recurrent stone formers
 - Some benefit to surveillance but at a cost
 - Radiation and Financial
 - “Can’t follow everyone for ever”

Controversy III

NICE Guideline – Renal and ureteric stones: assessment and management

NICE (2019) Renal and ureteric stones: assessment and management

1.1 Diagnostic imaging

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

1.2 Pain management

- 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.
- 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.
- 1.2.3 Consider opioids for adults, children and young people with suspected renal colic if both NSAIDs and intravenous paracetamol are contraindicated or are not giving sufficient pain relief.
- 1.2.4 Do not offer antispasmodics to adults, children and young people with suspected renal colic.

1.3 Medical expulsive therapy

1.3.1 Consider alpha blockers¹ for adults, children and young people with distal ureteric stones less than 10 mm.

1.4 Stenting before shockwave lithotripsy

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

1.6 Stenting after ureteroscopy for adults with ureteric stones less than 20 mm

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

1.5 Surgical treatments (including shockwave lithotripsy)

Renal stones

1.5.1 Consider watchful waiting for asymptomatic renal stones in adults, children and young people if:

- the stone is less than 5 mm **or**
- the stone is larger than 5 mm and the person (or their family or carers, as appropriate) agrees to watchful waiting after an informed discussion of the possible risks and benefits.

Table 1 Surgical treatment (including SWL) of renal stones in adults, children and young people

Stone type and size	Treatment for adults (16 years and over)
Renal stone less than 10 mm	Offer SWL Consider URS: <ul style="list-style-type: none">• if there are contraindications for SWL or• if a previous course of SWL has failed or• because of anatomical reasons, SWL is not indicated Consider PCNL if SWL and URS have failed to treat the current stone or they are not an option
Renal stone 10 to 20 mm	Consider URS or SWL Consider PCNL if URS or SWL have failed
Renal stone larger than 20 mm, including staghorn stones	Offer PCNL ² Consider URS if PCNL is not an option

Ureteric stones

1.5.3 Follow the recommendations in table 2 for surgical treatment (including SWL) of ureteric stones in adults, children and young people.

Table 2 Surgical treatment (including SWL) of ureteric stones in adults, children and young people

Stone type and size	Treatment for adults (16 years and over)
Ureteric stone less than 10 mm	Offer SWL Consider URS if: <ul style="list-style-type: none">• stone clearance is not possible within 4 weeks with SWL or• there are contraindications for SWL or• the stone is not targetable with SWL or• a previous course of SWL has failed
Ureteric stone 10 to 20 mm	Offer URS Consider SWL if local facilities allow stone clearance within 4 weeks Consider PCNL for impacted proximal stones when URS has failed

Timing of surgical treatment (including SWL) for adults with ureteric stones and renal colic

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.

1.7 Metabolic testing

- 1.7.1 Consider stone analysis for adults with ureteric or renal stones.
- 1.7.2 Measure serum calcium for adults with ureteric or renal stones.

1.8 Preventing recurrence

Dietary and lifestyle advice

- 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).
- 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>).

Potassium citrate

The following recommendations apply alongside the recommendations on dietary and lifestyle advice.

- 1.8.3 Consider potassium citrate³ for adults with a recurrence of stones that are predominantly (more than 50%) calcium oxalate.
- 1.8.4 Consider potassium citrate for children and young people with a recurrence of stones that are predominantly (more than 50%) calcium oxalate, and with hypercalciuria or hypocitraturia.

Thiazides

The following recommendation applies alongside the recommendations on dietary and lifestyle advice.

- 1.8.5 Consider thiazides⁴ for adults with a recurrence of stones that are predominantly (more than 50%) calcium oxalate and hypercalciuria, after restricting their sodium intake to no more than 6 g a day.

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Latest Issue



● Stone disease

The assessment and management of renal and ureteric stones

Luke Hanna, Post OCT Fellow; Matthew Bultitude, Consultant Urological Surgeon, Stone Unit, Guy's and St. Thomas' NHS Foundation Trust

To address the management of urolithiasis in the UK, NICE has recently published guidance on the assessment and management of renal and ureteric stones (NG118). In this article, the authors consider the impact of new guidelines in an update on the assessment and management of renal and ureteric stone disease.

Stone disease is a common problem with a prevalence in excess of 10% in some regions of the world.¹ However, an individual's risk will vary greatly, as lifetime stone risk is multifactorial. If an individual has a history of stone disease then their future risk is substantial, with 15% experiencing recurrence within three years of initial presentation.²

Nephrolithiasis can manifest in many different ways, from pain to recurrent infection. However, a significant proportion of cases will be identified incidentally; for example, when undergoing radiological examinations for potential abdominal malignancies or bowel symptoms.

Although specialist associations have published guidance on stone disease (for example, the European Association of Urology [EAU]³ and the American Urological Association [AUA]⁴) practice patterns still vary enormously around the world, being based on socio-economic variables, availability, and patient and surgical preference.

Diagnostics

NICE suggest that initial imaging for renal colic be in the form of a low-dose CT-KUB, unless the individual is a young person, a child or pregnant, for which they would suggest an ultrasound (US) first.⁴

Non-contrast-enhanced CT is widely recognised as the gold standard imaging modality in the acute setting. Figure 1 shows a CT scan with dilatation of the right renal pelvis and mild peri-nephric stranding caused by obstruction, which is the result of a 6mm distal ureteric stone (see Figure

2). There is the potential to reduce the dose of radiation by utilising a low-dose protocol, which has been shown to maintain accuracy with a specificity of 96.6% and a sensitivity of 93.1%;⁵ however, there is a decrease in sensitivity in patients with high BMI or in those with tiny stones.¹

Ultrasound is also a good primary imaging modality. It allows visualisation of stones within the renal pelvis and calyces, and at both the vesico-ureteric and pelvi-ureteric junctions. A randomised controlled trial suggested it was safe and effective as an initial screening modality in patients presenting with renal colic compared with CT scanning.⁶ Issues may arise with access out-of-hours, and with sensitivity, as it is a very user-dependent examination. It is a useful tool in the follow up of patients and in guiding extracorporeal shock wave lithotripsy (ESWL).

An X-ray KUB can be of use in a patient with known radiopaque stone disease. This, in combination with US, increases the sensitivity of US compared with US alone. It is also widely used for the follow up of patients in the clinical setting.

Management Analgesia

NICE recommends that initial pain management should be in the form of a non-steroidal anti-inflammatory drug (NSAID). If this were not to provide adequate analgesia then NICE would recommend intravenous paracetamol then opioids (see Figure 3).⁴

NSAIDs work by decreasing prostaglandin synthesis, which can be stimulated when stones are passed.



Figure 1. Dilated right kidney with mild peri-nephric stranding (from the obstruction)



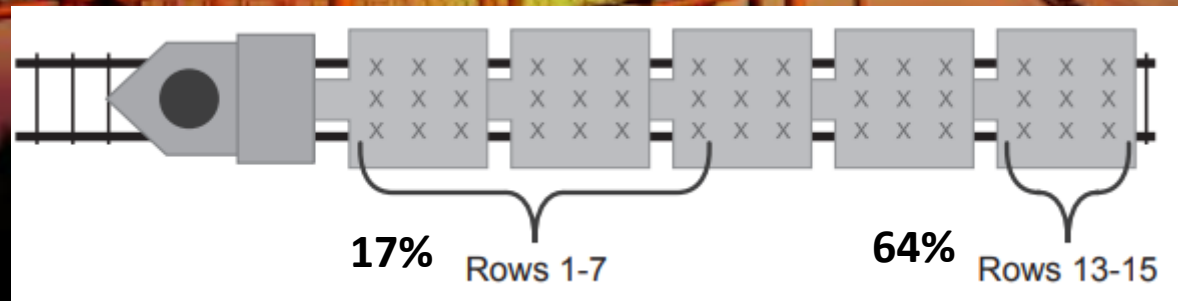
Figure 2. A 6mm stone in the distal right ureter

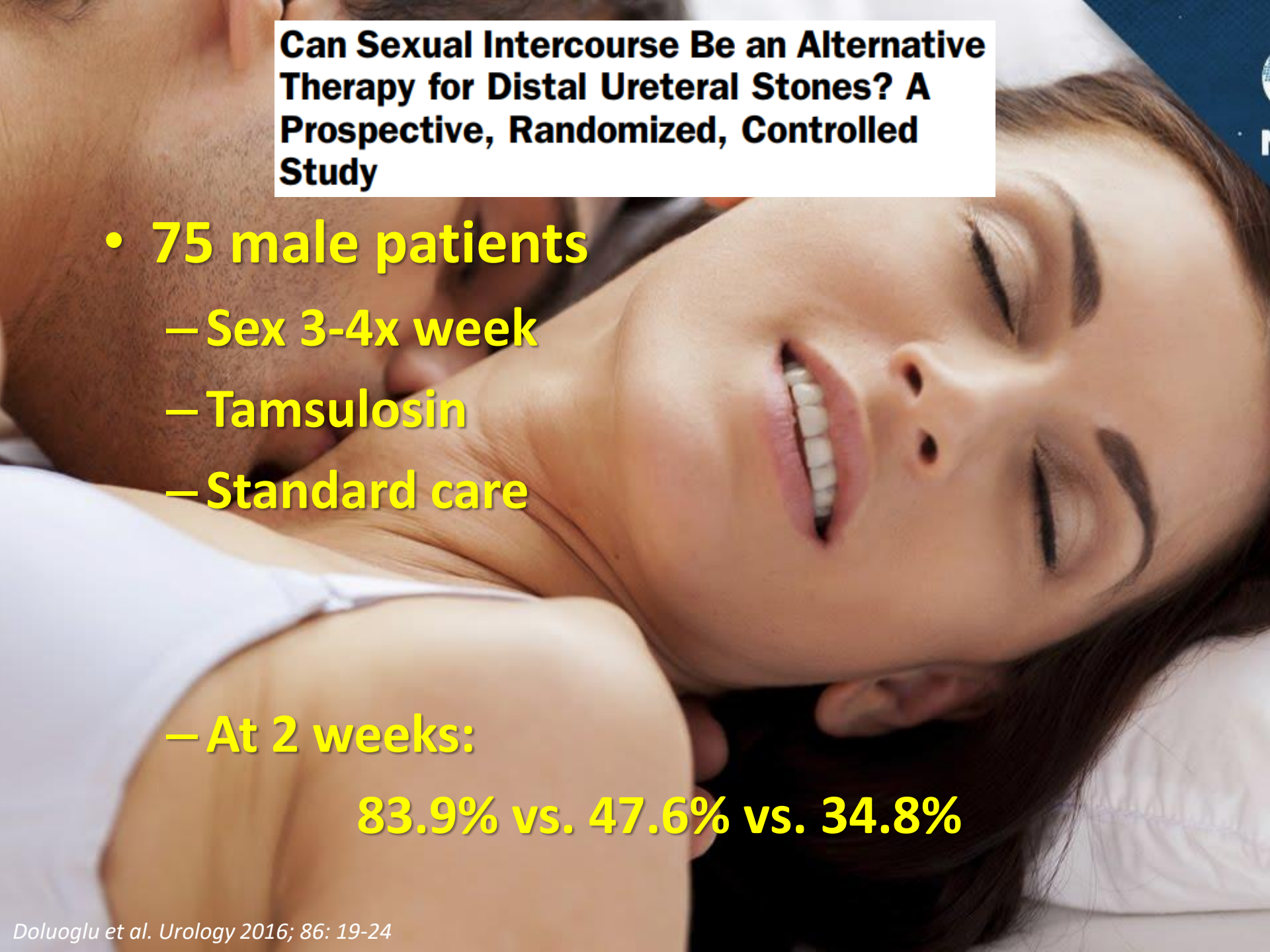
Links

- **2019 NICE Kidney Stone Guidance:**
www.nice.org.uk/guidance/ng118
- **Summary review for GP's (2019 Trends article):**
<https://onlinelibrary.wiley.com/doi/epdf/10.1002/tre.710>
- **BMJ Renal Colic Article 2012:**
www.bmj.com/content/345/bmj.e5499
- **Tap or bottled water? BJUI Article 2019:**
<https://onlinelibrary.wiley.com/doi/epdf/10.1111/bju.14871>

“ practical management ... ”

Validation of a Functional Pyelocalyceal Renal Model for the Evaluation of Renal Calculi Passage While Riding a Roller Coaster



A close-up photograph of a man and a woman in a romantic embrace. The woman is in the foreground, smiling broadly with her eyes closed, showing her teeth. The man is behind her, also smiling, with his face partially visible. They appear to be in a hospital or clinical setting, as a white pillow is visible behind the woman's head.

Can Sexual Intercourse Be an Alternative Therapy for Distal Ureteral Stones? A Prospective, Randomized, Controlled Study

- **75 male patients**

- Sex 3-4x week

- Tamsulosin

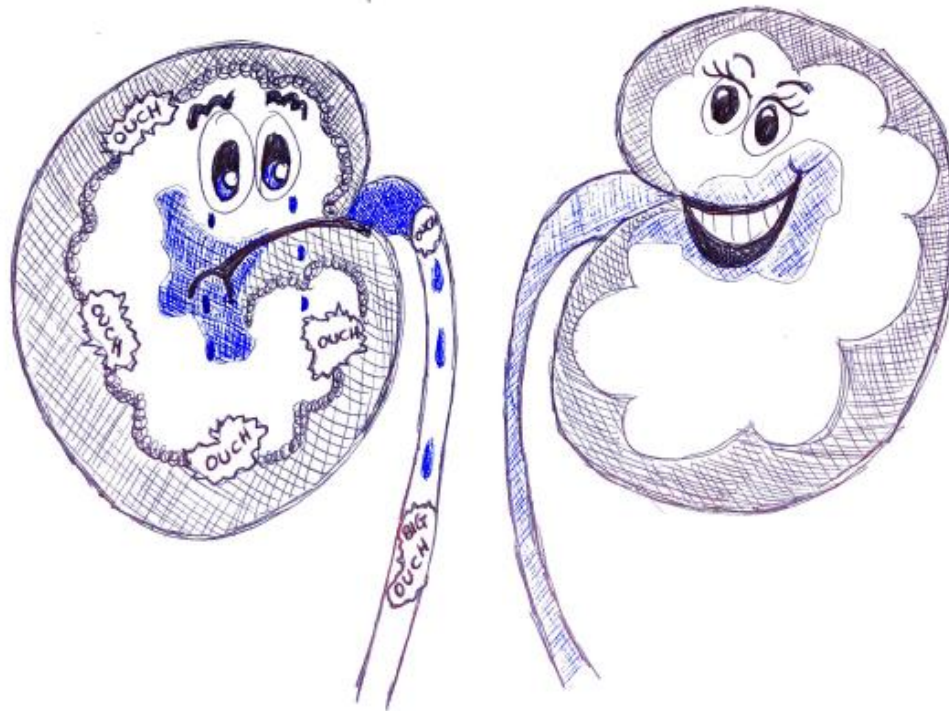
- Standard care

- At 2 weeks:

83.9% vs. 47.6% vs. 34.8%

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