

Endourology update for Primary care

Mr. Matt Young

Consultant Urologist

Subspecialist interest in Endourology

15th November 2023

Contents

- Urolithiasis imaging, workup and management options through our UAN (BHNHSFT and MYTT)
- Renal cysts and follow-up
- Angiomyolipoma (AML) follow-up
- BPH surgical treatment options through our UAN (BHNHSFT and MYTT)

Urolithiasis imaging

Ultrasound:

- sensitivity of 45% and specificity of 94% for ureteric stones
- sensitivity of 45% and specificity of 88% for renal stones
- Recognised to 'overcall' the size of renal stones
 - User dependent – variable depth of US field, probe position
 - US wave divergence

CT: Gold standard

- Standard dose CT KUB (5-8mSV) approaching 99% sensitivity and specificity for ureter and renal stones
- Low-dose CT (2-3mSV) has been shown to have a sensitivity of 89% for detecting ureteral stones < 3 mm and 100% for calculi > 3 mm
- L-D CT KUB almost equivalent radiation dose to XR KUB with far greater accuracy (sensitivity and specificity of XR KUB is 44-77%)

NICE guidelines – renal colic

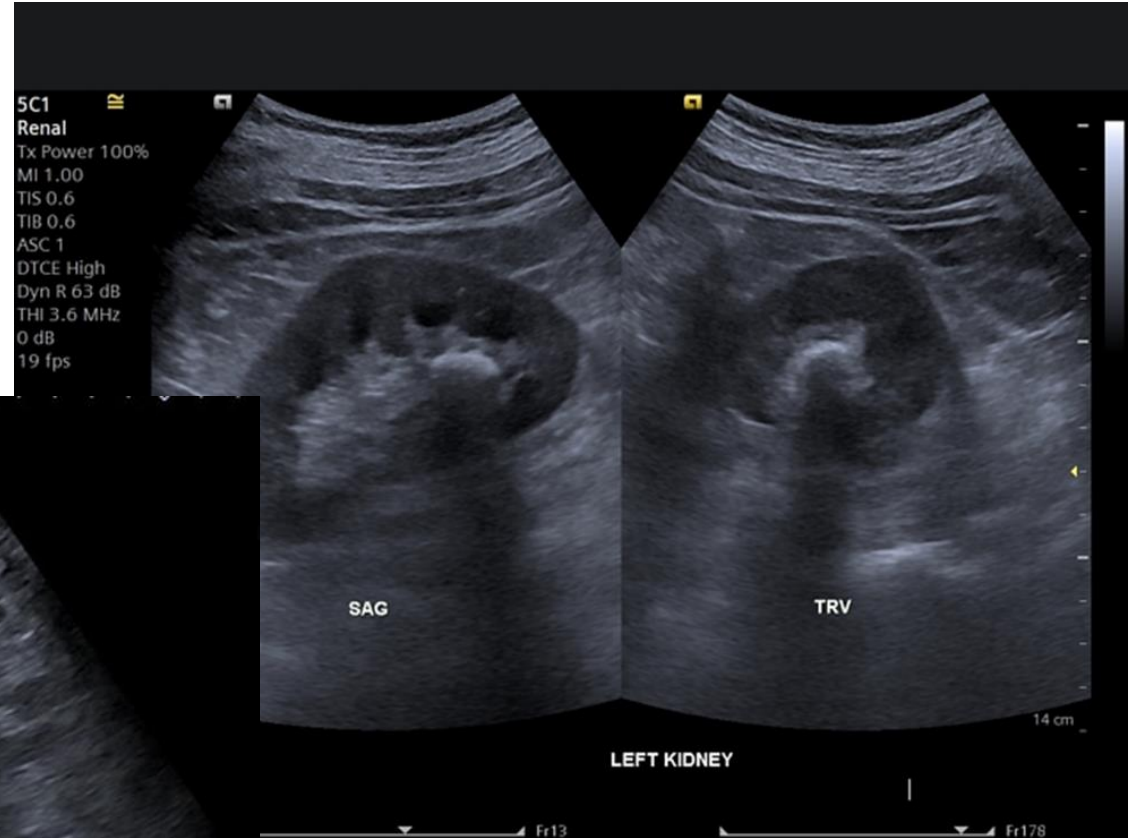
1.1 Diagnostic imaging

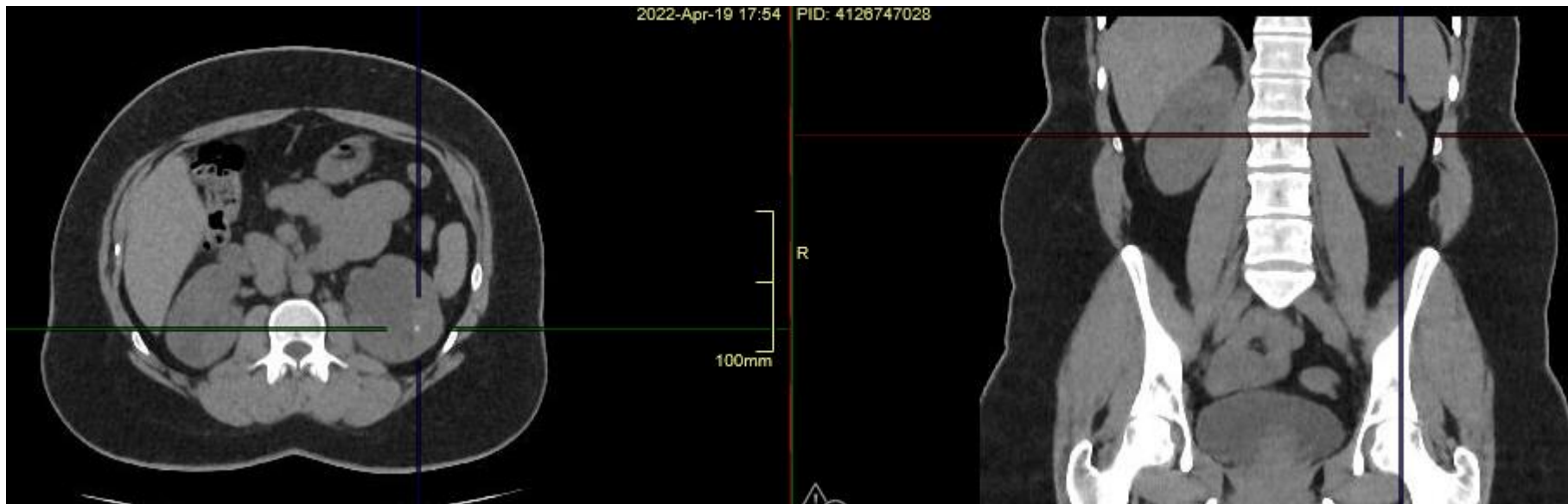
1.1.1 Offer urgent (within 24 hours of presentation) low-dose non-contrast CT to adults with suspected renal colic. If a woman is pregnant, offer ultrasound instead of CT.

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.

Urolithiasis imaging





Urolithiasis imaging - pregnancy

- Teratogenic effects are cumulative with increasing dose and require a threshold dose (< 50 mSV are considered as safe) and depend on the gestation age (**minimum risk prior to 8th week and after the 23rd week**)
- 1st line
 - Ultrasound has become the primary radiological diagnostic tool when evaluating pregnant patients suspected of renal colic.
 - Normal physiological changes in pregnancy can mimic ureteral obstruction.
- 2nd line - MRI
 - Define the level of urinary tract obstruction, and to visualise stones as a filling defect.
 - Gadolinium is not routinely recommended in pregnancy to avoid toxic effects to the embryo.
- 3rd line
 - Low dose CT is associated with a higher positive predictive value (95.8%), compared to MRI (80%) and US (77%).
 - Low-dose CT offers improved diagnostic accuracy that can avoid negative interventions, such as ureteroscopy. Although low-dose CT protocols reduce the radiation exposure, judicious use is currently recommended in pregnant women as a last-line option.

Basic metabolic work up

- Serum U&E, calcium (+/- PTH if raised - primary hyperparathyroidism)
- Urine dip – blood, pH, evidence of infection (+/- MSU for MC&S if concern)
- ?urate/uric acid – not routinely part of NICE recommendations
 - Correlation between hyperuricaemia and hyperuricosuria is often low
 - Uric acid stones are commonly seen in patients with hyperuricosuria, but overall, aciduria is the most common underlying aetiology.
 - Gout and/or hyperuricemia is associated with uric acid uropathy in 15-25% of uric acid nephrolithiasis patients
- Assessment for metabolic syndrome – strong association with stone disease
 - >BMI, HTN, T2DM

Conservative management

- [Stone diet.pdf \(baus.org.uk\)](http://baus.org.uk/Stone%20diet.pdf)
- FLUID – the right fluid!
- Analgesia PRN
- Address metabolic abnormalities
 - Urinary alkalinization +/- allopurinol
 - Prophylactic Abx
 - Thiazides
 - D-penicillamine / Thiola
- Metabolic stone clinic monthly and PGH



DIETARY ADVICE FOR STONE FORMERS

Information about your condition from
The British Association of Urological Surgeons (BAUS)

You have been given this leaflet because you have been diagnosed with urinary stones. The aim of the leaflet is to provide you with advice on how to modify your diet and fluid intake to reduce your risk of getting further stones.

We have consulted specialist surgeons during its preparation, so it represents best practice in UK urology. You should use it in addition to any advice already given to you.

To view the online version of this leaflet, type the text below into your web browser:

[http://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Stone diet.pdf](http://www.baus.org.uk/_userfiles/pages/files/Patients/Leaflets/Stone%20diet.pdf)

Key Points

- Specific types of stone can be managed by measures aimed at the cause of your stone formation
- Generally, keeping your urine dilute & colourless reduces your risk of forming a further stone by almost one third (30 to 40%)
- In addition, a normal calcium, low-salt, low-protein dietary intake can reduce your risk of stone formation even further

How much do I need to drink?

Drinking plenty of fluid is the most effective way of preventing stone formation and reduces your risk of stone formation by almost one third (30 to 40%). Not drinking enough can cause your urine to become concentrated, making stones more likely to form.

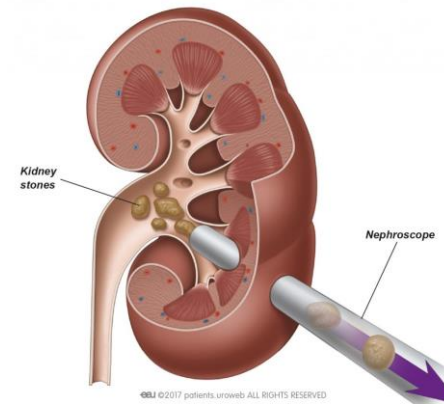
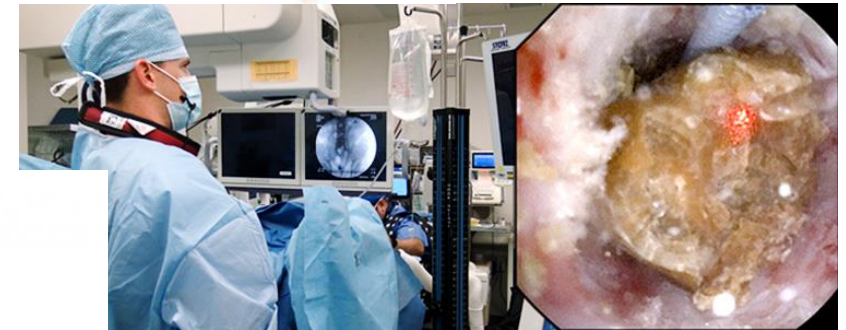
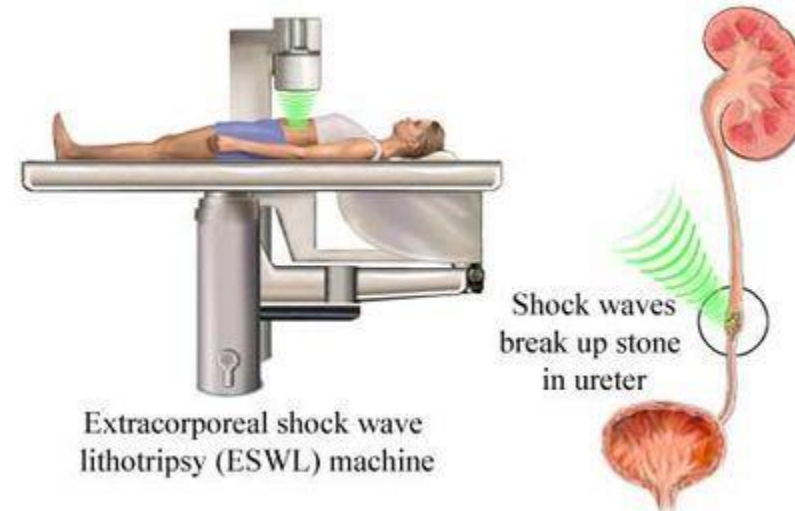


Try to drink two to three litres (four to six pints) of fluid (water or squash) each day. You should aim to keep your urine colourless throughout the day. This should give you a urine output of at least two litres (four pints) per day. If you have cystine

Surgical options available within the UAN

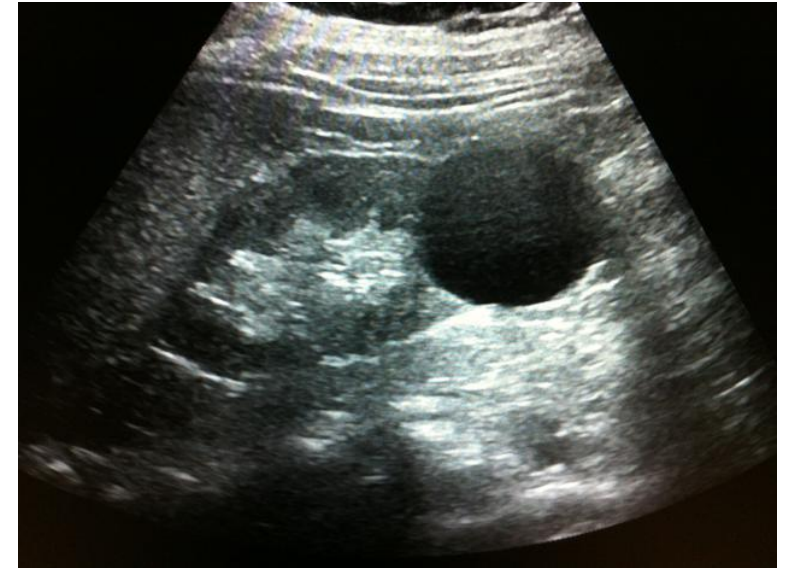
- Extracorporeal shockwave lithotripsy (ESWL) – Pinderfields
- Ureteroscopy (URS) – Barnsley, Dewsbury and Pinderfields
- Percutaneous Nephrolithotomy (PCNL, maxi and mini) - Pinderfields

- Nephrostomy service (acute at Pinderfields, elective / nephrostomy exchange Barnsley / Pinderfields)
- Acute colic – presentations to Barnsley A&E and admit to Pinderfields if intervention required urgently



Renal cysts

- Simple renal cysts = common
- Incidence increases with age.
 - Approximately 25% 40 years or older and approximately 50% >50 years have simple kidney cysts. Simple renal cysts can double in size over 10 years. Solitary renal cysts are usually incidentally discovered
- Typically asymptomatic.
- Simple renal cysts are acquired, not inherited. The exact cause is unknown. Risk factors are advancing age and male sex.
- The exact pathophysiology for renal cysts is unclear. Diverticula on the distal tubule of the nephron may be the starting point for cyst formation
- Usually asymptomatic and detected incidentally on radiological exams.
- Management is not required unless the cyst becomes infected or enlarges and causes symptoms.



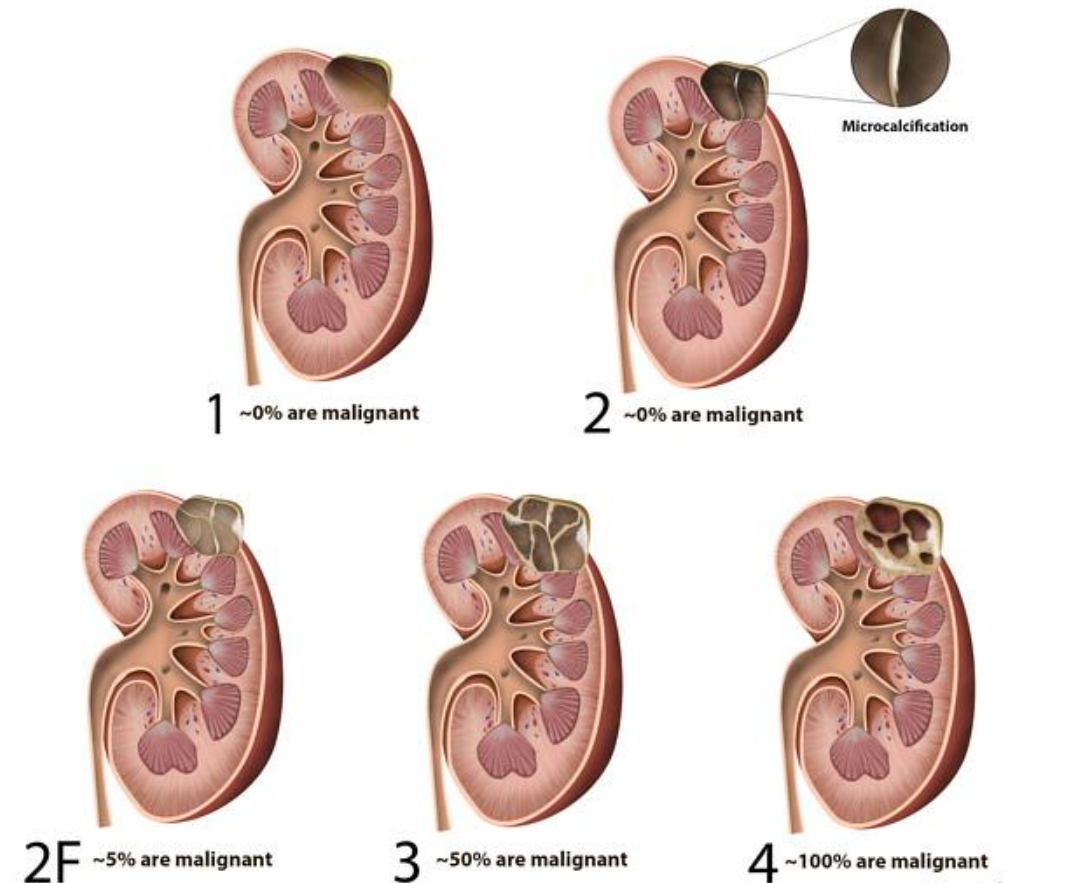
Renal cysts

- Renal cysts, sonographically, may be classified as “simple” or “complex.” “Simple” cysts are best defined using sonographic criteria:
 - absence of internal echoes
 - posterior enhancement
 - round/oval shape
 - sharp, thin posterior walls
- Ultrasonography is helpful for simple cyst identification, but provides limited information with increasingly complex renal cysts and solid masses
- The Bosniak system consists of four categories **based on tri-phasic CT findings**, ranging from simple to complex cysts

Renal cysts

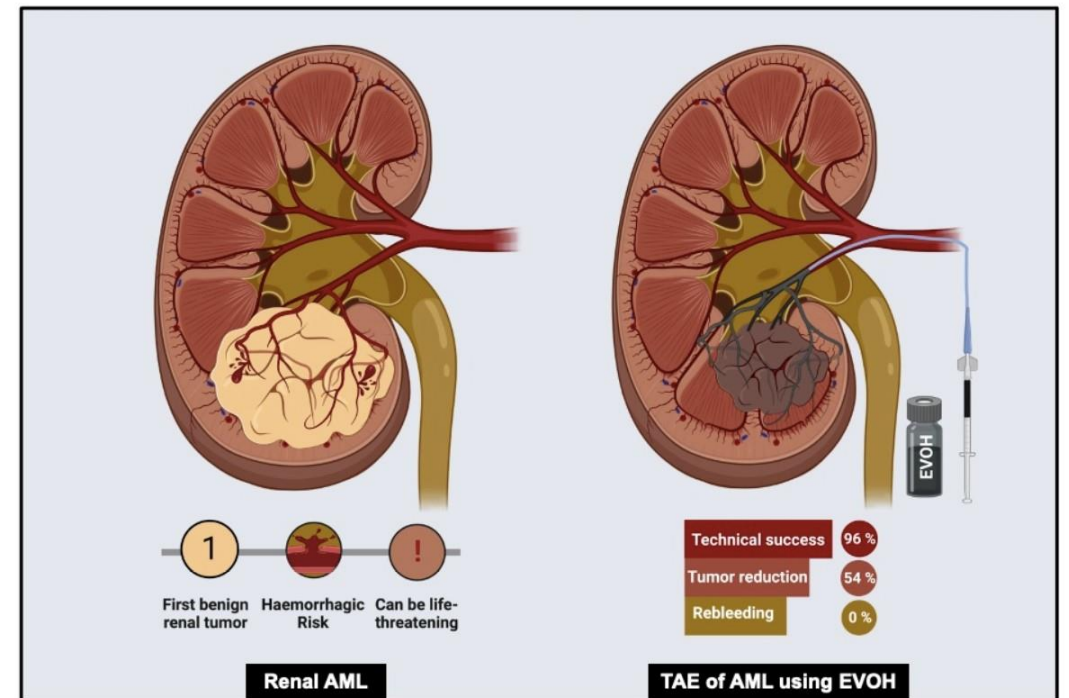
Bosniak classification of renal cysts

Class	Description	Features	Workup	% malignant
1	Simple cyst	Anechoic, imperceptible wall, round	Nil	~0%
2	Minimally complex	Single thin septation, thin calcification	Nil	~0%
2F	Minimally complex- (need follow up)	Thin septation, thick calcification, hyper dense on CT	USG or CT followup	5%
3	Indeterminate	Thick or multiple septation, mural nodule	Partial nephrectomy	50%
4	Clearly malignant	Solid mass with cystic spaces	Partial/Total nephrectomy	~100%



Angiomyolipoma (AML)

- Benign renal tumour
 - Fat, vascular and smooth muscle elements
- Most common solid renal lesion
- 80% sporadic, 20% associated with neurocutaneous syndromes (tuberous sclerosis, vHL, neurofibromatosis)
 - Neurocutaneous = earlier diagnosis, greater number, larger
- Risk of rupture increased >4cm
- AMLs have a greater tendency to increase in size and rupture during pregnancy.
 - Causal mechanism is not clearly defined, it is thought that this is due to ubiquitous expression of oestrogen and progesterone receptors in AMLs.



Created with BioRender

Angiomyolipoma (AML) on US follow-up

<1cm

- F/U US in 1 year
 - Report to include 'appearance likely AML. F/U US in 1 year to exclude interval growth / small RCC
- Stable at 1 year - discharge
 - Interval growth – renal CT

>1cm

- Recommend CT renal
 - Report to include 'likely to represent AML. NC renal CT for further characterisation'
- CT – macroscopic fat = AML
 - <2cm – discharge*
 - 2-4cm – US F/U 1-2 years – treat once 4cm, if stable for 4 years – discharge
 - >4cm – refer to urology for consideration of embolization or surgery
- *unless multiple or TS – annual US for 5 years

Angiomyolipoma (AML) definitive imaging

- If no fat on CT = indeterminate
 - Triple phase CT renal (MRI if <30 yrs)
 - Enhancement >20HU – MDT review of images
 - Enhancement 10-20HU – CT/US surveillance**
 - No enhancement – Benign/Discharge **
 - **to be decided by reporting radiologist/MDT if needed



Intervention options for BPH within the UAN

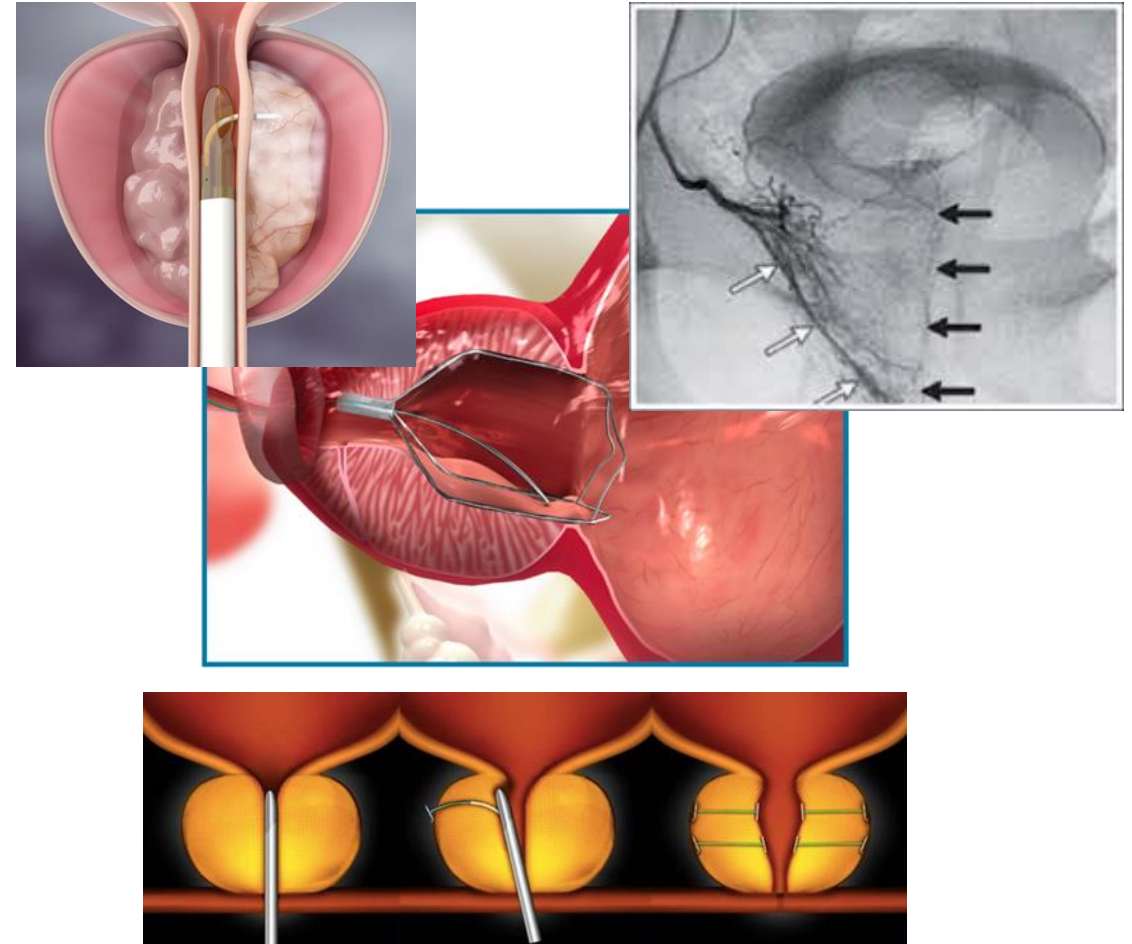
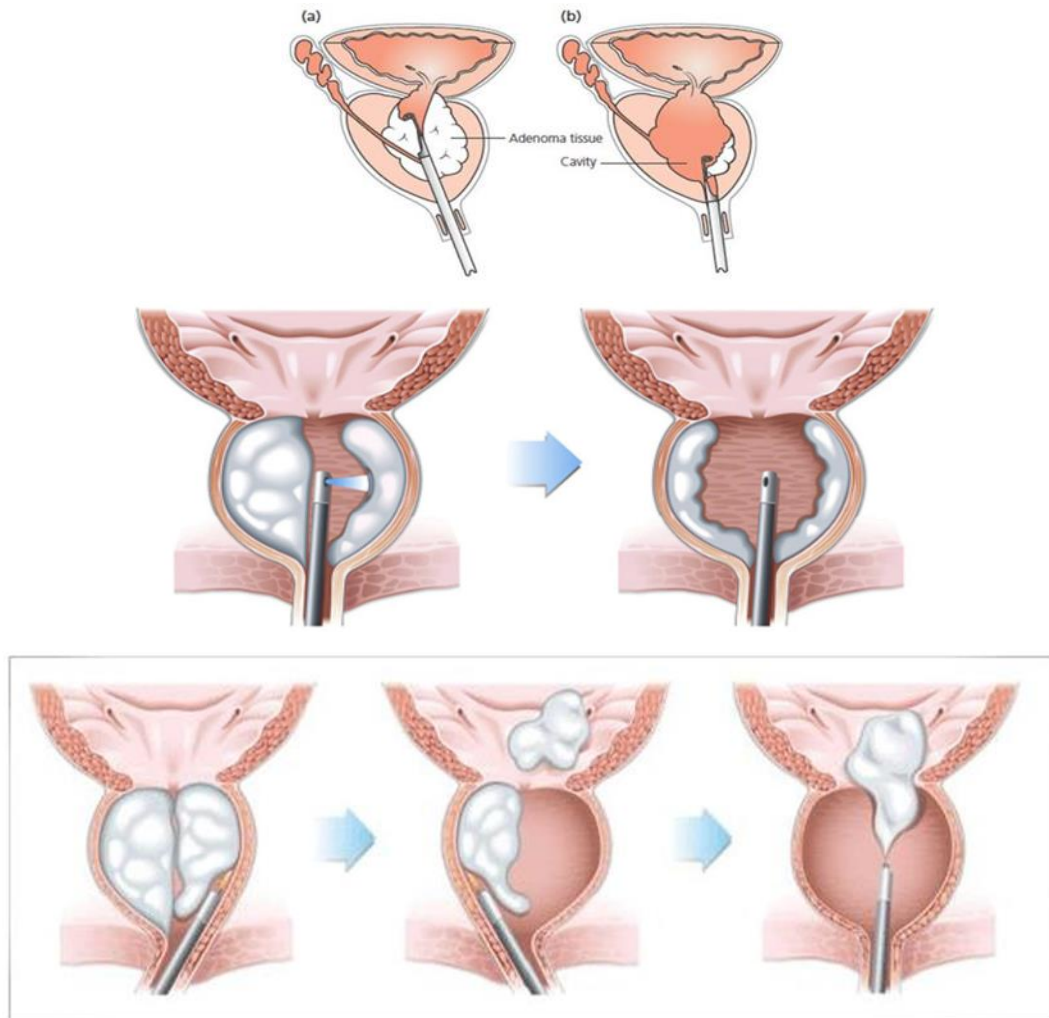
Minimally invasive

- Urolift (Dewbury/Pinderfields)
- Prostate artery embolization (Pinderfields +/- Leeds)
- Planned:
 - iTIND (Dewsbury)
- Not in UAN
 - Rezum (Airedale/Bradford)

Invasive

- Monopolar/bipolar TURP (Barnsley, Dewsbury, Pinderfields)
- Greenlight laser prostatectomy (GLL) (Dewsbury)
- Holmium laser enucleation of prostate (HoLEP) (Barnsley)

Intervention options for BPH within the UAN



Surgical decision making

	Your score out of 10
I want a local anesthetic procedure	
I want a day case procedure	
I don't want a catheter	
I want maximum improvement in symptoms	
I want maximum improvement in urinary flow	
I don't want urine leakage	
I want to keep my erections	
I want to be able to ejaculate semen when I climax in sex	
I don't want a narrowing (stricture) do develop in my water pipe	
I want a permanent solution – something that works for the rest of my life	

Surgical Procedure	Size recommendation	Level of evidence
TURP (Mono or Bi Polar)	30-80 ml	Strong
Green Light Laser	Any size prostate	Strong
HoLEP	Any size prostate	Strong
PAE	Under investigation	Weak
Rezum	30-80 ml	Under investigation
Urolift	<70ml and no middle lobe	Strong
Bipolar Enucleation	Not specified	Weak
<i>Based on European Association of Urology 2022 and NICE guidelines</i>		

Questions?

- Thank you

