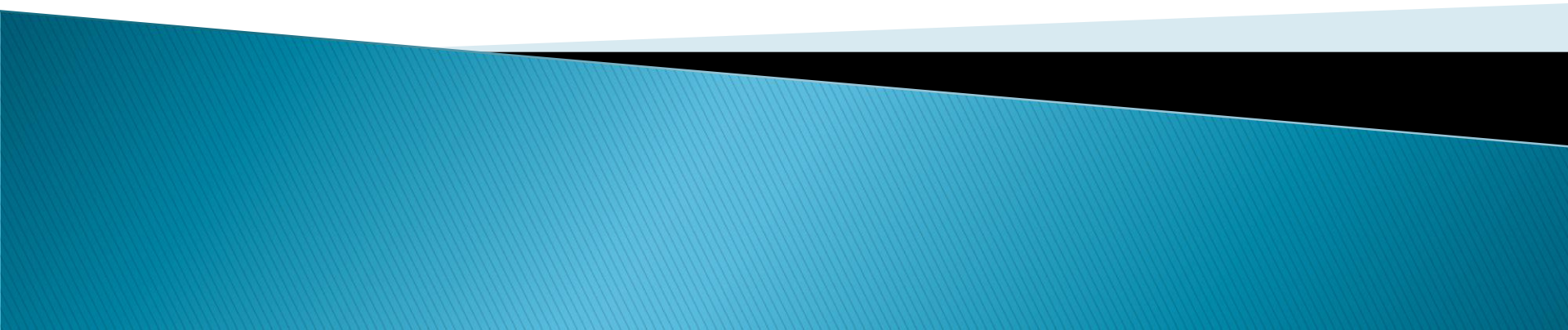
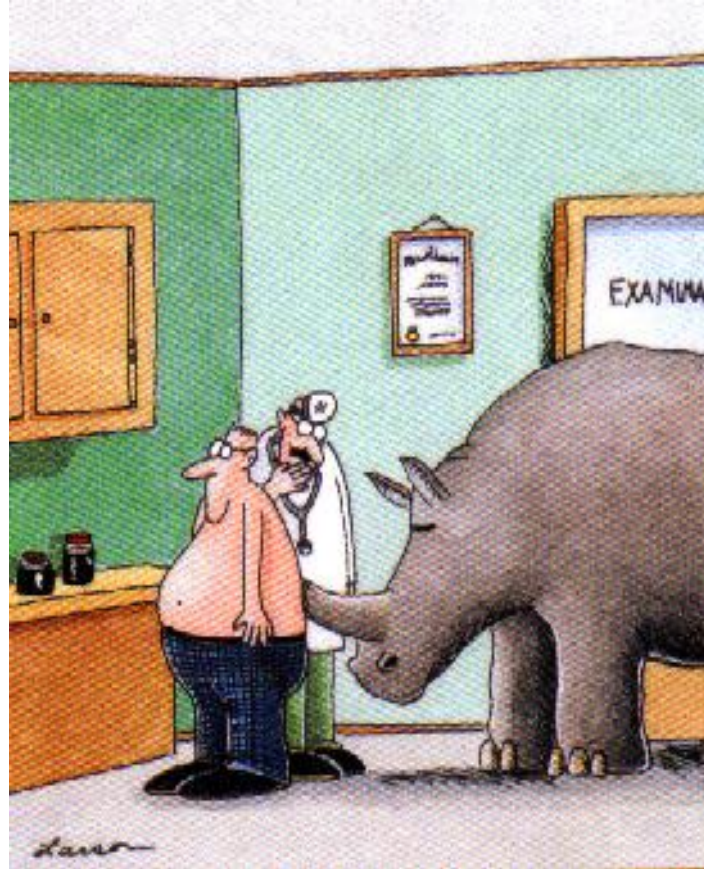


Workshop : Managing Urinary Stones and BPH

Dr John Tuckey
Urologist
Auckland

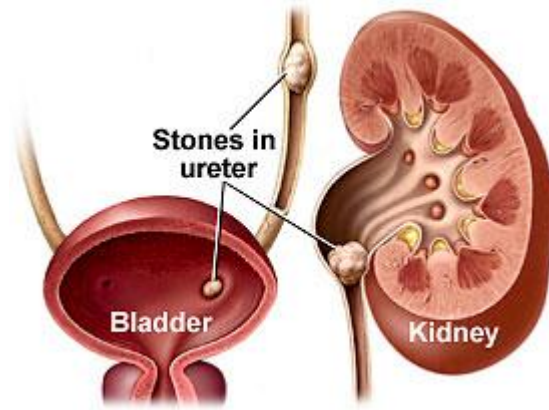


Kidney Stones

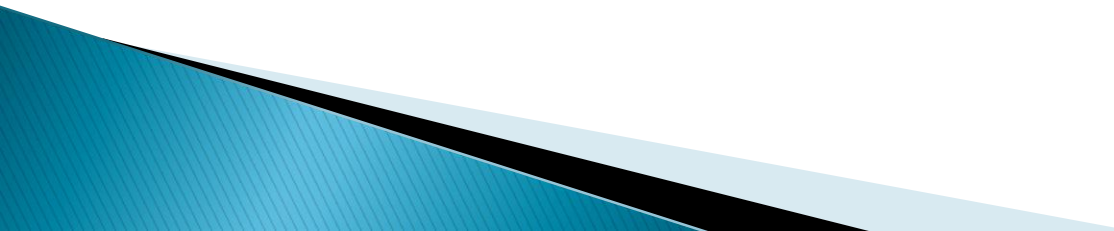


Well Mr. Osborne, it may not be kidney stones after all.

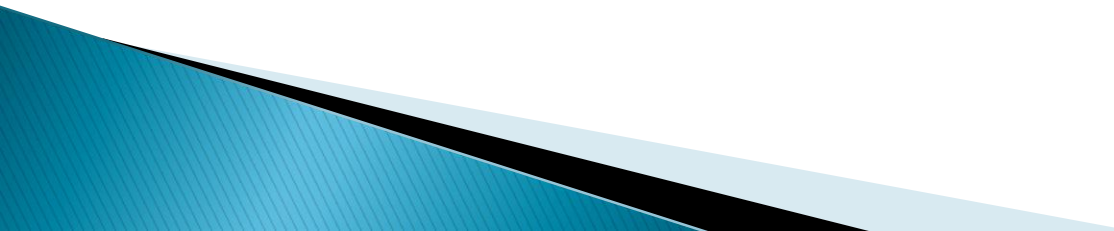
Urinary Stones



How common are they?

- ▶ lifetime risk 15% men, 6% women
 - ▶ males 2.3:1
 - ▶ 105 new stones /100,000
 - ▶ peak age incidence 30–50
- 

How common are they?

- ▶ 1 / 3 renal – often haematuria
 - ▶ 2 / 3 ureteric – usually pain
 - ▶ 1 / 3 have previously had a stone
 - ▶ 20% have a family history
- 

How do they present?

- ▶ Loin or loin to groin pain
- ▶ Typically colicky, patient cannot get comfortable
- ▶ beware – older patient – AAA
 - distal stones – irritative without pain

Investigation

- ▶ MSU

 - microhaematuria 10% no RBC's

- ▶ Blood Ca Hyperparathyroidism

 - Urate Uric acid stones
Nidus for Ca stones

 - Creatinine

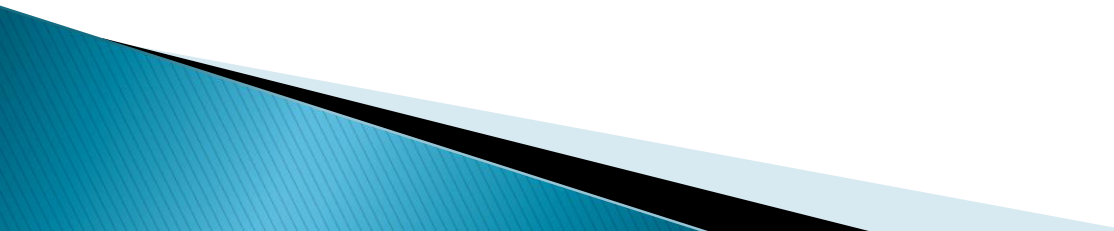
Diagnosis – Plain X ray



Intravenous Urogram – IVU



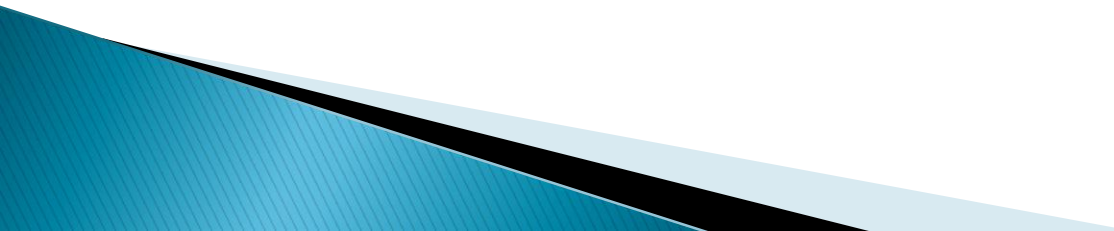
Ultrasound

- ▶ Accuracy around 80%
 - ▶ Ureteric stones can be missed
 - ▶ Best for follow-up or recurrent stone formers
 - ▶ Hydronephrosis infers a PUJ/ureteric stone
 - ▶ Ureteric jet
- 

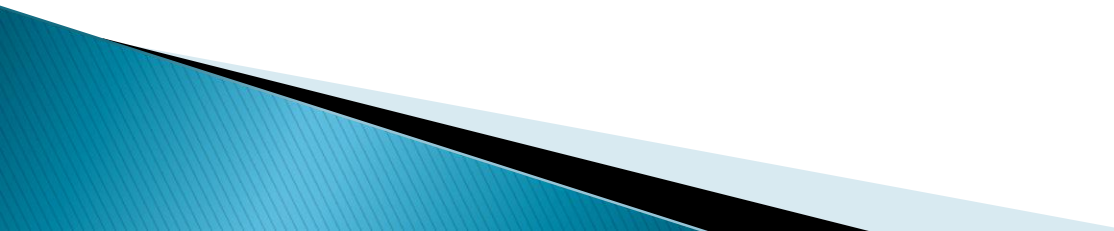
CT Urogram (C-)



CT Urogram (C-)

- ▶ accuracy around 99%
 - ▶ quick
 - ▶ best for ureteric stones
 - ▶ size and position of stones
 - ▶ anatomic detail for renal stones
- 

CT Urogram (C–)

- ▶ associated pathology
 - ▶ low dose protocols – accuracy vs dose
 - ▶ other MRI – stones not visible
- 

Natural History

- ▶ ureteric stones
 - 80–90% <5mm pass
 - usually 1–3 weeks
 - remove at 6 weeks
- ▶ renal stones
 - unlikely to pass

Management

- ▶ Refer if
 - ureteric stones 6mm or larger
 - ongoing pain
 - renal impairment
 - infection
 - pregnant
 - renal stones (outpatient)

Management

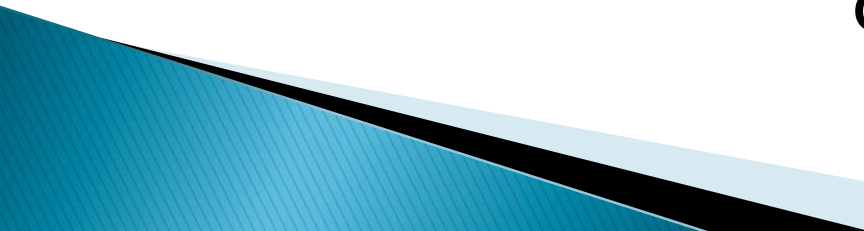
- ▶ Fluid intake

- ▶ Medication – if creatinine normal

Diclofenac 75 mg

- ureteric smooth muscle relaxation

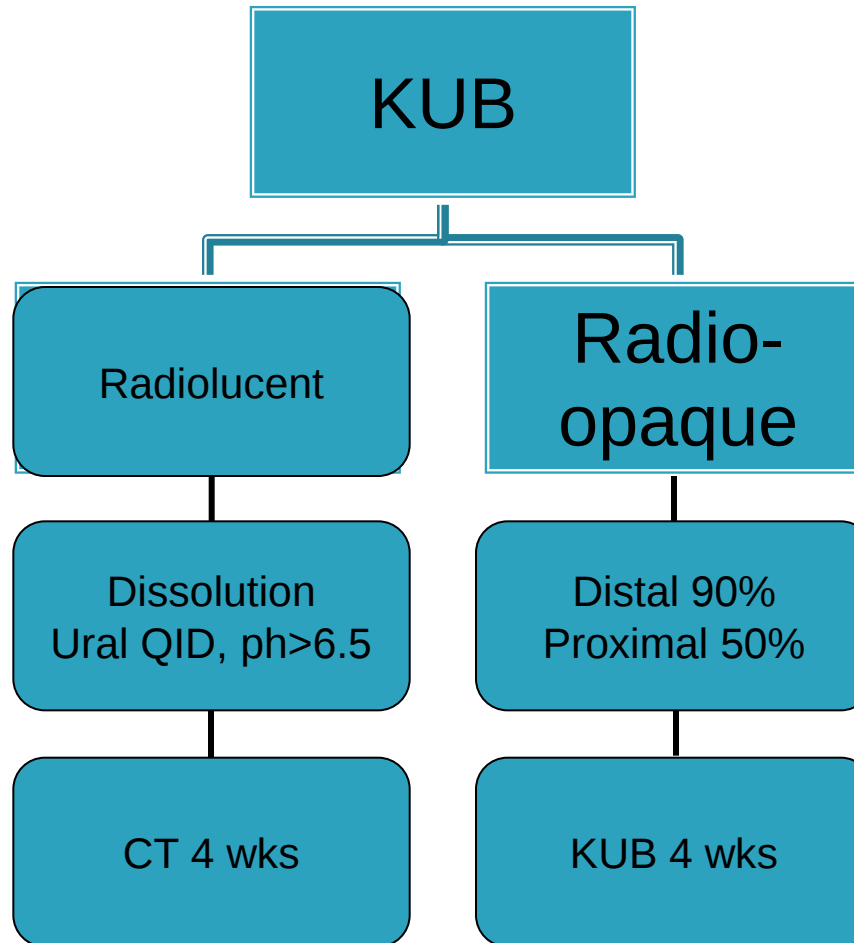
alpha blockers
ca antagonists



Expulsive Therapy–Alpha blockers

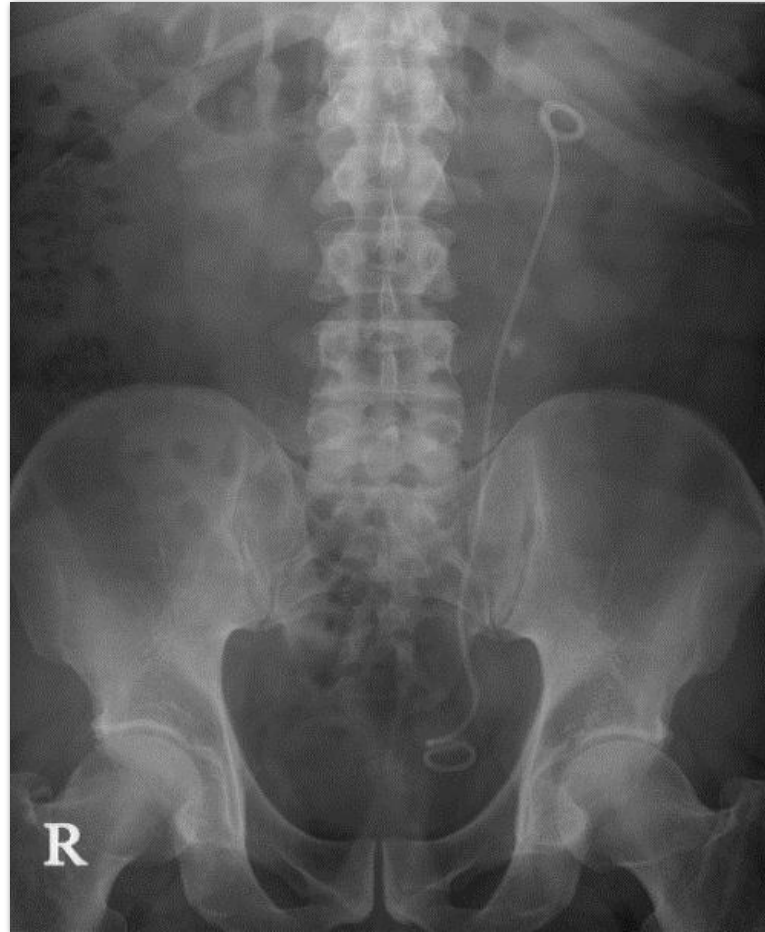
- ▶ chance of passing
 - Doxazosin 38%–70%
 - Tamsulosin 57%–88%
- ▶ time to passing
 - Tamsulosin 7vs12 days
- ▶ analgesia
 - 0.14 vs 2.78 vials
- ▶ which alpha blocker?

Follow-up



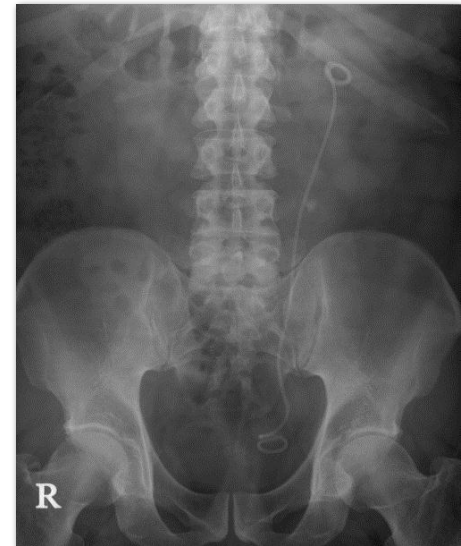
What are the options if medical management fails?

Ureteric Stent



Ureteric stents

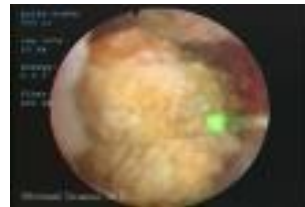
- ▶ protect kidney, prevent obstruction
- ▶ stent pain an issue
- ▶ symptoms improve with
alpha blockers
anticholinergics
- ▶ remove if no improvement



What are the options if medical management fails?

- ▶ Mid and lower ureter

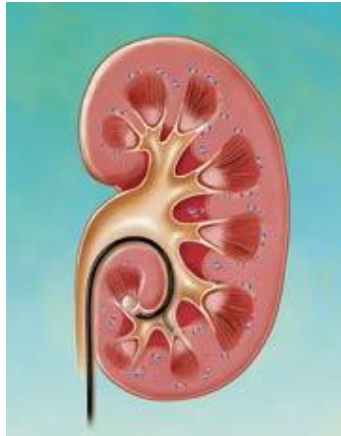
rigid ureteroscopy



What are the options if medical management fails?

- ▶ Upper Ureter and Kidney

Flexible Ureteroscopy

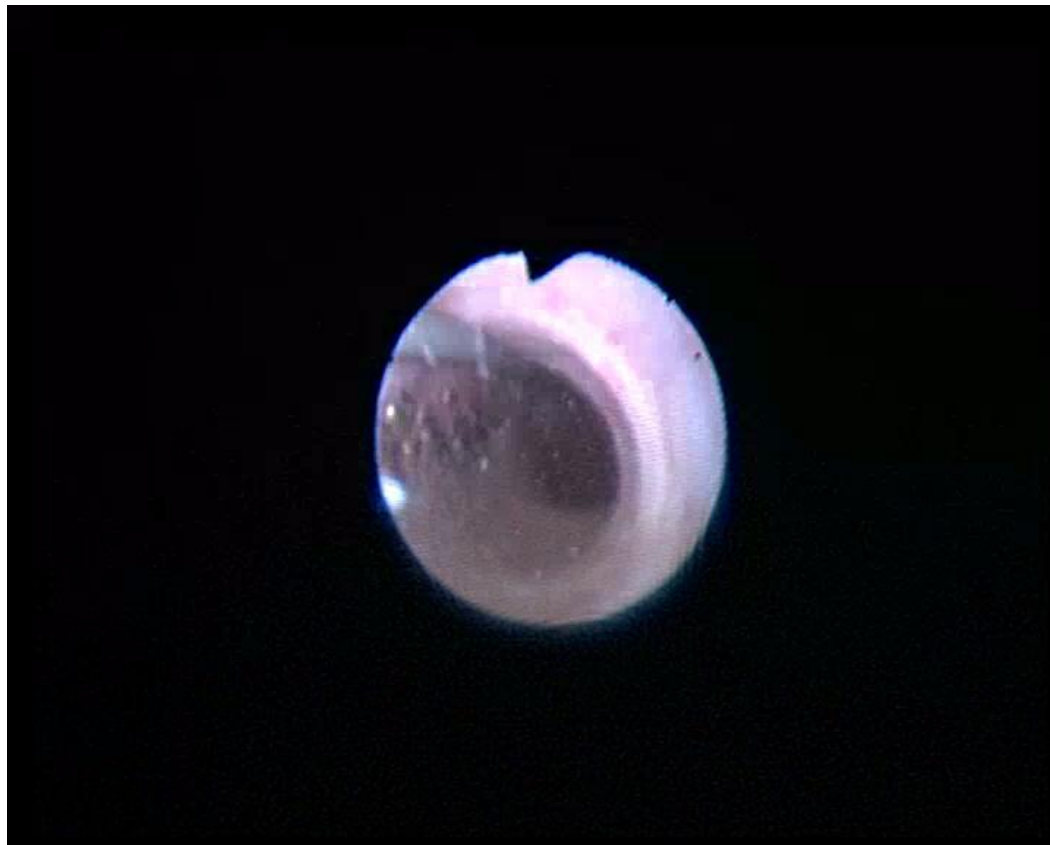
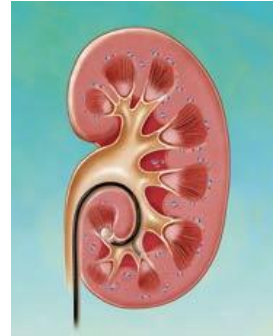


Lithotripsy



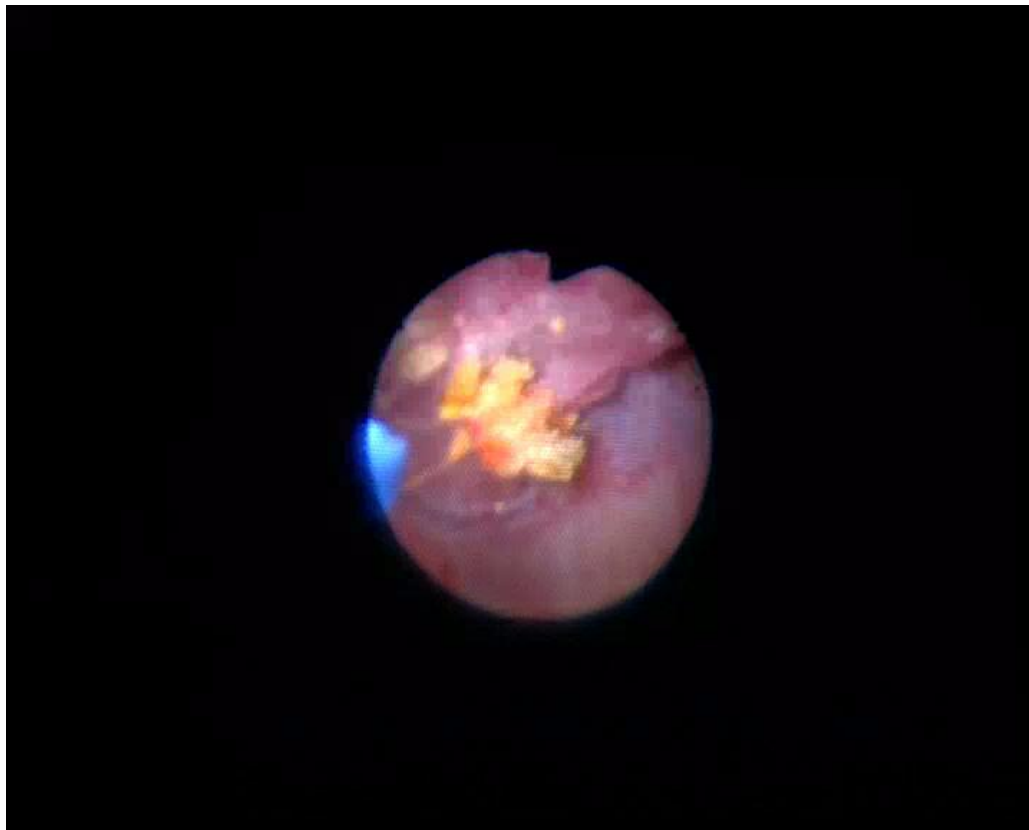
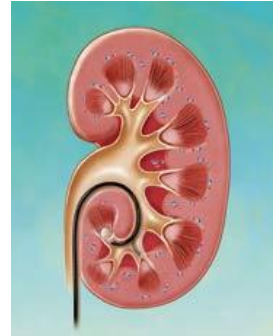
Flexible Ureteroscopy

- ▶ Upper Ureter and Kidney



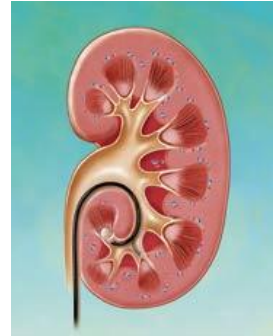
Flexible Ureteroscopy

- ▶ Lasering stones



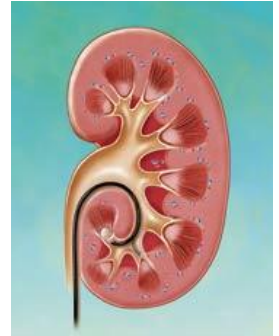
Flexible Ureteroscopy

- ▶ Basketing Stones



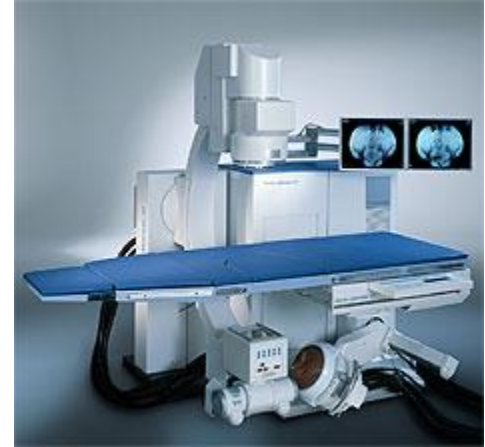
Flexible Ureteroscopy

- ▶ Basketing Stones



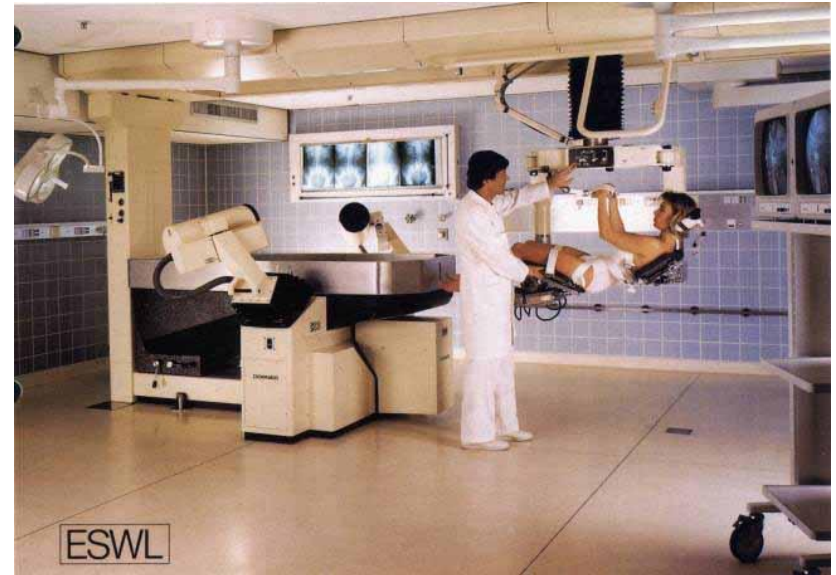
Extracorporeal Shock Wave Lithotripsy (ESWL)

- ▶ Acoustic waves
- ▶ Dornier aircraft manufacturer
- ▶ Prototype 1980, first HM3 1984

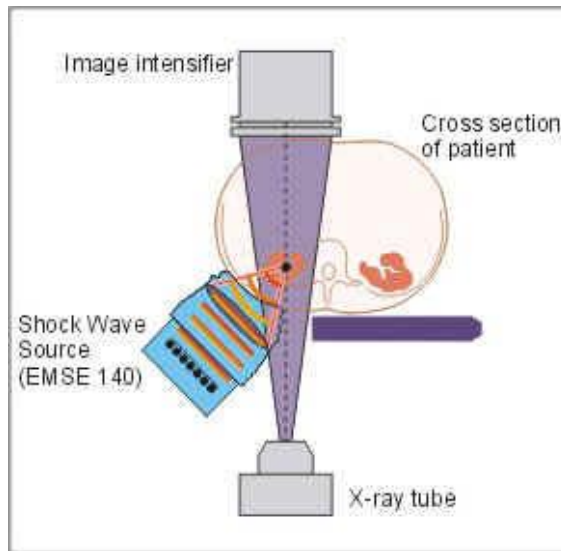


The original Lithotripter

- ▶ HM3 American trials
 - solitary renal calculi
 - < 1 cm
 - success 77–90 %



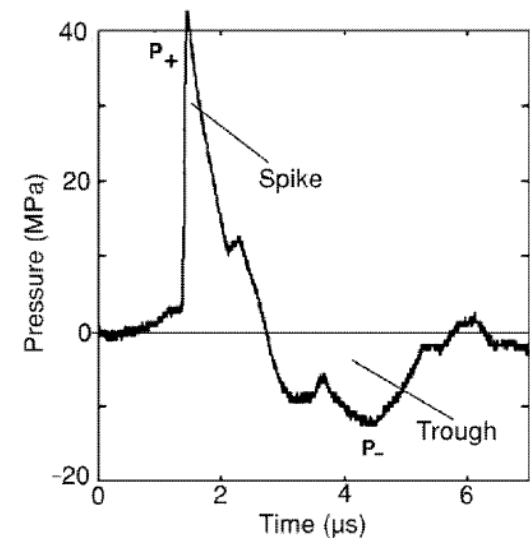
Shock Wave Generation



How does ESWL work?

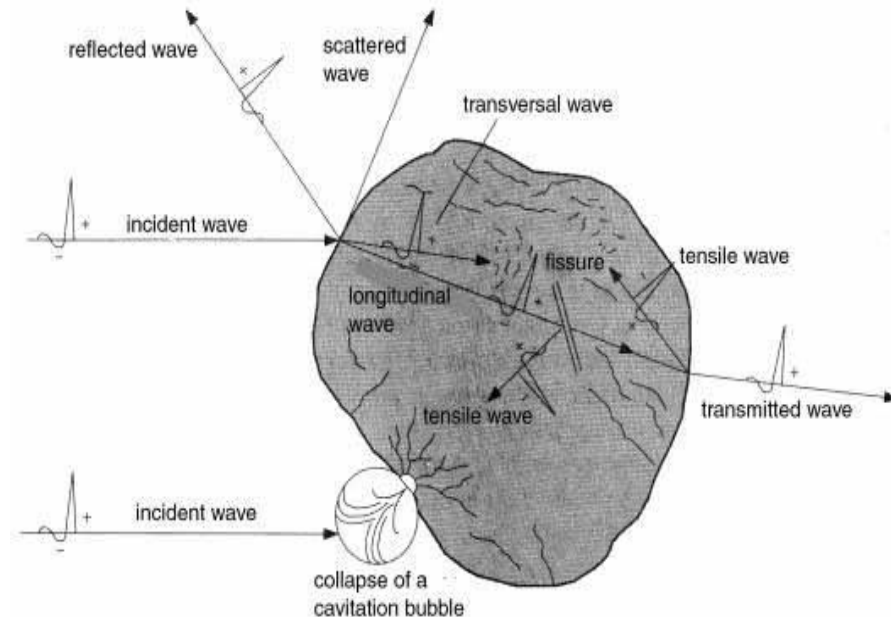
- ▶ Dynamic fracture – compression wave
– tensile tail
- ▶ Erosion – cavitation

SW Lithotripter Pressure Tracing

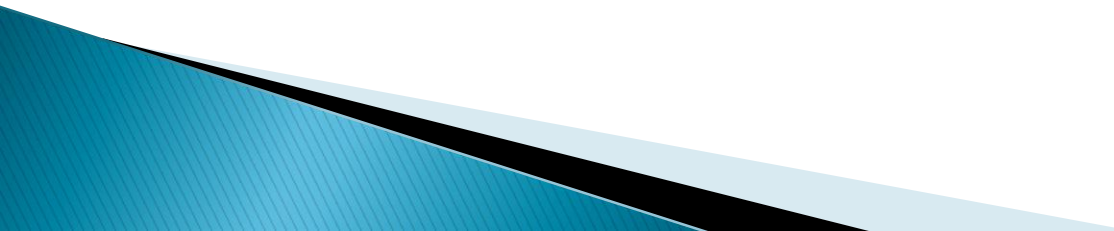


Cavitation

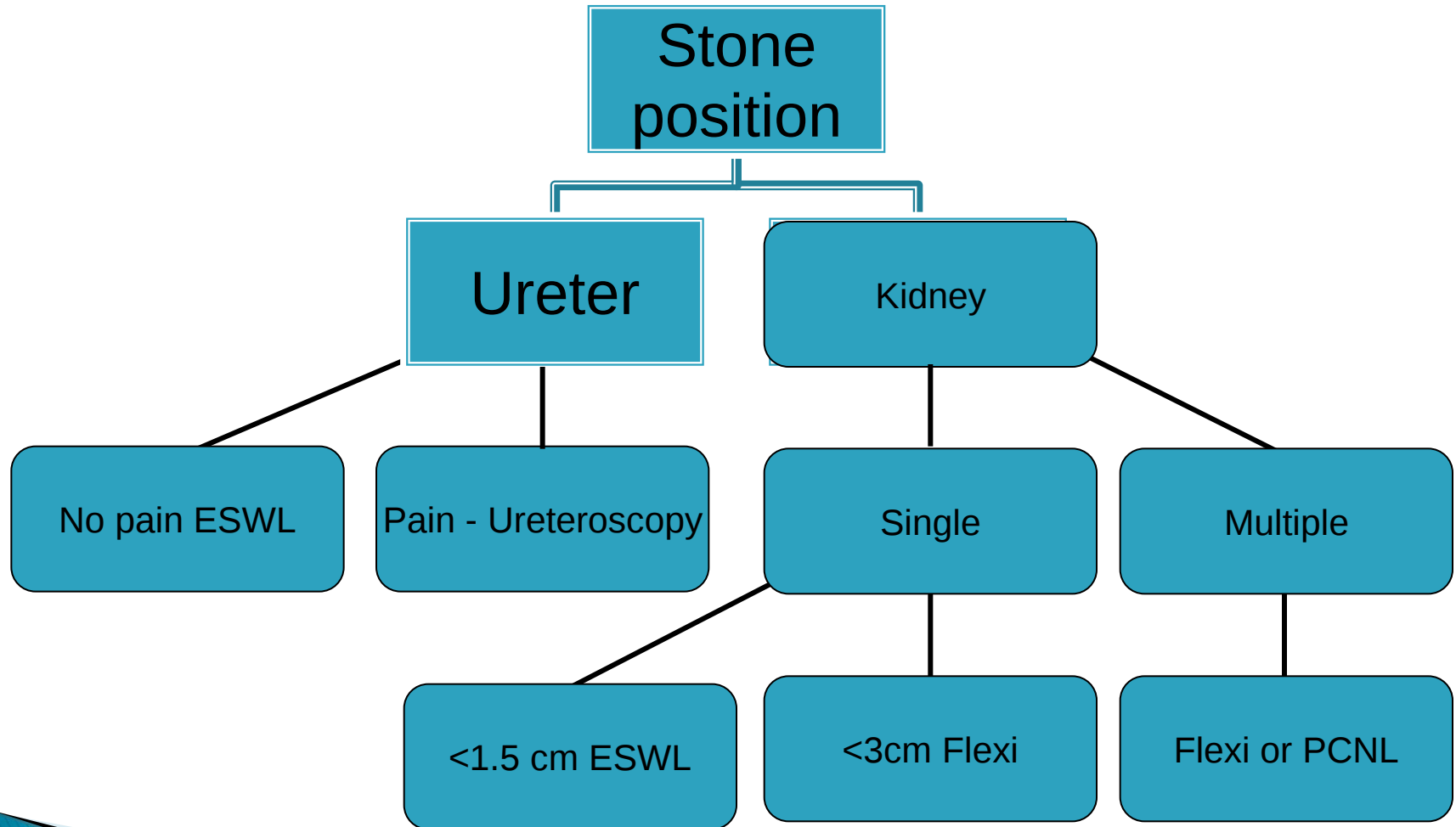
- ▶ Bubble cluster collapse
 - filled with vapour
 - powerful water jet
 - can pit metals



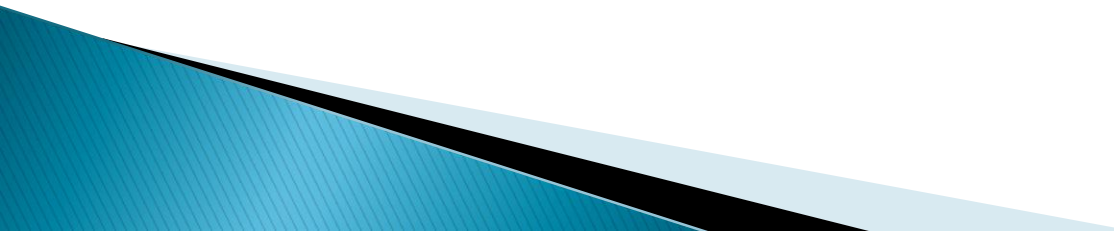
Surgical options

- ▶ ESWL – success 70 %, day stay
 - ▶ Flexi – success 90–95%, day or 1 night stay
 - ▶ PCNL – success 90–95%, 3–4 nights
- 

Surgical options

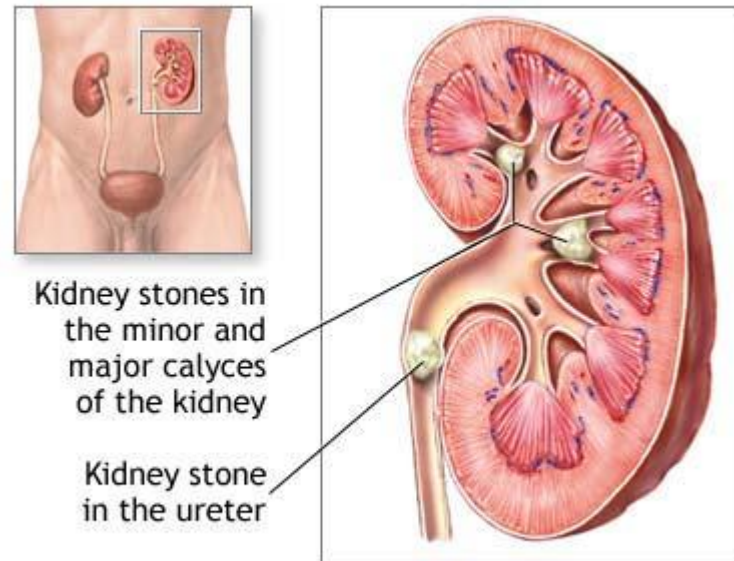


Stone Prevention

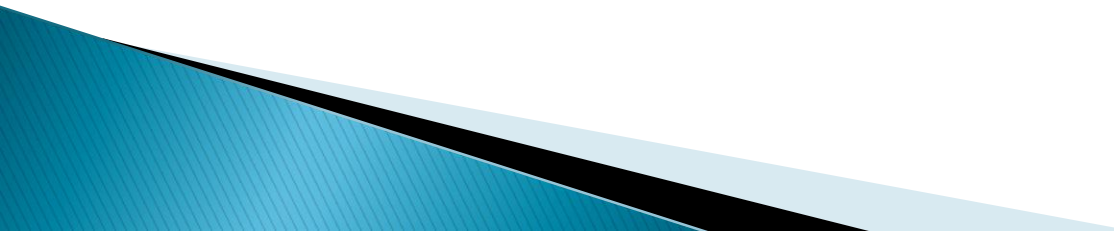
- ▶ 50% develop another stone within 10 yrs
 - ▶ Reduce to 20% with lifestyle/medication
 - ▶ GP's ideally placed
- 

Why do stones form?

- ▶ ***Solubility product:*** concentration in pure solution at which crystallisation begins
- ▶ Stone inhibitors
- ▶ Stone promoters
- ▶ Temperature, pH



Fluid

- ▶ most common problem
 - ▶ most important factor
 - ▶ aim for clear urine or 2 litres output
 - ▶ compliance an issue
- 

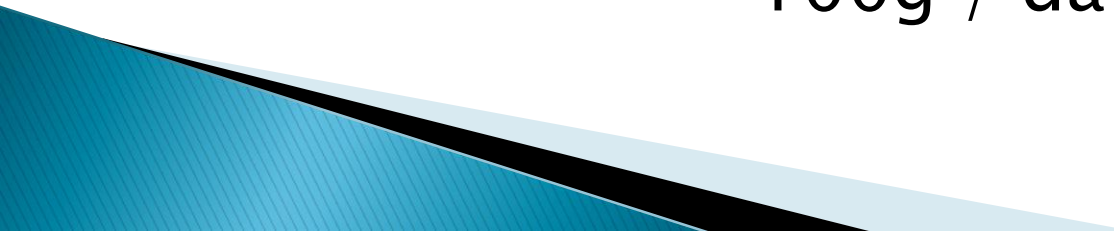
Is diet relevant?



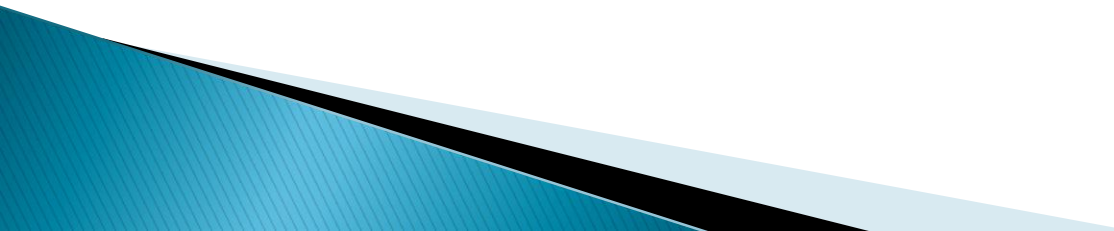
Dietary Changes

- ▶ calcium
 - intake inversely related to risk
 - 2+ servings per day
- ▶ oxalate
 - 15x more potent than calcium
 - nuts, spinach, chocolate, taro, rhubarb
- ▶ citrate
 - 1 lemon/day

Dietary Changes

- ▶ salt
 - increases calcium excretion
 - healthy heart advice
 - ▶ protein
 - increased uric acid, oxalate
 - acid buffering in bone
increased calcium excretion
 - 100g / day
- 

Medication

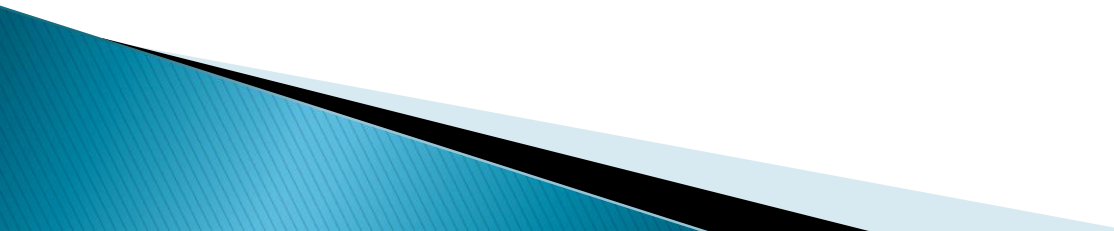
- ▶ Allopurinol – hyperuricaemia
– hyperuricosuria
 - ▶ Thiazides – hypercalciuria
- 

Recurrent stone formers

- ▶ 24 hour urines give more detail about risks
 - commonest findings

low fluid intake

high calcium excretion



Recurrent stone formers

- ▶ 24 hour urines
 - normal diet and fluid intake
 - results can vary
 - 6 is best
 - two as a compromise

Recurrent stone formers

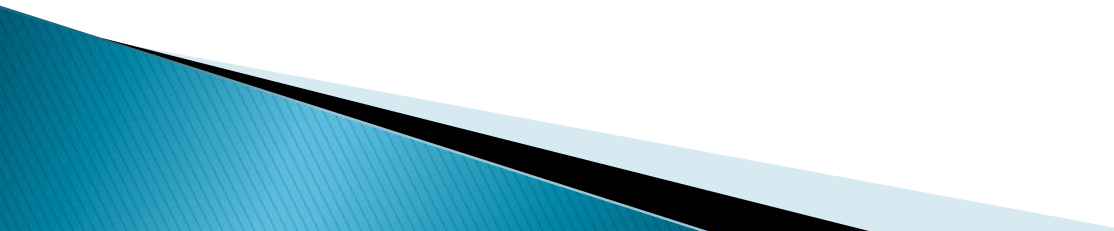
- ▶ 24 hour urines

Acid Ca, PO₄, Citrate, Oxalate

Non-acid uric acid , sodium

- ▶ if abnormal refer to a Urologist with an interest

Stone Prevention Summary

- ▶ 50% chance of more at 10 years
 - ▶ urine output over 2 L per day (clear urine)
 - ▶ moderate calcium intake
 - ▶ reduced dietary oxalate, meat, sodium
 - ▶ citric acid – juice of 1 lemon / day
- 

Stone Prevention Summary

- ▶ monitor fluid/diet at yearly wellbeing check
- ▶ imaging at 1 year
- ▶ imaging periodically thereafter



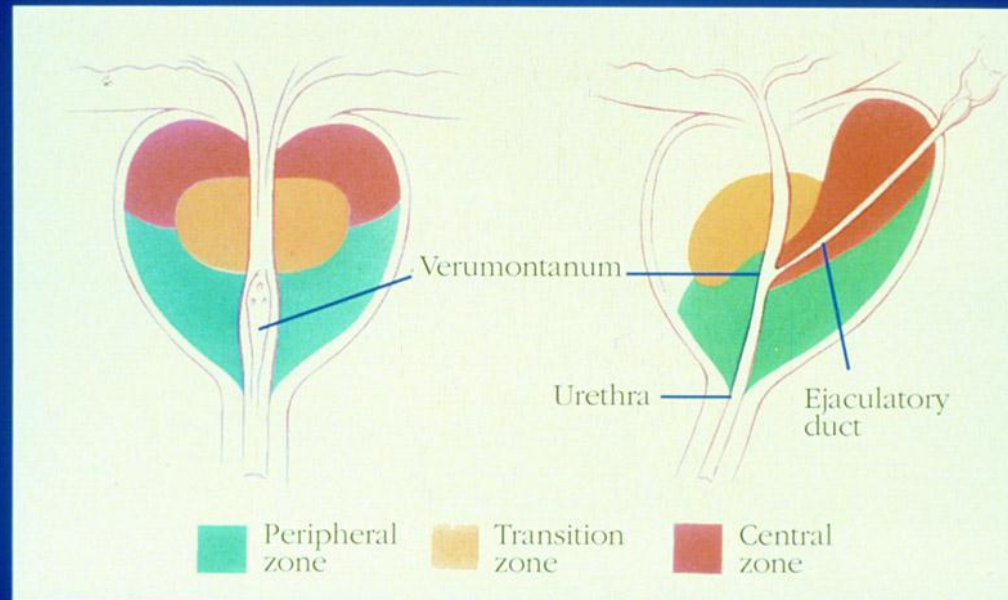
“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”

Benign Prostatic Hyperplasia



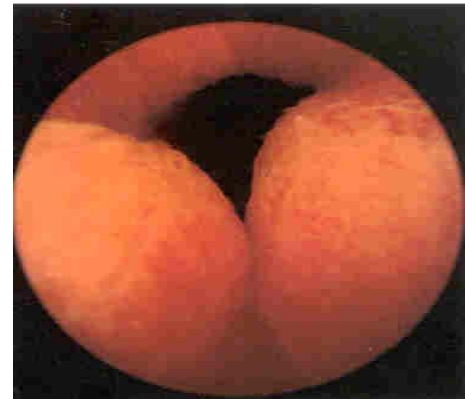
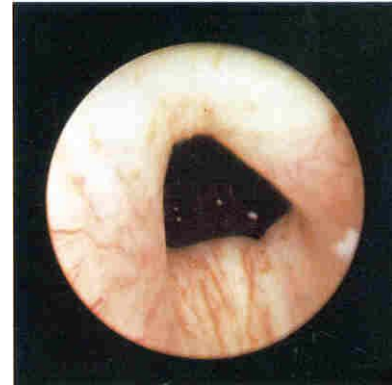
BPH

Development of Prostatic Diseases – Zonal anatomy of the prostate



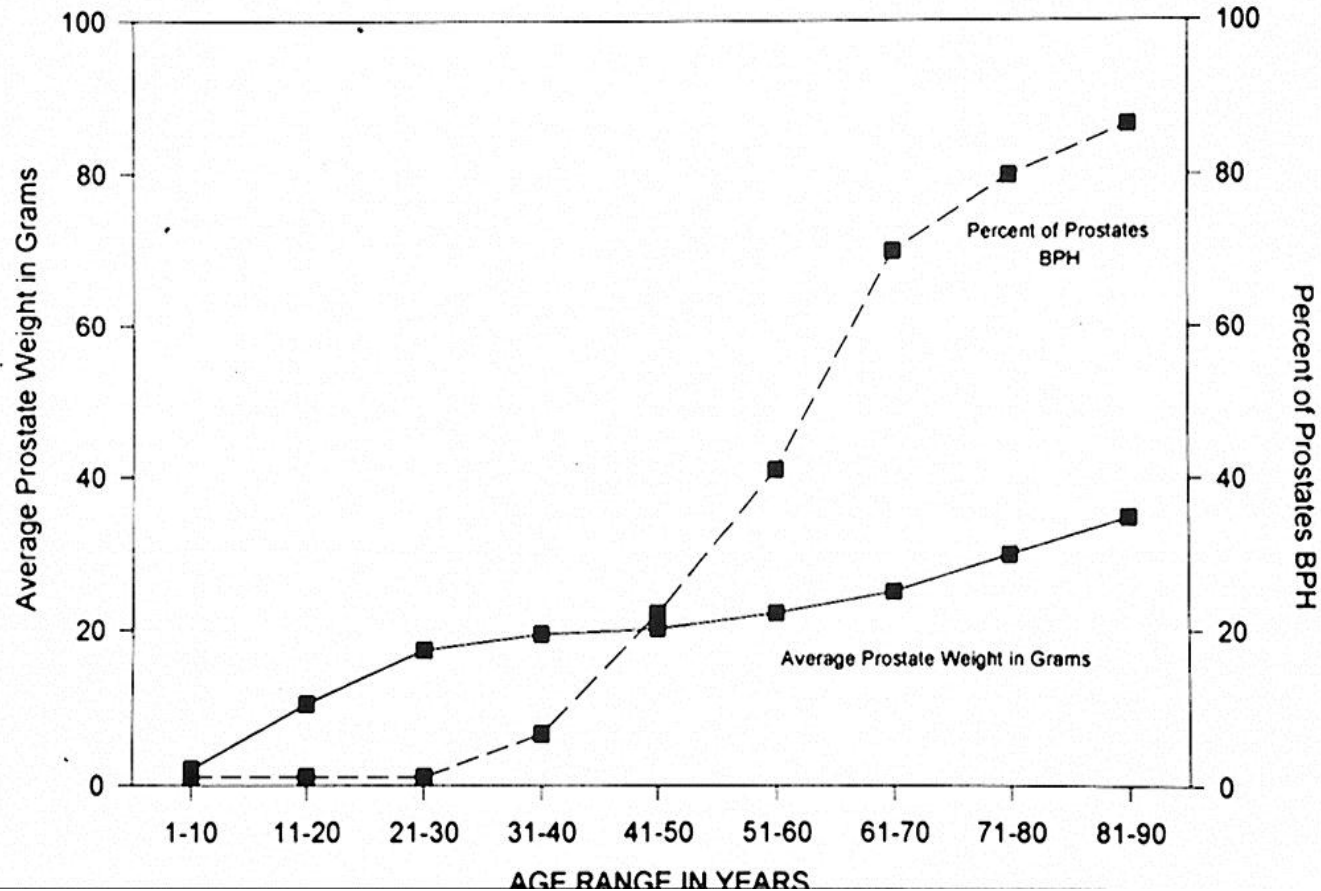
BPH

- ▶ Transition zone increases in size with age



Prostate and Age

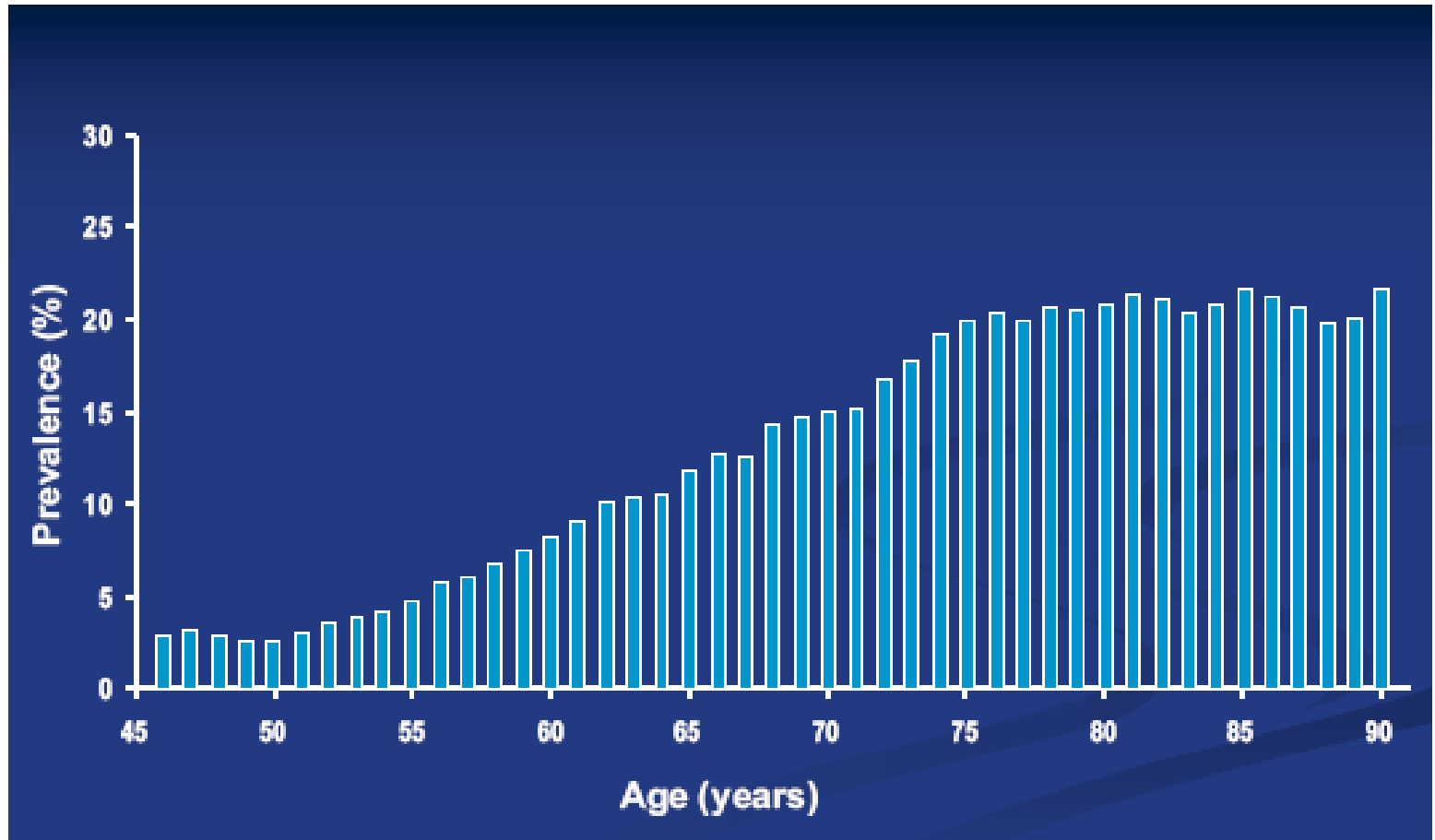
AGE RELATED CHANGES IN HISTOLOGIC BPH
AND SIZE OF THE HUMAN PROSTATE



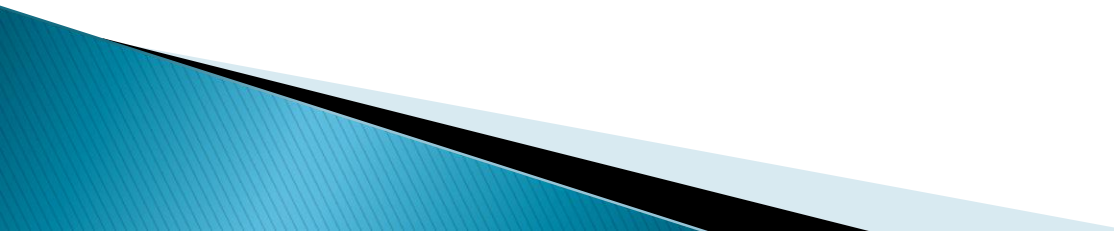
BPH

- ▶ 50% of histological BPH have benign enlargement
- ▶ 50% of benign enlargement have symptoms

Prevalence of LUTS and Age



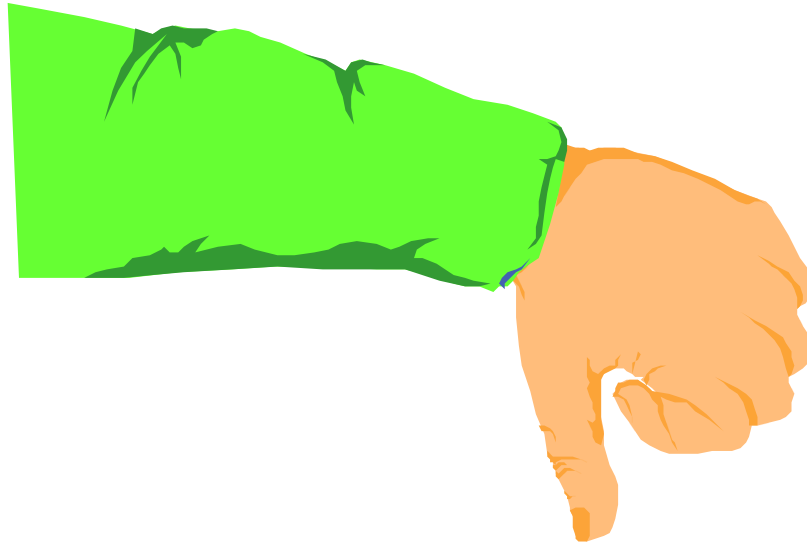
Can BPH be prevented?

- ▶ Age
 - Androgens
 - Genetic
 - Growth factors
 - Inflammation, Ischaemia, Nitric oxide
- 

Can it be prevented?

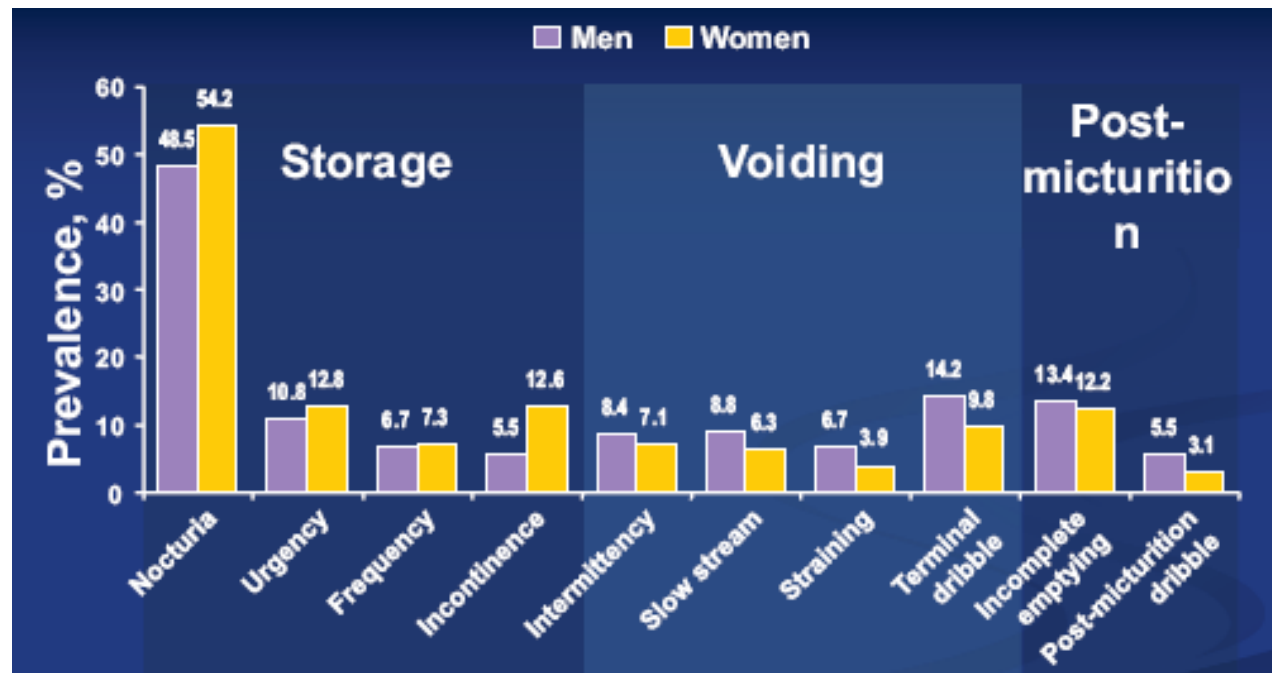
- ▶ Metabolic syndrome is associated with BPH
 - fasting glucose
 - diabetes
 - BMI

Prostatism?



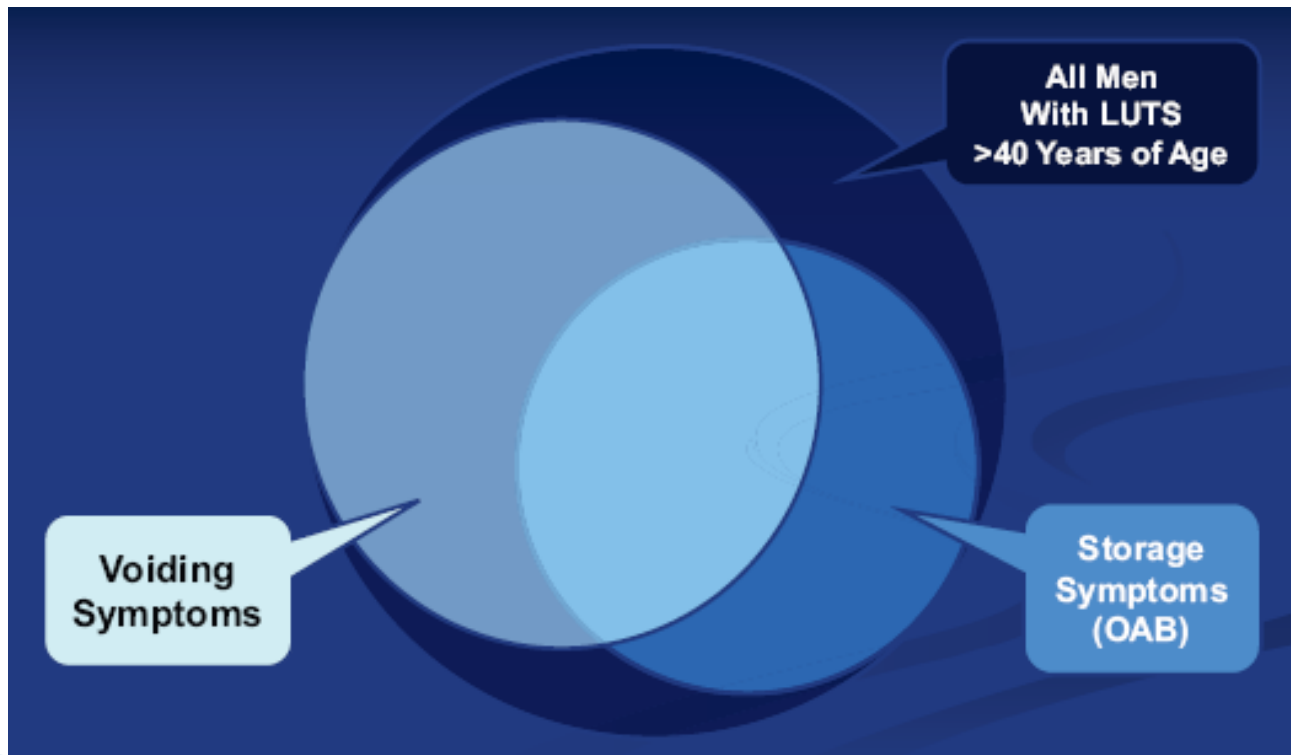
Lower Urinary Tract Symptoms

- ▶ aetiology could be bladder/prostate/urethra
- ▶ they are not sex-specific



Lower Urinary Tract Symptoms

- ▶ look at the pattern to obtain a likely diagnosis

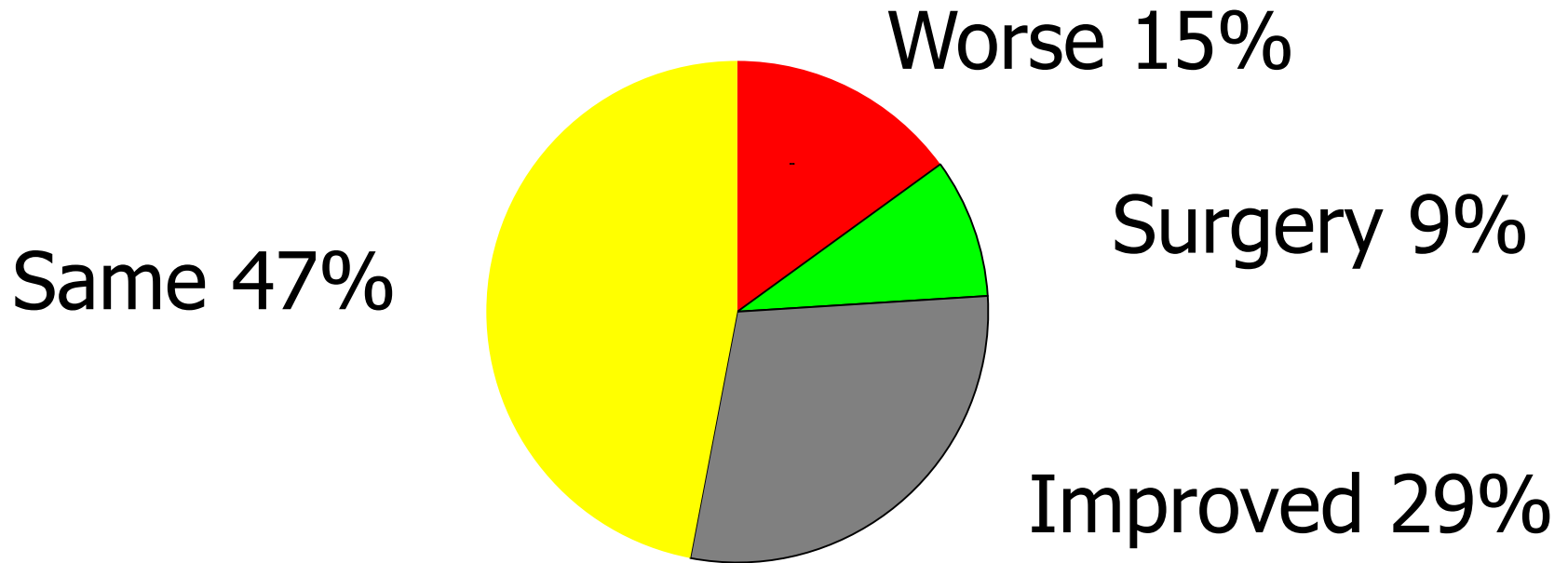


LUTS

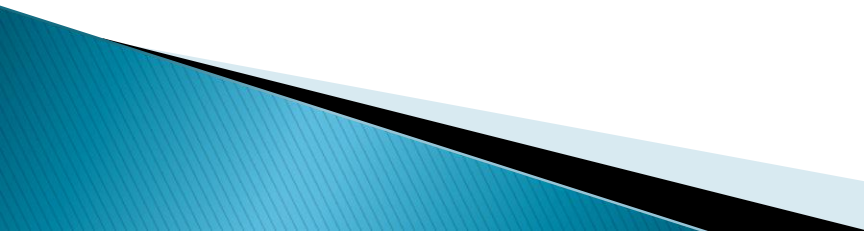
- ▶ voiding symptoms due to urethral narrowing
 - reduced flow, hesitancy, emptying
- ▶ storage symptoms are most annoying
 - over active bladder or obstruction
 - frequency, urgency, incontinence
nocturia

Natural History

- ▶ symptoms wax and wane

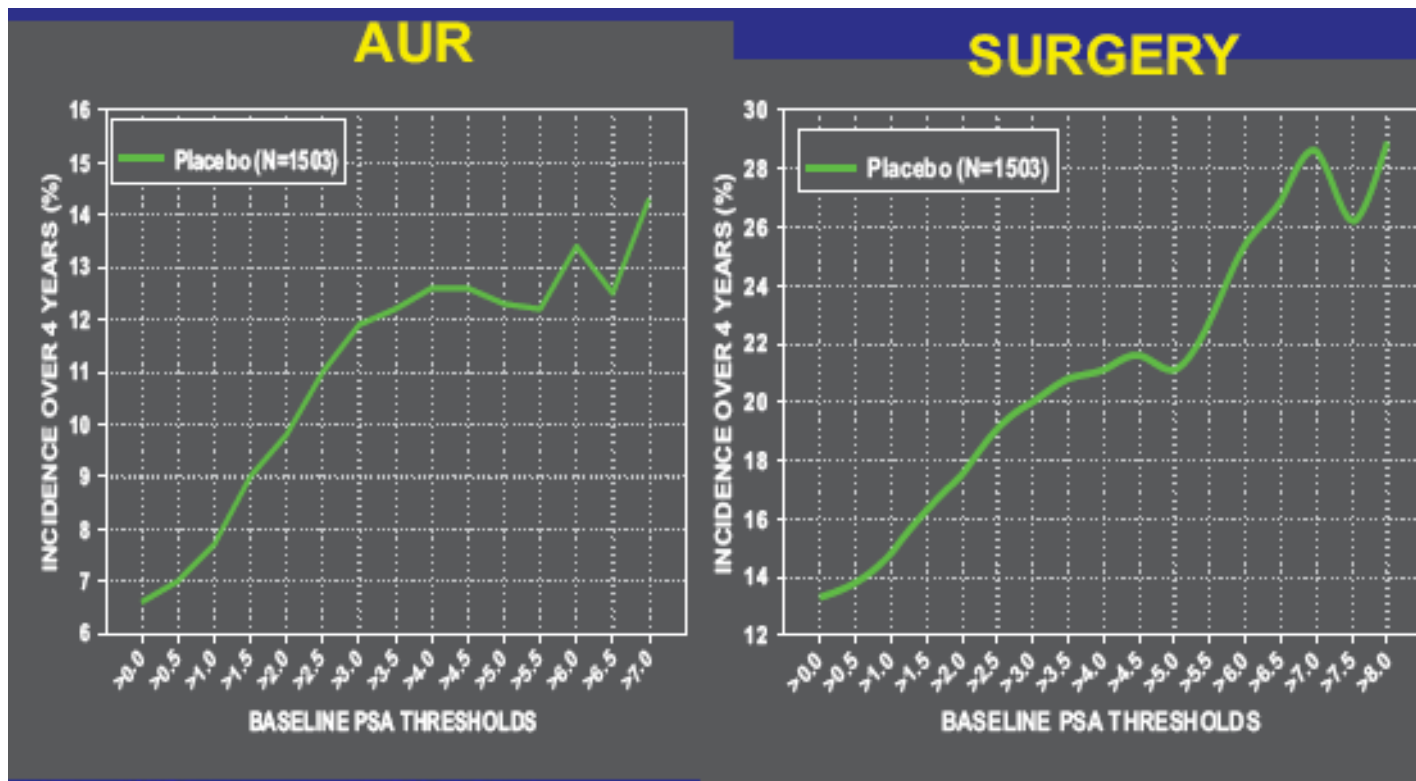


Natural History

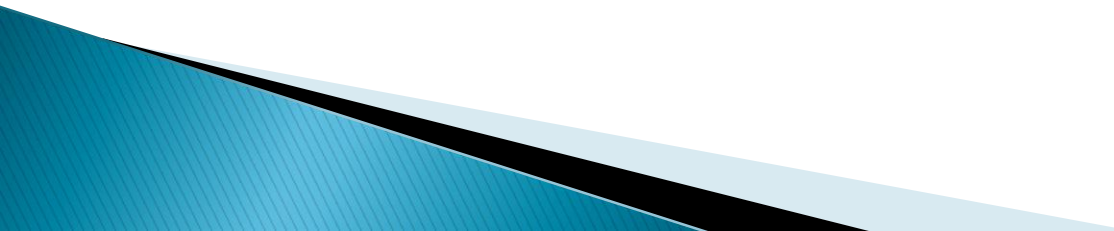
- ▶ prostate growth 1–2g per year (age, PSA)
 - ▶ retention 0.5–2.0% over 4 years
 - ▶ risk increases with age 70+
PSA >4
volume >40g
slower flow <12mls/sec
- 

PSA and Complications

- cumulative incidence of retention or surgery

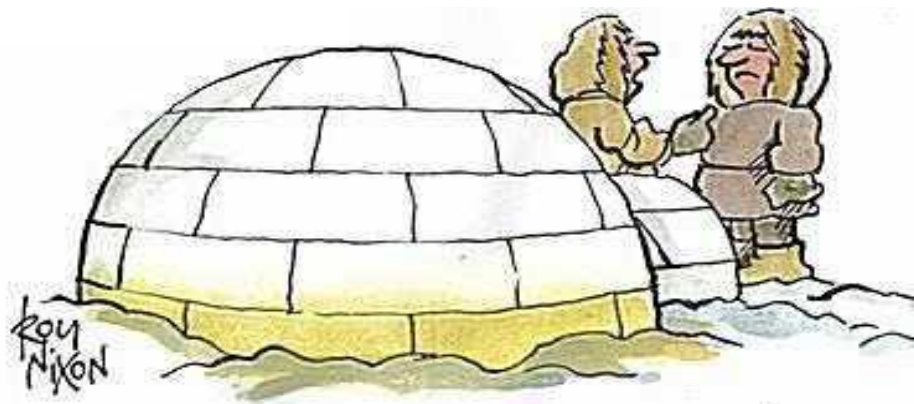


History

- ▶ the bladder is an unreliable witness
 - ▶ listen to the partner
 - ▶ men understate their symptoms
 - ▶ patients may not notice gradual changes
- 

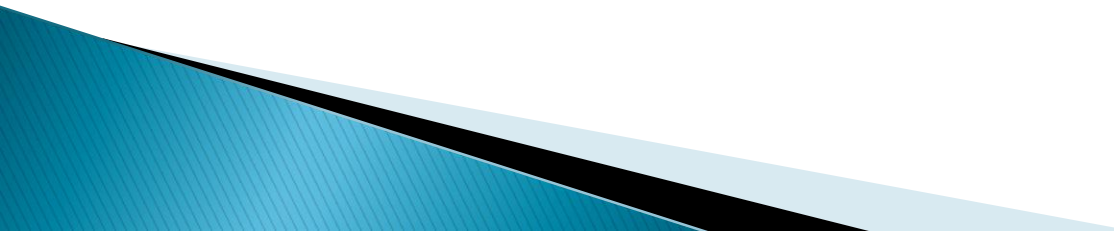
History

- ▶ Nocturnal enuresis is pathognomonic for chronic retention

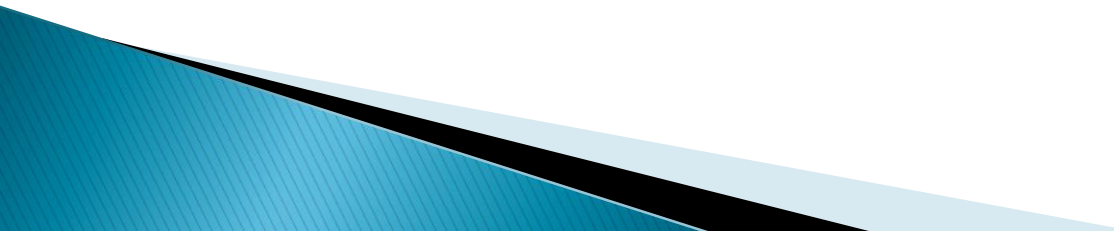


"YOU CAN DENY IT TILL YOU'RE BLUE IN THE FACE BUT
YOU'RE DEFINITELY INCONTINENT!"

History

- ▶ beware haematuria/pain
 - ▶ abrupt ending of flow
 - ▶ dysuria or infections
 - ▶ difficulty voiding particularly with alcohol
- 

History

- ▶ Fluid intake – ask volume and type
 - ▶ Constipation may affect symptoms
 - ▶ Past History
 - STD
 - strictures
 - surgery
 - diabetes, cancer
- 

History

- ▶ Medications
 - anticholinergics
- ▶ Family history
 - 1st degree relative
 - 2–4 risk of TURP

Examination

- ▶ Abdomen – often unrewarding
- ▶ Genetalia – meatal stricture
- ▶ Prostate
 - BPH (thenar emminence)
 - Ca (knuckle)
 - anal tone and sensation
- ▶ Ankles – oedema → nocturia

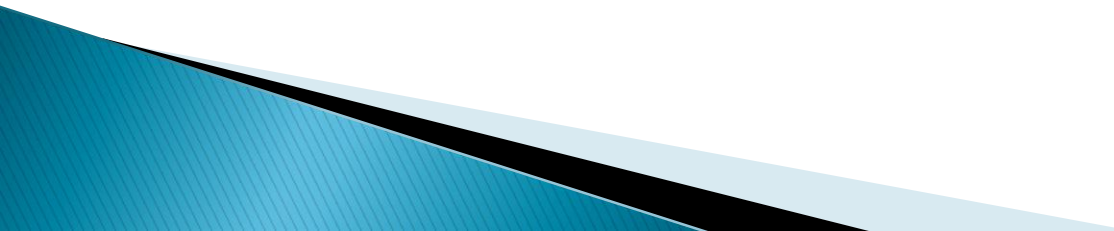
Examination

- ▶ Prostate
 - 2 fingers – 40g
 - 3 fingers – 60g
 - 4 fingers – 100g
- ▶ If you don't put your finger in, you will put your foot in

Is prostate size important?

- ▶ Prostate – small glands can cause problems
 - bladder neck rather than prostate
 - long history
 - usually use cubicles
 - respond well to alpha blockers

Investigation

- ▶ MSU
 - ▶ Creatinine
 - ▶ PSA
 - ▶ Ultrasound not required
- 

Fluid Balance Chart

[illegible]

IPSS

- ▶ does not diagnose BPH
- ▶ increases with age
- ▶ basis for management

score <8
score 8+

fluid
fluid+meds

- ▶ measuring response

INTERNATIONAL PROSTATE SYMPTOM SCORE SHEET

Dr Name: _____ Address: _____
 Patient Name: _____ Address: _____
 Date: _____

Age Group: 40-49 ☐ 50-59 ☐
 60-69 ☐ 70+ ☐

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always	Your score
1. INCOMPLETE EMPTYING Over the past month, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5	
2. FREQUENCY Over the past month, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
3. INTERMITTENCY Over the past month, how often have you found you stopped and started several times when you urinated?	0	1	2	3	4	5	
4. URGENCY Over the past month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. WEAK STREAM Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
6. STRAINING Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	
7. NOCTURIA Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?	None	1 time	2 times	3 times	4 times	5 or more times	
	0	1	2	3	4	5	

Which of the above do you regard as most troublesome (1-7) _____

TOTAL PROSTATE SYMPTOM SCORE _____

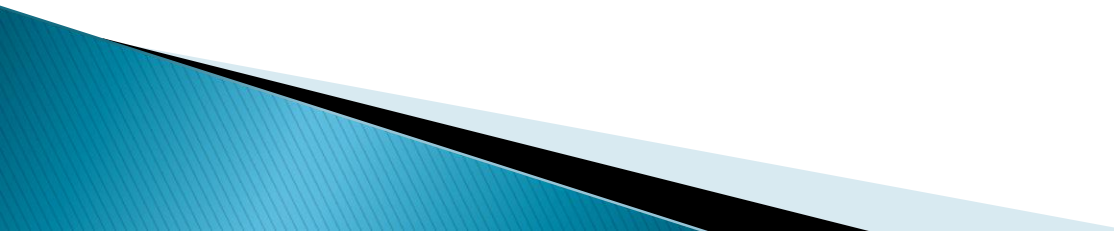
HYTRIN-BPH
 HYDROCHLORIDE
 5 mg tablets
 (See package insert for complete prescribing information.)

	Delighted	Pleased	Mostly satisfied	Mixed - satisfied and dissatisfied	Mostly dissatisfied	Unhappy	Terrible
QUALITY OF LIFE DUE TO URINARY SYMPTOMS If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that? (Pick one)	0	1	2	3	4	5	6

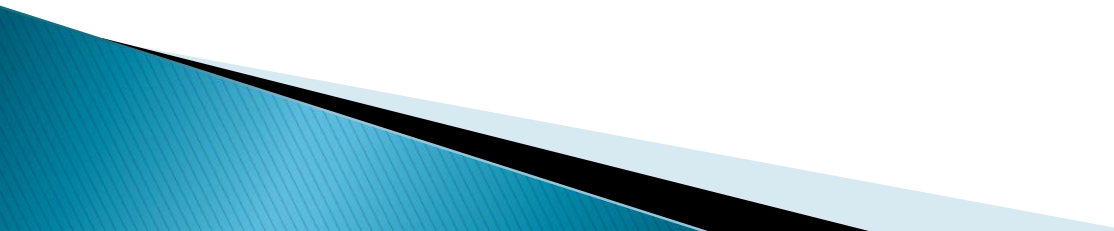
Management

- ▶ IPSS <8 fluid management
 - ▶ IPSS 8+ fluid management
alpha-blockers
finasteride
anticholinergics
phytotherapy
 - ▶ Surgery failed medical management
or complications
- 

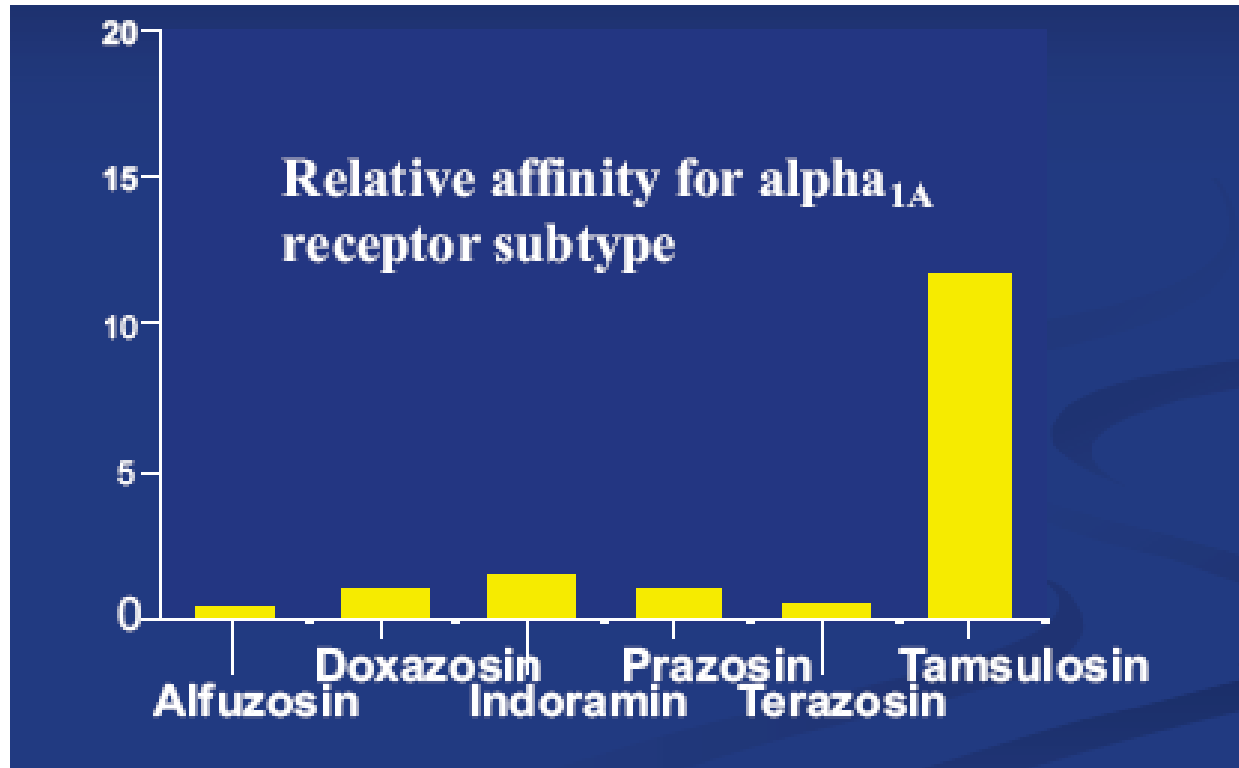
Fluid management

- ▶ volume
 - ▶ timing
 - ▶ type of fluid – caffeine, alcohol, diuretics
 - ▶ can make a difference
- 

BPH – Alpha-blockers

- ▶ Alpha 1 a prostate
b blood
d bladder
 - ▶ act on smooth muscle, spinal cord, afferent
 - ▶ do not relieve obstruction
 - ▶ do not improve residuals
- 

BPH – Alpha-blockers



- ▶ No difference in symptoms or flow rates

BPH – Alpha-blockers

- ▶ Doxazosin
 - 50–70% respond
 - 30–50% reduction in symptoms
 - first dose effect
 - titrate from 1 – 8 mg

BPH – Alpha-blockers

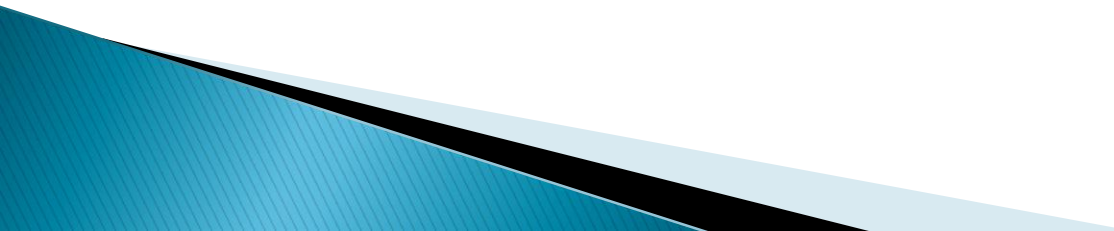
- ▶ Doxazosin – side effects 10–20%
 - lightheadedness
 - palpitations
 - nasal congestion

failure – trial Terazosin or Tamsulosin

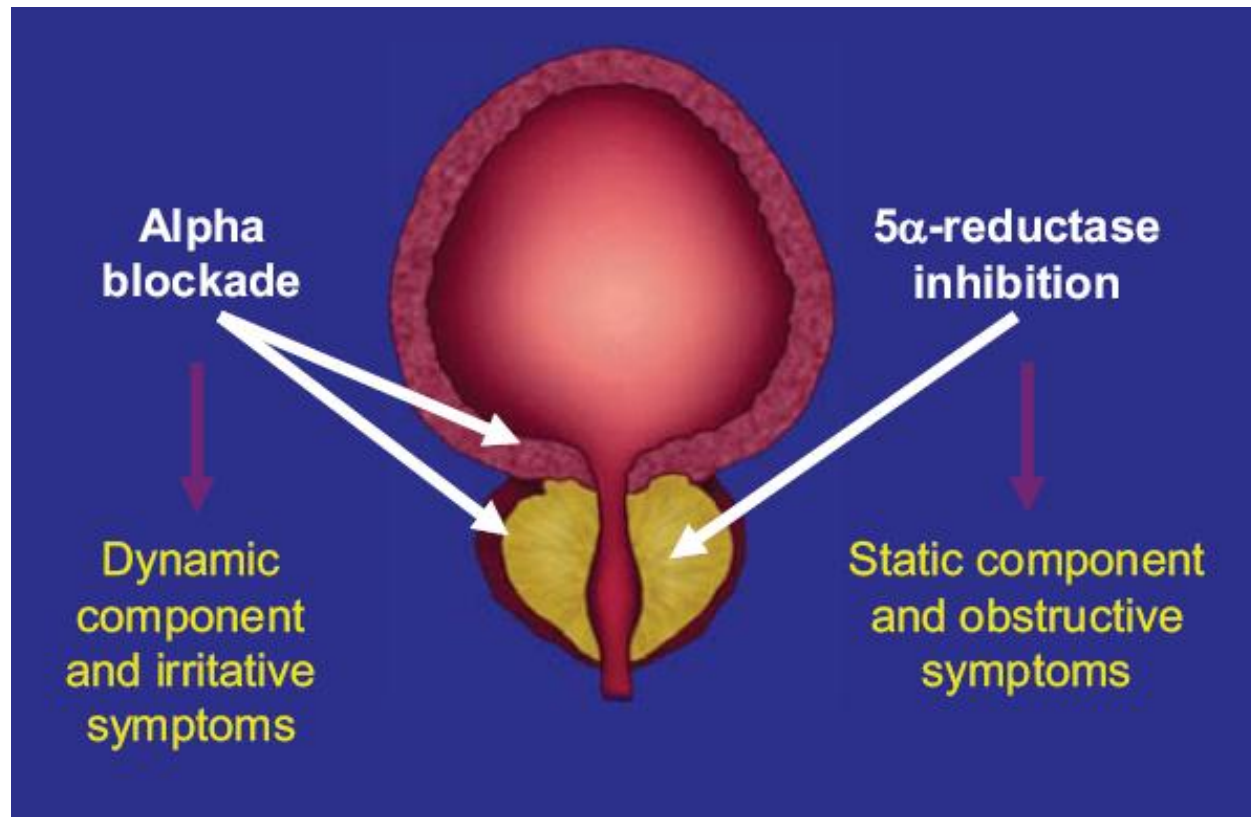
BPH – Alpha-blockers

- ▶ Tamsulosin
 - selective , 0.4 mg daily
 - fewer CVS side effects
 - higher anejaculation (SV,VAS)
 - floppy iris syndrome
 - special authority

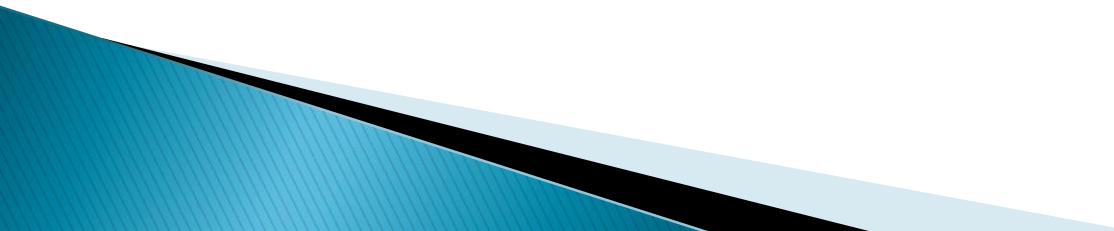
BPH – Alpha-blockers

- ▶ benefit is independent of prostate size
 - ▶ efficacy is similar for all agents
 - ▶ retention –increases chance of voiding by 30%
 - ▶ more effective than 5 alpha reductase inhibitors in the short term
- 

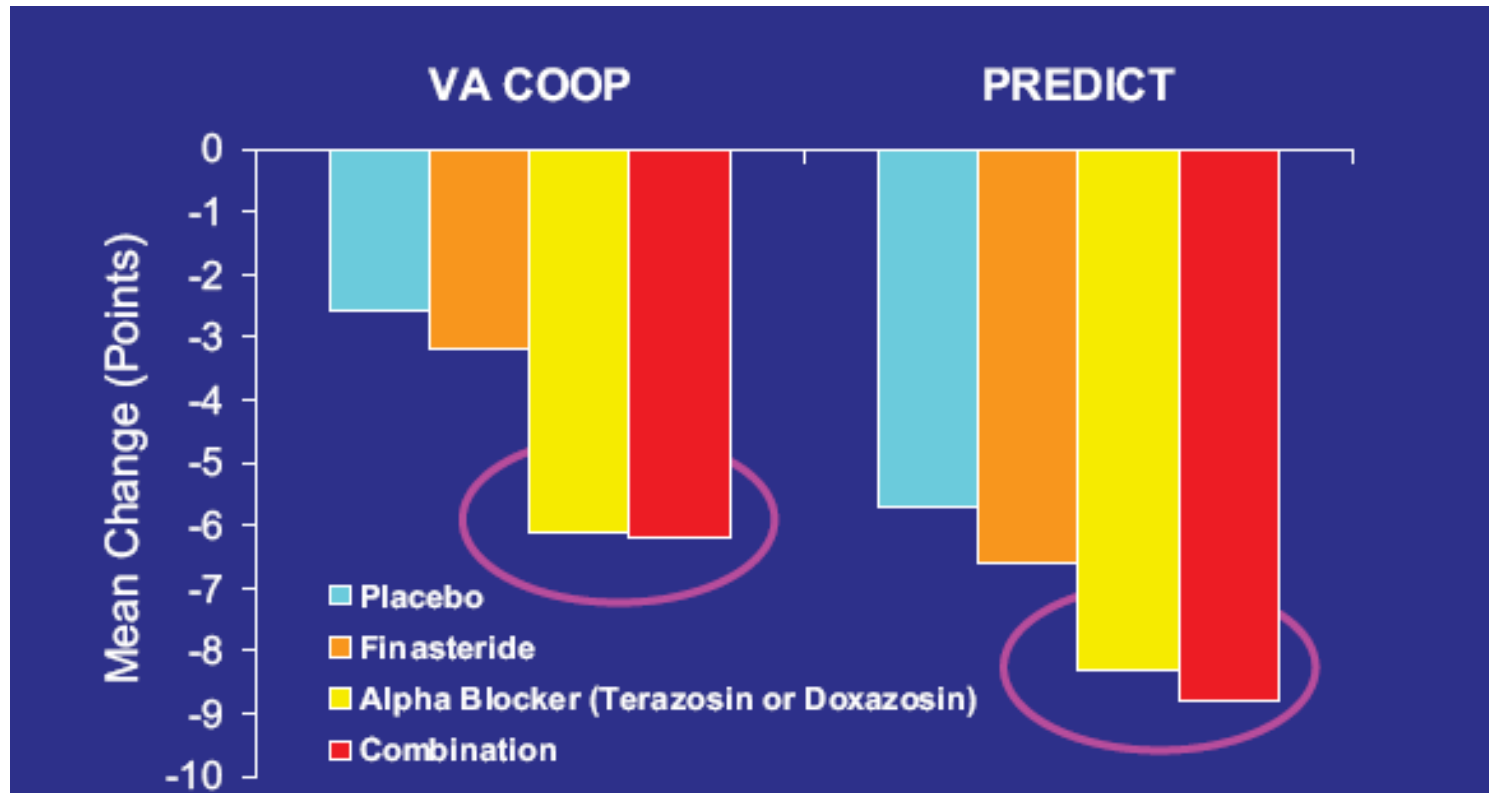
5 alpha reductase inhibitors



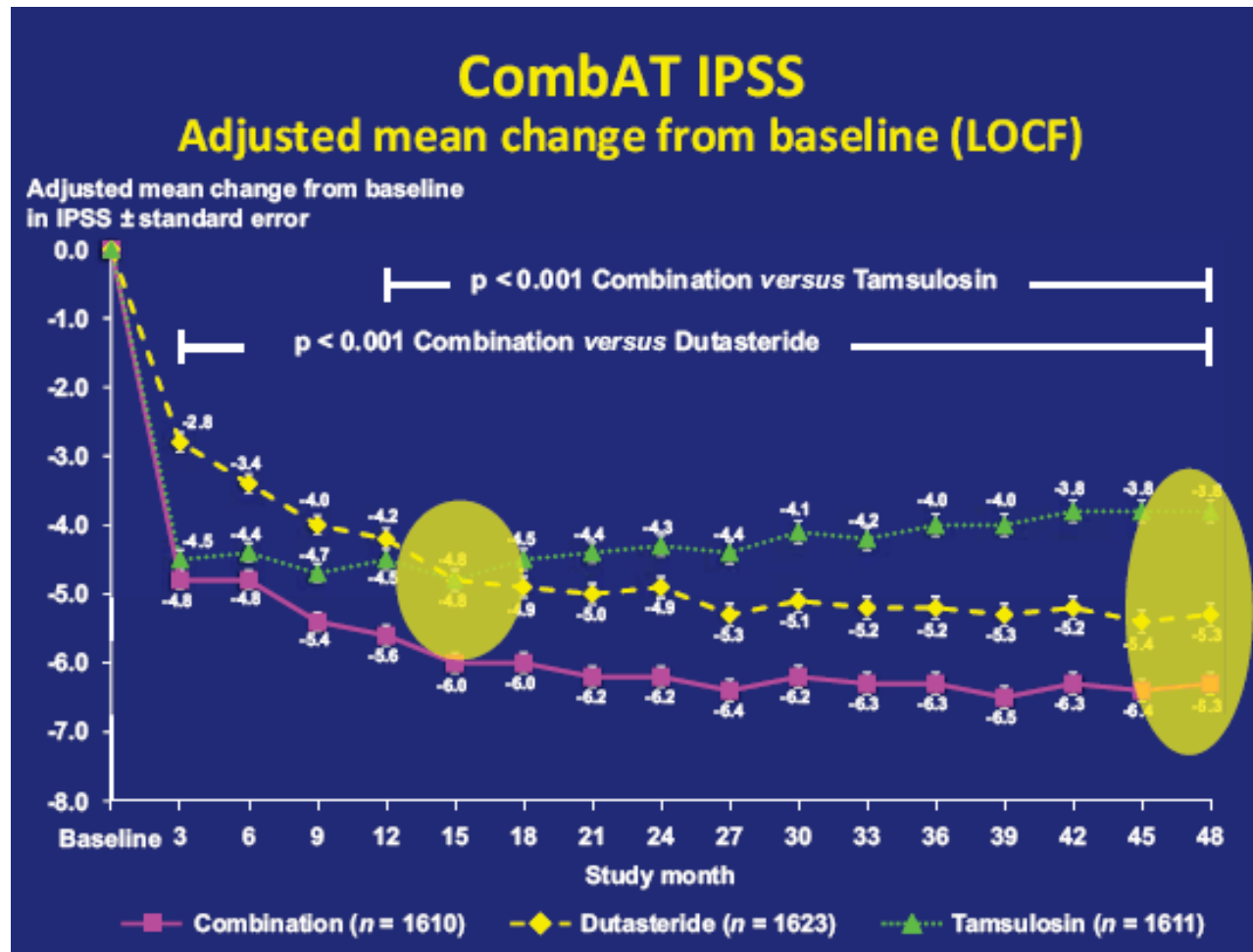
5 alpha reductase inhibitors

- ▶ Improves IPSS by 3–4 points
 - ▶ reduces prostate volume – 30% over 6 months
 - ▶ reduces PSA by 50% – double to give true PSA
 - ▶ no change to PSA ratios
- 

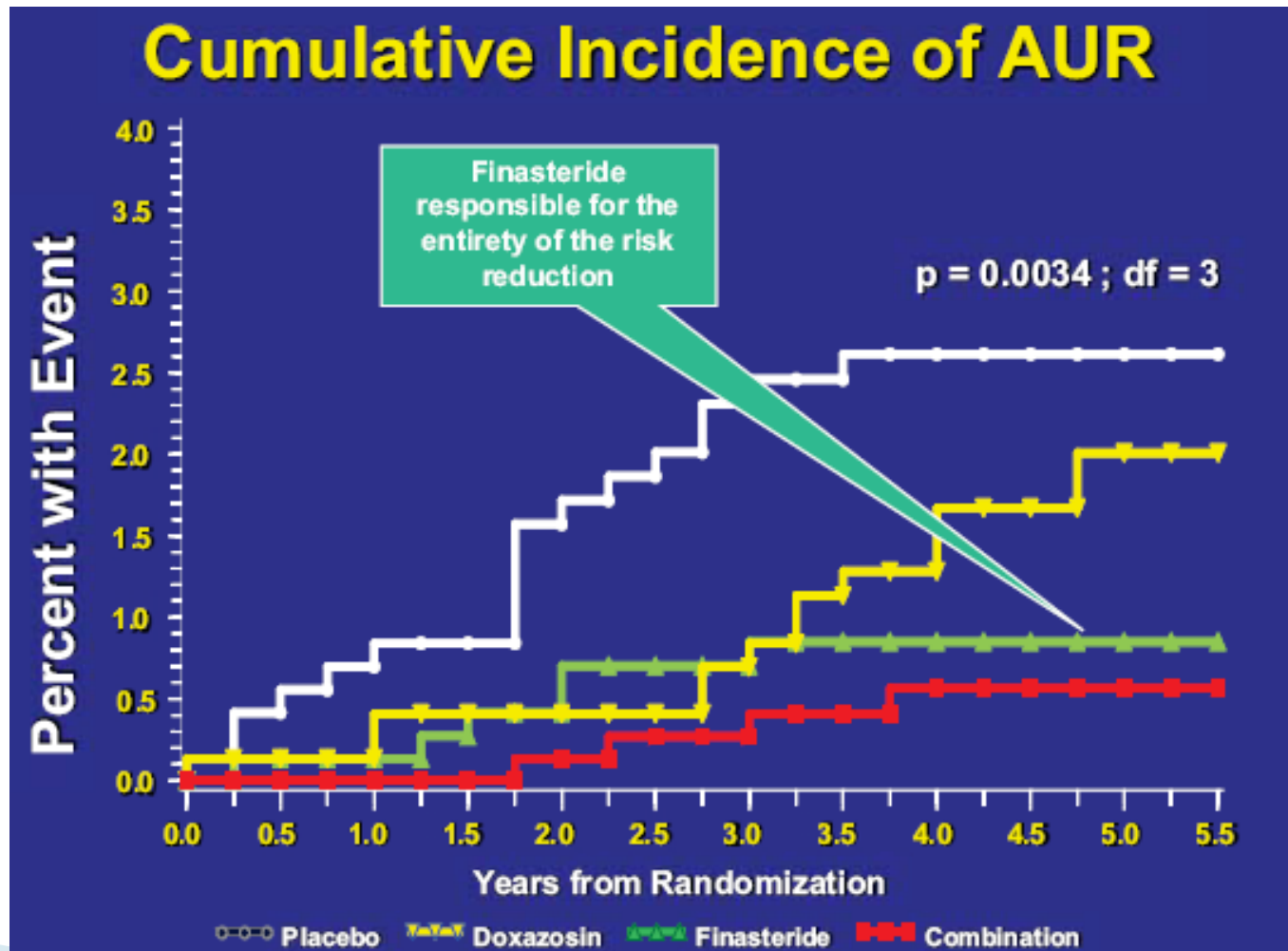
5 alpha reductase inhibitors



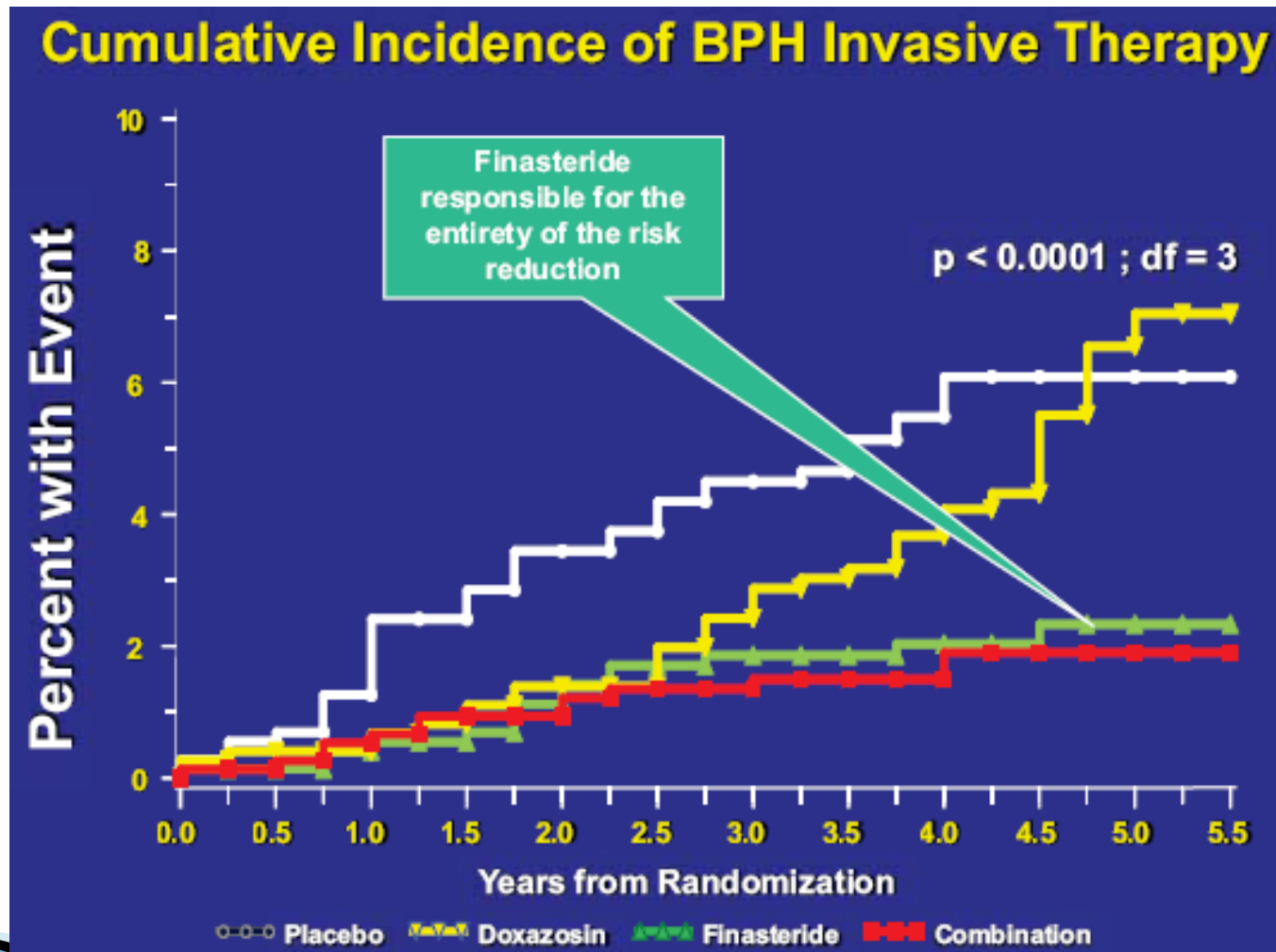
5 alpha reductase inhibitors



5 alpha reductase inhibitors



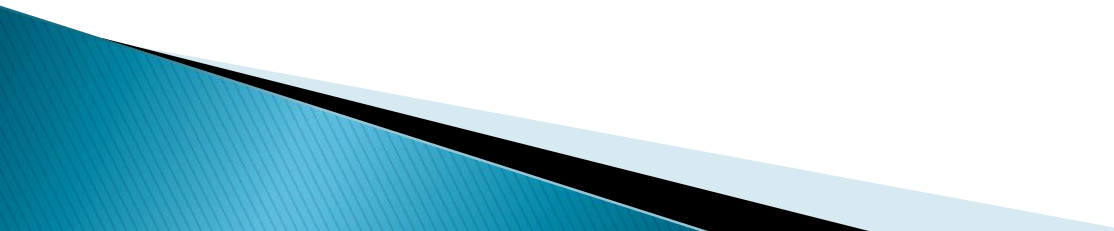
5 alpha reductase inhibitors



5 alpha reductase inhibitors

- ▶ reduces the chance of surgery and retention
- ▶ reduces symptom progression
- ▶ long term probably more important than alpha blockers

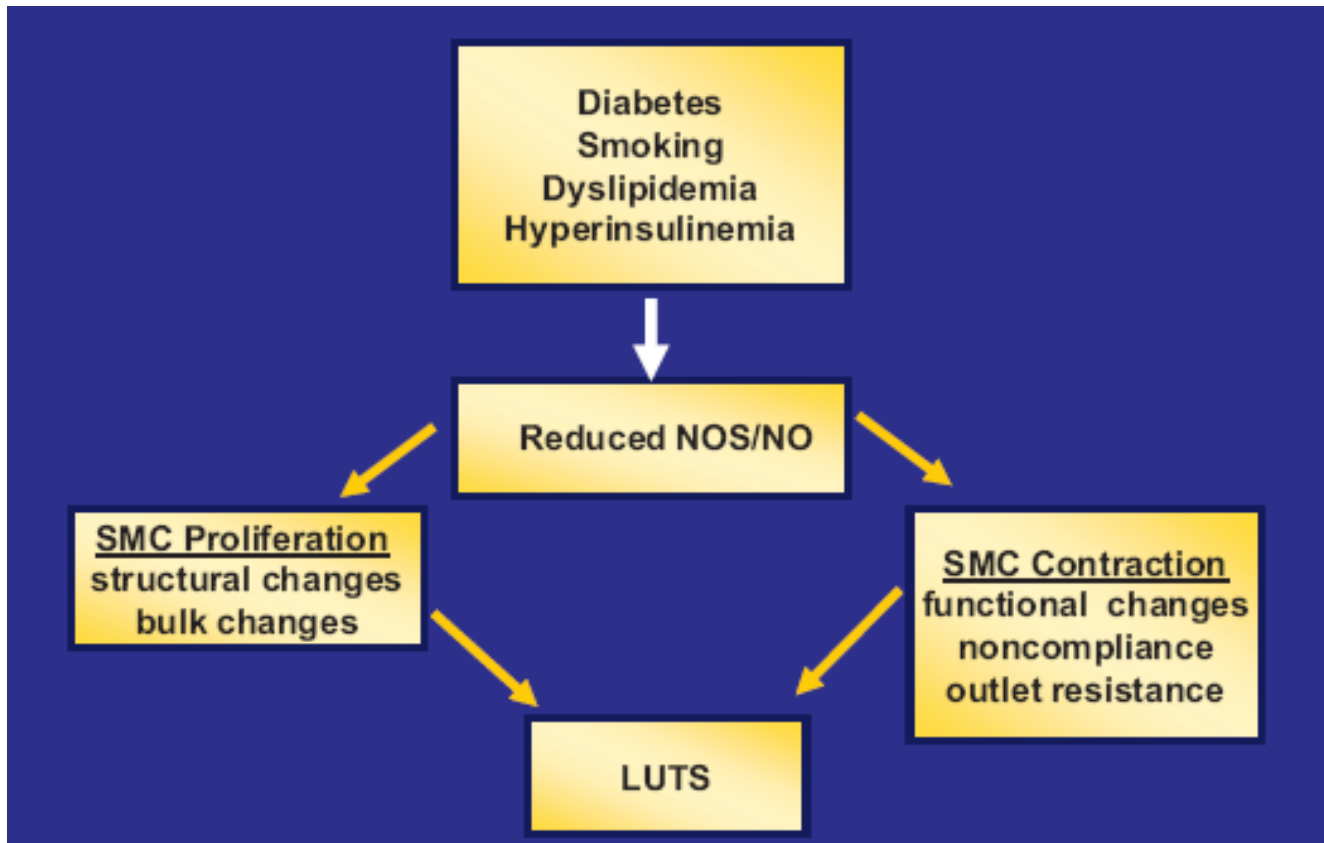
Anticholinergics

- ▶ overactive bladder common in obstruction
 - ▶ only storage symptoms – overactive bladder
 - ▶ may increase residual urine –check <200mls
 - ▶ minimal chance of retention – around 1%
- 

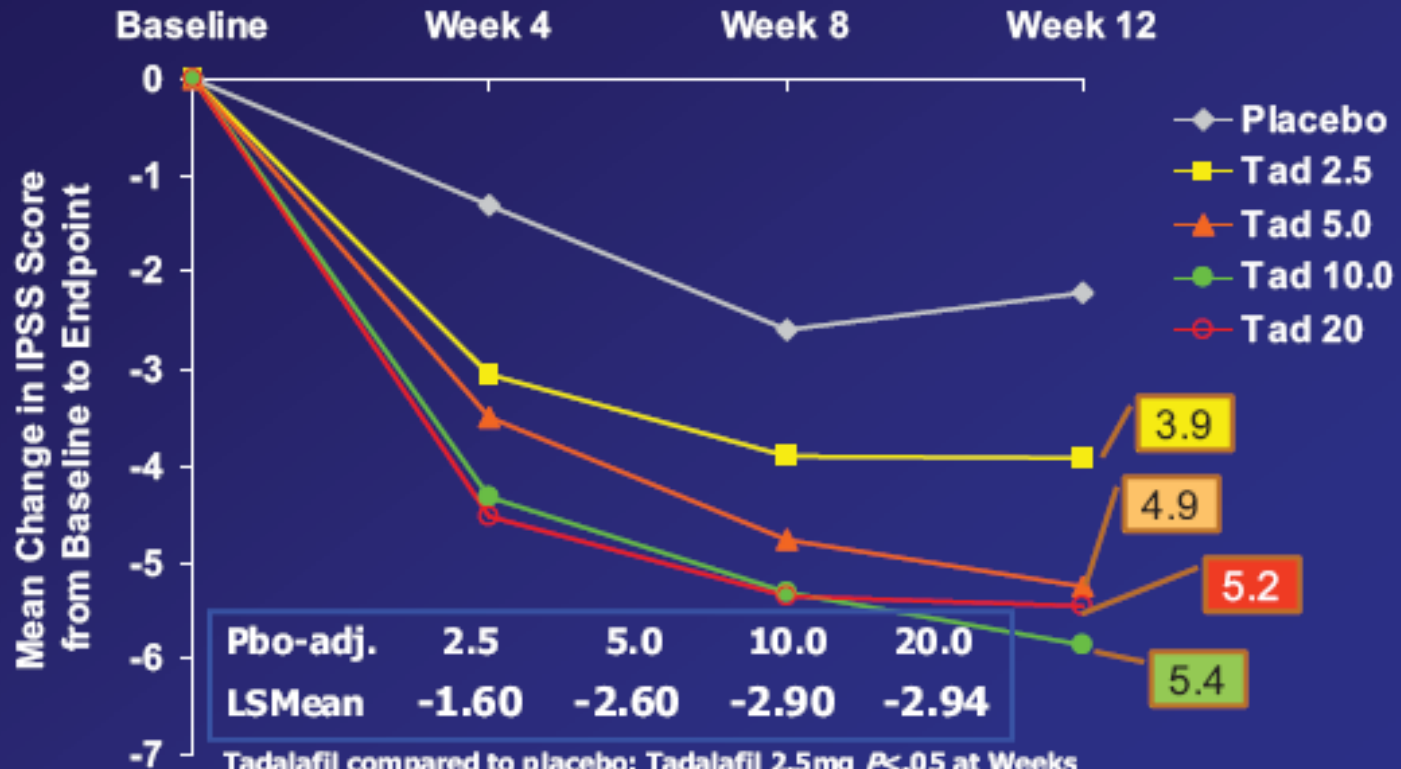
Anticholinergics

- ▶ oxybutynin 5mg bd or tds
- ▶ side effects trial Vesicare at 5mg
 - 5 mg may be better than 10 mg daily
- ▶ overall combination treatment may work well

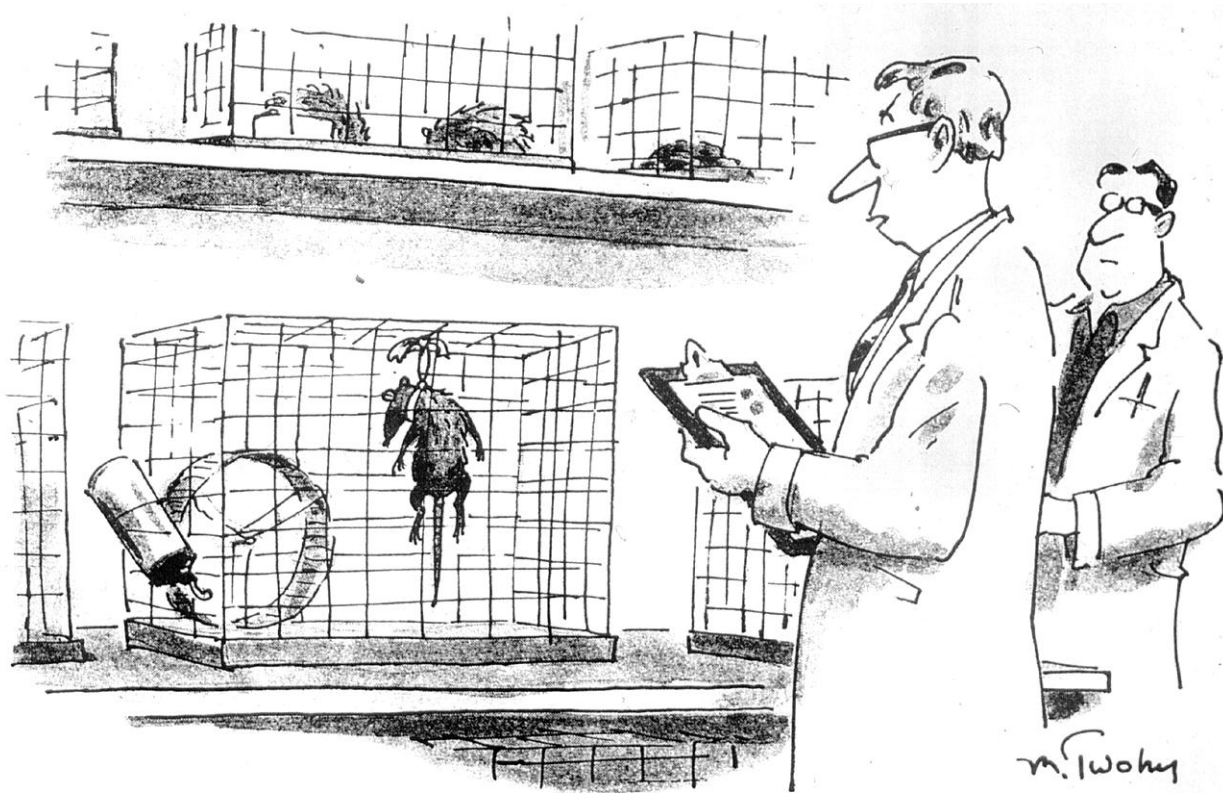
Nitric oxide



PDE-5 inhibitors



Saw Palmetto

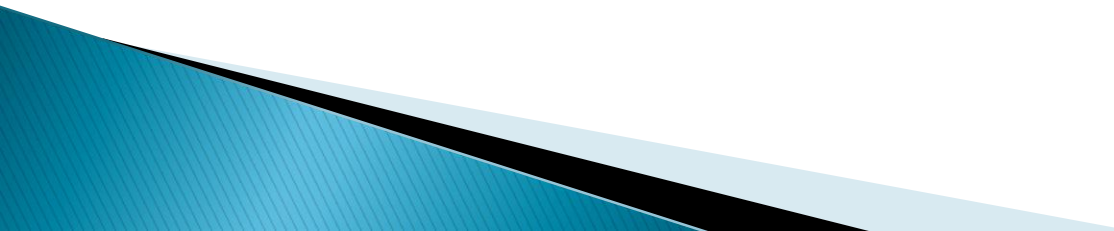


"Discouraging data on the antidepressant."

Saw Palmetto

▶ JAMA	369 pts RCT	72 weeks
	Placebo	Saw Palmetto
IPSS pre	14.7	14.4
IPSS post	11.7	12.2
Change	-3	-2.2

Medications Summary

- ▶ alpha blockers best for $<40\text{g}$
 - ▶ combine with 5-AR best for $>40\text{g}$
 - ▶ anticholinergics helpful – beware residual
 - ▶ 5-AR useful long term
 - ▶ monitor higher PSA, larger glands, older
- 

When to refer

- ▶ bothersome symptoms
 - ▶ complications
 - retention
 - recurrent infections
 - bleeding
 - bladder stones
 - pain
 - incontinence
 - unresponsive
- 