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EBU

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Male LUTS and PPI

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Prevalence of MLUTS

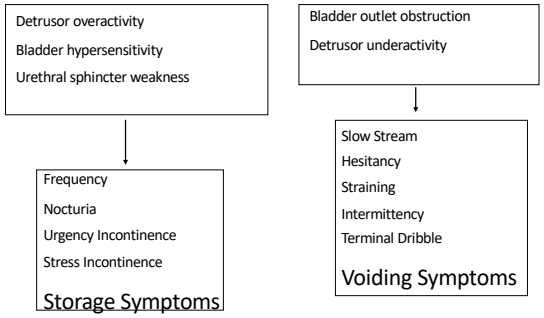
- In unselected French Males aged 50-80 years >80% of men complained of LUTS sufficient to score 1 or more on the AUA symptom index.
- Nocturia and repeat voiding within two hours were the commonest symptoms.

LUTS

Storage	Voiding	Post-micturition
Urgency	Hesitancy	Post void dribble
Frequency	Poor flow	Sense of incomplete emptying
Urge incontinence	Intermittency	
Other incontinence	Straining	
Nocturia		

Abrams P et al.Neurourology & Urodynamics 21:167-168

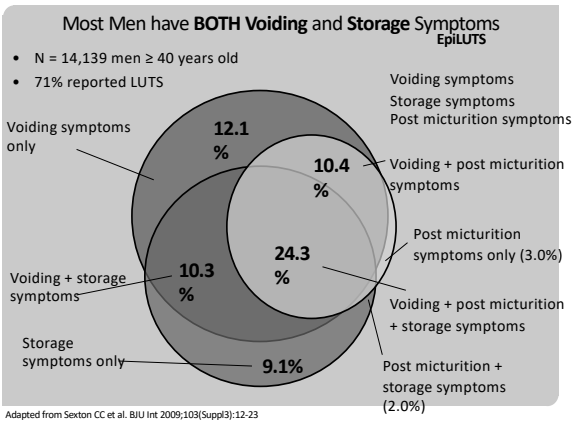
Understanding Lower Urinary Tract Symptoms



Most Men have **BOTH Voiding** and **Storage** Symptoms

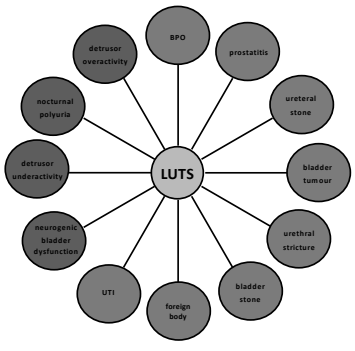
EpiLUTS

- N = 14,139 men ≥ 40 years old
- 71% reported LUTS



Adapted from Sexton CC et al. BJU Int 2009;103(Suppl3):12-23

Conditions or diseases behind LUTS



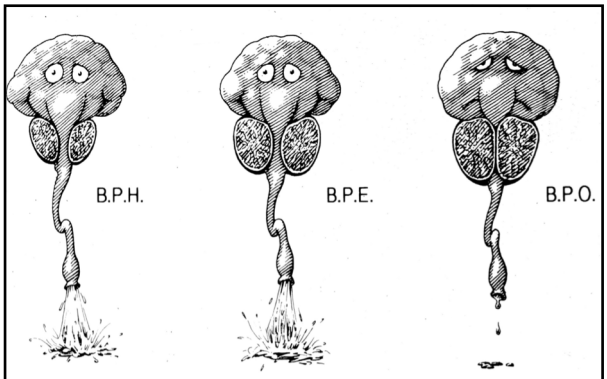
Oelke M et al. EAU Guideline on Male LUTS. Update February 2012

The Aging Male Population

- Increasing prevalence of not only:
  - LUTS
  - Prostatic enlargement and obstruction
- But also of:
  - Detrusor overactivity and OAB symptoms
  - Detrusor underactivity during voiding
  - Fluid balance problems and nocturia

MLUTD Consultation, Paris 2006 (J Urol 2009, and AUA Guidelines 2011)

- Benign prostatic hyperplasia
- Benign prostatic enlargement
- Benign prostatic obstruction

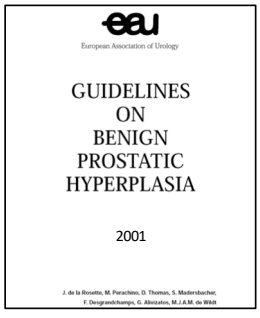


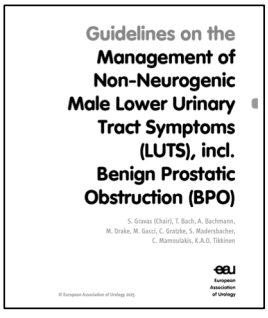
AUA Guidelines

Definitions and Terminology

- **Benign prostatic hyperplasia** is reserved for the histological pattern it describes.
- **Benign prostatic enlargement** is used when there is gland enlargement and is usually a presumptive diagnosis based on the size of the prostate.
- **Benign prostatic obstruction** (BPO) is used when obstruction has been proven by pressure flow studies, or is highly suspected from flow rates and if the gland is enlarged.
- **Bladder outlet obstruction** (BOO) is the generic term for all forms of obstruction to the bladder outlet (e.g., urethral stricture) including BPO.

From BPH to male LUTS, including BPO the recipe has changed





Life was easy in "The good old days"

- Man complains of symptoms
- "Blame it on the prostate"
- Take out his prostate

So, what's the problem?

The problem is, the continued use of the imprecise "prostate-centric" terms:

- "Clinical BPH"
- "Symptomatic BPH"
- "The BPH man"
- "Symptoms of BPH"

Can you define these terms, do they describe the man, do they help management?

LUTS

Storage	Voiding	Post-micturition
Urgency	Hesitancy	Post void dribble
Frequency	Poor flow	Sense of incomplete emptying
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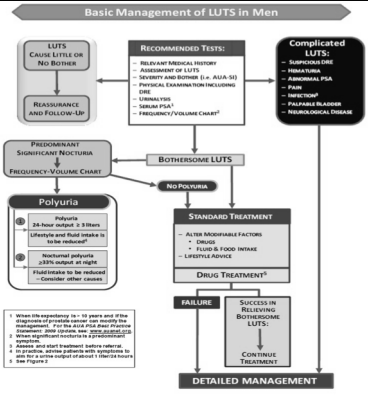
Other incontinence	Straining	
Nocturia		

Abrams P et al.Neurourology & Urodynamics 21:167-168

	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
Incomplete emptying Over the past month, how often have you had a **sensation** of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
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	
Intermittency Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
Urgency Over the last month, how difficult have you found it to postpone urination?	0	1	2	3	4	5	
Weak stream Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
Straining Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	

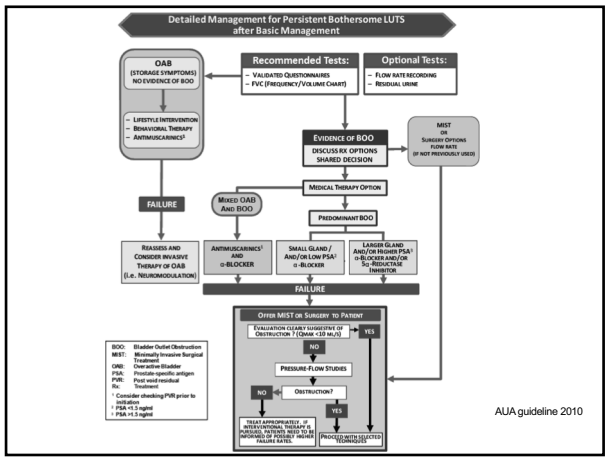
LUTS Guidelines

- ICUD recommendations on MLUTS 2006
- International Consultation on MLUTS 2012
- AUA Guidelines 2010 (validated 2014)
- EAU on MLUTS and BPO 2015



AUA guideline 2010

Figure 1.1. Basic management of lower urinary tract symptoms (LUTS) in men (adapted with permission from Abrams 2009). AUA-SI, American Urological Association Symptom Index; DRE, digital rectal exam; PSA, prostate-specific antigen.



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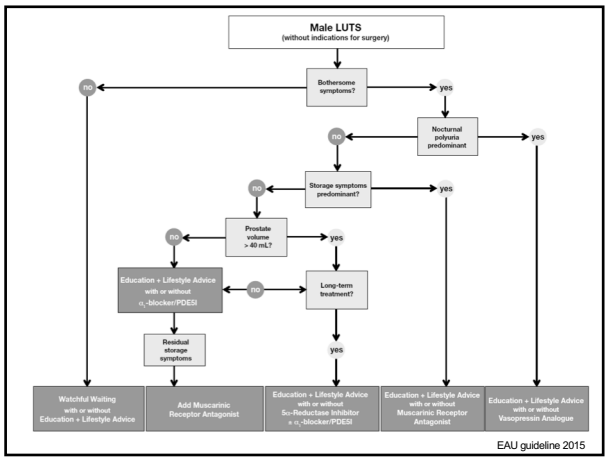


EAU guideline 2015

Factors altering LUTS Management

- evidence of BOO complicated by UTI's
- PVR consistently > 250 ml with low Q max plus troublesome symptoms
- upper tract at risk
- bladder stone

- Complications of BPO

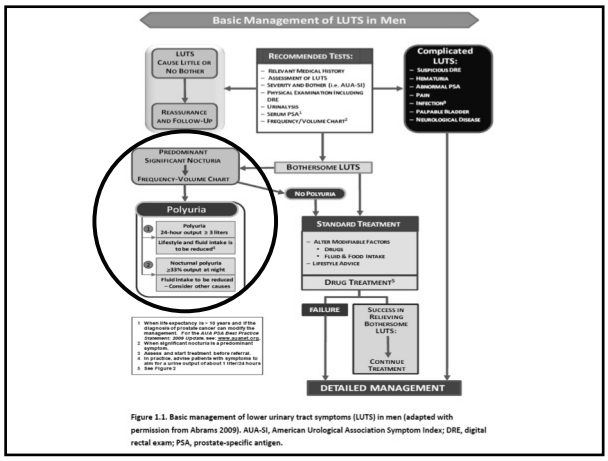


Figure 1.1. Basic management of lower urinary tract symptoms (LUTS) in men (adapted with permission from Abrams 2009). AUA-SI, American Urological Association Symptom Index; DRE, digital rectal exam; PSA, prostate-specific antigen.

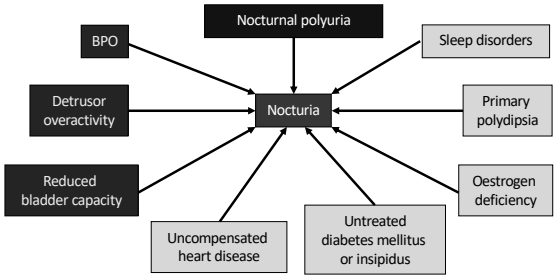
Frequency-Volume Chart

DAY	Time / Volume (mls.)	Day-Time	Night -Time	Number of pads used in 24 hour period
1	9am 250 / 4.30pm 150 / 5.30pm 200 / 8pm 200 / 7.30pm 150		1.30pm 200 / 2.30pm 200 / 2pm 250 / 6.30pm 350	1
2	8.30am 250 / 1.30pm 150 / 5.30pm 300 / 9.15pm 300		12.15pm 200 / 1.45pm 200 / 3pm 250 / 5pm 300	1
3	7am 200 / 10.15 200 / 12.30pm 150 / 5.30pm 300 / 9.30pm 200		midnight 250 / 1.15am 350 / 315 250 / 6am 300	1
4	8.30am 200 / 10am 200 / 1pm 200 / 5pm 200 / 9.15pm 250 / 9.15 250		11.45 200 / 1am 300 / 215 200 / 4.30 150 / 7am 300	1
5	8am 200 / 2.30pm 200 / 4.45 250 / 9.30 300		12.15am 150 / 2.30 200 / 6.15 300	1
6	7.45 250 / 9.45 150 / 3pm 300 / 4.15 200 / 8pm 300 / 9.15 100		11.15 250 / 1.30 300 / 3.45 200 / 6.30 200	1
7	11 / 1pm 200 / 4pm 150 / 6pm 150 / 9.15 150		12.45 200 / 315 300	

* instructions on other side *

AVERAGE DAILY FLUID INTAKE (in cups) = 6 mostly teas/coffee

Multifactorial Aetiology of Nocturia



Management of Fluid Intake

- Fluids
  - tea / coffee / alcohol
  - quality / timing
- fluids in food
  - vegetables / salad / fruit
  - timing of meals

Particularly important in nocturia and urgency incontinence

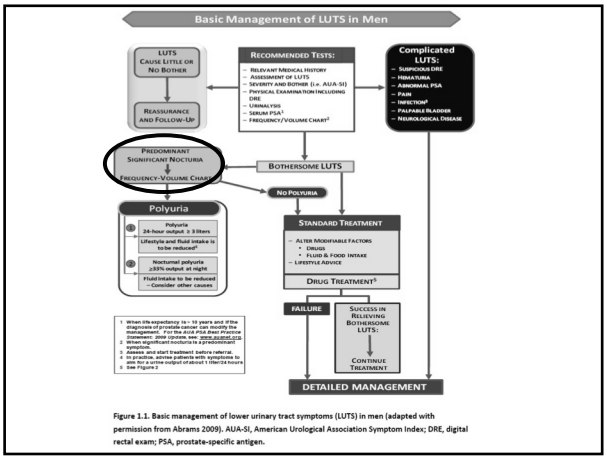
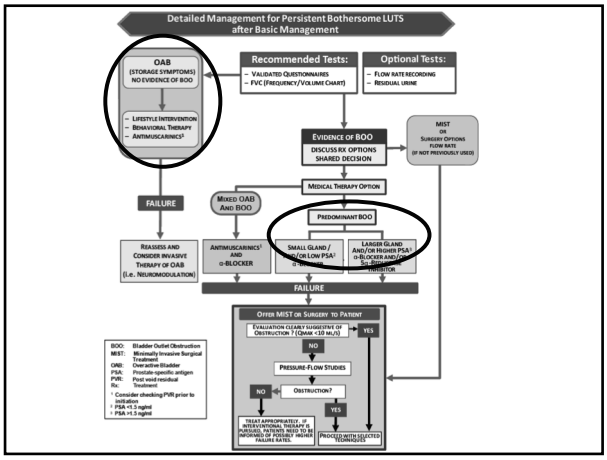
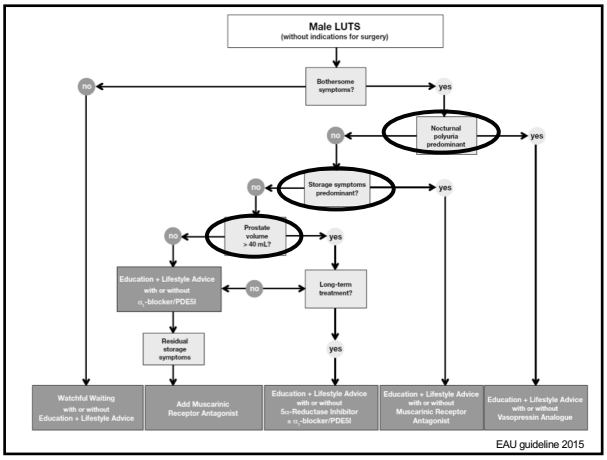


Figure 1.1. Basic management of lower urinary tract symptoms (LUTS) in men (adapted with permission from Abrams 2009). AUA-SI, American Urological Association Symptom Index; DRE, digital rectal exam; PSA, prostate-specific antigen.





Relationships between BOO and other factors

- symptoms
- prostate size
- radiographic findings
- cystoscopic findings

Relationships between BOO and other factors

- symptoms
- prostate size
- radiographic findings
- cystoscopic findings

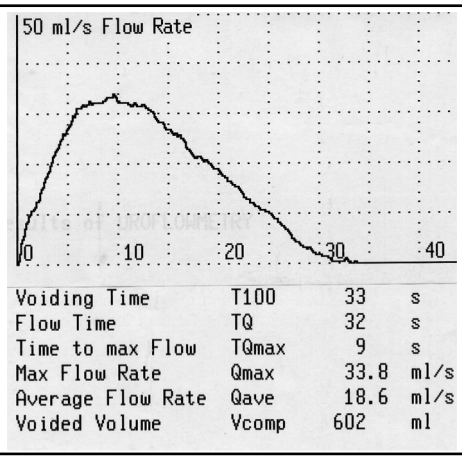
NO CLINICAL OR INVESTIGATIVE FEATURES CORRELATE WELL WITH BOO PROVED BY PRESSURE-FLOW STUDIES

Does the patient have prostatic obstruction?

- Diagnostic value of symptoms?
- Diagnostic value of prostatic size?
- Urine flow rates
- Pressure flow studies

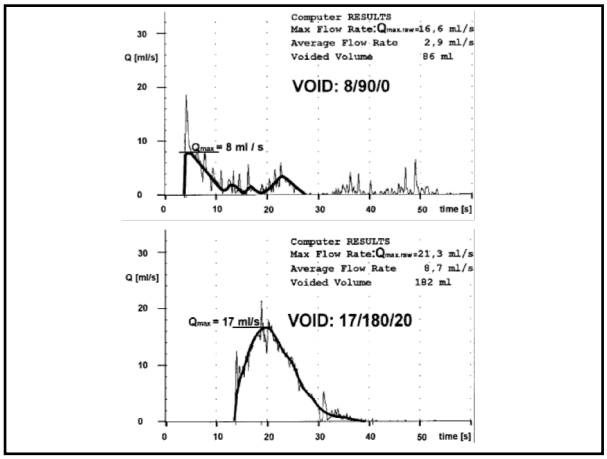
Urine flow rates

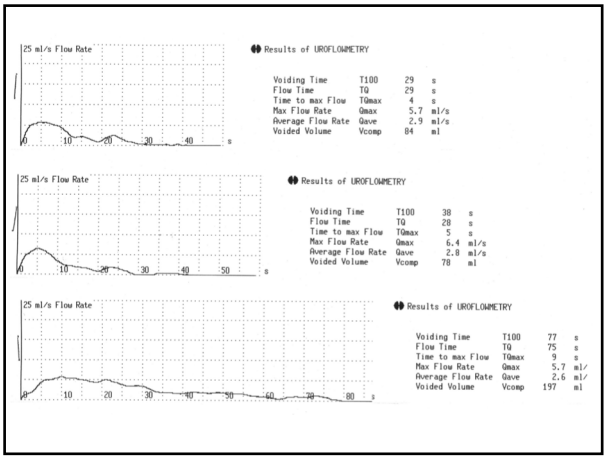
Quick revision



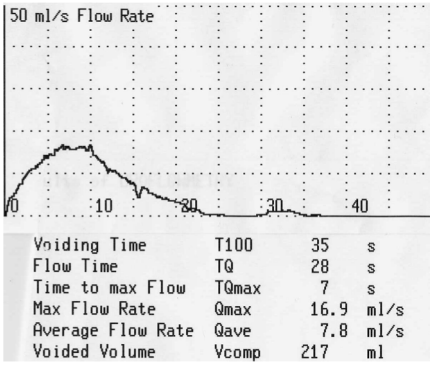
Uroflow recommendations

- Standardize graphical scaling
- Flow rate values should be 'smoothed'
- A sliding average over 2 s should be used to remove positive and negative spike artifacts
  - the line should be smoothed by eye into a continuous curve so that in each period of 2 s there are no rapid changes



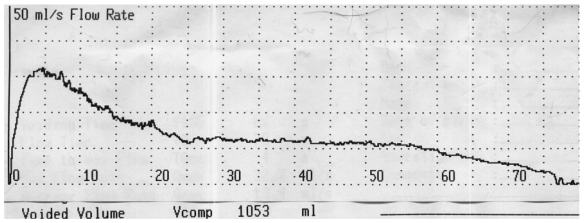


Normal

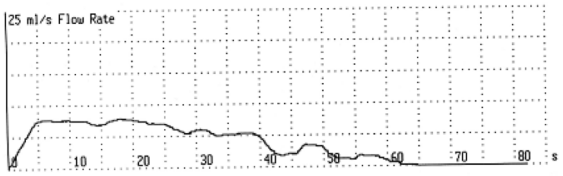


Voiding Time	T100	35	s
Flow Time	TQ	28	s
Time to max Flow	TQmax	7	s
Max Flow Rate	Qmax	16.9	ml/s
Average Flow Rate	Qave	7.8	ml/s
Voided Volume	Vcomp	217	ml

Normal



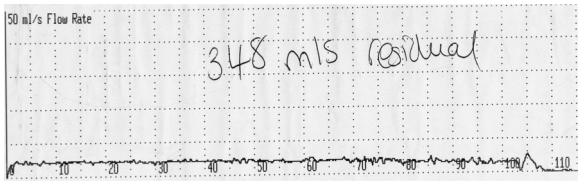
BOO



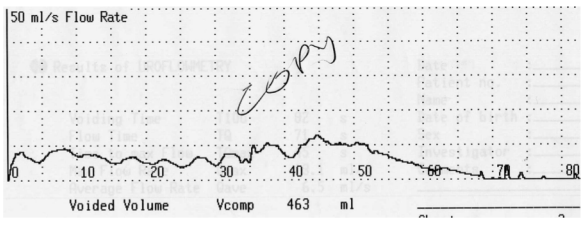
Results of UROFLOWMETRY

Voiding Time	T100	62	s
Flow Time	TQ	62	s
Time to max Flow	TQmax	18	s
Max Flow Rate	Qmax	7.9	ml/s
Average Flow Rate	Qave	4.8	ml/s
Voided Volume	Vcomp	300	ml

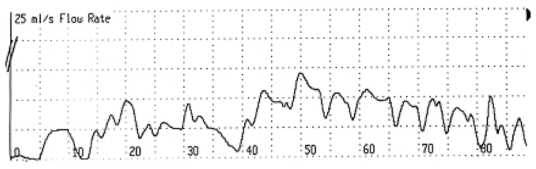
Stricture



Detrusor Underactivity



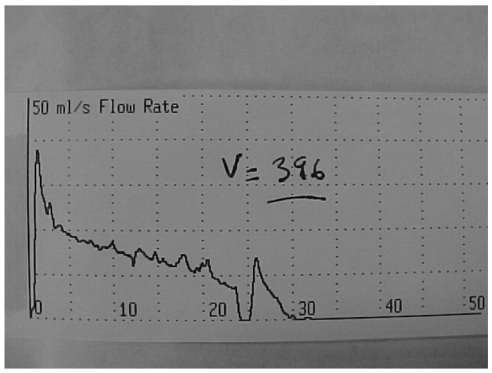
Straining



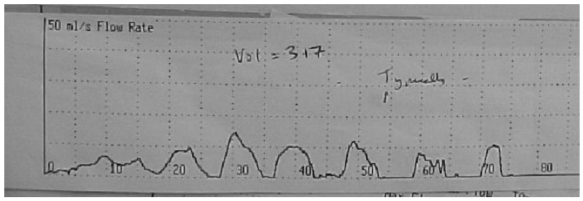
Results of UROFLOWMETRY

Voiding Time	T100	100	s
Flow Time	TQ	95	s
Time to max Flow	TQmax	50	s
Max Flow Rate	Qmax	14.1	ml/s
Average Flow Rate	Qave	6.1	ml/s
Voided Volume	Vcomp	580	ml

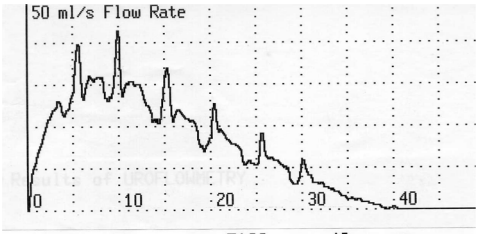
Detrusor Overactivity



Fluctuating Detrusor Contraction

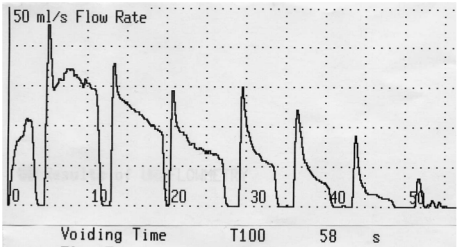


Cruising



Voiding Time	T100	40	s
Flow Time	TQ	39	s
Time to max Flow	TQmax	10	s
Max Flow Rate	Qmax	42.7	ml/s
Average Flow Rate	Qave	17.1	ml/s
Voided Volume	Vcomp	669	ml

Squeezing



Voiding Time	T100	58	s
Flow Time	TQ	44	s
Time to max Flow	TQmax	5	s
Max Flow Rate	Qmax	45.9	ml/s
Average Flow Rate	Qave	15.6	ml/s
Voided Volume	Vcomp	688	ml

Diagnosis of BOO: Accuracy of maximum urine flow rate (Qmax)

Qmax	<10	10 – 15	>15mls
Obstructed	88	66	32
Unobstructed	12	34	68

Data from 134 men using AG nomogram to define BOO

Management of LUTS

If drug therapy fails and patient wants surgery

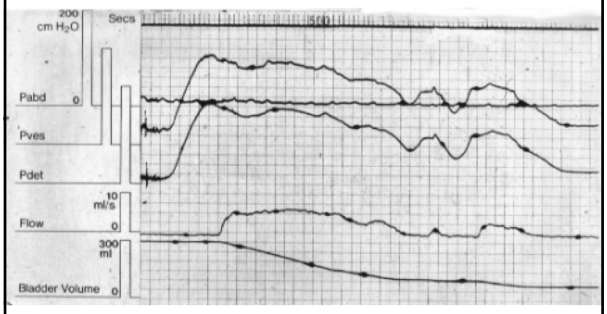
- if Qmax < 10ml/s go to TURP
- if Qmax $\geq$ 10 ml/s do PFS and proceed to TURP if obstructed

Conclusions : Uroflowmetry

1. Uroflowmetry indicates voiding abnormalities but has a 10% incidence of false negatives and a 25% incidence of false positives
2. Inclusion of uroflow data in the decision process prior to prostatectomy does improve outcome

The Diagnosis of BOO

1. May be suspected from symptoms
2. May be indicated by reduced flow rate in most obstructed patients
3. Can only be diagnosed by pressure flow studies – with very few exceptions.



Diagnosis of BOO from PFS

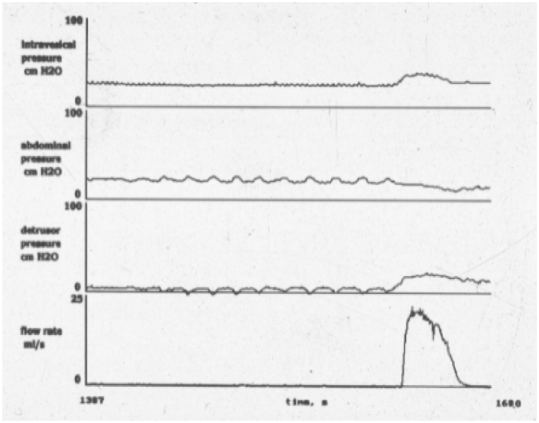
This depends on examining the relationship between flow and pressure

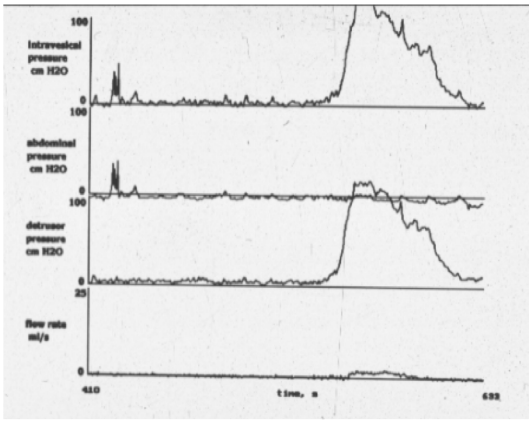
Methods below use same raw data:

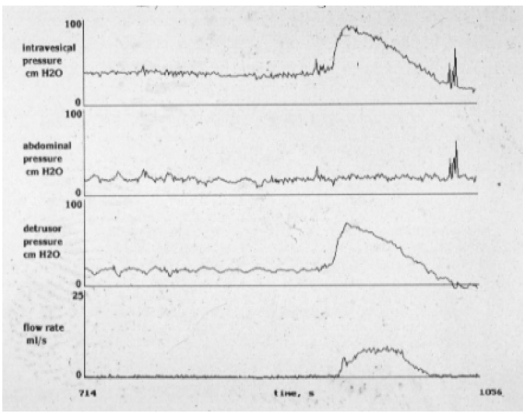
- AG nomogram and number
- URA
- LPURR
- CHESS

Recommended by ICS:

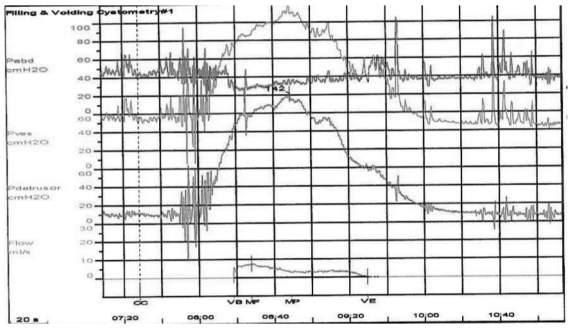
- ICS Nomogram







Bladder outflow obstruction



Bladder Voiding Function

Three simple indices :

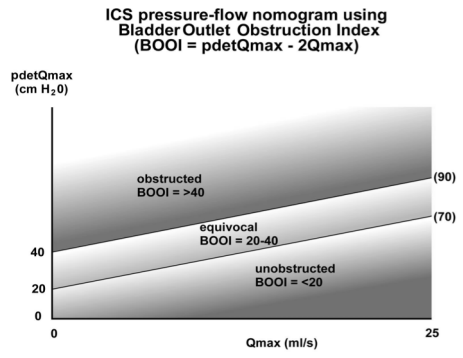
- BOOI (bladder outlet obstruction index)
- BCI (bladder contractility index)
- BVE (bladder voiding efficiency)

Bladder Outlet Obstruction Index (BOOI)

(previously Abrams – Griffiths number)

BOOI = pdetQmax – 2Qmax

- BOOI > 40 Obstructed
- BOOI 20 – 40 Slightly Obstructed (Equivocal)
- BOOI <20 Unobstructed

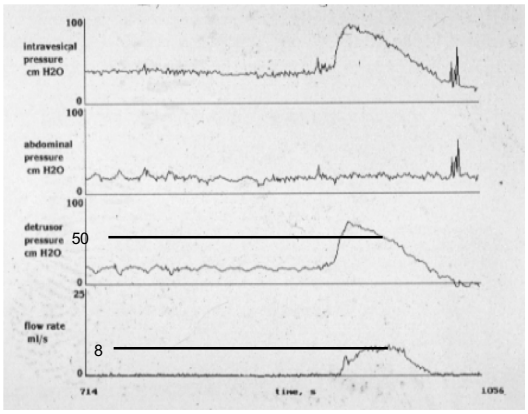


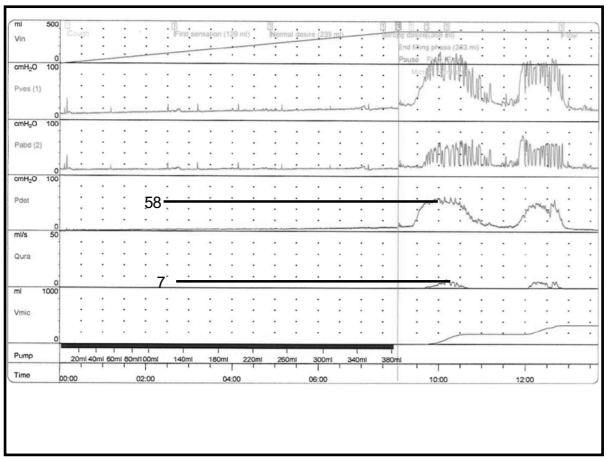
- PFS have acceptable reproducibility. However, if the patient's "ICS number" is in the range 20-40 then the PFS can be repeated if invasive therapy is being contemplated.

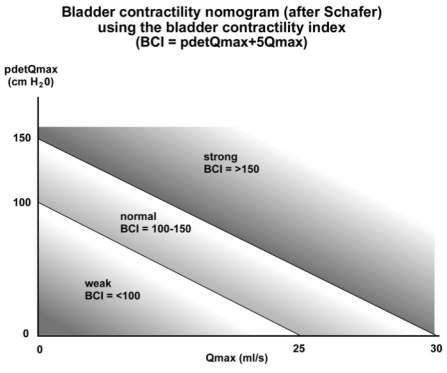
Bladder Contractility Index (BCI)

BCI = pdetQmax + 5Qmax

- BCI > 150 Strong Contractility
- BCI 100-150 Normal Contractility
- BCI <100 Weak Contractility







Bladder Voiding Efficiency (BVE)

$$BVE = \frac{\text{voided volume}}{\text{total bladder capacity}} \times 100\%$$

BVE is a measure of bladder emptying

Traditional Selection Criteria for Prostatectomy

Results in 53 patients

Surgeon blinded to preop. flow values

28% failure rate

- 14% unimproved flow rate
- 14% unimproved symptoms

Results of prostatectomy in 100 men when urodynamics included in selection criteria

12% failure rate

- 7% unimproved flow rate
- 5% unimproved symptoms

Reasons for not doing Urodynamics

Inaccurate ?

No, given proper attention to technique the variability is only 10%.

Costly ?

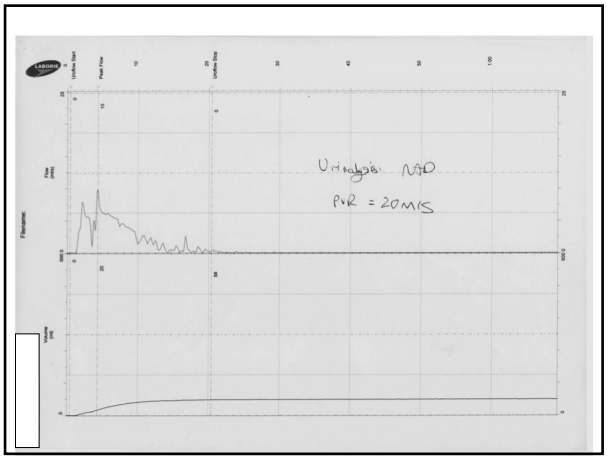
No, they have been shown to be cost effective by directing management more appropriately.

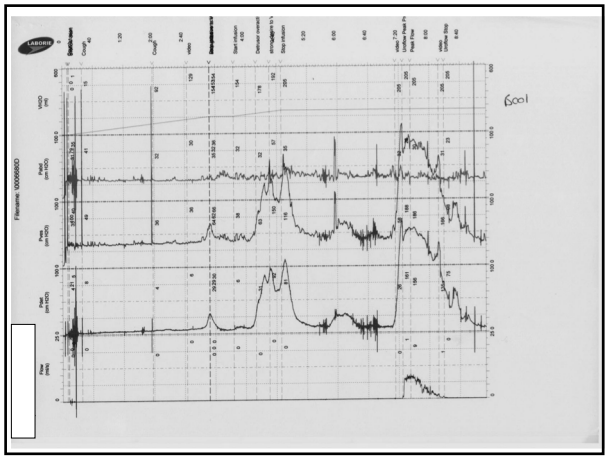
Invasive ?

Case discussions

54 Year Old Man

- 2 year history of frequency, urgency, occasional urgency incontinence (no pads required)
- On Alfuzocin only
- 40-50g prostate





Urodynamics

- Interrupted flow pattern, 20mls residual
- DO with associated urgency on filling
- Obstructed looking flow
- BOOI- 134, BCI- 197

Management Plan

- Fluid advice, Bladder training, anticholinergic
- Started Finasteride
- Consider TURP

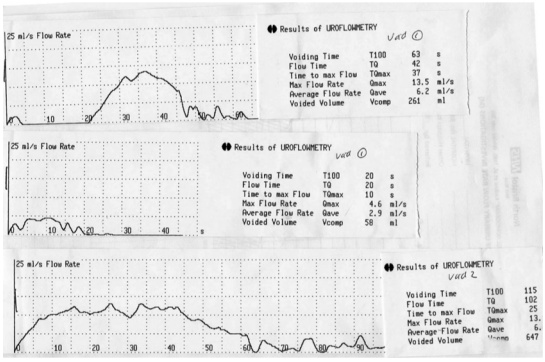
Man aged 59

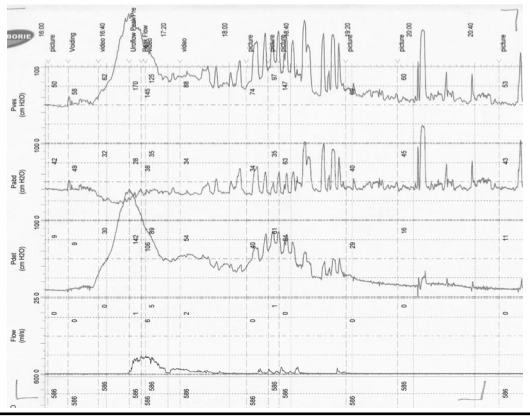
- Referred in 2006 with
  - –bladder discomfort
  - –"severe cystitis, 80% of the time"
- Plan
  - – For Flow Rates
  - – Cystoscopy (2007): no abnormality other than 3 diverticula

2008

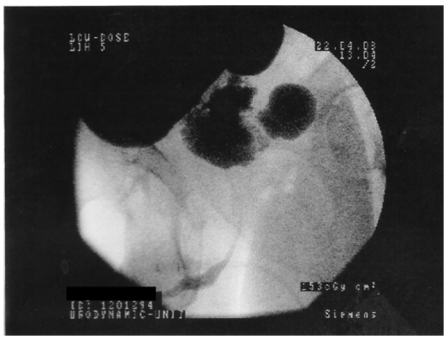
- Frequency – Volume Chart
- Flow Studies
- Video urodynamics

Flow Rates





FVC



VIDEO URODYNAMICS

- Cystometric capacity 740mls (slight terminal DO)
- pdetQmax 102cm H_2O
- Qmax 6ml/s
- Video
  - 3 diverticula
  - Bladder emptied

MANAGEMENT

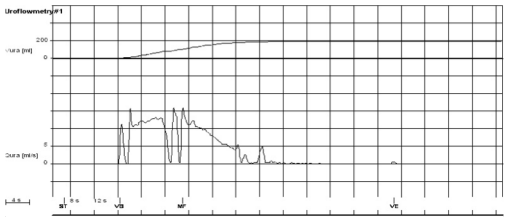
- Alpha blockers, no success
- WHAT NEXT?

M / 60

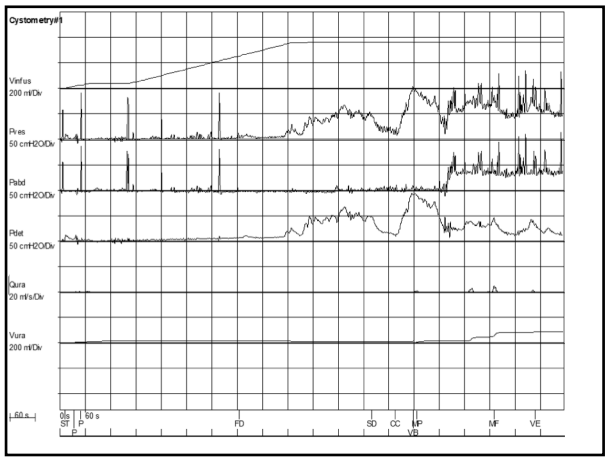
- Refractory urinary retention with TURP done Feb 2004.
  - 59 gm resected
  - Benign pathology
- Voided well afterwards until early 2010

- Status 5 years after TURP
- Complained of weak stream
- IPSS: 15/35, QOL 4
- Cystoscopy: mild regeneration at apical lobes.
- CMG:

C.P.C. M/60



Qmax	15.9
Voided volume	191ml
RU	6ml



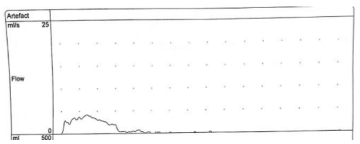
Male / 73

- wheelchair bound, communicable, live with wife
- Past Health:

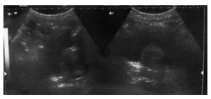
DM, HT, old CVA on Aspirin, VitB12 Deficiency, Vascular Dementia with delusional ideas

- LUTS on Hytrin 2mg Nocte
- Mainly C/O urgency and urge incontinence, wet napkin.
- 1st Uroflow:

VV 51.1ml
Qmax 4.3ml/s
PVR 194ml by bladder scan

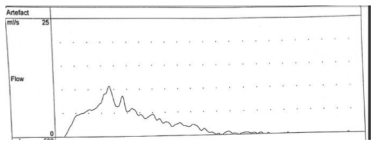


- Prostate Size: N/A
- USG Bladder: Intravesical Prostate

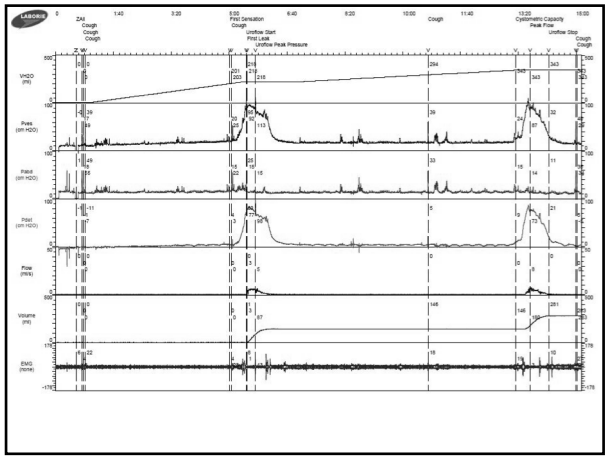


- TURP discussed due to symptomatic conditions and significant PVR
- Repeated Uroflow in 7/2013 :

VV 100ml Qmax 8ml/s PVR 90ml by bladder scan



CMG ?



Post Prostatectomy Incontinence

Pathophysiology

Bladder component

- Revelation of pre-existing voiding dysfunction
- De novo detrusor overactivity after surgery
  - Nerve damage & devascularisation
- Decreased bladder capacity
- Altered bladder compliance

Sphincter component

- Relative contribution of bladder neck & sphincter
- Altered sphincter function
  - Nerve damage & devascularisation
- Altered sphincter compliance
- Scarring and healing of surround tissue
- Direct sphincter damage

Functional outcome

- No pad/safety pad definition
  - 12-month incontinence: 8-11%
  - Mean 9%
- Continue to improve, up 2 years

Ficarra et al. European Urology. 62(3):405-17, 2012 Sep.
Biano et al. Urology. 66(5 Suppl):83-94, 2005 Nov

Early continence

- Upon Foley removal: 17%
- 6 weeks 20-30%
- 3 months 40-50%
- 6 months 60-80%

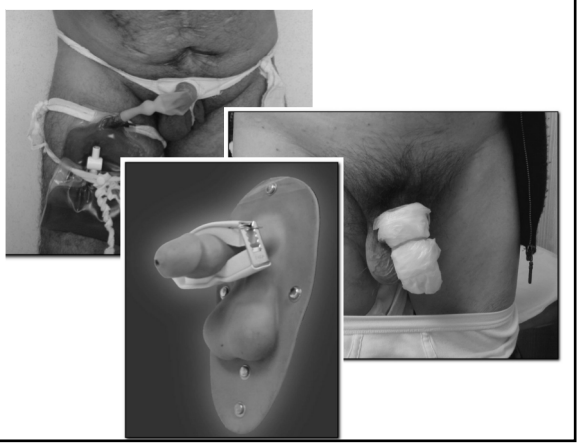
Sammon et al. Journal of Endourology. 27(4):442-6, 2013 Apr
Dev et al. Nature Reviews Urology. 9(4):189-95, 2012 Jan 24

Risk factors

- Pre-existing voiding dysfunction: detrusor overactivity, neurogenic bladder dysfunction
- Age
- BMI
- Radiotherapy
- Larger prostate volume
- Urethral length: anatomical & functional

Management

- Conservative
- Surgical



The Lancet, Volume 378, Issue 9788, Pages 328 - 337, 23 July 2011

THE LANCET

Urinary incontinence in men after formal one-to-one pelvic-floor muscle training following radical prostatectomy or transurethral resection of the prostate (MAPS): two parallel randomised controlled trials

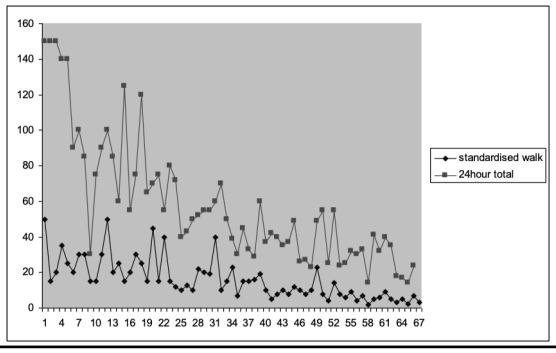
Prof Cathryn Glazener PhD a, Charles Boachie MSc a, Brian Buckley PhD b, Claire Cochran MSc a, Prof Grace Dorey PhD c, Prof Adrian Grant DM d, Prof Suzanne Hagen PhD e, Mary Kilonzo MSc f, Allison McDonald MSc a, Gladys McPherson MSc a, Prof Katherine Moore PhD a, Prof John Norrie MSc b, Craig Ramsay PhD a, Prof Luke Vale PhD f, James M'Dawi FRCS i

- One-to-one conservative physical therapy for men who are incontinent after prostate surgery is unlikely to be effective or cost effective.
- High rates of persisting incontinence at 12 months suggest a substantial unrecognised/ unmet need for management in these men.

Pelvic floor muscle exercise

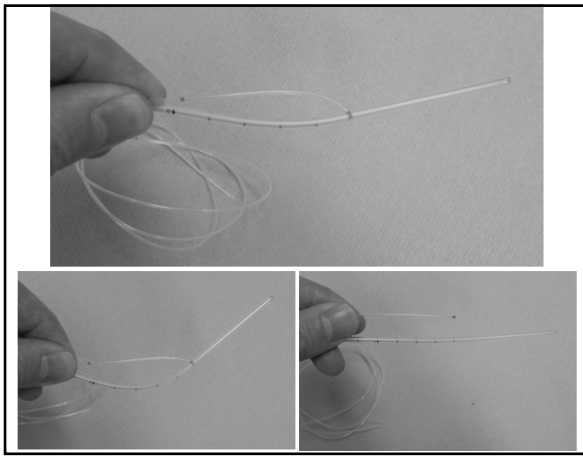
- Cochrane review update: 2015
- 45 trials incontinence after radical prostatectomy
- Men's symptoms improved over time irrespective of management
- 8 trials with pelvic floor muscle training: NO better than control after 12 months

Evaluate 1yr after prostatectomy



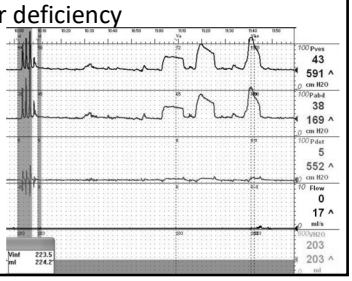
Urodynamics

- **Reproduce symptoms**
- **Detrusor factors**
  - **Urodynamic studies**
    - **Sphincteric deficiency (ISD) alone**
    - **ISD + detrusor overactivity**
    - **Detrusor overactivity alone**



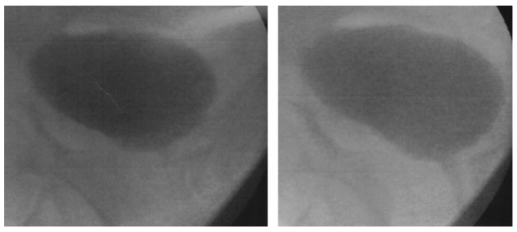
ALPP

- The pressure at which a patient leaks when he/ she does a series of valsalva strains of increasing strength
- Measures sphincter deficiency

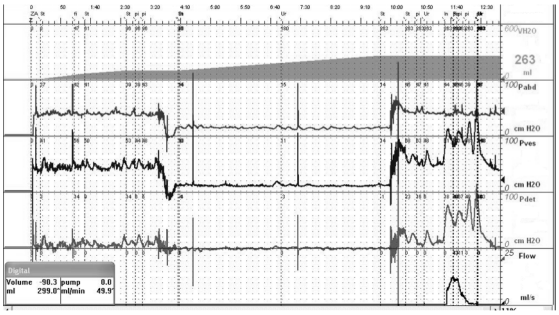


"Spurious" incontinence

- A strong sense of leakage with exertion, but without actual leakage; urine got into proximal urethra but not beyond EUS



Stabilising the detrusor to allow stress testing



Penile clamp to enable better bladder filling in severe USI

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology

EUROPEAN UROLOGY

Platinum Priority – Review – Incontinence
Editorial by XXX on pp. x–y of this issue

The Artificial Urinary Sphincter After a Quarter of a Century: A Critical Systematic Review of Its Use in Male Non-neurogenic Incontinence

Frank Van der Aa[a,], Marcus J. Drake[b], George R. Kasyan[c], Andreas Petrolekas[d], Jean-Nicolas Cornu[e], for the Young Academic Urologist Functional Urology Group*

Eur Urol. 2013 Apr;63(4):681-9

- Continence (patient-reported pads, questionnaires) achieved in 61–100% (zero or one pad/day).
- Dry rates (no pad) were given in 7 studies
- Patient satisfaction evaluated in four studies with four different tools and seems to improve after AUS

Table 3 – Dry rates in selected series

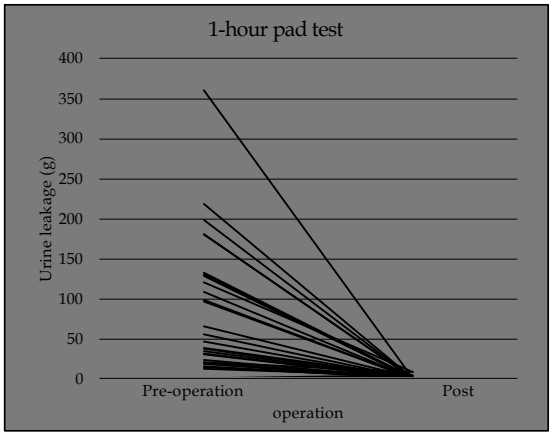
Study	No. of patients dry	Total no. of patients	Percentage of patients dry, %
Singh and Thomas [14]	18	21	85.7
O'Connor et al. [17]	7	29	24.1
O'Connor et al. [40]	1	23	4.3
Imamoglu et al. [18]	18	22	81.8
Walsh et al. [16]	17	91	18.7
Mottet et al. [21]	59	103	57.3
Trigo Rocha et al. [15]	20	40	50.0
Total	140	329	42.5

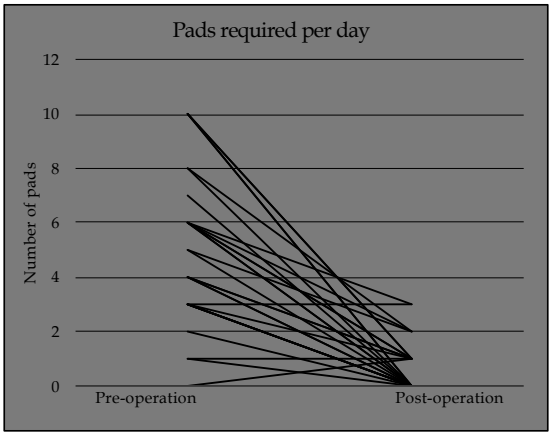
- Infection or erosion 8.5%,
- Mechanical failure 6.2%
- Re-operation 26.0%

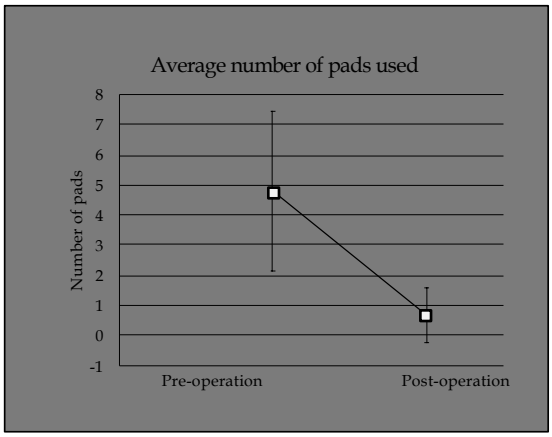
Table 4 – Pooled analyses of artificial urinary sphincter outcomes*

Outcomes	Results, % [range]	No. of included participants (no. of studies)
Infection/erosion	8.5 [3.3–27.8]	562 (10)
Mechanical failure	6.2 [2.0–13.8]	562 (10)
Urethral atrophy	7.9 [1.9–28.6]	456 (6)
Reintervention (for any reason)	26.0 [14.8–44.8]	549 (10)
No. of patients social continent (≤1 pad/24 h)	79.0 [60.9–100]	262 (7)
No. of patients completely dry (0 pads/24 h)	43.5 [4.3–85.7]	336 (7)

- Evidence for AUS in non-neurogenic male SUI uses heterogeneous, mostly small, outdated and retrospective case series.
- With alternatives to AUS emerging, our goal was to report outcomes of AUS using current evaluation guidelines in a contemporary, homogeneous cohort of male patients

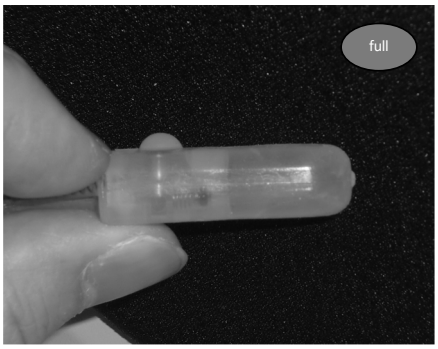


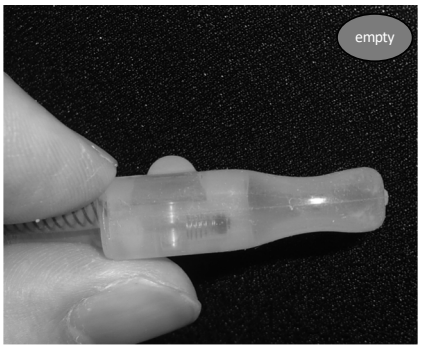


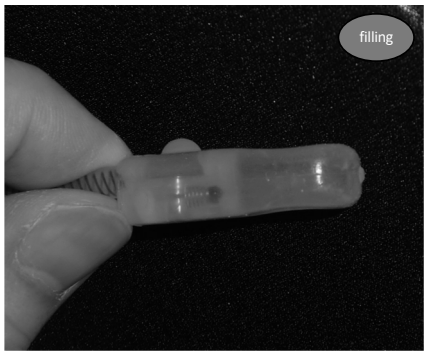


Artificial sphincter

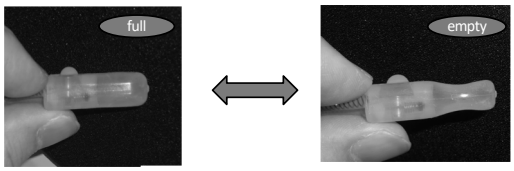
- **Patient selection**
  - **How wet?**
  - **Radiation**
  - **Detrusor factors**
  - **Dexterity/cognition**
  - **Patient preference**
  - **When to implant?**

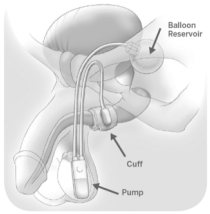




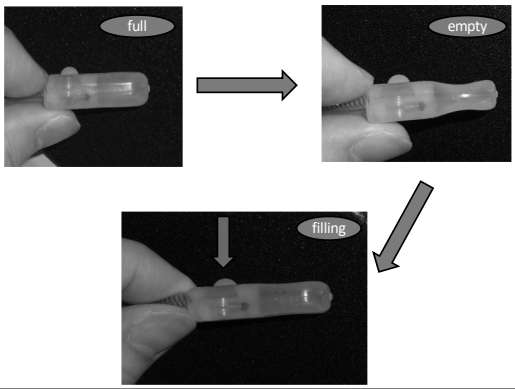


Voiding

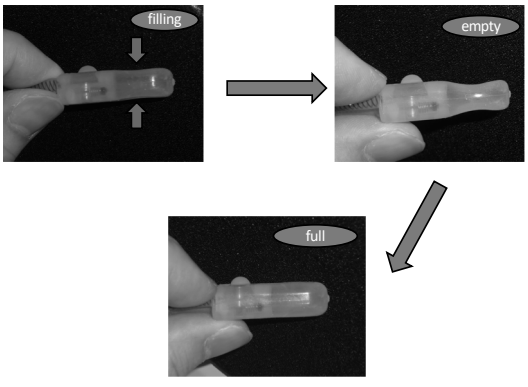




De-activation



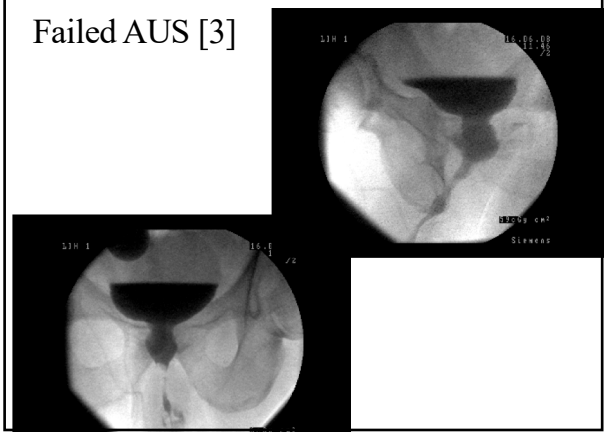
Activation



Failed AUS

- Inadvertent inactivation
- Mechanical
- Air-lock
- Deflation
- Erosion
- Atrophy

Failed AUS [3]



MLUTS management can and should be individualised

Symptom Control and improvement of Quality of life

- Voiding Symptoms
  - Alpha blockers for small prostate (<30-40 cc)
  - Alpha blockers and 5 ARI for large prostate
  - Surgery for BPO
- Storage Symptoms/OAB
  - Antimuscarinics
- Storage Symptoms/ Nocturia
  - Frusemide/Desmopressin?
- Storage and Voiding symptoms
  - Antimuscarinics and alpha blockers

MLUTS: Conclusions

- Identify cause
- Individualize treatment
- Urodynamics improves surgical outcome