Ambulatory Urodynamics (AUDS)

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What is AUDS?
A functional urodynamic test of the lower urinary tract, performed in a less clinical setting:
- ‘Ambulatory’ refers to the nature of monitoring
- ‘Natural’ fill
  - refers to the natural production of urine to fill the bladder rather than an artificial medium
- ‘Normal activity’
  - refers to everyday ‘normal’ activities – symptoms are often more likely to occur

Advantages of AUDS
- Capture more realistic and/or more physiological observations
- Attempts to increase sensitivity by providing a longer time for detrusor overactivity to manifest itself
  - up to 17% on conventional cystometry in normal subjects vs. 69% on AUDS
- Detects more actual incontinence than conventional cystometry

Disadvantages of AUDS
- Cannot predict which patients would suffer from urgency post-operatively, or even which women would demonstrate detrusor overactivity post-surgery
  - (Brown et al, BJU Int, 1999)
- Not very helpful in deciding on management
  - (Gorton et al, BJOG, 2000)
- Shows large inter-individual variation in young men

Indications

Primarily...
- If conventional urodynamic studies fail to provide an answer to the urodynamic question being posed
  - (Pannek et al, Scand J Urol Nephrol, 2008)

Occasionally...
- Situations in which conventional urodynamics may be unsuitable
- Neurogenic lower urinary tract dysfunction
- Research – evaluation of new or existing therapies for lower urinary tract dysfunction

Disadvantages

- Urethral Discomfort
- Quality Control Issues
- Test Analysis
- Patient Expectations
- Patient Selection
- Time
- Cost

No published data on reproducibility

Agree?

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Requirements for AUDS

- Fit for Test?
- Pves/Pabd
- Water/Air/Micro-tip Transducers
- Pad Sensor?
- Patient diary
- Experienced UDS Practitioner
- Pad Weighing scales

The test...

http://www.youtube.com/watch?v=gNZXaa2lFf8

What ‘events’ need to be recorded?

- Flow rate
- Post Void Residuals (PVR)
- Abdominal & Intravesical pressure
- Episodes of urgency/UUI
- Episodes of discomfort or pain
- Provocative manoeuvres
- Time and volume of fluid intake
- Time and volume of urinary leakage – SUI
- Time of pad change
Other important points to consider

- Check signal quality throughout
- Catheter fixation – the secret is in the taping!
- Recording of urinary leakage
- Clear verbal/written instructions to patients

Analysis of traces

- Assess quality of data recorded – record any technical problems
- Identify the different phases that occurred using markers placed by the patient
- Correlate events with the patient diary
- Use descriptive terminology same as for conventional urodynamics – were symptoms reproduced?

Clinical report should include:

- Duration of recording (number of filling cycles)
- Fill rate, timing, method and volume of any instigating filling
- Time and timing of injections, if administered
- Volume of fluid used during the test
- Number of voids – total and range of voided volumes and post-micturition urinary residual
- Episodes of urgency, urinary incontinence and pain
- Details of fluid changes during the test
- Results of provocative manoeuvres employed during the test
- Reasons for termination of recording if prematurely terminated

Our experience...

(Williams et al, 2014 EAU Published Abstract)

<table>
<thead>
<tr>
<th>Condition</th>
<th>21% Normal</th>
<th>34% DO +/- DOI</th>
<th>23% USI</th>
<th>16% MUI</th>
<th>6% Voiding Dysfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>200 Cases</td>
<td>200 Cases</td>
<td>200 Cases</td>
<td>200 Cases</td>
<td>200 Cases</td>
</tr>
<tr>
<td>Symptoms</td>
<td>67% symptoms reproduced</td>
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<td>67% symptoms reproduced</td>
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The future...

- Nanotechnology
- Intravesical capsule (Wille Capsule ‘Wi-Ca’)
  - Combined with a handheld device to register voiding desire and micturition
  - Placed/removed with cystoscope
  - Registers urodynamic parameters for several days
    - Long-term urodynamic measurement
Conclusion

• AUDS is usually a 2nd line investigation

• Useful when conventional urodynamics fail to reproduce symptoms and diagnosis would alter management

• Need experienced staff to interpret traces