

## A PICTURE CAN TELL...THE QUALITY OF URODYNAMICS, AS SHOWN IN SCIENTIFIC PAPERS.

### Hypothesis / aims of study

Urodynamic tests are pivotal in urogynecology or functional urology. Urodynamic testing is clinically and technically demanding and clear practice guidelines and standard operating procedures, together with strict training of relevant skills for the persons that perform tests, can be deemed useful. The Standardisation Committee of the International Continence Society (ICS) has published a 'Good urodynamic Practices'-report (GUP) for [citation]: '...the measurement, quality control and documentation of urodynamic investigations in both clinical and research environments'.<sup>1</sup> Quality control of urodynamic test-practice, test evaluation (-urodynamic diagnosis) depends on local initiatives. (External) audits on quality of urodynamic testing have never been published nor have IUGA or ICS developed such tools. Scientific manuscripts however, show the results of urodynamic testing. Published urodynamic graphs can be regarded as examples of urodynamic test results from 'centres of excellence'. Urodynamic graphs are there above published, only after peer-reviewing through relevant experts, and might therefore be regarded as examples of 'best practice'. We have evaluated the 'technical –clinical practical- quality', as addressed in the GUP-report, of urodynamic graphs published in international peer reviewed journals over the last ±15 years.

### Study design, materials and methods

The 'Neurourology and Urodynamics' (1998-2010), the 'International Urogynecology Journal' (1998-2010), the 'Urology' (1995-2009); the 'European Urology'(1998-2010); the 'Journal of Urology'(1995-2009), and the 'British journal of Urology'(1995-2010), were hand-searched for urodynamic graphs, of (filling) cystometry. Ambulatory urodynamic studies and gas- cystometry were excluded. The urodynamic graphs were evaluated and scored per item, explained in the table, derived from the above mentioned GUP-report:

Filling-cystometry	
Item	Explained:
$p_{det}$	Was the detrusor (subtracted) pressure graph shown?
$p_{ves}$	Was the intravesical pressure graph shown?
$p_{abd}$	Was the intra-abdominal pressure graph shown?
Fill Volume	Was the (intravesical filled) volume shown/indicated?
Sensation	Was the (patient reported) sensation (perception) of filling indicated?
Permission	Was 'permission to void' indicated?
Scale	Was the scale size indicated (vertical axis)?
Overlapping	Were the traces <i>not</i> overlapping (and therefore difficult to analyse)?
Physiological	Were the pressures in the 'physiological range' (indicated in the GUP)?
Zero	Were the $p_{ves}$ and the $p_{abd}$ 'zeroed in the patient'?
Detrusor	Was the detrusor pressure in the physiological range (indicated in the GUP)?
Cough	Are cough -tests done (visible in the figure)?
Symmetry	Were cough tests or (patient movements) identical / 'balanced' in both ( $p_{ves}$ and $p_{abd}$ ) pressure graphs?
EMG	Was an EMG shown (not mentioned in the GUP)?
Vertical scale	Was the vertical scale size as recommended in the GUP?
Horizontal vcale	Was the horizontal (time) scale size as recommended in the GUP?

Every item was scored one point when applicable. 'Filling sensation(s)' and 'permission to void' are not standard items in patients with relevant neurological abnormalities. EMG is not mentioned in the GUP-report. The maximum points 'to earn' for every figure were 16, but 14 in tests done in patients with relevant neurological dysfunction.

### Results

We found (63) graphs of urodynamic (filling) cystometry studies in; 'Neurourology and Urodynamics' (28); the 'International Urogynecological Journal' (0); 'Urology' (3); the 'Journal of Urology' (21); the 'British journal of Urology' (8); and in 'European Urology' (3). The average points scored was 8.4 (range 2-14). Fifteen of these graphs were 'neurogenic' and therefore 'sensation' or 'permission' were not scored. The table shows the items and the *percentages* of graphs where these items were in accordance with the GUP-report. (\*percentage adapted to 'neurogenic').

$p_{det}$	$p_{ves}$	$p_{abd}$	fillvol	sens	perm	scale	overl	phys	zero	detr	cough	symm	EMG	ver	hor
86	87	86	46	27*	25*	89	56	46	43	70	35	46	49	32	32

28 figures were published before 2002 and 35 after the GUP-report. We have not been able to observe a tendency to changed quality 'over time'. There was also no significant difference in the quality of the graphs before (8.5 points) or after the GUP-

report (8.4 points). Although the 3 figures in European Urology were (all after 2005) slightly above average (11 points) there were no significant differences in quality of the graphs between the various journals.

#### Interpretation of results

The small number of graphs on which 'permission to void' is indicated, the large number of studies where intra-(rectal)abdominal and/or intravesical pressure were (around) zero and/or not symmetrically responding to cough tests or patient movements bares concern about the implementation of the GUP-recommendations. The many deficiencies in scale sizing on the figures or in graph lay-out should alarm reviewers and editors. The urodynamic graphs that are published in peer reviewed journals are far from perfect, when the recommendations that are listed in the GUP-report are used as the reference. The GUP-recommendations might be considered too vigorous and it is possible to argue that these not reflect 'Good Clinical Practice'. However we have no argument so substantiate that. When these observations are taken as an external (audit or) quality indicator analysis it is mandatory to conclude that 'Good Urodynamic Practice' is not yet overall sufficiently applied.

#### Concluding message

Analysis of published cystometry graphs provides arguments to improve dissemination of, and knowledge about GUP. A vigorous implementation strategy of Good Urodynamic Practice will probably be essential, in this regard.

#### References

1. Schäfer et al: NU&U 21:261-274 (2002)

<b><i>Specify source of funding or grant</i></b>	<b>none</b>
<b><i>Is this a clinical trial?</i></b>	<b>No</b>
<b><i>What were the subjects in the study?</i></b>	<b>NONE</b>