<table>
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<th>Start</th>
<th>End</th>
<th>Topic</th>
<th>Speakers</th>
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<tr>
<td>14:00</td>
<td>14:10</td>
<td>introduction</td>
<td>• Jean Jacques Wyndaele</td>
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<td>14:10</td>
<td>14:30</td>
<td>Voiding diary as method to evaluate LUT function and LUT symptoms</td>
<td>• Jean Jacques Wyndaele</td>
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<td>14:30</td>
<td>14:40</td>
<td>Electronic or paper diary</td>
<td>• Ingrid van Neyghen</td>
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<td>14:40</td>
<td>15:00</td>
<td>voiding diary for elderly, children and neurologic patients</td>
<td>• Tom David van Meel</td>
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<td>15:00</td>
<td>15:30</td>
<td>evaluations of voiding diaries and determining the clinical value, pitfalls and limitations</td>
<td>All</td>
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**Aims of course/workshop**

A bladder diary is used to document the symptoms and signs of lower urinary tract function in daily life. This course will highlight the indication, practical application, clinical value and limitations of using a bladder diary in men, women, children, elderly, neurologic patients.

**Educational Objectives**

Making a proper diagnosis in cases of lower urinary tract problems and incontinence is a prerequisite to propose an optimal treatment.

The use of a voiding diary is of upmost importance as it gives objective and reliable information of the clinical signs and symptoms, grades them and puts patients complaints into proper perspective.

As diagnostic tool a bladder diary is valuable if filled in correctly and interpreted without making mistakes.

Participants will learn from this course how the optimal clinical use should be so that they can apply it or improve their actual use.
**Voiding diary as method to evaluate LUT function and LUT symptoms**

**JJ Wyndaele**

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**LUT symptoms**

- **Filling/Voiding**
  - Frequency
  - Nocturia
  - Stream ↓
  - Start ↓
  - ...
- **Incontinence**
- **Sensation**
  - Desire to void
  - Urgency
  - Pain
- **Other**

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**Diagnosis**

- History
- Physical examination
- Urine analysis
- Imaging
- Endoscopy
- Functional tests: padtest, urodynamics,..

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**Problems**

The diagnostic accuracy is not bad but:

- The reporting of symptoms is sometimes difficult
- Additional tests can cause more confusion
- Tests have limitations: artificial, non functional, non physiological, done in an uncommon environment.
- They can give data not related to the symptoms

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**Major problem**

- Patient has symptoms in daily life
- Evaluation should therefore focus on gathering information on LUT function in daily life

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**Voiding diary (= frequency volume chart, voiding chart)**

- Patient writes down what is experienced of LUT function during a certain period

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**Questionnaires**

**Voiding diary = Frequency/Volume Chart**
Voiding diary

Standardization is lacking

What would **you** think is needed on a bladder diary?

Voiding diary

**Only valuable if completed correctly**

Patient’s compliance

- Information, clear instructions and encouragement important for all types of VD !!!!
- Adaptation to information needed and to patient’s possibilities
- More complex VD for research

Good quality VD

- How many days
- Which parameters
- Interpretation
- Reliability

Voiding diary: how many days needed?

- Long complex charts
  - yield more data
  - may lower patient’s compliance
How many days

• 1 full day + night = good basic impression
• 3 full days + nights = consistency of events
• 7 days = research
• 14 days or more = training

Number of days?

• Nocturia and incontinence most variable and are not present every day in all (Groutz et al., 2000; Wyman et al., 1988; Locher et al., 2001; Naoemova et al 2010).
• Low incidence = more days needed (Homma et al., 2002)
• Urine loss 2/week = diary needed of 7 days to be reliable (Locher et al., 2001).

Voiding diary

• 24 hour frequency?
• depends on
  — fluid ingested
  — change in insensate fluid loss (weather)
  — why did patient go void?

Food and water

• Yogurt 125 ml = 100 ml
• Pudding 150 g = 100 ml
• 2 scoops ice cream = 70 ml
• Fruit 1 piece = 100 ml
• 1 grape fruit = 180 ml
• 250 gr grapes = 200 ml
• ¼ melon = 200 ml

What do we want patients to report?

Older publications:

• n* voiding episodes
• n* incontinence episodes
• + voided volumes
• + drinks/food/activities

Which data needed?

Urodynamic Society 1997

• Time micturition
• Time and type incontinence
• Voided volumes
Which data needed?
Yamanishi et al 2000 Urology

- Number of voids
- Number of leaks
- Number pad changes
- Degree urge 0 to 3 (3 = very much)
- Quality of life 0 to 3 (0= delighted)

Which data needed?
De Wachter Wyndaele 2003

- Hour awakening + hour going to bed
- Day of the week
- Time drinking + volume
- Time voiding + volume
- Reason for voiding= urge to void
- Leakage + grading
- Sleep interruption to make void

Sensation related bladder diary

- Patients tend to fill VD during weekend as more time.
- Day of week and season does not alter results (Van Haarst et al., 2004).

Grading Desire to void-Incontinence

Desire to void
- 1= convenience void
- 2= urge with easy postponement 30 min
- 3= urge postponement 15 min
- 4= urgency (< 5 min postpone) or pain in lower abdomen
Incontinence:
- 1= some drops.
- 2= underpants and /or protection wet
- 3= clothes wet

Reliability

- If patient 100% cooperative
- If instructions 100% clear
- If interpretation 100% sound

Reliability is high
ELECTRONIC OR PAPER DIARY

VAN NEYGHEM INGRID
GLASGOW
29 AUGUST 2011

WHAT DO WE PREFER?

PAPER DIARY

STRENGTHS

• Only way to access patients condition
• Allow tracking changes
• Accurate reflection of patients symptoms

Abravanel et al. 1996

WEAKENESS

• Validation of test instrument
• Logistic problems
• Quality of data
• No control of retrospective entry

ELECTRONIC DIARY

STRENGTHS

• All of the paper
• Greater subject compliance
• Possibility interim acces
• Dynamic display

WEAKENESS

• Requires training
• Cost of devices
• Possible errors
• Data entry requires program planning
ARE THERE DIFFERENCES?

- Age related influence
  - No difference in easiness to use
  - Difference in the completeness of filling in of the records

ARE THERE DIFFERENCES?

- Reproducible measure/monitoring
  - Reported compliance with paper diaries was 90% (86-94%)
  - Actual compliance with an electronic diary system was 94% (92-96%)

Stone et al. 2002

CONCLUSIONS

- Electronic diary can be a very specific tool for an evaluation of the bladder function
- Electronic diary is comparable with a paper diary
- Electronic diary has advantages in specific research with large sample sizes
- Paper diary remains useful in daily practice
Voiding diary for children, elderly and neurologic patients

Indications
- Lower urinary tract symptoms
- Post Micturition syndrome

Terminology
- Increased daytime frequency: the complaint by the patient who considers that he/she voids too often by day
- Nocturia: the complaint that the individual has to wake at night one or more times to void
- Enuresis: means any involuntary loss of urine.
  - If it is used to denote incontinence during sleep, it should always be qualified with the adjective "nocturnal"
- Nocturnal enuresis: the complaint of loss of urine occurring during sleep

Practical Applications
- Micturition time chart: this records only the times of micturiations, day and night, for at least 24 h
- Frequency volume chart: this records the volumes voided as well as the times of each micturition, day and night, for at least 24 h
- Bladder diary: this records the times of micturiations and voided volumes, incontinence episodes, pad usage and other information such as fluid intake, the degree of urgency and the degree of incontinence

What can we measure from bladder diaries?
- Daytime frequency: number of voids recorded during waking hours and includes the last void before sleep and the first void after waking and rising in the morning
- Nocturia: the total number of daytime voids and episodes of nocturia during a specified 24 h period
- 24-hour frequency: the total number of voids recorded during a night’s sleep, each void is preceded and followed by sleep
- 24-hour production: is measured by collecting all urine for 24 h

Clinical Value
- Limitations
What can we measure from bladder diaries?

- **Polyuria**: the measured production of more than 2.8 litres of urine in 24h in adults
- **Nocturnal urine volume**: the tidal volume of urine passed between the time the individual goes to bed with the intention of sleeping and the time of waking with the intention of rising (excludes last void before going to bed, includes first void after rising in the morning)
- **Nocturnal polyuria**: present when an increased proportion of the 24h output occurs at night (excludes last void before sleep, includes first void of the morning)

**Normal range of nocturnal urine production**
- **D**iffers with age
- **Nocturnal polyuria** > 20% young adults
  > 33% over 65 years
- **Maximal voided volume**: largest volume of urine voided during a single micturition

**Voiding diary for children**

**FREQUENCY-VOLUME CHART**
Detailed diary recording fluid intake and urine output over several 24h periods (NOGAARD et al. 1998)

**TERMINOLOGY ICCS**

- **Number of voidings**
- **Times of voiding**
- **Voided volumes**
- **Episodes of urgency**
- **Episodes of leakage**

**Why do we use it in children?**

- Reproducible measure/monitoring of
  - Functional bladder behaviour
    - Powell 1979 et al., Beers et al. 1987, Aprson 2004
  - Functional bladder storage in children
  - Paediatric bladder problems
    - Darchet et al. 1987, Larsson et al. 1980, Melton et al. 1984
Effectiveness and reliability

- Motivation of the child ("Bladder detectives")
  Bower et al. 2001

- Responsibility of the child, the parents should assist and support
  Norgaard et al. 1998

<table>
<thead>
<tr>
<th>1 glass</th>
<th>day miction</th>
<th>day accident</th>
<th>night miction</th>
<th>night accident</th>
<th>dry</th>
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Effectiveness and reliability

- Exclusion of the first and last miction
  First miction is in 72-75% the largest
  Matson 1994, Matson et al. 1985

Last miction is low, habit related or parent-prompted

Limitations

- The importance of residual urine

- The influence of the moment:
  Cooperation, errors, time of registration, "hidden" voids, ...

- Normal fluid intake:
  No increase, drinking pattern

Voidsing diary for elderly

BLADDER DIARY:
A tool for the registration of bladder habits within the "limits" of the patient

Why do we use it in elderly?

- Reproducible measure/monitoring of
  - Functional bladder behaviour
    Powell et al. 1979, Snow et al. 1981
  - Incontinence episodes
  - "Elderly" bladder problems
    Sato et al. 1983, Nakao et al. 1984

Limitations

- Lower cognitive level
- More ADL-limitations
- Fewer complaints of incontinence
- Impaired mobility
- Fewer chronic diseases
- More medication intake
- Registration by others
Are there some changes of micturition events with ageing?

- Volume/void and maximal voided volume decreases significant with age in both sexes
  (More prominently in men) Haart et al. 2004
- Fluid intake decreased with age in both sexes
  (Cardial problems, social isolation,...)

IN MEN
- Frequency increased with age (Development of prostatic enlargement)

IN WOMEN
- Frequency increased initially and decreased in the elder

Take home messages

- Frequency-volume chart adapted to needs
  (complexity of VO, number of different data)
- Patient’s limitations influence the outcome
  (variability, completeness, interpretation)
- Registration by others if needed

Why do we use it in neurogenic patients?

- Reproducible measure/monitoring of
  - Functional bladder behaviour
  - Incontinence episodes

Limitations

- More ADL-limitations
- Fewer complaints of incontinence
- Impaired mobility
- Fewer chronic diseases
- More medication intake
- Registration by others

BLADDER DIARY:
A tool for the registration of bladder habits within the "limits" of the patient
Take home messages

• Frequency-volume chart adapted to needs
  (complexity of VC, number of different data)

• Patient’s limitations influence the outcome
  (availability, completeness, interpretation)

• Registration by others if needed