

# הרטבת יום והרטבת לילה גישה לטיפול

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גושן Zoom 2020



# הרטבה בלילה וביום

- מהפכה בת 40 שנה בתפיסה שלנו.  
מבעיה שהייתה לגמרי פסיכולוגית/התנהגותית  
לבעיה אורגנית עם בסיס גנטי.
- בסיס משותף או חפיפה בין - הרטבה בלילה, הרטבה  
ביום, ואנקופרזיס.



# הרטבת לילה

## הרטבה אחרי גיל 5 שנים



# Terminology of Nocturnal Enuresis (NE)

## מערכת מונחים בתחום

### Two subgroups of NE:

- *Primary / Secondary NE.*
- *Monosymptomatic / Non*

### ***Monosymptomatic NE***

Nevés T, von Gontard A, Hoebeke P, et al. The Standardization of Terminology of Lower Urinary Tract Function in Children and Adolescents: Report from the Standardisation Committee of the International Children's Continence Society. J Urol 2006;176: 314-324.



# NE - Secondary

Primary vs Secondary – less important than once thought

Secondary NE is most commonly caused by overactive bladder.

Nonetheless consider:

- UTI
- Sexual abuse
- Diabetes Mellitus/Insipidus
- Epilepsy
- Obstructive Sleep Hypoventilation
- Neurogenic Bladder
- (Ectopic ureter – usually primary)

Schaumburg HL, Kapilin U, Blasvaer C, et al Hereditary phenotypes in nocturnal enuresis. BJU Int 2008;102;816-821.



# Terminology of Nocturnal Enuresis (NE) מונחים בתחום של הרטבות

**חלוקה יותר חשובה:**

***Monosymptomatic NE (MNE)***

***Nonmonosymptomatic NE (NMNE)***



# Monosymptomatic NE

= Night wetting

Without ANY daytime urinary symptoms.

(Earlier definitions of MNE defined it as NE *without* daytime incontinence)



# Nonmonosymptomatic nocturnal enuresis (NMNE)

NE

+

Daytime Lower Urinary Tract (LUT) symptoms:

Increased voiding frequency - תכיפות

Urgency - דחיפות

Jiggling - נעים בתזזית

Daytime incontinence – חוסר שליטה במהלך היום

= “Filling problems” - שלפוחית השתן לא מספיקה להתמלא





# בעיות בהתרוקנות של כיס השתן

## Emptying problems:

Hesitancy, straining, weak stream, infrequent voiding, a feeling of incomplete emptying, post-micturition dribble and genital or lower urinary tract pain.

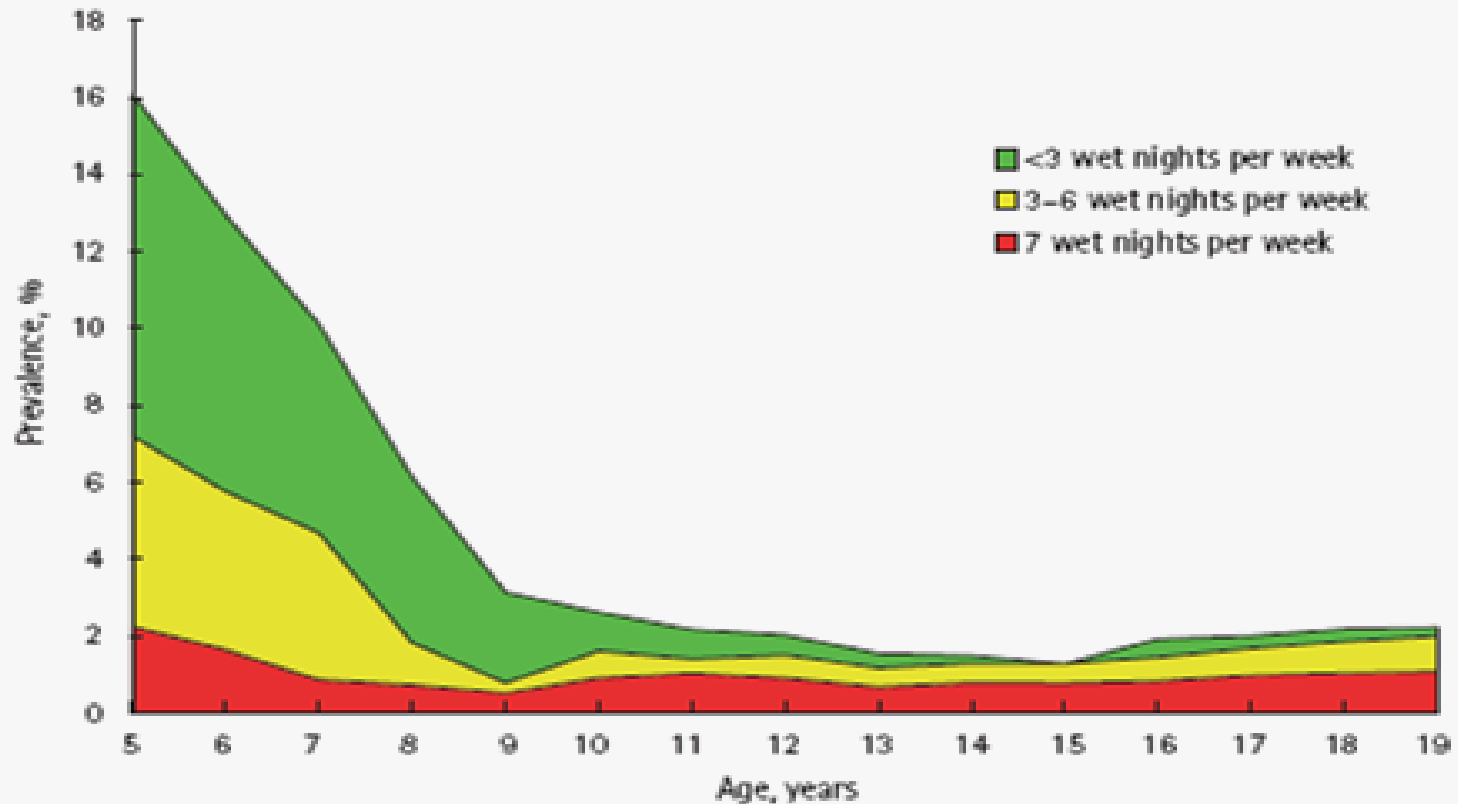
לרוב קשור לבעיות אורולוגיות



# אפידמיולוגיה של הרטבת לילה



## Prevalence and Severity of Primary NE in Hong Kong Male:Female Ratio is 3:2



| Yeung CK, Sreedhar B, Sihoe JDY et al. Differences in characteristics of nocturnal enuresis between children and adolescents: a critical appraisal from a large epidemiological study. BJU Internat. 2006;97:1069-1073.



# Prevalence of Nocturnal Enuresis occurring at least once a month

<b>AGE (Years)</b>	<b>PERCENTAGE OF CHILDREN AFFECTED</b>
5	15-20
7	7
10	5
15	1-2

Bakwin H. Enuresis in children J Pediatr 1961;58:806-819.

Bakwin H. Enuresis in twins Am J Dis child 1971;121:222-225

## Epidemiological risk of a 5 y old child having Nocturnal Enuresis

Both parents were enuretic	77% risk
One parent enuretic	43% risk
Neither parent enuretic	15%
Monozygotic twins	70% concordance
Dizygotic twins	31% concordance



# גורם גנטי?

3 genetic loci discovered by gene linkage analysis  
ENUR 1,2,3....



# גורם גנטי?

Inheritance:

Autosomal dominant with variable penetrance.

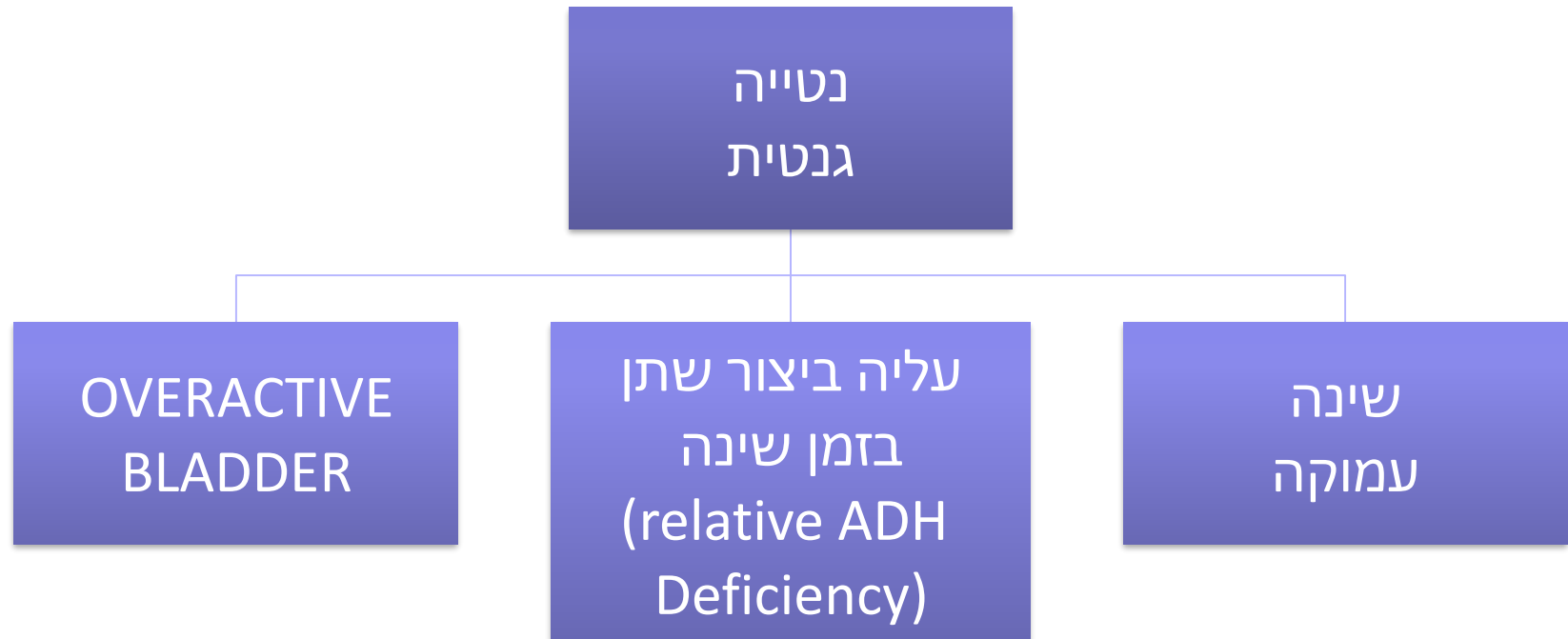
Locus heterogeneity

Poor phenotype-genotype correlation.

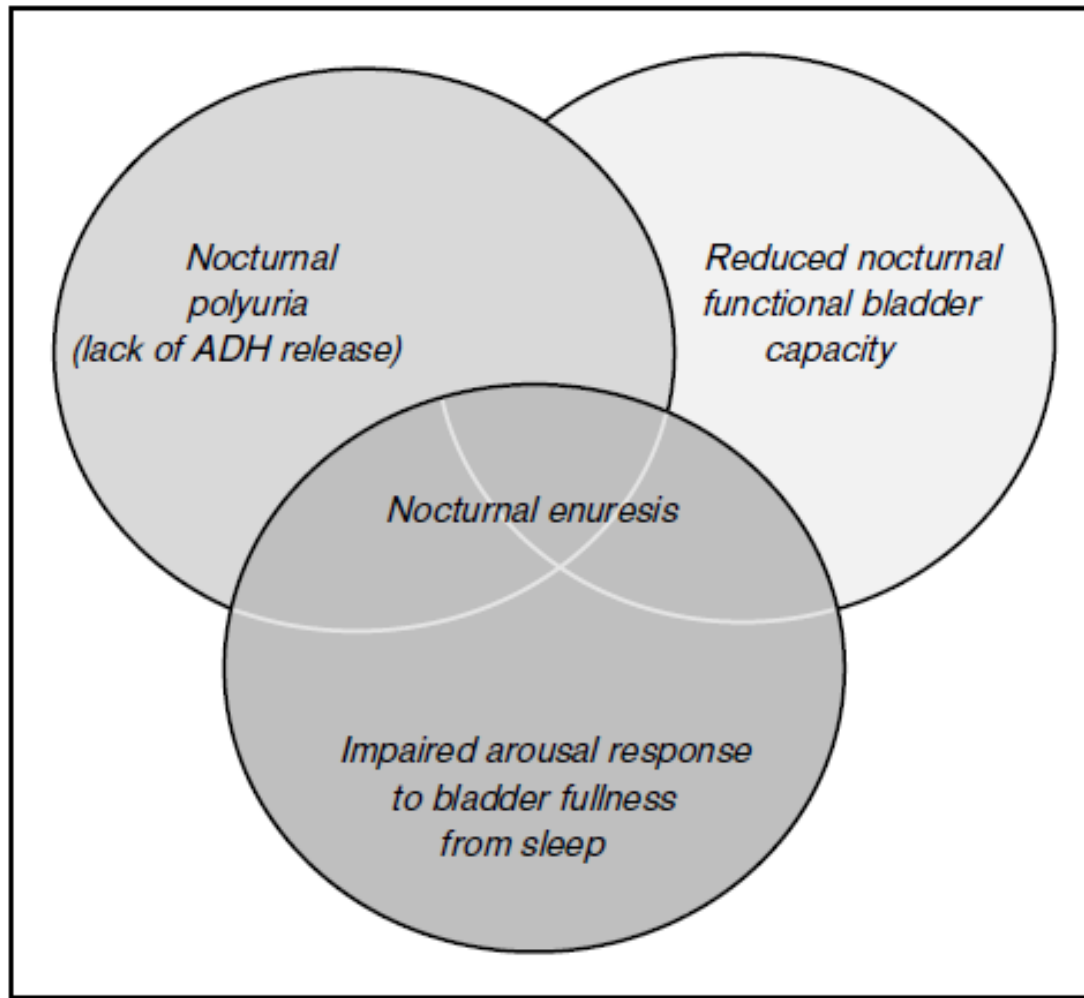


# הרטבת לילה – פתופיזיולוגיה

## A physiological imbalance







Pathophysiology of NE - The “Double Hit” hypothesis



# מרכיב – Nocturnal Polyuria

פגם במחזור יומי של שחרור של ADH  
(Antidiuretic hormone)

i.e. loss of circadian variation in ADH release.

מסביר למה הילד מרטיב, אפילו בלי לשתות בערב ולמרות זה שהוא הולך לשרותים לפני שינה.



## מסתבר ש-

אין לכלל ילד עם הרטבת לילה POLYURIA

אין לכלל ילד עם POLYURIA חוסר ADH

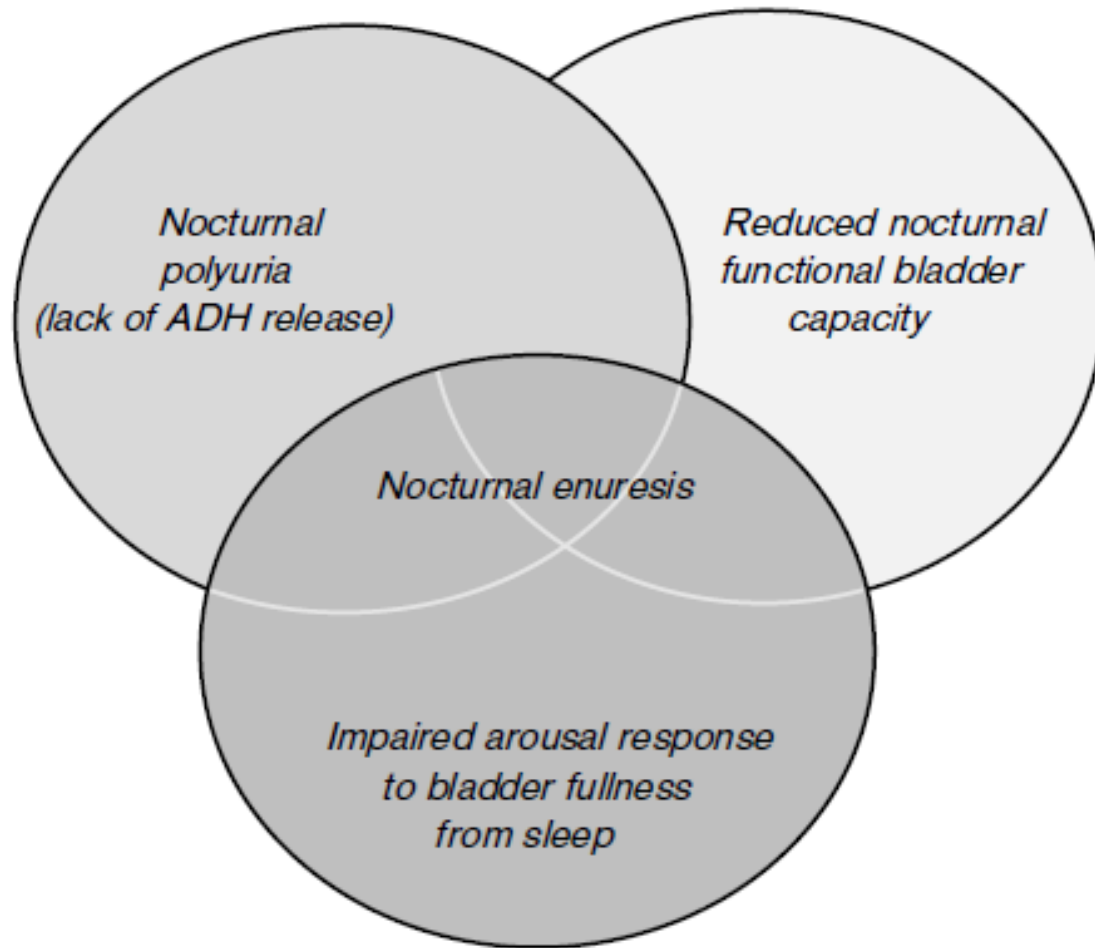


## Non-ADH causes of Nocturnal Polyuria (unresponsive to Desmopressin)

- Increased evening solute load and high nocturnal urine osmolarity
- Abnormal renal sodium handling
- Nocturnal hypercalcuria
- Abnormal circadian rhythm of prostaglandin
- Abnormal circadian rhythm of GFR
- Abnormal sympathetic tone to kidneys
- Innate suboptimal renal concentrating capacity

All able to increase nocturnal urine production or decrease desmopressin response.





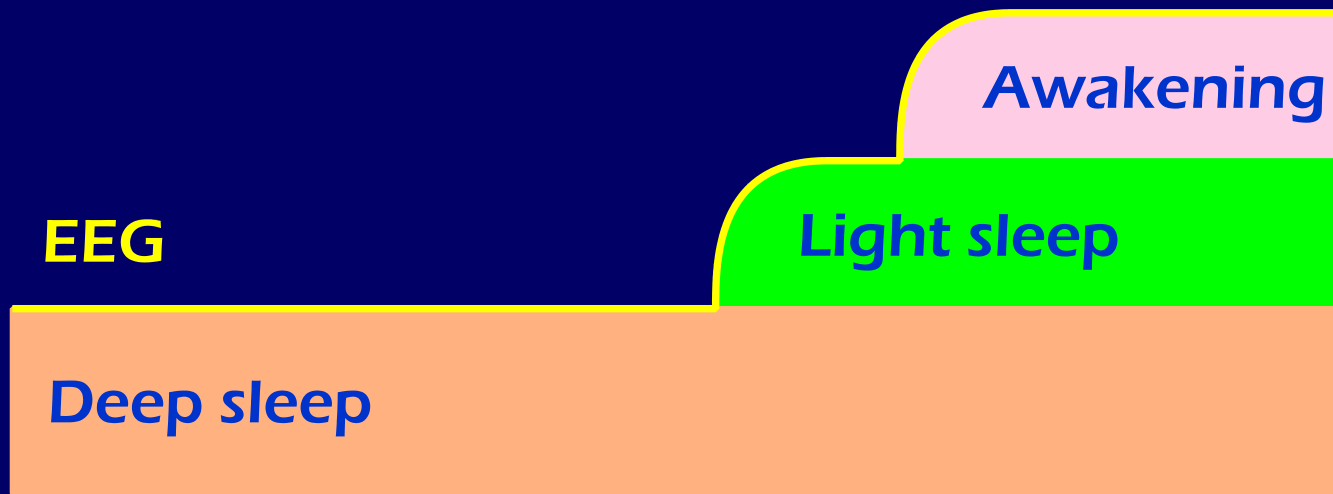
Pathophysiology of NE  
The “Double Hit” hypothesis



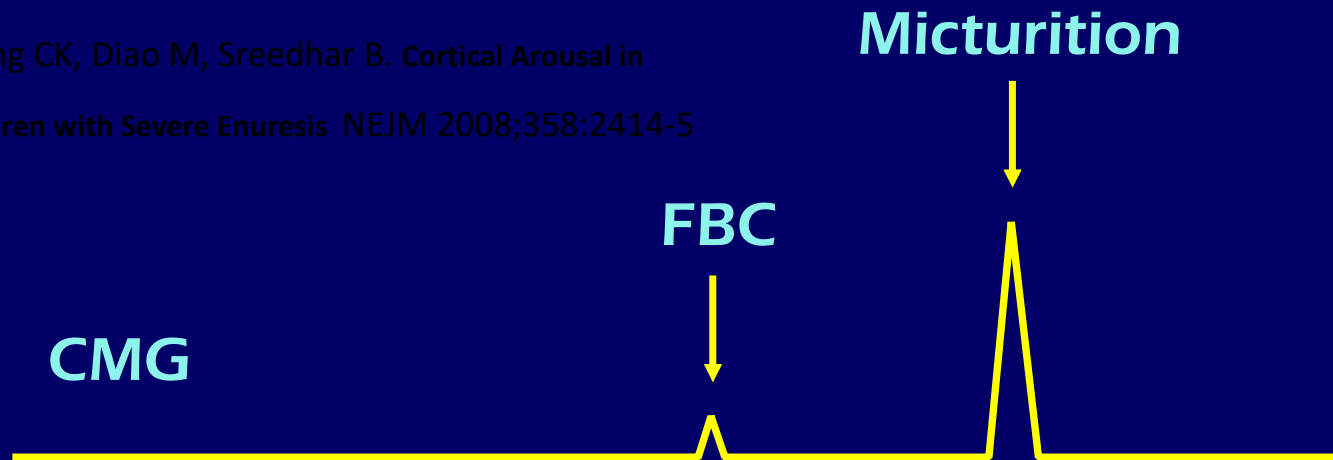
# מרכיב #2 – שינה עמוקה



# Bladder Behaviour and Sleep Changes



Yeung CK, Diao M, Sreedhar B. Cortical Arousal in  
Children with Severe Enuresis NEJM 2008;358:2414-5



**Normal Children**

# Bladder Behaviour and Sleep Changes

EEG

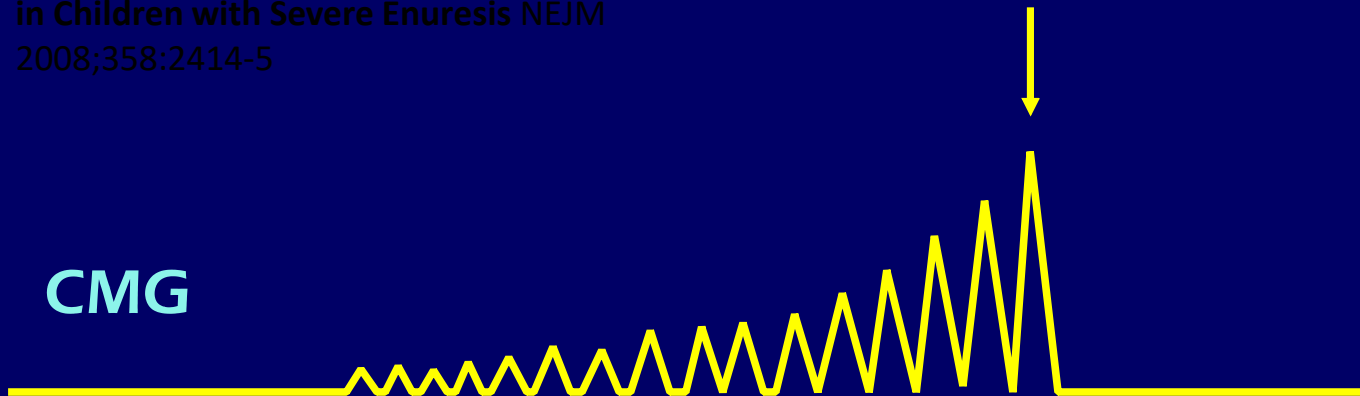
Light sleep

Deep sleep

Yeung CK, Diao M, Sreedhar B. **Cortical Arousal in Children with Severe Enuresis** NEJM 2008;358:2414-5

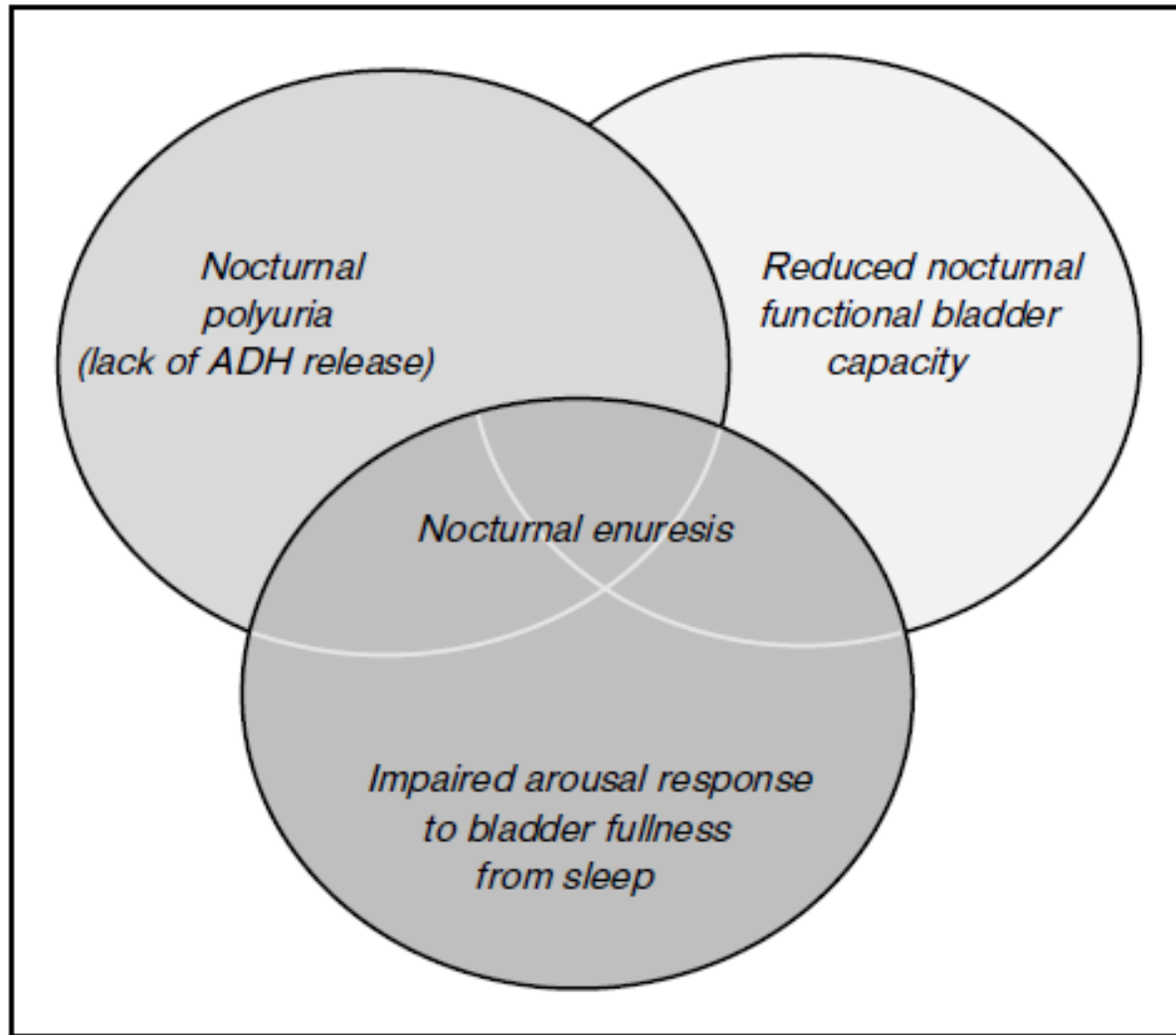
Micturition

CMG



Enuretic Children





Pathophysiology of NE  
The “Double Hit” hypothesis



## מרכיב #3

### Small nocturnal functional bladder capacity

= *decreased bladder storage*

שמות נרדפים

Overactive Bladder (OAB)

Detrusor instability

כיס שתן רגיז - Irritable bladder

פעילות יתר של דופן כיס השתן



מה זה פעילות יתר של דופן שלפוחית השתן?

Overactive Bladder (OAB) =

**Detrusor muscle contractions**

(Usually when the bladder is relatively empty)



# Overactive Bladder (OAB)

בלילה – קשה לאבחן כי לא מרוגש  
אבל אם יש OAB במהלך היום:

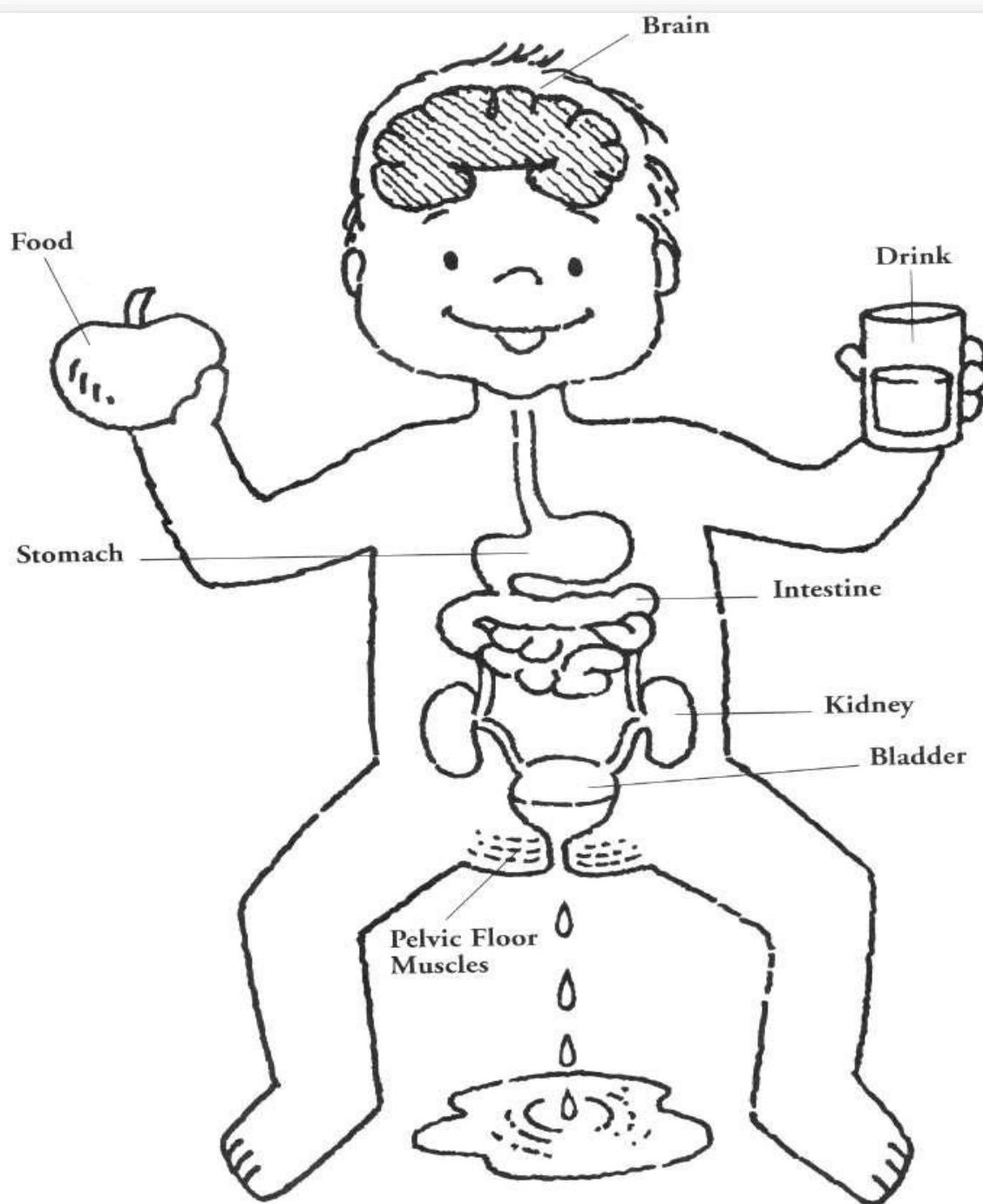
Increased voiding frequency – תכיפות

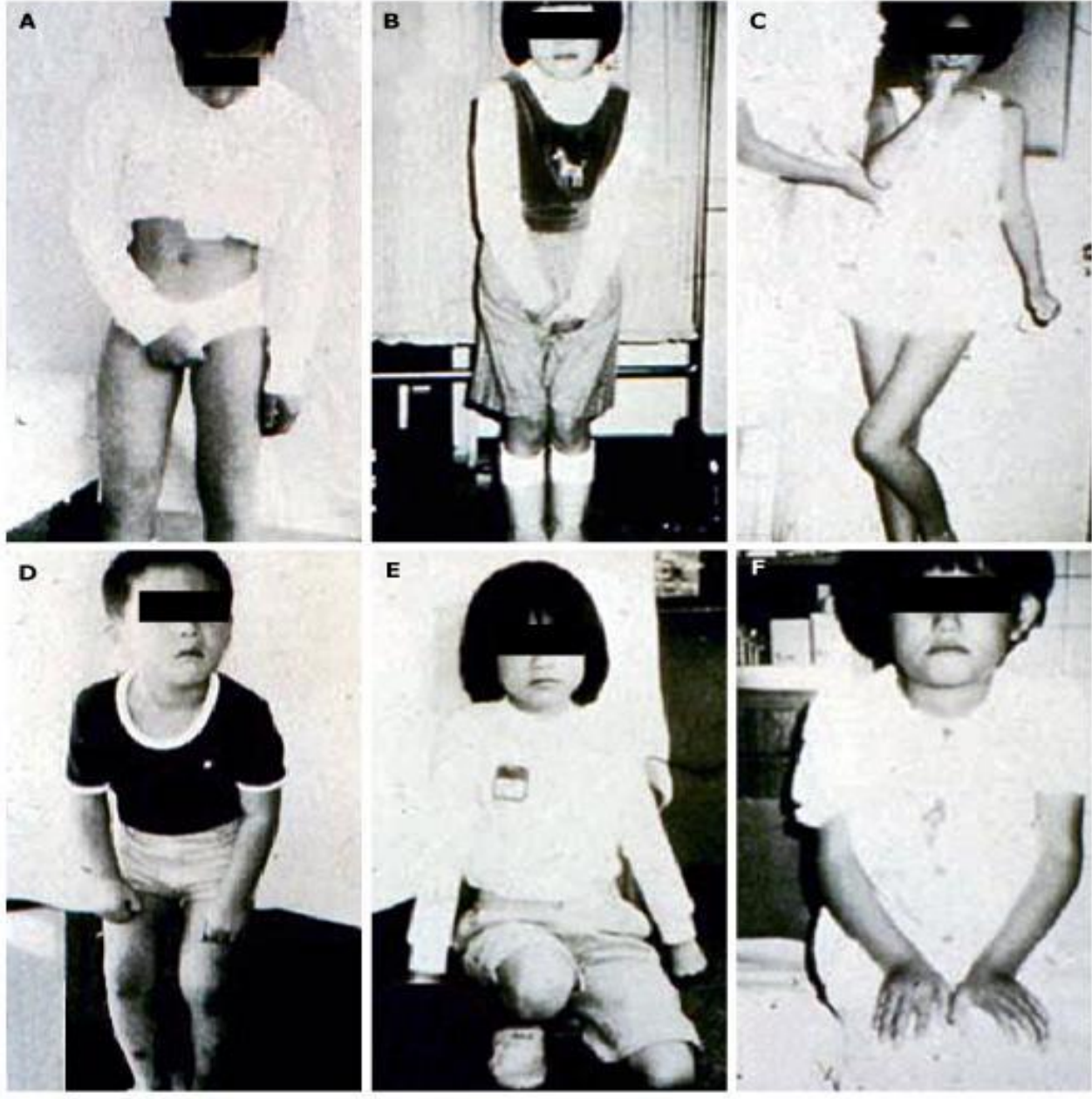
Urgency - דחיפות

Jiggling – נעים בתזזית

Daytime incontinence – פספוסים קטנים







“Hockering”, Vincent’s Curtsy. (From Uptodate)



# Overactive bladder

MNE traditionally regarded as NOT having OAB.

NMNE usually associated with OAB



# Overactive Bladder - associations

- Non monosymptomatic NE
- Refractory NE – even without daytime symptoms
- Adolescent NE
- Recurrent UTI
- Secondary NE

If you have OAB by day then you will also have it at night.





# OAB - אבחון

1. **History** - frequency, urgency, small volumes, hockering, day wetting

2. **Voiding and fluid intake diary for 24–48 hr**

**Expected bladder capacity (EBC)**

**= (age in year + 1) x 30 mls**

up to age 12 years

Voiding frequent small volumes, often well below the EBC, suggests OAB



# לסיכום הרטבת לילה

נטייה  
גנטית

OVERACTIVE  
BLADDER

עליה ביצור שתן  
בזמן שינה  
(relative ADHD  
Deficiency)

שינה  
עמוקה



# NE - Management

- >10 years old require urgent attention.
- Avoid treating children under the age of 6 years.
- Most places start treating at 6-7y



# NE - The interview

- Reassure - not the child's fault.
- Explain - the inherited nature of the problem.
- Explain the prevalence
- Most of all explain the pathophysiology



# NE management

טיפול שונה בין MNE ל - NMNE



# Monosymptomatic NE

- Treatment of choice is bed wetting alarm (Cochrane Review 2013)
- Desmopressin (DDAVP) is probably a second line drug



# MNE - Management

## **ALARMS – “Cure”**

- Bedwetting alarms are the mainstay of therapy for MNE.
- When properly explained and used, initial success rates are of the order of 80%
- Relapse rate of 20-30%.
- Statistics difficult to interpret
- Used for 8-12 weeks
- Overlearning



# Personal Alarm/Clip on Alarm





# Pad and Bell alarm



# זמזם לילה

ל 8-12 שבועות

הזמזם לא יעיר את הילד (בהתחלה) – ההורים מעירים

Overlearning

איך הוא עובד? – כנראה לא דרך התניה קלאסית



# MNE – Desmopressin

desmopressin acetate, DDAVP, Minirin  
(1-deamino-8-D-arginine vasopressin)

- Synthetic analogue of ADH
- Short-term stopgap i.e not curative
- Medium term solution if treatment with the alarm has failed.

Not usually a cure



# Desmopressin

120 mcg sublingual –

200 mcg oral –

Take 1-2 before bed –

– אין לשתות כלל לאחר מתן התרופה עד למחרת בבוקר



# NE - Other treatments

- Waking or 'lifting' the child
- Fluid restriction - no use
- Rewards/stickers
- Imipramine - seldom used, potential for accidental overdose. Being rediscovered for very difficult cases. Has some  $\alpha$  agonist (tightens bladder neck) and may influence sleep architecture



# NMNE

Daytime OAB found in at least 1/3 of NE.

48hr voiding volume charts.

Expected bladder capacity  
= (AGE in years + 1) x 30 ml



# NMNE

- ראשית הכל, לשלול עצירות/אנקופריזיס



# Overactive Bladder - Treatment

Oxybutynin (anticholinergic) “Novitropan”

2.5 - 5 mg X 2/day

במשך כ 6 חודשים (לפעמים שנים).  
בונים את המינון במשך כשבועיים.





# Oxybutynin – לואאי – תופעות

Anticholinergic (muscarinic)

כולם הפיכות

**שכיח -**

פה יבש

סומק

**נדיר יחסית -**

עצירות

עור יבש, דמום מהאף

שינוי התנהגותי

כאבי ראש

טשטוש ראייה



# NMNE – further investigation

## Renal and bladder US

Bladder wall thickening – chronic OAB or DV

## Immediate post-voiding bladder US – שארית

- Normally <5 mL
- 5–20 mL ?should be repeated
- >20 mL repeatedly suggests DV or other lower urinary tract pathology



# Dysfunctional Voiding (DV)

Longstanding OAB can cause and be caused by contraction of pelvic floor muscles during voiding

= Dysfunctional Voiding

DV can cause:

- Incomplete bladder emptying,
- Refractory NMNE,
- Vesticoureteric (VU) reflux
- UTI.



NMNE

**FIX THE BOWEL FIRST**

THEN THE OVERACTIVE BLADDER

THEN THE NOCTURNAL ENURESIS

FOR TOUGH CASES - UROTHERAPY



# אל תשכחו

Role of constipation/anismus/withholding

Dysfunctional Elimination Syndrome



**תודה על ההקשבה!**

[michael.h@ziv.health.gov.il](mailto:michael.h@ziv.health.gov.il)

050-8434012

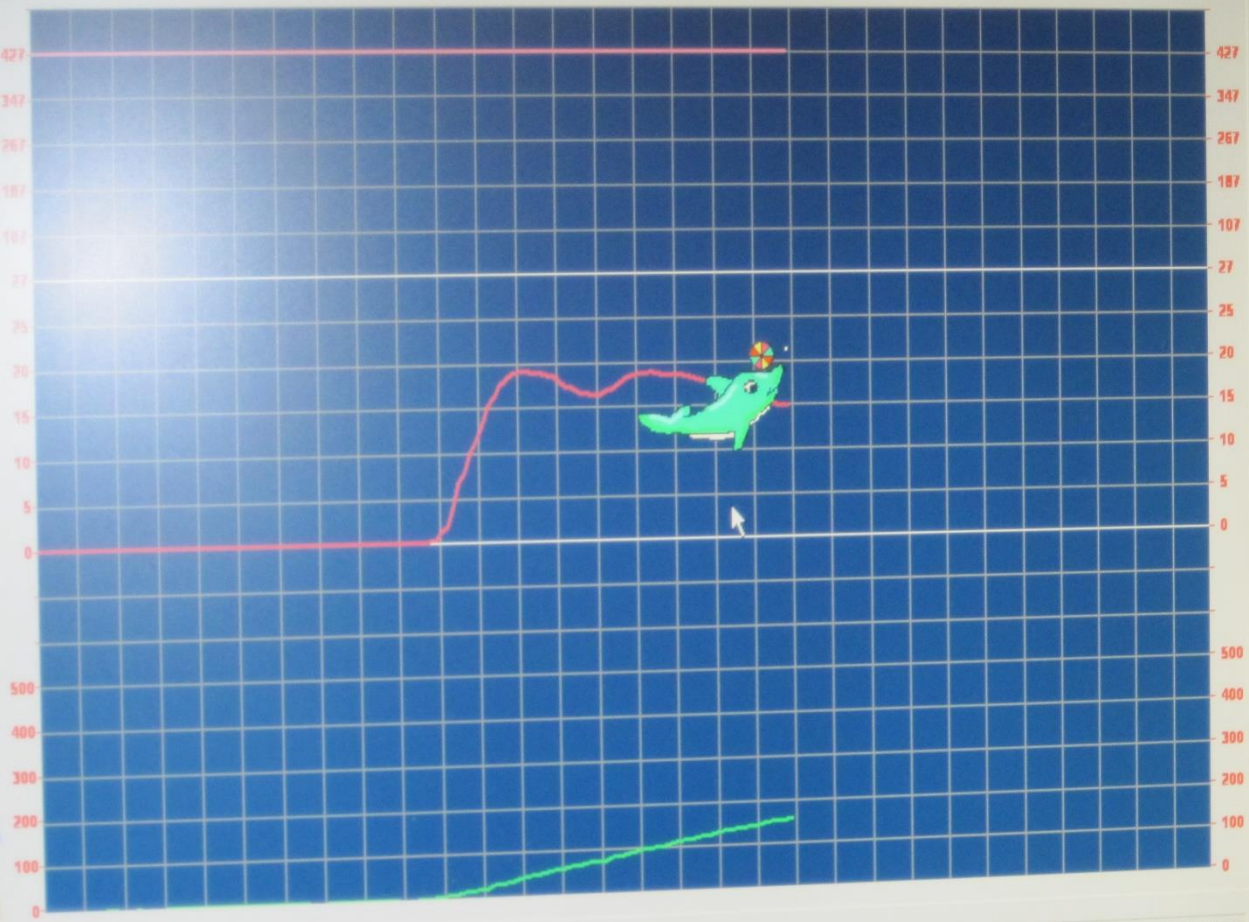






Flow Vol. Auto Start

Phase Time: 19



EMG 00:00:19 Sequence No. 1/1 Repeat Time: 1/50 Phase No. 1/1  
 Laborie Medical Technologies Inc. Urostym 6.0.3 Firmware 1.13 200 Hz.  
 25/05/2009 7:05:32

m: 1 UDS U MiniD 23 FR 7:05

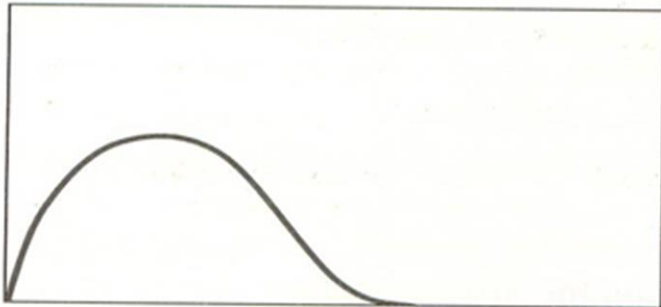
Willy Bullert  
 Managing Director  
 0977/121310

*Herremann 2 1905*  
*Martin Herbst 11810*  
*Alto Supady*  
*John (2500) ma de*

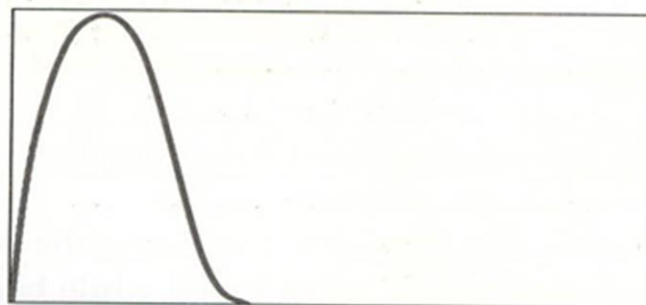




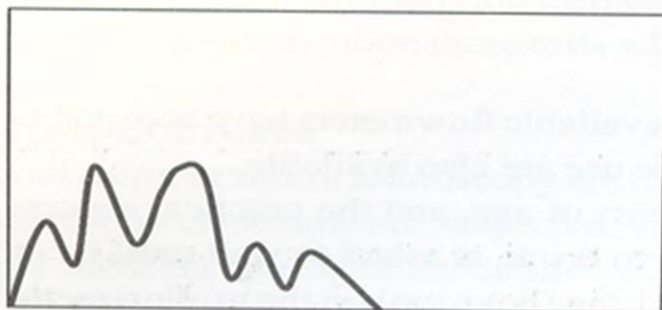
Bell



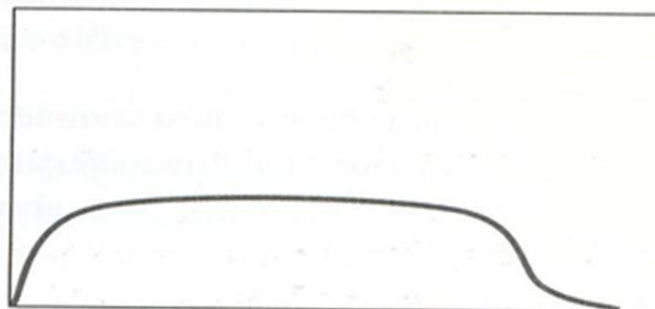
Tower



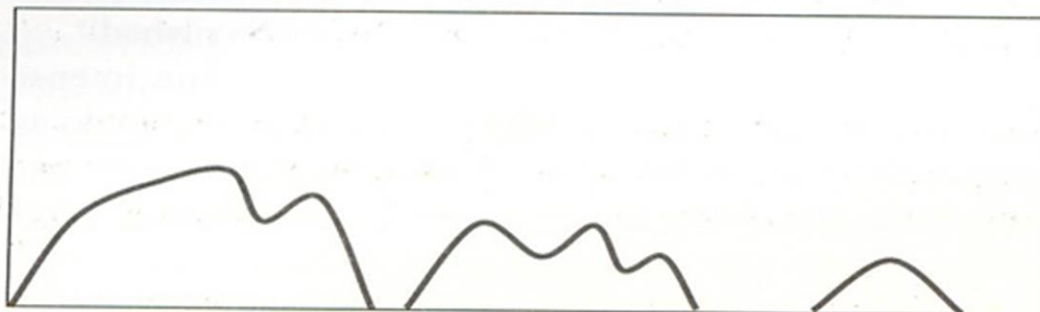
Staccato



Plateau



Interrupted



**Fig. 4.2** A simplified depiction of the five basic uroflow curve types.