



The image shows two screenshots side-by-side. The left one is a document titled 'CESPER 2024' with a background image of a forest. The right one is a social media post from 'Lorenza Fianchi' with the text 'richiesta disponibilità' and some details about the event.

**COS'E' L'ENURESI E
PERCHE'
DOBBIAMO OCCUPARCENE**

1

- **PROBLEMA DIFFUSO**



The graphic features an orange box with the word 'WHY' in white. Below it is a book cover titled 'ENURESI' with the subtitle 'percorso diagnostico terapeutico assistenziale'. The book cover also mentions 'PROGETTO FORMATIVO A RISPONSA' and dates 'dal 20 settembre 2017 al 10 settembre 2018'.

2

ENURESI
È IL SECONDO PROBLEMA PER

NOTTURNA
PREVALENZA IN ETÀ PEDIATRICA?

1.000.000 DI BAMBINI E 500.000 ADULTI

The infographic features a dark blue background with a grid of yellow dots in the top-left and bottom-right corners. A dashed blue arrow points from the top-right towards the word 'ENURESI'. The text 'È IL SECONDO PROBLEMA PER' is positioned below the word. The word 'NOTTURNA' is written in a large, light blue font, with 'PREVALENZA IN ETÀ PEDIATRICA?' in a smaller, white font below it. At the bottom, a grey box contains the text '1.000.000 DI BAMBINI E 500.000 ADULTI' in dark blue.

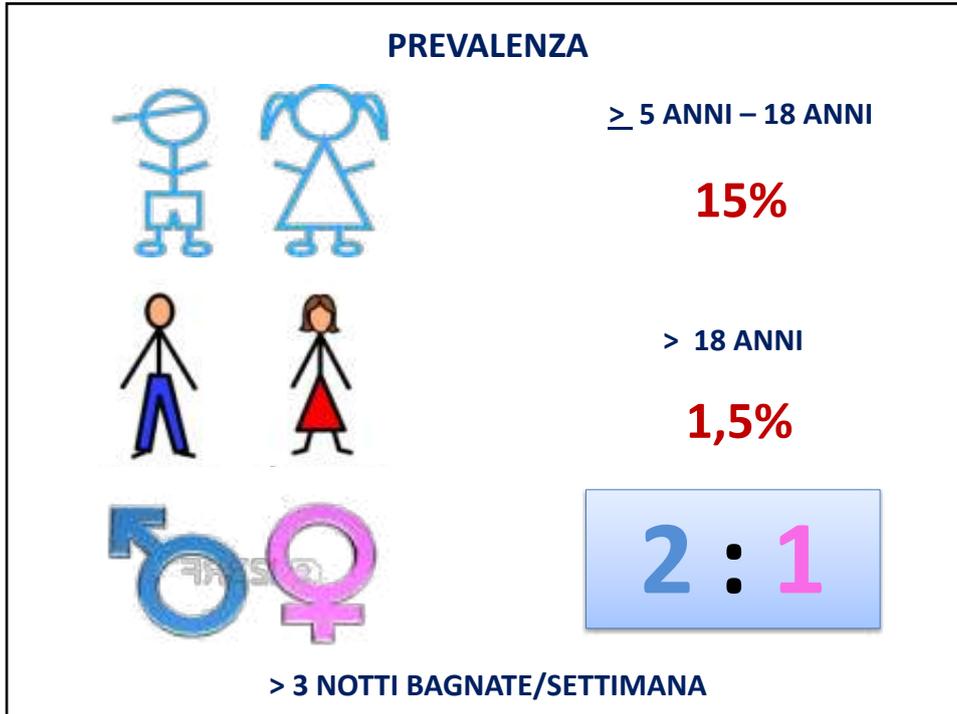
3

ENURESIS

20 %

The infographic shows a grey box with the word 'ENURESIS' in black. Below it, a horizontal bar contains ten blue stick figures. Two red arrows point down to the first two figures. Below the bar, a grey box with a marbled texture contains the text '20 %' in red.

4



5

- **90%** TRASMISSIONE PER VIA AUTOSOMICA DOMINANTE AD ALTA PENETRANZA
- **1/3** CASI SPORADICI
- **?** ASSOCIAZIONE GENOTIPO/FENOTIPO

Identification of genetic loci associated with nocturnal enuresis: a genome-wide association study
Lancet Child Adolesc Health 2021; 5: 101-09
Published Online January 14, 2021

HIGHLY POLYGENIC DISORDER.

CHIEDERE SEMPRE FAMILIARITA'

6

- PROBLEMA DIFFUSO
- CARENZA TRAINING PROFESSIONALE
- “LINEE GUIDA “VECCHIE”
- LINEE GUIDA “IPERSPECIALISTICHE”
- INTERNET INACCURATO/INAFFIDABILE
- PROVE ED ERRORI”: EFFETTO DELETERIO

WHY



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PRESENZA PREGRESSA ENURESIS



**FATTORE RISCHIO
INCONTINENZA URINARIA
IN ETA' ADULTA**

80%

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ISSN 0954-6794 (print) / 1473-274X (online) Vol. 174, 1620-1625, October 2005
 THE JOURNAL OF UROLOGY™ Printed in U.S.A.
 Copyright © 2005 by AMERICAN UROLOGICAL ASSOCIATION DOI: 10.1097/JU.0000748299.31859.12

DYSFUNCTIONAL ELIMINATION SYMPTOMS IN CHILDHOOD AND ADULTHOOD

W. F. BOWER,* S. K. YIP AND C. K. YEUNG

From the Departments of Surgery (WFB,CEI) and Obstetrics and Gynecology (SEI), Chinese University of Hong Kong, Hong Kong

J Epidemiol Community Health 1994;51:453-458 453

Urinary incontinence in middle aged women: childhood enuresis and other lifetime risk factors in a British prospective cohort

Diana Koh, Linda Cardozo, Rebecca Hardy

J Urol. 2006 March; 175(3 Pt 1): 989-993.

Childhood Urinary Symptoms Predict Adult Overactive Bladder Symptoms

Mary Pat Fitzgerald*,†

From the Departments of Obstetrics/Gynecology and Urology, Loyola University Medical Center, Maywood, Illinois

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© 2006 WILEY-BLACKWELL | DOI: 10.1111/j.1469-7610.2006.01600.x

Enuresis in childhood, and urinary and fecal incontinence in adult life: do they share a common cause?

RYSE SHIBUKAWA KAWAOKI and TAMARA KAWAOKA
 Downloaded from www.blackwell-synergy.com by University of Toronto on 06/10/24
 Access to published online articles is provided by Wiley Online Library



Objective: to investigate any **ASSOCIATION BETWEEN URINARY OR FECAL incontinence and childhood bedwetting**

Participants: 1021 women referred to a gynaecology outpatient clinic

Results:

- history of childhood bedwetting in **29.6%** and **21.1%** of women **WITH** and **WITHOUT UI** respectively ($P < 0.05$)
- Women with **SUI** had significantly **HIGHER RATES** of enuresis in childhood (**35.4%**) than those without it (**21.1%**; $P = 0.003$)
- **FECAL INCONTINENCE** was significantly **MORE COMMON** in women with a history of bedwetting in childhood ($P < 0.05$)

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REGULAR ARTICLE

The impact of a history of childhood nocturnal enuresis on adult nocturia and urgency

Shunji Akashi (s-clinic@so-net.ne.jp)¹, Kazuo Tomita²

¹Shimotani Child Clinic, Suitama, Japan
²Department of Pediatrics, Keiochika Medical Center, Keio University School of Medicine, Tokyo, Japan

ABSTRACT

Aim: This study examined the association between a childhood history of nocturnal enuresis and nocturia and urgency as an adult.

Conclusion: A childhood history of nocturnal enuresis, particularly nocturnal enuresis that resolved at ≥ 12 years old, was associated with an increased frequency of adult nocturia and urgency. The impact of previous nocturnal enuresis on adult nocturia and urgency presents a risk that is comparable to ageing and prostatic disease.

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Childhood Symptoms and Events in Women With Interstitial Cystitis/Painful Bladder Syndrome

Kenneth M. Peters, Kim A. Kilinger, and Ibrahim A. Ibrahim

EFFECT OF CHILDHOOD DYSFUNCTIONAL VOIDING ON URINARY INCONTINENCE IN ADULT WOMEN

HIGHER PREVALENCE of a HISTORY OF CHILDHOOD DYSFUNCTIONAL VOIDING in women with

- URINARY FREQUENCY (P = 0.004)
- URGENCY (P = 0.03),
- STRESS INCONTINENCE (P = 0.01),
- URGE INCONTINENCE (P = 0.009).

WOMEN WITH ADULT LOWER URINARY TRACT SYMPTOMS
→ **HIGHER PREVALENCE OF HISTORY OF CHILDHOOD DYSFUNCTIONAL VOIDING.**

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Int J Epidemiol 2019; 48(1): 222-230
Published online 2019 May 01 doi:10.1093/ije/dy240

Childhood nocturnal enuresis—a predictor for pelvic floor disorders and urinary tract symptoms in women?

van de Meeuwen-Bosch^{1,2}, van der Aar¹, van der Wal¹, van der Glas^{1,3}

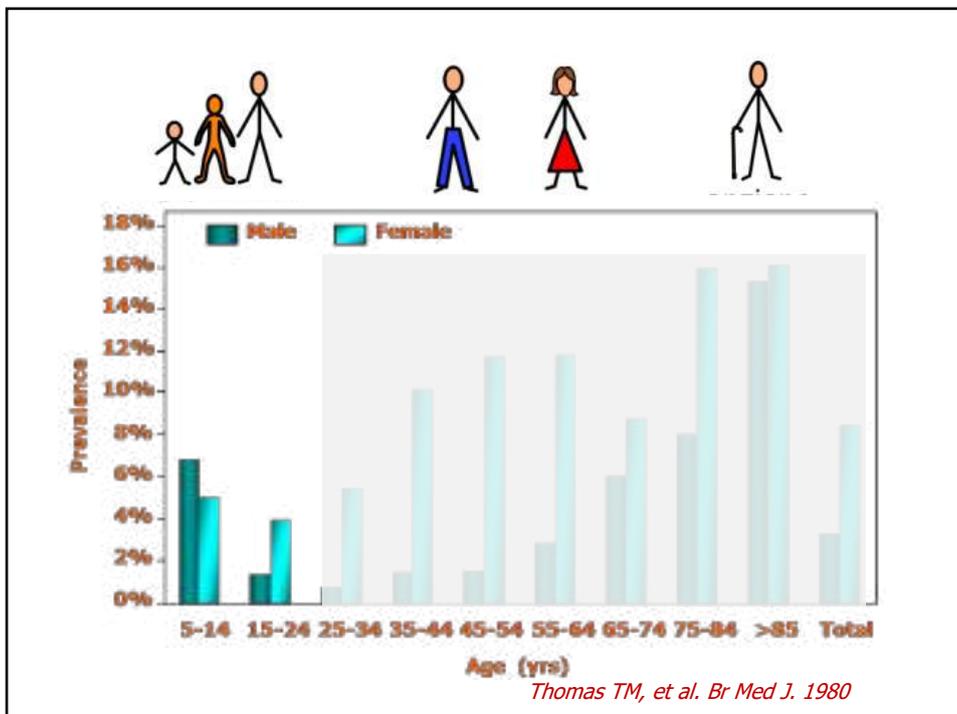
National survey of **URINARY (UI)** and **FECAL INCONTINENCE (FI)** and **SYMPTOMS OF PELVIC ORGAN PROLAPSE (sPOP)**

random sample of **20,000** nulliparous women aged **25–64**

Women ≥ 5 years of age having **CHILDHOOD NOCTURNAL ENURESIS (CNE)** compared with those without the condition

- One or more **PFDs** occurred in **38.3%** of women with **CNE** compared to 23.8% in those without CNE ($p < 0.0001$).
- **Mixed UI** had the **strongest association** with CNE (OR 2.63)
- The rate of **FI** was 11.2% in the non-CNE group and **16.8%** in those with CNE ($p < 0.0001$)
- **sPOP** 2.6% in the non-CNE and **4.8%** in the CNE group ($p = 0.0004$),
- The prevalence of lower urinary tract symptoms was **CONSISTENTLY HIGHER** in women with a history of CNE:
 - **overactive bladder** 32.6% versus 18.4%
 - **daytime micturition** ≥ 8 /day 29.6% versus 24.0% ($p < 0.0001$),
 - **nocturia** ≥ 2 /night 12.4% versus 7.8% ($p < 0.0001$)

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LIFE COURSE THEORY and LIFE COURSE EPIDEMIOLOGY

Applying Concepts of Life Course Theory and Life Course Epidemiology to the Study of Bladder Health and Lower Urinary Tract Symptoms among Girls and Women

Kevin E. Brady, PhD
 Centers for Epidemiology & Community Health, University of Minnesota School of Public Health, Minneapolis, MN

Aracelis Bory, PhD, DNP
 Division of Urology, Children's Hospital of Pittsburgh, Pittsburgh, PA

Joseph H. Slaughter, MD, MPH
 Department of Pediatrics, Yale School of Medicine, New Haven, CT

Colleen M. Fitzgerald, MD, MS
 Department of Obstetrics and Gynecology, Loyola University Chicago, Stritch School of Medicine, Chicago, IL

Shella Schlegel, MS, MPH
 Division of Academic General Pediatrics, University of California San Diego School of Medicine, San Diego, CA

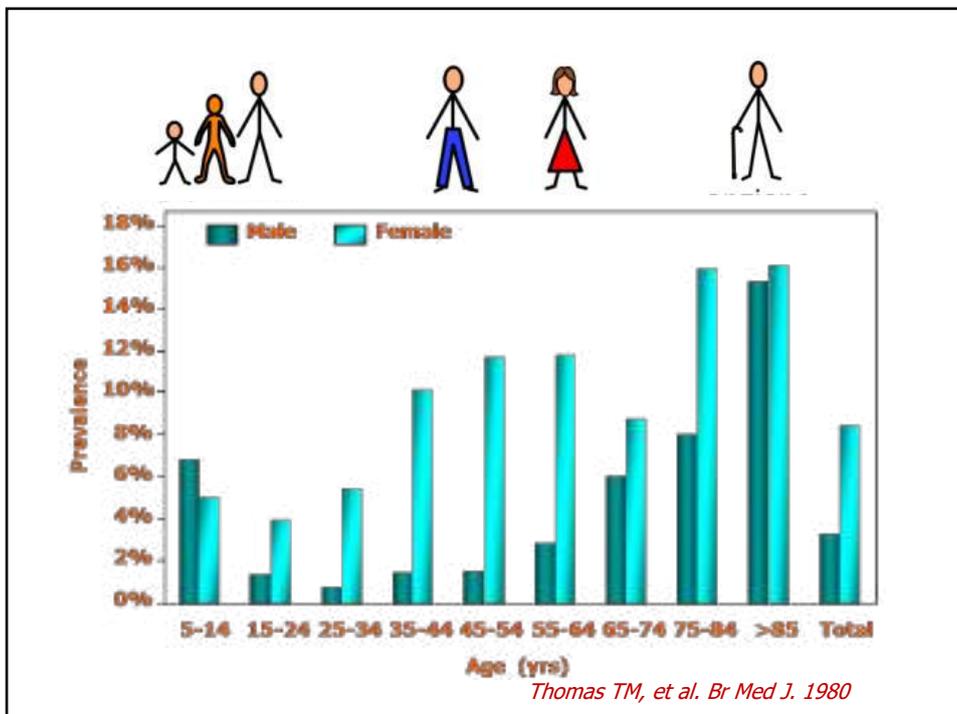
Brady S. et al. NeuroUrol. Urodyn. '20



Focus su IDENTIFICAZIONE e TRATTAMENTO DELLE LUTS piuttosto che attenzione AI RISCHI E AI FATTORI PROTETTIVI che possono INFLUENZARE il buon funzionamento della vescica.

Scarsa familiarità ricercatori con concetti di **LIFE COURSE THEORY**

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WHY

- PROBLEMA DIFFUSO
- PERSISTENZA IN ETA' ADULTA
- LINEE GUIDA "VECCHIE"
- LINEE GUIDA "IPERSPECIALISTICHE"
- CARENZA TRAINING PROFESSIONALE
- "INTERNET INACCURATO/INAFFIDABILE
- "PROVE ED ERRORI": EFFETTO DELETERIO
- IMPATTO SU AUTOSTIMA/AUTONOMIA
- ALTO IMPATTO FAMILIARE: INTOLLERANZA
- IMPATTO SU ARCHITETTURA SONNO



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BIAS

Nevés T, et al. J Urol. 2006 Jul;176(1):314-24.

Spesso i **genitori** "INTERPRETANO" come **PIGRIZIA** e scarso impegno l' **URGENZA** e le manovre per contrastare perdita di urina



**SONO SINTOMI!! E le
SEGNI !!!!! Di
INCONTINENZA URINARIA**

GENITORI SPESSE NON CONOSCONO LE ABITUDINI MINZIONALI dei loro bambini contribuendo a creare **CONFUSIONI** sul tema.
Non siate preoccupati di classificare , ma di **DOCUMENTARE E DI MISURARE FREQUENZA** minzioni e **VOLUMI VUOTATI**

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J Pediatr Urol. 2018 Jun;13(3):150-4. doi: 10.1016/j.jpurol.2015.11.011. Epub 2015 Dec 24.

Prevalence of nocturnal enuresis and its influence on quality of life in school-aged children.

Sacchi M¹, Telli C², Dogru BC³, Demircan A⁴, Gogur S⁵, Karagoz M¹.

Studio prospettico condotto su 1984 bambini di età 6-13 anni (mediante somministrazione di questionario per valutare presenza di enuresi, caratteristiche, familiarità)

Age, years	Boys		Girls		Total	
	n	%	n	%	n	%
6	18	9.5	0	-	18	9.5
7	39	30.6	26	13.75	65	34.4
8	42	33.3	16	8.4	58	30.7
9	39	30.5	12	6.1	51	26.9
10	2	1.05	0	-	2	1.1
11	5	3.94	0	-	5	2.6
12	0	-	2	1.09	2	1.1
13	0	-	6	3.17	6	3.2
Total	125	66.66	63	33.34	188	100

9.52% (189/1984): enuresi

48% dei bambini e gli adolescenti enuretici mostrano:

- **ridotta autostima**
- **scarsa performance scolastica**
- **disturbi depressivi**

Attenzione

School performance of children and the effect of enuresis on quality of life on parents were analyzed in the last part of the questionnaire. Of enuretic children, **48%** reported that they had poor school performance. However, approximately **71%** of parents reported that the condition did not have a negative impact on overall quality of their child's life.

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SELF-ESTEEM

Diseases such epilepsy (24%) and enuresis (24%)

SCORED HIGHER

Than diabetes (19%), localized eczema (19%), alopecia (19%) and acne (16%)

Bettie PE, BR J Dermatol 2006

Dysfunctional voiding can affect a child's self-esteem, interpersonal relationships with peers and parents (↑ risk of physical abuse) and have impact on schooling (underachieving at school) and later sexual activity

Redsell SA. Child Care Health Dev. 2001; 27:149-162

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Comparative analysis of the frequency of lower urinary tract dysfunction among institutionalised and non-institutionalised children.

Barroso UJ, et al. BJU Inter. 2006; 97: 813-15

Symptom	Institutional, n (%)	Not institutional, n (%)	P
Urinary incontinence	46 (51)	57 (40)	0.17
Urgic ID	36 (40)	19 (13)	<0.001
Nocturnal enuresis	35 (47)	38 (27)	0.003
Constipation	27 (30)	43 (30)	0.76

TABLE 7
The rate of LUTS in the two groups of children

Andersson cited the relationship between **DEPRESSION** and **DETRUSOR OVERACTIVITY**
 → **DEFICIENCY IN SEROTONIN (5-HT)** and its metabolism could be associated with **LUTD**.

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CLINICAL INQUIRIES

Delivered online content from the Family Physician Journal Network

Plus Peng, MD
 Gary Gelsberg, MD
 Family Practice Medicine
 Academy, Ferris, Wash.

Sarah Sanford, MD
 University of Washington
 Harborview Medical Center
 Seattle

Lee E. Nefler, MD
 Family Practice Medicine
 Academy, Ferris, Wash.

Q Does primary nocturnal enuresis affect children's self-esteem?

EVIDENCE-BASED ANSWER

A Yes. Children with primary nocturnal enuresis often, but not always, score about 10% lower on standardized rating scales for self-esteem, or scores for symptoms similar to low self-esteem (sadness, anxiety, social fears, distress) than children without enuresis (strength of recommendation [SOR] B, systematic review of cohort and case-control studies with some limitations).

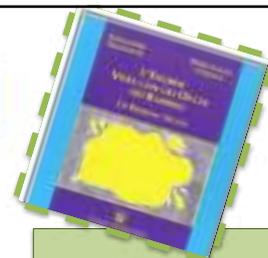
Enuretic children 8 to 9 years of age are less likely to have lower self-esteem than older children, ages 10 to 12 years. (SOR B, case-control study).

Successful treatment of primary nocturnal enuresis improves self-esteem ratings, probably to normal (SOR B, randomized, controlled trial, prospective cohort, and case-control studies).

10% LOWER SELF-ESTEEM

SADNESS ANXIETY SOCIAL FEARS DISTRESS

SUCCESSFUL TREATMENT IMPROVES SELF-ESTEEM



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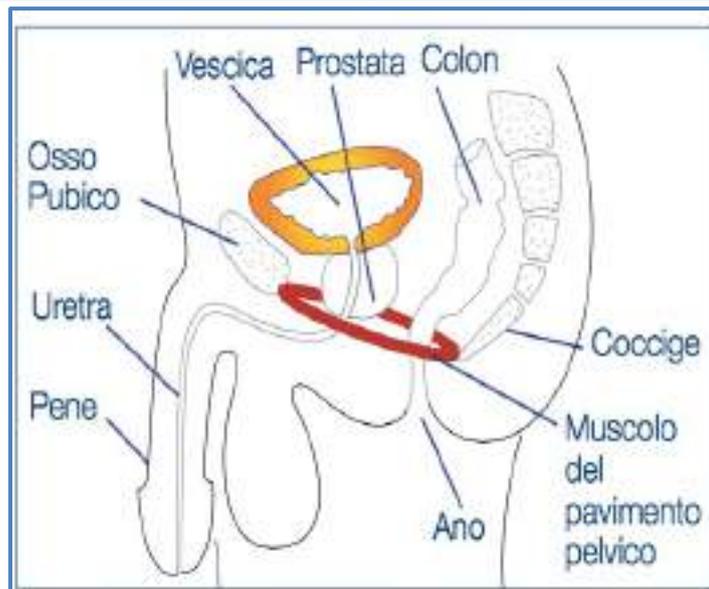
DISTURBI MINZIONALI & ENURESI



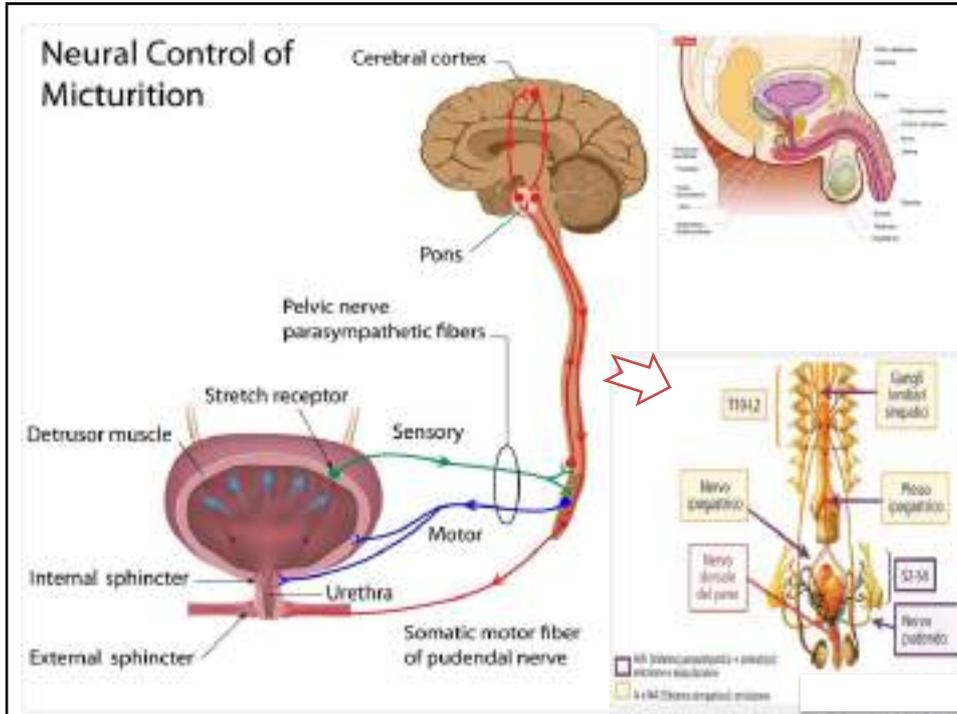
IMPATTO SULLA SESSUALITA

23

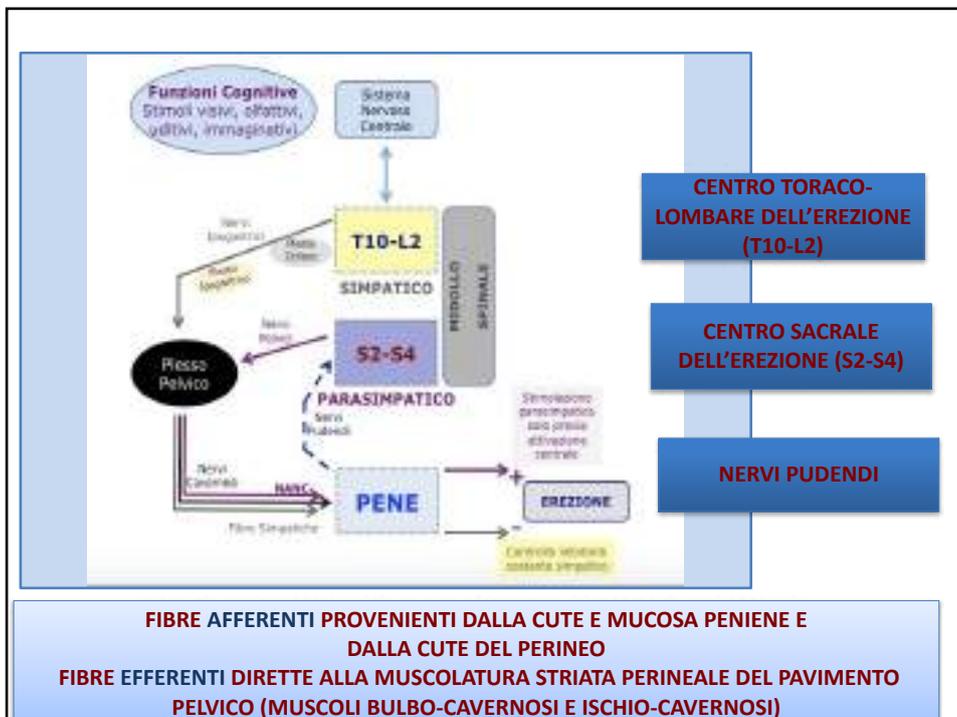
Muscoli pavimento pelvico maschile



24



25



26

Urol. 2013 Jun;18(6):2223-8. doi: 10.1016/j.juro.2012.12.012. Epub 2012 Dec 7.

Childhood enuresis is associated with shorter intravaginal ejaculatory latency time in healthy men.

Gokce A¹, Haki E.

INTRAVAGINAL EJACULATORY LATENCY TIME in men with a history of monosymptomatic enuresis is significantly SHORTER than that of controls

ORIGINAL PAPER ANDROLOGY

Is there a correlation between intravaginal ejaculatory latency time and enuresis? An exploratory study

Hakan Koyuncu¹, Ege Can Serenoglu², Safak Karacay³, Ahmet Tunc Ozdemir⁴, Mehmet Kalkan⁵, Faruk Yencilek¹

¹Department of Urology, Istanbul University School of Medicine, Istanbul, Turkey
²Department of Urology, Tulane University School of Medicine, New Orleans, USA
³Department of Pediatric Surgery, Heliyon University School of Medicine, Istanbul, Turkey
⁴Department of Urology, Istanbul Training and Research Hospital, Istanbul, Turkey
⁵Department of Urology, Princesa Genca Hospital, Istanbul, Turkey

Central European Journal of Urology Dec. 8, 2013

Gokce et al. revealed a **HIGHER PREVALENCE OF ME in patients with lifelong PE than observed in a healthy population**

COMMON DEFICIENCY IN INHIBITORY SIGNAL PROCESSING IN THE CNS MAY UNDERLIE BOTH THE INABILITY TO INHIBIT EJACULATION CONTROL MICTURITION



27

CORRELAZIONE PE /ENURESIS

Recenti ricerche cliniche suggeriscono un'associazione e POSSIBILI MECCANISMI PATO-FISIOLOGICI COMUNI TRA PE e NE, .

Gokce A, Ekmekcioglu O. The relationship between lifelong premature ejaculation and monosymptomatic enuresis. J Sex Med. 2010; 7: 2868-2872.

ALTERAZIONI NELL'ATTIVITÀ DELLA SEROTONINA NEL SISTEMA NERVOSO CENTRALE E PERIFERICO

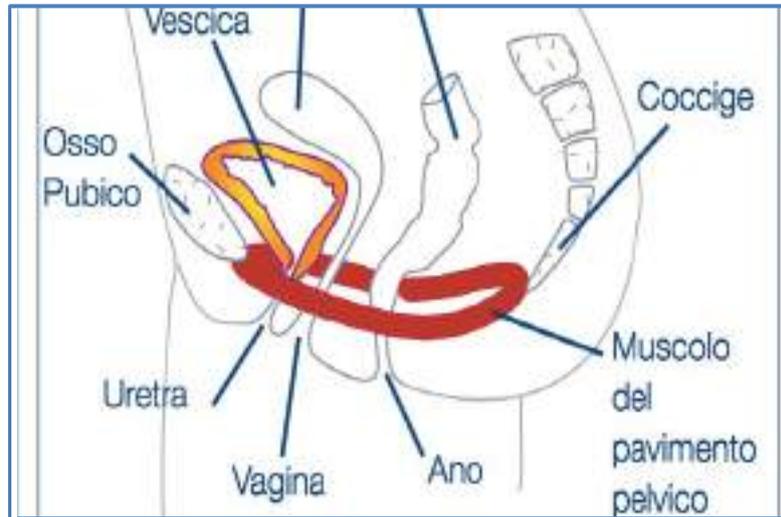
possibile meccanismo sottostante comune in EP e ME

Waldinger MD. The neurobiological approach to premature ejaculation. J Urol. 2002; 168: 2359-2367.
Waldinger MD, Olivier B. Animal models of premature and retarded ejaculation. World J Urol. 2005; 23: 115-118.
Catacutan-Labay P, Boyarsky S, Gerber C. The effect of serotonin (5-hydroxytryptamine) on ureteral peristalsis. Invest Urol. 1966; 4: 224-234.
Testa R, Guarneri L, Poggesi E, Angelico P, Velasco C et al. Effect of several 5-hydroxytryptamine(1a) receptor ligands on the micturition reflex in rats: Comparison with way 100635. J Pharmacol Exp Ther. 1999; 290: 1258-1269.

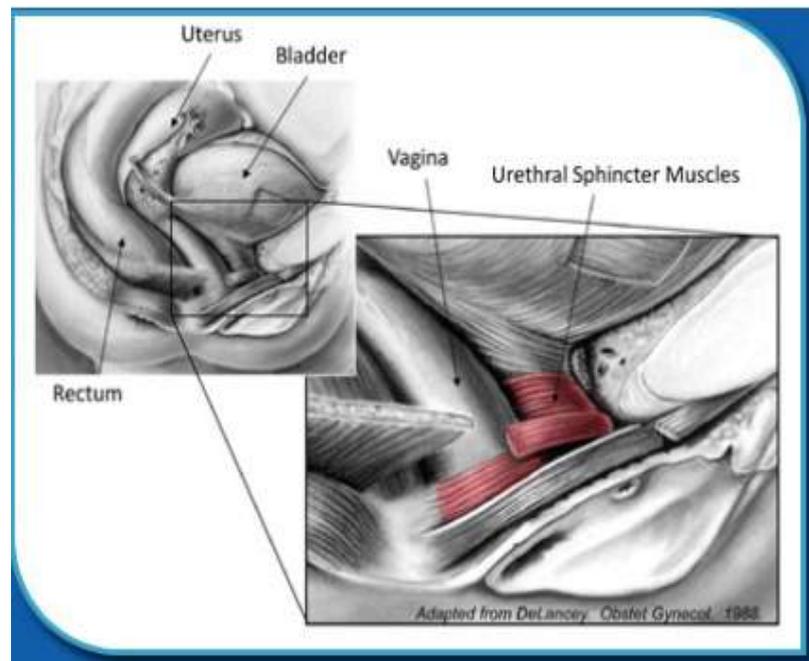


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Muscoli pavimento pelvico femminile



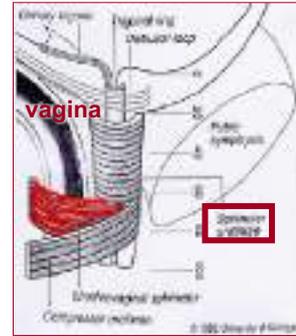
29



30

Chiozza ML, Graziottin A. Urge incontinence and female sexual dysfunction: a life span perspective. *Urodynamic*; 2004 14 (2): 133-138

Unfortunately, a **persisting communication failure** still separates the pediatric world from the gynecologica/urological one, **puberty being a sort of invisible wall** that separates the two clinical domains.



Greenstein A, et al. Childhood nocturnal enuresis in vulvar vestibulitis syndrome. *J Reprod Med.* 2005;50(1):49-52.

Primary Vulvar Vestibulitis Syndrome

26,6% women had a history of childhood enuresis

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- PROBLEMA DIFFUSO
- PERSISTENZA IN ETA' ADULTA
- LINEE GUIDA "VECCHIE"
- LINEE GUIDA "IPERSPECIALISTICHE"
- CARENZA TRAINING PROFESSIONALE
- "INTERNET INACCURATO/INAFFIDABILE
- "PROVE ED ERRORI": EFFETTO DELETERIO
- IMPATTO SU AUTOSTIMA/AUTONOMIA
- ALTO IMPATTO FAMILIARE: INTOLLERANZA
- IMPATTO SU ARCHITETTURA SONNO
- **2006: PUNTO DI SVOLTA**

WHY



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PAPIRO DI EBERS 3500 B.C.

Nel 1862 il documento è stato acquistato a Luxor, dal famoso egittologo e collezionista Edwin Smith e che, nel 1872 o 1873, è stato comprato da Ebers. Si racconta che sia stato trovato tra le gambe di una mummia proprio a Luxor.





George Moritz Ebers, egittologo tedesco del secolo scorso, scopre a Tebe un papiro che parla della medicina degli egizi (XVIII dinastia).

In questo papiro si parla anche di problemi vescicali. (LIEPZIG, VERLAG VON WILHELM ENGELMANN, 1875)

I trattamenti si basano sull'uso radici di una pianta denominata qadet, uva, miele, bacche di ginepro, birra dolce.

Una pagina della tavola 50 in cui si parla di problemi della minzione.

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1. Enuresi: alcune note di epidemiologia

Abnormal diurnal rhythm of plasma vasopressin and urinary output in patients with enuresis.

© Author 1989

2.500 a.c.



1989

Medioevo, Paul di Egine (620 - 680) : somministrazione di tonici come olio e vino caldo.
 Thomas Phaer (1510 - 1560), padre della pediatria inglese, : *"Prendete dei ventrigli di gallo, essicateli, riduceteli in polvere e somministrate questa polvere due o tre volte al giorno!"*

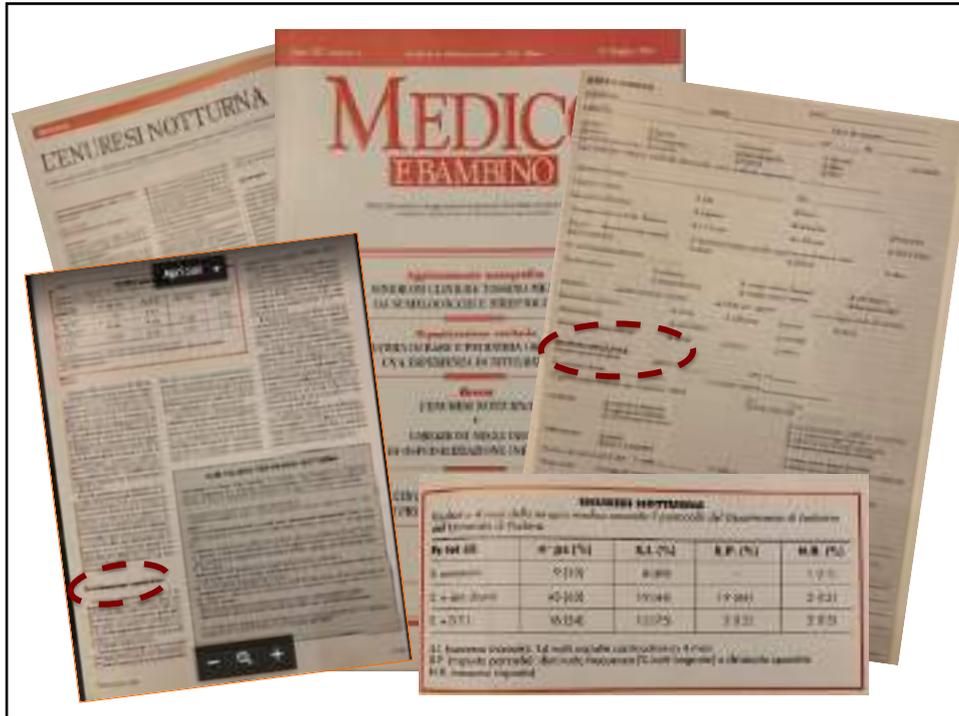
Secoli successivi : terapia a base di vescica di animale polverizzata, intestini di topo o cervella. Talvolta si esigeva che il bambino enuretico schiacciasse nella sua mano un topo vivo.

XIX secolo : trattamenti farmaceutici a base di stricnina o di estratti di belladonna

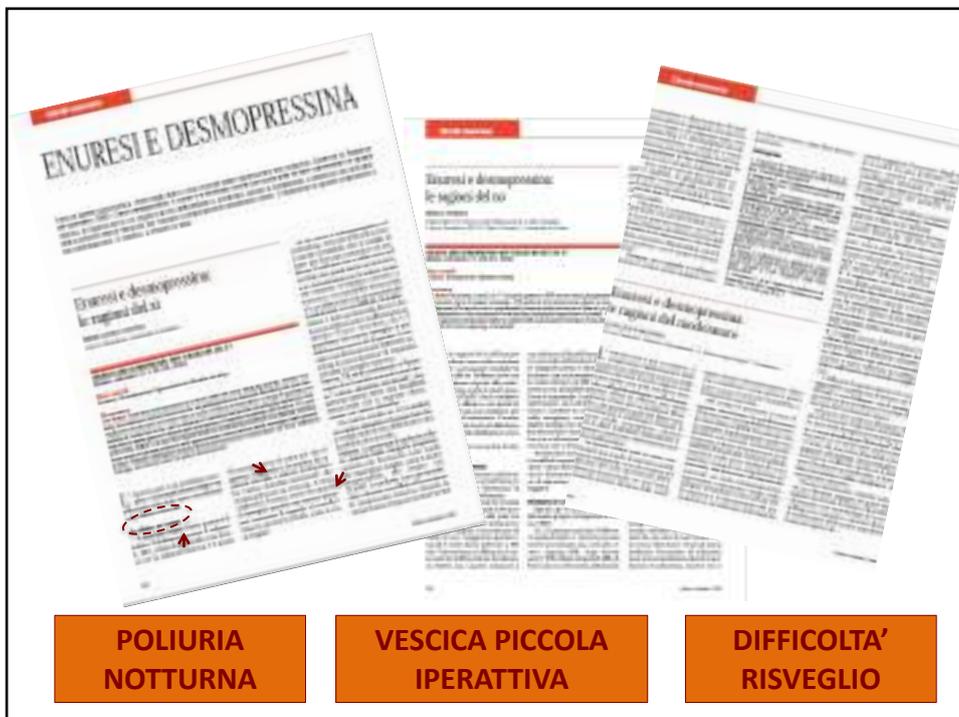
XX secolo : trattamento con gli antidepressivi triciclici, l'imipramina (Tofranil®).

1977: efficacia desmopressina.

34



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Multicenter Study > Br J Urol. 1998 May;81 Suppl 3:86-9.
doi: 10.1048/j.1464-410x.1998.00015.x

An Italian epidemiological multicentre study of nocturnal enuresis

M L Chiozza¹, L Bernartelli, P Caione, R Del Gado, P Ferrara, P L Giorgi, C Montomali, P Verbucci



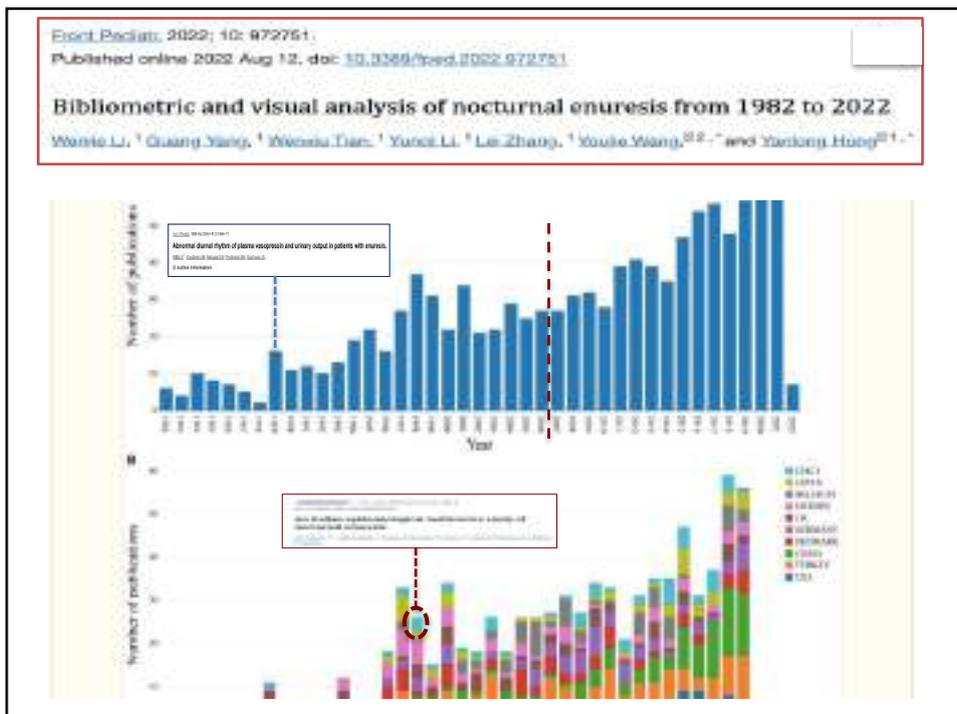
The association between enuresis and potential risk factors: family history of enuresis, stress, socio-economic status and **ABNORMAL DIURNAL VOIDING HABITS**, was investigated.

BOTH the DSM III and DSM IV definitions of enuresis were used because **AT PRESENT, THERE IS NO CONSENSUS ON THE DIAGNOSTIC CRITERIA.**

There was A **LARGE DIFFERENCE IN PREVALENCE** using the two DSM definitions.....a high percentage of DSM III enuretic children had more than two wet nights per week.

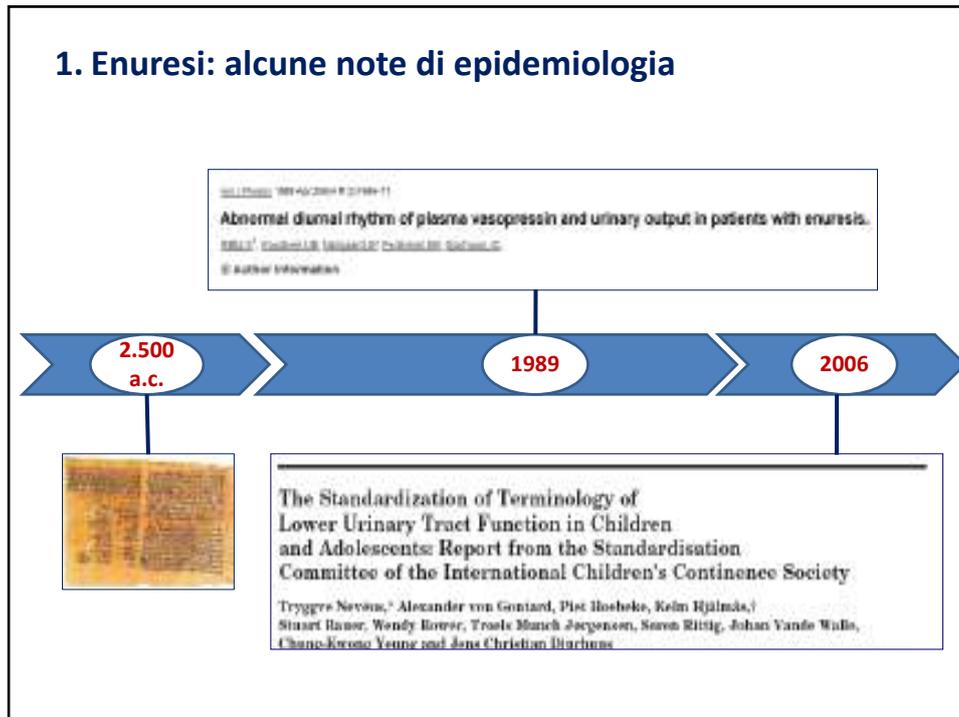
It is important that a CONSENSUS about THE 'WORKING DEFINITIONS' of enuresis is reached TO AVOID BIAS in the RECRUITMENT STEP, to carry out COMPARABLE EPIDEMIOLOGICAL STUDIES and to obtain ADEQUATE THERAPEUTIC RESPONSES.

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1. Enuresi: alcune note di epidemiologia



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The **TERM DYSFUNCTIONAL VOIDING** has become relatively **NONSPECIFIC** often being used to characterize **ANY CHILD** with voiding symptoms or urinary incontinence.

condividere un linguaggio chiaro e inequivocabile:

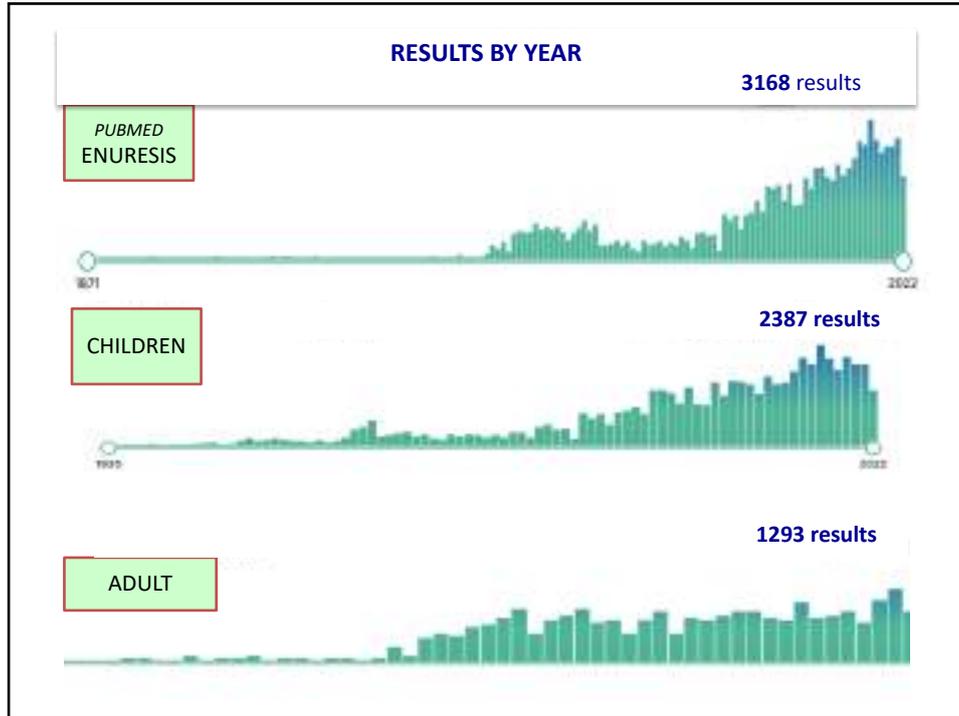
- ridurre confusione
- rendere confrontabili i dati

2006

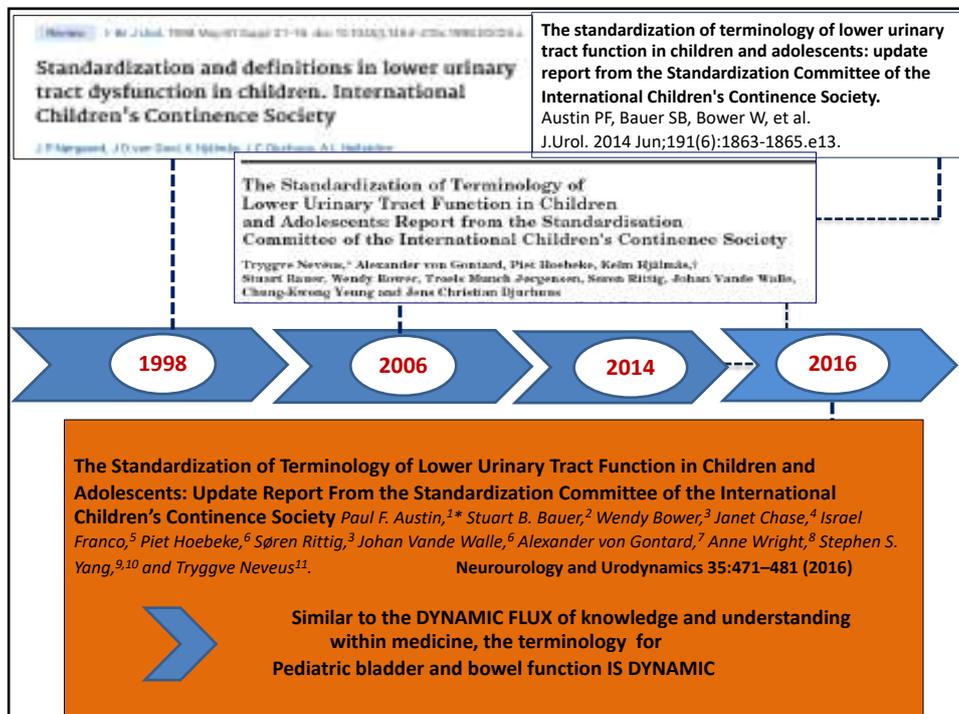
The Standardization of Terminology of Lower Urinary Tract Function in Children and Adolescents: Report from the Standardisation Committee of the International Children's Continence Society
Trygve Nevius,¹ Alexander von Gontard, Piet Hasebe, Kelm Hjalms,¹ Stuart Hauser, Wendy Horner, Troels Munch Jørgensen, Sarah Rittig, Johan Van de Walle, Chung-Kwong Yeung and Jens Christian Bjørnhus

NEW DEFINITIONS AND A STANDARDIZED TERMINOLOGY ARE PROVIDED, TAKING INTO ACCOUNT CHANGES IN THE ADULT SPHERE AND NEW RESEARCH RESULTS.

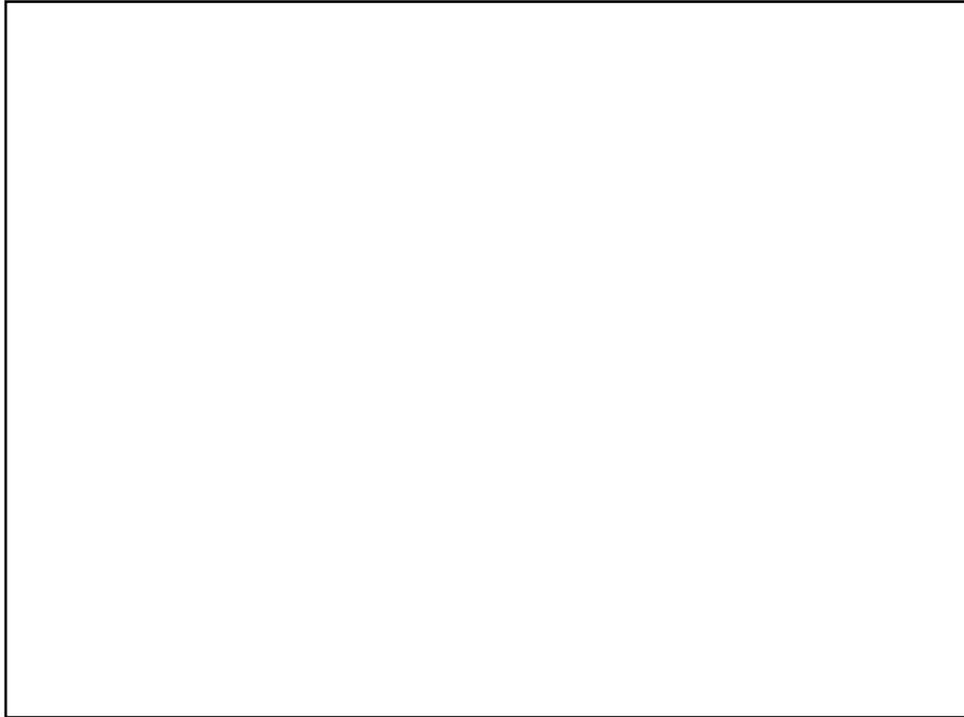
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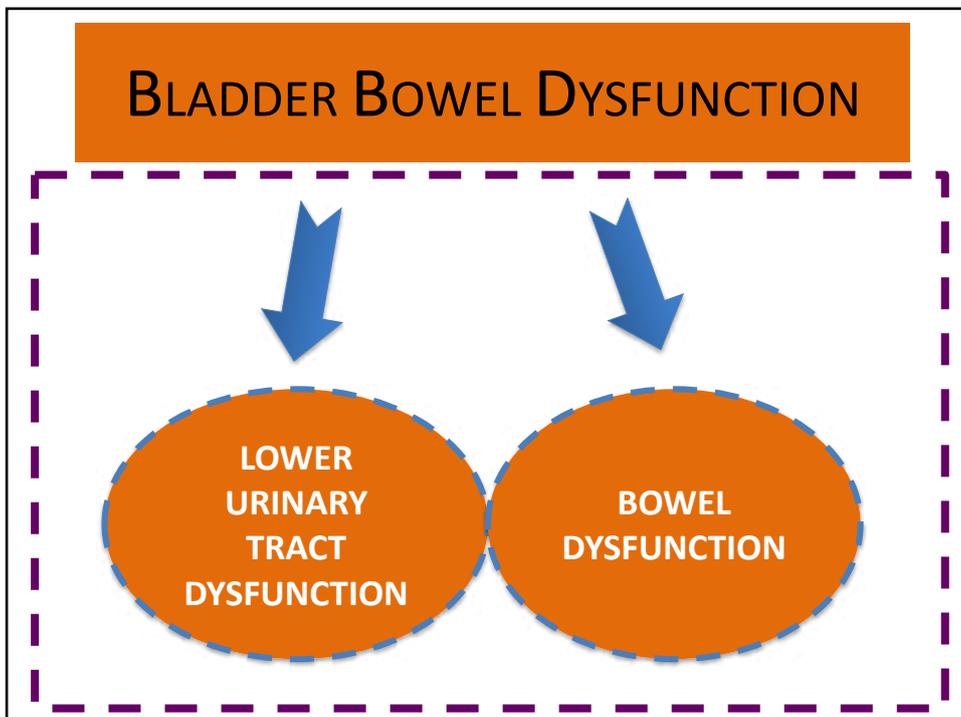
41



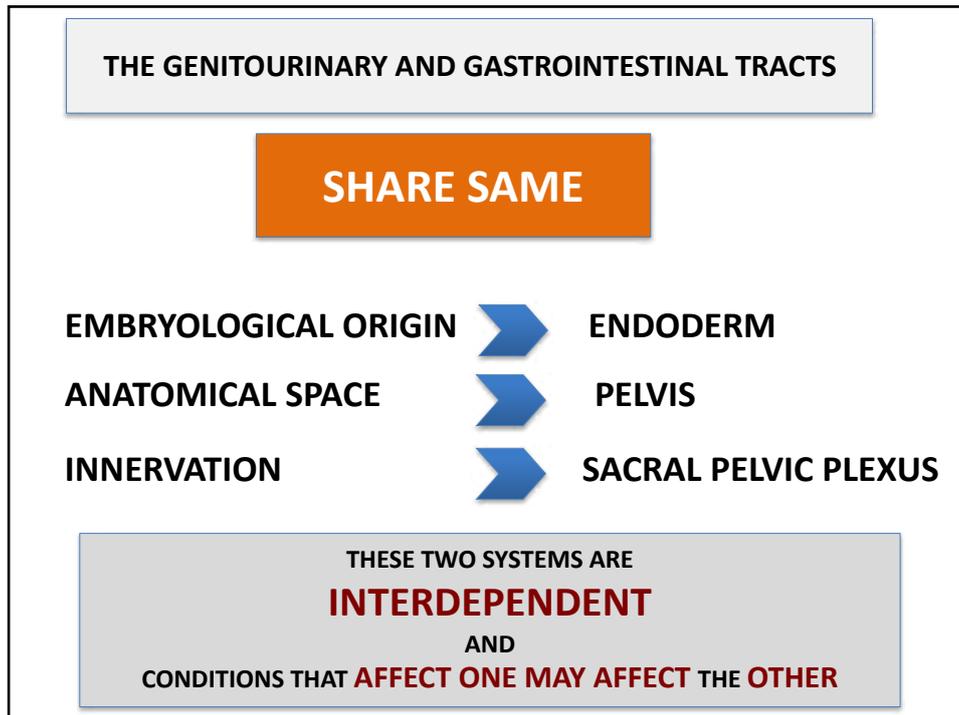
42



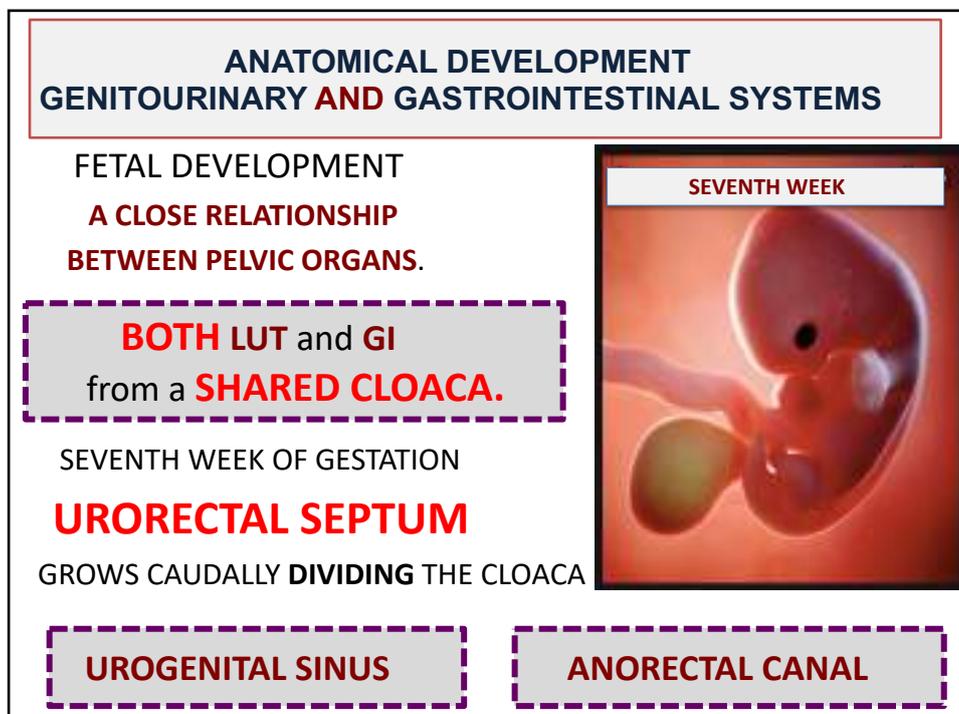
43



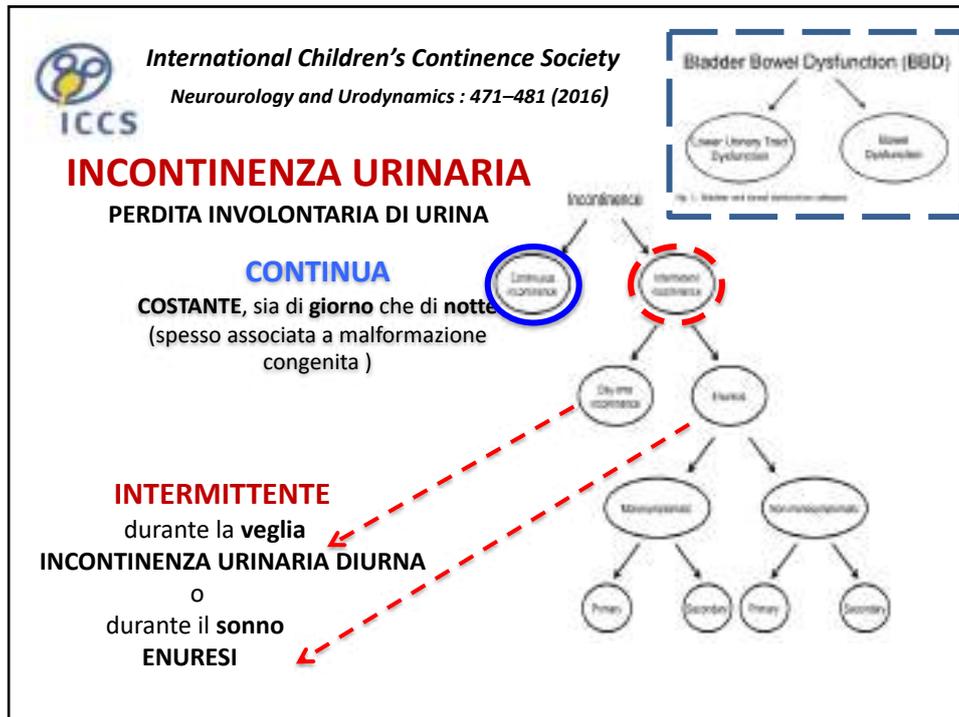
44



45



46



47

- STORAGE VOIDING PHASE** • **SYMPTOMS** are classified according to their relation to the storage and/or voiding phase of bladder function
- DURATION** • **DURATION OF TIME** is beneficial in characterizing symptoms.
- AGE** • **AGE** of the child is particularly relevant
- Our reference point for LUT symptoms is **>5 YEARS** of age as this age is used by the DSM-5 and the International Classification of Diseases-10 (ICD-10) to characterize urinary incontinence disorders.
- For functional bowel dysfunction the minimum age is **4 YEARS**

48

STORAGE SYMPTOMS

- **VOIDING FREQUENCY :**
Increased => **8 /day** or decreased => **3 /day** FORMAL VOIDING FREQUENCY /VOLUME CHART *MUEFS
- **INCONTINENCE :** CONTINUOUS or INTERMITTENT (day-time incontinence / enuresis ONLY night /Day-time incontinence AND enuresis)
- **URGENCY .** Not applicable before the attainment bladder control . It's often sign of bladder overactivity
- **NOCTURIA**

VOIDING SYMPTOMS

- **HESITANCY**
- **STRAINING**
- **WEAK STREAM**
- **INTERMITTENCY**
- **DYSURIA**

49

OTHER SYMPTOMS

- **HOLDING MANEUVERS :** standing on tiptoes, forcefully crossing the legs, grabbing or pushing on the genitals or abdomen and placing pressure on the perineum (e.g., squatting with the heel pressed into the perineum or sitting on the edge of a chair).
- **FEELING OF INCOMPLETE EMPTYING**
- **URINARY RETENTION**
- **POST-MICTURITION DRIBBLE :** may be associated with vaginal reflux
- **SPRAYING (SPLITTING) OF THE URINARY STREAM.** It usually implies a mechanical obstruction at or just below the meatus (e.g., meatal stenosis).

50

OTHER SYMPTOMS

- **BLADDER PAIN**
- **URETHRAL PAIN**
- **GENITAL PAIN.** In girls, vaginal pain and vaginal itching are commonly seen with **localized irritation** from incontinence.
- Penile pain and episodic priapism may be seen in young boys as symptoms associated with a **full bladder, constipation** or the result of urine trapping inside a **phimotic foreskin**.

MUFS

Myofascial Urinary Frequency Syndrome

51

Sci Rep. 2023 Oct 27;13(1):18412. doi: 10.1038/s41598-023-44867-5.

Myofascial urinary frequency syndrome is a novel syndrome of bothersome lower urinary tract symptoms associated with myofascial pelvic floor dysfunction

A. Linton Ackertrapp¹, Nicholas J. Jackson², Ashley T. Ciarro³, Melissa R. Kaufman⁴, Jonathan C. Routh⁵, Jerry L. Loeders⁶

MUFS

NOVEL, DISTINCT PHENOTYPE of urinary symptoms

- **one-third** of individuals presenting with **URINARY FREQUENCY**.

"PERSISTENCY" persistent feeling of needing to urinate regardless of urine volume

- **97%** of MUFS patients demonstrated **PELVIC FLOOR HYPERTONICITY** with either global tenderness or myofascial trigger points
- **92%** displayed evidence of **IMPAIRED MUSCULAR RELAXATION**, hallmarks of myofascial dysfunction.

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ENURESI

**INCONTINENZA
URINARIA
INTERMITTENTE
DURANTE IL SONNO**

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 **International Children's Continence Society**
Neurourology and Urodynamics : 471-481 (2016)

Bladder Bowel Dysfunction (BBD)
Lower Urinary Tract Dysfunction Bowel Dysfunction
Fig. 1. Bladder and bowel dysfunction-related

INCONTINENZA URINARIA
PERDITA INVOLONTARIA DI URINA

CONTINUA
COSTANTE, sia di **giorno** che di **notte**
(spesso associata a malformazione congenita)

INTERMITTENTE
durante la **veglia**
INCONTINENZA URINARIA DIURNA
o
durante il **sonno**
ENURESI

Incontinentia

```
graph TD
    Incontinentia --> Continuous
    Incontinentia --> Intermittent
    Intermittent --> Daytime
    Intermittent --> Nocturnal
    Daytime --> Monosymptomatic
    Daytime --> Nonmonosymptomatic
    Nocturnal --> Monosymptomatic
    Nocturnal --> Nonmonosymptomatic
    Monosymptomatic --> Primary
    Monosymptomatic --> Secondary
    Nonmonosymptomatic --> Primary
    Nonmonosymptomatic --> Secondary
```

54

The Standardization of Terminology of Lower Urinary Tract Function in Children and Adolescents: Update Report From the Standardization Committee of the International Children's Continence Society Paul F. Austin,^{1*} Stuart B. Bauer,² Wendy Bower,³ Janet Chase,⁴ Israel Franco,⁵ Piet Hoebeke,⁶ Søren Rittig,³ Johan Vande Walle,⁶ Alexander von Gontard,⁷ Anne Wright,⁸ Stephen S. Yang,^{9,10} and Tryggve Neveus¹¹. *Neurourology and Urodynamics* 35:471–481 (2016)

ENURESI MONOSINTOMATICA 

ENURESI NON-MONOSINTOMATICA  

ENURESI PRIMARIA	NESSUN periodo asciutto continuativo
ENURESI SECONDARIA	PERIODO CONTINUATIVO notti asciutte > 6 MESI 

55

ENURESI MONOSINTOMATICA

I BAMBINI

- **BAGNANO IL LETTO SOLO DURANTE IL SONNO** 
- **NON PRESENTANO ALTRI SINTOMI DISFUNZIONE VESCICALE (esclusa la nicturia)**

Neveus T, et al. J Urol. 2006 Jul;176(1):314-24

56

ENURESI NON-MONOSINTOMATICA

▪ **I BAMBINI**

bagnano il letto

SIA

durante il sonno

CHE

durante il giorno





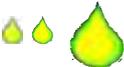
57

ENURESI NON-MONOSINTOMATICA





=> 1 sintomo di disfunzione vescicale:

- **diminuita/aumentata frequenza minzionale** $\leq 3 - \geq 8$
- **incontinenza diurna** 
- **urgenza**
- **manovre sostegno piano perineale**
- **mitto esitante, debole, intermittente**
- **minzione da sforzo**
- **sensazione svuotamento incompleto**
- **gocciolo post-minzionale.**

Nevés T, et al. J Urol. 2006 Jul;176(1):314-24.

58

> J Pediatr Urol. 2019 Feb;15(1):21.e1-31.e5. doi: 10.1016/j.jpurol.2018.08.005. Epub 2018 Aug 10.

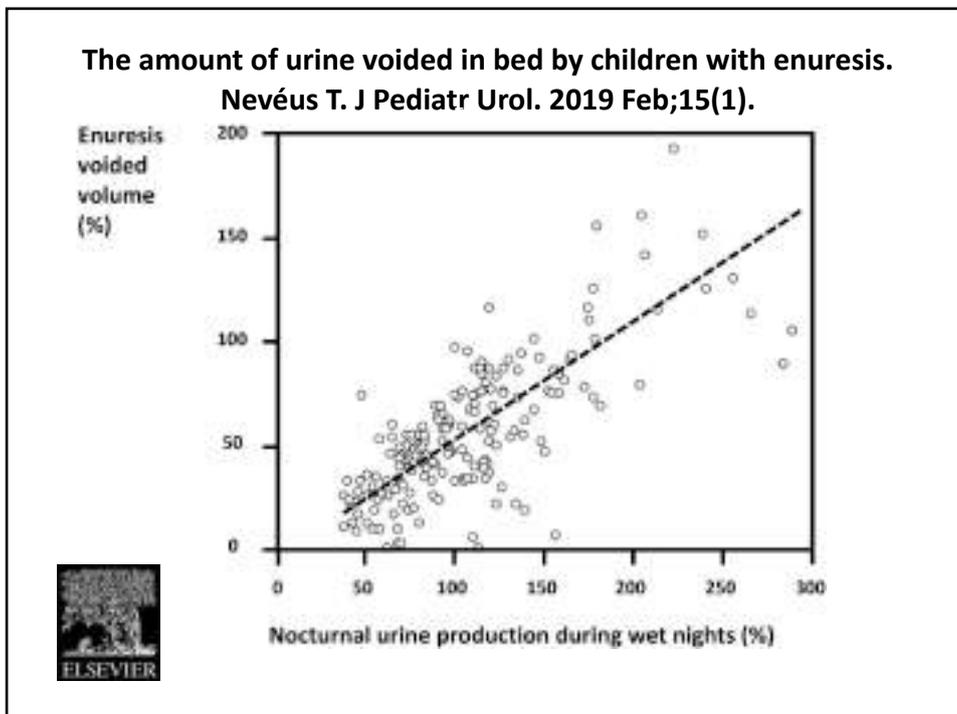
The amount of urine voided in bed by children with enuresis

T Nevés¹

THE ENURETIC EVENT ONLY VERY RARELY REPRESENTS THE EMPTYING OF A FULL BLADDER.

A COMPONENT OF NOCTURNAL DETRUSOR OVERACTIVITY CAN BE ASSUMED TO BE PRESENT IN ALMOST ALL ENURETIC CHILDREN, EVEN IN CHILDREN WITH NOCTURNAL POLYURIA.

59



60

POLIURIA NOTTURNA

IPERATTIVITA' DETRUSORIALE

DISTURBI DEL RISVEGLIO

Spessore detrusoriale

Urina

Uetro

The diagram consists of three orange rectangular boxes. The top-left box contains a yellow star and the text 'POLIURIA NOTTURNA' above a cluster of green teardrop shapes. The top-right box contains a red star and the text 'IPERATTIVITA' DETRUSORIALE' above a cross-sectional diagram of a bladder. A dashed box with an arrow points to the bladder wall, labeled 'Spessore detrusoriale'. The bladder is labeled 'Urina' and 'Uetro'. The bottom box contains a blue star and the text 'DISTURBI DEL RISVEGLIO' above a cartoon illustration of a man with a yellow head sleeping on a white pillow.

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POLIURIA NOTTURNA

IPERATTIVITA' DETRUSORIALE

DISTURBI DEL RISVEGLIO

Spessore detrusoriale

Urina

Uetro

This diagram is identical in content to the one on slide 61, featuring three boxes with stars, text, and illustrations related to urinary symptoms and bladder anatomy.

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ENURESIS

INCONTINENZA URINARIA NOTTURNA INTERMITTENTE > 5 ANNI

IL CICLO MINZIONALE

The diagram illustrates the micturition cycle with two main phases: 'Fase di riempimento' (filling phase) and 'Fase di svuotamento' (emptying phase). The y-axis represents 'Pressione vescicale' (vesical pressure). Key points include: 'Riempimento vescicale' (vesical filling), 'Prima sensazione di riempimento' (first sensation of filling), 'Normale stimolo a urinare' (normal urge to urinate), and 'Riempimento vescicale' (vesical filling). Below the graph, four diagrams show the state of the bladder and associated muscles: 1. 'Detrusore si rilassa' (detrusor relaxes) and 'Utricolo si contrae' (utricle contracts). 2. 'Detrusore si rilassa' (detrusor relaxes) and 'Utricolo si contrae ulteriormente' (utricle contracts further). 3. 'INCONTINENZA' (incontinence) with 'Detrusore si contrae' (detrusor contracts) and 'Utricolo si rilassa' (utricle relaxes). 4. 'Detrusore si rilassa' (detrusor relaxes) and 'Utricolo si contrae' (utricle contracts).

APPROCCO PRO ATTIVO: CHIEDERE AL BILANCIO DI SALUTE!!

63

IN SLEEPING NEWBORNS

**CORTICAL AROUSAL
IN RESPONSE TO
BLADDER DISTENSION.**

These observations further **CHALLENGE** the traditional that human **INFANTS** have bladders which **EMPTY AUTOMATICALLY BY A SIMPLE SPINAL REFLEX.**

THE CONCEPTS OF THOSE INFANTS ARE BORN WITH UNINHIBITED BLADDERS NEEDS TO BE RECONSIDERED.

64



SVEZZAMENTO PANNOLINO

1,5 - 2,5 aa.

2,5 - 3,5. aa.



Bambino che a **4-5 anni** ancora bagna il letto va **monitorato**, soprattutto se c'è una familiarità per enuresi.

A quest'età è già possibile insegnare

BUONE ABITUDINI

VESCICA INTESTINO LIQUIDI.

65

The neural mechanisms of bladder emptying undergo marked changes **DURING THE FIRST 3 WEEKS** of life in many mammals

AFTER BIRTH, THE RAT PUP CANNOT VOID SPONTANEOUSLY BECAUSE VOIDING IS CONTROLLED BY THE PERIGENITAL-BLADDER REFLEX, WHICH IS TRIGGERED BY THE MOTHER LICKING THE PERIGENITAL REGION OF THE PUPS.

ALTHOUGH INFANTS HAVE A PERIGENITAL-BLADDER REFLEX AS WELL THEY ARE BORN WITH A FUNCTIONAL BLADDER-BLADDER REFLEX AND SHOW SPONTANEOUS BLADDER EMPTYING.



THE MAJOR CHANGE THAT OCCURS IN CHILDREN



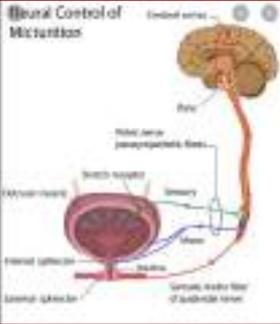
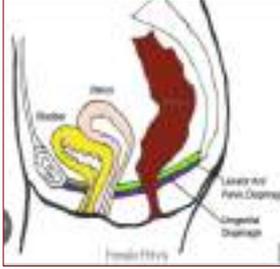
1. **VOLUNTARY CONTROL OVER VOIDING**
2. **COORDINATION OF THE BLADDER AND EXTERNAL URETHRA SPHINCTER.**

66

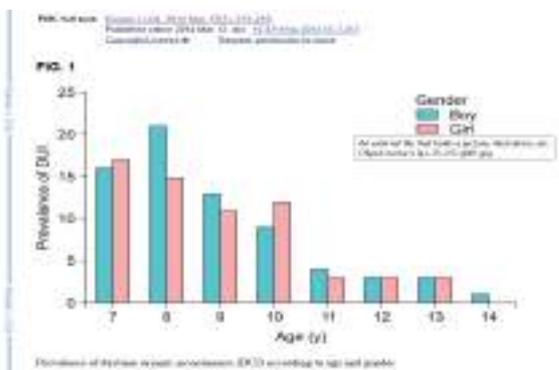
VOIDING MASTERY

SUPPRESSION
INVOLUNTARY REFLEX
BY
VOLUNTARY CONTROL
LUTD
=
COMBINATION

IMMATURE AND MATURE RESPONSES
TO THE SAME STIMULUS...

67



Age (y)	Boys (%)	Girls (%)
7	16	17
8	21	15
9	13	11
10	9	12
11	4	3
12	3	3
13	3	3
14	1	0

- diminuita/aumentata frequenza minzionale ≤ 3 - ≥ 8
- incontinenza diurna 💧💧💧💧
- urgenza
- manovre sostegno piano perineale (saltelli/accovacciamento)
- mitto esitante, debole, intermittente
- minzione da sforzo
- sensazione svuotamento incompleto
- gocciolio post-minzionale

68

La capacità vescicale attesa va comparata con il massimo volume vuotato riportato nel diario minzionale. Se è presente un volume residuo questo va sommato.

“CAPACITÀ VESCICALE ATTESA”
[30 + (età x 30)] ml

valore valido fino ai 12 anni (max 390 ml).

Massimo volume vuotato:

- inadeguato < 65%
- eccessivo > 130%



69

VOCABOLARIO



CAPACITA' VESCICALE ATTESA [30+(30 x età)] ml

VOLUME MASSIMO VUOTATO Maggior volume vuotato durante il giorno desunto da diario minzionale (esclusa 1° minzione mattino)

VESCICA IPERATTIVA Presenza di sinergia e frequenza con o senza incontinenza urinaria

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POLIURIA NOTTURNA

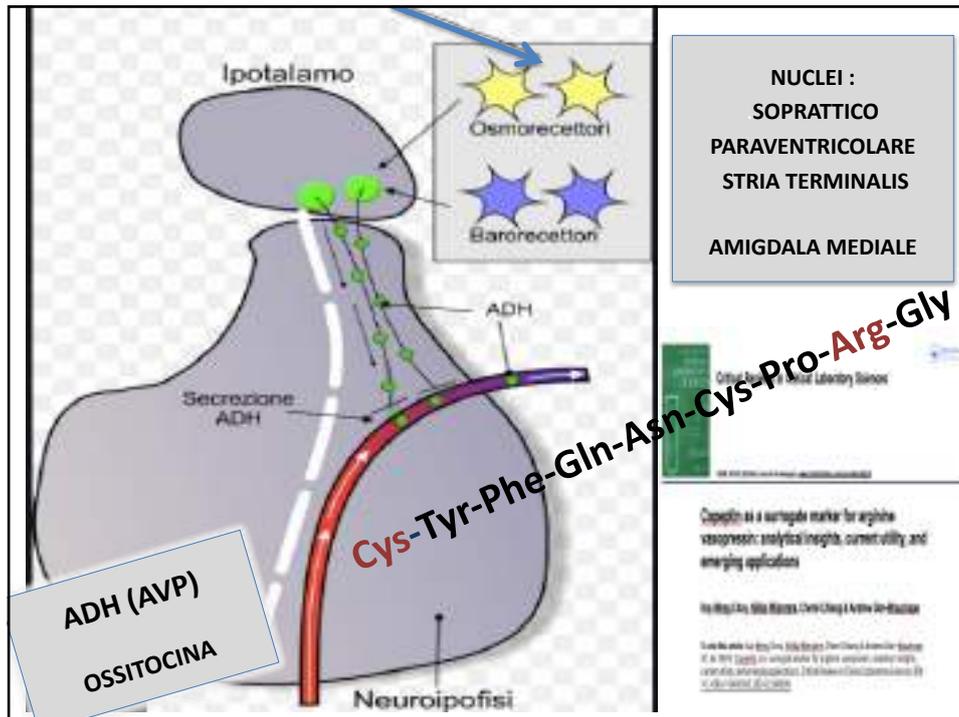
IPERATTIVITA' DETRUSORIALE

DISTURBI DEL RISVEGLIO

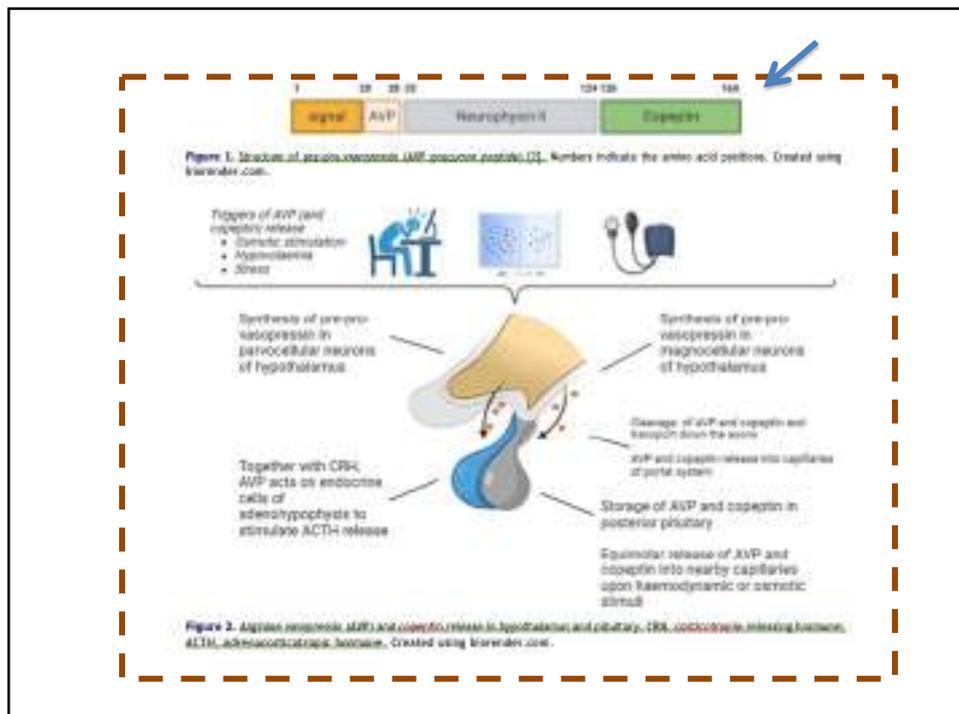
71

VOCABOLARIO	
POLIURIA NOTTURNA	Volume urine notturno > 130% della capacità vescicale attesa per l'età
CAPACITA' VESCICALE ATTESA	$[30+(30 \times \text{età})]$ ml
VOLUME MASSIMO VUOTATO	Maggior volume vuotato durante il giorno desunto da diario minzionale (esclusa 1° minzione mattino)
VESCICA IPERATTIVA	Presenza di sinergia e frequenza con o senza incontinenza urinaria

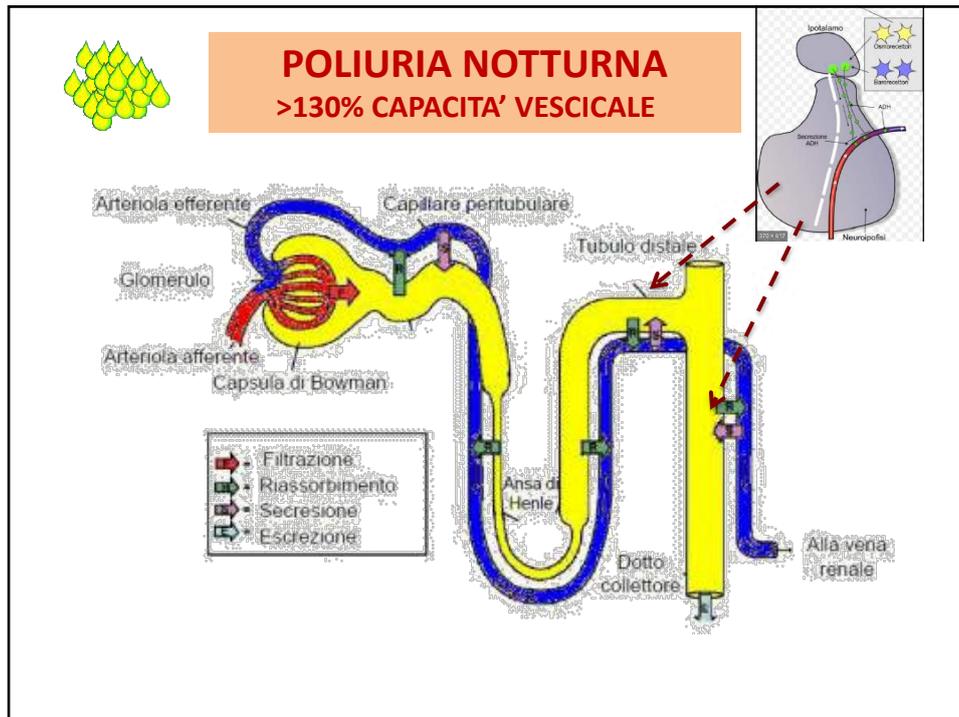
72



73



74



75

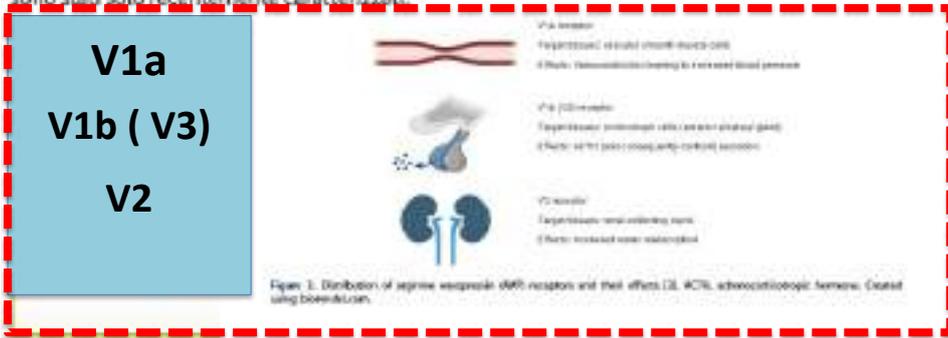
G PROTEIN-COUPLED RECEPTORS

V1	V2	V3
AVPR1A	AVPR2	AVPR1B

I recettori della vasopressina sono fondamentali in quanto tramite queste strutture la vasopressina può svolgere la sua funzione. I recettori della vasopressina mediano l'azione della vasopressina a livello di vari tessuti. I recettori della vasopressina sono degli specifici recettori accoppiati a proteine G chiamati GPCRs (G protein-coupled receptors). Ci sono 3 sottotipi di recettori della vasopressina, che differiscono per localizzazione, funzione e meccanismo utilizzato per la trasduzione del segnale.

76

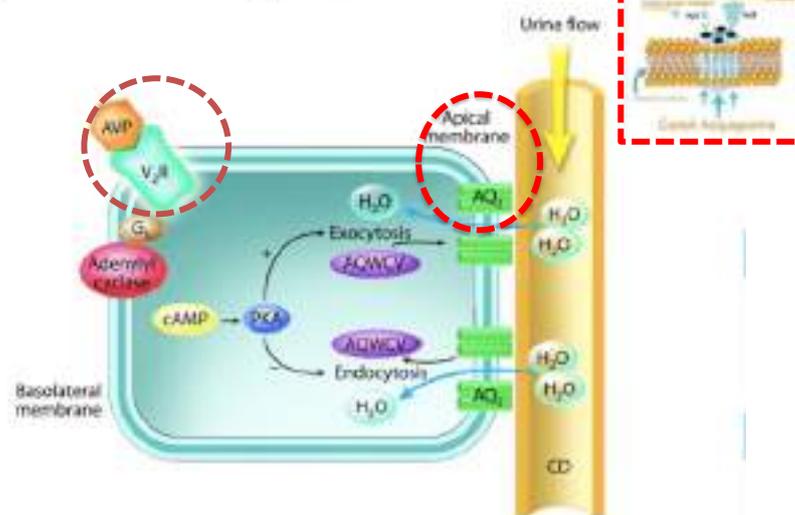
I **recettori V1 della vasopressina** si trovano a livello della muscolatura liscia dei vasi sanguigni e una volta attivati causano **vasocostrizione** (per questo motivo la vasopressina viene chiamata in questo modo). Questi recettori si trovano anche ad altri livelli come: **cervello, fegato e la midollare del surrene**. I **recettori V2 della vasopressina** mediano l'effetto antidiuretico della vasopressina (per questo la vasopressina viene chiamata anche **ADH** cioè ormone antidiuretico). Questi recettori si trovano a livello del **dotto collettore**, dove hanno la funzione di far fondere le molecole di **acquaporine-2** sulla membrane delle **cellule principali del collettore** per aumentare la permeabilità all'acqua. I **recettori V3 della vasopressina** sono localizzati a livello della **ghiandola pituitaria** e sono stati solo recentemente caratterizzati.



77

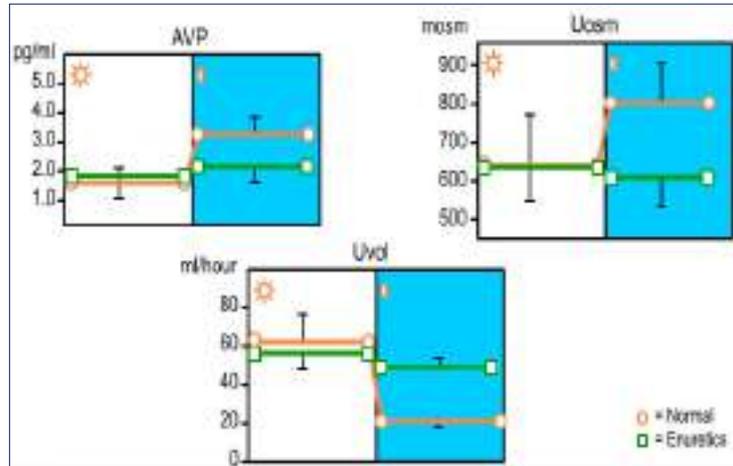
I diversi recettori della vasopressina

I recettori della **vasopressina** sono codificati da **geni** che prendono il nome di **AVPR**, abbiamo 3 tipi di geni **AVPR** (**AVPR1A, AVPR1B, AVPR2**) che codificano per 3 tipi di **recettori**, che rispettivamente sono **V1** (a loro volta suddivisi in **V1A e V1B**, questi ultimi chiamati anche **V3**) e **V2**.



78

ADH



Long-term home studies of water balance in patients with nocturnal enuresis.
 Rittig S, Schaumburg H, Schmidt F, et al. *Scand J Urol Nephrol Suppl.* 1997;133:25-6

79

LIVELLI ADH

Table 2 Nocturnal ADH levels in the PSE patients in previous studies and the present study

Source	No. of patients	Country	Nocturnal ADH level (pg/ml)
Previous study			
Wiltz et al. [5]	19	Sweden	2.86 ± 0.44
Akawa et al. [6]	28	Japan	0.47 ± 0.17
Rittig et al. [7]	25	Denmark	2.12 ± 1.73
Devitt et al. [8]	31	UK	1.69
Chiovini et al. [9]	25	Italy	2.14 ± 0.93
Bala et al. [10]	39	Turkey	2.18 ± 0.27
Tennari et al. [11]	18	Italy	0.64 ± 0.69
Present study	99	Taiwan	0.87 ± 0.73

Normal range ADH 1–5 pg/ml

Clinical characteristics, nocturnal antidiuretic hormone levels, and responsiveness to DDAVP of school children with primary nocturnal enuresis.

Chang JW, Yang LY, Chin TW, Tsai HL. *World J Urol.* 2011 Sep 7

80

ANTIDIURETIC HORMONE (ADH)

Valenti G, J Am Soc Nephrol 2000

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ENURESIS MONOSINTOMATICA: ASSENTE RITMO CIRCADIANO

- DIURESI
- ESCREZIONE SODIO
- FRAZIONE FILTRAZIONE GLOMERULARE

	Control Group MNE/ST-	Study Group MNE/ST+
No. pts (St. grade)	20 (12)	11 (9)
Mean pt. age ± SD	8.6 ± 0.6	9.2 ± 0.8
Mean ± SD daylength		
Uvol (ml/min)	1.7 ± 0.48.8 ± 0.4*	1.0 ± 0.31.7 ± 0.5†
Uosm (mOsm/l)	583 ± 13956.0 ± 70†	629 ± 10967.0 ± 12067.0 ± 190†
FE _{Na} %	1.1 ± 0.60.8 ± 0.4*	0.8 ± 0.27.0 ± 0.4†
U _{Na} /U _{osm} %	41 ± 147.0 ± 10†	46 ± 10.91 ± 8
GFR (ml/min/1.73 m ²)	136 ± 297.12 ± 23†	121 ± 27.19 ± 29

* p < 0.05 between dry and nighttime is wettable.
† p < 0.05 between the 2 groups.

*Nocturnal polyuria is related to absent circadian rhythm of glomerular filtration rate.
De Guchteneare A, Vande Walle C, Van Sintjan P, et al. J Urol. 2007;178(6):2626-9.
The pathophysiology of monosymptomatic nocturnal enuresis with special emphasis on the circadian rhythm of renal physiology.
Dossche L, Walle JV, Van Herzeele C. Eur J Pediatr. 2016;175(6):747-54*

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ADH

Legend:
Filtrazione
Riassorbimento
Secrezione
Escrezione

ADH Mechanism:
Vasopressina (ADH) binds to V₂ receptors on the distal tubule cell, activating a G-protein pathway that leads to the production of cAMP and PKA, which then phosphorylates aquaporin-2 channels, moving them to the apical membrane for water reabsorption.

Western Blot:
A and B: Western blots showing ADH levels in various tissues (Kidney, Adipose, Pituitary, Liver, Heart, Muscle, Brain, Plasma, Urine). Lane 1: Control; Lane 2: ADH treatment.

Valenti G, J Am Soc Nephrol 2000

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POLIURIA NOTTURNA

IPERATTIVITA' DETRUSORIALE

DISTURBI DEL RISVEGLIO

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CAUSE RISVEGLIO DIFFICILE

THE NEW ENGLAND JOURNAL OF MEDICINE

Cortical Arousal in Children with Severe Enuresis

N ENGL J MED 368:22 www.nejm.org MAY 29, 2013



DIALOGO VESCICA – CERVELLO

Table 1. Sleep Architecture and the Cortical Arousal Index in Children with Enuresis and Normal Controls.*

Variable	Patients with Nocturnal Enuresis (N=25)	Normal Controls (N=23)	P Value
Mean age (yr)	9.5	10.1	NS
Sleep stage (%)			
1	9	3	<0.02
2	48	46	NS
Light (stages 1 and 2)	57	50	<0.02
3	6	7	NS
4	20	21	<0.05
Deep (stages 3 and 4)	26	30	<0.05
Rapid eye movement	36	20	<0.01
Cortical arousal index†	6.22	1.80	<0.01

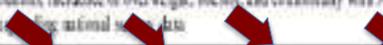
* NS denotes not significant.
† The cortical arousal index ranges from 1.12 to 12.48, with a higher score indicating greater frequent cortical arousals.

SONNO PIÙ LEGGERO
associato a frequenti risvegli
MA
INCAPACITA' A SVEGLIARSI
COMPLETAMENTE

Transizione da
sonno leggero a veglia
SOPPRESSA DA
IPERSTIMOLAZIONE
SEGNALI VESCICALI

85

COMORBILITA'



















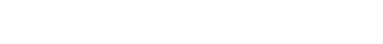














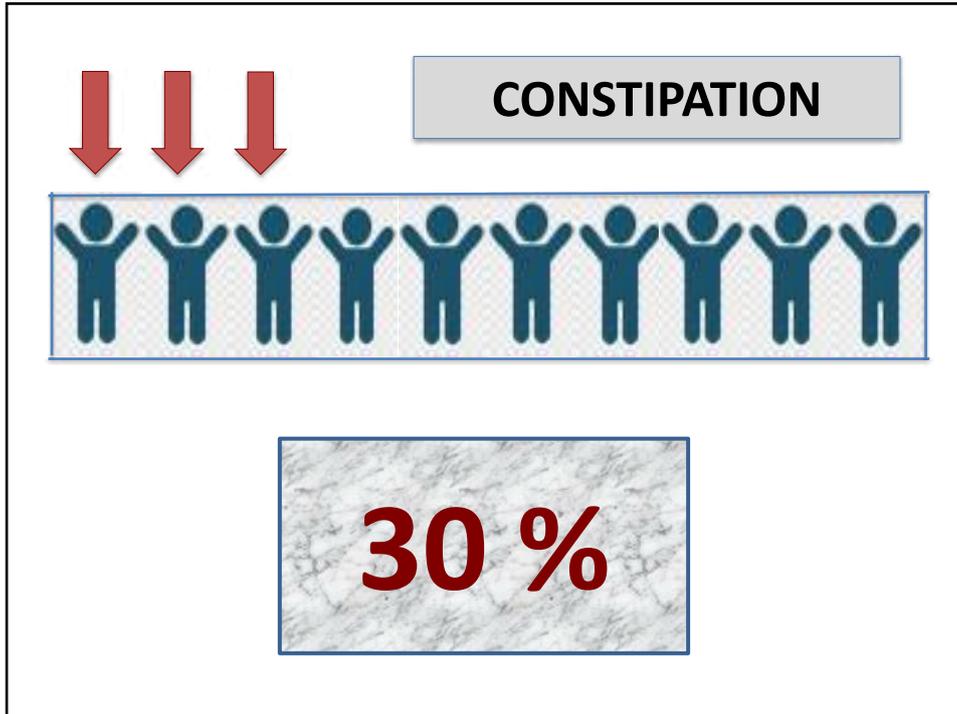












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Koff et al. demonstrated that **CONSTIPATION AND BOWEL DISTENSION** may lead to **DEFORMATION OF THE BLADDER** which in turn may lead to **HYPERACTIVITY OF THE DETRUSOR** and thus to urinary incontinence

Both the univariate and multivariate analyses showed that **CONSTIPATION** was significantly **RELATED TO DUI**.
*Recent studies also reported that **children with constipation had HIGHER PREVALENCE RATES** of urinary incontinence than did children without constipation.*

Koff SA, Wagner TT, Jayanthi VR. The relationship among dysfunctional elimination syndromes, primary vesicoureteral reflux and urinary tract infections in children. J Urol 1998;160(3 Pt 2):1019-22.
Soderstrom U, Hoelcke M, Alenius L, Soderling AC, Hjern A. Urinary and faecal incontinence: a population-based study. Acta Paediatr 2004;93:386-9.
Kajiwara M, Inoue K, Usui A, Kurihara M, Usui T. The micturition habits and prevalence of daytime urinary incontinence in Japanese primary school children. J Urol 2004;171:403-7.
Loening-Baucke V. Prevalence rates for constipation and faecal and urinary incontinence. Arch Dis Child 2007;92:486-9.

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COMORBILITA'

STIPSI – ENCOPRESI

Stipsi: criteri di Roma

- due o più dei seguenti criteri per 8 settimane :
- meno di 3 defecazioni alla settimana
- almeno un episodio di incontinenza alla settimana
- feci abbondanti palpabili in addome o nel retto
- produzione di feci così grandi che possono ostruire il gabinetto
- evidenza di posture o di atteggiamenti di ritenzione
- defecazione dolorosa
- (l'esplorazione rettale non sarà quasi mai necessaria , se non in rari casi dubbi o nell'ottica di escludere un Hirschprung)



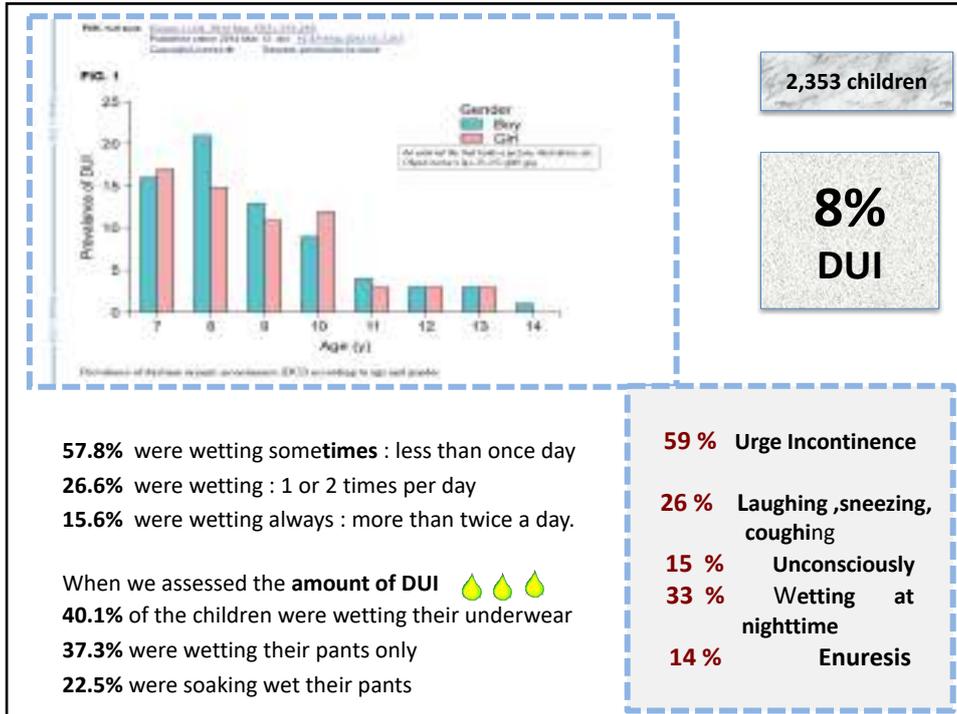
89

DAY TIME URINARY INCONTINENCE

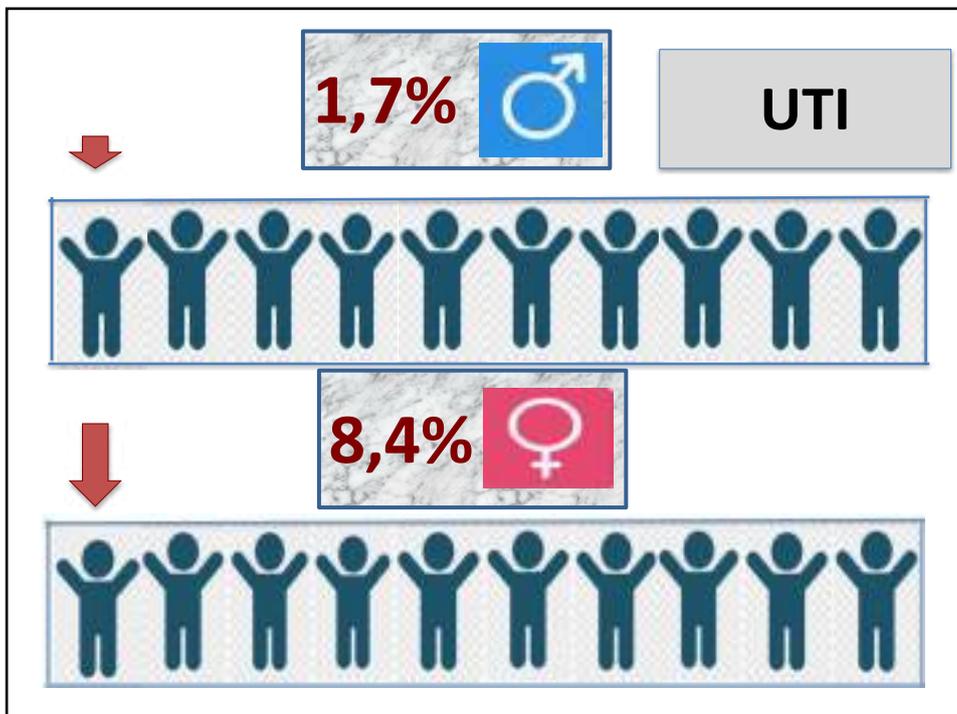


8%

90



91



92

“THE ETIOLOGY OF UTI, especially recurrent UTI, is OFTEN UNKNOWN; however, **URODYNAMIC DISTURBANCES WITH HIGH BLADDER PRESSURE OR EMPTYING DIFFICULTIES** are predisposing factors. It is well known that in children with UTI, especially in girls, there is a **CORRELATION WITH DAYTIME WETTING**, which suggests that EITHER daytime wetting is a **CONSEQUENCE** of the inflammation in the bladder or a **PRIMARY DYSFUNCTION** in the bladder predisposes to UTI.



Our study showed that all the voiding symptoms and history of uti were significantly associated with DUI

HISTORY OF URGENCY AND UTI RISK FACTORS FOR DUI.

Hansen A, Hansen B, Dahm TL. Urinary tract infection, day wetting and other voiding symptoms in seven- to eight-year-old Danish children. Acta Paediatr 1997;86:1345-9.

Kajiwara M, Inoue K, Usui A, Kurihara M, Usui T. The micturition habits and prevalence of daytime urinary incontinence in Japanese primary school children. J Urol 2004;171:403-7.

Bakker E, van Sprundel M, van der Auwera JC, van Gool JD, Wyndaele JJ. Voiding habits and wetting in a population of 4,332 Belgian schoolchildren aged between 10 and 14 years. Scand J Urol Nephrol 2002;36:354-62.

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VOIDING DISORDERS AND RECURRENT URINARY TRACT INFECTIONS UTI

IMPAIRMENT IN THE FUNCTION OF THE LOWER URINARY TRACT CAN BE A CAUSE FOR RECURRENT UTI

8.4% GIRLS	1.7% BOYS.
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Recurrent UTI with or without reflux

DETRUSOR HYPERACTIVITY 45%	DETRUSOR - SPHINCTER DYSSYNERGIA 7%.
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COMORBILITA'

OSA
*Apnee notturne ostruttive

ANP = FeNa_U
*Azione natriuretica osmotica *azione di escrezione Na⁺

Linked NCS: Sleep-disordered breathing and nocturnal polyuria: evidence and answers. Sleep Medicine Reviews 2011.

* Polgar SA, Park RT, Eddy KA. Elevated sleep arousal thresholds in obstructive sleep apnea. Annals of the New York Academy of Sciences 2007; 1117: 381-396.

* Durrant RM, Russell AJ, Kinnaird G, et al. Prevalence of nocturia and the relationship of primary nocturnal polyuria. Sleep Medicine Reviews 2008; 12: 177-188.

* Frankska J. Sleep-related electroencephalogram arousals. Sleep 1994; 17: 253-258.

POTOMANIA

MISURARE LIQUIDI INTRODOTTI

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DEPARTMENT OF UROLOGY
The University of Virginia
Charlottesville, VA 22904

CORTICOTROPIN RELEASING FACTOR: A MEDIATOR OF EMOTIONAL INFLUENCES ON BLADDER FUNCTION

ADAM P. KLAUSNER AND WILLIAM D. SPRENG
From the Department of Urology, University of Virginia Health System, Charlottesville, Virginia

- synthesized in neurons of PVN = key mediator anxiety–hypothalamic–pituitary–adrenal (HPA) axis
- expressed in areas of CNS that control voiding (Locus Coeruleus – Barrington’s nucleus) during anxiety – depression – pain – functional disorders of pelvic viscera
- bladder activity
- the expression may be influenced by estradiol

... HPA dysregulation occurs primarily with urge incontinence and does not appear to be involved with stress urinary incontinence ...

Klausner AP, J Urol 2004; 172: 2570-73

96

Female, but not male, serotonin reuptake transporter (5-HTT) knockout mice exhibit bladder instability.

Cornelissen LL, et al. Auton Neurosci. 2005; 122: 107-110



... LOWERING MONOAMINES in CNS such as
SEROTONIN (5-HT) and NOREPINEPHRINE (NE)
leads to

DEPRESSION - URINARY FREQUENCY - HYPERACTIVE BLADDER
in experimental animals

Steers W., et al. World J Urol 2001; 19: 351-57

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VOCABOLARIO



POLIURIA NOTTURNA	Volume urine notturno > 130% della capacità vescicale attesa / età
CAPACITA' VESCICALE ATTESA	[30+(30 x età)] ml
VOLUME MASSIMO VUOTATO	Maggior volume vuotato DURANTE IL GIORNO desunto da diario minzionale (esclusa 1° minzione mattino)
VESCICA IPERATTIVA	Presenza URGENZA E FREQUENZA con o senza incontinenza urinaria
COMORBILITA'	Condizioni associate e maggiore incidenza enuresi e/o aumentata resistenza a terapia

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POLIURIA NOTTURNA

IPERATTIVITA' DETRUSORIALE

DISTURBI DEL RISVEGLIO

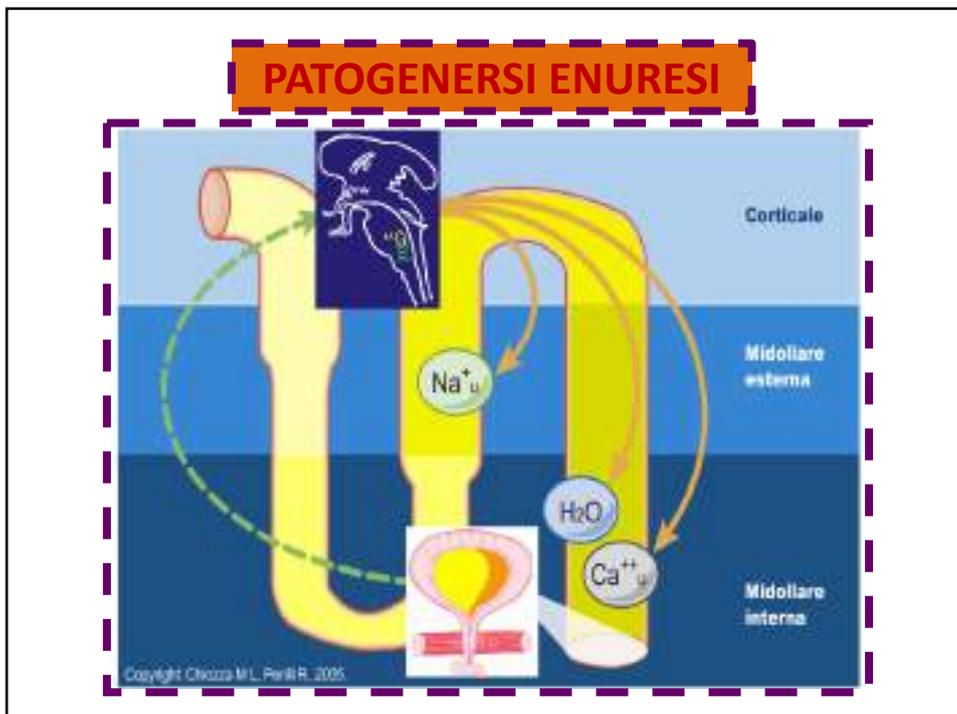
Spessore detrusoriale

Urina

Uetro

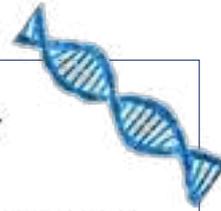
The diagram is contained within a large orange rectangular frame. It is divided into three sections. The top-left section, marked with a yellow star, shows a cluster of green teardrop shapes representing urine. The top-right section, marked with a red star, contains an anatomical illustration of the bladder and ureter, with a dashed box and arrow pointing to the bladder wall labeled 'Spessore detrusoriale'. The bottom section, marked with a blue star, shows a cartoon character sleeping in bed. Labels 'Urina' and 'Uetro' are present in the anatomical diagram.

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2. Enuresi: aspetti di fisiopatologia



Acta Paediatr. 1998;87(12):1511-5

Molecular genetics of nocturnal enuresis: clinical and genetic heterogeneity.

van Gessel J¹, Eilers H, Laitinen E, Rittig S, Laitinen J²

Author information

Abstract

Forty-two children with nocturnal enuresis (27 with primary, 4 with secondary nocturnal enuresis and 11 with combined primary nocturnal enuresis and daytime wetting) were selected retrospectively from a study of 167 consecutive children with enuresis. The aim of the study was to collect formal genetic data, perform molecular genetic linkage-analyses with five microsatellite markers on chromosomes 13q, 12q of 8q and specify the associations between genetic findings and clinical, as well as psychiatric diagnoses.

Environ Biol Child. 1999;21(3):246

Total genome scan analysis in a single extended family for primary nocturnal enuresis: evidence for a new locus (ENURS) for primary nocturnal enuresis on chromosome 22q11.

Glass H¹

Scand J Urol Nephrol. 2018;44(2):181-5. doi: 10.1080/08000566.2018.14727

Correlations between enuresis in children and nocturia in mothers.

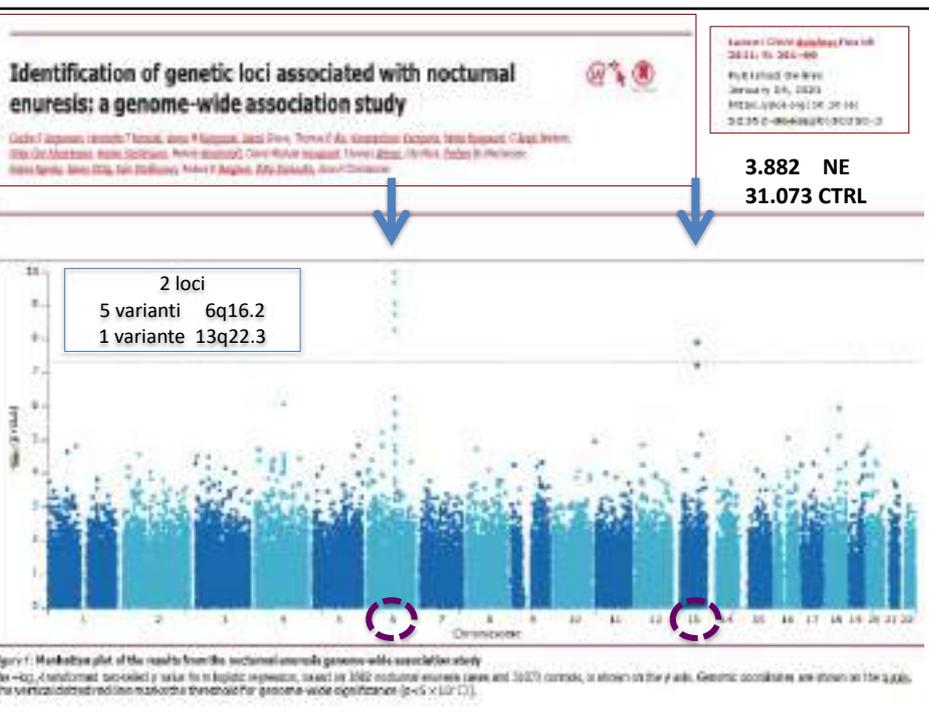
Martino P¹, Tabellì G, Cacciari A, Scatena M, Scatena L, Cacciari G

J Child Fam Stud. 2017;26(12):2094-2100. doi: 10.1007/s10826-017-0917-7. Epub 2017 Feb 17.

Are lower urinary tract symptoms in children associated with urinary symptoms in their mothers?

Seccia AP¹, Cacciari G², Cacciari A², Cacciari L², Cacciari M², Scatena L², Vanni S³, Netti AM², Scatena L²

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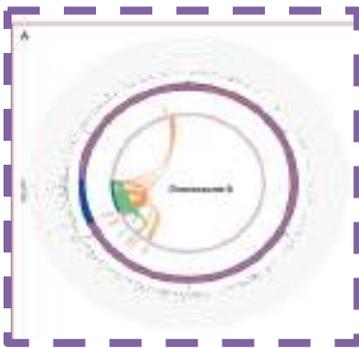
PRDM13
PR DOMAIN ZINC FINGER PROTEIN 13

NUCLEAR PROTEIN INVOLVED IN TRANSCRIPTIONAL REGULATION. During neurodevelopment, this protein **Regulates the balance of INHIBITORY and EXCITATORY NEURONS** by **REPRESSING EXCITATORY CELL LINEAGES IN THE DORSAL SPINAL CORD.**

Besides evidence of a **circadian** and **age-dependent expression pattern**, PRDM13 seems to be highly expressed in the **DORSOMEDIAL NUCLEI OF THE HYPOTHALAMUS.**

Inactivation of PRDM13 in these cells might be of interest in the context of nocturnal enuresis, because it seems to have an **EFFECT ON SEVERAL SLEEP PARAMETERS IN MICE, INCLUDING QUALITY AND DEPTH.**

In the retina, PRDM13 is involved in the **formation of GABAergic and glycinergic amacrine Cells**, and its **inactivation** in these cells in mice results in **higher spatial, temporal, and contrast sensitivities to visual stimuli.** PRDM13 **COULD AFFECT THE CENTRAL REGULATION OF CIRCADIAN RHYTHMS THROUGH ITS ROLE IN VISION**



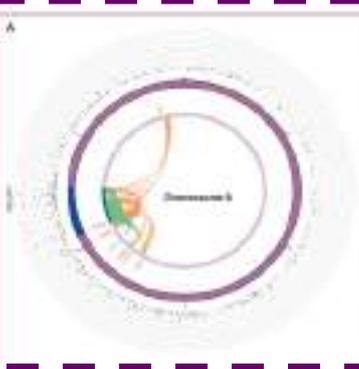

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SIM1
SINGLE-MINDED HOMOLOG 1

SIM1 encodes the transcription factor single-minded homolog 1

ESSENTIAL REGULATOR OF THE FORMATION OF ARGININE VASOPRESSIN-PRODUCING MAGNOCELLULAR NEURONS IN THE SUPRAOPTIC AND PARAVENTRICULAR NUCLEI.

.....Thus, the findings of our nocturnal enuresis GWAS point to a well established pathophysiological mechanism in nocturnal enuresis (NIGHT-TIME POLYURIA DUE TO DEFICIENT ARGININE VASOPRESSIN SECRETION) and thereby an association with a well known nocturnal enuresis DRUG TARGET (ARGININE VASOPRESSIN).....



SIM1 IS HIGHLY EXPRESSED IN BOTH THE DEVELOPING AND ADULT KIDNEY.

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ENURESIS -ADHD

INDIVIDUALS WHO ARE GENETICALLY VULNERABLE TO ADHD ARE AT **HIGHER RISK** OF PRESENTING WITH NE

ADHD AND NOCTURNAL ENURESIS **SHARE** COMMON PATHOGENIC PATHWAYS

	Sex ratio (M:F)	Overweight	Obesity	Comorbidity	Comorbidity with ADHD	Number of children per family
PNE patients	1.91	10.0%	17.8%	36.7%	12.2%	2.24 ± 0.66
National survey	1.00 ¹	19 ²	10.3 ³	32.2 ⁴ (15)	8.4% (14)	2.64 ± 0.9 ⁵
P value	0.64 ⁶	0.203	0.103	0.285	0.214	0.063 ⁷

¹ P < 0.05

LACK OF THE APPROPRIATE CORTICAL INHIBITION
THAT INCREASES AS THE BRAIN DEVELOPS.

DEFICIENT PREPULSE INHIBITION OF THE STARTLE
HAS BEEN FOUND AND DISCUSSED IN RELATION TO BOTH
ADHD AND NOCTURNAL ENURESIS

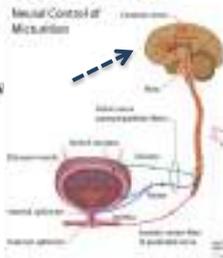
... Our GWAS cannot provide any direct evidence **TO CLARIFY WHETHER** nocturnal enuresis is associated with such a central maturation defect **AND WHETHER** this might be a **COMMON** pathway **SHARED BY NOCTURNAL ENURESIS AND ADHD**

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Exp Biol Med (Maywood). 2021 Jul; 246(13): 1483–1490.
Published online 2021 Mar 9. doi: 10.1177/153537012210997363

Pathogenesis and brain functional imaging in nocturnal enuresis: A review

Jiawei Dang^{1,2} and Zhenhua Tang^{2,3}



- STRUCTURAL MAGNETIC RESONANCE IMAGING (MRI)
- TASK-BASED AND EVENT-RELATED FUNCTIONAL MRI (fMRI)
- RESTING-STATE FMRI

THALAMUS

CAN REGULATE BOTH URINE STORAGE AND AWAKENING FROM SLEEP WHILE THE LATTER CEREBRAL AREAS ARE ALL INVOLVED IN CONTROLLING MICTURITION.

BRAIN MORPHOMETRY

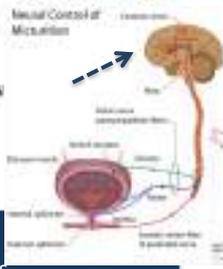
OXYGEN EXTRACTION FRACTION

LEVELS ARE IMPORTANT FOR MAINTAINING OXYGEN SUPPLY IN CHILDREN WITH NOCTURNAL ENURESIS. THESE PATIENTS MAY BE MORE SUSCEPTIBLE TO HYPOXIA. THE INCREASED OEF LEVELS WERE POSITIVELY CORRELATED WITH THE DIFFICULTY OF AROUSAL FROM SLEEP

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Ergonomics, 2021 Jul; 64(7): 1483-1490.
Published online 2021 Mar 9. doi: 10.1080/00140139.2021.1997363

Pathogenesis and brain functional imaging in nocturnal enuresis: A review
Jiamin Dang^{1,2} and Zhenhua Tang^{2,3}



THALAMUS

Most of the evidence seems to support the view that the thalamus is a **PIVOTAL AREA** involved in the pathogenesis of nocturnal enuresis. Zhang *et al.* investigated the **functional connectivity** between the thalamus and other brain regions, and noted that **FOUR BRAIN REGIONS** had a decreased connection efficiency with the thalamus, including the frontal lobe, parietal lobe, precentral gyrus, and cerebellum posterior lobe. **DYSFUNCTIONS IN THESE AREAS** may be associated with an **AROUSAL DISORDER** and may lead to nocturnal enuresis.

ADHD

NO OVERLAP IN ABNORMAL BRAIN FUNCTIONAL REGIONS
between **ADHD** and **NE** patients.

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“Sono andato per tracciare i contorni di un’isola e ho scoperto i confini dell’oceano.”
Ludwig Wittgenstein

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