Dealing with the Wet Child: *Getting to Dry*

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Getting to Dry

- In the child with wetting after toilet training has been attempted, understanding the possible causes is critical to defining the best therapy
- Most wetting is functional and behavioral, but structural causes should never be missed
- Most diagnoses can be excluded with a careful history and exam

Wetting

- Anatomic abnormalities
- Neurogenic incontinence
- Stress incontinence
- Enuresis
- Dysfunctional voiding

Incontinence

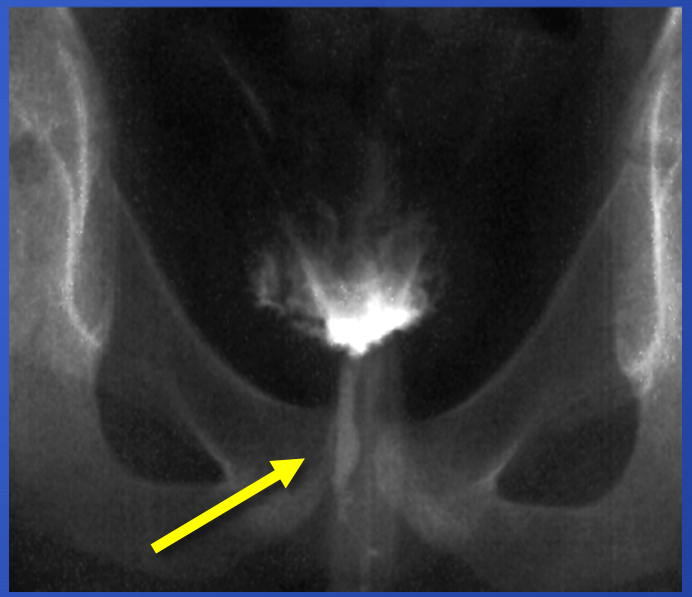
- Total - almost always anatomic or neurogenic
- Stress - only with activity
- Overflow - small amounts intermittently
- Urge - associated with urge to void, but cannot suppress void
- Giggle - only vigorous laughter

Incontinence: *Ectopic ureter*

- Constant wetting, small volume: "never dry" *(girls only)*
- Hydronephrosis or abdominal mass
- Purulent drainage from perineum
- Imaging:
  - US if mass or purulence
  - IVP/CT/MRI if wetting alone and normal US

11 year-old with life-long wetting despite bladder retraining; always "damp"

IVP shows duplicated right system and ureter passing by bladder neck, exiting onto perineum



Incontinence: *Neurogenic*

- Progressive
- Associated bowel incontinence
- Never really dry
- Associated physical anomalies:
  - foot
  - lower back
- Perinatal complications

Incontinence: *Stress incontinence*

- Apparently more common in athletes
- Structural basis unclear
- Treatment:
  - alpha-agonists for bladder neck tone
    - *pseudoephedrine*
  - bladder neck injections
  - bladder neck suspension or sling

Stress urinary incontinence in young female athletes

- Nygaard, et al., Obs Gyn, 84:183, 1994
  - 156 female college athletes (19.9yrs)
  - 28% reported sports-related SUI; 17% started in junior high, 40% in high school
- Bo, et al., Obs Gyn, 84:1068, 1994
  - 37 college age students
  - 38% reported sports-related SUI; 6/7 with symptoms had urodynamic evidence of sphincter incompetence
- Nygaard, et al., Obs Gyn, 87:1049, 1996
  - women with sports related SUI had less foot arch flexibility than those without
- Eliasson K, et al.,Int Urogynecol J Pelvic Floor Dysfunct. 19(5):687-96, 2008
  - Urinary incontinence in very young and mostly nulliparous women with a history of regular organised high-impact trampoline training: occurrence and risk factors
- Carls, Urol Nurs. 27:21-4, 2007
  - The prevalence of stress urinary incontinence in high school and college-age female athletes in the midwest: implications for education and prevention.

Incontinence: *Nocturnal Enuresis*

- Nighttime wetting only
  - *(mono-symptomatic enuresis - MSE or MNE)*
- 50% more common in boys
- 15% of 5 years olds wet at night
- 5% of 10 year olds wet at night
- 1% of 15 year olds wet at night
- 15% of patients resolve per year

Enuresis - Laws of 15

- ✓ 15% of enuretics have encopresis
- ✓ 15% of enuretics become dry each year
- ✓ 15% of enuretics have daytime symptoms
- ✓ 15% of enuretics have an initial dry period
- ✓ 15% of non-enuretics have nocturnal polyuria
- ✓ 15% of non-enuretics have nocturnal wakenings

Enuresis - Etiology

- Inherited
- Sleep factors
- Bladder instability
- Nocturnal polyuria - *vasopressin abnormality*
- Developmental Delays
- ? Psychiatric factors
- ? Allergies

Enuresis - Management

- Reassurance
- Family-determined goals and timing
- Basic
  - ✓ Reduce evening fluids
  - ✓ Void before bed-time
  - ✓ Awaken after 2 to 3 hours of sleep
- Behavioral - alarms
- Pharmacological
  - ✓ DDAVP - continuous or episodic
  - ✓ Anticholinergics
- Treat any daytime voiding dysfunction

Incontinence: *Dysfunctional Voiding*

- Bladder and dowel dysfunction (BBD) due to behavioral or developmental factors
- No anatomic or neurological cause evident
- Usually after toilet training
- May be associated with UTI and reflux
- Management based on etiology

Dysfunctional Voiding: Significance

- 29% of Danish 6 and 7-year olds
  - *Hansen et al, Acta Pediatrica 86:1345, 1997*
- 8% of Belgian school age children
  - *Bakker, et al, Scand J Urol Nephrol 36:354, 2002*
- 15% of teenage girls
  - *Alnaif, et al, Int Urogyn J Pelvic Floor Dysf 12:134, 2001*

Dysfunctional Voiding: Significance

- UTI affects 2.6 to 3.4% of children
- UTI is the cause of 1.1 million office visits in the USA per year in children under 18 years
  - *Freedman, J Urol, 2005*
- At least 50%, if not more, are associated with or due to dysfunctional voiding

Dysfunctional Voiding: Etiology

- Interaction between behavioral and biological processes
- Should not be considered as purely one or the other
- Once established, the patterns can be self-perpetuating

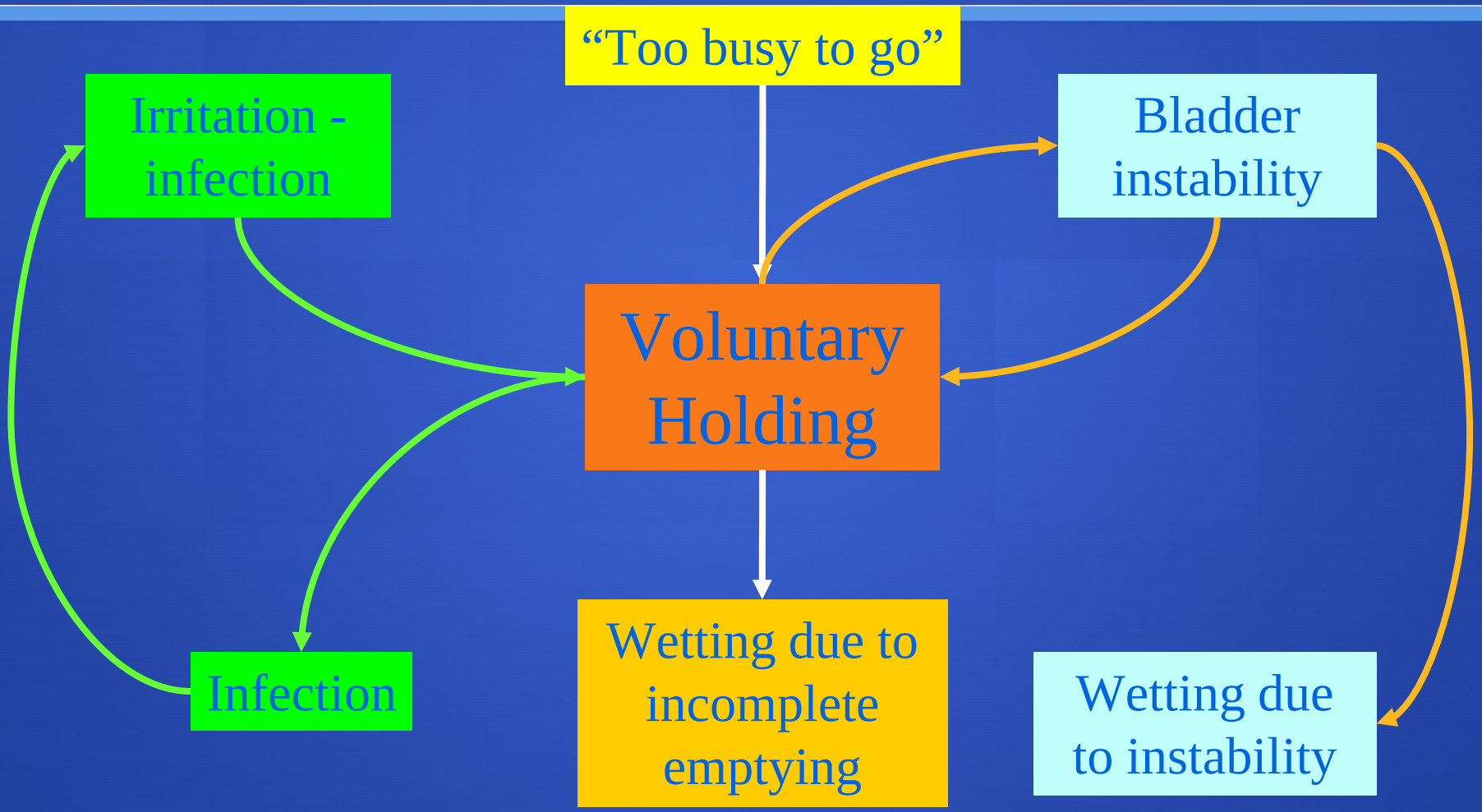
Dysfunctional Voiding: Etiology

- Holder
  - Too busy to go
  - Hurts to go
- Unstable bladder ("Urge syndrome")
  - Immature bladder; always creating an urge to void
  - Resisted with toilet training – trying to stay dry
- "Lazy" bladder
  - Inadequate emptying; over-flow wetting, infections

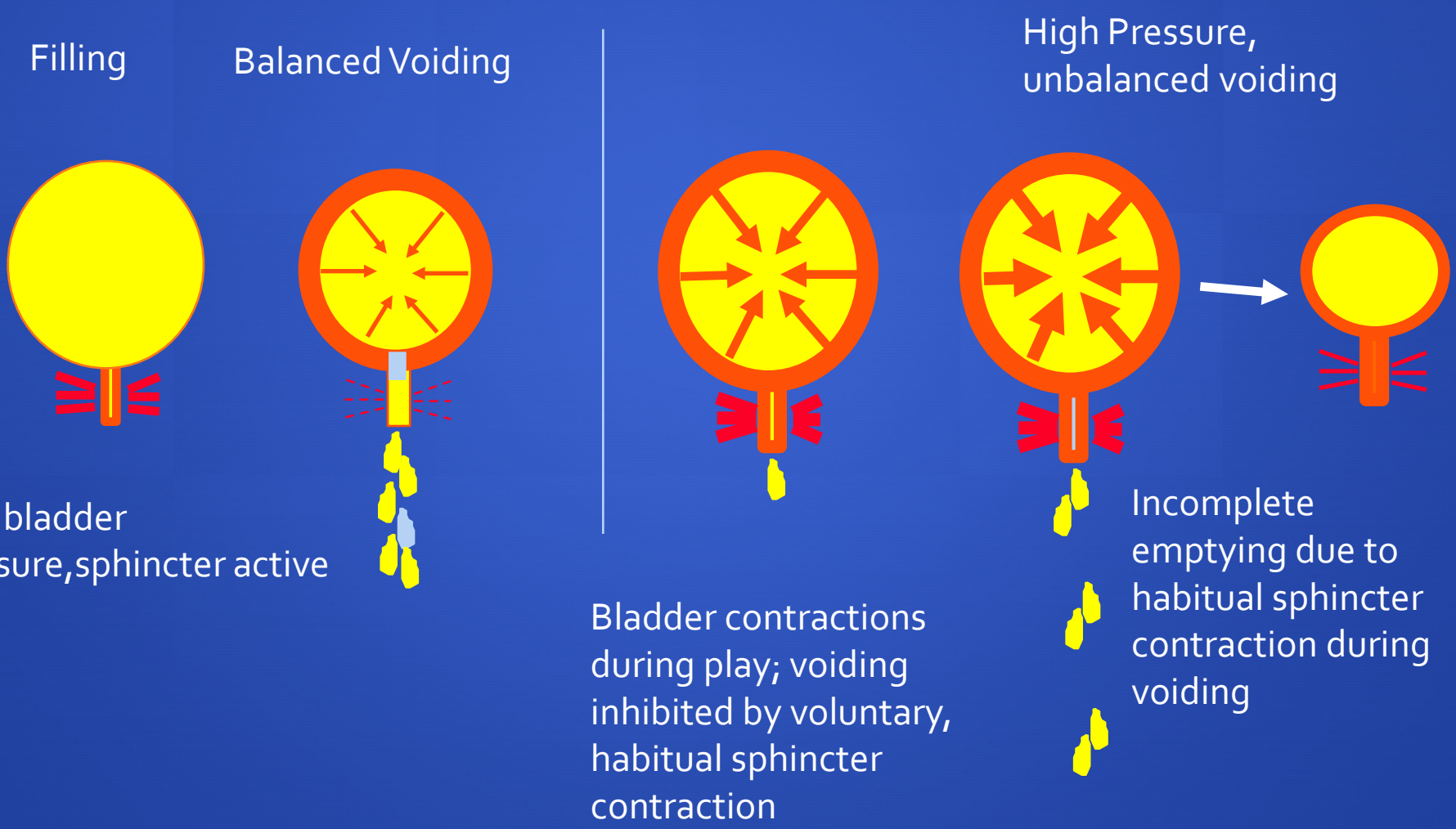
Dysfunctional Voiding: Etiology

- Vicious cycle
  - ✓ The holder has pain from her bladder contracting against a closed sphincter, the pain causes more tendency to hold and more pain
  - ✓ The holder gets a UTI due to inadequate emptying, it hurts to void, and she holds more
  - ✓ The unstable bladder is resisted, it contracts harder against the sphincter which acts to obstruct the bladder, which makes it more unstable

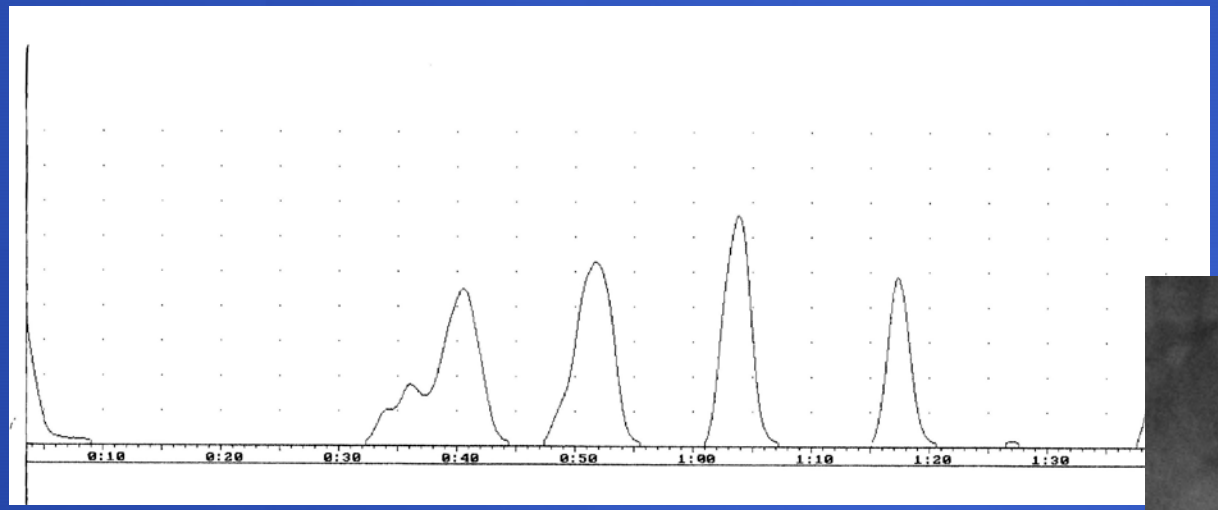
Incontinence and Dysfunctional Voiding



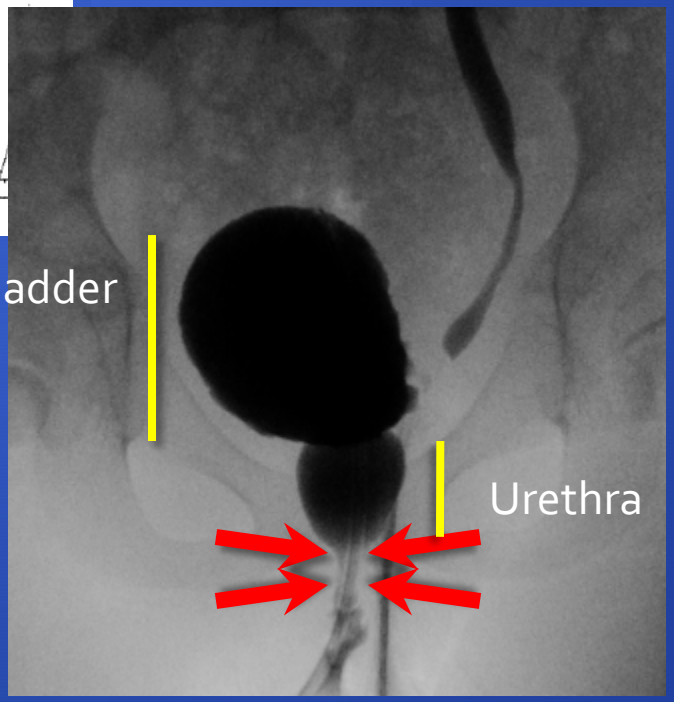
Incontinence: *Dysfunctional Voiding*



Dysfunctional Voiding



"Staccato" or intermittent voiding



"Spinning top" deformity during voiding indicating non-relaxation of external sphincter

Vincent's curtsy

Dysfunctional Voiding: Evaluation

- Diagnosis is based on history
- The remainder of the evaluation is confirmatory and education to parent and child…
- And to rule out the dangerous causes of wetting and infection

Dysfunctional Voiding: Evaluation

- Diagnosis is based on history
- Questions must be directed to elicit what is often perceived to be a normal pattern of behavior to the child or parent
- When a parent asks the child "how many times to you go?" - *neither has a clue*

Dysfunctional Voiding: Evaluation

- Ask about:
  - Wetting pattern
  - Toilet training
  - Developmental history
  - Constipation
  - Family history of bladder dysfunction

KUB: stool burden

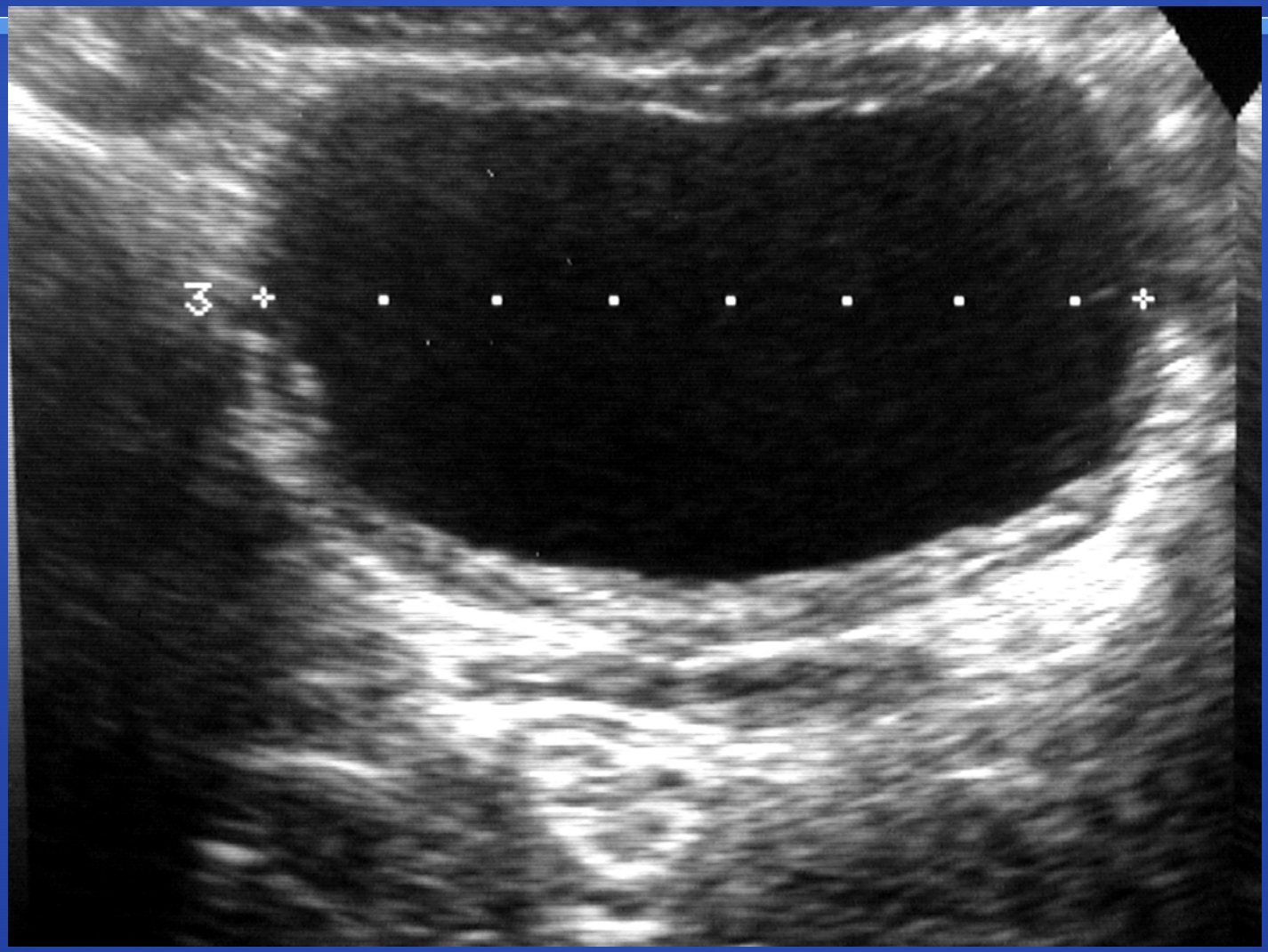
Constipation and Wetting

- Frequent association
- Probably due to pelvic floor tightness, lack of relaxation, and tendency to postpone voiding
- Likely contributes to bladder instability
- Reservoir for uropathogens
- Must ask specific questions to identify presence

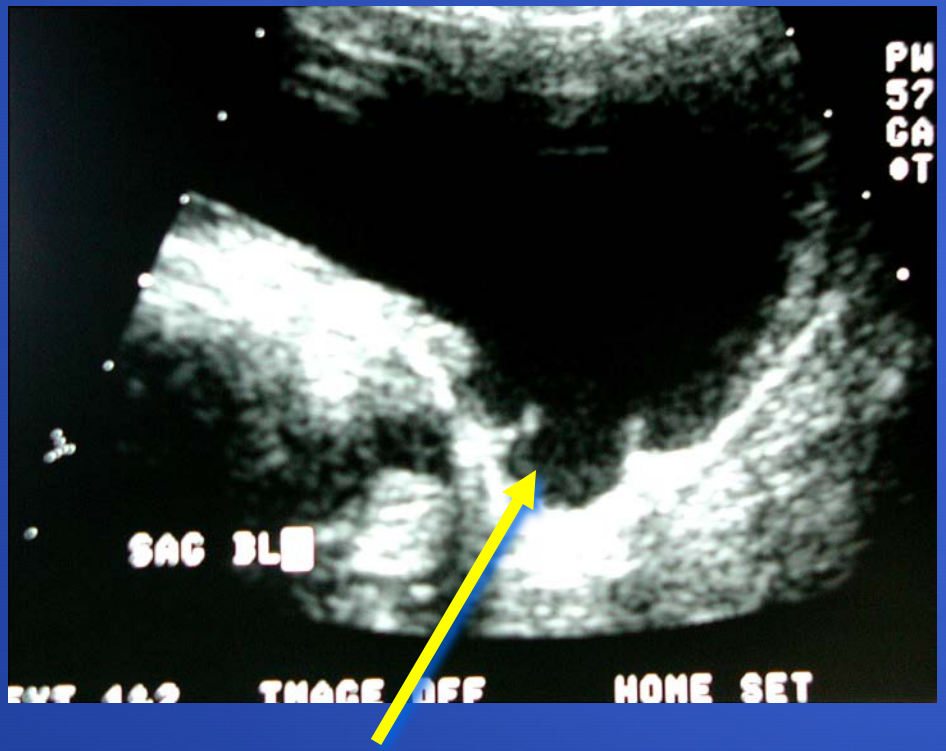
Using Ultrasound to evaluate bladder function

- Capacity
- Wall thickness
  - ✓ Anatomic obstruction (rare in girls)
  - ✓ Neurogenic bladder
  - ✓ Dysfunctional voiding patterns
  - ✓ Acute inflammation (irregular wall)
- Emptying efficiency - Post Void Residual (PVR)
  - ✓ You have to ask for it - *after first void*
- Anatomy
  - ✓ Internal structures - all are abnormal
- Ureters

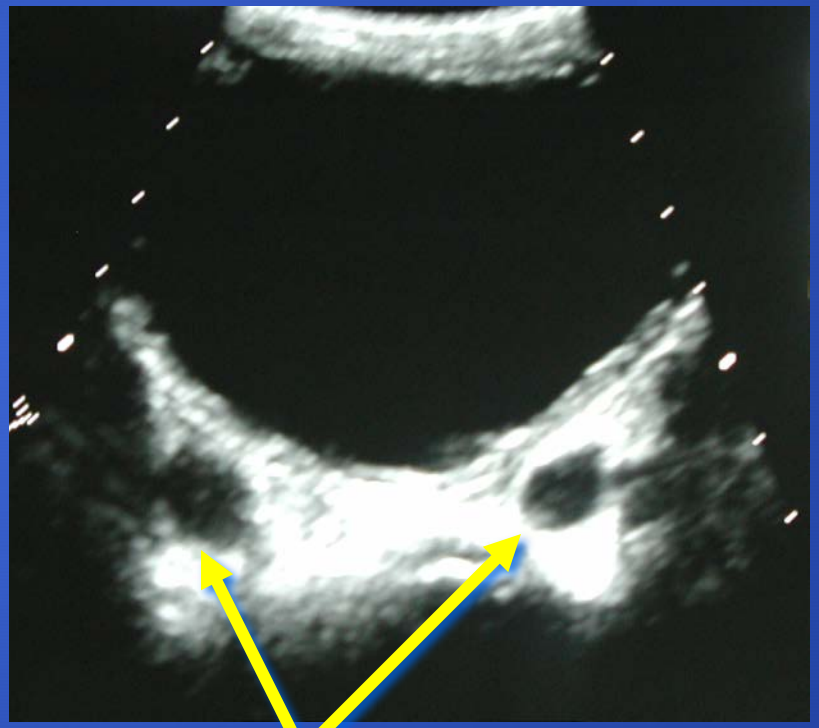
Bladder Ultrasound: Wall thickness



Bladder Ultrasound



Bladder diverticulum



Dilated ureters

Indications for Urodynamic Evaluation

- What can be learned?
  - Pressure : volume relationships
  - Sensation at volume (*patient has to be awake*)
  - Voiding dynamics
    - Stability
    - Pressure
    - Sphincter relaxation
  - Emptying efficiency
  - Flow rate
  - Innervation - looking for denervation pattern

UDS: What are we looking for?

- Pattern of voiding to explain symptoms that is amenable to specific therapy
- Neurogenic bladder dysfunction vs. learned or maturational pattern
- Identify potentially progressive lesions (nearly all neurogenic)

UDS: What can we treat?

- Neurogenic - complex
- Sphincteric weakness - rare except neurogenic

- Poor emptying – *Rx: CIC*
- Over-activity - *Rx: anticholinergics*
- Normal with voluntary incoordination - *Rx: behavioral*

These three are usually evident by history and US

Voiding dysfunction: Treatment

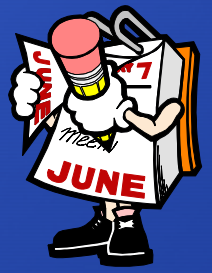
- Voiding pattern: timed, double voiding
- Correct constipation – diet, Miralax
- Acidophilus
  http://www.healthandage.com/html/res/com/ConsSupplements/Lactobacillusacidophiluscs.html
- Behavioral modification; biofeedback for external sphincter relaxation
- Antibiotic prophylaxis: if recurrent symptomatic UTIs would impair voiding retraining

Shortliffe, LM: The management of urinary tract infections in children without urinary tract abnormalities, Urol Clinics NA 22:67, 1995.

Bladder Retraining: 3-R's

- **R**egular
  - ✓ timed schedule of voiding, every 2.5 to 3 hours
  - ✓ alarm wristwatch useful in older children
- **R**elax
  - ✓ double void with distraction between voids for 2 minutes

- **R**ecord
  - ✓ calendar to remind child (parent) and record progress; reinforcement



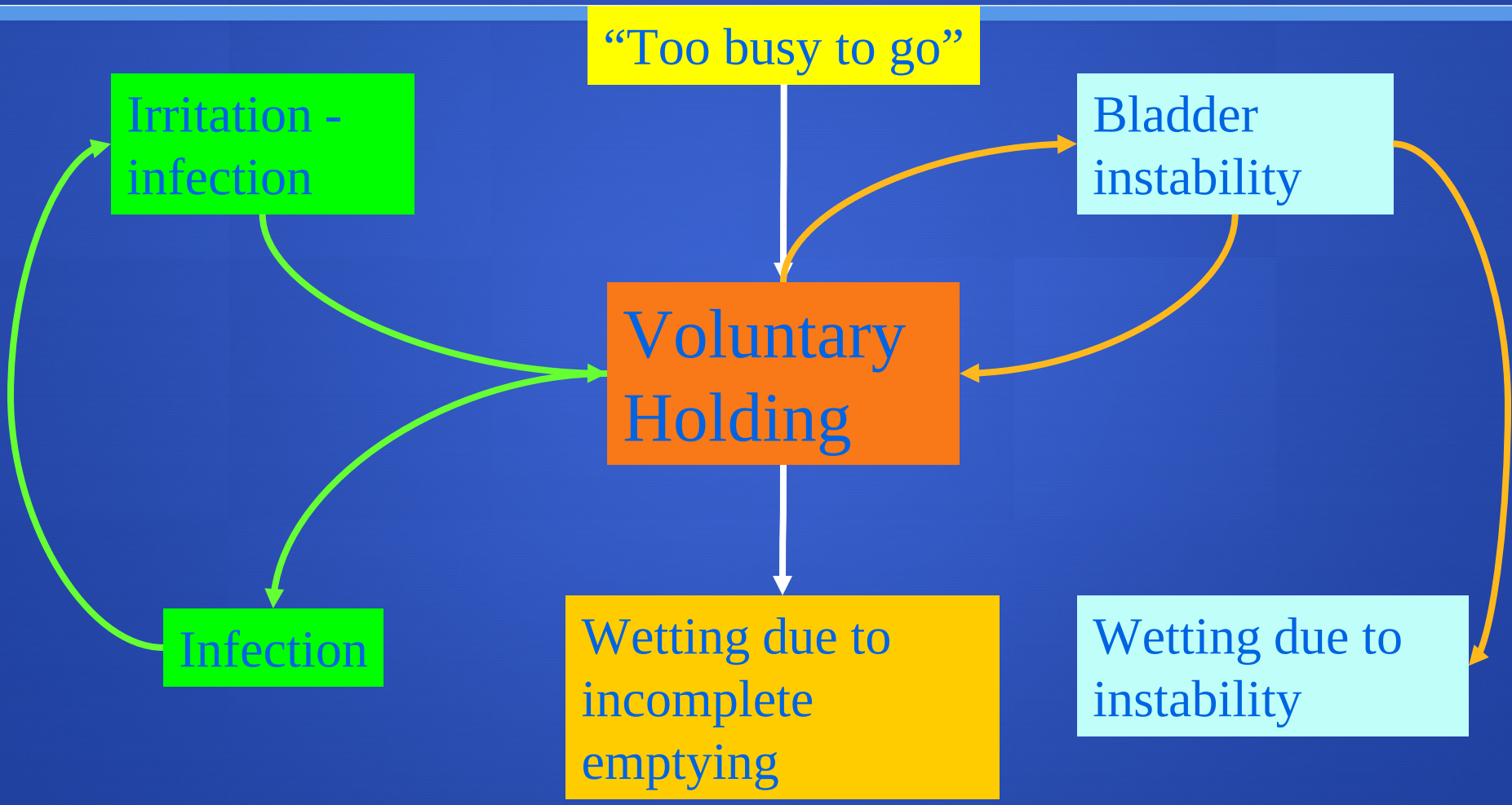
Dysfunctional Voiding: Management

- Identify the likely pattern
- Educate the parent and child to the degree possible
- Behavioral aspects
- Pharmacologic assistance
- Follow-up and follow-through

Dysfunctional Voiding: Management

- Two basic patterns:
  - Holder
    - ✓ Voiding postponement, infrequent
    - ✓ Often with constipation and abdominal pain
    - ✓ Post-void residual on US
    - **Behavioral retraining**
  - Unstable bladder
    - ✓ Urgency and frequency
    - ✓ Small volume dampness
    - ✓ Suggestions of neuromuscular immaturity
    - ✓ Small bladder with no PVR
    - **Behavioral therapy and anticholinergics**

Incontinence and Dysfunctional Voiding



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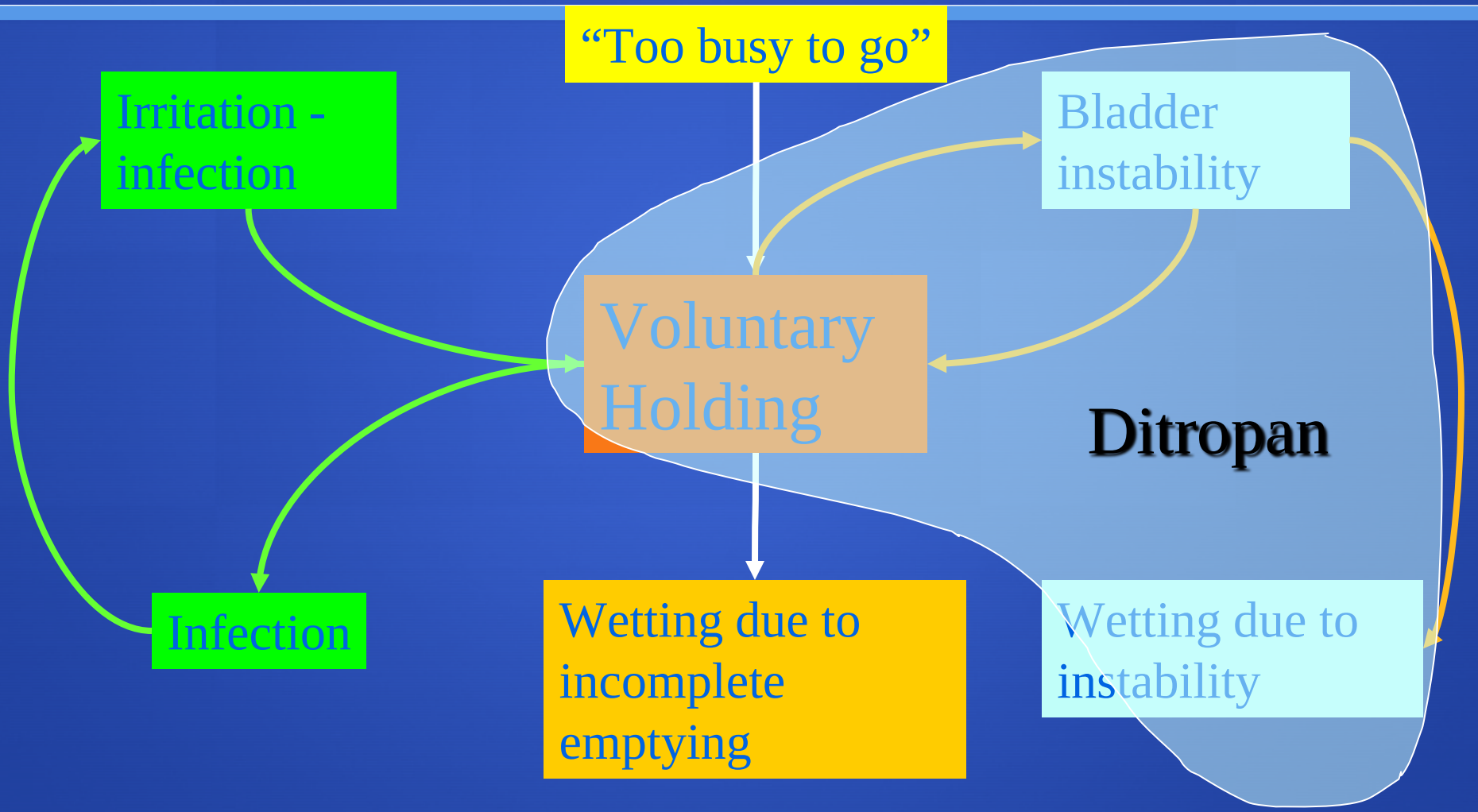

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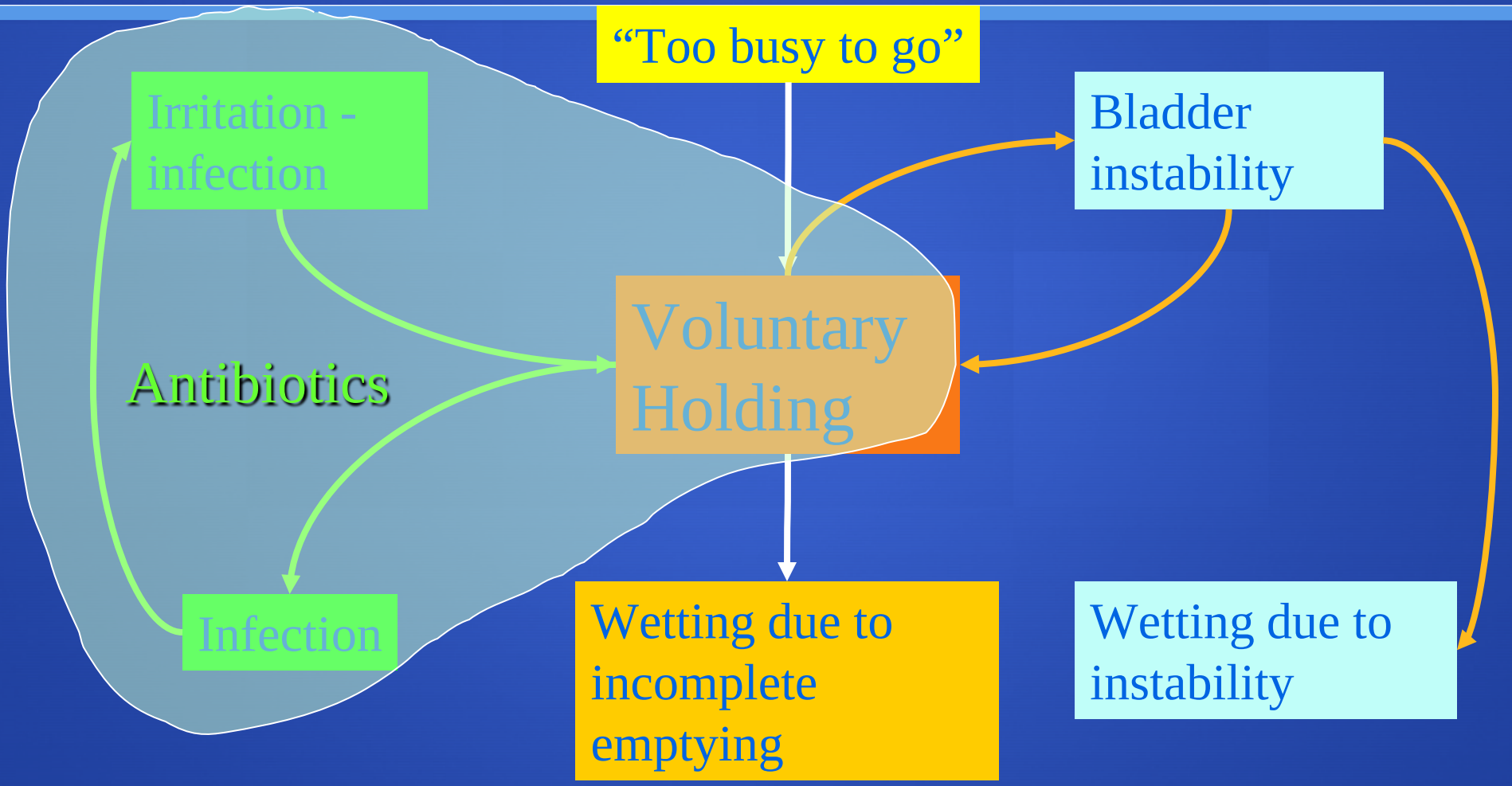

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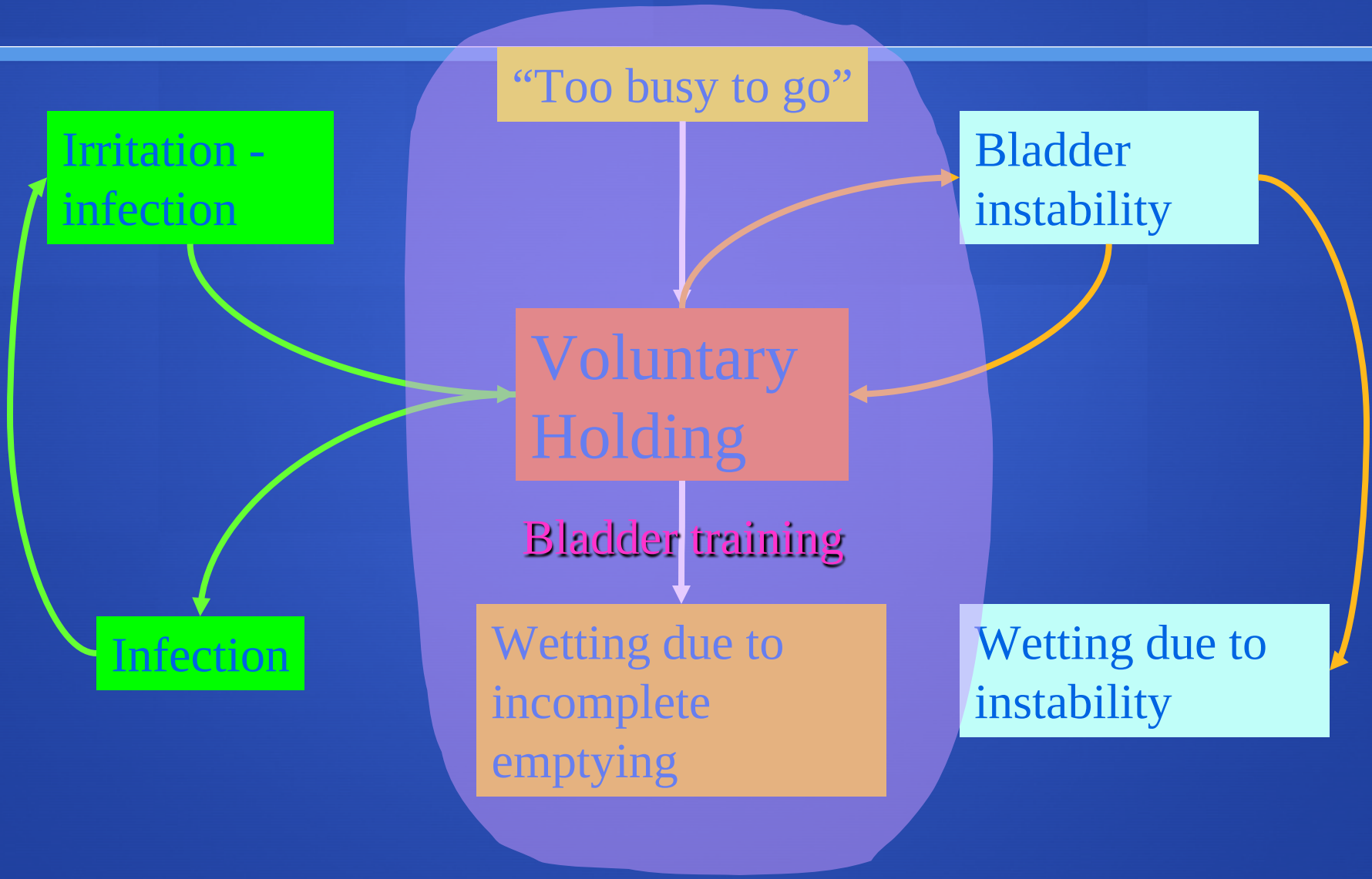

Dysfunctional Voiding: Management

- Antibiotic prophylaxis in Dysfunctional Voiding
  - ✓ If child is having recurrent infections associated with dysfunctional voiding, prevention of UTI during bladder retraining is essential
  - ✓ Each infection creates pain, aggravates ongoing voiding dysfunction
  - ✓ Prevent infection until better voiding has been established

Dysfunctional Voiding: Management

- Follow-up
  - ✓ Phone check on progress
  - ✓ Written record helpful
  - ✓ Emphasis on patient/parent education
  - ✓ US for re-check of PVR
  - ✓ Determine potential need for anticholinergics; many parents prefer no meds and will work on a behavioral program first
  - ✓ If started on meds, adjust dosage by response
  - ✓ Determine when further investigation may be warranted: UDS

Dysfunctional Voiding: Management

- Pitfalls
  - "It's not working" - compliance, understanding, child resistance
  - "We don't have time"
  - "She won't do the program"
  - "It worked great for a year, but she's doing the same thing; what should we do now?"
- Use UDS to confirm impression of voiding program (rarely adds anything new, but can be convincing to parent)
- Moving to alternative therapy: add in anticholinergics, biofeedback, acupuncture

Dysfunctional Voiding: Management

- Biofeedback
  - Use of formal biofeedback of pelvic musculature activity during voiding to train children about control of relaxation
  - Complex, multi-session programs
  - Can be effective in some cases; uncertain relative to simple behavioral training
  - Limited access in eastern Massachusetts
  - Insurance coverage limited

Wetting: Getting to Dry

- Common problem with significant health and quality of life impact
- Essential to recognize the patterns as largely behavioral
- Rule out structural or neurogenic problems
- Management based upon understanding the pattern of dysfunctional voiding and an integrated behavioral/functional approach to treatment
- Follow-up must allow for variable responses and will take significant time: 6 to 24 months
- Invasive testing is rarely useful

How you can be

BOSS OF THE BLADDER

When you
“gotta go”,
you gotta go.