



SPINA BIFIDA
HYDROCEPHALUS
IRELAND



Overview of the Urinary System

Kidneys & Spina Bifida Awareness Day

17th September 2011

What do we know: Adult Spina Bifida and Urology

- Very little peer reviewed literature in adult Spina Bifida
- Absence of Level I evidenced based medicine for Urologic care in adult Spina Bifida
- Need to address potential new Urologic issues
 - Fertility
 - Other (prostate, etc.)
- Prevention and treatment of Urology problems likely to occur in Spina Bifida with ageing
 - Stones, UTI's, etc.

Why transition to an “adult” provider?

- Need for ongoing f/u of previously treated Urologic conditions
 - Monitoring of kidney function
 - Prior surgery, etc.
 - Continence (creation or preservation)
- Unlike other pediatric issues, many Spina Bifida Urologic issues do not go away with time

Key to Urological Health as an Spina Bifida Adult

Be

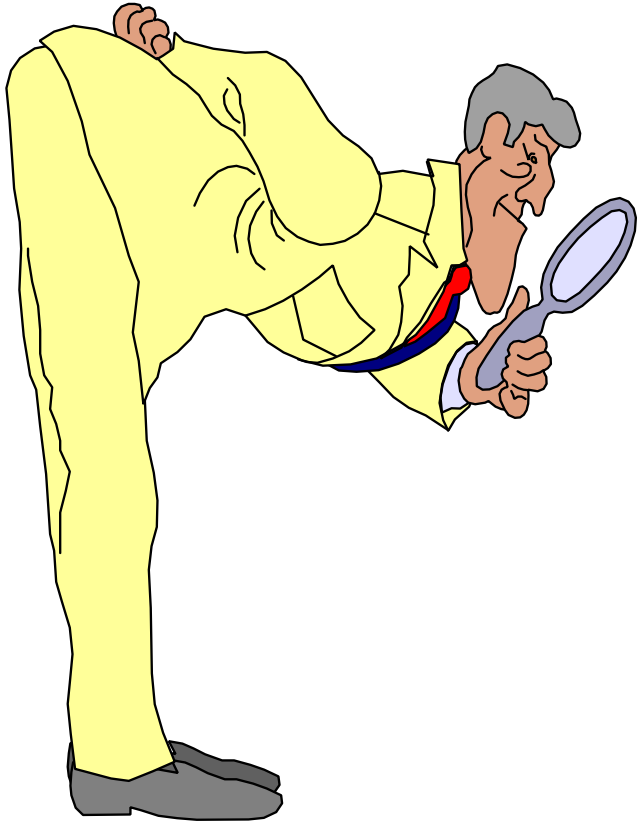
PROACTIVE

not

REACTIVE

Be an active participant in your healthcare. Too many "silent" problems in Urology can be prevented: renal failure, stones, UTI, etc.

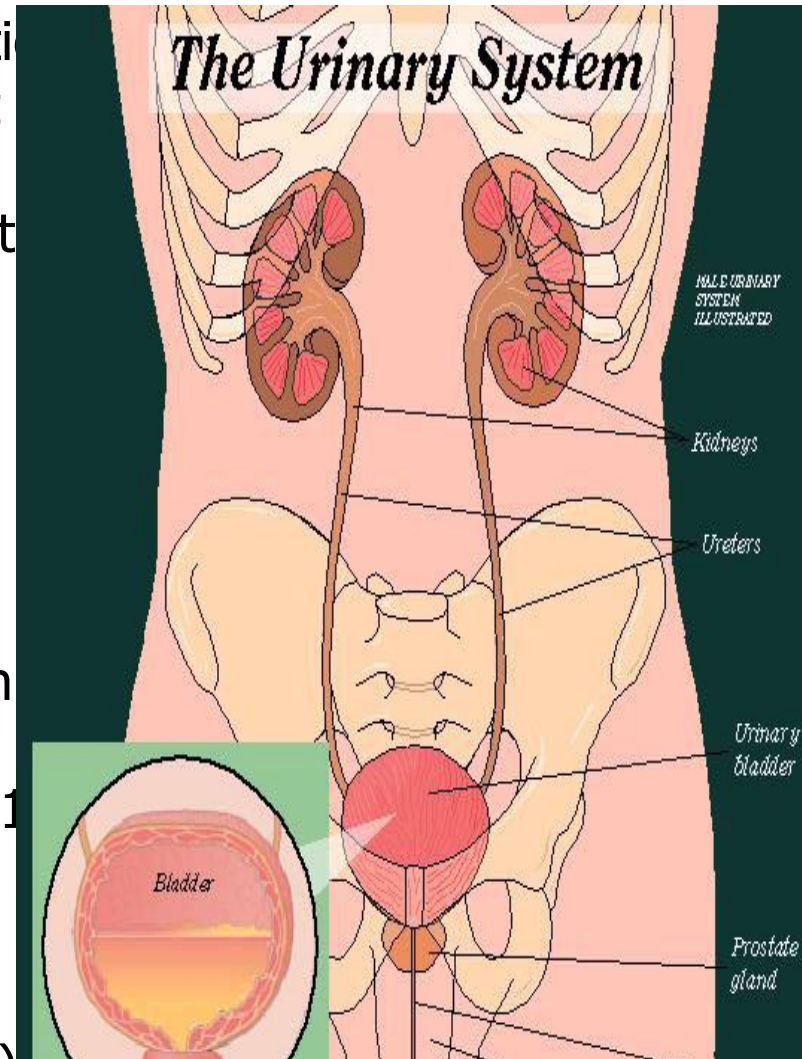
Importance of Continued Urologic Care



- Renal
 - Renal function
 - “silent” problems
 - Hydronephrosis
 - Other
- Urinary
 - Continence
 - Skin/Stoma problems
 - Post surgical reconstruction:
 - Rupture, cancer, metabolic, etc.
 - Infection
 - Stones
- Sexual function
- Fertility

Kidney: what does it do?

- Goal of care is preservation of kidney function
- Receives 20% of blood flow from the heart
- Function
 - filters blood: products of metabolism, etc.
 - Makes urine
 - Maintains acid-base balance
 - Produces certain hormones: EPO, etc.
 - Regulates blood pressure
 - Regulates fluid balance
- Creatinine
 - Is a rough surrogate for kidney function
 - Breakdown product from muscle
 - Normal creatinine for adult male ≈ 0.5 -1.3 mg/dL
 - But depends on:
 - age
 - muscle mass
 - Other factors (medications, etc.)

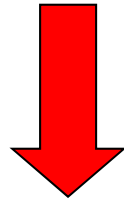


The goal of Urological intervention in the global scheme of things is renal preservation

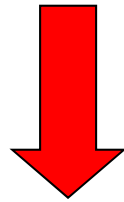
What can happen to the kidneys?

- Infection (acute pyelonephritis)
- Reflux nephropathy (chronic pyelonephritis)
 - Vesicoureteral reflux and infection
- Hydronephrosis due to bladder/urethral problems
 - High pressure voiding/emptying
 - Obstruction, etc.
 - Non compliance with catheterization regimen
- Hydronephrosis due to ureteral problems
- Other: stones, etc.

Renal failure



Dialysis



Transplantation

Why does this happen to the kidneys?

- Lack of attention
- Lack of compliance
- Lack of follow-up

Kidneys and Spina Bifida

- At all ages: renal failure can be a cause of death from Spina Bifida
 - Prior to CIC it was THE PRIMARY cause of death at all ages
- Risk of renal failure is related to sensory level
 - Rarely seen with levels below L4
 - More common with levels above T10
- Renal failure can occur with even minor neural tube defects such as Spina Bifida occulta
 - In one study of Spina Bifida O in 55 patients
 - 43% had urological surgeries
 - All eventually became incontinent
 - 8 developed renal failure

How to avoid Kidney problems?

- Personal
 - Diet: ↓protein ???
 - Fluid management
 - Hygiene: prevent infection
- Adherence/compliance to medical regime
 - Void or catheterise as directed
 - Take medications as directed
- Regular monitoring
 - Annual check-ups
 - Renal function studies
 - X-rays as needed
 - +/- UDS
- Aggressive interventions as needed
 - Treat infections quickly and completely



Urinary Incontinence in Spina Bifida

Leakage of urine- lack of bladder control

Condition defined by society/societal norms

-Bothersome, affects social or occupational functioning

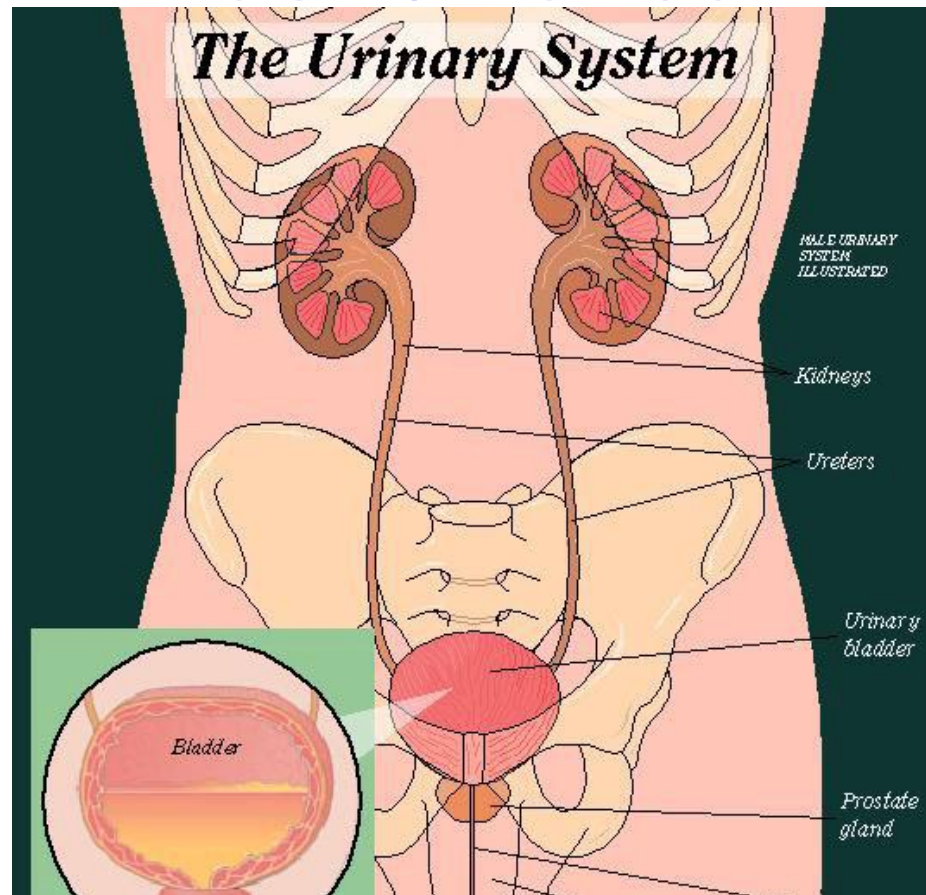
Amount (volume/episodes) is irrelevant



*Incontinence as an adult is abnormal.....
and can be treated*

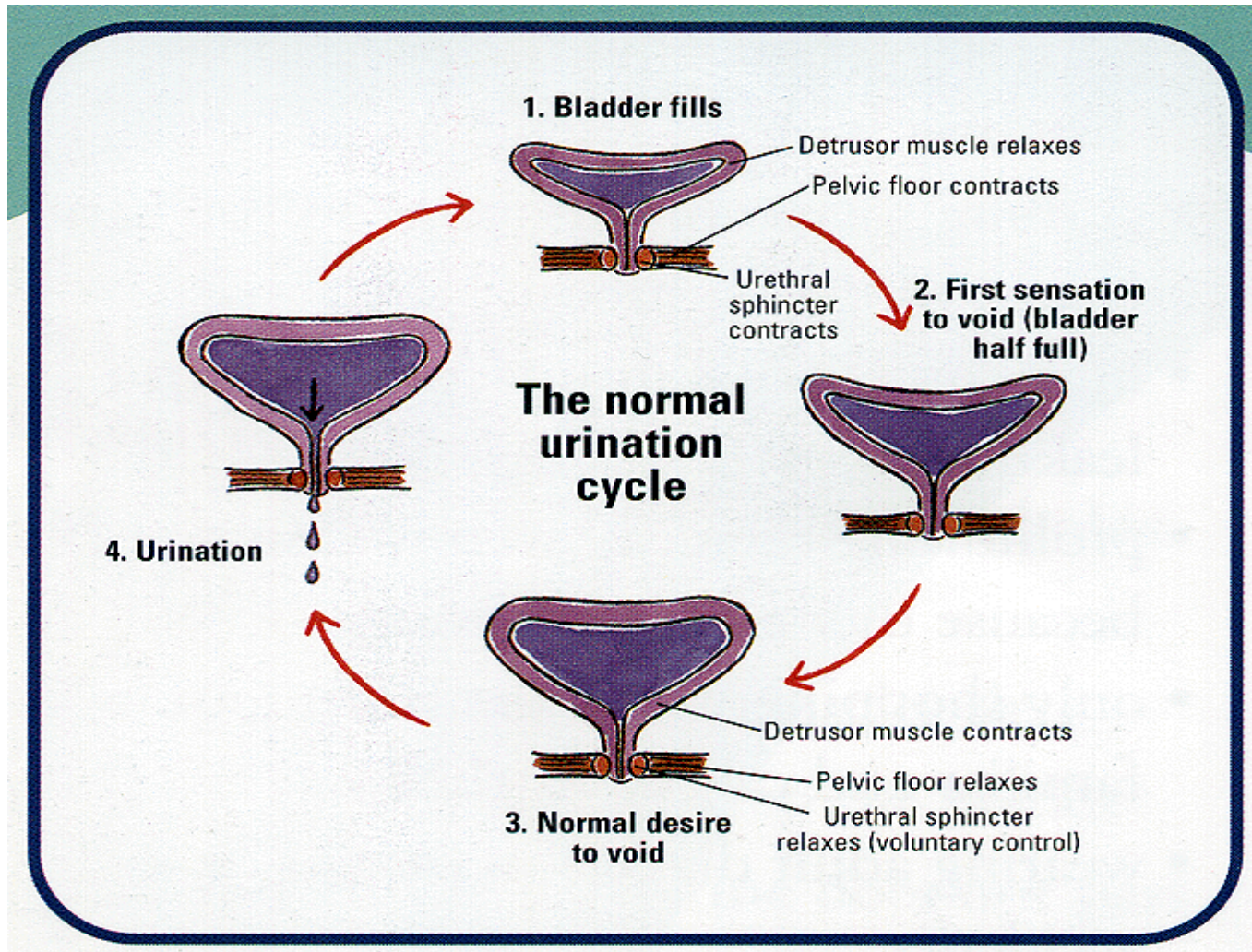


The Urinary Tract and Continence

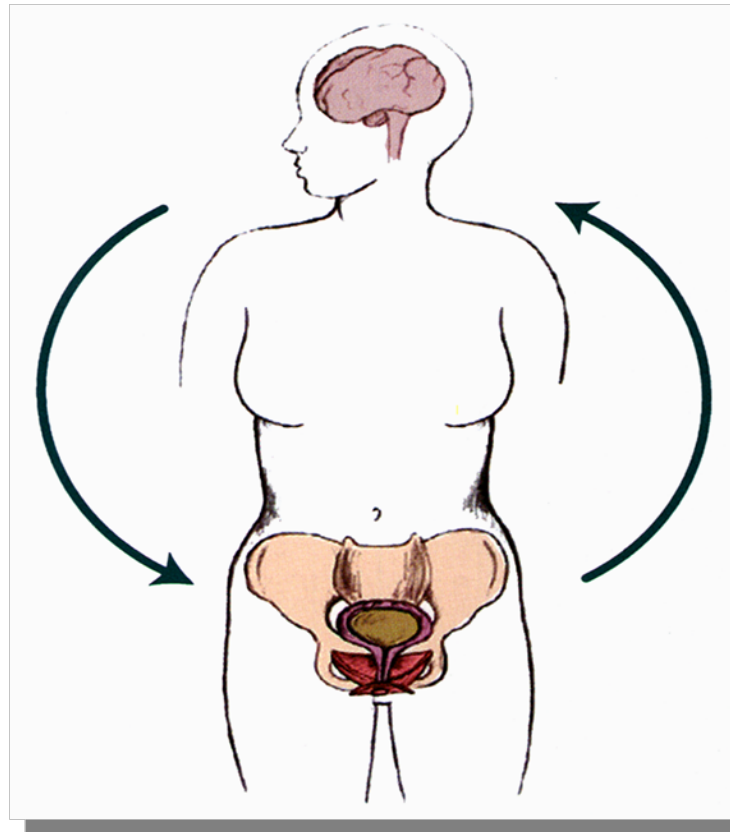


Urine collects from kidneys, stored in bladder, released through the urethra

Normal Voiding Cycle



Bladder Control System – Nerves, Spinal Cord and Brain



Bladder emptying dependent of nerves. In Spina Bifida these can be non communicating

What are the types of UI in Spina Bifida Adults?

Any type of Urinary Incontinence may be present:

- Bladder:
 - Overactive (urge incontinence)
 - Poorly compliant
 - Underactive (overflow)
 - (Normal)
- Outlet (urethra, sphincter)
 - Overactive
 - Fixed, non-relaxing (obstructing)
 - Dyssynergic (obstructing)
 - Underactive (stress)
 - Open bladder neck
 - (Normal)

What happens to the urinary tract with puberty and ageing?

- Bladder function does not improve spontaneously
- Bladder function may worsen
 - Incontinence
 - Renal failure
 - It may APPEAR to be better....but actually be worse !!!!!
- Prostate growth
 - ?continence improved in some
 - Worry about increased DLPP and renal failure
 - Difficulty cathing
- Renal deterioration, when present, is largely SILENT
 - **Must have regular monitoring**
 - Renal function, imaging
 - Blood pressure monitoring

Management of Urinary Incontinence



- Behavioral therapies
- Pharmacologic (drug) Rx - **Directed at the bladder, outlet or both**
- Surgery
- It has been shown that behavioral therapy alone can improve the symptoms of OAB
- However, it is often difficult to achieve high compliance with behavioral therapies, and optimal success is dependent on how intense the program is and, in many cases, also requires a high input of caregiver time
- Studies have shown that the best outcomes are achieved with a combination of pharmacologic and behavioral therapy

Urinary Tract Surgery in Spina Bifida - Indications

- Despite attempts with conservative/medical tx:
- Elevated intravesical storage pressure (“Hostile” bladder)
- Leakage of urine between catheterisations
- Inability or unwillingness to catheterise urethra
 - Obesity, contractures, mobility issues with ageing
- Need to divert urine (i.e., pressure ulcer)
- Other:
 - Catheter complications
 - Recurrent UTI’s (depending on the cause)
 - +/- damaging reflux

Surgery of Urinary Tract in Spina Bifida: Goals

- Preserve kidney function
- Preserve or create continence (if possible and/or desired)
 - Low pressure storage of urine
 - Periodic (or constant) emptying of urine
 - Awareness or treatment of reflux
 - Minimize UTI's, stones, tumors, etc.
 - Minimize need for reoperation

Urinary Tract Surgery in Spina Bifida Adults

- Reconstruction of bladder or urethra or both
- Broadly categorised as either:
 - Continent:
 - Store urine safely until a periodic drainage can be effected (usually 4-5 x per day)
 - Incontinent:
 - Conduct urine immediately out of the body into an appliance

While avoiding:

UTI, renal deterioration, odor, skin and stoma problems

While minimizing:

short and long term costs, inconvenience, metabolic disturbances, stones, re-operation rate, and maintain body image

Long term (adult) postoperative problems

- Continent diversions:
 - perforation, difficulties with catheterization
- Incontinent diversions:
 - Stoma issues, skin issues, stenosis
- Recurrent UTI
- Stones
- Metabolic issues
 - acidosis, bone density, etc.
 - Nutrition: Vitamin B12, folate,, etc.
- GI dysfunction/incontinence: diarrhea, malabsorption
- Other:
 - Neuro/ortho problems:
 - Difficulty cathing due to obesity or progressive contractures
 - Tethered cord

CIC : Clean Intermittent Catheterization

- Why:
 - Reduction of pressure by intermittent drainage of bladder
 - Continence
 - Avoidance of UTI, hydronephrosis
- Clean.....not sterile (usually)
 - Difficult cases:
 - Coude tipped, Olive tipped, etc.
 - Single use closed systems
 - Hydrophilic catheters
- Other issues:
 - Size of catheter (French)
 - Type of catheter (silicone, etc.)
 - Schedule of catheterization
 - Cleaning of catheters
 - Changing catheters

Other types of Urinary Incontinence management:

- Pads
- Clamps
- Plugs
- Pessaries
- Catheters:
 - Indwelling: Urethral or Suprapubic (abdominal)
 - External (convene catheters)
- **SKIN CARE (as maintaining skin integrity is vital when addressing this issue)**

Misc. Adult Urologic Issues

- UTI
 - Upper vs. lower urinary tract
 - Colonization vs. infection
- Stones
- Hematuria (blood in urine)
- Prostate: infection, enlargement, catheterization, cancer

Summary

- Kidney preservation is vital.
- Regular monitoring of kidney function is necessary throughout life.
- Renal deterioration when present can be largely silent.
- Comply with any medical advice or support that is offered.
- If in doubt, contact your GP or SBHI Family Support Worker.



SPINA BIFIDA
HYDROCEPHALUS
IRELAND



***Kidneys & Spina Bifida
Awareness Day***

Thank you