

Pelvic Floor Physiotherapy for the Management of Incontinence

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Continence and Women's Health Physiotherapist

Overview

- **Role of a Continence and Women's Health Physiotherapist**
- **Function of the Pelvic Floor Muscles**
- **Pelvic Floor Muscle Dysfunction**
 - Bladder and Bowel Symptoms
- **Risk Factors for Pelvic Floor Muscle Dysfunction**
- **Urinary Incontinence**
 - Stress, Overactive Bladder Syndrome/Urgency Urinary Incontinence, Overflow Incontinence
 - Pathophysiology, Function of Pelvic Floor Muscles, Physiotherapy Assessment and Management, Evidence
- **Anal Incontinence**
 - Pathophysiology, Function of Pelvic Floor Muscles, Physiotherapy Assessment and Management, Evidence
- **Questions?**



Continence and Women's Health Physiotherapy

- Post graduate qualification – Curtin University
- Assessment and Treatment of Pelvic Floor, Bladder and Bowels
- **Incontinence**
 - Urinary and Anal
 - Men, Women, Children
- **Pain**
 - Pelvic Girdle
 - Dyspareunia
 - Pain conditions – Chronic pelvic pain, vaginismus
- **Bladder Dysfunction**
 - Urgency, frequency, nocturia
 - Poor voiding dynamics
 - Incomplete emptying
 - Reduced sensation/urge to void
- **Bowel Dysfunction**
 - Constipation
 - Defecation dysfunction
- **Pelvic Organ Prolapse**
- **Antenatal and Postnatal**
 - Exercise and pelvic floor muscle training
 - Perineal treatment, caesarean scar treatment
 - Breastfeeding – blocked ducts, mastitis, cracked nipples
 - Musculoskeletal complaints – LBP, Pelvic girdle pain
- **Men**
 - Prostatectomy and BPH
 - Pre and post operative PFMT

Function of the Pelvic Floor Muscles

- **Continence and evacuation**

- Bladder
- Bowel

- **Support**

- Pelvic Organs

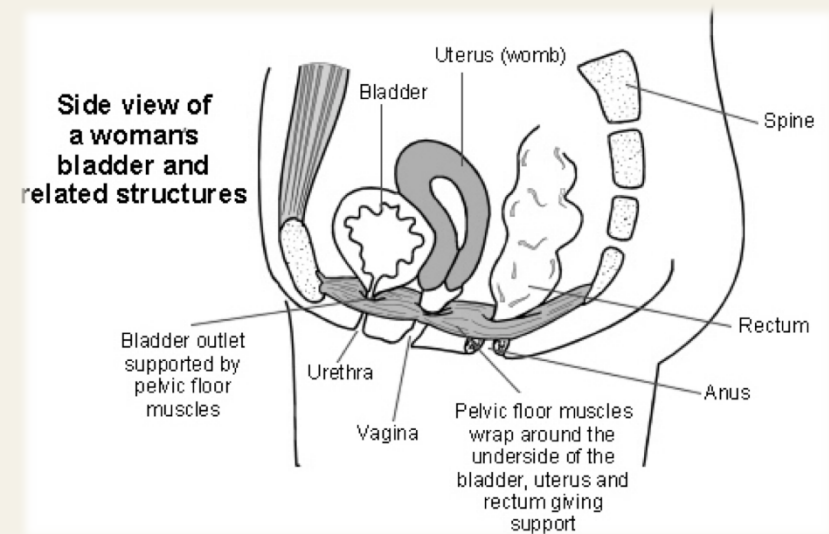
- **Stability**

- Lumbo-pelvic system

- **Control of Intra-abdominal Pressure**

- **Sexual Function**

- Arousal
- Performance



Pelvic Floor Muscle Dysfunction

- **Bladder Symptoms**

- ***Urinary Incontinence***

- Bladder storage issues – frequency, nocturia, urgency, OAB syndrome
 - Sensory – bladder sensations increased, decreased or absent
 - Voiding difficulties – hesitancy, slow stream, dysuria, post micturition dribble
 - Lower urinary tract infection – UTI, recurrent UTI and haematuria
 - Prolapse

- **Bowel Symptoms**

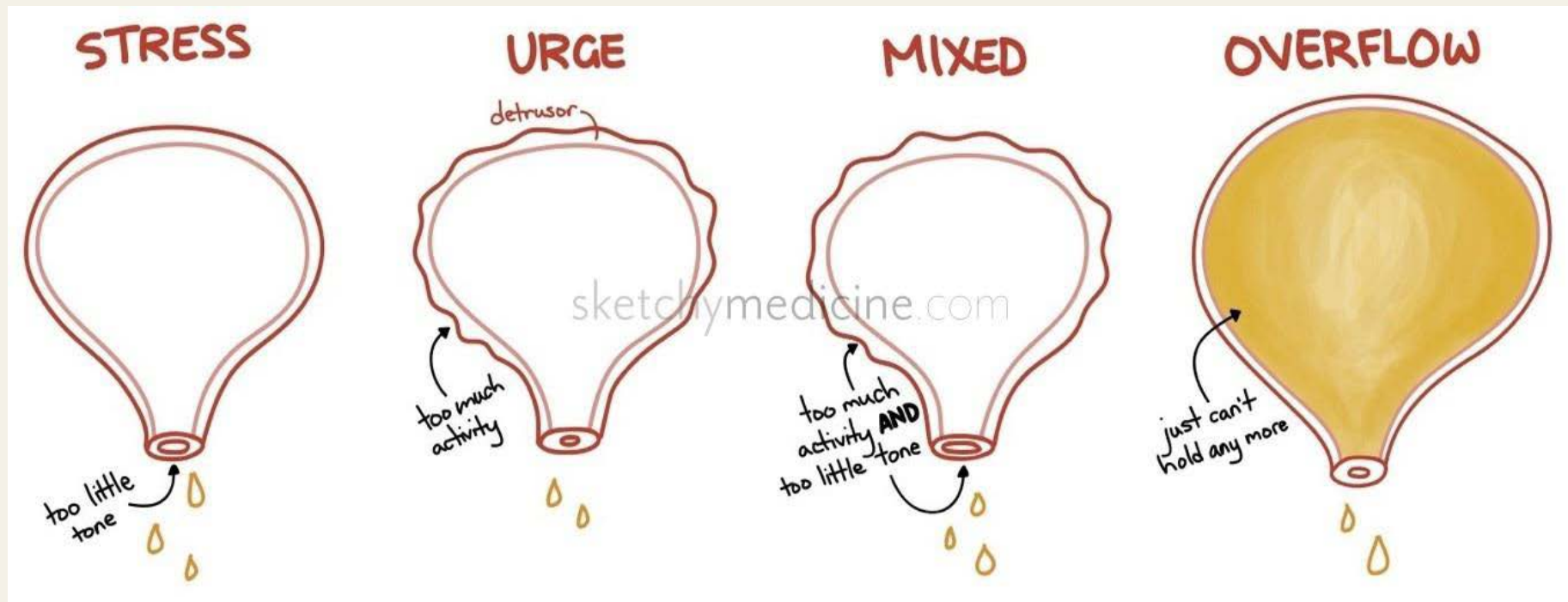
- ***Ano-rectal Incontinence***

- Defecation difficulties/constipation
 - Urgency
 - Prolapse
 - Pain

Risk factors for Pelvic Floor Muscle Dysfunction

- Female
 - Pregnancy
 - Childbirth
 - Menopause
 - Gynaecological surgery
- Age
- Obesity
- Lower urinary tract symptoms
- Prostatectomy
- Functional Impairment
- Family History
- Ethnicity and race (environmental component)
- Co-morbidities
- Physical activity
- Caffeine use and carbonated drinks
- Smoking
- Chronic cough
- Chronic constipation and straining

Types of Incontinence



Stress Urinary Incontinence

Definition

- Complaint of involuntary loss of urine on effort or physical exertion, or with sneezing and coughing.
- Activity related incontinence.
- Observation of involuntary leakage from the urethra synchronous with effort or physical exertion, or with sneezing and coughing.
- Most common type of urinary incontinence in women
 - Accounts for 49-60% of UI in women < 55 years

Stress Urinary Incontinence

Pathophysiology

Multiple theories:

- Hammock Theory (DeLancey 1994)
 - Integral Theory (Petros and Ulmsten 1990)
 - Intrinsic Sphincter Deficiency (ICS 2013)
 - Urethral hypermobility (Enhorning 1961)
-
- International Continence Society 2013 recommends that SUI likely a continuum between intrinsic sphincter deficiency and hypermobility.
-
- SUI is associated with:
 - Striated muscle mass and function deterioration (*Level 1 Evidence*)
 - Pudendal nerve dysfunction (*Level 1 Evidence*)
 - Urethral mucosa and sub-mucosa vascularisation
 - Intrinsic urethral smooth muscle dysfunction
 - Urethral mobility issues (*Level 2 Evidence*)



Stress Urinary Incontinence

Risk Factors

- Age
- Pregnancy – parity
- Childbirth
- Menopause
- BMI – high
- Constipation
- Coughing
- Low back/Pelvic Pain
- Gynaecological surgery
- Heavy lifting/manual tasks



(ICS 2013)

Stress Urinary Incontinence

Role of the Pelvic Floor Muscles

- Activation of pelvic floor muscles (PFM) prior to and during increases in intra-abdominal pressure = urethral compression = increased urethral pressure (DeLancey 1988).
- Upward and anterior displacement of pelvic floor supports the urethral and bladder neck position (Thompson et al 2003, Bo 2001).
- Pelvic floor muscle training (PFMT) improves the resting tone and shortens the levator ani (Dumullin et al 2007).
- External urethral sphincter hypertrophy is achieved with PFMT (Madill et al 2011)

Stress Urinary Incontinence

Pelvic Floor Muscle Dysfunction

- Decreased PFM tone and maximal strength
- Decreased endurance and speed of contraction
- Altered neuro-motor control
 - Decreased reflexive activation of PFM
 - Decreased reflexive co-activation of TA
 - Decreased cortical control

(Morin et al 2004; Verelst et al 2004; Barbic 2003, Devreese 2004)

Goals of Pelvic Floor Muscle Training

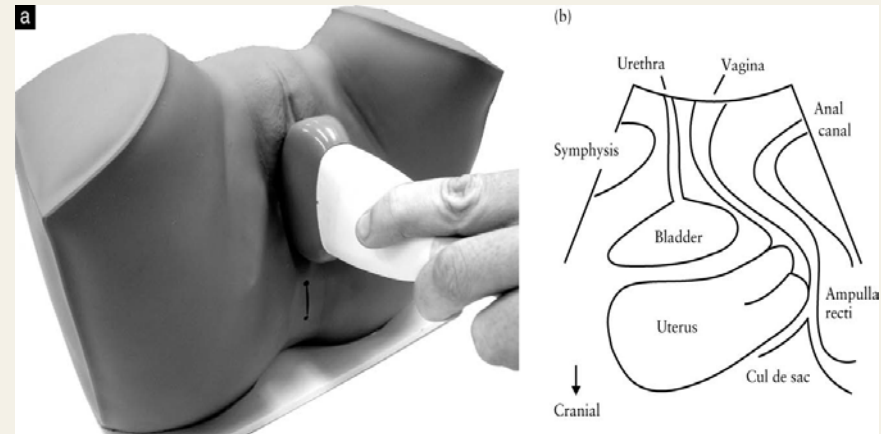
- Strengthen PFM
- Achieve hypertrophy of PFM and external urethral sphincter (increase resting tone and structural support)
- Improve the timing and automatic recruitment

(Bo 2014; ICS 2013)

Stress Urinary Incontinence

Physiotherapy Assessment

- Identify causative/contributing factors
- PFM function – VE +/- RTUS
- Real time Ultrasound
 - Elevation
 - Relaxation
 - Endurance
 - Timing/fast
 - Functional activation (sit-up, ASLR)
- Vaginal Examination – PERFECT
 - Tone, POP, fascial defect, specificity of contraction, timing
- EMG/Peritone



Stress Urinary Incontinence

Physiotherapy Management

- Education
 - PFM A&P, role of PFM in SUI, pathophysiology of SUI, identification of risk factors
- Bowels
 - Optimise stool consistency – Type 3-4 BSS, dietary and fluid modification, laxative or fibre supplements
 - Eliminate straining – defecation dynamics, splinting
- Exercise Modification
 - Low impact ideally
 - Pelvic floor friendly
- Pelvic Floor Muscle Training (*Level 1 Evidence, Grade A Recommendation*) (ICS 2013)
 - Increase strength, endurance, timing and co-activation of lower abdominals
 - +/- Biofeedback (RTUS, EMG)
 - 'The Knack' (Miller 2008)
- Bladder neck support
 - Tampon/contiform/pessary (Bo 2004)



Stress Urinary Incontinence

Physiotherapy Management

- Weight loss (*Level 1 Evidence, Grade A Recommendation*) (ICS 2013)
- Topical vaginal oestrogen (Cody et al 2012)
- Encouragement/support/motivation +++

Interdisciplinary Liaison

- If no improvement (6-8 weeks) – Urologist/Urogynaecologist for opinion and management
- Urodynamic studies for further investigation
- Surgical options

Stress Urinary Incontinence

Evidence

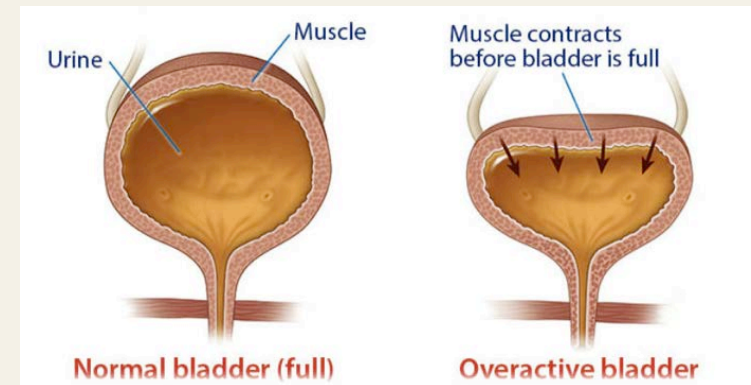
Supervised PFMT should be offered as a 1st line treatment for women with SUI (Grade A Recommendation) (ICS 2013)

- Health professional led PFMT programs are better than self-directed programs with more health professional contact better than less (*Grade A Recommendation*)
- Weight loss should be considered a first line treatment to reduce UI prevalence (*Level 1 Evidence, Grade A Recommendation*)
- PFMT is better than no treatment or placebo treatment for women with SUI (*Level 1 Evidence*)
- PFMT is a better first line treatment than E-stim or vaginal cones (there is no benefit to adding BFB) (*Level 2 Evidence*)

Overactive Bladder Syndrome

Definitions

- **Overactive Bladder Syndrome (OAB)**
 - Symptom syndrome
 - Presence of **urgency**, usually accompanied by **frequency** and **nocturia +/- urge incontinence**
 - Absence of UTI or obvious pathology
 - OAB wet versus OAB dry
- **Urgency**
 - Sudden compelling desire to pass urine, which is difficult to defer
- **Urgency Urinary Incontinence (UUI)**
 - Involuntary loss of urine associated with urgency OR detrusor overactivity
- **Detrusor Overactivity (DO)**
 - Diagnosed with urodynamic studies only



(Haylen et al 2010 IUGA/ICS Terminology)

Overactive Bladder Syndrome

Pathophysiology

Peripheral

- Urothelial Factors
 - Chemical mediators
- Myogenic Factors
 - Detrusor denervation
 - Increased excitability
- Inflammation
- Ischaemia

Central

- Conscious sensation
- Volition
- Emotional response

Neurogenic

- Suprapontine
 - CVA, PD
- Spinal Cord
 - SCI, MS

Non-Neurogenic

- Outflow Obstruction
- Ageing, low oestrogen
- Proximal urethra
- Behavioural
- PFM dysfunction
- Idiopathic

Overactive Bladder Syndrome

Clinical Presentation

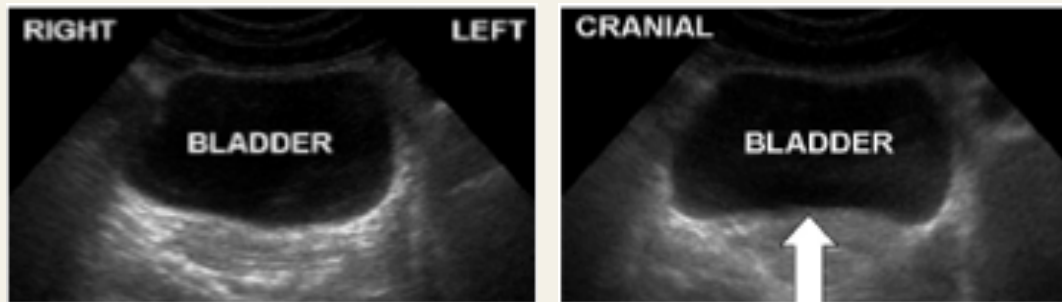
- Detrusor overactivity
- Bladder oversensitivity (without detrusor overactivity)
 - Early first sensation of filling
 - Early normal desire to void
- Poor detrusor compliance (small bladder capacity)
- Irritative Symptoms
- Third space offload - nocturia
- Dysfunctional Voiding
 - Post void residuals
 - Bladder Outlet Obstruction
- Behavioural
 - Just in case voiding
 - Excessive or low fluid intake
 - Anxiety



Overactive Bladder Syndrome and Urgency Urinary Incontinence

Role of the Pelvic Floor Muscles

- Increase urethral pressure
- Inhibit detrusor contraction
- Guarding Reflex
 - PFM and EUS automatically switch on while the bladder fills



(Burgio et al 1985; DeGroat 1997)

Overactive Bladder Syndrome and Urgency Urinary Incontinence

Pelvic Floor Muscle Dysfunction

- PFM are significantly impaired in women with UUI
 - EMG Assessment
 - Reduced urethral closing pressure
 - Reduced muscle activation

(Gunnarsson & Mattiasson 1999)
- PFM elevation and relaxation on real time ultrasound (RTUS) are difficult in women with OAB (Thompson 2005)
- Accumulative effect of PFM dysfunction and other pathophysiology (Bo 2007)

Goals of Pelvic Floor Muscle Training

- PFM contraction as an urge suppression strategy
- Strengthening and hypertrophy to stabilise neurogenic activity
 - Potential to resolve other factors underlying OAB/UUI that PFM dysfunction contributes to e.g. POP, urethral instability

(Bo 2014, ICS 2013)

Overactive Bladder Syndrome and Urgency Urinary Incontinence

Physiotherapy Assessment

- MSU – clear infection (1st line management)
- Post void residual (RTUS)
- Bladder Diary (3DBC)
 - Frequency: Day/Night
 - Voided volumes: min, max, average
 - Degree of urgency
 - Intake: total volume 24hrs, type of fluids
 - Input vs. Output
 - Correlation to fluid intake
- PFM Assessment (RTUS and VE)
 - Muscle strength, tone, TP, urethral closure
 - Activation patterns

24 Hour Bladder Diary			Date 12/03/14		
Time	Drinks		Urine		Pads
	Amount (ml)	Type	Amount (ml)	Bladder Sensation	
6am <i>WOKE</i>			500	2	
7 am	300	Water			
8 am			✓	2	
9 am					
10 am	Cup	Tea	LEAK	3	✓
11 am					
Midday					
1 pm					

(ICS 2013; Ghonieum et al 2008)

Overactive Bladder Syndrome and Urgency Urinary Incontinence

Physiotherapy Management

- Education
- Clear infection – urinalysis, MSU
 - If infection treated – proof of cure 5-7 days following AB's
- PVR – determine cause
- Check/treat bowel dysfunction
- Behavioural modification – eliminate 'JIC' voids
- Fluid modification/timing
- Pelvic Floor Muscle Training (*Grade A Recommendation*) – Based on assessment findings (ICS 2013)
 - Normalise tone/eliminate TP
 - Increase strength and endurance
 - Urethral closure/lift
 - Correct activation technique (co-activation of lower abdominal wall)
 - Motor control patterns – improve altered patterns (upper abdominal bracing)

Overactive Bladder Syndrome and Urgency Urinary Incontinence

Physiotherapy Management

- Bladder Calming and Retraining (*Grade A Recommendation*) (ICS 2013)
 - STOP – relax and breathe
 - PFM contraction (correct technique)
 - Calming Strategies
 - Distraction/Walking
 - Perineal/clitoral pressure
 - Toe curls/calf stretch
 - Sacral rubbing/pressure
 - Top lip pressure, ankle pressure point
- Retraining
 - Calm the urge
 - Defer the urge and gradually increase deferment times
- Neuromodulation/TENS (*Grade C Recommendation*)
 - Must eliminate PVR prior
 - 2/24 per day for 6-8 weeks

Overactive Bladder Syndrome and Urgency Urinary Incontinence

Physiotherapy Management

- Weight loss (*Grade A Recommendation*)
- Regular Exercise
- Stress reduction and active relaxation techniques

Interdisciplinary Liaison

- If no improvement referral to GP and Urologist for opinion and management
- Further investigation
 - Cystoscopy
 - Urodynamics
- Medications

Overactive Bladder Syndrome, Urgency & Mixed Urinary Incontinence

Evidence

PFMT should be offered as a 1st line treatment for women of all ages with UUI or MUI (Level 1 Evidence, Grade A Recommendation) (ICS 2013)

- PFMT is better than no treatment or placebo and should be offered as a first line conservative treatment for women of all ages with UUI or MUI (Level 1 Evidence, Grade A Recommendation)
- Bladder training may be an effective treatment for women with UUI, SUI and MUI (Level 1 Evidence, Grade A Recommendation)
- PFMT and bladder training are effective first line conservative treatments of UUI or MUI (Grade B Recommendation)
- Bladder training can be as effective as antimuscarinic drug therapy for women with detrusor overactivity or UUI (and has less side effects) (Level 1 Evidence, Grade B Recommendation)
- PFMT is better than Oxybutynin as a 1st line treatment (Grade B Recommendation)

(ICS 2013)

Overflow Incontinence

Definition

When the bladder is unable to empty, it over fills/distends and small volume leakage occurs (ICS 2013).

Pathophysiology - Associated with voiding dysfunction

- **Outflow obstruction**

- Bladder (detrusor underactivity, atonic detrusor, stones)
- Bladder neck (stricture, stone)
- Prostate (enlargement, cancer)
- Urethral (stricture, prolapse, TVT)
- Sphincter (dysynergic with detrusor, overactive PFM)

- **Neurogenic**

- Detrusor dysynergia, atonic bladder

- **Medication**

- **Co-morbidities**

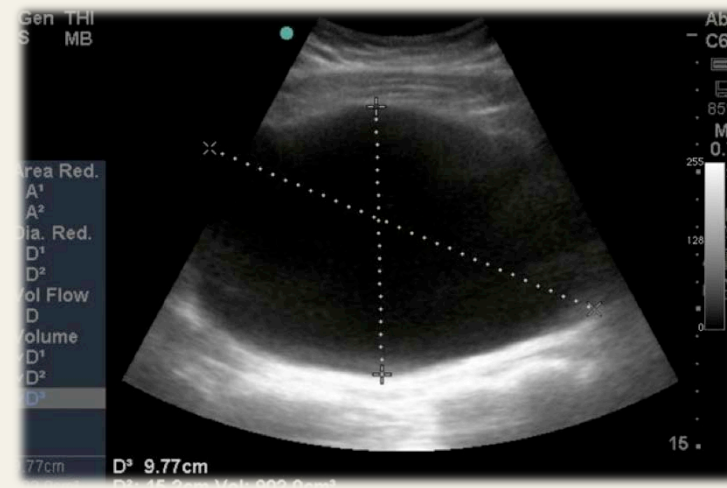
- DM

- **PVR common sign**

Overflow Incontinence

Physiotherapy Assessment

- Urinalysis/MSU – clear infection
- Pre void volume and post void residual (RTUS)
- Bladder Diary (3DBC)
 - Frequency: Day/Night
 - Voided volumes: min, max, average
 - Degree of urgency
 - Intake: total volume 24hrs, type of fluids
 - Input vs. Output
 - Correlation to fluid intake
- PFM Assessment (RTUS and VE)
 - Muscle strength, tone, TP, urethral closure
 - Activation patterns



Overflow Incontinence

Physiotherapy Management

- Urinalysis/MSU – clear infection
- Determine underlying cause – obstructed, behavioural, neurological
- Pre and Post void residual (RTUS)
- Bladder Diary (3DBC) for education
- Education
 - Good bladder habits
 - Appropriate fluids
 - Timing of fluids, loading
- Voiding Dynamics
 - Positioning
 - Relaxation (no straining)
 - Timed voids
 - Double voids
 - Splinting



Overflow Incontinence

Physiotherapy Management

- Manage contributing factors
 - UTI's – AB's, cranberry
- Bowels – optimise stool, defecation dynamics
- PFMT – based on assessment findings
 - Impaired relaxation: PFM down training with breathing sequence, visual cues
 - Normalise resting tone, decrease pain, manage TP's
 - Achieve consistent/complete relaxation of PFM
 - POP, underactive – Up training and strengthening
- Relaxation strategies – diaphragmatic breathing sequence

Interdisciplinary Liaison

- GP/Urologist/Urogynaecologist/Neurologist
- Continence Nurse – Intermittent self catheterisation
- Further Investigations
 - Urodynamics – low compliance, little to no detrusor activity, detrusor leak point pressure
 - Renal function

Overflow Incontinence

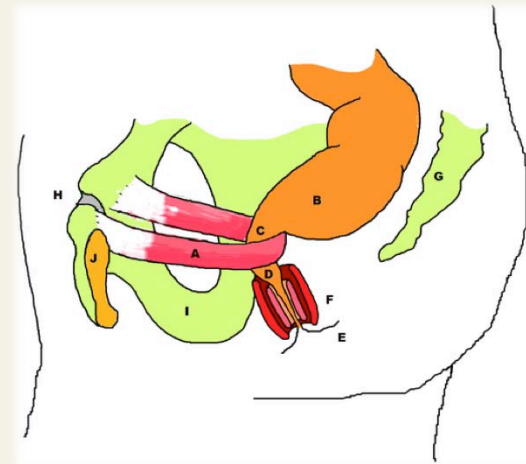
Evidence for Dysfunctional Voiding

- PFMT aimed at relaxation plus diaphragmatic breathing ex – positive effects in children with dysfunctional voiding (Zivkovic et al 2010)
- PFMT with biofeedback – improvements in men with chronic prostatitis at 10 weeks (He et al 2010)
- PFMT improves effectiveness of double voids – in women with recurrent UTI and DV (poor quality study) (Minardi et al 2010)

Bowels

Pelvic Floor Muscle Dysfunction

- ***Ano-rectal Incontinence***
- Defecation difficulties/constipation
- Urgency
- Prolapse
- Bleeding
- Pain



Anal Incontinence

Definition

- Involuntary loss of flatus, liquid or solid stool that is a social or hygienic problem (ICS 2005)

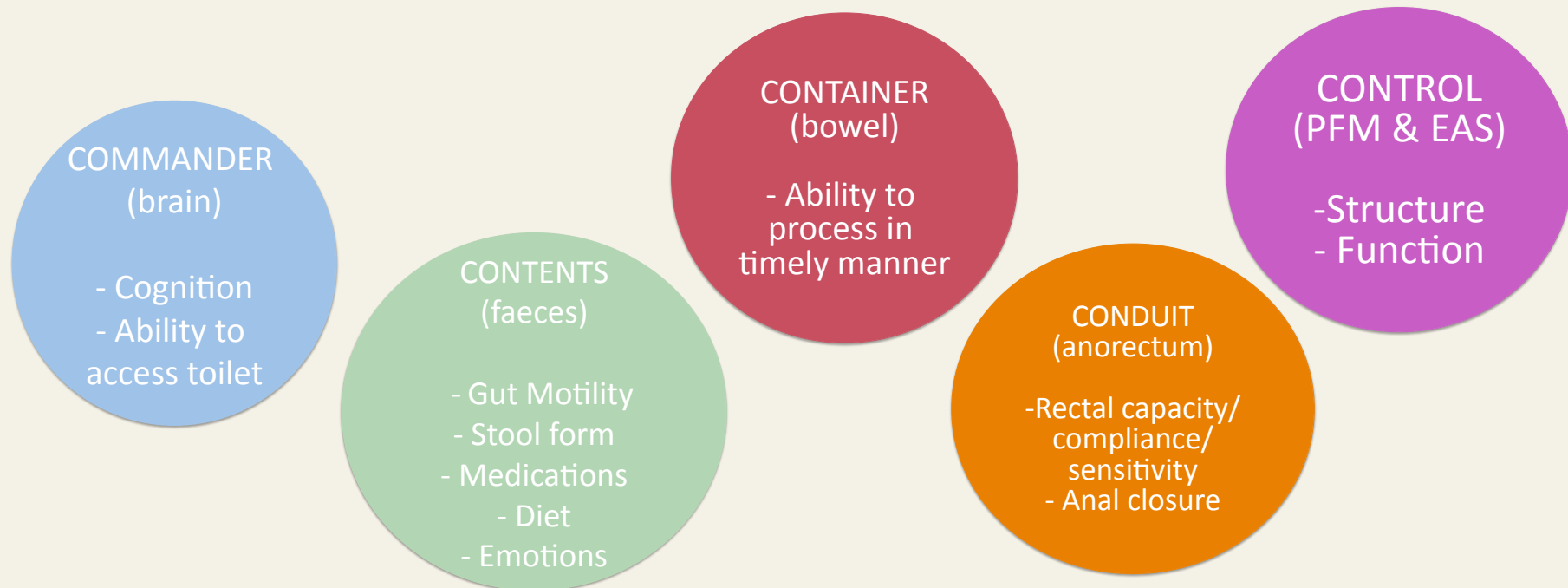
Types

- Passive
- Urge
- Stress
- Smearing



Anal Incontinence

Pathophysiology - Multifactorial Cause



Faecal Incontinence

Potential Underlying Problems

1. Rectal hypersensitivity and PFM (PR/EAS) overactivity

- Faecal urgency → dysfunctional PFM → anxiety+ → gut motility++ → urgency FI

2. Rectal hypersensitivity and PFM (PR/EAS) underactivity

- Urgency → dysfunctional PFM/weak → FI → anxiety++ → urgency++

3. Rectal hyposensitivity and PFM (PR/EAS) overactivity

- Constipation & FI present, usually hx of childhood constipation, no warning

4. Rectal hyposensitivity and PFM (PR/EAS) underactivity

- Both sluggish, no warning, no protective ability of PFM

Risk Factors for Anal Incontinence

- Age
- Gender
- Diabetes
- GI Disorders
 - Diarrhoea
 - Rectal urgency
 - Constipation/impaction
 - IBS
- Neurological
 - Dementia
 - Depression
 - SCI
 - CVA
- Nutrition
 - Obesity
 - Vit D deficiency
- Smoking
- Physical Mobility
- Radiation therapy
- Rectal prolapse
- Surgery
 - Anorectal
 - Rectal
 - Hysterectomy
 - Cholecystectomy
- Obstetric Injuries
 - Neurogenic trauma
 - Mechanical trauma

Anal Incontinence





Goals of Pelvic Floor Muscle Training

Prior to PFMT

- Optimise stool consistency
- Normalise urge
- Normalise frequency and defecation

Pelvic Floor Muscle Training

- Optimisation of 'exit'
 - Address/improve impairments of PFM, PR, EAS
 - Proprioception
 - Normalise rectal sensation
 - Management of rectal capacity and compliance

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on the surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clean-cut edges
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. Entirely liquid

Anal Incontinence

Physiotherapy Assessment

- Identification of modifiable factors – contributors to AI/FI
- Stool assessment – BSS
 - Type 4 (consistency firm or pasty)
- Bowel and diet diary
- Pelvic Floor Muscle Assessment – DRE
 - Resting tone/pressure
 - Squeeze pressure
 - Estimated length of anal canal
 - PERFECT
 - Relaxation following contraction
 - Proprioception
 - Pain/discomfort
 - Simulated defecation
- EMG
 - Resting tone
 - MVC
 - Hold time
 - Resistance to fatigue
 - Quality of sustained contraction
 - Relaxation following contraction

Anal Incontinence

Physiotherapy Management

- Education – Bowel function and FI
- Lifestyle modifications (*Level 5 Evidence*)
 - Weight loss (no benefits without surgery)
 - Environmental factors
 - Medications (diarrhoea side effects)
- Diet and fluid modification
 - Fasting (eat at home when close to toilet)
 - Avoid risky foods (vegetables, fruit, high fat foods (fried), caffeinated food/drinks, dairy, alcohol)
 - Identification of dietary intolerances (lactose, gluten, dairy, sorbitol/fructose, caffeine, alcohol, pre/pro/synbiotics (cause loose stools - > FI))
- Dietary fibre
 - Insoluble fibre (possibly good for loose stools and associated FI)
 - Soluble fibre supplements – psyllium husk (*Level 1 Evidence, Grade B Recommendation*) (ICS 2013)
 - Reduces FI of loose stools, liquid stool +/- rectal irrigation

(ICS 2013)

Anal Incontinence

Physiotherapy Management

- Defecation dynamics
- Establishment of regular habit (QoL/social situations)
 - Predictability to manage FI e.g. morning routine -> BO -> Imodium
- Pelvic Floor Muscle Training (*Level 2 Evidence*)
 - Strengthening then endurance
 - Focus on posterior PFM
 - Manometric biofeedback with experienced therapist (*Level 1 Evidence*)
- Rectal Irrigation (*Level 2 Evidence for reduction in FI*)
 - More effective for faecal soiling than loose stool FI
- Medications
 - Loperamide (*Level 2 Evidence for mx of diarrhoea associated FI*)
- Recovery time in supine
 - After BO to mx passive FI and smearing. Combine with PFMT
- Skin Management and Containment
 - Barrier creams, pads, plugs



Anal Incontinence

Physiotherapy Management Summary

Passive FI

- Optimise stool consistency
- Optimise PFM
- Eliminate/minimise PF challenging activities
- Defecation dynamics and emptying strategies (may include rectal irrigation)

Urge FI

- Calm down gut motility to normalise frequency
- Reduce urgency/rectal sensitivity (relaxation, rectal balloons, PFMT, BFB)
- Optimise stool consistency
- Up-train PFM

Stress FI

- Up-train PFM
- Optimise stool consistency
- The Knack
- Eliminate PF challenging activities/habits
- Defecation dynamics

Smearing

- Optimise stool consistency (firm up)
- Up-train PFM
- Hygiene

Anal Incontinence

Interdisciplinary Liaison

- Clinical Psychologist - Stress/Anxiety Management
- Continence Nurse – Rectal Irrigation
- GP/Specialist for opinion and management
- Further Investigations
 - ARM
 - EAUS
 - Defecation Proctogram
 - Neurophysiologic studies

Anal Incontinence

Evidence

- Manometric biofeedback by an experienced therapist is better than PFMT alone (*Level 1 Evidence*)
- PFMT is recommended as an early intervention in the treatment of faecal incontinence (*Level 2 Evidence, Grade B Recommendation*)
- There is no added benefit to adding E-stim or fast contractions in PFMT (*Level 2 Evidence*)

(ICS 2013; Bliss et al 2013)

Questions?

THANK YOU