Pelvic Floor Physiotherapy for the Management of Incontinence

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

• Bowel Symptoms
  o **Ano-rectal Incontinence**
    o Defecation difficulties/constipation
    o Urgency
    o Prolapse
    o 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

(ICS 2013)
Types of Incontinence

- **Stress**: too little tone, too much activity
- **Urge**: detrusor, too much activity
- **Mixed**: too much activity AND too little tone
- **Overflow**: just can't hold any more
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

(Haylen et al 2010 IUGA/ICS Terminology; ICS 2013)
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 (Doumullin 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

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

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

(Bo 2014; ICS 2013)
Stress Urinary Incontinence

Physiotherapy Assessment
• Identify causative/contributing factors
• PFM function – VE +/- RTUS
• Real time Ultrasound
  o Elevation
  o Relaxation
  o Endurance
  o Timing/fast
  o Functional activation (sit-up, ASLR)
• Vaginal Examination – PERFECT
  o 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*)

(Moore, Dumoulin et al ICS 2013)
Overactive Bladder Syndrome

Definitions

• Overactive Bladder Syndrome (OAB)
  o Symptom syndrome
  o Presence of urgency, usually accompanied by frequency and nocturia +/- urge incontinence
  o Absence of UTI or obvious pathology
  o OAB wet versus OAB dry

• Urgency
  o Sudden compelling desire to pass urine, which is difficult to defer

• Urgency Urinary Incontinence (UUI)
  o Involuntary loss of urine associated with urgency OR detrusor overactivity

• Detrusor Overactivity (DO)
  o Diagnosed with urodynamic studies only

(Haylen et al 2010 IUGA/ICS Terminology)
## Overactive Bladder Syndrome

### Pathophysiology

<table>
<thead>
<tr>
<th>Peripheral</th>
<th>Neurogenic</th>
<th>Non-Neurogenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urothelial Factors</td>
<td>• Suprapontine</td>
<td>• Outflow Obstruction</td>
</tr>
<tr>
<td>o Chemical mediators</td>
<td>o CVA, PD</td>
<td>Ageing, low oestrogen</td>
</tr>
<tr>
<td>• Myogenic Factors</td>
<td>• Spinal Cord</td>
<td>• Proximal urethra</td>
</tr>
<tr>
<td>o Detrusor denervation</td>
<td>o SCI, MS</td>
<td>• Behavioural</td>
</tr>
<tr>
<td>o Increased excitability</td>
<td></td>
<td>• Behavioural</td>
</tr>
<tr>
<td>• Inflammation</td>
<td></td>
<td>• PFM dysfunction</td>
</tr>
<tr>
<td>• Ischaemia</td>
<td></td>
<td>• Idiopathic</td>
</tr>
</tbody>
</table>

| Central                        |                                |                                  |
|• Conscious sensation           |                                |                                  |
|• Volition                      |                                |                                  |
|• Emotional response            |                                |                                  |
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

• PFM elevation and relaxation on real time ultrasound (RTUS) are difficult in women with OAB

• Accumulative effect of PFM dysfunction and other pathophysiology

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/UVI that PFM dysfunction contributes to e.g. POP, urethral instability

(Gunnarsson & Mattiasson 1999)
(Thompson 2005)
(Bo 2007)
(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

(ICS 2013; Ghonieum et al 2008)
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
    o Distraction/Walking
    o Perineal/clitoral pressure
    o Toe curls/calf stretch
    o Sacral rubbing/pressure
    o Top lip pressure, ankle pressure point

• Retraining
  o Calm the urge
  o Defer the urge and gradually increase deferment times

• Neuromodulation/TENS (*Grade C Recommendation*)
  o Must eliminate PVR prior
  o 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
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**

- **COMMANDER (brain)**
  - Cognition
  - Ability to access toilet

- **CONTAINER (bowel)**
  - Ability to process in timely manner

- **CONDUIT (anorectum)**
  - Rectal capacity/compliance/sensitivity
    - Anal closure

- **CONTROL (PFM & EAS)**
  - Structure
  - Function

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

(ICS 2013)
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

(ICS 2013)
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