Objectives

• Describe the prevalence and scope of under-active pelvic floor dysfunction in athletes.
• List risk factors for under-active pelvic floor dysfunction in female & male athletic populations.
• Compare & contrast approaches to evaluation and/or treatment for under-active pelvic floor dysfunction by pelvic PTs and orthopedic/sports PTs.
• Describe the role of multi- and interdisciplinary care for athletes with under-active pelvic floor dysfunctions.
• Explain the care continuum and diverse role of the physical therapist as a key pelvic health resource for athletes from screening and prevention, to pre-habilitation, to rehab and re-integration into sport and wellness.

The Scene

• USAT (usatriathlon.org, accessed 12/14/13)
  ◦ U.S. triathlon participation at all-time high
  • 550,446 members in 2012 (100,000 in 2000)
  • 59% growth in unique participants (2008-2011)
  ◦ > growth in ages 35-39 & 40-44yrs (avg 38)
  ◦ Casual vs core (2-10 events/yr)
  ◦ Women comprise 37% (27% in 2000)
  ◦ Sprint/Olympic/70.3 > IM (17%)
  ◦ Youth recognize as “real” sport
• 54% triathletes also participating in marathon...
• 2012 running stats (runningUSA.org)
  ◦ Women 56% (all time high) finishers at all US events (8.6mil)
  ◦ Males also on rise at 6.8mil finishers
  ◦ 80% increase finishers since 2000
  ◦ 13.1mi event growing at rate of 15% (women 60%)
  ◦ Ages 25-44yrs
• GOTR
  ◦ 130,000 girls in 200+ cities across North America each year (2012)

Operational Definitions

• UI = complaint of involuntary loss of urine (Haylen et al, IUGA/ICS joint report on terminology of female PFD Neurourol Urodynam 2010; 294-20)
  ◦ Stress = complaint of involuntary loss of urine on effort or physical exertion
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Urge = complaint of involuntary loss of urine associated with urgency
Mixed = both SUI & UUI symptoms
Other (coital, etc)
Fecal incontinence (FI) = accidental passing of solid/liquid stool/mucus
(http://digestive.niddk.nih.gov/ddiseases/pubs/fecalincontinence/#what)
Affects 18 million people in the U.S. or 2-8% of all adults (Whitehead et al Gastroenterology. 2009)
Anal incontinence (AI) = includes accidental passing of flatus
(http://www.bowelcontrol.nih.gov/bristol.aspx)
GI symptoms/distress
Bowel urge, nausea/vomiting, abdominal cramps, diarrhea
Pelvic organ prolapse (POP)
Diastasis Recti Abdominis (DRA)
Pelvic Floor Muscle Dysfunction (PFMD)
Overactive
In-coordination
Underactive PFMD (UPFMD)
High Impact = “both feet leave the ground” (Goldstick/Constantini 2013)
High Frequency = >8hr/wk
Recreational <> Competitive <> Elite (aka professional)
Sprint athlete
Activity 90min or less at or near max effort (eg 5K, sprint tri)
Endurance athlete**
Activity lasts longer than 90min (10K, 13.1, Oly/70.3 tri)
Ultra athlete
Activity lasts greater than 4hr (marathon, ultra, IM)
Power Athletes & UI
Power athlete (Olympic wt lifting)
Emphasis on strength and at/near max effort levels over a short time period
Cross Fit (Hak et al J Strength Cond Res. 2013)
N = 132
“No evidence re: UI/AI”...
Prevalence – UI & FI
NIH 2007 consensus report
Systematic lit review & expert testimony
25% lifetime combined risk
“...physical discomfort, embarrassment, stigma, and social isolation...financial costs are substantial...”
“Pelvic floor muscle training and biofeedback are effective...in women in the first year after giving birth...research is needed to...design interventions targeted to specific population groups...”
No PTs on panel, as speakers, or on planning committee (rehab med was represented)
UI Prevalence Lit Review (Goldstick & Constantini BJSM 2012)

- **All Women**
  - 1x/yr, 25-45%
  - Weekly, 10%
  - Cause for cessation (sedentary health risk factors)

- **Exercising Women**
  - 30-80% during sport UI in pregnant, non-pregnant, and post-partum all athletes
  - Elites (pros) during IADLs & sport

UI Risk Factors

- Most provoking activity = JUMPING
  - Vertical jump height (trampoline/BB/VB/dancers)
  - Running “double float”
  - “Double Unders” in CrossFit

- Training (95.2%) > competition (51.2%) (Goldstick BJSpMed 2012)
  - “…higher catecholamine levels in competition act on α receptors to maintain urethral closure.”

UI Risk Factors

- Training volume
  - Endurance athletes 5-8h/wk

- Training intensity
  - At/near max efforts

- Amenorrhea
  - Low estrogen

- Court athletes (Borin et al PMR 2013)
  - Games/year
  - On court time
  - Strength training time

Reporting

- General
  - <50% tell caregiver or healthcare provider about UI
  - In case of FI/AI, some primary care providers may not be aware of conservative treatment options

- Athletes
  - 50-90% do NOT tell their coach, friend, parent, healthcare provider about UI
  - Shame/embarrassment
  - Don’t know it can be fixed
  - Tension of opposites: supposed to be a healthy athlete but feel ‘unhealthy’

UI Prevalence – Female Athletes

- Ballet
  - 43% Danish elite women, avg 23yrs (Thyssen et Intl Urogyn J PFD 2002)
The Section on Women’s Health is proud to announce the course schedule for 2014. We hope you will be able to take advantage of the variety of course options and locations throughout the country.

Registration for 2014 educational courses and the 2014 Fall Conference is now open on our website: www.womenshealthapta.org/education/regional_courses/index.cfm

For updates on courses and registration openings, please follow the Section’s Twitter and Facebook pages.

**2014 CONTINUING EDUCATION COURSES**

**2014 CONTINUING EDUCATION COURSES**

**PELVIC PHYSICAL THERAPY 1**

**January 17-19, 2014**

Speakers: Lori Mize, PT, DPT, WCS
Carina Siracusa Majum, PT, DPT
Greenville, SC

**March 21-23, 2014**

Speakers: Lori Mize, PT, DPT, WCS
Houston, TX

**June 20-22, 2014**

Speakers: Lori Mize, PT, DPT, WCS
MJ Straubal, PT, BCB-PMD
Baton Rouge, LA

**July 11-13, 2014**

Speakers: Lori Mize, PT, DPT, WCS
Barb Settles-Huge, PT
Des Moines, IA

**October 10-12, 2014**

Speaker: Carina Siracusa Majum, PT, DPT
East Lansing, MI

**November 14-16, 2014**

Speaker: Barb Settles-Huge, PT
Boca Raton, FL

**PELVIC PHYSICAL THERAPY 2**

**February 28-March 2, 2014**

Speaker: MJ Straubal, PT, BCB-PMD
Portland, OR

**April 25-27, 2014**

Speaker: Barb Settles Huge, PT
Madison, WI

**August 1-3, 2014**

Speaker: Carina Siracusa Majum, PT, DPT
Towson, MD

**PELVIC PHYSICAL THERAPY 3**

**June 27-29, 2014**

Speaker: MJ Straubal, PT, BCIA-PMDB
Rocheester, NY

**September 12-14, 2014**

Speaker: MJ Straubal, PT, BCIA-PMDB
Portland, OR

**November 7-9, 2014**

Speaker: MJ Straubal, PT, BCIA-PMDB
Madison, WI

**FUNDAMENTAL TOPICS IN PREGNANCY AND POSTPARTUM PHYSICAL THERAPY**

**March 28-30, 2014**

Speakers: Suzanne Badillo, PT, WCS
Susan Giglio, PT, RYT
Baton Rouge, LA

**May 16-18, 2014**

Speakers: Karen Litos, PT, MPT
Valerie Bobin, PT, MPT, WCS, ATC
East Lansing, MI

**July 25-27, 2014**

Speaker: Suzanne Badillo, PT, WCS
Edina, MN

**August 22-24, 2014**

Speakers: Susan Giglio, PT, RYT
Karen Litos, PT, MPT
Longmont, CO

**ADVANCED TOPICS IN PREGNANCY AND POSTPARTUM PHYSICAL THERAPY**

**February 21-23, 2014**

Speaker: Susan Giglio, PT, RYT
St. Louis, MO

**May 4-6, 2014**

Speaker: Susan Giglio, PT, RYT
Susan Steffes, PT
Baltimore, MD

**THE PHYSICAL THERAPIST IN LABOR & DELIVERY: ADVANCED TECHNIQUES IN LABOR SUPPORT**

**October 24-26, 2014**

Speaker: Susan Steffes, PT, CD(DONA)
Austin, TX

Check website for new courses throughout the year!

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For more details on CAPPP, go to [http://www.womenshealthapta.org/cappp.cfm](http://www.womenshealthapta.org/cappp.cfm)

For more information on Section on Women’s Health sponsored courses go to [http://www.womenshealthapta.org/education/education.cfm](http://www.womenshealthapta.org/education/education.cfm) or contact the SOWH at sowh@apta.org, or 703-610-0224.
Volleyball
- 30% Danish elite women, avg 23yrs (Thyssen et Intl Urogyn J PFD 2002)
- 30-43%

Cycling
- Yrs of exposure & hardness of seat assoc w/SUI in women (Alanee Urol 2009)

Soccer
- 50% prevalence (Anderson 2011)

Cycling
- UUI highest prevalence (Constantini et al 2013)

UI Prevalence – Female Athletes

Track&Field
- 58% h.s./college (Dockter 2007)
- 25% 2-4x/mo during & outside of sport
  - 86 h.s./college (Carls 2007 USA)

Gymnastics
- 80% of 35 elite avg age 15yrs during sport (Elliasson et al 2002 Sweden)
- 56% (Anderson 2011)

Basketball
- 41.5% during & outside of sport
  - 106 18-45yr (Jacome et al 2010 Portugal)

CrossFit “Do you pee during workouts?” (http://www.youtube.com/watch?v=UKzq1upNljU accessed Jul 2013)

UI Prevalence - Female Athletes

- 28-49% h.s. and college athletes overall
- 52% of elites (pros)

UI Prevalence - Males

Prior military service (Vaughan et al J Urol 2013 Jul USA)
- Overall more likely to have mod/severe UI
- <= 55yrs have 3x greater odds of UI
- No odds increase for UI in men 56-69yrs or 70yrs +

UI Prevalence - Masters Athletes

USA Track & Field
- 5yr increments
  - 30yrs + for track & field
  - 40yrs + for distance events

Menopause effects on pelvic floor
- Lack of estrogen
- Poorer quality collagen
- Decreased muscle and skin integrity
- Reduced co-aptation or closure pressure at urethra
• Age not a risk factor? (Bo Scand J Med Sci Sports. 2010)
• Prior UI -> future UI

**Pelvic Floor & Urinary System**

• Anatomy review (CAPP II)
  ◦ Pelvic diaphragm
  ◦ Levator Ani (LA)
• Pubococcygeus (elevates urethral vagina & anal canal)
• Puborectalis (closes pelvic floor, forms anorectal angle)
• Iliococcygeus (elevates pelvic floor, supports viscera)
• Coccygeus (supports viscera)
  ◦ Sphincter urethrae at mid urethra (compress)
  ◦ Perineal membrane
• Compressor urethrae & urethrovaginal sphincter

**Pelvic Floor Muscle Optimal Function**

• Skeletal muscle (Marques et al Can Urol Assoc J 2010)
  ◦ CDC & ACSM 2008 added strength training to exercise recommendations to maintain health
  • 2x/wk or more

**Normal Micturition**

• Females
• Males

**Normal PFM Function in Sport**

• Requirements (Rivalta Healthcare for Women Intl 2010)
  ◦ Adequate abdominal pressure transmission
  ◦ Pelvic floor muscle strength, endurance, motor coordination
  ◦ Connective tissue integrity

**Pathophysiology of UI in Athletes**

• Athletes ↓ squeeze pressure (perineometer) vs non-athlete controls (Borin et al Amer Acad PMR 2013)
• Two current hypotheses (Constantini May 2013 BJSM)
  ◦ Mechanism by which strenuous physical activity affects the pelvic floor
• Strengthens the PFM
• Overloads & weakens the pelvic floor

**General UI Risk Factors**

**UI Risk Factors in Athletes**

• SUI & UUI
  ◦ Low BMI
  ◦ Lower body weight
  ◦ Eating disorders (Araujo et al 2008)
• Inadequate nutritional support for muscle, lig, collagen growth
• Vomiting = ↑ IAP
SUI

- High impact sport
- Multiple pregnancies
- ↑ Training volume
- Sx at end of training/race/competition (Caylet et al, Can J Urol 2006)
- Prior hx UI

UPFMD Co-Morbidities

- Females with eating disorders at risk for UI with low impact exercise
- Vitamin D (Hamilton Asian J Sp Med 2011)
- Receptors in skeletal muscle
- Decreased ratio type I to type III collagen in skin and periurethral tissues in women with UI
- Hypermobility Syndrome correlated with POP but not with UI (Goldstick et al BJSpMed 2013)

Hypermobility Syndrome

- Beighton Scale (Kruger et al 2007)
- Score > 6
- “increased joint laxity and decreased tissue stiffness”
- ↑ type III collagen
- Screening signs
5th finger ext >90deg
Thumb to forearm
Knee recurvatum >10deg
Elbow recurvatum >190deg
Lumbar flexion palms flat on floor

Urogenital Hiatus (Kruger et al. Ultrasound Obstet Gynecol 2007)
• Significant ↑ size of levator hiatus on Valsalva (simulate ↑ IAP) in participants with score >6 Beighton scale
• HIFIT (high impact freq intense training) group on 3D/4D US
• Significantly thicker LA muscles
• Marked ↑ LA hiatus during voluntary Valsalva
• Low UI prevalence
• Authors explanation: increased kinesthetic awareness and ability to recruit task specific mm + increased abdominal strength
• > bladder neck mobility & bladder descent

Negative UI Sequelae - Athletes
• Adverse sports performance (Jacome Intl J Obs Gyn 2011)
• Abandon sport (Jacome Intl J Obs Gyn 2011)
• Quality of life (Brown et al J Amer Geri Soc 2000)
• Medical & psychological morbidities (Brown et al J Amer Geri Soc 2000)
• Yeast infections
• UTIs
• Depression

UPFMD (Bowel Urge/Al/Fl) General Risk Factors
• 2008 NIH study
• Post obstetrical lesions (routine episiotomy)
• Hx prior GI Symptoms
• Diarrhea
• IBS
• IBS w/constipation -> depression > functional constipation
• IBS & pelvic floor dysynergia
• Segmental Colonic Transit Time (CTT)
• Marked difference: patients with IBS & normal subjects
• IBS patients with "normal" CTT are not "normal"
• Rome II criteria do not reflect differences
• Trauma/abuse
• Female gender
• Endurance exercise (Strid H, Scan J Gastroent 2011)
  Famous Fl (aka “runners trots”)
• 1982 Ironman Kona
• 1997 NBA finals
• 2005 London marathon (current female world record holder marathon)
  UPFMD (Bowel Urge/AI/Fl) Risk Factors
• High impact, endurance sports
• Training >8h/wk lead to AI in young nulliparous women as compared to sedentary controls (Vitton et al, JWH, 2011)
• Inadequate in race nutrition (Stuemple et al. Int J Sport Nutr Exerc Metab, 2013)
• 2011 study of 16 ultra marathoners indicated higher finishing rate in those who took in greater fuel, fluid, and sodium. (Stuemple et al J Am Coll Nutr, 2011)
  UPFMD (Bowel Urge/AI/Fl) Risk Factors
• Inadequate nutritional recovery (Zunquin Free Rad Res 2006)
• Normal Defecation
• Voluntary relaxation of puborectalis allows more obtuse orientation of the anorectal angle
• Allows passage of feces/gas from rectum and anal canal
  UPFMD (Bowel Urge/AI/Fl)
Pathophysiology
• Dehydration/electrolyte imbalance
• Free radical overload (Zunquin Free Rad Res 2006)
• GI ischemia (terStege et al Scand J Gastroenterol 2008)
  • Blood shunting away from core to working muscles in 100% during intense exercise & 50% at submax efforts (running, cycling, triathlon)
Anatomy
  • Runners > cyclists
  • Anorectal angle
  • Puborectalis fatigue
  UPFMD (Bowel Urge/AI/Fl)
• Upper & lower GI symptoms in 70% endurance athletes (van Niewenhoven et al 2004, ter Steege Br J Sp Med 2012)
• Most often flatus 84% (Vitton J WH 2011)
• Heterogeneity studies (gender, ex intensity, age, nutrition, tests, protocols)
• IBS
• w/constipation -> depression > functional constipation
  • ↑ pelvic floor dys synergy
• Segmental Colonic Transit Time (CTT)
  • Marked difference: patients with IBS & normal subjects
  • IBS patients with "normal" CTT are not "normal“
  • Rome II criteria do not reflect differences
  UPFMD (Bowel Urge/AI/Fl)
• Swid et al 2011 Sweden
• 15 elite orienteering athletes (avg 22yr, 8-9h/wk)
• Heavy training vs rest period
• GI transit/motilility, gastric emptying, stool consistency & frequency
• Increased small bowel transit
• No change gastric emptying or colonic transit
• Increased stool frequency
• Looser stool (Bristol)

PT Evaluation for UPFMD
• Ortho/Sports PT
• History & Exam
  • Activity vol (freq/int/dur) & mode
  • Precipitating factors
  • CV screen for volume overload
  • Neuro screen (DTRs, etc)
• GI/Nutrition screen
• Meds
• Safe at home, in relationships
• Joint & soft tissue mobility
• MMT static, dynamic, endur
• External palpation of PFM, TrAb
• US Imaging
• Gait/run analysis
• Pelvic PT
• History & Exam
  • At left PLUS...
  • Specific goal assessment
  • Screen for sexual dysfunction
  • Internal vaginal/rectal exam: atrophy, inflammation, urethral mobility (CAPP-Pelvic)
• PFM MMT Modified Oxford Grading 0-5/5 (Laycock 1992)
• Pelvic CT integrity
• Visceral assessment (ab/pelvic)
• EMG Bfd static & dyn (BCB-PMD)
• Specific, valid/reliable pelvic health questionnaires
• Bladder Log

Screening
• ICIQ-SF
• International Consultation on Incontinence Questionnaire
• UDI-6
• Urogenital Distress Index
• PISQ-IR (Rogers Intl Urogyn J 2013)
• POP Incontinence Sexual Questionnaire
• EAT-26
• Eating Attitudes Test
• FISI
• Fecal Incontinence Severity Index
• Non-validated
  Proposed Pre-participation PMH Questions (Anderson et al, Athl Train & Sports Healthcare 2011)

Treatment
• Pelvic PT first line treatment for UI/FI (Goldstick BJSpMed 2012)
• PFMD noted in patients with lumbopelvic dysfunction (Smith et al Aust J Physio 2006)
• UPFMD cure rates in athletes? (Bo Sports Med 2004)
• 44% and 69% female non-athletes
• Pilot study comprehensive pelvic rehab VB players in Italy (Rivalta M et al 2010)
  • Estim, EMG Bfd, PFM training, cones
  • MMT 5/5 all (1-2/5 baseline)
  • 0 protective liner (1-2/d baseline)
• Training principles
• Length-tension relationship
• Specificity
  • Muscle fiber type
  • Quality/extent of contraction – bladder neck
• Reversibility
  • Demonstrated in non-athletes
• Adaptability
  • Adequate stimulus
• Endurance focus
• Short term PFM fatigue after 90min strenuous exercise (Ree et al Obstet Gynecol Scand 2007)
• Supervised, intensive PFM training class (Hilde et al Obstet Gyn 2013)
• Mixed results in non-athletes (6wk-6mo)
• Athletes not consistently elevating bladder neck on US imaging (Baessler Neurol Urodynam 2010)
• Bladder neck elevation is key for effective Pelvic Brace with dynamic exercise
• Can be improved/verified with motor control training (Painter et al JOSPT 2007)
• Key muscles trained at 20-80% to compress urethra & functionally elevate bladder neck
• Unique to female perineal membrane
  • Urethrop vaginalis
  • Compressor urethrae
  • Levator ani (CAPP II)
  • Pubococcygeus* elevates urethral vagina*
  • Puborectalis
  • Iliococcygeus* elevates pelvic floor*
  • Coccygeus

• A&P*
• Knowledge*
• Behavioral*
• Personal*
• Societal*
• Developmental*
• Environmental
  • *PTs able to influence
• Education
• Normal A&P
• Prevalence
• Success rates
• Self reflection
  • Bladder Log
  • JICing
  • Fluids**
  • Client motivation (why run?)
  • Fitness
  • Competition
  • Depression/anxiety
    Treatment
  • Concurrent factors
  • IBS
• Comprehensive lumbopelvic stabilization
  • Pelvic brace
  • Neutral spine & hip dissociation (Wiebe CSM 2012)
  • Breath training
• Cross Training
  • Maintain aerobic fitness
  • Low impact aerobic vs anaerobic/LT (Araujo et al 2007)
  • Horseback riding protective effect on SUI (Alanee et al 2009 USA)
• Preventive devices (Bo Sports Med 2004)
• Tampons
• Pessaries
• Femme/Homme Jock
• Societal
• Community ed
• Social media
• Developmental
• Collaborate with peds PTs
• Parenting blogs
• Social media
  Treatment
• UI medications (Goldstick Br J Sp Med 2013)
• Rarely studied in athletes
• Anticholinergic drugs may compromise sweating mechanism (heat stroke risk)
• Banned in competition
  - E.g. pseudoephedrine hydrochloride
    (α adrenergic)

Case Report 1
• 29yo female mid distance runner
• 16yr hx UI “every time I run…”
• EMG Bfd, HEP, & run cueing

Reliability of EMG Bfd Running
• Intra-session test-retest reliability of pelvic floor muscle electromyography during running (Luginbuehl H et al Int Urogynecol 2012)
  ◦ EMG variables show good reliability (ICC 0.906-0.942)
  ◦ Time variables (e.g. heel strike to max acceleration of vaginal accelerator) show low reliability

Case Report 2 – UI & Bowel Urge
• 42 yr old mid distance runner
• Female 20yrs experience
• Fluid restriction day before running
• No nutrition/fluids while running 3x/wk
• C/O UI “harder efforts, hills, ½ way through long runs; bowel urgency onset around 6-7mi”

Multidisciplinary Care
• Goal focused approach
• Dependent on contributors’ skill sets & expertise
• May redefine healing/wellness
• Crucial for athletes at risk and affected
  ◦ Interdisciplinary Education
• Treatment/prevention of UPFMD
  ◦ Academic instruction
    • Entry level PT
    • Primary Care
    • Athletic Training
    • NSCA
    • CPT
    • CSCS
  ◦ Patient education
    • Coaching
Patient Education
• Individual Zone of Optimal Functioning/Performance (IZOF) (Robazza J Sport Sci 2008)
  ◦ Italian swimmers & track/field athletes
  ◦ State/trait anxiety, self confidence, bodily sx, etc
  ◦ Emotional states at/near IZOF and ‘good’ race correlated with self perceived “facilitative-pleasant”
Patient Education
  “A coach is someone who always makes you do what you don’t want to do, so you can be who you always wanted to be.” ~ Author unknown
Multidisciplinary Care Team & “Virtual Staff” (term coined by Scott Miller, PT, MS, Sports pre-con CSM 2013)
• Patient/Client
• Pelvic PT
• Ortho/Sports PT
• PCP (MD, urogyn/ urol, NP, CNM)
• Reg Dietician
• Neuro PT
• Psychologist
• Family/spouse
• Trainer/Coach
• Comp Med
- Acupuncturist, naturopathic doctor, functional medicine doctor
- Peds PT
- “Healthy Bladder” panel

Case Report (Nissenbaum JT et al JOSPT 2012)
- 33yr old female runner, post-partum (Csection x2)
- DLS training with lumbopelvic instability
- USI + qualitative run analysis/cueing + manual therapy + HEP
- Measures
  - Force attenuation/energy absorption (J) in LE at IC
  - Pelvic list (frontal plane), pelvic rotation, and pelvic tilt (sagittal plane)
- Pros: multidisciplinary care
- Cons: No screen/test for DRA or UPFMD despite pregnancy & surgical hx risk factor

Ultrasound Imaging
- After EMG Biofeedback the most commonly used rehab tool for UPFMD (Giggins et al. J Neuroeng Rehab 2013)
- Goal = maintenance of dynamic elevation of bladder neck
- Bene’s: visual cueing
- Limitations: static

Survey Research
- Ten midwestern triathletes/runners
  - 10-25yr experience
- Avg age 34.9 (29-42yrs)
- Avg # events/yr = 6
- Usual distance = mid (13.1/Oly tri)
- 40% nulliparous
- 50% 2+ babies
- 70% leaked during training/races “at least 1x/mo over the past year”
- Avg #h/wk “High Impact Exercise” = 5.4 (range 3-10hrs/wk)
- Most common mode = running
- Hx gymnastics >/= 1yr = 60%
- Fam Hx “hernia/POP/DRA/UI/Fl/Instability affecting low back/hips/SI Joints” = 70%
- “Ever” had B&B leakage in race or training = 70%

Summary
- UPFMD affects 25-80% of female athletes
- Underreported (90% never discuss)
- Key risk factors UPFMD in females
  - Jumping & “double float”
Yrs of high impact exposure
Training volume
Exercise at/near max effort
Inadequate nutrition in race/in recovery
Co-morbidities
Previous pregnancy
Urogynecologic surgery
Eating disorder
Depression/anxiety
Male athletes at risk for UPFMD
Young, former military - UI
Endurance athletes - bowel urge/AI
Risk factors
Depression/anxiety
IBS
Inadequate nutrition in race & in recovery
PTs are a crucial link for prevention
ID at risk youth to avoid exercise cessation
High impact sports
Pers/fam hx
POP
Giggle UI
Encopresis
Hypermobility
Screen outpatient PT patients w/NMSK injuries
Add Sx Qs and double back on comorbidities on intake
Make available: valid/reliable pelvic floor questionnaires & refer to pelvic PT
Community Education
Multi- & Interdisciplinary Care & Education
“Virtual staff” utilization
Policy & research panel participation
Organization & institution wide prevention & comprehensive treatment programs
Profound gap in research surrounding best practice treatment methods for UPFMD in athletes
Instruction in PFM exercise in popular fitness classes appears inadequate

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