Women's Health Physical Therapy

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Palmer Physical Therapy for Women

Palmer Physical Therapy for Women

- Free standing private practice established to meet the physical therapy needs of women
- Opened May 2003 by Pam Palmer, PT
- Current staff includes:
  - Pam Palmer, PT
  - Kathy Elston, PT
  - Ann Sundgren, PT
  - Susan Palmer, PT
  - Polly Holcomb, DPT
  - Shelli, Hill, DPT
- New website address: palmerphysicaltherapy.com

Women's Health Section

- First section established by Elizabeth Noble in 1987; Section on Obstetrics and Gynecology for prenatal/postpartum care
- 1995 updated to Section on Women's Health
- Current membership- 2,500 members
- Recently established criteria/testing to allow official specialty credentialing
- www.womenshealthapta.org

Course Outline

- Anatomical review of the pelvic girdle, neural controls, pelvic floor muscles and hormonal influences
- Review of types of incontinence and typical diagnosis associated with chronic pelvic pain including treatment options and efficacy
- Musculoskeletal issues of Breast Cancer Survivors
- Osteoporosis
- Health issues common to the female athlete

Anatomy of the Pelvic Girdle

Review Relevant to Physical Therapy Practice

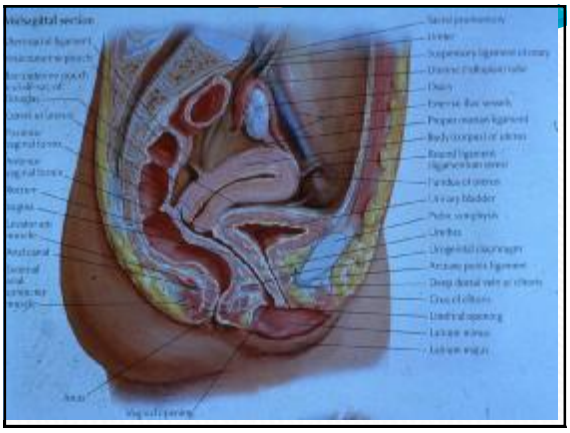
Pelvis-Anterior View Ligaments

Pelvic-Posterior View Ligaments

LUMBAR ANATOMY

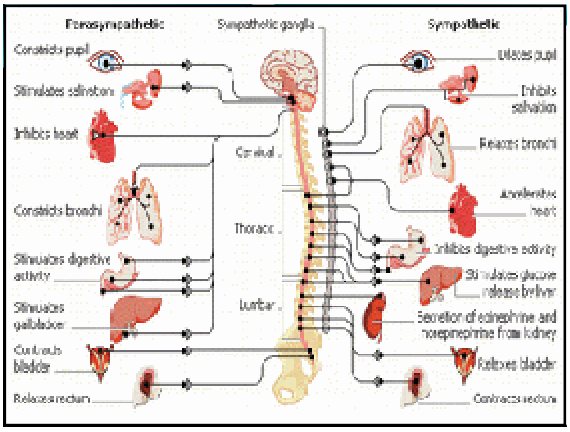
Organs of the Pelvic Cavity

- Bladder/Urethra
- Bowel
- Vagina/Uterus/Ovaries



Pelvic Girdle- Peripheral Nervous System

- Autonomic
  - Involuntary activities
    - Smooth muscles and many pelvic visceral functions
  - Further divided into Parasympathetic and Sympathetic systems
  - Lower urinary tract is principally under autonomic control with somatic and cortical modulation
    - Pontine micturition center coordinates relaxation of internal sphincter with bladder contractions; cerebral cortex can inhibit bladder contractions (decide when it is "OK to pee")
- Somatic
  - Voluntary activities
    - Skeletal muscles



Innervation: Urinary System

- Sympathetic- storage (inhibits micturation)
  - spinal cord levels T11-L2
- Parasympathetic- "pee" (promotes bladder contraction and internal urethral sphincter relaxation)
  - pelvic splanchnic nerves S2- S4
- Somatic- pudendal nerve innervation; external urethral sphincter and pelvic floor muscles
  - Nerve root levels S2-S4

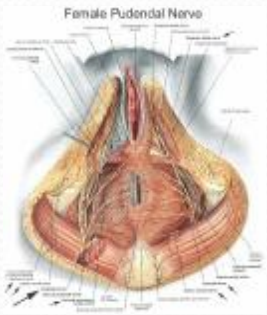
Innervations for Bowels

- Enteric Nervous System- the brain of the digestive tract
  - Part of the parasympathetic nervous system
  - Communicates with the CNS via the vagus nerve and the sacral plexus
  - Coordinates normal intestinal function
- Sympathetic Nervous System
  - Neurons synapse near the thoracic and lumbar spine
  - Mediates blood flow, senses pain and responds to inflammation and injury
- Anus is normally closed by the tonic activity of the internal anal sphincter- autonomic
- Closure is reinforced by the external anal sphincter- pudendal nerve S2-4

Innervation Pelvic Floor Muscles (PFM) and Perineum

- Urogenital triangle
  - S2-S4 perineal branch of pudendal nerve
- Urogenital Diaphragm
  - External urethral sphincter –pudendal nerve S2-4
  - Internal urethral sphincter- parasympathetic efferents S2-4
- Pelvic Diaphragm- levator ani/coccygeus
  - Pudendal nerve-S2-4
- External genitali
  - Branches of the ilioinguinal nerve
  - Genital branch of genitofemoral nerve
  - Perineal branch of femoral cutanous nerve

Pudendal Nerve



Origin: S2, S3, S4

Supplies sensation and motor function to the perineum

Pelvic Floor Muscles

- Pelvic floor muscles are comprised of 70 % slow twitch type fibers, 30 % fast twitch type fibers
- Fast twitch (type 2) fibers facilitate rapid sphincteric closure
- Slow twitch (type 1) fibers maintain tone and support of pelvic organs

Pelvic Floor Muscle Function

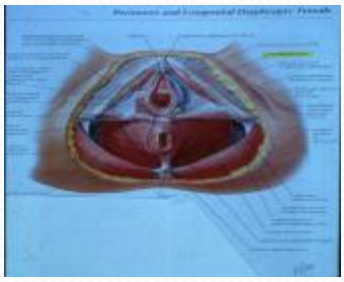
- Supportive- supports viscera and joints of pelvic girdle/spine
- Differ from most other skeletal muscles in that they demonstrate constant electrophysiologic activity except during voiding, defecation and the Valsalva maneuver
- Sphincteric- functions to contract and relax openings of the pelvic floor (urethra, vagina and anus)
- Sexual appreciation

Urogenital Triangle

Superficial muscular layer

- Superficial transverse perineal
  - Especially important to support pelvic floor with increased pressures; stabilizes the perineal body
- Bulbocavernosus
  - Assists with the secretion of underlying glands and clitoral erection
- Ischiocavernosus
  - Important for clitoral erection
- Deep branch of the perineal nerve S2-S4

Superficial Muscles



Urogenital Diaphragm

Second Muscle Layer

- Deep transverse perineal
  - Includes the External Urethral Sphincter (EUS)
  - Voluntary control; interrupts urine stream during voiding or causes inhibition of the bladder contraction
  - Innervated by the pudendal nerve (S2-4)
- Internal Urethral Sphincter muscle(IUS)
  - Actually outer circumferential layer of the smooth muscle of the bladder under parasympathetic control
  - Constant resting tension maintained until bladder contraction initiated then these sphincter muscles automatically relax

Pelvic Diaphragm
Deepest Muscle Layer

- Principal support of the pelvic viscera
- Innervation: pelvic nerve roots S2-S4
- Principal muscles in this area are the coccygeus and group of muscle commonly referred to as the levator ani
- Passive resting tone important as it supports pelvic viscera and assists with closure of urethra and rectum

Levator Ani complex

Coccygeus/Pubococcygeus

Posterior View

Obturator Internus-Lateral

Obturator Internus/Piriformis

Obturator Internus/Piriformis

Anal Triangle

- Internal anal sphincter (involuntary)
  - Trauma occurs often from lacerations and tearing during childbirth and fissures from straining during defecation
  - Provides 75% of the resting tone of the anus
- External anal sphincter (voluntary)
  - Contains the puborectalis muscle

Puborectalis

Internal Anal Sphincter

External Anal Sphincter

Abdominals

- Transverse Abdominus
  - Innervations by T10-L1 spinal nerve roots
  - Should work in a feed-forward loop to provide support to low back/pelvic girdle
  - Weakness increases the downward pressure on the pelvic viscera
  - Contract simultaneously with PFM especially with cough, sneeze, lifting

Hormonal Influences

- Estrogen-referred to as the primary female hormone
  - Produced by the ovaries but has impact on most organs in the body
  - Increases uterine lining, stimulates breast tissue and thickens vaginal lining
  - Has significant role in bodies maintaining bone structure and cardiovascular health
- Progesterone
  - Made only during the 2nd half of menstrual cycle and prepares uterine lining for implantation
- Testosterone
  - Involved in sexual desire, energy and building bone mass

Urinary Incontinence

Urinary Incontinence

- Common condition in women and increases with age
  - In young adults-- 20-30%
  - In middle age women-- 30-40%
  - Postmenopausal women--30-60%
- Significant cost- pads, medication and surgery
- Associated with social isolation, falls, fractures admissions to long term care facilities
- Severely -impacts quality of life
- Many women believe this condition is just a part of aging and having children and don't seek medical care

Stress Incontinence (SUI)

- Loss of urine secondary to increased intra-abdominal pressure during activity (bladder pressure exceeds urethral pressure)
- Leaking urine with coughing, laughing sneezing, intercourse, exercise and/or lifting

SUI Prevalence in Athletes

- Prevalence rates vary between 10-55% in women ages 15-64; only 25% seek help for the problem *(Urinary Incontinence, Pelvic Floor Dysfunction, Exercise and Sport*, Bo, Kari, Sports Med 2004*)*
- Prevalence in young female athletes ranges from 0% in golfers, to 80% in trampolinists
- SUI occurs in 28% of female college athletes, and 2/3 of female college gymnasts
- Highest incidence of SUI in high impact activities: jumping, landing, and running
- Very high in track & field, gymnastics, cheerleading, volleyball, and basketball

Urge Incontinence (UUI)

- Loss of urine secondary to inability to postpone voiding
- Patients may report that urge can be triggered by cold, running water or the “key in the door” syndrome
- May be referred to as detrussor instability

Mixed Incontinence (MUI)

- Combination of stress and urge incontinence symptoms
- Frequency and urgency- “overactive bladder”- combined with urine loss during physical activities
- Commonly identified with thorough history- combination of contributing factors

Functional Incontinence

- Inability to get to the toilet in time
- Pelvic muscle weakness
- Associated with problems with dexterity and ambulatory/transfer abilities
  - adapt the home environment

Overflow Incontinence

- Loss of urine associated with over distention of the bladder
- This is a failure to empty-bladder problem
- Diabetes, spinal cord injury, neurological disorder(MS)
- Historically not considered a rehab candidate however, clinic experience that bladder emptying and normal urge sensation enhanced when lumbar nerve root irritation remediated

Normal Bladder Function

- Voiding is voluntary- "potty-training"
- NO pushing or straining required
- Normal voiding every 3-4 hours / 6-7 times per day
- Voiding once per night after age 65
- Appropriate fluid intake is important
- Typically first urge felt at 150-200 cc and naturally postponed
- Postponed typically to 300-400cc when emptying is determined to be necessary

Continency

How should it work to stay dry

- The bladder needs adequate support from the pelvic fascia/ligaments and pelvic floor muscles
- The bladder should be able to maintain normal volumes; should be able to stretch and "sense" when really full
- Proper estrogen levels maintain the "seal" in the urethra
- The internal bladder sphincter is under autonomic control and is released when the bladder contracts
- Urethral pressures must exceed bladder pressure to be continent (striated muscles of urogenital diaphragm and levator ani provide this support)

Chronic Pelvic Pain

Physical Therapy Approach

Common Patient Complaints

- Painful Intercourse (Dyspareunia)
  - Genital pain experienced before, during or after intercourse
  - Often history of being unable to use tampons
- Vaginal pressure/burning/itching
  - May have a history of frequent yeast infections
  - Diagnosis may be vulvadynia or vestibulitis
- Inability to achieve orgasm
- Hypersensitivity or pain in clitorial area
- Abdominal pain
  - Areas of ovary, bladder or uterus
  - Usually lower quadrant and more laterally

Common Patient Complaints-cont

- Bowel dysfunction
  - Irritable bowel syndrome
  - Rectal pain/spasm
  - Incontinence
- Bladder dysfunction
  - Urinary frequency & urgency
  - Incontinence
  - Spasms and/or pain
- Prolapse
  - Cystocele-bladder
  - Rectocele-rectum
  - Uterine-uterus
  - Enterocele-intestinal
- Low back, pelvic girdle or pubic pain
  - Patient may or may not report this as an issue

COMMON DIAGNOSES

- Dyspareunia
- Vaginismus/Pelvic Floor Muscle Tension Myalgia
- Vulvodynia/Vestibulitis
- Lower Abdominal Pain
- Urinary Incontinence
- Urinary Frequency & Urgency
- Interstitial Cystitis
- Constipation or Fecal Incontinence
- Rectal pain
- Prolapse

Prevalence of Symptomatic Pelvic Floor Disorders in US Women

- JAMA; Sept. 2008; Vol 300 (11)
  - Defined as urinary incontinence (UI), fecal incontinence (FI) or pelvic organ prolapse (POP)
  - 10% of women have surgery for UI,POP or both and 30% of them have 2 or more surgeries
  - The proportion of women that report at least one pfm disorder increases with age (26.5% 40-59 yrs and 36.8% 60-79 yrs)
  - Other characteristics associated with @ least 1 pfm disorder were poverty, obesity and parity
    - Parity- 12.8% nulliparous, 18.4% w/ one, 24.6% w/ two and 32.4% w/ > 3

JAMA Study Additional Observations

- The presence of UI had a progressively lessening correlation with history of vaginal births as patients aged (no correlation after the age of 65 yrs)
- FI and parity was found to be inconsistent
- Fact that 1 in 8 nulliparous women have @ least 1 disorder demonstrates multifactorial nature
- As population ages, national burden of costs, lost of productivity and decreased quality of life will be substantial
- Conclusion- need to further understand the pathophysiology, prevention and treatment of PFM disorders is crucial

POP Prevalence and Treatment Implications

- Amer Journal Obst & Gyn; Feb 2009
- Cross sectional study of 1,869 women in the Netherlands designed to avoid cultural selection bias
- Identification of POP with + response to question: “Do you see or feel a vaginal bulge”
- Prevalence was 11.4%
- Most important predisposing factor was maternal hx of POP and heavy physical work was a “promoting” risk factor
- As previous studies cite most important risk factors as age and parity, prevention was thought to be very difficult
- Researchers cited importance for preventions strategies to include PT especially for body mechanics with lifting

Etiology

Multiple Hypotheses

Commonly Cited Contributing Factors of Incontinence

- Age
- Childbirth injury
- Pregnancy
- Chronic constipation-excessive straining
- Chronic cough
- Heavy lifting
- Pelvic Surgery
- Inactivity
- Disease/Spinal injury
- Medication
- Cognitive impairment
- Obesity (increase IAP)

Conflicting Findings

- Some studies show minimal correlation between vaginal and cesarean section birth and long term findings of urinary incontinence in post-menopausal women
- Study of nulliparous and parous post-menopausal sisters have same risk; implicated familial/genetic factors
- Previously accepted correlations between pelvic floor trauma due to instrumental vaginal delivery techniques (i.e., forceps, etc.) are now thought to be minimally significant.
- There does appear to be a correlation with birth trauma and post-partum fecal incontinence, however.

Initial Evidence of UI/LBP Correlation

Spine; 1994; Low Back Pain and Urinary Incontinence: A Hypothetical Relationship

- A study of 16 pts that had primary c/o severe low back pain also c/o urge incontinence; one pt had severe urinary frequency
- Further tests were done to eliminate the possibility of organic neural disease and genitourinary disease
- In 10 of 16 pts fusion was done with marked reduction of pain, return of perineal sensation and concomitant cure or marked improvement in their incontinence. Noted severity of urgency and UI associated with severity of LBP

UI/LBP Study(con't)

- Spinal canal imaging or urodynamic studies did not reveal any abnormality sufficient to explain the incontinence
- Reflected that the terminology "bladder instability" was an unsatisfactory term used when no other explanation was available
- Common c/o perineal paraesthesia not usually associated with chronic LBP but may be same pathology of paraesthesia in lower extremities
- Reflected increase prevalence in women common but not well explained

Additional Research

Urinary Incontinence in Women with Low Back Pain; Manual Therapy; 2008

- Questionnaires to 200 women
- Findings:
  - Majority of women with LBP report recurrent LBP (87%)
  - 78% of women with LBP reported UI
  - Nulliparous women did not have less UI than parous women
  - Parous women who delivered vaginally did not have more UI than women with C-section
  - 79% women with recurrent LBP had UI; 65% in women with occasional LBP
  - Women with "significant UI" had 93% reported recurrent LBP

UI/ LBP Study Findings (con't.)

- Discussion Points
  - Women with LBP significantly less able to interrupt the urine flow
  - Childbirth per se was not associated with UI nor was the mode of delivery
  - Timing of the pelvic floor muscle (pfm) response in relation to increases in IAP probably more important than strength of pfm in promoting continence (less about strength and more about neuromotor coordination)
  - Another sign of pfm dysfunction is "perceived pelvic load"
    - this is a symptom associated with organ prolapse and has been associated with decreased pfm strength
    - This was reported more by parous women with LBP than the reference group
    - Question posed in the article was " is pelvic load another symptom of dysfunctional pfm due to LBP"?

What are some of the muscle performance issues associated with the onset of LBP?

Muscle Denervation s/p Acute Low Back Pain

Multifidus Muscle Recovery is Not Automatic After Resolution of Acute, First-Episode LBP;Spine;1996 Vol 23:23

- Studies have shown localized segmental dysfunction of the multifidus muscle to occur after a first episode of acute or subacute unilateral LBP
- Study including 41 pts bt 18-45yrs experiencing first episode unilateral LBP examined at time of initial injury and then as f/u 10 weeks; parameters included pain, disability, ROM and US imaging
- Most important finding was that multifidus recovery does not occur spontaneously on remission of painful symptoms or return to previous functional levels of activity

Study re: Recurrent LBP and Multifidus/TrA

Long Term Effects of Specific Stab. Ex for First Episode LBP; Spine; 2001; Vol. 26, No 11

- Randomized clinical trial with 1 and 3-year telephone questionnaire follow-ups
- 39 patients included in study; divided into 2 groups
  - Medical management-advice and medications
  - Exercise group-focus on multifidus and TrA (previous study)
- At the 1-yr follow-up the Ex. Group's rate of reoccurrence of LBP was 34% compared to the Med. Management group rate of reoccurrence of 84%
- At the 3-yr f/u the recurrence was 35% for Ex. Group and 75% for the Medical Man. Group

Study Regarding Transverse Abdominus Function and LBP

Inefficient Mus. Stab. Of the L-spine Assoc with LBP; Spine; 1996; Vol. 21; # 22

- Contribution of TrA to spinal stabilization in people with and without LBP evaluated using an experimental model of coordinating trunk mm response to disturbance to spine
- Total of 30 subjects were in study and EMG activity and TrA, multifidus and deltoid were measured
- Contraction of TrA was significantly delayed in patients with LBP
- Conclusion-The delayed onset of TrA contraction indicates a deficit in motor control and hypothesized to result in inefficient mm. stabilization of spine

Since your PFM and TrA work in synergistic pattern, is it possible that PFM are similarly compromised with LBP?

Early Evidence- Pelvic Floor Denervation

The role of partial denervation of the PF in the aetiology of prolapse andSUI; British Journal of Ob% GYN; Jan 1989

- A study of the nerve conduction in the terminal branches of the pudendal nerve in 42 healthy and 87 women with SUI and genitourinary prolapse
- Found delayed conduction to both the striated urethral muscle and the pelvic floor muscles, indicative of denervation injury in the symptomatic group
  - Women with genitourinary prolapse and no SUI had normal striated urethral muscle conduction but clear decrease in pelvic floor muscle conduction
- Found no correlation between the # of pregnancies or the heaviest baby weight and muscle denervation

Is there any evidence that visceral could be also negatively effected by neuritis?

Visceral Impact of L/S Neuritis

J. of Neuroscience; 1998; vol. 18(23)Activation of CNS Circuits Producing a Neurogenic Cystitis Evidence for Centrally Induced Peripheral Inflammation

- Study that tested the hypothesis that bladder cystitis could be mediated by neural inflammation
- Pseudorabies virus (PRV) injected into neurons near the “bladder circuits” (L1-2 and S1-S2)which led to a localized immune response in the CNS and bladder inflammation
- They noted that the virus was not in the urine or the bladder ruling out infectious cystitis
- The close proximity infected CNS somatic neurons to non-infected bladder circuits, and the resultant bladder cystitis indicated a neurogenic inflammation localized to the bladder

Emerging Evidence of Shared Pathology

Prevalence of chronic constipation and feceal incontinence among men and women with symptoms of OAB; BJU Int.; 2010; June (not yet published)

- Fecal incontinence (FI) more common in incontinent patients with Overactive Bladder (OAB) that patients that have OAB and are continent
- OAB status has a very high predictive value of chronic constipation(CC), FI and overlapping CC and FI
- Findings suggest a shared pathophysiology among these conditions

If these problems are just a function of LBP and neuritis, why do women have such a higher prevalence?

"The complex role of estrogens in inflammation"

- Several studies
  - Gender differences in chronic pain and inflammatory diseases (IBS, IC, TMJ, fibromyalgia, etc)
  - Estrogen has role in affecting/influencing the excitability of nociceptive pathways in the dorsal horn
    - Pain modulation (up-regulate)
    - Central mechanism of increasing hypersensitivity and affecting peripheral symptoms

Impact of Estrogen in IC

Estrogen and Neuroinflammation; Bjorling and Wang; 2001

- Interstitial Cystitis (IC) –suspected neuroinflammation plays role in pathogenesis of the bladder; 90% of IC pts are female and as many 40% report increase with ovulation and decrease with pregnancy
- Studies involving the interaction of NGF(nerve growth factor) and peripheral nerves concluded that local pain and myalgia more severe and at lower threshold in women
- Estrogen may cause altered NGF synthesis and release and although may not directly stimulate pain, estrogen may indirectly render the bladder more sensitive to the effects of noxious stimulus
- Conclusion- Steroidal hormones, including estrogen, have the capacity to modulate neurogenic inflammation through interaction with a variety of mediators of pain and inflammation including NGF. Estrogen may play a role in determining the intensity of the response to neurogenic inflammation within the bladder.

Hormone research

- Hanneke 1990
- Retrospective, cross-sectional study/survey, included 11,428 females
- Examine how hormonal/reproductive factors are associated with chronic LBP/chronic UEP
- Results:
  - Estrogen-related factors with positive association with chronic LBP: past pregnancy, young maternal age at 1st birth, duration of oral contraceptive use, use of estrogens during menopause
  - No association between # of children and chronic LBP; previous studies have shown correlation—possibly related to child-rearing and not child-bearing since found in both M and F
  - Menarche at young age (≤ 11 yrs) and irregular/prolonged menstrual cycle are associated with both chronic LBP and chronic UEP
  - Positive correlations with LBP both in menstruation and pre-menstrual syndrome
  - Risk of LBP may be increased by factors related to increased estrogen levels
  - More research needed to examine effects of estrogen on LBP

PPTFW-Clinical Observations

- Common feature in the types of patients that we see are that they have a history of low back dysfunction
- Painful episode may be in the past or current pain is intermittent and not “life altering”
- Most often there is a unilateral component-one side is worse
- Consistent evidence of nerve root inflammation(NRI) is present often centrally at L5-S1 (cauda equina),L5-S1, L4-L5 or upper lumbar/lower thoracic segments (approximately T10-L2)
- This inflammation and subsequent chemical changes appears to impact tissue in that dermatome/nerve tract or viscera that receives innervations

Clinical Observations-cont

- If the nerve root inflammation is centrally in the lumbosacral junction, the pelvic floor muscles can be impaired (either in spasm or hypotonic state)
- Nerve root inflammation (NRI) that occurs in the lower thoracic and upper lumbar spine impacts the sympathetic nervous system which controls the bladder's ability to store urine (including the internal sphincter in the bladder) and bowel function
- Urinary incontinence & urgency and some bowel issues appear to be symptoms of spinal/neural dysfunction

Connection between Lumbar Dysfunction and NRI

- Postural deviations and movement patterns contribute to lumbar dysfunction
- Poor posture cause mechanical strain on joint capsules, ligaments and muscles (all pain sensitive) and promote restrictions in certain planes of motion
- Immobility leads to degenerative changes
- Injury and the resultant increase in stiffness in the T/L spine is often not addressed if pain subsides after initial injury
- Impaired lumbar mobility is common-especially decrease in extension and side bend/rotation
- Poor body mechanics (especially repetitive forward bending) and kyphotic/flat back posture can create nerve root irritation due to increased anterior pressure on disc with subsequent posterior displacement of disc; posterior disc displacement encroaches on the spinal nerve root

Clinical Interventions

Common Medical Treatments

- Surgery
- Medications
  - Urgency/OAB symptoms
  - Antidepressants/pain medications/muscle relaxants/Elmiron
- Hydrodistention of bladder (interstitial cystitis)
- DMSO- delivered intravesically (interstitial cystitis)
- Diet changes (low acidity foods only)
- Pessaries (pelvic organ prolapse)
- Estrogen creams
- Eliminate vulvar irritants: soap, bubble bath, detergents, sanitary pads, etc.
- Cortisone & Botox injections
- Sacral neuromodulation-InterStim implants

Cochrane Reviews

Sacral neuromodulation with implanted devices for urinary storage and voiding dysfunction in adults; Herbison and Arnold; 2009

- 8 randomized studies; continuous stim offers benefits for carefully selected people with OAB but many implants did not work and many required revision surgeries
- Conclusion- more research is needed especially contrasting against other interventions as well as research on patient selection and determination why so many fail

Cochrane Reviews

Intravesical treatments for painful bladder syndrome/interstitial cystitis; Dawson and Jamison; 2007

- Assessing the effects of putting medication directly into the bladder
- Total of 9 studies with 616 participants involving 6 different types of treatments
- Conclusions- overall evidence is limited with BCG (tuberculosis bacteruim) and oxybutin reasonably well tolerated with promising evidence but resiniferatoxin had no + effect and caused pain; more studies are needed

Cochrane Reviews

Mechanical devices for pelvic organ prolapse in women; Adams, Thomson, Maher and Hagen; updated Oct 2005

- Pessaries are mechanical devices designed to restore position and provide support to pelvic viscera
- No randomized trials are available; no apparent consensus re: different types, indications, pattern of placement or follow-up care
- Authors conclusion that there is an urgent need for randomized studies to address pessaries, surgery or other conservative measures

Cochrane Reviews

Conservative management of pelvic organ prolapse in women; Hagan, Stark, Maher and Adams; updated 8/2006

- 3 randomized trials of conservative management noted; one large trial excluded as study did not met criteria
- 1 feasibility study including 47 women that looked at PFM exercise vs. no treatment provided some evidence of benefit with a larger planned study in works
- Overall the evidence not sufficient to guide clinical practice

Why is it so hard to find the source of the problem?

- A patient may have many specialist consults- they often are looking for the answer in their domain
- Symptoms may involve many different visceral systems
- Symptoms may have a cyclic nature or patients report they do not know what makes them better or worse
- Patients expect the problem to be in the area that they are experiencing the pain
- No one usually looks at the musculoskeletal angle until after many treatments fail or several surgeries have been done

Physical Therapy Role

History Taking

Pelvic Floor Dysfunction

- Typical history of onset, quality and occurrence of symptoms
- Previous treatment/outcome; urodynamic testing
- Gynecological/obstetrical history
- Prior pelvic or back surgeries
- Low back/hip pain
- Bladder function
- Bowel function

History taking-continued

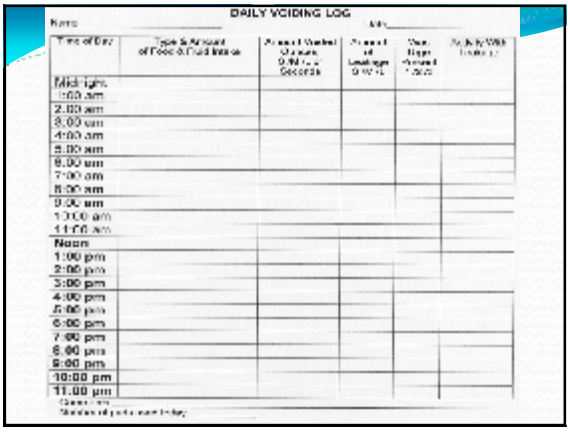
Pelvic Floor Dysfunction

- Sexual function
  - If suspected or pertinent, inquire about any history of sexual abuse
- Toileting habits; use of pads(number, type and usage)
- Medications
- Medical history-diabetes, stroke, MS, cardiac/arterial disease, pacemaker, abdominal surgeries
- Physical activity/work/hobbies
- Quality of life

If you don't ask you will never know.....

Bladder Diaries

- Have patient record type, amount and time of fluid intake
  - fluid intake needs to be specific
- Frequency, timing and amount of urine loss
  - may use urine hat for measurement of urine volumes
- Type of urine loss
  - stress versus urge
  - triggers: stress, work or home life, fatigue



DAILY VOIDING LOG

Name: _____ Date: _____

Time of Day	Type & Amount of Food & Fluid Intake	Amount Voided (Ounces or Milliliters)	Amount of Leakage (Ounces or Milliliters)	Urge (Yes or No)	Activity When Leakage Occurred
Midnight					
1:00 am					
2:00 am					
3:00 am					
4:00 am					
5:00 am					
6:00 am					
7:00 am					
8:00 am					
9:00 am					
10:00 am					
11:00 am					
Noon					
1:00 pm					
2:00 pm					
3:00 pm					
4:00 pm					
5:00 pm					
6:00 pm					
7:00 pm					
8:00 pm					
9:00 pm					
10:00 pm					
11:00 pm					

Comments: _____

Number of pads used today: _____

Efficacy of Pad Test

- Urology; 2010, Aug
- Study conducted to examine the concordance among the 1-hr pad test, subjective questions re: urinary incontinence and QOL questionnaire
- They found correlation between the pad test and subjective inquiry to patients about the presence of urinary incontinence
- Other studies have shown that the patient's self-report is a reliable source and correlates to other diagnostic testing re: presence of UI.....just ask the patient!

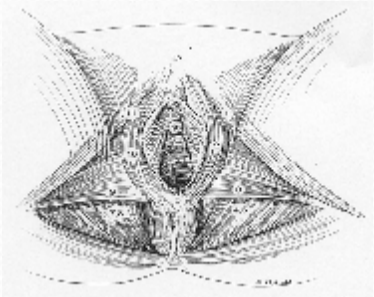
Musculoskeletal Evaluation

- Posture- standing, sitting and during movement
- Pelvic girdle alignment
- Lumbar/Thoracic spine-ROM, quality and amount of segmental movement/restriction, pain
- Nerve root inflammation, neural tension, sensation
- Hip- ROM, capsular restrictions, strength
- Soft Tissue- trigger points, paraspinal muscle tone, etc.
- Trunk strength- spinal extensors, abdominals

Pelvic Floor Muscle Exam

- Appearance of skin/genitalia
- Resting position
- Reflexes
- Sensation
- Tissue integrity and symmetry
- Pain
- Muscle Strength/Coordination/Tone
- Range of motion

Pelvic Clock



Reprinted from Chronic Pelvic Pain An Integrated Approach, Steege, Metzger & Levy; 1998 with permission from Elsevier

Pelvic muscle testing

- Isolation
- Endurance contractions
- Quick contractions
- Repetitions
- Integrity, response and symmetry of muscles of deep versus superficial muscle layers
- Laycock scale- strength/hold time/repetitions/quick flicks in 10 seconds
- Brink scale-measures muscle force, elevation of examiner's finger and duration of contraction using a 4-point ordinal scale

Common PT Interventions

- Bladder Training
- Pelvic Floor Muscle Strengthening-exercise, vaginal weights
- Biofeedback-PFM re-education
- Electrical Stimulation
- PFM myofascial release techniques and stretching (includes use of vaginal dilators)
- Spinal and pelvic girdle manual therapy techniques
- Neural Tension techniques
- Core Strengthening
- Body Mechanics

Bladder Training

- Educate in proper fluid management, toileting habits and timing
- May need urgency suppression techniques to spread out voids
  - Use Bradley's Loop for postponement
  - Instruction of spinal extension as strategy to address urge
- Look for habits of inappropriate postponing or frequency
- Distraction techniques
- Prompted voiding

Manual Treatment for PFM Instruction

- Palpation for performance instruction and monitoring progress
- Tactile input (i.e., quick stretch, etc.)
- Verbal or visual feedback of performance
- Soft tissue releases of trigger points and scars for optimal muscle function

Biofeedback

- Assessment of muscle tone
- Neuromuscular reeducation
- Endurance awareness
- Assists in up and down training needs
- Generates objective data for progress

Pelvic Floor Electrical Stimulation

- Referred to as Functional Electrical Stimulation (FES)
- Weakest clients
  - 0-2 muscle grade
  - 50 Hz is ideal for muscle weakness
- Detrusor instability urgency
  - "quiet" the bladder
  - 10 Hz is ideal for bladder inhibition
- Home units available for daily treatment

Vaginal Weights

- Promote significant strength gains
- Proprioception
- Progressive resistance through gravity changes
- Varied sizes available

Vaginal Dilators

- Progressive sizes to allow gradual progression of stretch
- Originally designed for women undergoing cervical cancer radiation treatments
- Affordable

PFM Ex for SUI-Comparing Low and High Frequency Maintanence Ex

Continence and QOL Outcomes 6 Months Following an Intensive PFM Ex Prog for Female SUI; Physical Therapy; 2008 Dec; 88(12)

- 36 women with SUI completed intensive PFM exercise interventions were randomly assigned maintenance exercise program of 1 or 4 times per week
- Measures of UI per week, QOL scale, PFM strength (Brink score) and urodynamic testing done at 6 month f/u
- 28 women completed program
- Conclusion-benefits of initial exercise to decrease SUI were sustained with both exercise frequency
- Limitation of study-only 15 of the 28 women provided documentation of exercise adherence

Long Term Study: PFM ex

Long-term effectiveness of antenatal PFM training:8 yr f/u of randomized control tiral;BJOG;2008;115(8)

- Study including 164 participants of women ranging from 16-47 yrs in age
- Treatment group received monthly PFM training with supervision of PT
- Control group received only verbal advice or written information on PFM training from the midwife
- The initial beneficial effect of supervised PFM training on SUI did not continue for a long term despite majority claiming to still perform PFM
- Author's Conclusion: These findings are in keeping with those of other studies and raise concerns about the long term efficacy of PFM ex

Study re: Incontinence and PFM Strength

Pelvic-Floor Strength in Women With Incontinence as Assessed by the Brink Scale; Physical Therapy; Oct 2007; Vo 87(10)

- Purpose- compare pfm strength using the Brink score to pt. variables of UI/FI, pad test, urodynamics and bladder diaries
- A total of 655 women enrolled in the SISTEr study(ongoing randomized surgical trial for 2 types of SUI surgery options) had PFM strength tested using the Brink score
- Found no relationship between PFM strength and SUI severity measures
- Found no relationship between PFM strength and number of vaginal deliveries after controlling for age and other factors
- Confirmed previous study findings of decrease strength and thinning of PFM often occurs with aging

Bladder Training & BF w/ UUI

Behavioral training w and w/out BF in the treatment of UI in older women: a randomized controlled trial; JAMA 2002; 228(18)

- Random clinical trial with 222 adult participants and c/o urge incontinence
  - Treatment group #1-behavioral training and BF
  - Treatment group #2-behavioral training w/out BF
  - Treatment group #3-behavioral training w/ written info only
- Conclusion-All groups were effective in helping pts identify PFM and using them with urge symptoms; BF did not effect the efficacy more than careful training with verbal feedback but did have better outcomes in the pt's perception of and satisfaction with progress

FES and OAB

Efficacy of physical therapeutic modalities in women with proven bladder overactivity; Eur Urol 2002; 41(6)

- 68 participants with c/o urgency, frequency/nocturia and UUI in a random clinical trial
- Assigned in 3 treatment groups for 9 wk interventions
  - #1-pfm exercise and bladder training
  - #2-office and home FES vaginally delivered at 100 mA at a maximally tolerated levels
  - #3-Office-based FES and PFM exercise
  - #4-Control group-no treatment
- Conclusion-the group with FES treatment only was significantly effective in decreasing OAB

Cochrane Review

Bladder Training for UI in Adults; Wallace & Williams; updated 3/15/2006

- Review of 12 trials were eligible and included 1473 participants (primarily female)
- Five primary outcomes included participant's perception of cure or improvement, # of incontinent episodes and total voids and QOL
- When comparing bladder training(increasing intervals between voids) with no treatment-no stat. difference
- Coupled with other treatment
  - PFM ex, BF and bladder training vs. PFM and BF; both had stat significant improvement for "improvement and QOL" favoring group that included bladder training but findings not sustained after 3 months

Cochrane Review, cont

- 3 trials comparing bladder training and the drugs oxybutynin (Ditropan) and imipramine plus flavoxate
  - Perception of cure and QOL favored bladder training but # of daytime voids favored drug treatment
- Limited evidence available suggests that bladder training may be helpful but conclusion tentative as trials were variable in quality with small size with wide confidence intervals. Studies coupling bladder training did not provide enough evidence to be definitive proof of effectiveness

Cochrane Review

PFM training versus no treatment, or inactive control treatments, for urinary incontinence in women; Dumouline, Hay-Smith; 11/10/2009

- 12 trials involving 672 women
- Women who did PFMT more likely to report improvement or cure, with improved quality of life and overall fewer incontinence episodes per day and less leakage on office-based pad test
- No serious adverse effects noted
- Review provides support for the widespread recommendation that PFMT be included in the first-line approach to all types of UI
- The approach was more successful in women w/ SUI

Cochrane Review

Weighted vaginal cones for urinary incontinence; Herbison & Dean 6/24/07

- 17 small studies reviewed involving 1,484 women
- Vaginal weights (weighted cones) to address SUI was more effective than no treatment but not significantly better than pfm exercises alone or ES of pfm
- Conclusion-
  - Treatment options viewed as unpleasant or difficult by women, thus limiting the application
  - Studies were only short term and thus limited in that long term benefits/results not available

Missing Research

- If emerging evidence strongly links UI and other issues of FI, chronic constipation and OAB symptoms, then efficacy of LBP treatment more relevant to discussion
- Specific studies comparing treatment of the spine to conventional Women's Health PT interventions does not exist
- Overview of efficacy of LBP and application to the pregnant client begins to link cause and effective treatment
- Best practice of LBP-recent presentation at CSM

Efficacy of Spinal Extension Exercise

The Spine Journal; 2008; Evidence-informed management of CLBP w/ lumbar ext. strengthening exercises

- A systematic review of literature using the Cochrane Back Review Group criteria
- All 11 studies met the following criteria
  - RCTs
  - Adult pts with chronic LBP (CLBP) > 12 wks
  - Lumbar ext exercises per standards outlined in article
  - Ex was supervised in clinic
  - Prescription of exercise clearly defined
  - If interventions were used in combination the effects of lumbar strengthening could be partitioned
  - Clinical outcome data available

Spinal Exercise Study(con't.)

- Conclusions
  - Enhances the structural integrity of lumbar spine and improves the metabolic exchange of lumbar discs through repititive motion
  - In the short term, lumbar ext. ex administered alone was more effective than no treatment and more effective than most passive modalities in improving pain and disability; in long term, some of these benefits are lost
  - Hyperextension during dynamic lumbar ext did not offer additional benefits compared ext to neutral
  - High intensity lumbar ext. strengthening superior to low-intensity

Summary

- Emerging research correlates LBP with bowel and bladder dysfunction
- Physical Therapy needs to be the provider of choice and the first level of intervention for these conditions
- Need to be certain that we are looking at the cause of the issues and not just symptoms
- Imperative that we evaluate and integrate evidence of most effective treatment of the spine

CASE STUDIES

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