Biofeedback for Pelvic Floor Muscle Re-education

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Objectives

• Describe the role of bio-feedback in strengthening the pelvic floor muscles in pelvic floor rehab
Overview

- Pelvic Floor Rehabilitation includes treatment for men and women with incontinence and/or pain in the pelvic region. This includes abdominals, buttocks, pelvic floor, tailbone, vagina, rectum, penis, or testicles.
- The pelvic floor are skeletal muscles that may become weak, tight or spastic as a result of disuse, surgery, or trauma.
- Physical Therapists are specially trained to rehabilitate the pelvic floor muscles and work with patients to develop and individualized plan of care.

Who is Pelvic Floor Rehabilitation for?

- People with incontinence of urine or stool with:
  - Coughing
  - Sneezing
  - exercising
- Women with:
  - Increased tension in pelvic floor muscles
  - Vaginal pain with intercourse, tampon use or tight clothing
- Men with:
  - Chronic genital or groin pain
  - Frequent urination
  - Burning with urination (diagnosed or chronic prostatitis)
Requirements for Pelvic Floor Rehabilitation

- Intact nervous system
- Intact urinary system
- Cognitive abilities to recognize the need to pass urine
- Identify proper places to urinate
- Physical skills to get there and undress
- Motivation/ compliance

What does Pelvic Floor Rehabilitation Involve?

*Evaluation & Non-surgical Treatment*

- Flexibility and strength assessment
- Pelvic floor muscle surface EMG (or biofeedback)
- Manual muscle testing (internal or external)
- Postural exercises
- Internal/ and external massage
- Myofascial release
- Relaxation techniques and diaphragmatic breathing
- Development of an individualized home exercise program
Urogenital Triangle

- **Bony Boundary**
  - Pubic symphysis
  - Pubic rami
  - Ischial tuberosities
  - Superficial transverse perineal muscles

- **Urogenital Triangle Muscles**
  - Superficial Muscle Layer
  - Deep Muscle Layer

http://www.studyblue.com/notes/note/n/laboratory-5-muscular-system-quiz.deck/739806
Urogenital Triangle

Anal Triangle

- Bony Boundary
  - Coccyx
  - Sacrotuberous Ligament
  - Gluteus Maximus
  - Superficial transverse perineal muscles

- Anal Triangle
  - External anal sphincter
  - Internal anal sphincter
Urogenital Triangle

- Pubic Symphysis
- Ischiopubic ramus
- Ischial tuberosity
- Sacrotuberous Ligament

Anal Triangle

- Coccyx

Normal Continence

**Continence requires:**
- Contraction of puborectalis
- Maintenance of anorectal angle
- Normal rectal sensation
- Contraction of sphincter

**Defecation requires:**
- Relaxation of puborectalis
- Straightening of anorectal angle
- Relaxation of sphincter

http://www.clevelandclinic.org/health/articles/478
Biofeedback

• The process of gaining greater awareness of many physiological functions by primarily using instruments that provide information on the activity of those same systems with a goal of being able to manipulate them at will \(^{(1)}\)

• Biofeedback only affects existing responses

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Biofeedback

• Biofeedback may be used to improve health, performance, and the physiological changes which often occur in conjunction with changes to thoughts, emotions, and behavior. Eventually, these changes may be maintained without the use of extra equipment \(^{(2)}\)
Biofeedback

- Research has shown that biofeedback can improve the efficacy of pelvic floor muscle (PFM) exercises and help restore proper bladder functions.\(^{(13)}\)
  - The literature presents evidence for the efficacy and effectiveness of pelvic floor muscle training performed together with adjunctive therapies (biofeedback, vaginal cones, electrical stimulation) as being greater than pelvic floor exercises performed alone (or using behavioral therapy alone).\(^{(3)}\)\(^{(4)}\)\(^{(5)}\)\(^{(12)}\)

Biofeedback

- Contradicting this, a 2013 randomized controlled trial found no benefit of adding biofeedback to PFM exercise in stress urinary incontinence.\(^{(11)}\)
- Another randomized controlled study in 2011 found no benefit from the addition of biofeedback and electrical stimulation in decreasing incontinence episodes following radical prostatectomy over behavioral therapy alone.\(^{(15)}\)
Biofeedback

• The rationale for teaching PFM exercises with biofeedback include (6):
  – Weak muscles give off limited proprioceptive sensations needed to gauge the effectiveness of the contraction
  – When PFM’s are weak, there is a strong tendency to substitute abdominal and gluteal contractions which gives faulty feedback for the desired contraction
  – When PFM exercises are performed inaccurately, there is no change in muscle function which reduces motivation
  – Effective training improves the PFM coordination needed to counteract sudden increases in abdominal pressure

Biofeedback

• Types of biofeedback
  – Electromyograph (EMG)
  – Surface EMG (SEMG)
  – Perineometer
  – Vaginal Weights/ Cones
EMG/ SEMG

- An electromyograph (EMG) uses surface electrodes to detect muscle action potentials from underlying skeletal muscles that initiate muscle contraction.
- Clinicians recorded the surface electromyogram (SEMG) using one or more target muscles and a reference electrode that is placed within six inches of either active electrode. (7) (8)
  - The SEMG is measured in microvolts.

Internal Sensors
External Sensors
External Electrode Placement

- Urethral opening
- Vagina
- Anus

Perineometer

- The perinometer is inserted into the vagina to monitor PFM contraction and can be used to enhance the effectiveness of Kegel exercises. (10)

Vaginal Weights/Cones

- Studies have shown that biofeedback obtained with vaginal cones is as effective as biofeedback induced through physiotherapy electrical stimulation. (13)
Food for Thought

- Recent 2012 study examined self-efficacy in performing PFM exercises in young women age 18-30 (16)
  - Using the Broome Pelvic Muscle Exercise Self-Efficacy Scale (PMSES) for data collection
  - Results suggest a high confidence that they are performing PFM exercises correctly
  - No actual muscle testing was performed in conjunction to measure perception along with actual ability

- Another 2013 study explored young women’s perceived educational needs regarding urinary incontinence among young women aged 18-30 (17)
  - 15% women surveyed indicated that they experience urinary incontinence
    - 31.9% of these women said they would consider seeking professional help
  - 71% women felt women were not able to talk about urinary incontinence freely
  - 51% were aware that there are professionals to help with urinary incontinence
    - Subject with incontinence were less aware of these services
  - Most women indicated they would not seek professional help for the condition

Cleveland Clinic Appointments

- **Brunswick Family Health Center**
  - 3574 Center Road
    - Brunswick, Ohio 44212
    - 330.225.8886

- **Cleveland Clinic Main Campus**
  - C Building - W.O.Walker Center
    - 10524 Euclid Ave. - Desk C22
    - Cleveland, OH 44195
    - 216.445.8000

- **Hillcrest Medical Building Atrium**
  - 6770 Mayfield Road - Colorectal Suite #348
    - Mayfield Heights, OH 44124
    - 440.312.7111
Cleveland Clinic Appointments

- **Lakewood YMCA**
  - 16915 Detroit Ave.
  - Lakewood, OH 44107
  - 216.227.2610

- **Westlake Medical Campus**
  - 850 Columbia Road Suite 110
  - Westlake, OH 44145
  - 440.250.5767

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