Treating Incontinence After Prostate Cancer Surgery

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UroToday

Post-prostatectomy Urinary Incontinence (UI)

- One of the most feared complications
- Has been shown to be an independent predictor of global quality of life (QOL)
- Prevalence ranging from 2 to 90%
- Typically decreases over time
  - 5–20% of men will continue to have some degree of incontinence 1–2 years after surgery

Anderson et al, (2015) Conservative management for postprostatectomy urinary incontinence. Cochrane Database Syst Rev 1:CD001843. https ://doi.org/10.1002/14651 858.CD001 843.pub5

Bauer (2011) Contemporary management of postprostatectomy incontinence. Eur Urol 59(6):985–996

Reynolds et al (2010) Analysis of continence rates following robot-assisted radical prostatectomy strict leak-free and pad-free continence. Urology 75(2):431–438

Recent Research: Post-prostatectomy UI

- Men undergoing prostatectomy surgery:
  - Reported clinically meaningful worse incontinence through 5 years compared with all other options
- Men undergoing prostatectomy for unfavorable-risk disease
  - Reported worse sexual function at 5 years compared with men who underwent EBRT with ADT.

Hoffman, Penson, et al Patient-Reported Outcomes Through 5 Years for Active Surveillance, Surgery, Brachytherapy, or External Beam Radiation With or Without Androgen Deprivation Therapy for Localized Prostate Cancer. JAMA. 2020 Jan 14;323(2):149-163

Post prostatectomy UI

- Detrusor instability in 33.7%.
  - Predominant cause of incontinence in 6/83 (7.2%) of patients.
- Low urethral compliance noted in 30.1% of cases and usually associated with scarring

Groutz et al, J.Urol. 163:1767, 2000

Pelvic Floor Muscle Training (PFMT)

The Evidence!

6th ICI: Adult Conservative Management International Consultation on Incontinence

Intervention	Recommendation	Grade
PFMT in men post-prostatectomy	Some preoperative or immediate post-operative instruction in PFMT for men undergoing radical prostatectomy may be helpful It is not clear whether PFMT taught by DRE offers any benefit over and above verbal or written instruction in PFMT The use of BF to assist PFMT is currently a clinician/patient decision based on economics and preference	**B**

Dumoulin, Adewuyi, Booth, Bradley, Hagen, Hunter, Imamura, Morin, Morkved, Thakar, Wallace, Williams, Adult conservative management. In Abrams, Cardozo, Wein, Wagg (Eds.): Incontinence: Proceedings from the 6th International Consultation on Incontinence. Proceedings from the 6th International Consultation on Incontinence. Bristol UK: 2017:1443- 1628

Table 2 Characteristics Of Trials Included In The Review

Authors/Year	Country	Age Of Participants (yr)	Sample Size	Time Of Interventions	Type Of Surgery	Intervention And Study Design	Outcome Measures	Results
Centemero A, et al, 2010[8]	Italy	46–68	N=118; EG=59; CG=59	1-month pre-RP, 1-month post-RP	RP	EG - preoperative and postoperative PFMT (supervised 2x week, 30 mins and 30 mins at home, maximal and submaximal contr); CG - postoperative unsupervised PFMT	BMI; s-PSA; clinical T stage; Gleason score; 24 hrs pad test; 3d Bladder Diary; ICS male SF; MMSE; assessment in 1,3 months post-RP	Preoperative PFMT improved early continence and QoL outcomes after RP
Dubbelman et al, 2012[9]	The Netherlands	60–67	N=66; EG=33; CG=33	26 weeks post-RP	RRP	EG - PFMT (supervised, 2x week, 30 mins); CG - unsupervised PFMT	24-hr pad test; UD; DOA assessment 1,2,3,6,12 months post-RP	More intensive PFMT might have a lowering effect on bladder outflow resistance after RRP

Abbreviations: EG, experimental group; CG, control group; PFMT, pelvic floor muscle training; RP, radical prostatectomy; RRP, radical retropubic prostatectomy; BMI, body mass index; s-PSA, serum prostate-specific antigen; contr, contractions; HRQoL, health-related quality of life questionnaire; UCLA-PCI, University of California, Los Angeles Prostate Cancer Index; SF-12, Short Form-12; ICS male SF, International Continence Society male Short Form; MMSE, Mini Mental State Examination; SF-36, Medical Outcomes Study 36-item Short Form; QoL, quality of life, ICIQ, the International Consultation on Incontinence Questionnaire; BDI, Beck Depression Inventory; UD, urodynamic examination; DOA, detrusor overactivity; PPUI, post-prostatectomy urinary incontinence; VAS, visual analogue scale.

Strączyńska et al The impact of pelvic floor muscle training on urinary incontinence in men after radical prostatectomy (RP) - A systematic review, Clin Interv Aging. 2019 Nov 12;14:1997-2005. doi: 10.2147/CIA.S228222

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Authors/Year	Country	Age Of Participants (yr)	Sample Size	Time Of Interventions	Type Of Surgery	Intervention And Study Design	Outcome Measures	Results
Filocamo MT, et al, 2005[10]	Italy	45–75	N=300; EG=150; CG=150	12 months post-RP	RRP	EG- PFMT (unsupervised, at home, 10 contr 5 sec 3x daily in sitting, standing, and squatting position and going up and down stairs); CG - no treatment	1 hr and 24 hrs pad test; UD; bladder diary; s-PSA; clinical T stage; assessment 1,3,6,12 months post-RP	After RRP an early supportive rehabilitation program like PFMT significantly reduces continence recovery time
Manassero F, et al, 2007[11]	Italy	67.3 (range not reported)	N=94; EG=54; CG=40	3 months post-RP	RRP	EG - PFMT (unsupervised, at home, 3x daily 15 contr in supine, sitting, standing position and daily activities); CG - no treatment	24-hr pad test; s-PSA; clinical T stage; VAS; a single question of QoL; assessment 1,3,6,12 months post-RP	The early intensive prolonged PFMT can further increase the number of continent patients, and this improvement carries on in the first 12 months.

Abbreviations: EG, experimental group; CG, control group; PFMT, pelvic floor muscle training; RP, radical prostatectomy; RRP, radical retropubic prostatectomy; BMI, body mass index; s-PSA, serum prostate-specific antigen; contr, contractions; HRQoL, health-related quality of life questionnaire; UCLA-PCI, University of California, Los Angeles Prostate Cancer Index; SF-12, Short Form-12; ICS male SF, International Continence Society male Short Form; MMSE, Mini Mental State Examination; SF-36, Medical Outcomes Study 36-item Short Form; QoL, quality of life, ICIQ, the International Consultation on Incontinence Questionnaire; BDI, Beck Depression Inventory; UD, urodynamic examination; DOA, detrusor overactivity; PPUI, post-prostatectomy urinary incontinence; VAS, visual analogue scale.

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Nilssen SR, et al, 2012[12]	Norway	48–72	N=85; EG=42; CG=43	12 months post-RP	RRP	EG - PFMT (supervised, 1x week 45 mins) 3x 10 contr. daily x 6–8 s and last 3–4 fast contr. at home in supine, sitting, and standing position; CG - unsupervised PFMT	BMI; s-PSA; clinical T stage; Gleason score; digital and palpation exams to assess muscle strength; HRQoL (urinary, sexual and mental function); UCLA-PCI; SF-12; assessment in 6 weeks, 3,6,12 months post-RP	PFMT after RP improved postoperative urinary incontinence significantly compared to those patients receiving standard care/training, this was not reflected in better outcome in HRQoL parameters
Overgard M, et al, 2008[13]	USA	>65	N=51; EG=26 CG=25	12 weeks post-RP	RP	EG - (resistance, flexibility and PFMT; 2x week 60 mins); CG - PFMT	BMI; s-PSA; clinical T stage; Gleason score; 24-hr pad test; 3d Bladder Diary; ICS male SF; MMSE; ICIQ, Beck Depression Inventory, Study 36-item short-form health survey (SF - 36); assessment in 1 month before and 3, 15 weeks post-RP	Exercise intervention improves the continence rate and the quality of life after RP. These exercise intervention effects could contribute to achieving prompt recovery of daily living

Abbreviations: EG, experimental group; CG, control group; PFMT, pelvic floor muscle training; RP, radical prostatectomy; RRP, radical retropubic prostatectomy; BMI, body mass index; s-PSA, serum prostate-specific antigen; contr, contractions; HRQoL, health-related quality of life questionnaire; UCLA-PCI, University of California, Los Angeles Prostate Cancer Index; SF-12, Short Form-12; ICS male SF, International Continence Society male Short Form; MMSE, Mini Mental State Examination; SF-36, Medical Outcomes Study 36-item Short Form; QoL, quality of life, ICIQ, the International Consultation on Incontinence Questionnaire; BDI, Beck Depression Inventory; UD, urodynamic examination; DOA, detrusor overactivity; PPUI, post-prostatectomy urinary incontinence; VAS, visual analogue scale.

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Authors/Year	Country	Age Of Participants (yr)	Sample Size	Time Of Interventions	Type Of Surgery	Intervention And Study Design	Outcome Measures	Results
Park SW, et al, 2012[14]	USA	>65	N=51; EG=26 CG=25	12 weeks post-RP	RP	EG - (resistance, flexibility and PFMT; 2x week 60 mins); CG - PFMT	BMI; s-PSA; clinical T stage; Gleason score; 24-hr pad test; 3 d Bladder Diary; ICS male SF; MMSE; ICIQ, Beck Depression Inventory, Study 36-item short-form health survey (SF - 36); assessment in 1 month before and 3, 15 weeks post-RP	Exercise intervention improves the continence rate and the quality of life after RP. These exercise intervention effects could contribute to achieving prompt recovery of daily living
Patel MI, et al, 2013[15]	Australia		N=284; EG=152; CG=132	4 weeks pre-RP; 3 months post-RP	RRP	EG - preoperative and postoperative PFMT (supervised, 10 contr 10 s in each sitting, standing, and lying position); CG - postoperative unsupervised PFMT;	24-hr pad test; 6 weeks and 3 months post-RP, s-PSA; clinical T stage; Gleason score	Postoperative PFMT commenced 4 weeks before RRP has a clear advantage in improving both the severity and duration of PPUI

Abbreviations: EG, experimental group; CG, control group; PFMT, pelvic floor muscle training; RP, radical prostatectomy; RRP, radical retropubic prostatectomy; BMI, body mass index; s-PSA, serum prostate-specific antigen; contr, contractions; HRQoL, health-related quality of life questionnaire; UCLA-PCI, University of California, Los Angeles Prostate Cancer Index; SF-12, Short Form-12; ICS male SF, International Continence Society male Short Form; MMSE, Mini Mental State Examination; SF-36, Medical Outcomes Study 36-item Short Form; QoL, quality of life, ICIQ, the International Consultation on Incontinence Questionnaire; BDI, Beck Depression Inventory; UD, urodynamic examination; DOA, detrusor overactivity; PPUI, post-prostatectomy urinary incontinence; VAS, visual analogue scale.

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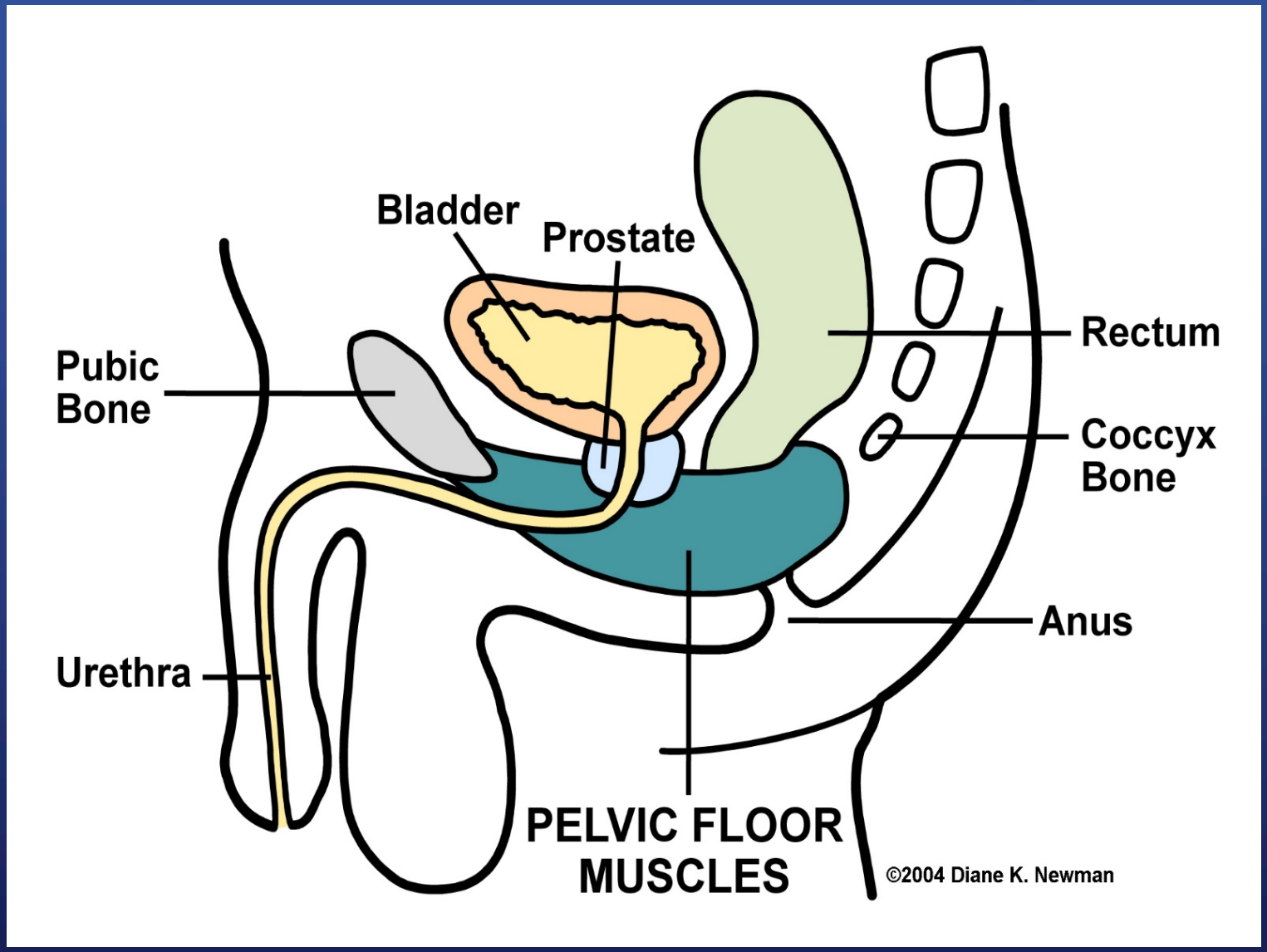
Pelvic Floor Muscle (PFM)



Pelvic Floor Muscle (PFM): Voluntary Striated/Skeletal Muscles

- **Type I** - slow twitch muscle fibers
- **Type II** - fast twitch muscle fibers
  - Stimulates increase in muscle fibre size (hypertrophy)
    - Hypertrophy not an immediate training response, but strength increases are noticed long before visible hypertrophy.
  - Increases muscle bulk.
  - Early improvements in strength result from neural adaptation including:
    - Greater number of activated motor units
    - Increased rate of motor unit excitation
    - More synchronised motor unit firing
    - More persistent activation of type II motor units

Pelvic Floor Muscle (PFM) Assessment

- Underactive
  - Weakness or lack of endurance of PFM contraction.
- Overactivity
  - Inability to relax the PFMs after a contraction, which was often but not necessarily accompanied by the presence of spasm and shortening of the pelvic floor musculature.
- Mixed (both underactive and overactive qualities)

Pelvic Floor Muscle Training (PFMT)

Exercises, Training, Rehabilitation

GOAL: To improve urethral resistance and urinary control through the active exercise of the PFM

Three Components:

- Proper identification of muscle
- Coordinate (contract and relax) a PFM contraction
- Planned active exercise
- Use of muscle during incontinent episode

Proposed Benefits of PFMT in SUI

- Intentional, effective PFM contraction (lifting the PFMs in a upward and forward direction) prior to and during effort or exertion clamps the urethra[1]
  - Increases urethral pressure preventing urethral leakage
- Bladder neck receives support from strong, toned PFM strength (resistant to stretching)[2,3,4]
  - Limits its downward movement during effort and exertion, thus preventing leakage.

1.DLlancey (1988) NUU 7; 509-519.
2.Bo, (2004) IUJPFD 15:76-84.
3.DeLancey (1998) NUU, 7:161-3.
4. Pechers, (2001) NUU, 20:269-75.

Women & Men have been taught to "*tighten your muscle down there*" but do not understand pelvic anatomy and function, know how to identify the muscle, and how to train it.

Kegel Exercises Alone are Often Inadequate

- In current practice, patients are often given a simple handout with limited explanation by their physician.
- Research indicates simple written and verbal instructions are inadequate (Burgio 1985).
- 30% perform incorrectly even with intensive instruction (Bump 1991)

Pelvic Floor Muscle Training

Training consists of 3 main components:

1. **Muscle training**
   - To improve function, tone, strength, and endurance
2. **Biofeedback**
   - To teach muscle identification and isolation for purposes of voluntary contraction and relaxation
3. **Neuromuscular re-education (skill training)**
   - To promote continence
   - To relieve bothersome urgency
   - To completely evacuate urine or feces during micturition and/or defecation

Advanced Clinical Practice

Pelvic Floor Muscle Rehabilitation Using Biofeedback

Diane K. Newman

The pelvic floor contains a group of muscles – pelvic floor muscles (PFMs) – that extend from the symphysis pubis (anterior) to the back (posterior) of the

Newman, D.K. (2014). Pelvic floor muscle rehabilitation using biofeedback. *Urologic Nursing, 34*(4), 193-202. doi:10.7257/1053-816X.2014.34.4.193

Pelvic floor muscle exercises have been r
since first described by obstetrician gynec

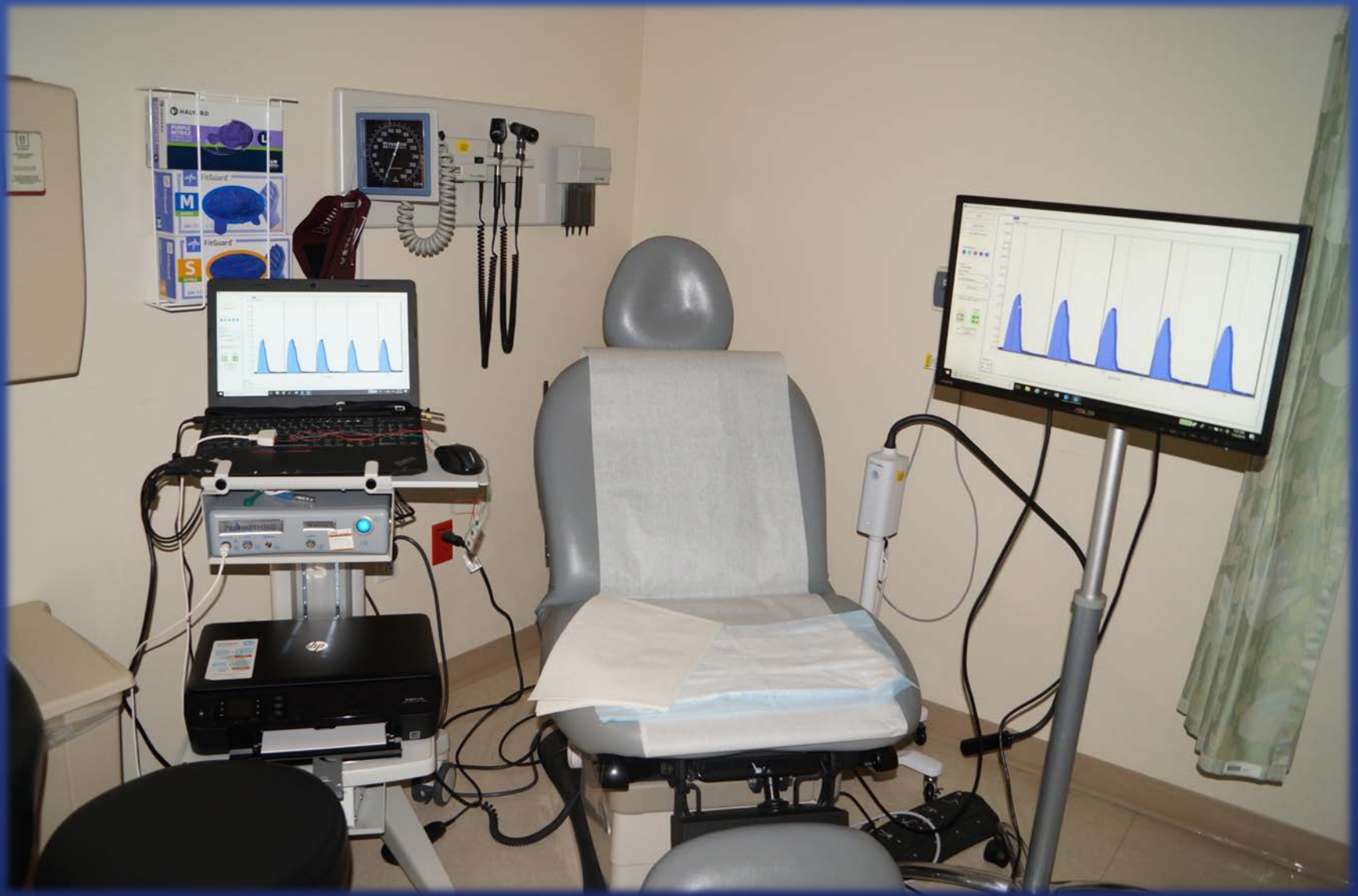
What is Biofeedback

- Is a painless, effective way to help a person identify and strengthen the pelvic floor muscles
- Can help the person locate the correct muscle (referred to as “muscle isolation”)
- Learn how to use them to prevent bladder leaks (urinary incontinence), bladder or bowel urgency, and frequency.

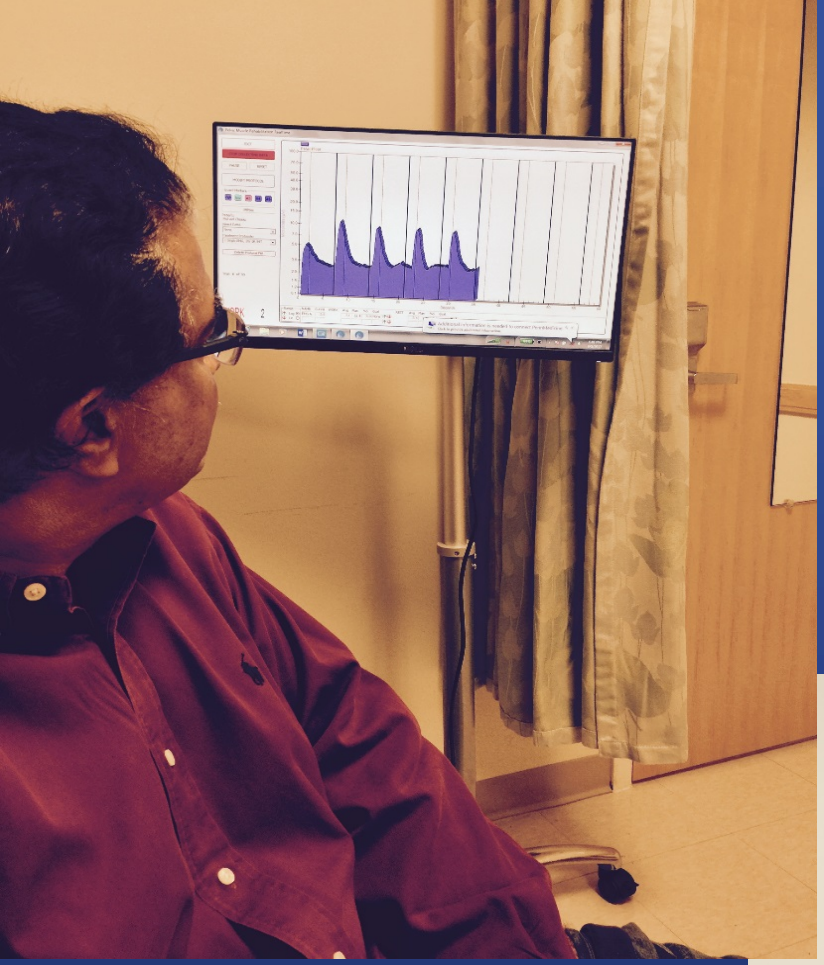
Has been shown to help 8 out of 10 people

What is Biofeedback-Assisted Pelvic Floor Muscle Training?

- Helps the person find the pelvic muscles by showing changes when squeezing the right muscle.
  - Much like an athlete uses special equipment to train; biofeedback can be used to reach a new level of strength in the pelvic muscles.
- Uses a computer that records muscle activity and a monitor so the person can visualize the improvement.



Prometheus Morpheus



Biofeedback-Assisted Pelvic Floor Muscle Training

EMG Biofeedback Defined

- The use of special instruments to measure the electrical activity of skeletal muscles.
  - In recent years, also called “surface EMG,” and sometimes abbreviated to “sEMG.”
- Increased electrical activity is a result of more muscle activity, however, it is not a measure of force.

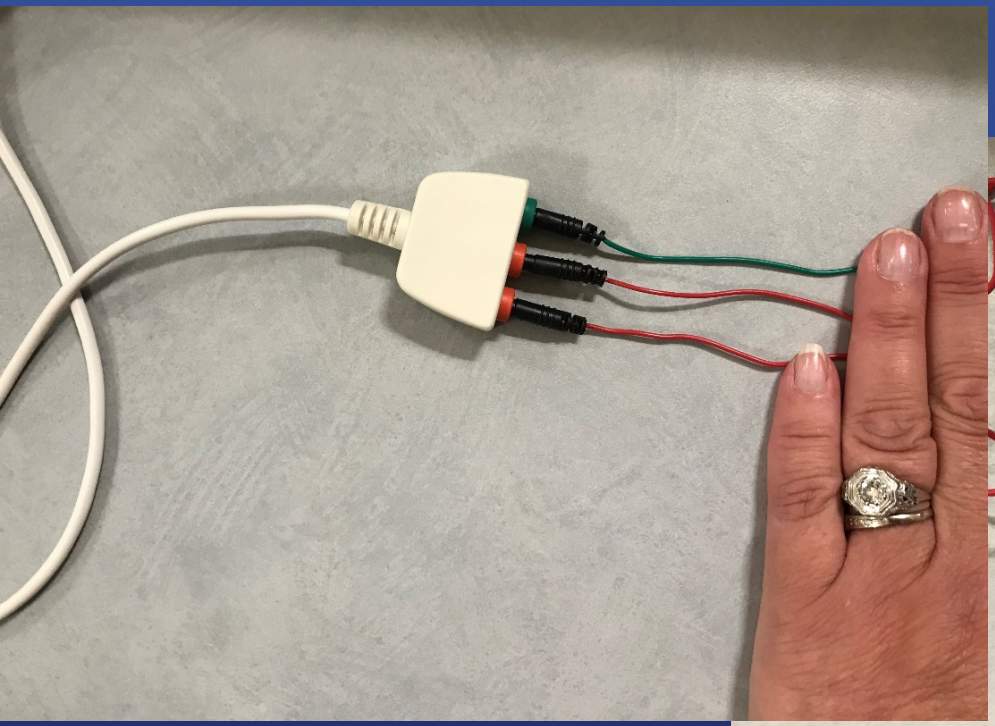
Newman, DK (2014). Pelvic floor muscle rehabilitation using biofeedback. [Review] *Urologic Nursing*. 34(4): 193-202.

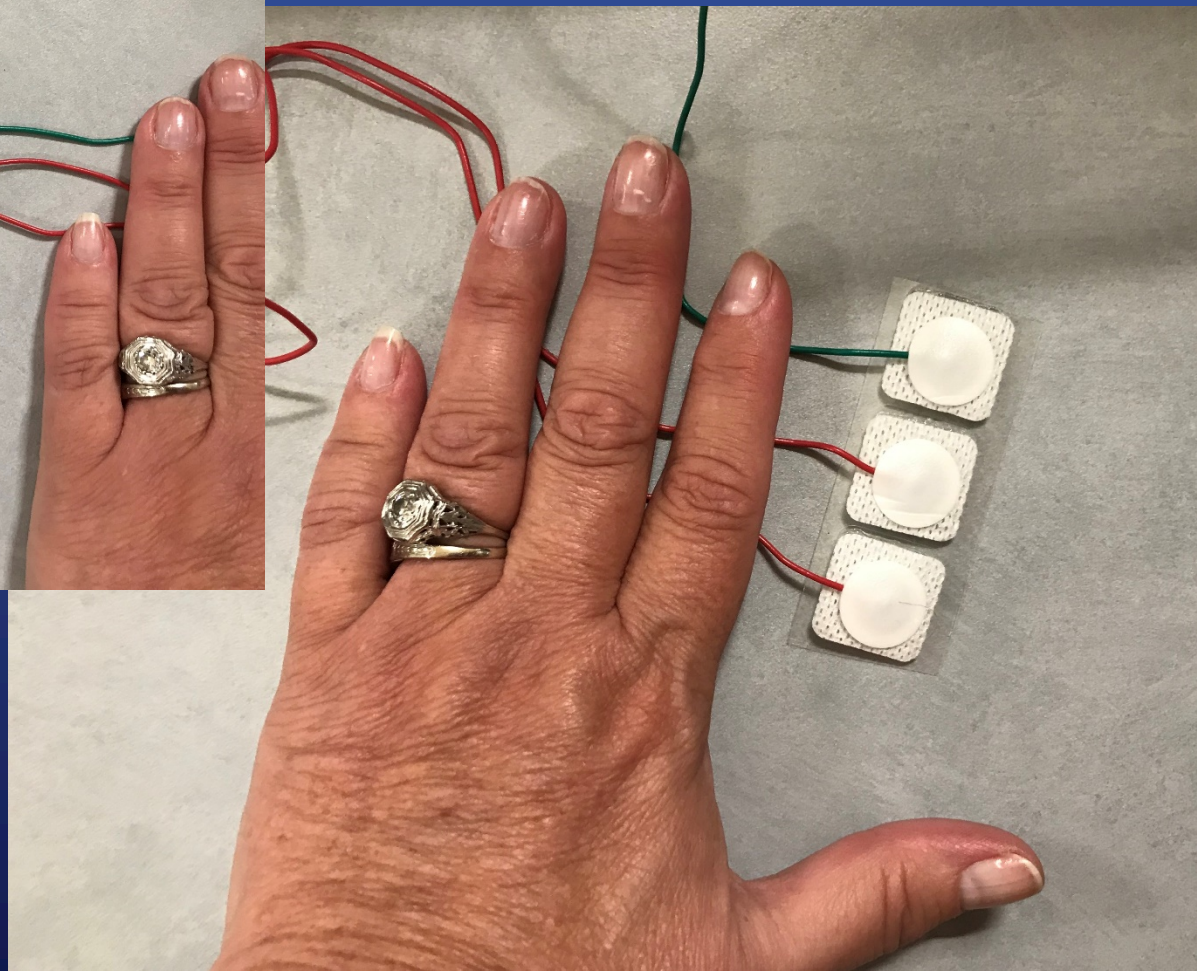
How does it work?

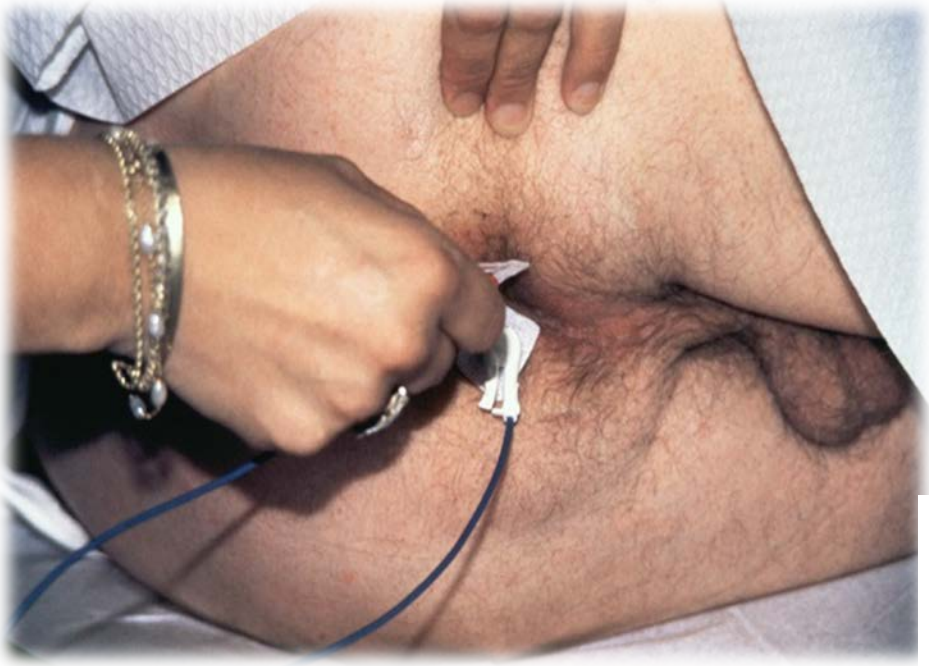
- Active electrodes
  - pick up data from the target muscle AND the background body noise and environmental noise
- Ground electrode
  - picks up the background body noise and environmental noise

Differential amplifier selectively amplifies the difference – the information from the target muscle.

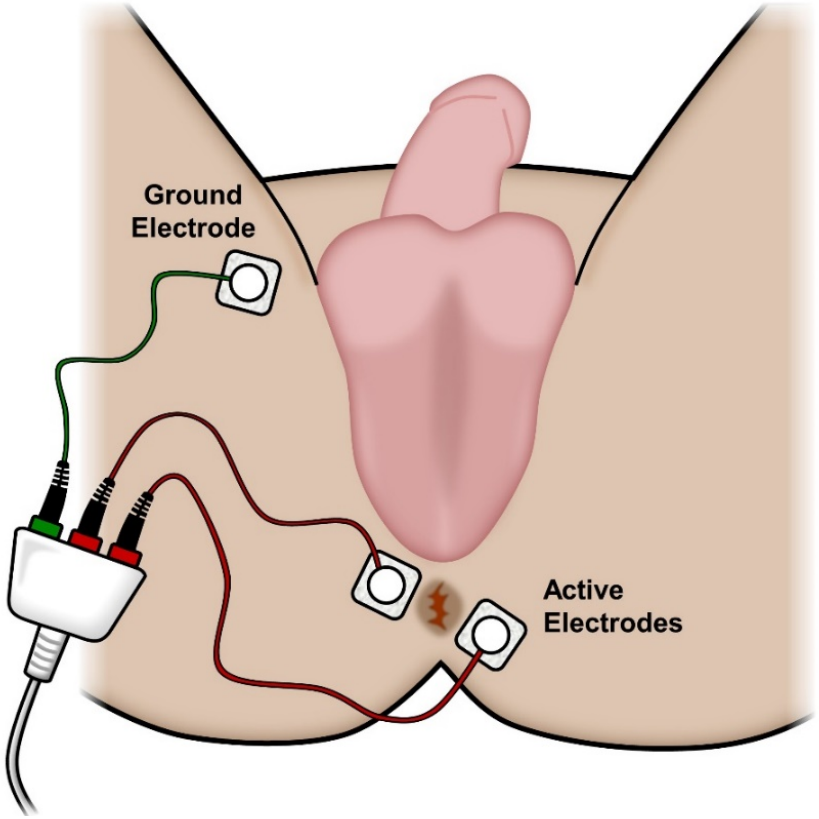
Surface Skin EMG (sEMG) Assessment



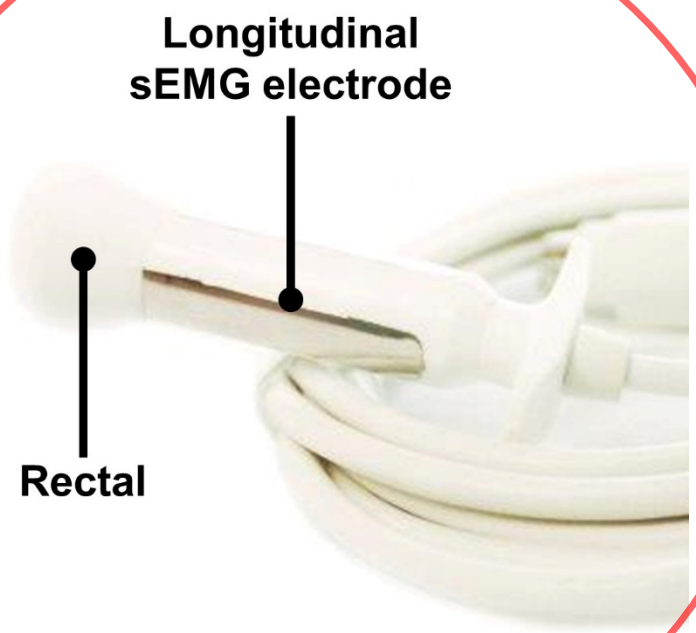




External skin placement: 9 and 3 o'clock or 10 and 4 o'clock positions

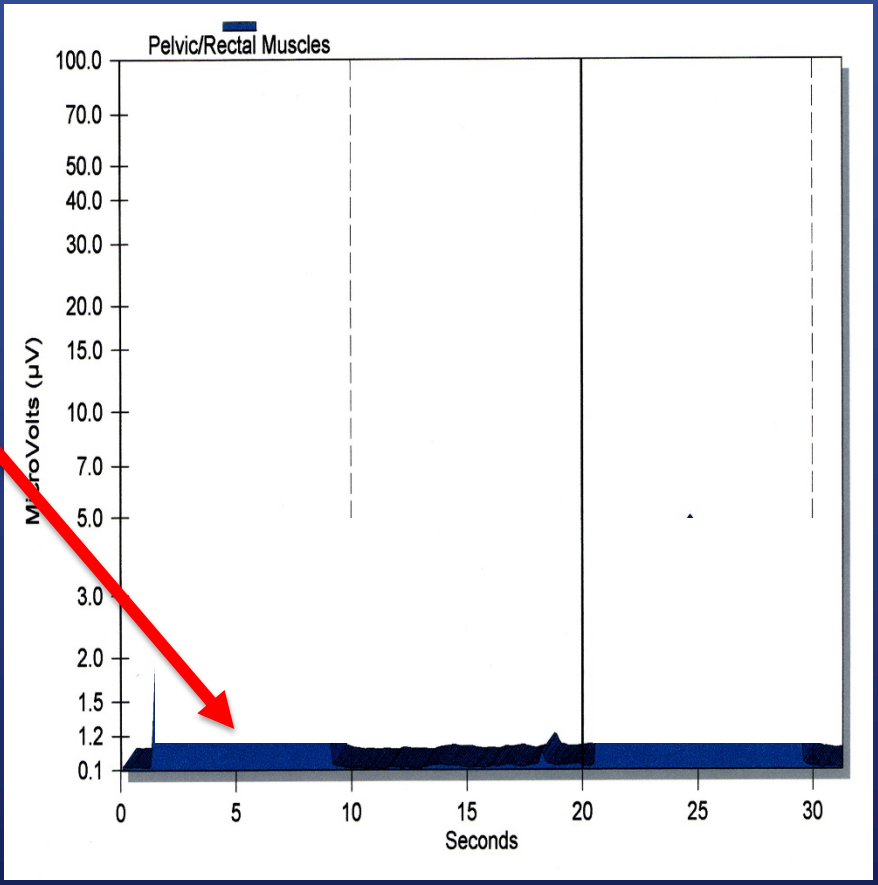


Single-use, Internal Sensors (Probes)



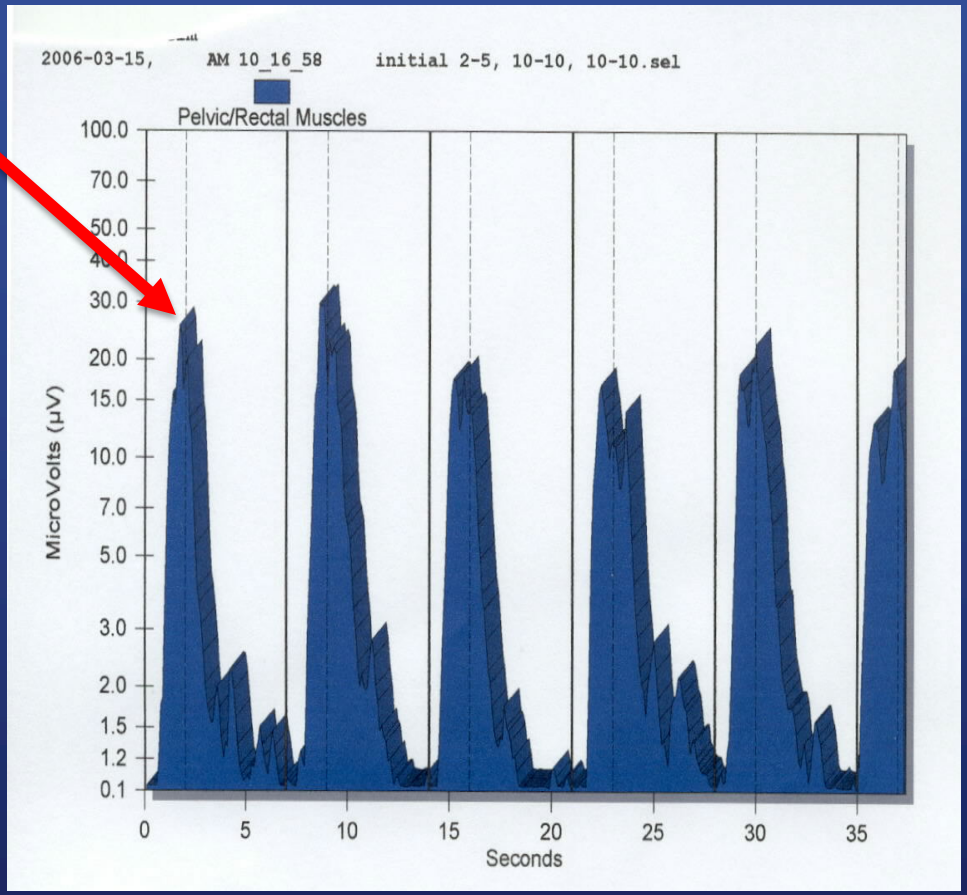
EMG Assessment of PFM

1. **Baseline Muscle Activity:** amount of microvolts generated by the target muscle during rest.



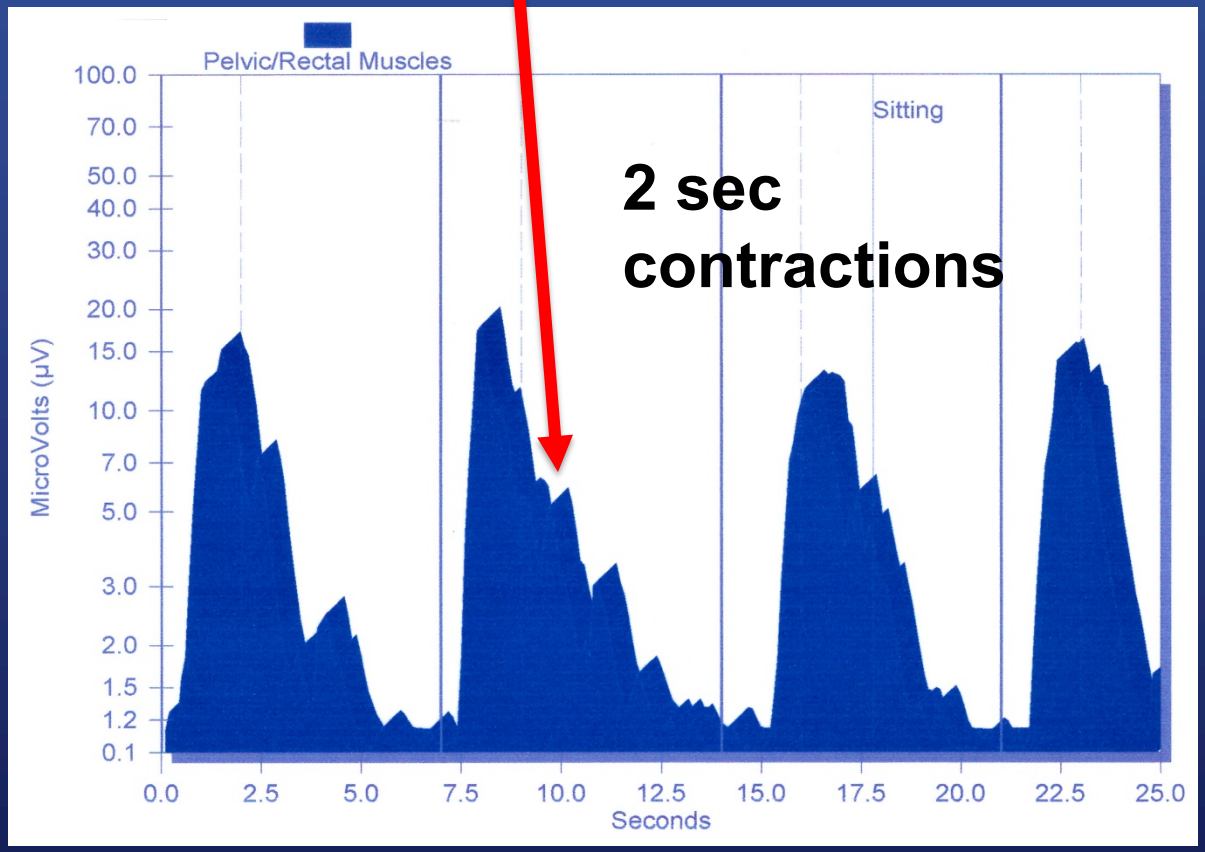
EMG Assessment of PFM

2. **Peak Microvolts:** the highest EMG amplitude achieved.



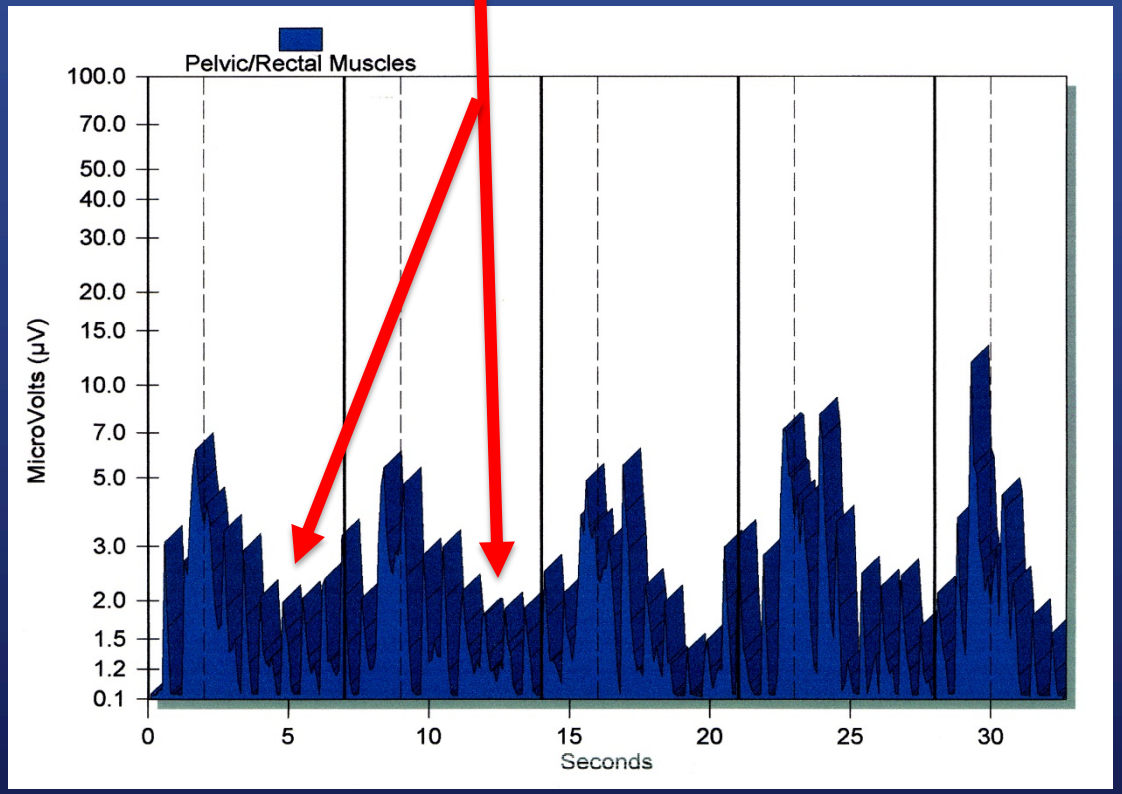
EMG Assessment of PFM

3. **Slow de-recruitment or slow latency to return to baseline:** slow relaxation of the muscle contraction.



EMG Assessment of PFM

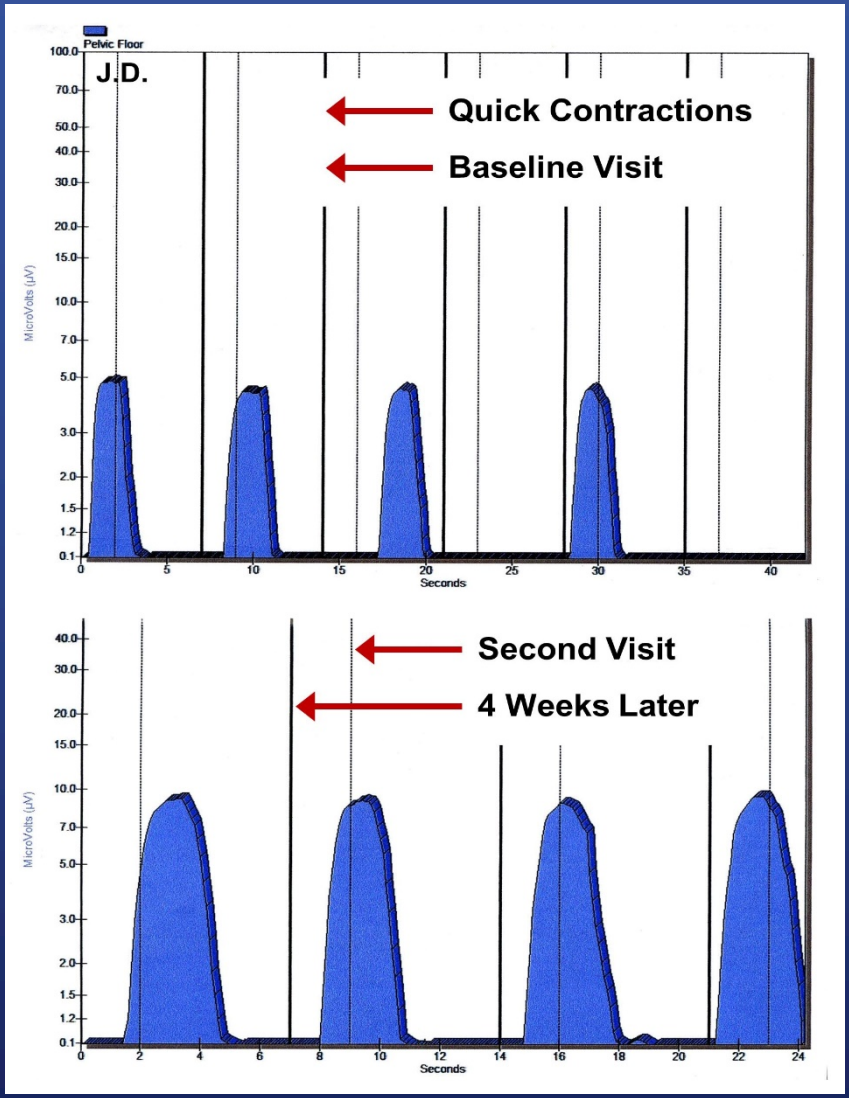
4. **Inconsistent Resting Baseline:** variation of baseline between contractions, between sets, or between days may be related to a change in patient symptoms, e.g., hypertonic PFM.

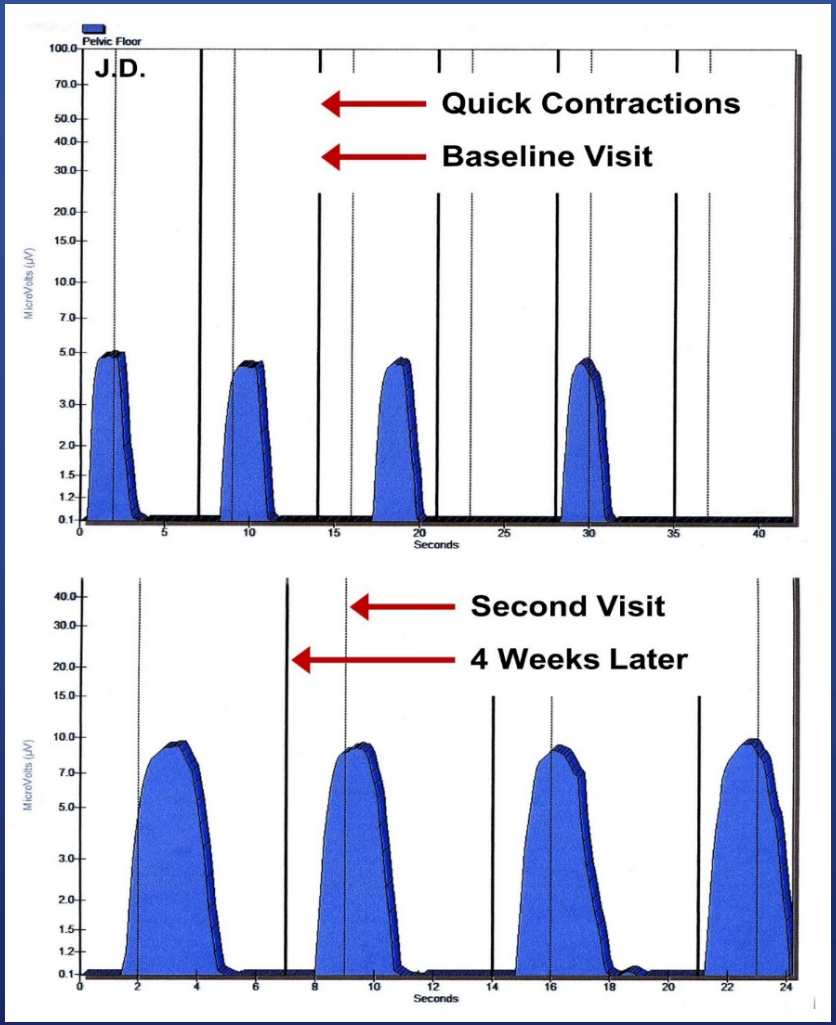


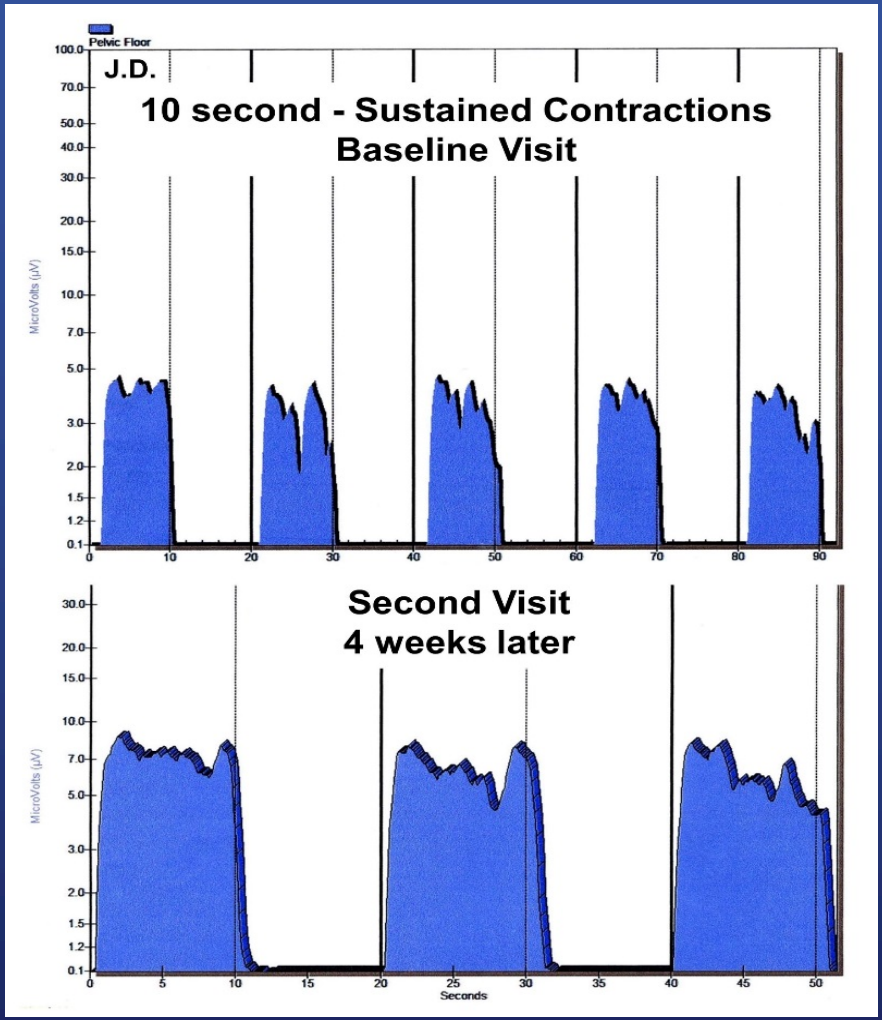
⇒ Sub-Maximum or "short/quick" muscle contractions of 2 seconds duration.

⇒ Muscle returns to resting of 2 to 5 second duration.

Quick – 2-second contractions at the baseline visits and 4 weeks later. Height of the contraction appear to have doubled from baseline to 1st visit.

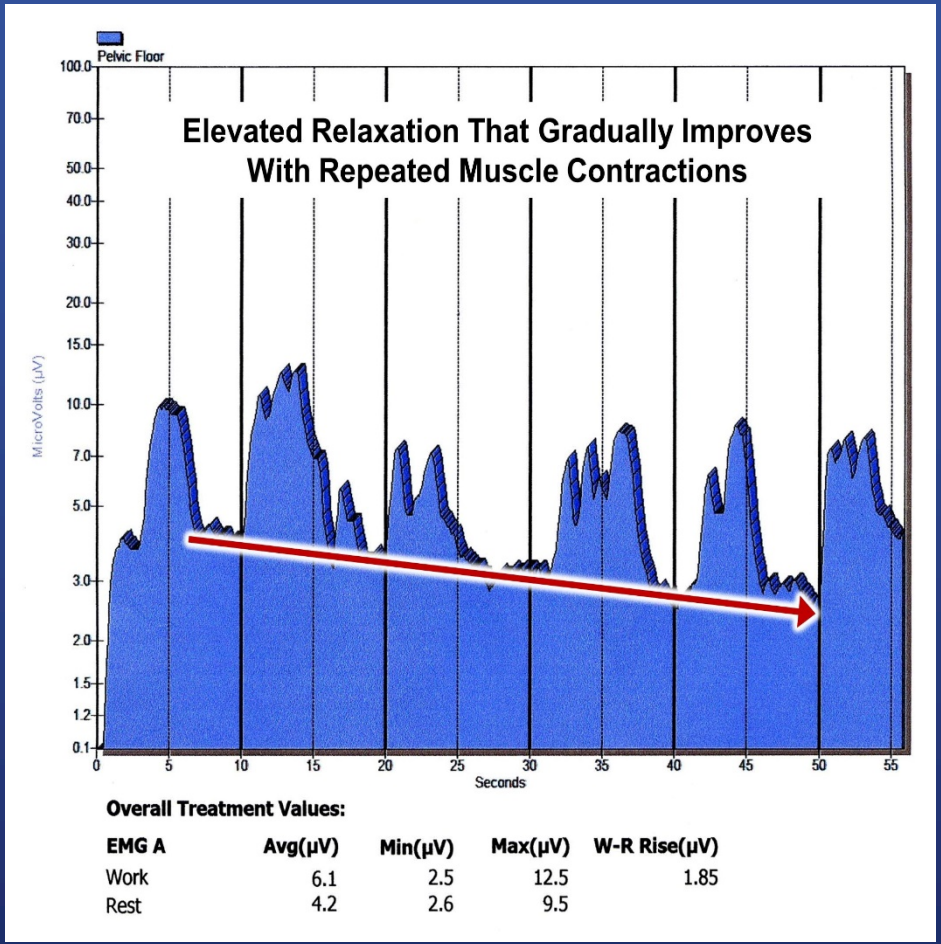


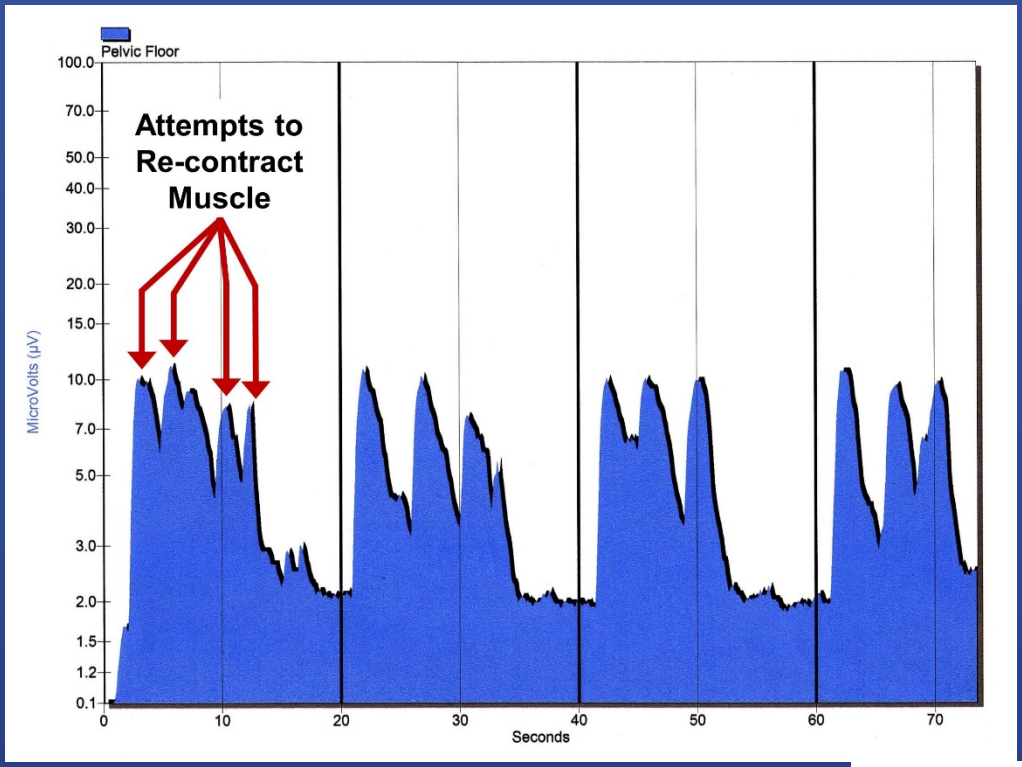

Pelvic Floor
J.D.
Quick Contractions
Baseline Visit
MicroVolts (µV)
Seconds
Second Visit
4 Weeks Later
MicroVolts (µV)
Seconds


Pelvic Floor
J.D.
10 second - Sustained Contractions
Baseline Visit
MicroVolts (µV)
Second Visit
4 weeks later
MicroVolts (µV)
Seconds

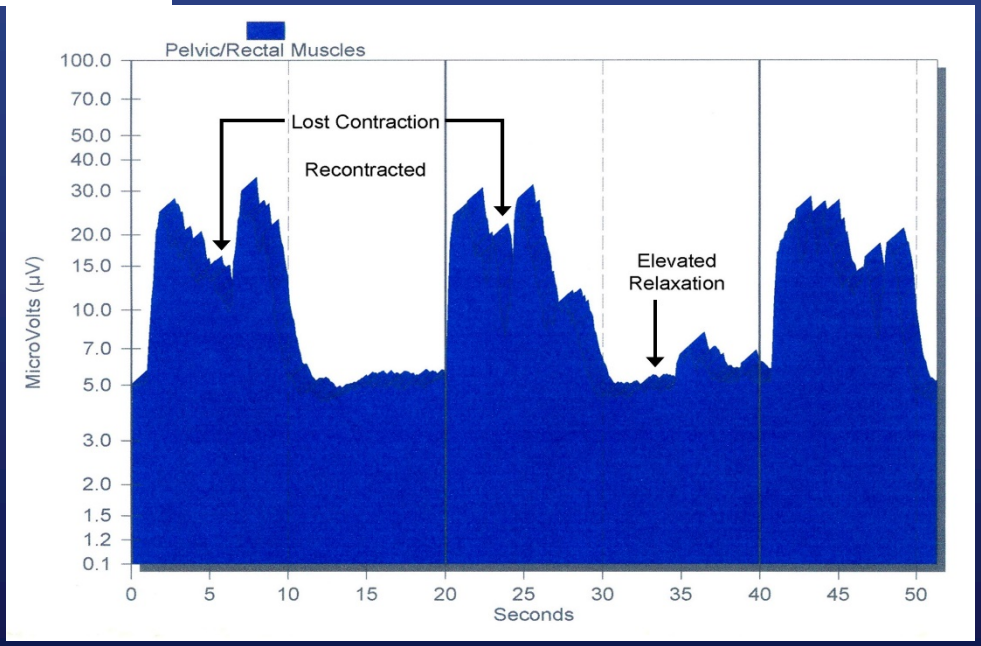
- Ability to relax PFM following a contraction is necessary to gain control and coordination of these muscles.
- At the beginning of therapy, most patients tend to have a higher resting rate (> 2 mvs)
- These numbers will gradually decrease to < 2 mvs as therapy progresses.

Resting average was 4.2 mvs but as patient continued through the session, relaxation improved.



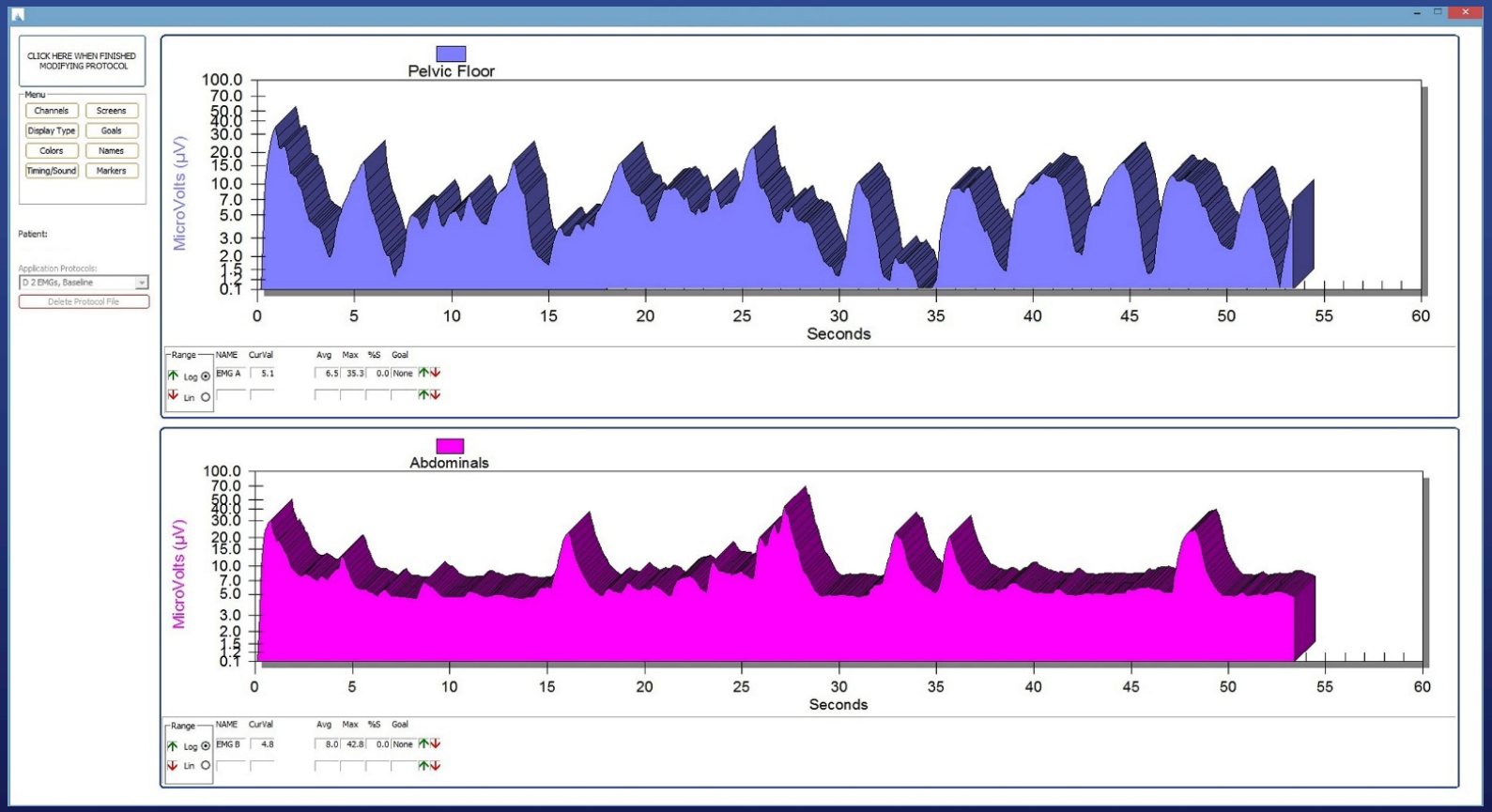


"Overactive PFM"



EMG Assessment of PFM

5. **Excessive accessory muscle contraction:** increased amplitude in accessory muscles often resulting in cross talk and is indicative of poor isolation of target muscle contraction.



When Can a Person See Improvement in Bladder Symptoms?

- Each biofeedback session is usually 20 to 30 minutes long
  - First visit may be as long as 45 minutes
  - Each visit includes counseling and education.
- Best results can take 3-6-months

An Effective PFMT Program

- Once they have mastered a muscle contraction in supine, It is practiced in sitting and standing.
  - Muscle function is position specific (more leakage standing)
- Is done consistently
- Works on Fast Twitch (quick flick) and Slow Twitch (longer holds) muscle fibers

Exercise Prescription Program "Penn Protocol"

Short Quick Exercise
Contract the muscle for 2 seconds and immediately relax.

Long Sustained Exercise:
Contract the muscle for a count of 10 seconds and immediately relax for a count of 10 seconds.

Be sure to rest your muscle after each muscle contraction for the same length of the contraction or longer.

Exercise Session
Lying Down
Do 10 exercises: 2 seconds SHORT/QUICK
Do 10 exercises: 5-10 seconds LONG

Sitting
Do 10 exercises: 2 seconds SHORT/QUICK
Do 10 exercises: 5-10 seconds LONG

Standing
Do 10 exercises: 2 seconds SHORT/QUICK
Do 10exercises: 5-10 seconds LONG

Do 2 exercise sessions each day

Total 120 exercises every day

Limitations of PFMT

- Requires patient motivation
- Knowledgeable provider
- Treatment is time intensive and success depends on intensity of program

Here is the website for you to download the MP3 file for the pelvic muscle training program

https://sites.google.com/site/myhealthybladder/

A Further Word on Kegels…

Do not do PFM exercises WHILE urinating (peeing) as stopping the stream of urine can cause dysfunctional voiding

An Effective PFMT Program

- Is isolated to the PFM (no one should be aware the patient is doing one).
  - Closure of the anus
  - Movement of scrotum, penis
- Is specific to patient ability, which provides optimal demand on the muscle to build strength and avoid fatigue

Use of the "KNACK" (stress strategy)

- Intentional, strong, fast muscle contraction
- Used before and during activity that causes leakage (e.g., laughing, coughing, sneezing, lifting)
- Timing is key!
- Can become as automatic as a reflex

Squeeze before you sneeze, cough…

Miller, Ashton-Miller, DeLancey, Neuro Uro 1996, 15; 302–393.

Drugs for Urgency UI /OAB

Antimuscarinic/Anticholinergics

- Darifenacin - Enablex® 7.5 or15 mg daily
- Fesoterodine – Toviaz 4 or 8 mg daily
- Oxybutynin
  - Oxybutynin 2.5-5 mg twice/day to 4x/day
  - Ditropan XL® 5-20 mg daily
  - Oxytrol® skin patch 3.9 mg 2x/week
  - Gelnique – gel – 1 packet daily
- Solifenacin - VESIcare® 5-10 mg daily
- Tolterodine
  - Detrol® 1-2 mg twice/day
  - Detrol LA® 2-4 mg daily
- Trospium chloride - Sanctura® 20 mg twice/day, 60 mg daily

Beta3 Adrenergic Agonist

- Mirabegron – Myrbetriq 25 mg, 50 mg daily


Thank You!