W19: Pre and postpartum pelvic floor muscle exercise in prevention of urinary incontinence - theory and practice
Workshop Chair: Siv Morkved, Norway
03 September 2019 16:00 - 17:30

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**Aims of Workshop**
The aim of this workshop is to improve the health care for women during pregnancy and after delivery, by facilitating implementation of evidence based practice. The workshop includes a practical exercise session, an update on pelvic floor anatomy and possible birth injuries, evidence for the use of pelvic floor muscle exercises (PFME) in prevention and treatment of urinary incontinence during pregnancy and after childbirth, and strategies to improve adherence and implementation of PFME.

At the conclusion of this workshop, the participants will know the rationale and evidence behind the use of PFME in pre and postnatal care, and how they can plan and implement an exercise program in clinical practice.

**Learning Objectives**
The rationale and evidence behind the use of pelvic floor muscle exercises in the prevention and treatment of pre- and postnatal urinary incontinence

**Target Audience**
Urogynaecology, Conservative Management

**Advanced/Basic**
Intermediate

**Suggested Learning before Workshop Attendance**


Pelvic floor anatomy and risk factors of birth injuries to the pelvic floor
Cornelia Betschart

Anatomy: The pelvic floor is a complex unity that consists of different anatomical structures. There are large, robust muscles on the pelvic side-wall like the piriformis muscle and the obturator internus muscle that are not prone to birth related injuries. The obturator muscle gives origin to the fascial structure like levator arch. More caudally a next condensation of connective tissue forms the fascial arch. Both arches support the levator ani muscle and the endopelvic fascia. The different subdivisions of the levator ani will be revised with focus on their fibers’ vectors. The functional consequence of levator muscle injury depends on the region of muscle affected.

The vagina and the cervical ring are anchored within the endopelvic fascia. Most caudally we find the perineal membrane where the urethra, the vagina and the rectum pass through. We know from imaging studies that 15 to 35% of women giving birth, have an injury of the levator ani muscle after their first vaginal delivery. The anatomical structures, subjected to injuries, will be revised by short video clips.

Apart from muscles’ injuries there are also ligaments and nerves that undergo a significant stretch during pregnancy and delivery. The two most important ligaments are the uterosacral ligament and the cardinal ligament. They both reinforce the membranes of the pelvic floor. The uterosacral ligament is situated more horizontally, from ventral to posterior, and the cardinal ligament acts in a vertical way.

In one MRI-model taken at five different time points in pregnancy and up to 1 year postpartum, a significant change during pregnancy and postpartum of both, the ligaments and levator ani was demonstrated. It was shown that the ligaments and levator ani one year after delivery remained still longer than at 16 weeks of pregnancy. Within one year, they did not return to their initial length.

When it comes to pelvic floor nerves we also have a good model of the second stage phase where Lien et al. demonstrated the effect of passing the baby’s head through the genital hiatus. In their model the posterior branches of the pudendal nerve, that means the inferior rectal nerve and the anal sphincter nerve were stretched 35% whereas the anterior nerves such as the urethral sphincter nerve and the labial nerves got stretched less, for about 15%.

Pressure on the pelvic floor: Delivery is not only a spatial issue, it is also a pressure issue. In everyday life the pelvic floor is subject to different pressures: walking, jogging, coughing, lifting weight. The rise in intraabdominal pressure during these activities is comparable to the rise of a second stage contraction that is between 60 and 70 cm H2O. The big difference is the length of the pressure impact. For example, when jogging, the rise of pressure lasts for milliseconds whereas the second stage contraction lasts for about 90 seconds. This makes a difference in the area under the curve and yields to a more than hundred times higher impact to the pelvic floor during a second stage contraction than for example jogging or lifting weights.

Literature
- Bo K, et al. Regular exercisers have stronger pelvic floor muscles than nonregular exercisers at midpregnancy. AJOG 2018

Evidence for pelvic floor muscle exercise during pregnancy and after childbirth
Siv Mørkved, PT, MSc, PhD
Professor, Department of Public Health, Norwegian University of Science and Technology, Trondheim, Norway
Associate medical director Central Norway Regional Health Authority

The role of physiotherapy in avoiding and treating pelvic floor disorders during pregnancy and after delivery

Aim of the presentation is to present literature on the evidence behind the use of pelvic floor muscle training (PFMT) during pregnancy and after delivery in prevention and treatment of urinary incontinence (UI). There is evidence that child-bearing results in higher risk of incontinence. The challenge is to find effective and acceptable methods to avoid injury to the PFM, treat dysfunction early to stop progression, and find strategies to treat and rehabilitate pelvic floor damage related to pregnancy and delivery. One such strategy is to encourage women to do PFM exercises.
The pelvic floor muscles give pelvic organ support and are an important continence mechanism. It is a strong biological rationale for PFMT for to treat stress UI and pelvic organ prolapse (POP) (Miller et al -04, Bø & Talseth -97, Peschers -01, Brækken et al -10). The rationale for PFMT is to perform strength training over time to build up «stiffness» and structural support of the pelvic floor. In addition, to the women can learn to consciously contract before and during an increase in abdominal pressure— «The Knack» - to prevent descent to the pelvic floor.

Does pelvic floor muscle exercise during pregnancy and after delivery prevent or treat urinary incontinence?

In The International Consultation on Incontinence 2017; Conservative Management, one Chapter adresses prevention and treatment in pregnant and postnatal women. The primary outcome of interest was self-reported UI (cure, improvement, number of leakage episodes). The recommendations are:

Prevention of UI in childbearing women: Offer continent, pregnant women a supervised (including regular health professional contact) and intensive strengthening antepartum PFMT programme to prevent antepartum and postpartum UI.

Treatment of UI in childbearing women: PFMT should be offered as first line conservative therapy to women with persistent UI symptoms three months after delivery. An ‘intensive’ PFMT programme (in terms of supervision and exercise content) is likely to increase the treatment effect.

Where a population approach (groups of women where some did and some did not have prior UI symptoms) is used, the ‘best’ evidence to date suggests the following: (a) an intervention comprising of a daily home PFMT and weekly physiotherapist-led exercise classes for 12 weeks, starting at 16-24 weeks’ gestation for pregnant women, and (b) an individually taught strengthening PFMT programme that incorporates adherence strategies for postpartum women who have had a forceps delivery or a vaginal delivery of a large baby (4000g or more).

Reflections

Knowledge about training principles, functional anatomy and motor learning principles including motivation theory is essential for physiotherapists dealing with exercise therapy in general. Moreover, this knowledge may be particularly important when dealing with prevention and treatment of incontinence. Pregnant women and women in the postpartum period seem to need thorough instructions in correct PFM contractions, strong motivation and close follow up if exercise is to be maximally effective.

Take home message

– To improve clinical management the interventions used should be based on high level evidence
– PFMT is an effective low-threshold treatment with no adverse effects, that should be offered to child-bearing women
– Multidiciplinary teams

Adherence strategies in promotion of pelvic floor muscle training

Helena Frawley

This presentation will cover:
• Why (long-term) exercise adherence is difficult
• How theory helps us understand adherence
• How a patient-centred and context-specific application can maximise adherence

At the end of this presentation you will be able to:
• Identify one or more behaviour change techniques that might support patients’ exercise adherence in your practice
• Record adherence strategies

Phases of adherence: Initial uptake -> Adoption of main routine -> Maintenance routine -> Relapse management.

The core concepts discussed will include:
• Adherence is a process AND an outcome
• Measuring adherence is difficult – no gold standard
• Most people are partially adherent, some are over-adherent
• Certain level of adherence is required to obtain therapeutic benefit
• Treatment adherence typically requires health behaviour change: 4As: Aware, Agree, Adopt, Adhere.
  o There is attrition in this pipeline, so that fewer reach adherence than start.

We will consider adherence to PFMT as an ‘exercise behaviour’.

Theories that have been used in PFMT adherence research, or theories that may be applied:
• Health Belief Model
- Social Cognitive Theory: Self-Efficacy Beliefs
- Information Motivation Behavioural Skills Model (IMB)
- Capability, Opportunity, Motivation, determining Behaviour (COM-B model)

We will discuss the research that has looked at:
- factors that modify adherence to PFMT: Knowledge, Feelings about PFMT, Physical skill, Cognitive analysis, planning and attention, Prioritisation, Service provision.
- Determinants of adherence (Moderators & Mediators) and the strategies that can be used to enable these determinants, in populations with UI, but not other PFDs.

Adherence is not uni-dimensional, there are interacting dimensions which affect adherence, highlighting the need for an individualised, context-specific approach. Important to consider the patient perspective, because does not always align with the clinician perspective.

We will discuss terminology for the exercise behaviour strategies used to promote adherence to PFMT, and optimal recording of these.

References:
- WHO 2003: Adherence to Long-Term Therapies - Evidence for Action http://apps.who.int/medicinedocs/en/d/Js4883e/7.2.html#Js4883e.7.2.1
Pelvic floor muscle training included in general pre- and postnatal exercise classes - an example
By Signe Nilssen Stafne

In this section I will present how pelvic floor muscle training (PFMT) can successfully be implemented in general pre- and postnatal exercise classes. The study was done in Trondheim, Norway, in 2007-2009 and was included in my PhD. The study has been published in BJOG (Stafne et al., Does regular exercise including pelvic floor muscle training prevent urinary and anal incontinence during pregnancy? A randomized controlled trial. BJOG, 2012). The study was a RCT aiming to study whether exercise training during pregnancy could prevent pregnancy related diseases as conditions, including urinary incontinence (UI). Healthy pregnant women with a single live fetus were eligible for study inclusion. In total 855 women were included in mid-pregnancy. Women randomized to the exercise group were encouraged to follow a 12-week exercise program. Women met for group training once per week and were encouraged to exercise on their own twice a week. The exercise program followed recommendations from the American College of Obstetricians and Gynecologists. The exercise groups consisted of 10-15 pregnant women and were led by a physiotherapist. The exercise program was standardized and consisted of both endurance training and strength training. The strength exercises was for upper and lower limbs, core muscles and the pelvic floor muscles. All exercise sessions were ended with light stretching, body awareness and relaxation exercises. More specific, the PFMT followed the principles for increasing strength of skeletal muscles, and women were encouraged to perform three sets of 8-12 close to maximum contractions of the PFM, and were encouraged to hold the contraction for 6-8 seconds, and if possible to add three fast contractions at the end of the contraction. Before starting the exercise period, all women met for an individual vaginal examination with a physiotherapist to ensure that they were able to do a correct voluntary contraction. Women who were unable to contract were instructed until they managed. All women received written and verbal information in pelvic floor anatomy and why they should do PFMT. The information were given both individually and repeated in the exercise group sessions. The exercise program consisted of low impact exercises as it stresses the continence system minimally. PFMT was done in different positions for variation and we also included functional exercises. After the 12-week exercise period, in late pregnancy, significantly less women in the exercise group reported UI (42% vs. 53%, p=0.004). At three months postpartum there was significantly fewer women in the exercise group reporting UI (29% vs. 38%, p=0.008). The implications of the study is that thorough instruction in correct PFM contractions and a specific PFMT program successfully can be included in exercise classes for pregnant women.

PELVIC FLOOR MUSCLE TRAINING CLASS/ CORE MUM PROGRAM
Kari Bø, Professor, PhD, exercise scientist, physical therapist, Norwegian School of Sport Sciences, Department of Sports Medicine.

Table 1. Example of a PELVIC FLOOR MUSCLE EXERCISE CLASS (30 minutes of low impact aerobic exercise can be added to the below program).

<table>
<thead>
<tr>
<th>TIME (minutes)</th>
<th>EXERCISE</th>
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<tbody>
<tr>
<td>Music 4.00 – 6.00</td>
<td>Warming up; stretch, walk, step touch, body awareness, posture</td>
</tr>
<tr>
<td>3.00</td>
<td>PELVIC FLOOR: STANDING</td>
</tr>
<tr>
<td>Music 2.30</td>
<td>Strength: back and abd (TrA); prone</td>
</tr>
<tr>
<td>3.00</td>
<td>PELVIC FLOOR: PRONE, ONE LEG IN FLEXION</td>
</tr>
<tr>
<td>Music 2.30</td>
<td>Strength: arms, back, TrA “Dog position”</td>
</tr>
<tr>
<td>3.00</td>
<td>PELVIC FLOOR: FROG POSITION</td>
</tr>
<tr>
<td>Music 2.30</td>
<td>Strength: abdominals, back; crook lying</td>
</tr>
<tr>
<td>Music 2.10</td>
<td>Relaxation, breathing. Neck and shoulder stretch; sitting position</td>
</tr>
<tr>
<td>3.00</td>
<td>PELVIC FLOOR: SITTING POSITION</td>
</tr>
<tr>
<td>Music 3.19</td>
<td>Move to standing, stretches, ergonomics, strength: thigh, gluteals and back</td>
</tr>
<tr>
<td>2.00</td>
<td>PELVIC FLOOR: STANDING &amp; WITH FLEXED HIPS AND KNEES</td>
</tr>
<tr>
<td>Music 3.18</td>
<td>Stretches, breathing relaxation; standing position</td>
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This model for pelvic floor muscle training consists of two main stages:

**STAGE 1: SEARCH, FIND, LEARN AND CONTROL**
This is done individually with a trained physical therapist (PT) and includes observation and vaginal palpation with verbal feedback of muscle performance. If the patient is able to perform a correct contraction, muscle strength is measured, and the patient can be sent to the exercise class. If she is not able to contract she comes back to the PT, and the PT may use facilitation techniques (tapping, stretching, massage, el.stim) in order to stimulate ability to contract correctly.

**STAGE 2: STRENGTH TRAINING**
The strength training can be performed individually in the PT’s office + home training, or in groups. The aim of the strength training is to build up the muscles in order to make them able to give better structural support to counteract increase in intra-abdominal pressures. Possible changes to the pelvic floor muscles due to strength training are:
1. lifting of the pelvic floor to a higher anatomical position inside the pelvis
2. increase of the cross sectional area of the muscles (hypertrophy)
3. increase of “stiffness” of the connective tissue within and around the pelvic floor muscles
4. reduction of the area of the levator hiatus

Such changes have been verified in a recent single blind randomized controlled trial.

In the group training class strength training of the pelvic floor muscles is done in 5 different positions with attempts of 8-12 maximum voluntary contractions (MVC) in each position. The participants are instructed to hold each contraction for 6-8 seconds. In addition about half of the contractions in each position are “intensive contractions” meaning that the women are asked to contract as hard as possible, hold the contraction for 6-8 seconds, and then add 3-4 fast contractions on top of the prolonged contraction. The instructor is using strong verbal encouragement to stimulate for maximum contractions. The patients typically exercise in the class once a week, but ideally supervised PFM training classes would be done 3 times/week.

Positions with legs apart are used to avoid strong outer pelvic muscles (hip adductor, gluteals and outer abdominal muscles) to take over and mask attempts of maximum contraction of the pelvic floor muscles. Co-contractions of the inner abdominal muscles have always been allowed in this program, as it does not seem to be possible to perform maximum contractions of the pelvic floor muscles without some co-contraction of the inner abdominals (no visible movement of the pelvis, only a small tucking in of the abdomen should be observed). When the PFM are contracted first, co-contraction of the abdominals is unlikely to open the levator hiatus or press the pelvic floor downwards.

In addition to the supervised training the patients are asked to perform 3 sets of 8-12 maximum contractions every day at home and to report training adherence in a training diary/app/mobile phone.

References
Bø K 2004 Pelvic floor muscle training is effective in treatment of stress urinary incontinence, but how does it work? International Urogynecology Journal and Pelvic Floor Dysfunction 15:76-84.
Brækken IHB, Majida M, Engh ME, Bø K: Can pelvic floor muscle training reverse pelvic organ prolapse and reduce prolapse symptoms? Am J Obstet Gynecol,


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<th>Agenda – Faculty</th>
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<th>Speaker, Location</th>
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<td>16.05-16.20</td>
<td>Cornelia Betschart Meier, Switzerland</td>
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<tr>
<td>Adherence strategies in promotion of PFMT</td>
<td>16.35-16.50</td>
<td>Helena Frawley, Australia</td>
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<td>PFMT included in general pre- and postnatal exercise classes</td>
<td>16.50-17.00</td>
<td>Signe Nilssen Stafne, Norway</td>
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<td>Kari Bo, Norway</td>
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Pelvic floor anatomy and risk factors of birth injuries to the pelvic floor

Cornelia Betschart, MD
Urogynecologist
Department of Gynecology
University Hospital Zurich
Switzerland

Anatomy – Muscles and Arches

Dissection – Levator ani muscle

Dissection – Levator ani muscle

Anatomy - ligaments
Dissection - Ligaments
Cardinal ligament
Uterosacral ligament

Changes already during pregnancy
USL and LA muscle more stretched postpartum than in 16th week of pregnancy

Pelvic Floor Nerves - delivery

How is it in-vivo?

MRI: avulsion of pubovisceral muscle left side (28y-old primipara)
Pelvic floor anatomy and risk factors of birth injuries to the pelvic floor

Perineal trauma - often clinically underdiagnosed

85% of women having a vaginal birth suffer some perineal trauma

United Kingdom
Pain and discomfort at 10-12d: 23% to 42%
Long-term pain 3–18 months after delivery: 7% to 10%


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Subjective risk assessment

**UR CHOICE – Score**

- U  UI before pregnancy
- R  Race/Ethnicity
- C  Child bearing started at what age?
- H  Height (mother’s height)

Data from longitudinal studies: ProLong und der SWEPOP databases

Scores for urinary and stool incontinence and prolapse [2]


http://riskcalc.org/UR_CHOICE/

Take Home Messages

**Anatomy**
- Pelvic floor anatomy: many different structures
- How they are orchestrated is not fully elucidated yet

**Risk mechanisms**
- Pelvic organ prolapse: most birth-related
- Educate women regarding benefits of weight optimisation
- Forceps is largest risk factor (vacuum not)
- Estimating women at risk feasible with estimations:
  - UR-CHOICE (patient’s history)
  - Capacity-Demand Estimates (ultrasound)
- Clinical trials next

Thank you very much for your attention
Siv Mørkved

Affiliations to disclose†:

None

† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

Funding for speaker to attend:

☐ Self-funded

☒ Institution (non-industry) funded

☐ Sponsored by:
EVIDENCE FOR PELVIC FLOOR MUSCLE EXERCISE DURING PREGNANCY AND AFTER CHILDBIRTH

Siv Mørkved, PT, MSc, PhD

Professor
Department of Public Health,
Norwegian University of Science and Technology
Trondheim, Norway

Associate medical director
Central Norway Regional Health Authority
Aims of the presentation

• Literature review
  ▪ Evidence behind the use of
    • pelvic floor muscle exercise during pregnancy and after delivery in prevention and treatment of urinary incontinence

• Example of an evidence based training protocol
  ▪ Results
• There is evidence that child-bearing may cause damage to the pelvic floor and higher risk of incontinence
Can we prevent dysfunction of the PFM?

- Elective Caesarean section?
- Obstetric management?

↓

Need for strategies to treat and rehabilitate pelvic floor damage

↓

- Pelvic floor muscle training
The pelvic floor muscles

- Pelvic organ support
- Continence mechanism
- Strong and fast contraction
- “Squeeze and lift”
Strong biological rationale for PFMT for SUI and POP

• During voluntary contraction
  – Constriction of levator hiatus
  – Increase in ↑ MUCP: 11.1 (10.7)-23.2 (8.4) cm H₂O
    (Miller et al -04, Bø & Talseth -97)
  – Resistance to ↓ movement (Peschers -01)

• Morphological changes after PFME: ↓ Hiatal area and muscle length during valsalva, indicating increased PFM stiffness? (Brækken et al -10)
Rationale for PFME

• Learn to consciously contract before and during an increase in abdominal pressure and continue to perform such contractions as a behaviour modification to prevent descent to the pelvic floor – The «Knack»

• Perform strength training over time to build up «stiffness» and structural support of the pelvic floor
Does pelvic floor muscle exercise during pregnancy and after delivery prevent or treat urinary incontinence?
The International Consultation on Incontinence 2017; Conservative Management

Prevention and treatment in pregnant and postnatal women

• The primary outcome of interest was self-reported UI (cure, improvement, number of leakage episodes)

• Other outcomes of interest included adherence measures
Is PFMT effective in the prevention of UI in childbearing women?

Level of Evidence: 1

- Offer continent, pregnant women a supervised (including regular health professional contact) and intensive strengthening antepartum PFMT programme to prevent antepartum and postpartum UI
  - Grade of Recommendation: A
Is PFMT effective in the treatment of UI in childbearing women?

Level of Evidence: 1

- PFMT should be offered as first line conservative therapy to women with persistent UI symptoms three months after delivery
  - Grade of Recommendation: A

- An ‘intensive’ PFMT programme (in terms of supervision and exercise content) is likely to increase the treatment effect
  - Grade of Recommendation: B
Is PFMT effective in the mixed prevention and treatment of UI in childbearing women?

Level of Evidence: 2

• The characteristics of trials demonstrating reduced UI prevalence in late pregnancy and six months postpartum are high adherence to a supervised PFM strength training program and home exercises.
  – Grade of Recommendation antepartum PFMT: A
  – Grade of Recommendation postpartum PFMT: B
Is PFMT effective in the mixed prevention and treatment of UI in childbearing women?

- Where a population approach is used, the ‘best’ evidence to date suggests the following:
  - an intervention comprising of a daily home PFMT and weekly physiotherapist-led exercise classes for 12 weeks, starting at 16-24 weeks’ gestation for pregnant women
  - an individually taught strengthening PFMT programme that incorporates adherence strategies for postpartum women who have had a forceps delivery or a vaginal delivery of a large baby (4000g or more)
  - Grade of Recommendation C
Additional PFMT is more effective than usual antenatal or postnatal care for the prevention and treatment of urinary incontinence

Cochrane review
Woodely et al, 2017
An example of a training protocol

Intervention (12 weeks)

- Instruction in correct PFM contraction
- Training in groups 60 minutes once per week
- Home training: 10 strong PFM contractions x 3 per day
Important !!

Intervention based on knowledge about:

- Exercise principles
- Functional anatomy
- Motor learning principles
- Motivation theory (adherence strategy)
Motor learning principles

Instructions in correct PFM contraction
General recommendation:
- 3 sets of 10 high resistant contractions three times per week
- Rehabilitation situations – overload not possible – more frequent training sessions
Motivation (adherence strategies)
The myth that pelvic floor muscle training during pregnancy will cause prolonged labour has not been confirmed.

Salvesen & Mørkved. BMJ 2004
Training in pregnancy (TRIP)

Signe Stafne, Siv Mørkved, Kjell Å Salvesen
NTNU and St.Olavs Hospital, Trondheim, Norway
Do pelvic floor muscle exercises reduce postpartum anal incontinence? A randomised controlled trial

HH Johannessen, a A Wibe, b, c A Stordahl, d L Sandvik, e S Mørkved f, g

RESULTS: Weekly PFME can reduce postpartum AI

The effect is dependent on
• Degree of AI
• Persistant anal sphincter defect
• PFME frequency
Take home message

- Pelvic floor muscle exercises: Easily accessible and effective low-threshold treatment / no adverse effects
- To improve clinical management the interventions used should be based on high level evidence
- PFMT should be offered as first-line treatment to women and men with several pelvic floor dysfunctions
- Multidiciplinary teams
FÅ MED FLERE!
Adherence and implementation strategies in promotion of pelvic floor muscle training

ICS Workshop #19, 3 Sep 2019
Helena Frawley, PhD, FACP
• Associate Professor, Physiotherapy,
• Monash University
• Melbourne, Australia

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**Learning objectives**

We will cover:
- Why (long-term) exercise adherence is difficult
- How theory helps us understand adherence
- How a patient-centred and context-specific application can maximise adherence
- How to maximise implementation of adherence strategies

You will be able to:
- Identify one or more behaviour change techniques that might support patients’ exercise adherence in your practice
- Record adherence strategies
- Implement evidence-based findings

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**Core concepts**

- Adherence is a process AND an outcome
- Measuring adherence is difficult – no gold standard
- Most people are partially adherent, some are over-adherent
- Certain level of adherence is required to obtain therapeutic benefit
- Treatment adherence typically requires health behaviour change
- Implementation requires behaviour change

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**Adherence**

Adherence is "the extent to which a patient’s behavior matches agreed recommendations/instructions from the prescriber; it is intended to be nonjudgmental, a statement of fact, rather than to ascribe blame (to patient, prescriber, or treatment method)."

- National Institute for Clinical Effectiveness
- World Health Organizations

**Phases of Exercise Adherence**

- Initial uptake
- Adoption of main routine
- Maintenance routine
- Relapse management

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**PFMT adherence as an exercise behaviour** (Frawley et al 2017)

- Behaviours: Behaviours are what people do as a consequence of their inner state or because of external drivers (environmental cues)
- Behaviours are observable by others
- An example of a behaviour is exercise or PFMT
- For uptake of a new behaviour, CHANGE is required
It's challenging...

- Long term adherence to exercise based interventions typically very poor:
  - Urinary incontinence
    - Short-term: 64% (Sluijs 1991)
    - Long-term: 23% (e.g. Borello-France 2013)
  - Initial take up (often in a supported treatment setting) does not translate into daily routine
  - People relapse and don’t resume their exercises
  - ‘knowledge-behaviour’ gap

Attrition in the ‘pipeline’ of research to practice (Glasziou & Haynes 2005)

1. Awareness
2. Acceptance
3. Target: Able
4. Intervention
5. Action
6. Agreed
7. Adhere

Valid and relevant research

Theories used in PFMT (McClurg 2015)

<table>
<thead>
<tr>
<th>Theoretical Framework</th>
<th>Authors/References</th>
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<tbody>
<tr>
<td>Health Belief Model</td>
<td>Rosenstock &amp; Becker (1974)</td>
</tr>
<tr>
<td>Theory of Planned Behaviour</td>
<td>Ajzen (1991)</td>
</tr>
<tr>
<td>Transtheoretical Model</td>
<td>Prochaska &amp; DiClemente (1983)</td>
</tr>
<tr>
<td>Health Action Process Approach</td>
<td>Schwarzer (1992)</td>
</tr>
</tbody>
</table>

Social Cognitive Theory: Self-Efficacy Beliefs (Bandura, 1986)

Information Motivation Behavioural Skills Model (IMB) (Fisher et al 2003)
Modifiers of adherence to PFMT (Hay-Smith et al 2015)

- Knowledge
- Feelings about PFMT
- Physical skill
- Cognitive analysis, planning and attention
- Prioritisation
- Service provision

Determinants of adherence (Dumoulin et al 2015)

<table>
<thead>
<tr>
<th>Population</th>
<th>Determinants (Moderators &amp; Mediators)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women with Urinary Incontinence (UI)</td>
<td>Positive intention to adhere</td>
</tr>
<tr>
<td>Alewijnse, Chen</td>
<td>Amount of urine lost (i.e. symptom level)</td>
</tr>
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</tr>
<tr>
<td></td>
<td>Dyadic cohesion (i.e. feedback)</td>
</tr>
<tr>
<td>Men with UI</td>
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<td>Dyadic cohesion (i.e. feedback)</td>
</tr>
<tr>
<td>Pre &amp; Post natal UI</td>
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### Clinical Recommendations (Frawley 2015)

1. **Patient-related factors** may be the most important category of barriers to long-term PFMT adherence.
   - Patient’s perception of minimal benefit of the therapy
   - Reduced self-efficacy
   - Poor identification with pelvic anatomy
   - Poor understanding of the condition
   - → Low motivation to adhere to PFMT.
   - Health professionals need to identify and address these factors.

2. **Patient- and therapy-related factors** may optimally facilitate long-term adherence
   - → Health professionals need to provide tangible evidence or feedback to patients on PFMT benefits.

3. **Long-term adherence** may be best achieved through follow-up appointments and a re-assessment of factors impeding progress
   - Determinants may change over time.

4. **An individualized approach to treatment** based on a person’s age, sex, and ethnicity is recommended.

5. The belief that PFMT adherence determinants differ according to condition is not strongly supported
   - → Therefore, individualized patient-centered, as opposed to condition-centered, approaches are recommended.
Phases in the process of change (Grol 2013)

- Orientation
- Insight
- Acceptance
- Change
- Maintenance

Behavior change stages (Frawley et al 2017)

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<tr>
<th>Definition/Explanation</th>
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<tr>
<td>Change: actual adoption of a new behavior; confirmation of its benefit or value</td>
<td>Uptake of PFMT; adherence in the prescribed program</td>
</tr>
</tbody>
</table>

Behavior change techniques (BCTs) (Michie et al 2013)

- 93 item taxonomy
- Naming active ingredients of delivery
- Choose for context
- many terms in the BCT taxonomy may be used to name and describe elements of PFMT
<table>
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<tr>
<th>BCT items (Michie et al 2013)</th>
<th>Consensus on Exercise Reporting Template (CERT) Items</th>
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<tbody>
<tr>
<td><strong>ITEM</strong></td>
<td><strong>Explanation</strong></td>
</tr>
<tr>
<td>1.4</td>
<td>Action planning</td>
</tr>
<tr>
<td>2.6</td>
<td>Biofeedback</td>
</tr>
<tr>
<td>6.1</td>
<td>Demonstration of the behaviour</td>
</tr>
<tr>
<td>2.2</td>
<td>Feedback on the behaviour</td>
</tr>
<tr>
<td>5.1</td>
<td>Information about health consequences</td>
</tr>
<tr>
<td>4.1</td>
<td>Instruction on how to perform the behavior</td>
</tr>
<tr>
<td>9.1</td>
<td>Credible source</td>
</tr>
<tr>
<td>2.7</td>
<td>Feedback on outcome of behavior</td>
</tr>
<tr>
<td>15.1</td>
<td>Verbal persuasion of capability</td>
</tr>
<tr>
<td>41</td>
<td>Mental rehearsal of successful performance</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Consensus on Exercise Reporting Template (CERT) Items</th>
<th>Items to report behavior change interventions (*Albrecht 2013, Borek 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain</strong></td>
<td><strong>Item</strong></td>
</tr>
<tr>
<td><strong>WHAT</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>WHO</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>HOW</strong></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>7a</td>
</tr>
<tr>
<td></td>
<td>7b</td>
</tr>
<tr>
<td><strong>WHERE</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>WHO</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>WHAT</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>HOW</strong></td>
<td>11</td>
</tr>
</tbody>
</table>

**To summarise**

- Promote motivation through goal setting and action planning
- "If-then" rules
- Boost self-efficacy
- Work out a relapse strategy
- Ensure patient has necessary behavioural skills
- Correct exercise technique
- A program to follow that allows progression and relapse management
- Skills and equipment to self-monitor or review progress
- Aim for sufficient adherence to obtain therapeutic benefit
REFERENCES


Pelvic floor muscle training included in general pre- and postnatal exercise classes - an example

Signe Nilssen Stafne
Physiotherapist, Specialist in Women’s Health, MNF
St.Olavs Hospital, Trondheim University Hospital, Norway
Researcher
Department of public health and nursing, NTNU, Trondheim, Norway

Study
- Randomized controlled trial (recruited from April 2007 to June 2009)
  - General exercise classes including PFMT 3x/week versus usual care
- N=855
- Eligible for study inclusion:
  - Healthy pregnant women
  - ≥ 18 years
  - Singleton live fetus
- Included in gest.week 18-22

Objective: Are women following a standardized exercise program including PFMT during pregnancy less likely to report UI?

Exercise group
- Led by a physiotherapist
- Group of 10-15 pregnant women
- Standardized exercise program:
  - 30-35 min aerobic activity
  - 20-25 min specific strength training
    - Upper/lower limbs
    - Core muscles
    - Pelvic floor muscles
  - 10 min stretching, body awareness and relaxation exercises

Pelvic floor muscle training (PFMT)
- 3 sets of 8-12 repetitions
- Close to maximum contractions
- 3 days / week
- Hold of contraction in 6-8 seconds
- End of contraction; add 3 fast contractions
- Different positions
Pelvic floor muscle training (PFMT)

Who? Information and vaginal examination

What? Low-impact exercises, different positions, functional exercises

Why? Pelvic floor muscle training

Urinary incontinence (UI)

✓ Outcome measure:
  - Self-reported questionnaire (Sandviks severity scale)
  - UI defined as “any involuntary leakage of urine”

Baseline characteristics Pregnancy week 18-22

<table>
<thead>
<tr>
<th></th>
<th>Exercise group (N = 429)</th>
<th>Control group (N = 426)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age - years</td>
<td>30.5 ± 4.4</td>
<td>30.4 ± 4.3</td>
</tr>
<tr>
<td>Weight - kg</td>
<td>70.4 ± 9.8</td>
<td>70.8 ± 10.3</td>
</tr>
<tr>
<td>Body mass index - kg/m²</td>
<td>24.7 ± 3.0</td>
<td>25.0 ± 3.4</td>
</tr>
<tr>
<td>Nulliparous</td>
<td>58 %</td>
<td>56 %</td>
</tr>
<tr>
<td>Exercise regularly ≥ 3x/week</td>
<td>14 %</td>
<td>12 %</td>
</tr>
</tbody>
</table>

Plus-minus variables are mean ± SD

Results

<table>
<thead>
<tr>
<th></th>
<th>Exercise group</th>
<th>Control group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy week 22-36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UI</td>
<td>42 %</td>
<td>53 %</td>
<td>0.004</td>
</tr>
<tr>
<td>PFMT</td>
<td>95 %</td>
<td>79 %</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>3 months postpartum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UI</td>
<td>29%</td>
<td>38%</td>
<td>0.008</td>
</tr>
<tr>
<td>PFMT</td>
<td>88%</td>
<td>85%</td>
<td>ns</td>
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UI = any involuntary leakage of urine
PFMT = pelvic floor muscle training

Implications

Thorough instructions in correct PFM contractions and a specific PFMT program should be included in exercise classes for pregnant women