Title of the project: *Innovative education for students of medical and health sciences, resulting to better adapt the didactic offer to the health needs of pregnant and post-pregnant women (INSTEpp)*

OUTPUT 1 - UNIFICATION OF THERAPEUTIC METHODOLOGY. PROCEDURE AND DEVELOPMENT OPTIMAL METHODS OF INTERDISCIPLINARY TEAMS COOPERATION.

KA203 - Strategic Partnerships for higher education Project no. 2020-1-PL01-KA203-081905

INTRODUCTION

Team administration/ management and interdisciplinary approach

Enhancing Interprofessional Collaboration in Maternity Care

Interdisiplinary teams for:

- Physical health during the pregnancy and postpartum
- Mental health during the pregnancy and postpartum
- Patient safety
- Patient empowerment

T eam of maternity care providers:

- Obstetricians/gynecologists
- Family practitioners
- Physicians (specialists)
- Nurses and midwifes
- Physiotherapists
- Specialists of physical activity
- Psychologists
- Social workers
- Etc.

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PREGNANCY

Manual therapy during pregnancy

Manual therapy

- is defined as any touch-based conservative treatment approach that includes skilled hands-on techniques to assess and treat different symptoms and conditions using touch as exteroceptive solicitation. It is used by a wide variety of professionals, including *physical therapists, osteopaths, and chiropractors*, and its use among different age groups and pathologies has been steadily increasing since 2000. MT includes a wide range of techniques such as **soft tissue techniques**, **joint mobilisations** or **manipulations**, **massage**, **myofascial release**, **nerve manipulation, strain/counterstrain, acupressurE (1), craniosacral therapy, osteopathic manipulative, treatment, massage and partner-delivered massage (2).**

Pregnancy related pain and manual therapy

- When hormone levels rise during pregnancy, the fascial tissue becomes more elastic: after administration of β-estradiol, collagen-I falls from 5.2 to 1.9%, whereas collagen III and fibrillin increase. This change in (extracellular matrix, ECM) composition allows tissues to adapt during pregnancy proces. A rigid fascia can help to stabilize the sacroiliac joint and the spine - more lax fasciae may trigger pain at the pelvic or lumbar level, which is typical of pregnancy (3)

- MT intervention produce neurophysiological responses able to modulate the pain experience at three levels:
  - peripheral (the tissue level), where the application of MT induces a modulation of inflammatory response after tissue injury;
  - spinal: mechanical solicitations activate somato-autonomic reflexes, which in turn produce indirect neuromuscular responses and trigger intrinsic spinal networks through spino-spinal loops;
  - supraspinal, the use of manual contact might regulate brain areas like anterior cingulate cortex, amygdala or periaqueductal grey, which are crucial, for example, in pain experience, autonomic responses and hypoalgesia (1)

Manual therapy for:

- **Low back pain**: pain between the 12th rib and the gluteal fold
- **Pregnancy-related pelvic girdle pain**: pain between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the sacroiliac joint, which may radiate to the thighs and hips
- **Prevention of perineal injuries** during delivery and reduction of incidence and severity of perineal tear an application protocol has not been standardised yet: manual therapy, its duration, its method of application (selfmassage, applied by partner or physiotherapist), its frequency, start of application during pregnancy or suitability of instruments and/or simultaneous application of oils or lubricants with skin care substances (4)
- **Perineal pain (4)**
- **Thoracic outlet syndrome (5)**
- **Carpal Tunel Syndrome (6)**
- **Body Posture (7)**
- **Breathing disorders (8,9)**

Recent systematic reviews suggest that the MT approach is clinically effective in treating chronic nonspecific neck pain, low back pain and pelvic girdle pain during pregnancy (1)

BUT:

High quality studies, such as RCTs, regarding manual therapy for pregnancy- and postpartum-related dysfunctions are still lacking. Authors calling for improved reporting of such events in all papers going forward, it appears these events are rare. Future research should focus on the proper reporting of all adverse events while assessing efficacy of appropriate treatment options for these populations.

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Physical activity during pregnancy

Physiologic Changes with Pregnancy

- **Soft-tissue edema:** reported by approximately 80% of women in the last 8 weeks
- **Increased fluid retention:** predispose nerve entrapment (carpel tunnel)
- **Ligamentous Laxity**
  - Relaxin known to remodel pelvic connective tissue and activate collagenlytic system
  - Initial increase relaxin levels peak at 12 weeks and decline until the 17th week
- 20% increase in weight during pregnancy may **increase force on a joints** by as much as 100%
- **Hyperlordosis** accentuates anterior pelvic tilt
- **Symphysis pubis widening** begins in 10th and 12th week of pregnancy under the influence of the hormone relaxin

Anatomic and Physiologic Changes with Exercise during Pregnancy

- **About 60% of pregnant women experience LBP** (low back pain)
  - Strengthen deep muscles to reduce these chances
- **Respiratory Changes**
  - Decrease in pulmonary reserve: ability to exercise anaerobically is impaired, oxygen availability for strenuous exercise decreases
  - Aerobic training increases aerobic capacity in normal weight and overweight women
- **Temperature regulation**
  - Stay well-hydrated
  - Wear loose fitted clothing
  - Avoid exercising in high heat and humidity to avoid heat stress
- **Decreased Arch Height**
  - Avoid running on uneven terrain, difficult to adapt
  - Wear supportive shoes, consider orthotics

Physical activity and exercise - definition

Physical activity

- defined as any bodily movement produced by the contraction of skeletal muscles in all stages of life, maintains and improves cardiorespiratory fitness, reduces the risk of obesity and associated comorbidities, and results in greater longevity.

Exercise

- defined as physical activity consisting of planned, structured, and repetitive bodily movements done to improve one or more components of physical fitness, is an essential element of a healthy lifestyle, and obstetrician–gynecologists and other obstetric care providers should encourage their patients to continue or to commence exercise as an important component of optimal health.

American College of Sports Medicine. ACSM's guidelines for exercise testing and prescription. 10th ed. Philadelphia, PA: Wolters Kluwer; 2018.

Benefits of Exercise During Pregnancy

Regular exercise during pregnancy:

- reduces back pain
- improve or maintain physical fitness
- helps weight management
- reduces risk of gestational diabetes in obese women
- reduces the risk of developing depression in pregnant women and after the birth of a child
- enhances psychologic well-being

U.S. Department of Health and Human Services. Physical activity guidelines for Americans. 2nd ed. Washington, DC: DHHS; 2018. Available at: https://health.gov/paguidelines/second-edition/. Retrieved October 18, 2019.
Berghella V, Saccone G. Exercise in pregnancy! Am J Obstet Gynecol 2017;216(4):335–7.

Routine exercise should be recommended to healthy pregnant women after consultation with an **obstetric** provider

- Physical activity and exercise in pregnancy are associated with minimal risks and have been shown to benefit most women, although some modification to exercise routines may be necessary because of normal anatomic and physiologic changes and fetal requirements.
- **Women with uncomplicated pregnancies** should be encouraged to engage in aerobic and strength-conditioning exercises before, during, and after pregnancy.
- A thorough clinical evaluation should be conducted before recommending an exercise program to ensure that a **patient does not have a medical reason to avoid exercise**.
- Obstetrician–gynecologists and other obstetric care providers should evaluate women with medical or obstetric complications carefully before making recommendations on physical activity participation during pregnancy.
- In women who have **obstetric or medical comorbidities**, exercise regimens should be individualized.
- Activity restriction should not be prescribed routinely as a treatment to reduce preterm birth.

Physical Activity and Exercise During Pregnancy and the Postpartum Period: ACOG Committee Opinion, Number 804. Obstet Gynecol. 2020 Apr;135(4):e178-e188.
Gregg VH, Ferguson JE 2nd. Exercise in Pregnancy. Clin Sports Med. 2017 Oct;36(4):741-752.

Recommended Exercise Frequency/Duration

Safe and desirable is **150 minutes per week** of **moderate-intensity aerobic activity** (equivalent to brisk walking) - use talk test to prevent over exhaustion.

U.S. Department of Health and Human Services. Physical activity guidelines for Americans. 2nd ed. Washington, DC: DHHS; 2018. Available at: https://health.gov/paguidelines/second-edition/. Retrieved October 18, 2019.

Treatment Frequency and Length of Session:

- **Previously sedentary women:**
  Aerobic exercise
  15 minutes, 3 x/ week,
  work up to **30 minutes,** 4 x/ week
- **Women with uncomplicated pregnancies:**
  Moderate intensity (rate of perceived exertion: 12-14)
  Resistance/flexibility training and aerobic exercise, individually or in combination
  30 min/day, 4 or 5 days/week

Oliveira C, Imakawa TDS, Moisés ECD. Physical Activity during Pregnancy: Recommendations and Assessment Tools. Rev Bras Ginecol Obstet. 2017;39(8):424-432.

Safe Physical Activities

- Walking
- Stationary cycling
- Hydrotherapy, water aerobics
- Aerobic exercises
- Resistance exercise (eg, using weights, elastic bands)
- Stretching exercise
- Pilates

- If the woman are an experienced runner and jogger, may be to able to keep doing these activities during pregnancy, but should discuss these activities with obstetrician.

Berghella V, Saccone G. Exercise in pregnancy! Am J Obstet Gynecol 2017;216:335–7.

Potencialy harmfull, unsafe Physical Activities

Activities to Avoid

- Contact sports (ie soccer, basketball)
- Activities with high risk of falling (ie off road cycling)
- Hot Yoga, Hot Pilates **(avoiding positions that result in decreased venous return and hypotension)**

Absolute contraindications to exercise during pregnancy

- Severe respiratory diseases (eg, chronic obstructive pulmonary disease, restrictive lung disease and cystic fibrosis)
- Severe (acquired or congenital) heart disease with exercise intolerance
- Uncontrolled or severe arrhythmia
- Placental abruption
- Vasa previa
- Uncontrolled type 1 diabetes
- Intrauterine growth restriction (IUGR)
- Active preterm labour
- Severe pre-eclampsia
- Cervical insufficiency

Meah VL, Davies GA, Davenport MH. Why can't I exercise during pregnancy? Time to revisit medical 'absolute' and 'relative' contraindications: systematic review of evidence of harm and a call to action. *British Journal of Sports Medicine* 2020;**54:**1395-1404.

Relative Contraindications to Aerobic Exercise During Pregnancy

- Anemia
- Unevaluated maternal cardiac arrhythmia
- Chronic bronchitis
- Poorly controlled type 1 diabetes
- Extreme morbid obesity
- Extreme underweight (BMI less than 12)
- History of **extremely sedentary lifestyle**
- Intrauterine growth restriction in current pregnancy
- Poorly controlled hypertension
- Orthopedic limitations
- Poorly controlled seizure disorder
- Poorly controlled hyperthyroidism
- Heavy smoker

Meah VL, Davies GA, Davenport MH. Why can't I exercise during pregnancy? Time to revisit medical 'absolute' and 'relative' contraindications: systematic review of evidence of harm and a call to action. *British Journal of Sports Medicine* 2020;**54:**1395-1404.

Warning Signs to Discontinue Exercise While Pregnant

- Vaginal bleeding
- Abdominal pain
- Regular painful contractions
- Amniotic fluid leakage
- Dyspnea before exertion
- Dizziness
- Headache
- Chest pain
- Muscle weakness affected balance
- Calf pain or swelling (rule out thrombophlebitis)

Physical Activity and Exercise During Pregnancy and the Postpartum Period, Obstetrics & Gynecology: April 2020 - Volume 135 - Issue 4 - p e178-e188

AVOID: Activities that make the pain worse

- Standing on one leg
- Crossing legs
- Sitting on the floor
- Sitting twisted
- Sitting or standing for long periods of time
- Lifting heavy weights
- Carrying anything in only one hand

Physical Activity and Exercise During Pregnancy and the Postpartum Period, Obstetrics & Gynecology: April 2020 - Volume 135 - Issue 4 - p e178-e188

During Pregnancy DO:

- Be as active as possible, avoid activities that make the pain worse
- Rest when possible, may need to sit down more often
- Wear supportive shoes
- Keep knees together when moving in and out of the car, rolling in and out of bed
- Sleep in comfortable position (with pillow between the knees)
- Take stairs one at a time: upstairs leading with less painful leg, downstairs leading with more painful leg

Physical Activity and Exercise During Pregnancy and the Postpartum Period, Obstetrics & Gynecology: April 2020 - Volume 135 - Issue 4 - p e178-e188

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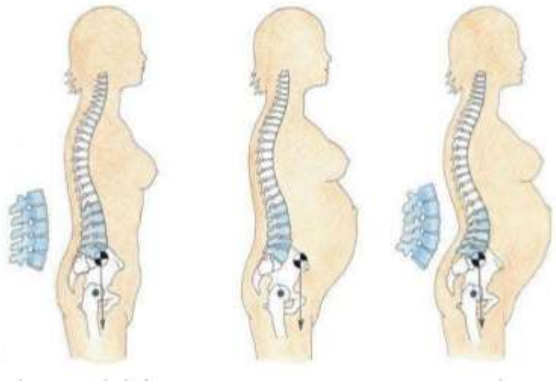
Pelvic floor muscles exercise (examples)

Specific objectives of physical training during pregnancy

1. To make joints flexible.
2. To maintain and/or recover muscular tone.
3. To find central stability.
4. To increase and improve balance.
5. To favour intestinal transit.
6. To activate blood circulation.

ATENTION!
Individual expectations
Sports vs no sportswoman

GRAVITY CENTRE



Uterus increasing volume
Moves forward the gravity centre

→ Compensated by:
- lumbar lordosis
- slightly lower limbs flexion

↓ Gravity centre turns back posterior

Key elements to physical training during pregnancy

1. Pelvis.
2. Spine.
3. Pelvic Floor.
4. Abdomen.

Key elements to physical training during pregnancy

1. Pelvis:

"The key of the spine is the pelvis"

- Primary objective: to help motor control in order to find balance Lumbo-Pelvic.

- The achievement of this objective will be connected to a good **alignment**, **commodity,**
abdominal wall right **distension**, **weight distribution**, **blood and lymph** flow **improvement**.

- It will facilitate all kind of **assisted training movements towards CKC** (*fitball* most frequently):
Anteversion, retroversion, elevation and decline, closing, opening, nutation and counternutation (opening and closing the straits).

Key elements to physical training during pregnancy

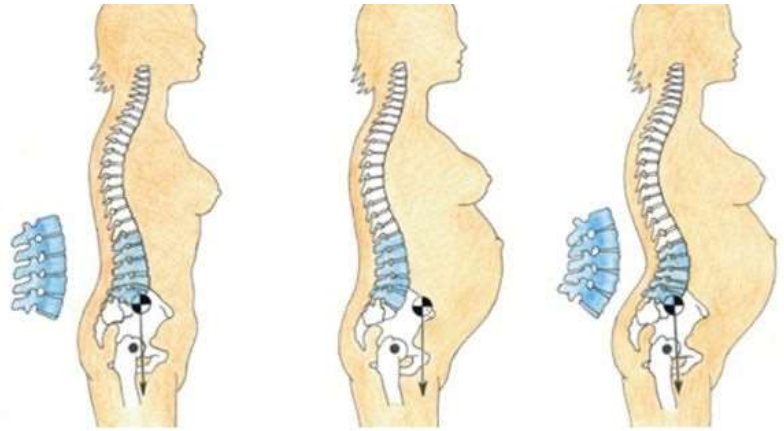
2. Spine:

The spine is a vital structure of the body, the origin of nerve roots, insertion of a great number of muscles, ligaments and fascias.

STAB Spine = interaction 3 systems

- Neural Control System
- Passive System (vertebrae, discs, ligaments, etc.)
- Active System (MS + Tendons)

MOTOR CONTROL



Key elements to physical training during pregnancy

3. Pelvic Floor:

- Before pregnancy the **pelvic floor is unknown** by many women.

Objectives of PF training:

1. To gain **strength and tone** (subjects with weak PF).
2. To increase **elasticity and flexibility** by **perineal massage**.
3. To improve **motor control**.
4. To control **perineal relaxation.**
5. To favour *lumbopelvic stability*.

Key elements to physical training during pregnancy

4. Abdomen (Transversus Abdominis and CORE)

- During 9 months pregnancy the abdomen is the centre of transformation

- The abdominal growth is due to increase of:

1. **Fascia (Athletes).**
2. **Abdominal muscles (not Athletes).**

Which one could be better? Distended abdominal muscles? Fascia? Both?

Very high specific weight in the Lumbo-Pelvic STAB Equation

DRY AND WATER ACTIVITY PROTOCOL FOR PREGNANT WOMEN

1. **DRY TRAINING:**

FIRST TRIMESTER (12 weeks) – OBJETIVES:

- **Postural Control:** Spine and pelvic static monitoring. Teaching retroversion and anteversion of pelvis **(PELVIC SWING).**

- **Muscular training:** Perineal contraction-relaxation. Bridge exercise (gluteus + perineum). Feet support (gluteus + perineum). Adductors (ball in isometric).

- **Coxofemoral joint flexibility:** Supine stretching of hamstrings, medium gluteus, piriformis and adductors muscles.

DRY AND WATER ACTIVITY PROTOCOL FOR PREGNANT WOMEN

1. **DRY TRAINING:**

SECOND TRIMESTER (24 weeks) – OBJETIVES:

- **Postural Control (++):** Advising about hygiene during ADLs (activities of daily living).

- **Flexibilization:** Add Joints and Soft Tissues Normalization (JSTN) for pectorals and latissimus dorsi muscle using espalier.

- **Muscular training:** Same training but progressively decreasing the intensity of ABDs exercises as it gets closer to the seventh month.

- **Breathing:** Awareness of breathing and dissociation between abdominal and thoracic breathing.

- **Circulatory exercises of lower limbs:** feet on the ball, make circles to both sides.

DRY AND WATER ACTIVITY PROTOCOL FOR PREGNANT WOMEN

1. **DRY TRAINING:**

THIRD TRIMESTER (36 weeks) – OBJETIVES:

- **Postural Control (+++)**.

- **Flexibilization:** do sitting stretching (¿?): Adductors, medium gluteus, hamstrings, piriform.

- **Muscular training:** quadruped pelvic swing, dorsal support (fit ball), adductors by isometric while sitting, semi-squats to the wall, avoid hyper pressure abdominal training.

- **Breathing:** Awareness of breathing and dissociation between abdominal and thoracic breathing.

- **Circulatory exercises of lower limbs:** feet on the ball, make circles to both sides.

DRY AND WATER ACTIVITY PROTOCOL FOR PREGNANT WOMEN – AEROBIC TRAINING

2. SWIMMING POOL TRAINING:

- **Muscular training taking advantage of weight absence, without favouring lordosis positions:**

- Movements: aqua jogging, crawl, breaststroke alternate kick, climbing, double and normal back swim. Using material like swimming foam tube, foam swimming floats, balls, weights, ballasted training, etc.

- Overflow: gluteus, abdominals, adductors, abductors.

- Cardiopulmonary training: extensive aerobic.

- Floating relaxation

Pregnancy anxiety and physical activity

- The lifestyle of a pregnant woman has a significant impact on her and her child's health. Regular physical activity is one of the elements that help maintain normal mental and physical well-being.
- Physical activity, at least once a week, significantly reduces the symptoms of depression in pregnant women and may be an important factor in the prevention of depression in this period. Thus, supervised physical activity during pregnancy could be a good approach to prevent and reduce prenatal anxiety and anxiety symptoms.

- During pregnancy, physical activity is decreased but should not be eliminated, as studies have reported a high correlation between sleep disorders and the absence of physical activity.
- The reduced weight gain during pregnancy, as a result of physical exercise, is associated with greater physical resistance to the demands of childbirth, combats the fatigue caused by pregnancy and reduces back pain.

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CHILDBIRTH AND PUERPERIUM

Perineal incision surgery

Obstetrics technique - protection of the perineum during natural childbirth byforces or by means of nature
The legitimacy of implementing vertical positions
Puerperium - characteristics of the fourth stage of labor
General changes (in organs and systems)
Changes in the pelvic organs, genitals

Perineal incision surgery

- An episiotomy is a procedure often performed during childbirth
- During the first birth, an episiotomy is often performed
- Perineal incision surgery is more common in women over 35 years of age
- An episiotomy is more common in women who have had a perineal injury in a previous delivery
- The longer the duration of the second stage of labor, the greater the risk of an episiotomy

Incision of the perineum during childbirth

- Swimming during pregnancy reduced perineal trauma.
- Oxytocin-induced or enhanced labor was not significantly associated with increased trauma to the soft tissues of the birth canal.
- Pelvic floor muscle exercises and the length of their use have a positive effect on the frequency of perineal incisions.
- Perineal massage has a negative correlation with the performed incision of the perineum, it also reduces the frequency of perineal tears.

Incision of the perineum during childbirth

- The use of both components, pelvic floor muscle exercises and perineal massage, reduces the risk of possible perineal injuries and the degree of their damage.
- The use of both pushing techniques (spontaneous and directed) influences the number of perineal incisions.
- The same effect is seen in women adopting an active posture such as walking and moving the hips.
- The use of facilities available in delivery rooms, such as balls, ladders and Sako bags, causes fewer perineal tears and reduces the possible severity of perineal trauma.
- The use of both of the above-mentioned forms of activity has a positive effect on the incidence of perineal tears.

Incision of the perineum during childbirth

- An episiotomy during childbirth is an invasive procedure that may cause negative psychophysical and sexual feelings in some women.
- Physical treatments, appropriately selected procedures can be an effective method of mitigation the consequences of an episiotomy
- Lowering the quality of sex life in women after childbirth and natural forces associated with the resulting abnormalities of the vulva and perineum is common nowadays.
- A large number of women after childbirth declare little or no satisfaction with the postpartum condition of the vulva and perineum in terms of resuming sexual activity

Incision of the perineum during childbirth

- The lack of a minimum of education in the field of sexology means that both midwives and doctors, supervising solutions in the ways of nature, do not take into account the sexual activity of women after the puerperium.
- Excessively, reckless promotion of "natural" births, "routine", "force" protection of the perineum without predicting negative effects are very harmful phenomena.
- Incompetent, incorrect incision of the perineum in the second stage of labor, followed by wound management by inexperienced assistants, significantly disturbs anatomical aesthetics and functionality, including the sexual function, vulva and perineum.

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POSTPARTUM

Manual therapy in postpartum period (IV trimester)

"Physical therapists' knowledge base and expertise related to the assessment and treatment of urinary and fecal incontinence, and for perinatal musculoskeletal issues including sexual dysfunction, pelvic girdle, and low back pain, as well as diastasis recti and painful scar tissue, will complement the contributions of other health care providers working in this important area of practice".

Carrie Pagliano, PT, DPT, president of the APTA Section on Women's Health.

COMMON ISSUES WOMEN EXPERIENCE POSTPARTUM INCLUDE (1,2):

1. URINARY, FECAL INCONTINENCE AND PELVIC ORGAN PROLAPSE (3)
2. NON-NEUROGENIC PELVIC FLOOR HYPERTONICITY(4): SEXUAL DYSFUNCTION- DYSPAREUNIA (5,6), CHRONIC PELVIC PAIN (7,8,9)
3. DIASTASIS RECTI SEPARATION (10)
4. PAINFUL PERINEAL OR C-SECTION SCAR TISSUE (11,12,13)
5. NECK PAIN, LOW BACK PAIN AND POSTURE DYSFUNCTION WITH BREASTFEEDING AND CHILDCARE (14,15)

Manual Treatment options vary by condition and may include:

- Muscle energy techniques to realign the pelvic girdle joints and lumbar spine
- Soft tissue mobilization and gentle joint mobilization during prenatal phase
- External/internal soft tissue mobilization, scar mobilization, visceral mobilization and/or joint mobilization during postpartum phase
- Pelvic floor muscle neuromuscular re-education, coordination and strength training
- Postural reeducation
- Diastasis recti correction
- Self-management strategies to expedite transition to home program

WHY Manual Therapy in postpartum period?

Manual Therapy = Mechanotherapy

Mechanotherapy as “any intervention that introduces mechanical forces with the goal of altering molecular pathways and inducing a cellular response that enhances tissue growth, modeling, remodeling, or repair.”(16,17)

CONCLUSIONS:

Evidence shows manual therapy is an effective, low-risk, therapeutic approach especially for non-neurogenic hypertonicity pelvic floor dysfunctions and scars ; however, physical therapists in POLAND currently have a peripheral role in providing postpartum care.

Future recommendations can regarding ways in which physical therapists can increase their involvement in the fourth trimester within their community, stimulate policy change, and promote improved postpartum care practices.

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Physiotherapy of the caesarean section scar

Cesarean section scar

- During the cesarean section, the skin, subcutaneous tissue, fascia and uterus are cut 10-15 cm long.
- The abdominal muscles are most often moved apart, with partial disruption of the tissues between them.

Consequences of an improperly healing scar

- ból lub dyskomfort podczas aktywności fizycznej
- pain and pulling in the area of the cut,
- change of body posture,
- back pain,
- migraines
- excessive tension in the pelvic floor muscles,
- adhesions in the scar area
- pain during physical activity

The wound then passes through three phases toward final repair:

- the inflammatory phase - from 2 to 7 days after surgery
- the fibroblastic phase - up to 6 - 8 weeks after surgery
- the remodeling phase - from 6 months to even 2 years after surgery.

Scar therapy - the inflammatory phase

- Manual work with the surrounding tissues and lymphatic drainage of the lower limbs and abdomen
- The purpose of this action is to reduce postoperative swelling and to improve blood and lymph circulation
- The recommended frequency of therapy in this phase is 1-2 times a week
- By coughing or sneezing, a woman can protect the scar and bring the edges of the wound closer together

Scar therapy - the fibroblastic phase

- direct work with the scar is recommended 4-5 weeks after the cesarean section - when the wound on the skin is completely healed
- the aim of the procedure is to make the scar more flexible and restore mobility to the surrounding tissues.
- manual therapy of soft tissues - manual scar mobilization,
- myofascial techniques
- maintaining the correct body posture
- properly selected exercises.
- scar auto-therapy

Scar therapy - the remodeling phase

- scar treatment can be started or continued if required
- at this stage, more force may be used during mobilization as the scar has already reached its full strength
- activities similar to phase 2

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Pelvic floor muscles exercise after physiological delivery

Pelvic Floor Muscle Training Programs

General recommendations:

- **Active PF exercises** starting **24 hours after** labour.
- **Local cryotherapy.**
- Practice **exercises several times a day**, **few repetitions**, during breast or artificial feeding (only postpartum).
- Same for caesarean delivery.

Pelvic Floor Muscle Training Programs

Review Protocol previous prescription:

- PFM assessment together with **gynecologist, midwife and/or physiotherapist**.
- **Complete obstetric background** (numbers of labors, types, dates, weight, type of anaesthesia, multiple labors, episiotomy, vaginal tears).
- **Hydric valance, voiding and faecal history.**
- **Constipation** stage and treatments.
- Presence of **urine incontinence: stress / urgency incontinence.**
- Pain or urine loss during **sexual act.**
- **Hereditary** of PF disorders between **female family members**.

Pelvic Floor Muscle Training Programs

Review Protocol previous prescription:

- **General and specific personal background**, usual medication, surgical background.
- **Employment history** (dynamic, dispersed, prolonged seating, loads).
- **Sport history**, imperative to medium-long term recovery program.
- **PF assessment (only postpartum):** labia majora and labia minora, "closed" vagina, tissue trophicity, painful scars, fibrosis, fistulas, PF general and particular tone, stress automatism, rectus abdominis diastasis, parasite contractions of adductors, gluteus and abdominals, lumbar column biomechanics exploration, **perineometer objective assessment.**

Pelvic Floor Muscle Training Programs

Algorithm of Classification of PF muscle estate

Depending of the exploration we could classify into **3 groups:**

- Group A, good estate of PF, we recommend **prevention** realising the PF exercises **in house**, use of **vaginal cones or balls**, choosing an **perineal Hypopressive** sport activity, the ideal is to realize **5 sessions of PF re-education as prevention.**

- Grupo B, weaked PF, we recommend **PF exercises**, **vaginal cones or balls**, **specifics therapeutically exercises (TE) programs** and repeat consultation after **6-8 weeks.**

- Grupo C, very deteriorated PF, we recommend PF **physical treatment** WITH consultation and **prescription of the gynaecologist.**

Pelvic Floor Muscle Training Programs

Perineal or abdominal low impact hypopressive activity:

- We recommend **NOT proceed with abdominal high impact physical activities** until **4-6 months after** labor (individual evaluation).

- **Included:** postpartum adapted activity, walking, skating, elliptical bike, sitting bike, Pilates, physiotherapy Pilates, Fit ball, elastic band, dancing in general, belly dance in particular, back training program, swimming, Aquagym, Aquafit, water aerobics.

- **Temporarily forbitten:** running, jumping, racket sports, Spinning, Aerobic, Step.

Pelvic Floor Muscle Training Programs

General Guidelines of the Training Program:

- DRY ACTIVITY TRAINING (1/2 Hour)

Consists of a synergic work between abdominals, perineal hypopressive, upper and lower limbs stabilization for ADLs postural control, schemes.

- WATER ACTIVITY TRAINING (1/2 Hour)

Consists of a vertical synergic work with different materials and horizontal adapted swimming. Inside the swimming pool extensive-intensive aerobic work.

Rectus abdominis diastasis exercises

Diastasis recti abdominis – definition and frequency of occurrence

- Diastasis Rectus Abdominis, also known as DRA, is the separation of the two rectus abdominis muscles along the linea alba. In the female population, DRA is common in pregnant and postpartum women.
- The most common location of occurrence is in the umbilicus, but may also include the supra- and sub-umbilical areas.
- The prevalence of DRA in pregnant and postpartum women is approximately 24-70%.

Inter-recti distance

- The separation of the linea alba in the DRA creates a space called inter-recti distance (IRD).
- The physiological parameters of the linea alba width are up to 15 mm by the xiphoid process, up to 22 mm by 3 cm above the navel and up to 16 mm by 2 cm below the navel.
- The IRD distance decreases gradually with time in the postpartum period with inter-individual variability

DRA risk factors

- pregnancy (hormonal changes, increased size of the uterus, pelvic tilt, increased pressure in the abdominal cavity),
- cesarean section,
- multiple pregnancies,
- fetal macrosomia,
- genetically conditioned defects in the structure of collagen,
- significant weight loss, either spontaneously or after bariatric or abdominal surgery
- obesity,
- diabetes

Consequences of the DRA

- bad body posture
- weakening of the strength of the abdominal muscles
- restrictions during physical activity
- low back pain
- pain in the lumbosacral region
- pelvic floor muscle dysfunction and weakness, urinary incontinence
- reduced quality of life

- Some studies, however, contradict these claims

Conservative treatment - physiotherapy

- abdominal muscle exercises
- posture training
- education and training in appropriate movement and lifting
- methods to strengthen the abdominal muscles (pilates, functional training, Tupler's technique)
- Nobel technique
- pelvic floor muscle exercises as activation of the transverse abdominal muscle
- manual therapy (soft tissue mobilization, myofascial techniques)
- osteopathic techniques
- kinesiotaping
- external bracing
- tubigrip

Which exercises for the abdominal muscles - no unanimity among the authors

use of the transverse abdominals versus avoiding the rectus abdominis exercises to potentially not exacerbate the DRA

inclusion of pelvic floor muscle exercises that activate the transverse abdominal muscle

activation of the rectus abdominis muscle

What to avoid with a DRA?

- exercises that cause the abdominal wall to bulge
- exercises involving exercises of the oblique abdominal muscles,
- lifting the lower limbs above the ground while lying on the back,
- the so-called crunches,
- intense cough without abdominal support,
- lifting heavy objects

Surgery

- In the absence of the effectiveness of conservative treatment in people with high aesthetic and / or functional discomfort or the presence of a hernia, surgical intervention is used
- However, sometimes relapses are observed after surgical treatment

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Umbilical hernia

Exercises to avoid include:

- Some core exercises such as crunches, planks, sit-ups and some more advanced Pilates exercises.
- Heavy lifting, such as high intensity deadlifts and squats.
- Contact sports or high impact physical activities.

A **mild** umbilical hernia during pregnancy might **not need any treatment at all**. The swelling around your belly button may only be fat that got pushed between the muscles. It should go away once you deliver.

Recovering from a hernia involves taking it slow for a few weeks. A body needs to heal, whether you had surgery or not. Exercises to help recovery focus on strengthening the muscles of the abdominal wall and keep the lungs and intestines working efficiently as you recover. Consider:

- Deep Breathing
- Gentle Walks
- Leg Straightens
- Core Twists
- Pelvic Tilts

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Breastfeeding and restoring function

- Regular activity can relax during the postanatal period, keep one fit and help feel more energetic. It can also help a body recover after childbirth and may help prevent postnatal depression.
- Exercise, along with a balanced diet, is an essential part of a healthy lifestyle. Light to moderate physical activity is safe and beneficial for breastfeeding moms, plus it does not affect the amount, taste, or composition of your breast milk
- While lactic acid can increase in breastmilk following maximal exercise (exercising to the extreme of exercise intensity), mild or moderate exercise does not cause lactic acid to increase in breastmilk and does not affect a baby taking the milk.

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