THE EVIDENCE-BASED GUIDE TO:

EXERCISE IN PREGNANCY

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MODULE 1:

UNDERSTANDING PRENATAL FITNESS

Overview

Physical activity during pregnancy is widely supported by current research in exercise science, obstetrics, and pelvic health.
This module provides a clear foundation for prenatal fitness by addressing:

- The importance of physical activity during pregnancy
- Physiological changes that occur across pregnancy and how they influence exercise
- Evidence-based benefits of exercise for both mother and baby
- Common myths and misconceptions that lead to unnecessary fear or restriction

Understanding these principles creates confidence in movement and removes confusion around what is safe, appropriate, and beneficial during pregnancy.
Key message: Exercise is safe and beneficial for most pregnancies when it is appropriately prescribed and progressed.

TRIMESTER 1:
Foundations of Prenatal Exercise (Weeks 0–13)

Importance of Physical Activity in Early Pregnancy

During the first trimester, significant physiological changes occur even before visible body changes appear. Research consistently shows that continuing physical activity during early pregnancy does not increase the risk of miscarriage in uncomplicated pregnancies and supports maternal health.

Exercise in early pregnancy helps to:

- Maintain cardiovascular fitness
- Support metabolic health
- Reduce excessive fatigue over time
- Maintain musculoskeletal strength
- Support mental health and stress regulation

Fatigue and nausea are common during this trimester and may temporarily reduce exercise tolerance. This reflects hormonal and metabolic demands rather than a decline in fitness.

Physiological Changes & Their Impact on Exercise

Key physiological adaptations in Trimester 1 include:

- Rapid hormonal shifts (including progesterone and HCG)
- Increased resting heart rate
- Increased energy expenditure at rest
- Changes in breathing patterns

Research shows that these changes elevate physiological strain at any given workload. As a result, fixed external measures such as pace, load, or heart rate zones may overestimate safe or sustainable intensity during early pregnancy.

For this reason, perceived exertion (how hard the exercise feels) is considered a more reliable and responsive guide than absolute intensity targets. Using perceived exertion allows exercise intensity to adjust day-to-day in response to fatigue, nausea, sleep quality, and hormonal fluctuations, while still maintaining training benefits.

Benefits For Mother & Baby

The most recent evidence indicates that appropriate physical activity during pregnancy is associated with:

- Reduced risk of gestational diabetes
- Improved cardiovascular health
- Reduced pregnancy-related discomfort
- Improved mood and mental wellbeing
- Healthier birth outcomes

These benefits begin in early pregnancy and accumulate across gestation.

Common Myths & Misconceptions

Despite decades of research supporting the safety and benefits of prenatal exercise, misconceptions about what is “safe” during pregnancy are still widespread. Many people receive outdated or overly cautious advice, which can lead to unnecessary fear, reduced activity, and missed health benefits. Understanding the facts behind these myths is important for making informed decisions, maintaining confidence in movement, and supporting both maternal and fetal health throughout pregnancy.

Myth: Exercise causes miscarriage
Truth: Large population studies show no increased miscarriage risk associated with appropriately prescribed exercise in healthy pregnancies.
Myth: Rest is safer than movement in early pregnancy
Truth: Prolonged inactivity can increase discomfort, fatigue, and deconditioning without improving pregnancy outcomes.
Myth: Strength training should be avoided in early pregnancy
Truth: Strength training is safe when load, technique, and breathing are appropriately managed.

TRIMESTER 2:
Adaptation and Capacity (Weeks 14–27)
Importance of Physical Activity in Mid-Pregnancy

Many individuals experience improved energy levels during the second trimester as early pregnancy symptoms such as nausea and significant fatigue often begin to settle. This period can create an opportunity to continue developing strength and endurance while the body adapts to ongoing physiological and biomechanical changes.

During this stage, blood volume and cardiovascular output continue to increase, and the growing uterus begins to shift posture, balance, and breathing mechanics.

Physical activity during the second trimester supports:

- Musculoskeletal resilience, helping joints, muscles, and connective tissues adapt to increasing load
- Pelvic stability, supporting efficient load transfer through the hips and pelvis
- Continued cardiovascular adaptation, supporting endurance and circulation
- Preparation for later pregnancy demands, helping maintain strength and movement capacity as mechanical load increases

Maintaining structured and appropriately progressed exercise during this trimester supports both pregnancy comfort and postpartum recovery.

Physiological Changes & Their Impact on Exercise

Key physiological adaptations in Trimester 2 include:

- Continued increase in blood volume and cardiac output
- Expanding uterus shifting posture, balance, and center of gravity
- Increased ligament and joint laxity due to relaxin
- Ongoing hormonal changes affecting energy levels and perceived effort

Research shows that during mid-pregnancy, the growing uterus shifts the center of gravity and alters posture, which can change the way muscles are recruited and joints are loaded. Combined with increased blood volume and joint laxity, this can make some movements feel less stable or more effortful than before. As a result, exercises may need to be adapted — for example, modifying range of motion, stance, or support — to maintain safety, comfort, and effectiveness.

Relying solely on fixed external measures such as pace, load, or heart rate may not accurately reflect what is safe or sustainable at this stage. Instead, perceived exertion (how hard the exercise feels) is the most practical and responsive guide. This allows exercise to be adjusted day-to-day based on energy levels, fatigue, comfort, and ongoing hormonal changes, while still delivering cardiovascular, musculoskeletal, and metabolic benefits.

Benefits For Mother & Baby

During mid-pregnancy, appropriate physical activity continues to provide meaningful benefits for both mother and baby. Evidence indicates that regular, well-scaled exercise at this stage is associated with:

- Reduced risk of gestational diabetes and hypertension
- Improved cardiovascular fitness, supporting endurance and circulation
- Maintenance of musculoskeletal strength and posture, reducing discomfort such as back or pelvic pain
- Enhanced mood, reduced stress, and improved mental wellbeing
- Support for healthy fetal growth and improved birth outcomes

These benefits, which begin in early pregnancy, continue to accumulate throughout the second trimester, helping the body adapt to increased load while preparing for the final stages of pregnancy.

Common Myths & Misconceptions

Even in the second trimester, myths about prenatal exercise remain common, despite strong evidence supporting safe, appropriately scaled activity. Understanding the facts helps maintain confidence, supports ongoing movement, and reduces unnecessary worry.

Myth: Increased energy means it's safe to push harder
Truth: Feeling more energetic is common in mid-pregnancy, but load and intensity still need to be managed. Overexertion can increase strain on joints, ligaments, and the cardiovascular system.
Myth: Core training should stop because of the growing bump
Truth: Core and pelvic floor exercises can and should continue, with modifications to accommodate the changing center of gravity, posture, and comfort. Safe adaptations preserve strength, stability, and support labor preparation.
Myth: Strength or resistance training is unsafe in mid-pregnancy
Truth: When technique, load, and breathing are appropriately managed, strength training is safe and beneficial. It supports musculoskeletal health, posture, and functional capacity as the body adapts to increased mechanical load.

TRIMESTER 3:
Preparing for Birth and Beyond (Weeks 28 - Birth)

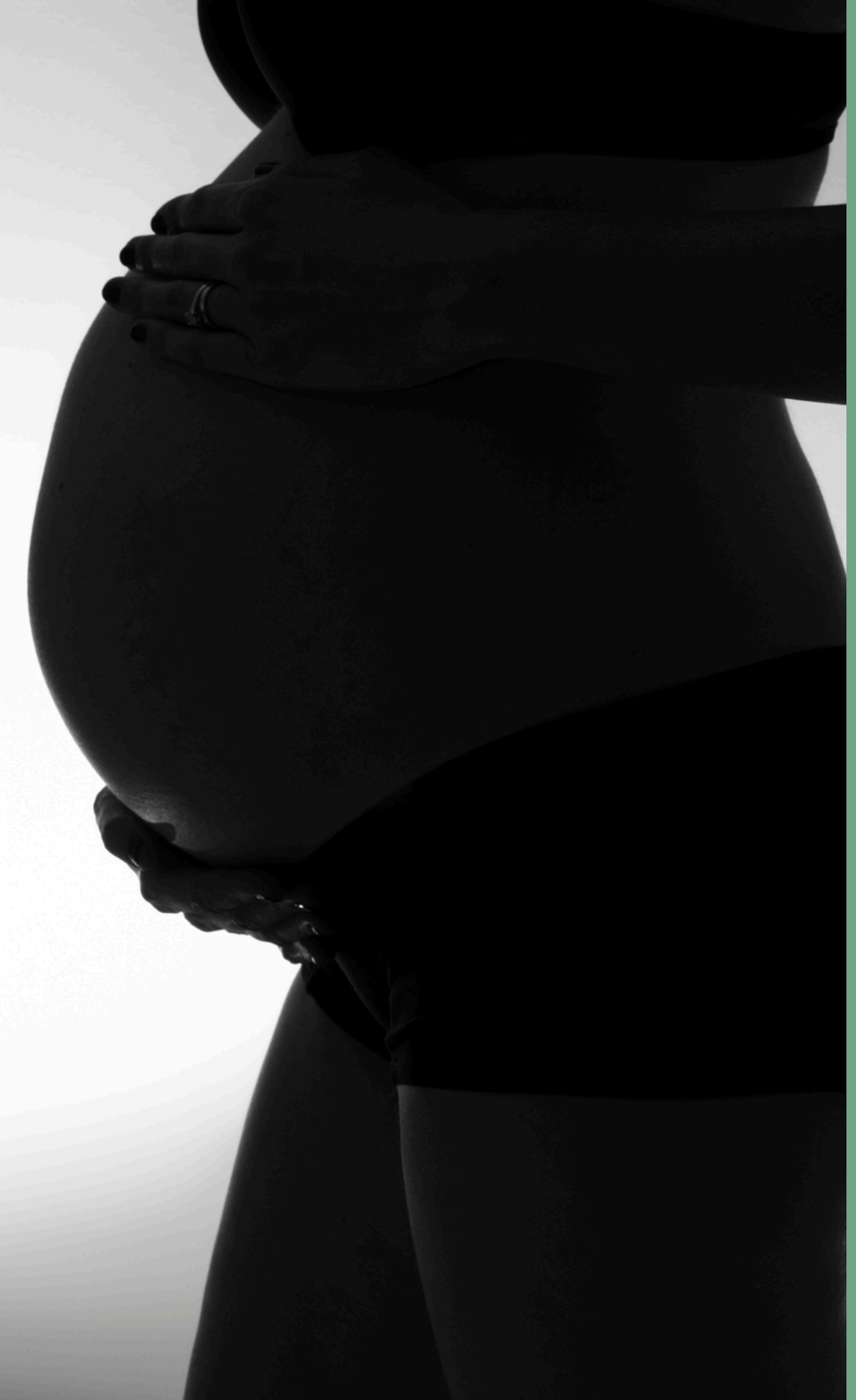
Importance of Physical Activity in Late-Pregnancy

In late pregnancy, fatigue, breathlessness, and mechanical load increase as the body prepares for birth. The growing uterus continues to shift posture and the center of gravity, and breathing mechanics are further adapted to accommodate the expanding abdomen. Maintaining regular, appropriately modified physical activity supports comfort, functional strength, and prepares the body for labor and postpartum recovery.

Physical activity during this trimester supports:

- Musculoskeletal support, helping muscles and joints handle increased load
- Pelvic stability, aiding posture, balance, and efficient load transfer
- Cardiovascular function, supporting circulation, endurance, and energy levels
- Birth preparation and postpartum readiness, preserving strength and functional capacity

Maintaining structured and appropriately progressed exercise during this trimester supports both pregnancy comfort and postpartum recovery.



Physiological Changes & Their Impact on Exercise

Key physiological adaptations in Trimester 3 include:

- Further increase in mechanical load on the spine, hips, and pelvis
- Postural changes affecting balance and stability
- Respiratory adaptations, including reduced diaphragmatic excursion
- Intra-abdominal pressure influencing core and pelvic floor engagement

These changes can make certain movements feel more demanding and may reduce tolerance for higher volumes or longer durations of exercise. As balance, breathing capacity, and load management are increasingly affected, exercises often require modification in stance, range of motion, support, or tempo to remain comfortable and effective.

At this stage, perceived exertion is the most practical guide for regulating intensity. Using how the exercise feels allows training to be adjusted day-to-day in response to fatigue, sleep quality, breathlessness, and overall comfort, while still supporting cardiovascular fitness, muscular endurance, and metabolic health.

Benefits For Mother & Baby

Evidence shows that continued physical activity in late pregnancy supports:

- Maintenance of strength, mobility, and functional capacity for daily activities and labor
- Pelvic stability and posture, reducing discomfort and lower back strain
- Cardiovascular fitness, promoting energy and circulation
- Better labor outcomes, including endurance, confidence in movement, and potential for improved postpartum recovery

Regular exercise at this stage helps the body stay resilient and prepares for the transition into postpartum recovery.

Common Myths & Misconceptions

In the third trimester, exercise advice often becomes overly cautious, with many people encouraged to significantly reduce or stop movement altogether. While the body undergoes substantial physiological and biomechanical changes at this stage, these changes do not make exercise unsafe. Instead, they highlight the importance of appropriate modifications to support comfort, safety, and continued physical capacity through late pregnancy.

Myth: Exercise late in pregnancy is unsafe for the baby
Truth: Properly modified activity is safe and continues to offer maternal and fetal benefits.
Myth: It's best to stop completely in the final weeks
Truth: Abrupt cessation can reduce functional capacity; gentle, tailored exercise is preferable.
Myth: High-intensity activity must be avoided entirely
Truth: Intensity can be adjusted based on perceived exertion; moderate activity remains safe and effective

The Impact of Exercise During Pregnancy

Current evidence shows that regular, moderate exercise during pregnancy is associated with significant reductions in the risk of **several complications:**

- Gestational diabetes
  ↓ 38–40% reduced risk
- Preeclampsia / hypertensive disorders
  ↓ 35–40% reduced risk
- Excessive gestational weight gain
  ↓ 30–35% reduced risk
- Prenatal depression symptoms
  ↓ 25% reduced risk
- Low back and pelvic pain
  ↓ 25–30% reduced risk

Birth & Baby Outcomes

- No increased risk of miscarriage, preterm birth, or low birth weight with appropriately prescribed exercise
- Reduced likelihood of large-for-gestational-age infants
- Improved placental function and fetal environment

What This Means

Exercise during pregnancy is not just safe — it is one of the most effective, evidence-based strategies for improving both maternal and fetal health outcomes.
Movement is not a risk — inactivity is.

MODULE 2:

SAFETY, SCREENING & EXERCISE BOUNDARIES

Overview

Exercise during pregnancy is widely supported by current research as safe and beneficial for most individuals. However, safe participation requires an understanding of appropriate screening processes, individual health considerations, and how to recognise when modification or medical guidance is needed.

Pregnancy is not a contraindication to exercise, but it does introduce variables that influence how training should be approached. These include pre-existing medical conditions, pregnancy-specific complications, and the body’s evolving physiological responses.

This module provides a clear framework for exercising safely and confidently throughout pregnancy. It outlines how to identify when exercise is appropriate, how to recognise symptoms that require attention, and how to apply practical boundaries that support both maternal and fetal wellbeing.

The goal is not restriction, but informed decision-making.

Medical Clearance & Risk Assessment

Most pregnant individuals can safely engage in regular physical activity without medical restriction. Large systematic reviews led by Dr Margie Davenport and colleagues demonstrate that prenatal exercise in low-risk pregnancies is not associated with increased risk of miscarriage, fetal mortality, preterm birth, or low birth weight.
That said, some medical conditions require additional screening or modification.

Pregnancy risk categories:

- Low-risk pregnancies

Most individuals fall into this category and can follow general prenatal exercise recommendations.

- Higher-risk pregnancies

These may include pre-existing medical conditions, pregnancy complications, or a history of adverse pregnancy outcomes. In these cases, exercise may still be beneficial but should be guided by a healthcare provider.

Medical Clearance & Risk Assessment continued...

Contraindications to exercise:

Some conditions may require temporary restriction or close medical supervision, including:

- Significant heart or lung disease
- Uncontrolled hypertension or preeclampsia
- Placenta previa later in pregnancy
- Ongoing preterm labour

Current evidence increasingly supports individualised risk–benefit assessment, rather than blanket avoidance of exercise, with decisions made collaboratively between the pregnant individual and their healthcare provider.

Warning Signs to Stop Exercise

While exercise is safe for most pregnancies, certain symptoms indicate that activity should stop immediately and medical advice should be sought.

Stop exercise if you experience:

- Vaginal bleeding or fluid leakage
- Persistent dizziness, fainting, or severe headache
- Chest pain or shortness of breath that is disproportionate to effort
- Painful or regular uterine contractions
- Sudden swelling, visual changes, or severe pelvic pain
- Reduced fetal movement (later pregnancy)

Recognising and responding to these signs supports maternal safety and appropriate clinical follow-up.

Modifying Exercise Across Pregnancy

As pregnancy progresses, physiological and biomechanical changes alter how the body responds to exercise. Modifications are not a sign of reduced capability, but an appropriate response to changing demands.

- **Early pregnancy:** Fatigue, nausea, and hormonal shifts may affect tolerance. Maintaining consistency is more important than maintaining intensity.
- **Mid-pregnancy:** Changes in posture, joint laxity, and load distribution may affect balance and comfort. Exercise selection and stance may need adjustment.
- **Late pregnancy:** Abdominal growth, altered breathing mechanics, and increased fatigue may require reduced range of motion, additional support, or alternative positions.

Research supports modifying movement to accommodate these changes while continuing to accumulate meaningful physical activity across pregnancy.

Regulating Exercise Intensity Safely

Pregnancy alters cardiovascular, respiratory, and metabolic responses to exercise. Because of this, fixed external intensity measures such as heart rate zones, pace, or absolute load are less reliable.
Research supports the use of subjective intensity monitoring as the most practical and safe approach.

Recommended tools:

- **Perceived exertion:** Moderate intensity is appropriate for most pregnancies. Exercise should feel challenging but sustainable.
- **Talk test:** You should be able to speak in full sentences without gasping.
- **Internal feedback:** Day-to-day energy, fatigue, sleep quality, and comfort should guide adjustments.

Using perceived exertion allows intensity to respond to physiological fluctuations while still supporting cardiovascular, muscular, and metabolic benefits.

Environmental & Lifestyle Considerations

Safe prenatal exercise is influenced by more than the activity itself.

Key considerations include:

- Hydration: Increased fluid needs during pregnancy require regular intake before, during, and after exercise.
- Temperature regulation: Avoid overheating by exercising in climate-controlled environments and wearing breathable clothing.
- Illness or injury: Light activity may be appropriate during minor illness, but fever, infection, or injury may require rest or modification.
- Recovery: Adequate sleep and nutrition support both maternal adaptation and fetal growth.

Managing these factors supports safe participation and reduces unnecessary physiological stress.

MODULE 3:

CORE, PELVIC FLOOR & PRESSURE MANAGEMENT

Overview

The core and pelvic floor play a central role in supporting the body throughout pregnancy. As the uterus grows and physical demands increase, these systems must adapt to manage internal pressure, support posture, and maintain efficient movement. Understanding how the core and pelvic floor function — and how to train them appropriately — supports comfort during pregnancy and recovery after birth.

This module provides in-depth education on:

- Deep core anatomy and pressure regulation
- Diastasis recti (abdominal separation)
- Pelvic floor structure and function
- Intra-abdominal pressure and exercise
- Symptom interpretation and when to seek support
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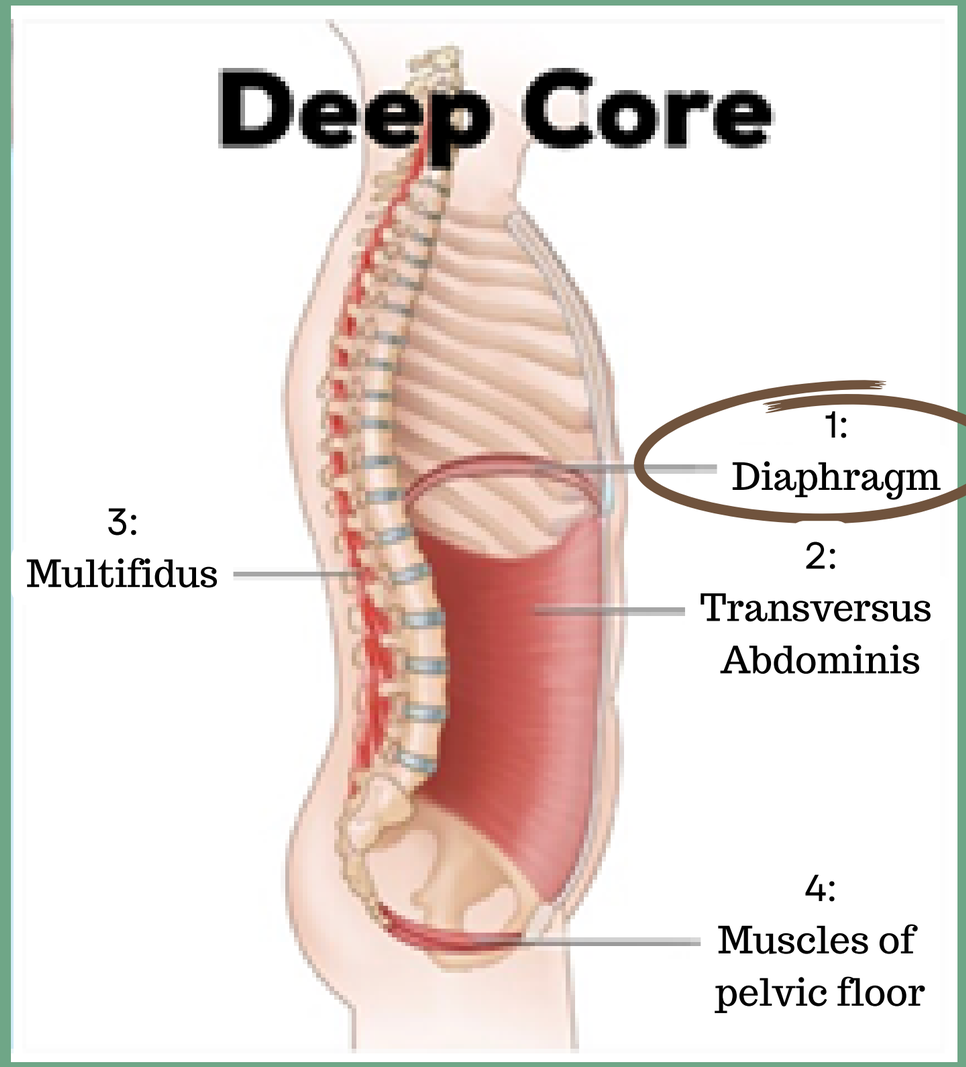
The goal is confidence, not caution.

Understanding the Core & Pelvic Floor System



The core is not just your “abs.” It is a coordinated system of muscles that manage pressure, stabilize the spine, and transfer force between the upper and lower body.

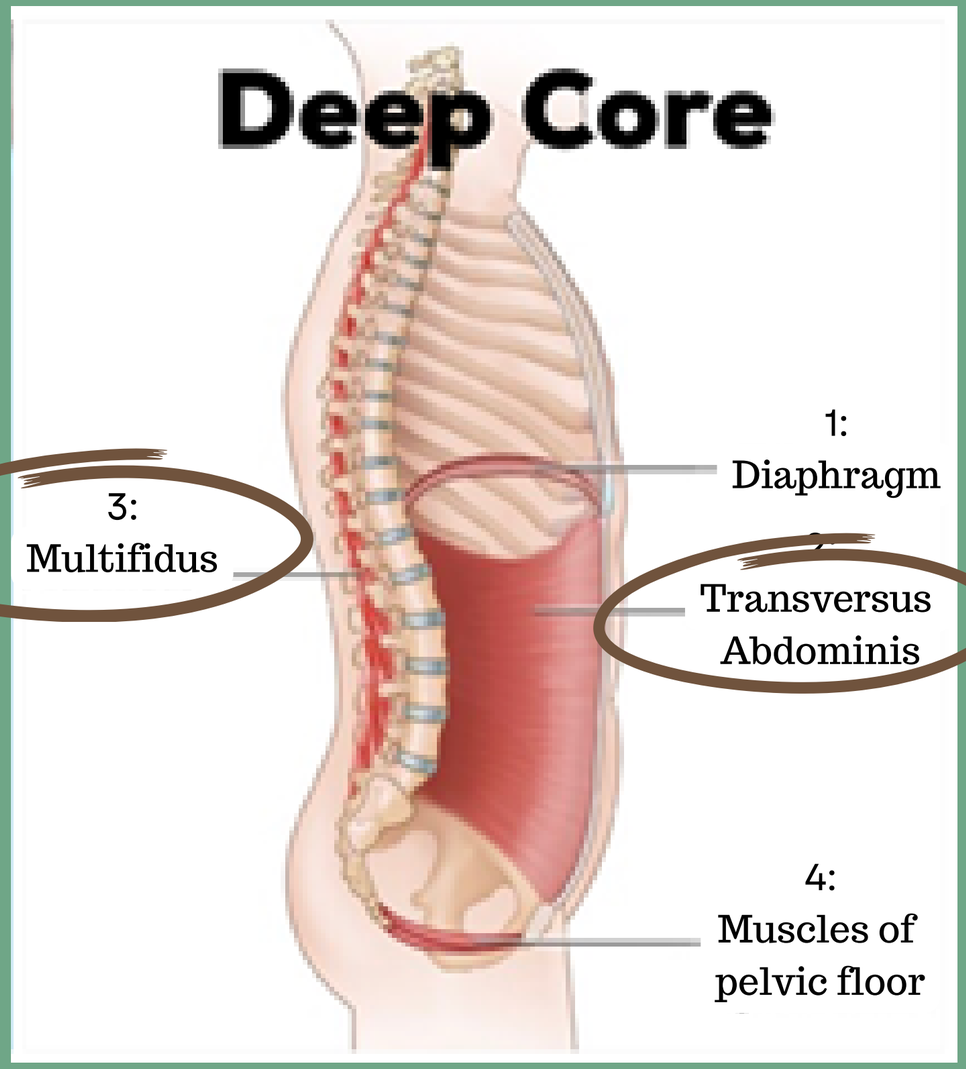
1: Diaphragm

The diaphragm is your primary breathing muscle. It forms a dome underneath the rib cage and moves downward during inhalation, creating expansion through the ribs and abdomen.
Breathing is not separate from stability — it is central to it.

- Inhalation increases intra-abdominal pressure and gently lengthens the pelvic floor.
- Exhalation assists with recoil and can be scaled in intensity depending on the demand of the task.

An intentional exhale during effort helps regulate pressure and improve force transfer.

Understanding the Core and Pelvic Floor System continued...



2: Transversus abdominis (TVA)

The TVA is the deepest abdominal muscle. It wraps around the torso like a corset, providing compression and support to the abdominal wall. Rather than “pulling your belly in,” its role is to:

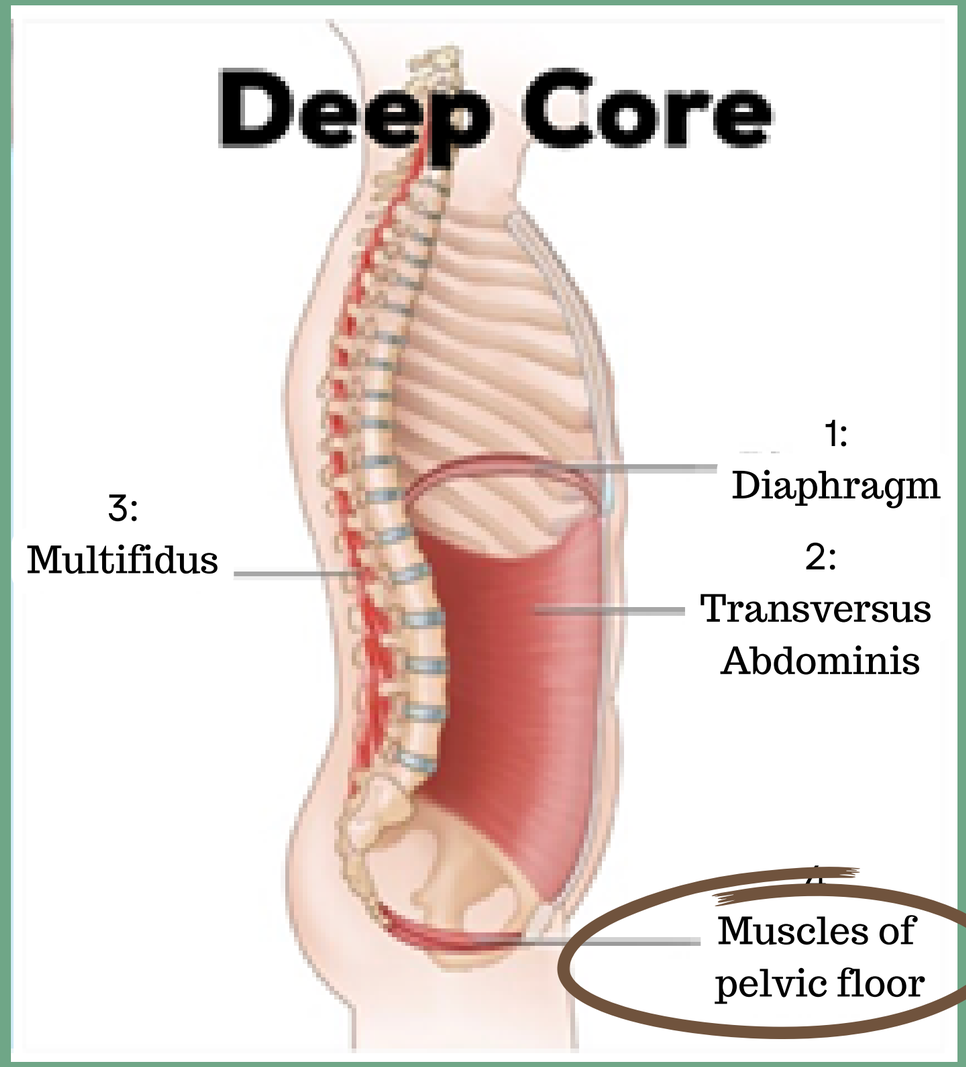
- Support load transfer
- Assist in pressure regulation
- Contribute to trunk stiffness when required

It functions best when coordinated with breath — not when constantly braced.

3: Multifidus

The multifidus is a group of small stabilizing muscles that run along both sides of the spine. They provide segmental spinal stability and help maintain posture as your center of mass shifts throughout pregnancy. As the uterus grows and lumbar curvature increases, these muscles play an increasingly important stabilizing role.

Understanding the Core and Pelvic Floor System continued...



4: Pelvic floor muscles

The pelvic floor forms the base of this system. It is a sling of muscle and connective tissue that:

- Supports the bladder, uterus, and bowel
- Assists with continence
- Contributes to lumbopelvic stability
- Regulates pressure in coordination with the diaphragm

The pelvic floor is not just a “Kegel muscle.” It is dynamic, reflexive, and load-responsive.

It typically runs into difficulty when the pressure it is required to manage exceeds its capacity — not simply because pregnancy exists.

Together, these muscles function as an integrated system, meaning that how load, intensity, and movement demands are managed during exercise directly influences how effectively pressure is distributed and controlled throughout pregnancy.

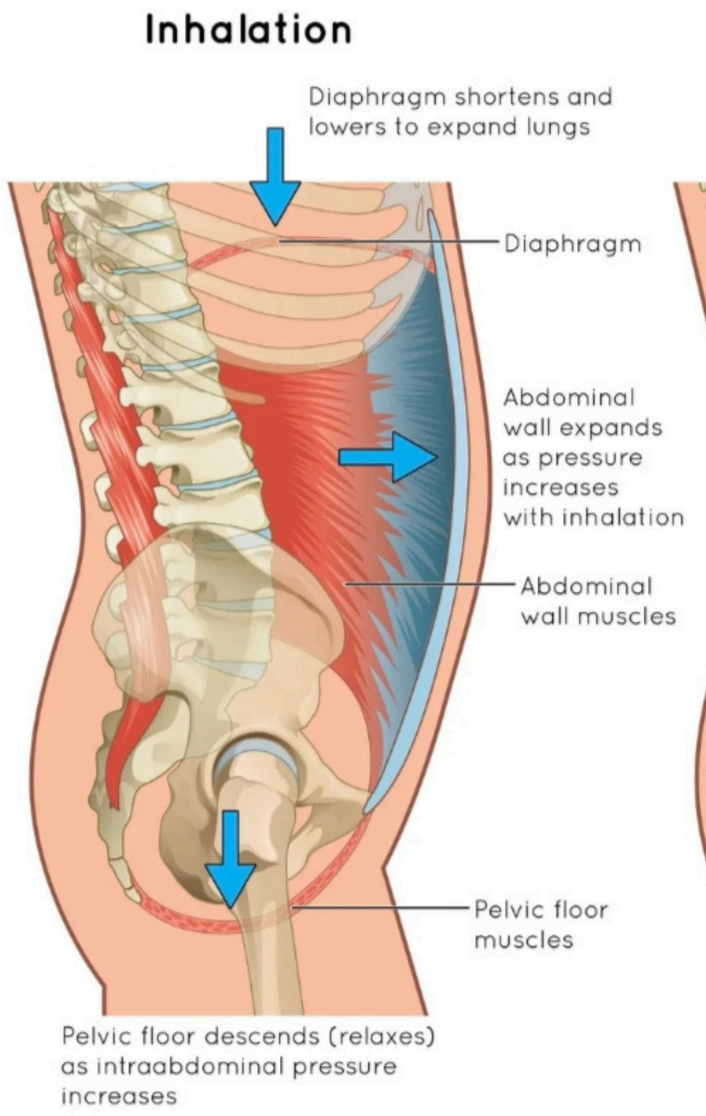
Understanding Intra Abdominal Pressure

Intra-abdominal pressure (IAP) is essential. It stabilizes the spine and supports force production. Without it, lifting and movement would be inefficient and unsafe.

However, IAP increases significantly during:

- Heavy lifting
- Valsalva maneuver (breath holding under load)
- High-impact exercise (running, jumping)
- Sudden directional changes

On a well-managed inhale, the diaphragm gently descends and lengthens, creating space for the lungs to fill. As this happens, pressure is distributed 360° through the trunk: the rib cage expands outwards and slightly back, the abdominals soften and widen (front, sides, and back), and the lats subtly expand as they attach into the thoracolumbar fascia and rib cage. At the same time, the pelvic floor lengthens and descends slightly, mirroring the diaphragm. This coordinated expansion allows intra-abdominal pressure (IAP) to be shared evenly rather than pushed into one direction.

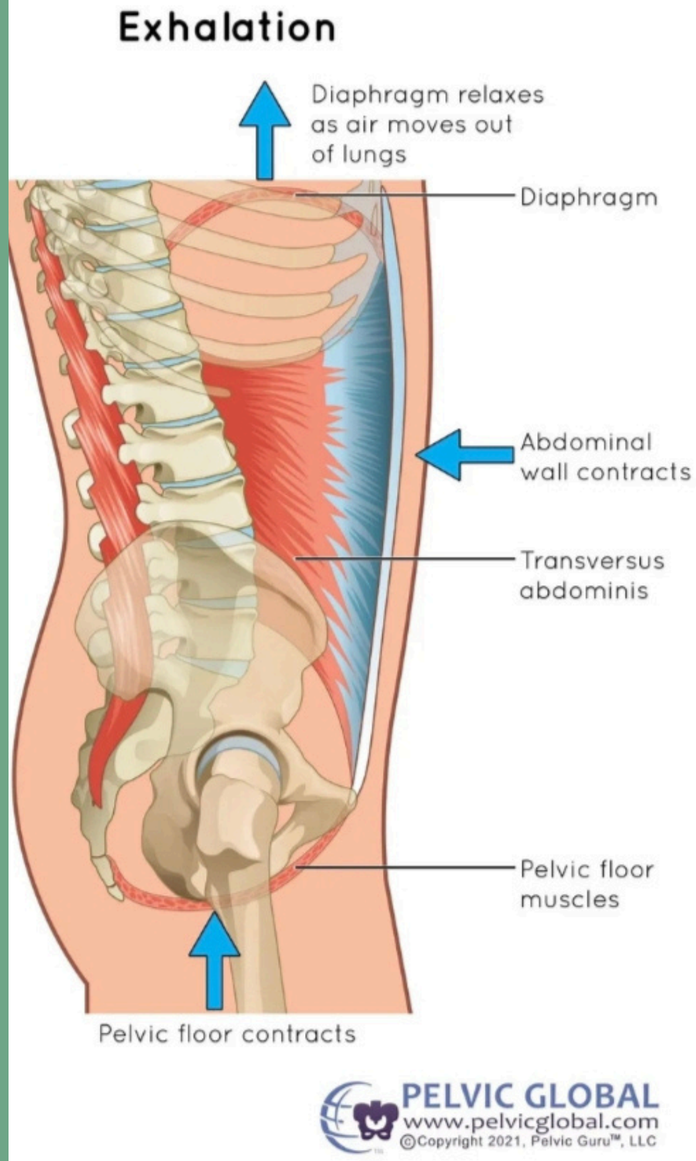


Understanding intra abdominal pressure continued...

On a controlled exhale, the diaphragm recoils upward, the ribs gently move down and in, the abdominals draw back toward midline, and the pelvic floor recoils upward—restoring tension without gripping or bracing.

When effort is added (lifting, pushing, pulling, impact), the breath should support this same pressure strategy. If breathing is held, forced, or directed poorly (for example, excessive abdominal bracing, breath-holding, or rib flare), pressure can no longer be distributed evenly. Instead, IAP is redirected forward toward the path of least resistance—often the linea alba—which can present as coning or doming of the abdominal wall (More on this in the next few slides!)

Over time or under repeated load, this pattern can increase strain on connective tissue and reduce efficient force transfer through the core. Evidence consistently shows that coordinated diaphragm–rib–abdominal–pelvic floor function improves pressure management, spinal stability, and load tolerance—making mindful breathing a key component of safe, effective movement, especially during pregnancy, postpartum, and higher-load training. Knowing this, you can see why Kegels alone rarely solve pelvic floor dysfunction. True improvement requires restoring how the pelvic floor works with breathing, pressure, and whole-body movement—not in isolation.



Diastasis Recti (Abdominal Separation)

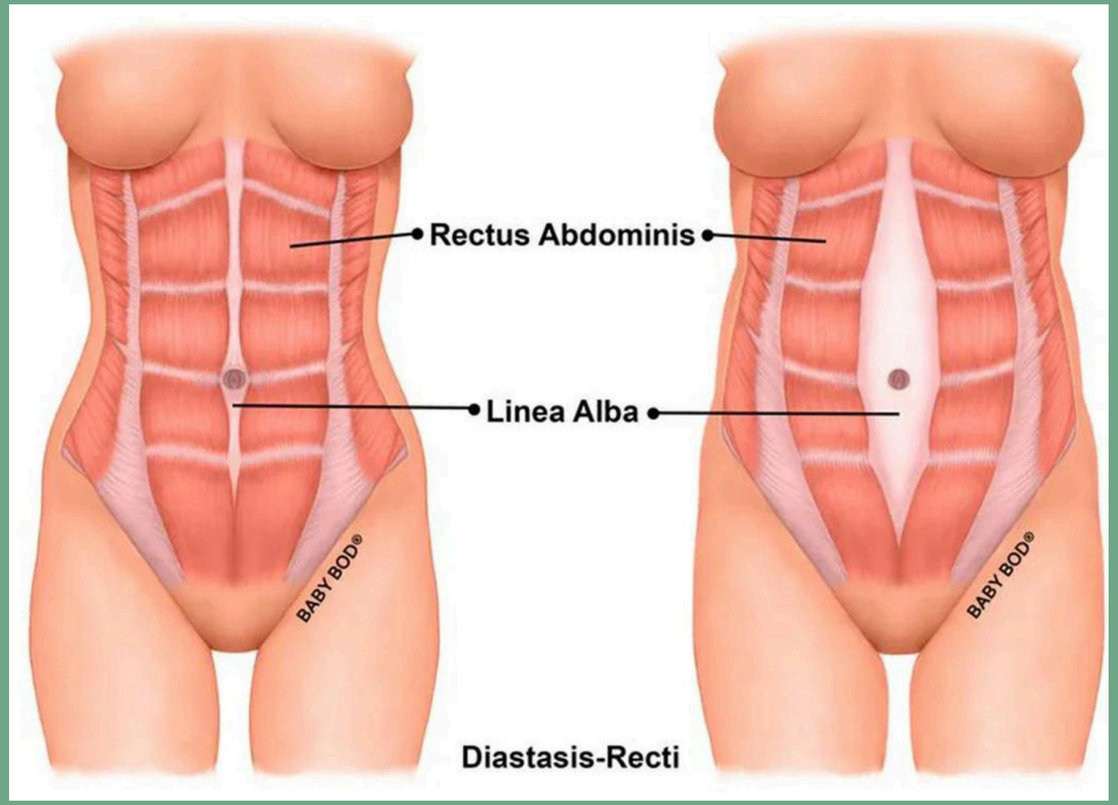
Diastasis recti (DR) refers to the separation of the left and right sides of the rectus abdominis along the linea alba. This occurs as the uterus expands and abdominal tissues stretch to accommodate growth.

Important context:

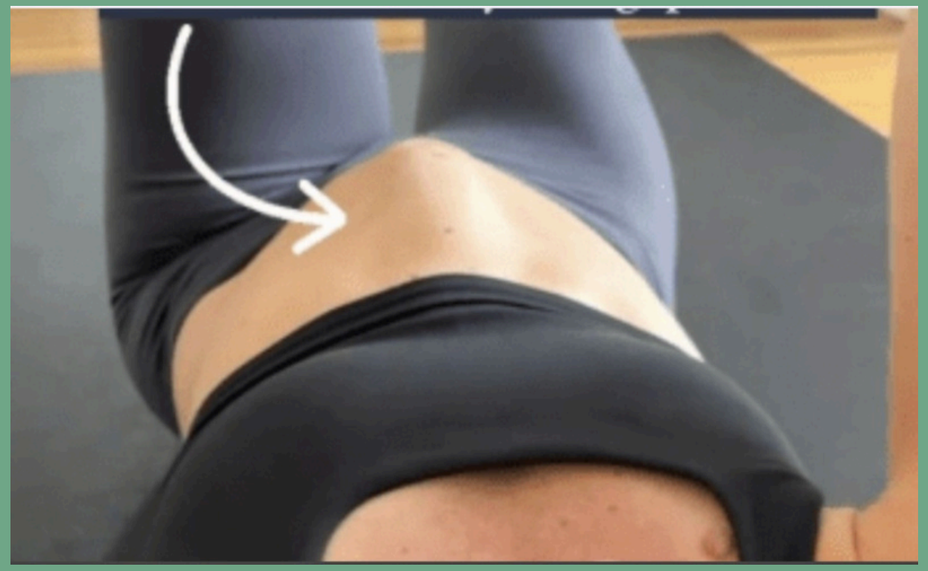
- Some degree of separation occurs in nearly all pregnancies carried to term.
- It is a normal physiological adaptation, not a pathology.
- Severity varies based on tissue properties, genetics, connective tissue integrity, and load management.

What Influences Severity?

- Connective tissue elasticity
- Fetal size and number of pregnancies
- Hormonal environment
- Intra-abdominal pressure patterns
- Exercise load and breathing strategy



Exercise does not cause diastasis recti. Poor pressure management under load may increase strain on the linea alba, but appropriately programmed training can support tissue capacity.



Coning & Doming

Coning occurs when intra-abdominal pressure pushes outward along the midline during movement.

Key points:

- Occasional, brief coning is not dangerous.
- Persistent or exaggerated coning suggests pressure exceeds tissue capacity.
- Modifying load, position, or breathing usually resolves it.

This is feedback — not failure.

Referral to a pelvic floor physiotherapist may be helpful if:

- There is significant functional weakness
- There is associated pain
- The separation feels wide, deep, and unresponsive postpartum

Practical Load Management Strategies

- Exhale during the effort phase of lifts
- Allow rib and abdominal expansion on inhale
- Avoid chronic abdominal bracing
- Reduce load if symptoms appear
- Modify position (e.g., incline instead of supine if uncomfortable)

Perceived exertion remains the most reliable intensity guide throughout pregnancy.

Symptoms — What Is Normal vs What Needs Support

Mild and occasional symptoms can occur during pregnancy due to tissue adaptation.

Common experiences include:

- Temporary heaviness
- Occasional urine leakage
- Increased pressure sensation with fatigue
- Visible coning during challenging movements

These are often manageable with load and breathing adjustments.

Professional pelvic floor physiotherapy support is recommended if you experience:

- Persistent or worsening urinary or fecal incontinence
- Ongoing pelvic heaviness or bulging sensation
- Pain in the pelvis, tailbone, or vaginal region
- Symptoms that interfere with daily function
- A feeling of vaginal pressure that does not resolve with rest

Seeking support is proactive, not reactive.

Removing Fear Around Core & Pelvic Floor Training

The core and pelvic floor are designed to respond to load. Avoiding all stress does not improve resilience. Gradual, progressive, well-managed load improves tissue capacity and neuromuscular coordination.

The objective is not to eliminate pressure — it is to distribute it effectively.

With appropriate breathing, strength training, and symptom awareness, most individuals can continue exercising safely throughout pregnancy.

Knowledge reduces fear. Strategy builds confidence.

MODULE 4:

STRENGTH & MOBILITY TRAINING IN PREGNANCY

Overview

Strength and mobility are foundational to maintaining physical capacity throughout pregnancy. As body mass increases and posture, balance, and movement demands change, the musculoskeletal system must adapt to support daily activity, exercise, and preparation for later pregnancy and birth. Appropriately prescribed strength and mobility training helps maintain joint stability, muscular endurance, and movement efficiency as these demands evolve.

This module provides in-depth education on:

- Strength training principles during pregnancy
- Load selection, intensity regulation, and perceived exertion
- Mobility strategies to support posture and movement
- Exercise adaptation as the body changes
- Structuring prenatal training sessions safely and effectively

The focus is not on avoiding challenge, but on understanding how to train intelligently as the body adapts — maintaining strength, confidence, and function throughout pregnancy.

Training Intensity & Load Selection

One of the most common misconceptions surrounding prenatal strength training is that loads must remain “light” throughout pregnancy. Current research does not support this idea.

When exercise is properly programmed and pressure is well managed, pregnant individuals can safely lift at moderate to high intensities, similar to non-pregnant populations — with appropriate adjustments over time.

Rather than using percentages of one-rep max (which are impractical and unnecessary in pregnancy), intensity is best guided by autoregulation tools such as Rate of Perceived Exertion (RPE) or Reps in Reserve (RIR).

Understanding RPE and RIR

- RPE (Rate of Perceived Exertion) describes how hard a set feels on a scale from 1–10
- RIR (Reps in Reserve) refers to how many additional reps you could have completed with good form

For example:

- RPE 8 ≈ 2 reps in reserve
- You feel challenged, but you are not lifting to failure
- Breathing remains controlled, and technique does not break down

This approach aligns well with pregnancy, where internal feedback is more important than external load.

Training Intensity & Load Selection continued...

Current evidence supports resistance training at moderate to vigorous intensities throughout pregnancy when no medical contraindications are present. This includes lifting loads that feel challenging while still allowing good technique, breathing control, and symptom-free movement.

An RPE of up to ~8 (approximately 2 reps in reserve) is appropriate during pregnancy for well-tolerated exercises. This intensity is sufficient to stimulate muscular strength, maintain lean mass, and support functional capacity without requiring maximal effort.

As pregnancy progresses, it is important to understand that perceived exertion may change even if the external load remains the same.

Several normal physiological and biomechanical changes influence how hard exercise feels, including:

- Increased resting heart rate and cardiovascular demand
- Greater baseline fatigue due to hormonal and metabolic changes
- Postural shifts and changes in balance as the abdomen grows
- Altered breathing mechanics and intra-abdominal pressure regulation

Training Intensity & Load Selection continued...

Due to the factors mentioned, a weight that previously felt like RPE 6–7 may feel closer to RPE 8 later in pregnancy, even though the load itself has not changed.

For this reason, RPE should always be interpreted relative to how the movement feels on that day, rather than chasing a specific number or external load. Maintaining movement quality, breathing control, and symptom-free execution is more important than progressing weight.

This approach allows training intensity to:

- Self-adjust across pregnancy stages
- Accommodate day-to-day changes in energy and recovery
- Remain safe, effective, and evidence-based

Mobility Strategies to Support Posture & Movement

Mobility training during pregnancy supports joint health, posture, and efficient movement as the body adapts to increasing load and shifting alignment. As the abdomen grows, changes commonly occur at the thoracic spine, hips, pelvis, and rib cage, which can influence movement patterns and contribute to stiffness or discomfort if not addressed.
Effective mobility work focuses on maintaining functional range of motion rather than forcing excessive flexibility. Controlled, active movements that promote joint control and coordination are particularly valuable. Mobility exercises should feel supportive and relieving, not aggressive or painful.

Incorporating regular mobility work can assist with:

- Managing postural changes and movement restrictions
- Supporting comfortable breathing mechanics
- Improving exercise tolerance and movement efficiency
- Reducing the likelihood of compensatory patterns

Mobility training works best when integrated alongside strength training, rather than as a separate or corrective-only component.

Exercise Selection & Movement Patterns

Rather than focusing on individual exercises, prenatal programming is best organised around movement patterns.

These include:

- Squatting and sit-to-stand patterns
- Hinges (deadlift-type movements)
- Push and pull patterns for the upper body
- Carry and hold variations
- Rotational and anti-rotational core work

As pregnancy progresses, stance width, range of motion, and load placement may change — but the patterns themselves remain valuable. Avoidance is rarely necessary. Modification is usually sufficient.

Safety, Symptoms & Self-Monitoring

Exercise during pregnancy should feel challenging but manageable.

Adjust or pause an exercise if you experience:

- Dizziness or light-headedness
- Sharp pain
- Persistent breath holding
- Pelvic heaviness or pressure that does not resolve
- Significant coning that does not improve with modification

Training should leave you feeling better after, not depleted.
When in doubt, reducing load, slowing tempo, or changing position is usually sufficient.

Prenatal Training Structure

There is no single “correct” way to structure resistance training during pregnancy. While full-body sessions are commonly used — particularly when training frequency is two to three days per week — they are not the only effective option.
Upper/lower splits, push–pull formats, or other structured programming styles are equally appropriate, provided overall volume, recovery, and symptom response are managed.

Training structure should reflect:

- Individual preference
- Weekly schedule and recovery capacity
- Previous training experience
- Energy levels across pregnancy

Consistency and sustainability are more important than format. A well-designed split that allows adequate recovery is just as effective as a full-body approach.

Prenatal Strength Session: Example Layout

Regardless of structure, most sessions benefit from thoughtful sequencing.

1. Warm-Up & Preparation

Focused on gradually increasing circulation, preparing joints, and coordinating breathing with movement. This may include mobility work, light pattern rehearsal, and progressive loading.

- Rib cage and thoracic mobility
- Hip and pelvic movement
- Light sets of programmed exercises

2. Primary Strength Work

Compound, multi-joint movements that provide the greatest training stimulus. Examples include squat patterns, hinge patterns, presses, rows, or supported single-leg variations.

These exercises:

- Drive strength adaptations
- Maintain muscle mass
- Support functional capacity
- Provide the highest return on training time

Prenatal Strength Session: Example Layout

3. Secondary / Support Work

Accessory exercises complement primary lifts by targeting muscle groups that may not be fully challenged during compound movements, or by improving tolerance in specific ranges of motion.

accessory work serves to:

- Increase overall training volume in a controlled manner
- Strengthen stabilising musculature
- Improve muscular endurance
- Address individual movement asymmetries
- Support joint integrity across changing biomechanics

Examples may include:

- Single-leg or staggered stance variations
- Upper back and shoulder stabilisers
- Hip abductors or adductors
- Controlled anti-rotation or carry variations

Accessory work enhances the robustness of the system as a whole. It reinforces strength adaptations without requiring maximal loading.

4. Cool Down & Regulation

Lower-intensity movement, breathing work, or light mobility to transition out of the session and support recovery.

Intensity is guided by:

- Ability to breathe throughout the movement
- Stable technique
- Perceived exertion rather than absolute load

Exercise Selection During Pregnancy

There are no universally “forbidden” exercises in pregnancy for individuals without medical contraindications. The body does not suddenly become fragile because it is pregnant. Most resistance training movements can continue to be performed safely when they are appropriately loaded, well executed, and adapted to accommodate physiological and anatomical changes.

Exercise selection should be guided by:

- Previous training experience
- Technical proficiency
- Symptom response
- Comfort and confidence with the movement

An individual who has trained consistently prior to pregnancy will often tolerate a broader range of exercises than someone new to resistance training. Capability and training history matter more than the exercise name itself.

Exercise Selection During Pregnancy continued...

Adapting for the Growing Abdomen

As the abdomen expands, some movements require practical modification — not because they are inherently unsafe, but because the physical space available changes.

A common consideration is bar path.

For example:

- A barbell bent-over row may become mechanically limited as the bar approaches the abdomen. Transitioning to dumbbells allows full range of motion without altering torso angle or compensating through technique.
- Olympic lifting variations such as the clean & jerk, or snatch rely on a close and vertical bar path. As the abdomen grows, maintaining this path becomes increasingly difficult and may encourage compensatory movement patterns. Switching to dumbbell variations preserves power development and coordination without forcing technical compromise.

The goal is not to eliminate movement patterns such as hinging or pulling, but to select tools that allow them to be executed cleanly and comfortably. In many cases, equipment choice — rather than exercise removal — is the simplest solution.

Exercise Selection During Pregnancy continued...

Loaded Hip Thrusts

One exercise that warrants specific consideration is the barbell hip thrust, where significant load is placed directly across the pelvic region.
While there is limited direct research evaluating loaded hip thrusts in pregnancy, the potential for direct compressive force across the abdomen and pelvic region — particularly as tissues become more sensitive — makes this a higher-risk, lower-necessity option.
Because the gluteal muscles can be trained effectively through:

- Romanian deadlifts
- Squats and split squats
- Cable or banded hip extensions
- Elevated glute bridges without direct anterior pelvic loading

There is little practical reason to continue heavy barbell hip thrusting during pregnancy.
This is not because glute training should be reduced — but because there are equally effective alternatives that avoid direct loading over the uterus and anterior pelvis.

Supine Positioning

Recent research suggests that the relationship between supine positioning (lying flat on your back) and maternal or fetal risk during short periods of exercise is more nuanced than previously thought. Studies indicate that many pregnant individuals tolerate brief periods of supine exercise without adverse effects, particularly earlier in pregnancy.

Symptoms typically occur before any clinically meaningful compromise develops. In practice, individuals will often experience clear warning signs such as:

- Light-headedness
- Nausea
- Dizziness
- A sense of discomfort or breathlessness

These symptoms act as natural cues to adjust position. Because of this, many contemporary prenatal exercise guidelines recommend symptom-guided modification rather than strict avoidance.

As pregnancy progresses, lying flat may simply become uncomfortable or impractical. In these cases, exercises can easily be modified by:

- Performing them on an incline bench
- Using side-lying positions
- Choosing seated or standing alternatives

The key principle is responsiveness to comfort and symptom feedback, rather than rigid rules based on gestational age alone.

The Guiding Principle

Exercise selection during pregnancy is not about rigid prohibition.
It is about maintaining:

- Clean movement mechanics
- Stable breathing strategies
- Symptom-free execution
- Appropriate load tolerance

If an exercise requires significant technical alteration to “make it work,” or consistently provokes discomfort, modification or substitution is appropriate.
The objective remains the same: continue training fundamental movement patterns in ways that respect changing anatomy while preserving strength and confidence.

MODULE 5:

CARDIOVASCULAR TRAINING & CONDITIONING

Overview

Cardiovascular exercise supports overall health, endurance, and energy regulation throughout pregnancy. As the body adapts to support the developing baby, the cardiovascular system undergoes significant changes including increases in blood volume, heart rate, and oxygen demand. Maintaining aerobic fitness during this time helps support circulation, fatigue management, and the body's ability to tolerate physical stress.

This module provides education on:

- How pregnancy affects the cardiovascular system
- Safe intensity regulation and monitoring
- Suitable forms of aerobic exercise
- Structuring conditioning sessions
- When to modify or pause training

The goal is sustainable conditioning that supports health, energy, and confidence in movement.

Cardiovascular Adaptations During Pregnancy

Pregnancy places increased demand on the cardiovascular system. Blood volume begins increasing early in pregnancy and can rise by approximately 40–50% by the third trimester. Cardiac output also increases, allowing more oxygen and nutrients to reach both maternal tissues and the developing fetus.

Because of these changes, several normal responses occur during exercise:

- Resting heart rate increases
- Heart rate rises more quickly during activity
- Breathing becomes heavier at lower workloads
- Recovery between efforts may take longer

These changes are normal physiological adaptations and do not indicate reduced fitness.

Research shows that most pregnant individuals can safely perform moderate to vigorous aerobic activity when no medical contraindications are present.

Understanding these changes helps set realistic expectations for training and prevents unnecessary concern when exercise begins to feel different.

Regulating Intensity During Cardio

Because heart rate responses vary widely during pregnancy, fixed heart rate targets are often unreliable for guiding exercise intensity. Instead, perceived effort and breathing patterns provide more practical guidance.
Two simple tools are commonly used:
Rate of Perceived Exertion (RPE)
A scale from 1–10 describing how hard an activity feels.
The Talk Test
A practical way to assess breathing and exertion.
For most prenatal cardiovascular training:

- RPE 5–6 reflects moderate effort
- RPE 6–7 reflects moderately challenging work
- Conversation should still be possible, though breathing is elevated

Short periods of higher effort may occur naturally during activities such as hills or intervals, but exercise should not feel uncontrolled or exhausting. Because physiological demands increase throughout pregnancy, the same activity may feel harder over time. Adjusting pace, duration, or rest periods allows training to remain comfortable and effective.

Types of Cardiovascular Exercise

Cardiovascular exercise can take many forms during pregnancy. The most appropriate choice depends on comfort, experience, and personal preference.

Common prenatal cardio options include:

- Walking (outdoors or treadmill)
- Stationary cycling
- Swimming or water-based exercise
- Elliptical machines
- Low-impact aerobic-based classes
- Conditioning circuits

Higher-impact activities such as running may remain appropriate for individuals who were already conditioned to them prior to pregnancy. As the body changes, some individuals naturally choose to transition to lower-impact options due to comfort or pelvic floor response.

There is no single “best” form of cardio — consistency and symptom-free participation are what matter most.

Structuring Cardiovascular Training

Public health and prenatal exercise guidelines consistently recommend that pregnant individuals accumulate at least 150 minutes of moderate-intensity physical activity per week, spread across multiple days. These recommendations are supported by large reviews of prenatal exercise research, including work led by Dr Margie Davenport, which demonstrate that regular aerobic activity during pregnancy is associated with improved maternal health outcomes without increasing the risk of adverse pregnancy events in healthy pregnancies.
Importantly, these 150 minutes do not need to occur in long continuous sessions. Cardiovascular activity can be accumulated across the week in a variety of formats depending on energy levels, schedule, and training preferences.
For example, this may look like:

- 30 minutes of cardio on 5 days per week
- Shorter 20–25 minute sessions performed more frequently
- A combination of dedicated cardio sessions and conditioning work integrated into strength workouts

Cardiovascular sessions do not need to be exhaustive to be beneficial. Consistent moderate effort supports aerobic fitness, circulation, and energy regulation while complementing strength training.

Structuring Cardiovascular Training continued...

Common formats include:

Steady-State Conditioning

Continuous moderate effort for approximately 20–40 minutes.

Benefits include:

- Supporting aerobic capacity
- Improving circulation
- Enhancing endurance

Walking, cycling, and swimming are commonly used for steady-state exercise.

Interval-Based Conditioning

Alternating periods of moderate-high effort with periods of easier recovery.

For example:

- 1–3 minutes moderate effort
- 1–2 minutes easy pace
- Repeated for several rounds

Intervals can help maintain cardiovascular fitness while preventing excessive fatigue.

Strength-Integrated Conditioning

Some workouts combine strength exercises with short aerobic efforts in a circuit-style format. This can provide both cardiovascular and muscular benefits in a time-efficient format.

Examples may include alternating between resistance exercises and short bursts of cardio or a typical Crossfit ‘WOD’, scaled appropriately.

Monitoring Symptoms During Cardio

Cardiovascular exercise should feel energising rather than overwhelming. It is normal to experience heavier breathing and increased warmth during exercise, but certain symptoms should prompt modification or stopping activity.

Exercise should be paused and medical guidance sought if symptoms such as the following occur:

- Persistent dizziness or faintness
- Chest pain
- Vaginal bleeding or fluid leakage
- Painful contractions
- Severe shortness of breath
- Sudden swelling or severe headache

These symptoms are uncommon but important to recognise.

Most individuals will instead experience normal sensations such as fatigue, warmth, and elevated breathing, which resolve quickly with rest.

Hydration, Temperature & Recovery

Because pregnancy increases metabolic and circulatory demands, hydration and temperature regulation become especially important during cardiovascular exercise.

Practical considerations include:

- Drinking fluids regularly before and during exercise
- Wearing breathable clothing
- Exercising in well-ventilated environments
- Avoiding excessively hot or humid conditions

Recovery between sessions is equally important. Pregnancy often brings increased baseline fatigue, so allowing adequate rest and adjusting training frequency when needed helps maintain consistency without excessive strain.

MODULE 6:

NUTRITION & SUPPLEMENTS

Overview

Nutrition plays an essential role in supporting both maternal health and fetal development during pregnancy. While energy needs increase gradually as pregnancy progresses, the quality of nutrients consumed is more important than simply increasing calories.

Adequate intake of protein, essential fats, vitamins, minerals, and fluids supports fetal growth, maternal tissue changes, hormonal regulation, and recovery. When combined with regular exercise, balanced nutrition also helps maintain energy levels and support overall health throughout pregnancy.

This module provides evidence-based education on:

- Energy requirements and weight gain during pregnancy
- Protein intake and macronutrient balance
- Key micronutrients required for fetal development
- Hydration needs during pregnancy and exercise
- Evidence-based prenatal supplementation
- Practical nutrition strategies for active pregnancies

The goal is not restrictive dieting, but supporting the body with the nutrients needed to adapt, grow, and remain strong throughout pregnancy.

Energy Needs During Pregnancy

A common misconception is that pregnancy requires dramatically increasing calorie intake. In reality, energy requirements increase gradually, and the exact amount varies based on body size, activity level, metabolism, and stage of pregnancy.

For most individuals, calorie needs increase modestly:

- First trimester: minimal increase in energy needs
- Second trimester: approximately +300–350 kcal per day
- Third trimester: approximately +400–500 kcal per day

These increases reflect the energy required to support:

- fetal growth
- placental development
- expansion of maternal tissues
- increased blood volume
- metabolic changes

Energy Needs During Pregnancy continued...

For individuals who exercise regularly, additional energy may also be required to support training demands and recovery.
Rather than focusing solely on calories, it is more beneficial to prioritize nutrient-dense foods that provide protein, essential fats, fiber, vitamins, and minerals.

Examples include:

- Lean proteins (fish, poultry, eggs, dairy, legumes)
- Whole grains
- Fruits and vegetables
- Nuts and seeds
- Healthy fats such as olive oil and avocado

Energy needs vary widely, so appetite, energy levels, and overall well-being are often the most practical guides.

Protein Requirements for Pregnancy

Protein is one of the most important nutrients during pregnancy because it provides the building blocks required for fetal tissue growth and maternal adaptation.

Protein supports:

- fetal growth and organ development
- expansion of maternal tissues such as the uterus and breasts
- placental development
- increased blood volume
- muscle recovery for physically active individuals

Current evidence suggests protein requirements during pregnancy increase to approximately:

1.1 g of protein per kilogram of body weight per day

However, emerging research indicates that physically active pregnant individuals may benefit from slightly higher intakes, often in the range of:

1.2–1.6 g/kg/day

Distributing protein across meals helps optimize absorption and satiety.

Carbohydrates, Fats & Energy Balance

Carbohydrates and fats provide the primary energy sources required to support daily activity, exercise, and fetal development.

Carbohydrates

Carbohydrates are the body's preferred fuel source and support:

- brain development of the fetus
- maternal energy levels
- exercise performance

Whole-food carbohydrate sources are generally recommended:

- whole grains
- fruit
- vegetables
- legumes

These foods also provide fiber, which helps support digestion and reduce constipation, a common pregnancy symptom.

Carbohydrates, Fats & Energy Balance continued...

Dietary Fats

Dietary fats are essential for hormone production and fetal neurological development.

Particularly important fats include omega-3 fatty acids, which support:

- fetal brain development
- retinal development
- neurological function

Foods rich in omega-3 fatty acids include:

- salmon
- sardines
- walnuts
- chia seeds
- flaxseeds

Balancing carbohydrates, fats, and protein helps maintain stable energy levels and blood glucose regulation, which can be beneficial for overall pregnancy health.

Key Micronutrients & Supplementation

Several vitamins and minerals become especially important during pregnancy due to their roles in fetal development and maternal physiology. A well-balanced diet should provide most essential nutrients during pregnancy. However, supplementation is often recommended because certain nutrients are difficult to obtain in adequate amounts through food alone. Requirements during pregnancy can increase significantly and individual needs vary.

Folate (Folic Acid)

Folate supports neural tube development in early pregnancy and helps prevent neural tube defects.

Recommended intake:

600 mcg per day

Sources include:

- leafy green vegetables
- legumes
- fortified grains
- prenatal supplements

Choline

Choline is an essential nutrient that plays a key role in fetal brain development, nervous system formation, and placental function.

Recommended intake:

450 mg per day

Sources include:

- Eggs (one of the most concentrated sources)
- Meat and poultry
- Fish
- Dairy products

Key Micronutrients & Supplementation continued...

Iron

Iron requirements increase substantially during pregnancy due to increased blood volume and fetal iron needs.

Recommended intake:

27 mg per day

Iron supports:

- oxygen transport in blood
- fetal growth
- prevention of maternal anemia

Food sources include:

- red meat
- poultry
- lentils
- beans
- spinach

Calcium

Calcium supports fetal skeletal development and helps maintain maternal bone health.

Recommended intake:

1,000 mg per day

Sources include:

- dairy products
- fortified plant milks
- tofu
- leafy greens

Iodine

Iodine is essential for thyroid hormone production and fetal brain development.

Recommended intake:

220 mcg per day

Sources include iodized salt, dairy products, and seafood.

Key Micronutrients & Supplementation continued...

Vitamin D

Vitamin D supports calcium absorption, bone and skeletal development, immune function, and may play a role in maternal muscle function and mood regulation during pregnancy.

Recommended intake:

600 IU (15 mcg) per day

Sources include:

- sunlight exposure
- fatty fish (e.g., salmon, sardines)
- egg yolks
- fortified milk and dairy alternatives
- prenatal supplements

Omega-3 (DHA/EPA)

Omega-3 fatty acids—particularly DHA—support fetal brain and eye development and contribute to healthy pregnancy outcomes. They also play a role in maternal cardiovascular health and may support mood regulation.

Recommended intake:

200–300 mg DHA per day

Sources include:

- fatty fish (e.g., salmon, sardines, mackerel)
- fish oil supplements
- algal oil supplements (plant-based DHA)
- omega-3 enriched eggs
- prenatal supplements containing DHA

Key Micronutrients & Supplementation continued...

Key Considerations for Prenatal Supplementation

Increased physiological demand

Pregnancy increases nutrient requirements to support maternal tissue changes, placental function, and fetal growth. Even with a high-quality diet, meeting optimal intake levels can be challenging.

Absorption variability

Digestive changes, nausea, food aversions, and individual absorption differences can affect nutrient intake and status.

Dietary patterns

Vegetarian, vegan, low-dairy, low-seafood, or restricted diets may require targeted supplementation.

Baseline nutrient status

Some nutrients (such as iron and vitamin D) are commonly low entering pregnancy and may require monitoring and adjustment.

Key Micronutrients & Supplementation continued…

Folate Supplementation — Form Matters

Folate is one of the most important prenatal supplements due to its role in early fetal development.
There are different supplemental forms:
• Folic acid — synthetic form used in many supplements
• Folate — naturally occurring food form
• 5-MTHF (methylated folate) — active form the body can use immediately
Synthetic folic acid must be converted into its active form before the body can use it. Some individuals have common genetic variations (such as MTHFR variants) that reduce how efficiently this conversion occurs.
With higher intakes of synthetic folic acid:
• Unmetabolized folic acid can circulate in the bloodstream
• This may interfere with normal folate metabolism in susceptible individuals

Key Micronutrients & Supplementation continued...

Emerging research suggests possible associations between high levels of unmetabolized folic acid and:

- Reduced availability of active folate
- Potential negative effects on mood and cognitive health
- Possible negative changes in immune cell function
- Altered DNA methylation patterns

Research is ongoing, but awareness of supplement form is important.

Practical guidance

- Food-first approach with folate-rich whole foods
- Consider prenatal supplements containing methylated folate (5-MTHF)
- Seek professional guidance if you have known MTHFR variants or specific concerns

Key Micronutrients & Supplementation continued...

Why Adequate Intake Matters

Ensuring sufficient intake of essential vitamins and minerals during pregnancy supports both immediate maternal wellbeing and optimal fetal development.

For baby, adequate nutrient availability supports:

- Healthy organ and tissue development
- Brain and nervous system formation
- Skeletal growth and mineralization
- Appropriate birth weight and growth patterns
- Long-term metabolic and cognitive health

For mother, meeting increased nutrient demands supports:

- Energy production and reduced fatigue
- Healthy blood volume expansion and oxygen delivery
- Immune function and resilience
- Musculoskeletal integrity and recovery
- Reduced risk of nutrient depletion during pregnancy and postpartum

Pregnancy is a period of accelerated growth and physiological change. Consistent, adequate nutrition helps create the biological environment that supports healthy outcomes for both mother and baby.

Key Micronutrients & Supplementation continued...

Not all general prenatal supplements contain optimal amounts of each nutrient so it may be beneficial to take each individual nutrient in it's own supplement.

This supplement information is educational and general in nature. Individual needs can vary, so always speak with your midwife, doctor, or qualified healthcare provider before starting, stopping, or changing any supplements during pregnancy.

MODULE 7:

RECOVERY, MONITORING & PROGRAM PROGRESSION

Overview

Effective prenatal training is not only about exercise selection or session structure — it also depends on recovery capacity, intelligent load management, and the ability to interpret body feedback.

Understanding how to recover well, monitor physical responses, and adjust training appropriately supports consistency, safety, and long-term physical outcomes. This module focuses on the management side of training — helping individuals sustain movement practices confidently without rigid rules or fear-based decision making.

This module provides practical guidance on:

- Recovery and fatigue management
- Sleep and physiological stress load
- Recognizing normal vs meaningful symptoms
- Flexible program progression
- Autoregulation and session readiness
- When modification or professional input is appropriate
- Sustaining consistency without performance pressure

Recovery Capacity During Pregnancy

Recovery capacity changes across pregnancy due to increased metabolic demands, hormonal shifts, and the energetic cost of fetal development. Blood volume expands, resting heart rate rises, and oxygen requirements increase. These adaptations support pregnancy but also increase baseline physiological load, meaning the same training stimulus may require more recovery time than previously.

Fatigue during pregnancy is not simply “feeling tired.” It reflects increased systemic demand across cardiovascular, endocrine, and musculoskeletal systems.

As a result:

- Muscle soreness may last longer
- High-intensity sessions may feel more taxing
- Back-to-back demanding training days may be less tolerable
- Perceived effort may increase despite unchanged workload

Recovery should therefore be viewed as an active component of training rather than a passive afterthought. Appropriate spacing of sessions, alternating training demands, and allowing flexibility in weekly structure helps maintain training consistency.

Importantly, reduced recovery capacity does not indicate reduced capability. It simply reflects altered physiology that benefits from responsive programming.

Sleep, Stress & Physiological Load

Sleep disruption is common due to hormonal changes, nocturnal urination, temperature regulation shifts, and physical discomfort as pregnancy progresses. Inadequate sleep influences exercise tolerance, coordination, mood, and perceived exertion.

Physiological stress load during pregnancy is cumulative. Daily life demands, occupational workload, emotional stress, and physical training all contribute to total systemic load. When overall load exceeds recovery capacity, individuals may notice:

- Reduced motivation to train
- Elevated perceived exertion
- Prolonged soreness
- Reduced movement quality
- Increased irritability or low mood

Managing total load supports sustainable training. This may include:

- Adjusting session intensity on low-energy days
- Replacing demanding sessions with mobility or low-intensity movement
- Prioritizing rest without guilt
- Maintaining hydration and fueling

The goal is not rigid adherence to a plan, but alignment between training demand and recovery state.

Understanding Normal Physiological Responses

Exercise during pregnancy produces many normal sensations that reflect healthy physiological adaptation. Increased breathing rate, elevated heart rate, warmth, sweating, and muscular effort are expected responses to physical activity.

Other common and typically normal experiences may include:

- Temporary breathlessness during exertion
- Mild postural discomfort as body mass distribution changes
- Transient muscular fatigue
- Increased perceived effort during later stages of pregnancy

Recognizing these responses as normal reduces unnecessary concern and supports confident participation in exercise.

Recognizing Meaningful Symptoms

While most exercise responses are normal, some symptoms signal that training load or session structure should be adjusted.

Indicators that warrant modification include:

- Persistent dizziness or lightheadedness
- Chest pain or unusual shortness of breath at rest
- Vaginal bleeding or fluid leakage
- Painful uterine contractions
- Calf pain with swelling or redness
- Sudden or severe abdominal pain

These responses are not typical exercise effects and warrant cessation of the session and medical review.

Less urgent but meaningful signs that training variables may need adjustment include:

- Unusual or persistent musculoskeletal pain
- Sustained pelvic heaviness or pressure
- Ongoing fatigue that does not improve with rest
- Noticeable decline in movement control

Symptom-aware training supports safety without creating fear. Adjustments are part of responsive programming, not indicators of failure.

Flexible Program Progression

Traditional training progression models often emphasize increasing load, volume, or intensity over time. During pregnancy, progression is better viewed as maintaining physical capacity while adapting to physiological change.

Progression may include:

- Maintaining strength across gestation
- Preserving movement quality
- Supporting joint function and posture
- Sustaining aerobic capacity
- Preventing deconditioning

Performance metrics may fluctuate due to normal physiological shifts. Temporary plateaus or reductions in output are expected and do not represent regression. Training progression during pregnancy prioritizes sustainability over continual overload.

Autoregulation & Session Readiness

Autoregulation is the practice of adjusting training based on daily readiness rather than fixed prescriptions. This approach is particularly valuable during pregnancy when energy levels and physical comfort can vary.

Readiness can be guided by:

- Perceived energy levels
- Sleep quality
- Motivation to train
- Movement comfort
- Perceived exertion during warm-up

On lower-readiness days, adjustments may include:

- Reducing load or volume
- Increasing rest intervals
- Choosing supported or lower-impact variations
- Replacing intense sessions with mobility or light aerobic work

This flexibility supports consistency and respects physiological variability.

When Modification or Professional Input Is Appropriate

xercise modification is a normal part of prenatal training. Adjustments support comfort, movement quality, and symptom management as the body changes. Professional input from a qualified healthcare provider or pelvic health physiotherapist may be helpful when:

- Symptoms persist despite exercise modification
- Pain interferes with normal movement
- There is uncertainty about symptom significance
- Return-to-exercise guidance is needed after medical events

Seeking guidance is proactive and supports informed decision-making.

Sustaining Consistency Without Performance Pressure

Pregnancy training is not a performance phase. It is a preparatory and maintenance phase supporting maternal health, functional capacity, and postpartum recovery.

Consistency may look different week to week. Effective training during pregnancy values:

- Regular movement over perfect programming
- Adaptability over rigid expectations
- Body awareness over external metrics
- Long-term health over short-term performance goals

Removing performance pressure supports positive exercise experiences and long-term engagement in physical activity.

MODULE 8:

LABOUR PREPARATION & BIRTH-SPECIFIC CONDITIONING

Overview

Labour and birth are physically demanding events requiring muscular endurance, coordinated breathing, positional strength, and the ability to regulate effort under fatigue. While birth cannot be scripted, physical preparation can improve comfort, movement confidence, and the ability to respond to changing demands.

This module focuses on preparing the body and mind for labour through targeted conditioning strategies.

This module provides education on:

- The physical demands of labour
- Breathing strategies for effort and relaxation
- Pelvic mobility and positional endurance
- Pelvic floor preparation for birth
- Energy Management & Hydration

The goal is preparation without pressure.

Understanding the Physical Demands of Labour

Labour is often compared to an endurance event with intermittent high-intensity efforts. Uterine contractions place repeated physiological stress on the cardiovascular and muscular systems, while prolonged labour requires sustained energy availability and fatigue resistance.

Key physical demands include:

- Muscular endurance of the trunk, hips, and legs
- Coordinated breathing under stress
- Ability to relax between contractions
- Positional tolerance for extended periods
- Neuromuscular control during pushing efforts

Preparation does not guarantee a specific birth experience but can improve comfort, efficiency of effort, and perceived control.

Breathing Strategies for Labour

Breathing serves two essential roles during labour: regulating nervous system state and supporting effective pressure management.

Down-regulation breathing supports relaxation between contractions. Slow nasal inhalation with relaxed rib expansion followed by long, controlled exhalation helps reduce excessive muscular tension and supports parasympathetic nervous system activity.

Effort breathing supports active phases of labour and pushing. A controlled exhale during effort helps manage intra-abdominal pressure while allowing coordinated engagement of the abdominal wall and pelvic floor.

Breath holding is not inherently harmful but prolonged, forceful breath holding can increase internal pressure and fatigue. Practicing varied breathing strategies during pregnancy improves adaptability during labour.

Pelvic Mobility & Position Tolerance

The pelvis is designed to move. Subtle mobility at the sacroiliac joints, coccyx, and hip joints assists fetal positioning and maternal comfort.

Maintaining mobility supports:

- Position changes during labour
- Comfort in upright and supported positions
- Reduced muscular guarding
- Efficient force transfer during pushing

Helpful movement capacities include:

- Hip flexion and extension
- Hip internal and external rotation
- Adductor flexibility
- Lumbopelvic movement control

Positional endurance is equally important. Many labour positions — such as supported squat, side-lying, hands-and-knees, or upright leaning — require sustained muscular support. Training these positions builds tolerance and confidence.

Pelvic Floor Preparation for Birth

The pelvic floor must be strong, responsive, and able to relax. During labour, these muscles need to lengthen and yield to allow the baby to descend through the birth canal. For this reason, preparation should focus on coordination and mobility — not just strengthening.

Pelvic floor exercises are often reduced to repetitive Kegel contractions. While strengthening can be helpful for individuals with weakness or incontinence, strength alone does not prepare the pelvic floor for the demands of birth. Over-training constant contraction without practicing relaxation may contribute to excessive tension and difficulty fully releasing during pushing.

Effective pelvic floor preparation includes:

- Coordinated contraction and full relaxation
- Breathing patterns that allow pelvic floor recoil on inhale
- Gentle lengthening drills that improve tissue compliance
- Positional mobility that reduces unnecessary muscular guarding
- Awareness of bearing-down mechanics without forceful straining

Research suggests that pelvic floor function — not simply strength — is most relevant for labour outcomes. A responsive pelvic floor that can contract, relax, and lengthen when required supports efficient pushing and may reduce excessive strain.

Perineal tissue preparation in late pregnancy, including gentle perineal massage where appropriate, has also been associated with reduced risk of severe perineal tearing in first births.

Energy Management & Hydration

Labour requires sustained energy availability. Maintaining hydration and accessible carbohydrate sources supports endurance and reduces fatigue-related distress.

Preparation considerations include:

- Familiarity with small, frequent fluid intake
- Easily digestible carbohydrate options
- Avoiding prolonged fasting when possible
- Recognizing early fatigue signals

Energy management supports sustained physical and cognitive capacity throughout labour.

MODULE 9:

EARLY POSTPARTUM FOUNDATIONS

Overview

Birth is a major physiological event, whether vaginal or caesarean. The early postpartum period is a time of tissue healing, hormonal transition, sleep disruption, and neurological recalibration. During this stage, recovery is the priority.

Understanding what is normal, how to support healing, and when to seek additional care helps reduce fear, set realistic expectations, and support a smoother transition into structured postpartum training later.

This module provides essential early guidance on:

- Physical recovery in the first weeks after birth
- Gentle movement and circulation
- Early core and pelvic floor reconnection
- When to seek professional support
- Guidance on Returning to Exercise

The focus is restoration, not performance.

What Happens to the Body After Birth

Immediately after delivery, the body shifts from pregnancy physiology to recovery physiology.

Key early changes include:

- Rapid hormonal fluctuations as estrogen and progesterone decline
- Uterine involution (the uterus gradually returning to pre-pregnancy size)
- Abdominal wall and pelvic floor tissue recovery
- Fluid shifts and swelling reduction
- Sleep disruption and nervous system fatigue

Vaginal births may involve:

- Perineal tissue strain or tearing
- Pelvic floor muscle soreness
- Temporary bladder and bowel sensitivity

Caesarean births involve:

- Abdominal incision healing
- Layered tissue recovery (skin, fascia, muscle, uterus)
- Temporary movement restrictions due to pain and tissue repair

Healing timelines vary widely. Early recovery is measured in weeks, not days.

Rest as a Physiological Strategy

Rest is an active component of recovery.
Tissue repair, hormonal regulation, and nervous system recalibration all depend on adequate downtime. While gentle movement is beneficial, structured exercise is not the priority in the immediate postpartum window.

Helpful recovery practices include:
- Frequent rest periods
- Accepting support with daily tasks
- Prioritizing sleep where possible
- Nourishment and hydration
- Gentle movement

This period is about healing capacity, not productivity.

Gentle Early Movement

Light, low-effort movement supports circulation, reduces stiffness, and promotes recovery without overloading healing tissues.

Appropriate early activities may include:

- Short, comfortable walks
- Gentle posture resets
- Shoulder and upper-back mobility
- Ankle and calf pumping for circulation
- Relaxed breathing exercises
- Kegels

Movement should feel restorative, not fatiguing.
Pain, heaviness, or pressure are signals to reduce effort.

Reconnecting with Core & Pelvic Floor

After birth, the deep core and pelvic floor often feel unfamiliar. Swelling, tissue stretch, and neurological fatigue can temporarily reduce strength and coordination.

Early focus should be on reconnection, not intensity.

This includes:

- Gentle diaphragmatic breathing
- Allowing the ribcage and abdomen to expand naturally
- Light pelvic floor engagement on exhale
- Full relaxation between contractions
- Avoiding strong bracing or forceful effort

These small inputs help restore coordination between breathing, abdominal muscles, and the pelvic floor.

Structured strengthening comes later.

When to Seek Professional Support

Additional support is appropriate if you experience:

- Persistent or increasing pain
- Heavy vaginal bleeding or large clots
- Signs of infection (fever, wound redness, discharge)
- Pelvic heaviness or pressure
- Urinary or bowel incontinence that does not improve
- Pain with gentle movement
- Emotional distress that feels overwhelming

Pelvic health physiotherapists, midwives, GPs, and obstetric providers play an important role in early recovery.
Seeking help is proactive care, not a setback.

Guidance on Returning to Exercise

Recent postpartum physical activity guidelines — including those led by Dr. Margie Davenport and international research teams — emphasise that postpartum activity should be:

- Initiated early in a gentle, symptom-guided way, such as short walks and mobility
- Progressed gradually to moderate efforts based on recovery and comfort
- Focused on total weekly activity, with a realistic target of approximately 120 minutes of moderate activity per week by around 12 weeks postpartum as tolerance improves
- Flexible to individual needs, acknowledging that healing timelines vary widely
- Symptom-guided — intensity increases only when there is minimal pain, heaviness, or pelvic floor strain
- Re-introduced thoughtfully for higher-impact or vigorous activities once tissue healing, core coordination, and pelvic floor control have been established

Research shows that returning to thoughtful activity can also support mental wellbeing and reduce the risk of postpartum depressive symptoms. Monitoring for symptoms such as unusual bleeding, pain, or pelvic heaviness remains essential as activity increases.

When to Seek Professional Support

Additional support is appropriate if you experience:

- Persistent or increasing pain
- Heavy vaginal bleeding or large clots
- Signs of infection (fever, wound redness, discharge)
- Pelvic heaviness or pressure
- Urinary or bowel incontinence that does not improve
- Pain with gentle movement
- Emotional distress that feels overwhelming

Pelvic health physiotherapists, midwives, GPs, and obstetric providers play an important role in early recovery.
Seeking help is proactive care, not a setback.

MOVING FORWARD WITH CONFIDENCE

Pregnancy and early motherhood are periods of profound physiological and structural change. Throughout this series, you've learned how your body adapts, how movement supports those changes, and how to train, fuel, and recover in ways that are both safe and effective.

Decades of research now show that appropriate physical activity during pregnancy is associated with meaningful health benefits for both mother and baby. Evidence links prenatal exercise with reduced risk of gestational diabetes, hypertensive disorders of pregnancy, excessive gestational weight gain, lower back and pelvic pain, and postpartum depression. It is also associated with improved cardiovascular fitness, better functional strength, and favourable birth outcomes. Really, it should be advised just as much as a prenatal supplement is.

Physical activity during pregnancy is about supporting your health, your function, and your long-term wellbeing — while helping create an optimal environment for fetal development.

The foundations you've built here — understanding your core and pelvic floor, managing training intensity, supporting recovery, nourishing your body, and preparing for birth and early postpartum — will continue to support you well beyond pregnancy.

You are not fragile. You are adapting. Now with the right knowledge, you can move through this stage feeling capable, informed, and supported.

Key Evidence Sources

This program is informed by international clinical guidelines and peer-reviewed research in prenatal and postpartum exercise science, pelvic health, and maternal nutrition.

Primary Guidelines & Consensus Statements

American College of Obstetricians and Gynecologists (ACOG). Physical Activity and Exercise During Pregnancy and the Postpartum Period. Committee Opinion No. 804.

Canadian Society for Exercise Physiology (CSEP). Canadian Guideline for Physical Activity Throughout Pregnancy.

World Health Organization (WHO). Guidelines on Physical Activity and Sedentary Behaviour.

American College of Sports Medicine (ACSM). Guidelines for Exercise Testing and Prescription.

Prenatal & Postpartum Exercise Research

Davenport MH, et al. Series of systematic reviews and meta-analyses on prenatal and postpartum exercise, maternal health outcomes, and neonatal outcomes. British Journal of Sports Medicine.

Davenport MH, Mottola MF, Poitras VJ, et al. (2018). Prenatal exercise for the prevention of gestational diabetes mellitus and hypertensive disorders of pregnancy: a systematic review and meta-analysis. British Journal of Sports Medicine.

Pelvic Floor & Core Function

Bø K, et al. Pelvic floor muscle training and female pelvic health. Cochrane Database of Systematic Reviews; Sports Medicine.

Hodges PW, et al. Research on diaphragm function, core stability, and pressure regulation. Journal of Physiology.

Maternal Nutrition & Supplementation

National Institutes of Health (NIH) Office of Dietary Supplements. Evidence-based nutrient guidance and supplement fact sheets.

Institute of Medicine (IOM). Nutrition During Pregnancy Guidelines.