

# Pregnancy & Postpartum Physical Training Handbook

## TECOM Human Performance Branch



### **DISCLOSURE**

The content of this document is not intended to be taken as medical advice; each Marine should consult a healthcare provider (HCP) for individual medical advice. Where HCP advice differs from information in this handbook, Marines should defer to recommendations by the HCP, who is most familiar with the Marine’s individual circumstances. This resource can be utilized to start a conversation with a HCP about the next steps in the stages of pregnancy. When participating in any physical training there are risks of strains, fractures, mental anguish or other physical effects that may cause serious injury or death. Such injuries occur more frequently when participants are not physically prepared, do not follow individual advice of HCPs, or when activities are performed incorrectly.

### **OVERVIEW**

This document provides Marines, commanders, and fitness personnel guidance for pregnant and postpartum Marines conducting physical training (PT). PT is important and beneficial in all stages of a Marine’s life and career, including pregnancy and postpartum periods. Physical activity during pregnancy and postpartum periods poses minimal risks and has consistently shown to benefit pregnant women by helping them maintain fitness levels as well as regain optimal fitness during the postpartum period. During required visits with a HCP for a pregnancy check-up, Marines should consult about participation in PT throughout pregnancy. The health and safety of the Marine and unborn child are the utmost priority, and PT programs can be adapted and modified to account for normal physiological and anatomical changes. The ability to conduct PT should be guided by the pregnant/postpartum Marine without exceeding limitations established by a HCP.

**BOTTOM LINE: Aerobic and strength training are safe during pregnancy and postpartum periods. Pregnant and postpartum Marines should consult with a HCP prior to starting or continuing a workout program. The Marine should also pay attention to fluctuations in the way her body and health respond to PT during this period. It is a valuable asset for the Marine to work with a Force Fitness Instructor (FFI) throughout their pregnancy and postpartum periods for improved professional guidance, to gain, or maintain optimal health and fitness levels.**

### **BENEFITS OF PHYSICAL TRAINING**

- PT during pregnancy can maintain and improve a Marine’s overall physical fitness, strength, and body composition, can prevent various health and medical conditions and complications, and help ensure a safe, steady, and effective postpartum recovery.

**Table 1: Benefits of Physical Training**

<b><u>Pregnancy</u></b>	<b><u>Postpartum</u></b>
<ul style="list-style-type: none"> <li>* Decreases back pain</li> <li>* Reduces constipation</li> <li>* Promotes healthy weight gain</li> <li>* Improves overall general fitness</li> <li>* Strengthens heart and blood vessels</li> <li>* Improves ability to lose weight post birth event</li> <li>* Reduces risk of gestational diabetes, preeclampsia, and cesarean delivery</li> <li>* Reduces stress, promotes better sleep</li> </ul>	<ul style="list-style-type: none"> <li>* Strengthens and tones abdominal muscles</li> <li>* Boosts stamina and metabolism (energy)</li> <li>* Promotes better sleep</li> <li>* Promotes healthy weight loss</li> <li>* Reduces stress</li> <li>* Decreases risk of postpartum depression</li> <li>* Decreases risk of deep vein thrombosis (DVT)</li> </ul>

**PRECAUTIONS & CONTRAINDICATIONS**

- o During pregnancy and postpartum periods, various symptoms, conditions, and complications may arise that will limit, and in some cases, prohibit the Marine from conducting particular activities and PT components.
- If a pregnant/postpartum Marine suffers from any of the signs or symptoms (listed in following charts) prior to PT, the activity should not commence. If the signs or symptoms occur during PT, the activity should be halted and should be treated as a medical emergency, and the Marine should immediately seek medical attention.

**Table 2: Pregnancy/Postpartum Precautions and Contraindications**





	<b>Pregnancy PT Stages</b>	<b>Postpartum PT Stages</b>
<b>Precautions During PT</b>	<ul style="list-style-type: none"> <li>* Avoid dehydration</li> <li>* Avoid overheating, especially during the first trimester</li> <li>* Avoid standing or lying on back for extended periods</li> <li>* Avoid low blood-sugar</li> </ul>	<ul style="list-style-type: none"> <li>* Avoid dehydration</li> <li>* Avoid overheating</li> </ul>
<b>Symptoms &amp; Warning Signs to Discontinue PT</b>	<ul style="list-style-type: none"> <li>* Dizziness</li> <li>* Feeling faint</li> <li>* Shortness of breath before physical training</li> <li>* Chest pain</li> <li>* Headache</li> <li>* Muscle weakness affecting balance</li> <li>* Calf pain or swelling</li> <li>* Regular, painful contractions</li> <li>* Bleeding or fluid leaking from the vagina</li> </ul>	<ul style="list-style-type: none"> <li>* Pain</li> <li>* Dizziness</li> <li>* Feeling faint</li> <li>* Severe headache</li> <li>* Bleeding</li> </ul>
<b>Environmental Conditions OR Activities PT NOT ADVISED</b>	<ul style="list-style-type: none"> <li>* Contact sports or training that increase risk of contact to the abdomen (e.g. MCMAP training)</li> <li>* Training conducted in low-pressure altitudes such as above 6,000 ft. (e.g. skydiving)</li> <li>* Training conducted in high-pressure altitudes such as below sea level (e.g. scuba diving)</li> <li>* Activities (including neuromotor training) that increase risk of falls</li> <li>* Training in a hot, humid environment</li> </ul>	<ul style="list-style-type: none"> <li>* Swimming or submersion in water - <i>during the convalescent period</i></li> </ul>
<b>Medical Conditions: PT NOT ADVISED</b>	<ul style="list-style-type: none"> <li>* Severe anemia</li> <li>* Cervical insufficiency or cerclage</li> <li>* Certain types of heart and lung disease</li> <li>* Pregnant with twins or more with risk factors for preterm labor</li> <li>* Preeclampsia or pregnancy-induced high blood pressure</li> <li>* Persistent second- and third- trimester bleeding</li> <li>* Placenta previa after 28 weeks of pregnancy</li> <li>* Premature labor or water has broken during current pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>* <b>Preeclampsia</b> or pregnancy-induced high blood pressure requires clearance from a medical provider to resume exercise.</li> <li>* <b>Cesarean birth (C-section)</b> will extend the duration of recovery and delay initiation of a physical training program up to six weeks. Physical training is not advised immediately following a C-section.</li> <li>* <b>Stress incontinence</b> happens when physical movement or activity — such as coughing, laughing, sneezing, running or heavy lifting — puts pressure (stress) on the bladder, causing leakage. Stress incontinence is not related to psychological stress.</li> </ul>

**Note 1:** All pregnant and postpartum Marines must be cleared by a medical provider prior to participation in physical training.

**Note 2:** For postpartum PT, medical clearance can be provided at the routine postpartum visit. Additional recovery may be warranted in the case of a cesarean delivery or complicated vaginal delivery.

**PHYSICAL TRAINING PROGRAM**

- o **Perceived Effort** - Due to physiological changes in pregnant women, the use of perceived exertion is an effective way to monitor exercise exertion and intensity.
  - Use of a heart rate monitor can help accurately measure exercise intensity.
  - Pregnant Marines should conduct periodic self-evaluations during any physical activity to ensure the overall safety and wellbeing of the unborn child.
    - The Borg 15-Grade Rating of Perceived Exertion (RPE) scale (below) is an effective and reliable scale supporting self-assessment and self-advocacy during PT sessions.
      - Dr. Gunnar Borg, who created the scale, set it to run from 6 to 20 as a simple way to estimate the heart rate (HR). Multiply the Borg score by 10 to calculate an approximate HR.
      - Individuals self-select their levels of perceived intensity on a scale of 6-20 from “none” (at rest, HR below 70 bpm) to “maximum exertion” (max HR at 190-200 bpm).

	<u>Describe Your Exertion</u>	<u>Borg Rating of Exertion</u>	<u>Examples (for most adults &lt;65 yrs. old)</u>	
<b>Sedentary</b>	None	6	Reading a book, or watching TV	
	Extremely light	7-8	Tying shoes	
<b>Light</b>	Very light	9-10	Household chores that seem to take little effort, like folding clothes	
	Light	11-12	Walking through the grocery store, or other activities that require some effort but not enough to speed up your breathing	
<b>Moderate</b>	Somewhat hard	13-14	Speed walking, weight training, or other activities that require moderate effort and speed your heart rate and breathing but don't make you out of breath	
	Hard	15-16	Bicycling, swimming, or other activities that take vigorous effort and get the heart pounding and make breathing very fast	
<b>Vigorous</b>	Very hard	17-18	The highest level of activity you can sustain for periods of time	
	Maximum exertion	19-20	A finishing kick in a race, or other burst of activity that you cannot maintain for long	

**Figure 1: Borg 15-Grade Rating of Perceived Exertion scale**

**EXERCISE RESOURCES**

- o There are several great resources for Marines when considering exercises and modifications.
  - Refer to the Marine Corps Force Fitness Readiness Center (FFRC) for more detailed information.
    - The Marine Corps Physical Fitness page at [https://www.fitness.marines.mil/HITT\\_Programs/](https://www.fitness.marines.mil/HITT_Programs/) provides links to different exercise libraries for specific examples in the following categories: movement prep, strength & power, speed, agility & endurance, and flexibility & mobility.

**PREGNANCY & POSTPARTUM TRAINING COMPONENT RECOMMENDATIONS**

- o **Flexibility & Mobility Training** - improves and maintains range of motion in muscle-tendon groups and associated joints.
  - Research has consistently shown that joint range of motion or mobility, improves after flexibility exercises, and constantly improves with 3-4 weeks of regular stretching at least 2-3 times per week.
  - Stretch each muscle group for a total of 90 seconds to 2 minutes. This includes holding a stretch to the point of tightness or of slight discomfort for 30 seconds, 3-4 times each.
    - Various types of flexibility exercise can improve range of movement (ROM), but may not be advisable for pregnant Marines.
    - Dynamic, slow-movement stretching, and ballistic “bouncing” stretches show the greatest benefit when used prior to PT activity to help prepare muscles for movement.
    - Static stretching is best applied post-activity or on recovery days, and has been shown to produce greater gains in joint ROM.

**\*\* Always use caution when conducting flexibility and mobility training during pregnancy and postpartum periods. As a result of anatomical and physiological changes, motionless posture, especially lying supine (flat on the back), is not advised for pregnant Marines.**

**Table 3: Examples of Flexibility Training**

	Pregnancy PT Stages			Postpartum PT Stages		
	1 <sup>st</sup> Trimester wks. 1-13	2 <sup>nd</sup> Trimester wks. 14-27	3 <sup>rd</sup> Trimester wks. 28-40	Maternity Convalescent Leave (MCL) wks. 1-6	Primary Caregiver Leave (PCL) wks. 7-12	Postpartum Exemption (PPE) wks. 13-39
<b>Flexibility/ Mobility Training Examples</b> 3-4 wks. of regular stretching at least 2-3x/wk. - Stretch each muscle group for a total of 90 seconds to 2 minutes. This would include holding a stretch to the point of tightness or of slight discomfort for 30 seconds, 3-4 times each.	<b>TOTAL BODY STRETCH:</b> * Brettzel  <b>LOWER EXTREMITIES:</b> * Ankle mobility * Standing, figure-4 glute * Half kneeling dorsiflexion * Standing hip flexor * Standing HS stretch * Quad stretch * Sumo stretch * Elbow to instep  <b>UPPER EXTREMITIES:</b> * Chest stretch * Cross body stretch * Shldr stretch * Triceps stretch * Neck stretches  <b>CORE &amp; BACK STRETCHES:</b> * Side-bend stretch * T-spine rib grab * Upper back stretch	<b>TOTAL BODY STRETCH:</b> * Brettzel  <b>LOWER EXTREMITIES:</b> * Ankle mobility * Supine glute (Piriformis) * Half kneeling dorsiflexion * Half kneeling hip flexor * Runner's HS stretch * Quad stretch * Sumo stretch  <b>UPPER EXTREMITIES:</b> * Chest stretch * Cross-body stretch * Shldr stretch * Triceps stretch * Neck stretches  <b>CORE &amp; BACK STRETCHES:</b> * Side-bend stretch * T-spine rib grab * Upper back stretch	<b>** TRAIN WITH CAUTION **</b>  <b>LOWER EXTREMITIES:</b> * Ankle mobility * Seated glute (Piriformis) * Half kneeling dorsiflexion * Half kneeling hip flexor * Seated HS stretch * Side-lying quad stretch  <b>UPPER EXTREMITIES:</b> * Chest stretch * Cross-body stretch * Shldr stretch * Triceps stretch * Neck stretches  <b>CORE &amp; BACK STRETCHES:</b> * Cat-Cow (on hands & knees) * T-spine rib grab * Upper back stretch	<b>ACTIVE RECOVERY</b>  * Foam rolling to UE & LE's 2-3x/wk. * Yoga or Pilates class 2-3x/wk.	<b>TOTAL BODY STRETCH:</b> * Brettzel  <b>LOWER EXTREMITIES:</b> * Ankle mobility * Supine glute (Piriformis) * Half kneeling dorsiflexion * Half kneeling hip flexor * Runner's HS stretch * Quad stretch * Sumo stretch  <b>UPPER EXTREMITIES:</b> * Chest stretch * Cross-body stretch * Shldr stretch * Triceps stretch * Neck stretches  <b>CORE &amp; BACK STRETCHES:</b> * Side-bend stretch * T-spine rib grab * Upper back stretch	<b>TOTAL BODY STRETCH:</b> * Brettzel  <b>LOWER EXTREMITIES:</b> * Ankle mobility * Standing, figure-4 glute * Half kneeling dorsiflexion * Standing hip flexor * Standing HS stretch * Quad stretch * Sumo stretch * Elbow to instep  <b>UPPER EXTREMITIES:</b> * Chest stretch * Cross body stretch * Shldr stretch * Triceps stretch * Neck stretches  <b>CORE &amp; BACK STRETCHES:</b> * Side-bend stretch * T-spine rib grab * Upper back stretch

Abbreviation Key:

HS: Hamstring

Shldr: shoulder

- **Neuromotor Training** - the development of nerve impulses to the muscles
  - Maintains and improves body control through balance, agility, coordination, gait, and proprioception (awareness of the position and movement of the body).
  - Training recommendations include 2-3 days per week with sessions of ≥ 20-30 minutes, or total of ≥ 60 minutes per week.
  - Adequate amounts of neuromotor training may be achieved in combination with resistance training by changing the position of exercises (e.g. half-kneeling, kneeling, standing, split stance, single leg, etc.). Variations in exercise position may affect body control and various motor skills.
  - **Pregnancy results in changes to the structure, function, and activity of the human body that may affect overall body control and increase the risk of falls.**
    - \*\* **Note: As Marines progress through pregnancy, they should consider avoiding neuromotor training, especially during the 3rd trimester, unless their PT is directly monitored by an FFI or NCO.**

**Table 4: Examples of Neuromotor Training**

	Pregnancy PT Stages			Postpartum PT Stages		
	1 <sup>st</sup> Trimester wks. 1-13	2 <sup>nd</sup> Trimester wks. 14-27	3 <sup>rd</sup> Trimester wks. 28-40	Maternity Convalescent Leave (MCL) wks. 1-6	Primary Caregiver Leave (PCL) wks. 7-12	Postpartum Exemption (PPE) wks. 13-39
<b>Neuromotor Training Examples</b> ≥ 2-3 days per wk. with sessions of ≥ 20-30 mins, or total of ≥ 60 mins/wk.	<b>Plyometrics, Balance, &amp; Agility:</b> * DL squat jumps 4 x 10 * DL zig-zag drill 4 x 25 yds * SL lateral hops – FWD & BWD 4 x 25 yds * FWD box jumps, ground to box 4 x 5 * Ladder drills, 3 x 3 down and back	<b>** TRAIN WITH CAUTION **</b> <b>Do each exercise with both feet:</b> * SLB 5-cone toe taps 3 x 5 * Lateral step-over hurdles 3 x 5 * TRX sprint start cont. 3 x 20" * DL skiers 4 x 25 yds * Combat glide cone shuffle 4 x 5	<i>Not advised</i>	<i>Not advised</i>	<b>Introduce as a component of resistance training</b> * DB curls on foam pad 3 x 10 * Chest throw sprawl 2 x 4 * Harness resisted sprints 3 x 25 yds * Depth box jumps 15x * Banded monster walks, FWD & BWD 4 x 15 yds	<b>Introduce Agility Drills</b> * Broad jump w/sprint 5 x 25 yds * Goalie drill 3 x 5 * DL lateral hurdle hops 5 x 5 * 10-yd resisted carioca shuttle 3 x 5 * Ladder drills 2 x 5 down & back

Abbreviation Key:

DL: double-leg  
SL: single leg

FWD: forward  
BWD: backward

DB: dumbbell  
SLB: single-leg balance

Cont.: continuous

- **Cardiorespiratory Training** - the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscles during sustained physical activity
  - Cardiorespiratory or aerobic training develops, maintains, and improves the functions of the cardiovascular and respiratory systems.
  - No more than 30 mins/day of aerobic training is recommended for maintenance and development of the cardiorespiratory systems, and alleviation of musculoskeletal injuries.
  - Aerobic training is considered safe during the pregnancy and postpartum periods, provided the Marine remains healthy and consults with a HCP.
  - A Marine's current training status or condition may require alternative activities, pace, or intensity to achieve the desired training results safely and effectively.
    - **Moderate-intensity aerobic training** - noticeably increases heart rate (HR)
    - **Vigorous-intensity aerobic training** - substantially increases HR and produces rapid breathing
  - Exercise experts measure activity in metabolic equivalents, or METs. The higher the MET value of a particular activity, the more energy an individual's muscles will need to expend to conduct that activity.

**Table 5: Aerobic Training Activities by Intensity**

Light-Intensity (<3.0 METs)	Moderate-Intensity (3.0-6.0 METs)	Vigorous-Intensity (>6.0 METs)
* Walking – slowly (1-3 mph) * Bicycling – slowly (≤ 6 mph) * Golfing * Playing most instruments * Cooking & washing dishes * Fishing * Sitting – using computer * Light housework (making the bed or doing laundry)	* Walking – briskly (4 mph) * Bicycling – rapidly (7–12 mph) * Water aerobics * Shooting hoops * Weight training – endurance program * Light dancing * Tennis – doubles game * Moderate housework (mowing lawn or vacuuming)	* Jogging or running (5+ mph) * Bicycling – fast (13+ mph) * Swimming laps * Hiking * Kickboxing * Basketball or soccer game * Tennis – singles game * Heavy yard work (pulling weeds or shoveling)

- **Resistance Training** - maintains and increases the strength and endurance of muscles and tendons
  - Exercises should be categorized into upper extremity (UE) and lower extremity (LE) muscle groups performing different actions to assist with developing a balanced and comprehensive training program.
    - Alternating upper and lower body workouts is recommended if exercise is already consistent and routine ( $\geq 3$  days/week) in order to provide the body with a proper amount of rest and recovery between muscle groups and actions. On days of combining both for a total body workout, it is advisable to combine UE push with LE pull exercises, followed by a switch to UE pull with LE push exercises on the next training day. This total body circuit training method should not be done more than 3 days a week.

**Table 6: Upper-/Lower-Body Resistance Exercises**

Upper Body Push	Upper Body Pull	Lower Body Push	Lower Body Pull
* Ammo can press	* Ammo can row	* Ammo can lunge	* Ammo can deadlift
* Bench press	* Barbell bent-over row	* Barbell forward lunge	* Ammo can single leg deadlift
* Dumbbell Arnold press	* Dumbbell bent-over row	* Barbell front squat	* Barbell Romanian deadlift
* Dumbbell bench press	* Sandbag bent-over row	* Dumbbell lateral lunge	* Dumbbell Romanian deadlift
* Dumbbell incline bench press	* Kettlebell row (single arm)	* Dumbbell split squat	* Dumbbell single leg deadlift
* Dumbbell shoulder press	* TRX inverted row	* Kettlebell goblet squat	* Sandbag deadlift
* Kettlebell military press	* TRX low row	* Sandbag shoulder lunge	* Sandbag good-morning
* Military press	* TRX mid row	* Sandbag shoulder squat	* TRX Hamstring curl
* TRX chest press	* TRX pull-up	* TRX lunge	
* TRX incline press	* Dead hang pull-up	* TRX squat	

For access to more exercise and videos demos visit: <https://www.fitness.marine.mil/Workout-Of-The-Day/>

- Pregnant/postpartum resistance training should focus on:
  - Minimizing loss of muscle strength and endurance during pregnancy.
  - Regaining muscle mass and strength during late postpartum periods.
  - **Kegel exercises:** For more information on Kegel exercises Marines should contact a HCP.
    - Beneficial for pregnant and postpartum women to improve the strength and control of the pelvic floor musculature
    - *Quick Flick Exercise:* 3x/day, with 3 sets of 10-15 repetitions. [Click this link for The Mayo Clinic - How to guide](#) for a helpful resource about how to perform Kegel exercises
- **Recovery Training** - temporarily reducing training intensity to provide time for the body to repair and rebuild tissue
  - During development of a PT program for pregnancy and postpartum periods, it is especially important to identify physically strenuous training days and plan recovery training for the following day(s).
  - Delayed onset muscle soreness (DOMS), the pain and stiffness felt in muscles several hours to days after exercise, peaks around 24-48 hours after physically strenuous events and makes exercise difficult.
  - To facilitate recovery, various techniques and strategies may be implemented.
  - Two general classifications of recovery training are active and passive recovery.
    - **Active recovery** - periods of reduced training intensity focusing on creating a more ideal environment within the body for recovery to occur
      - Does not completely restrict activity.
      - Flexibility and mobility training, and moderate-intensity aerobic training are optimal for active recovery days. For example, a Marine may choose to ride a stationary bike for 20-30 minutes on her recovery day to increase blood flow and temperature of sore leg muscles, and then conduct a few flexibility and mobility exercises to reduce stiffness.
      - Recovery exercises should focus on the parts of the body affected by the strenuous events of the previous day or days and should not themselves create excessive fatigue.
    - **Passive recovery** - periods that drastically limit or entirely restrict activity following strenuous physical events
      - Research has shown consistently that in healthy individuals active recovery is more beneficial than passive recovery.
      - As pregnancy progresses, passive recovery days may be more beneficial.

**PROGRAM STRUCTURE:**

- As Marines progress through the pregnancy trimesters, reduction in activity is not necessary; however, the workout or routine may vary slightly based on anatomical changes in the body shape, weight, and the Marines' physical condition (e.g., feeling nauseated or light headed).
  - During the late 2<sup>nd</sup> trimester through the 3<sup>rd</sup> trimester, single-leg (SL) exercises should be modified to improve stability and balance.
    - Modifications may include bracing with a free arm on a stable object such as a wall or squat rack, or resting the inactive leg on a stable object such as the floor or plyometric box.
  - Sample programs below incorporate all PT components and frequency, illustrating possible PT progression throughout different microcycles during the pregnancy and postpartum periods.
  - By adjusting the duration, frequency, and intensity of PT components, gradual progression is achieved.

**BOTTOM LINE: Priorities during the pregnant/postpartum periods are the health and well-being of the Marine and unborn child. In the event of health or wellness concerns including injury and illness, it is recommended that the Marine seek assistance from a HCP.**

**Table 7: Guidelines for Hypertrophy, Strength, Power, and Endurance Programs**

Sample Hypertrophy Program		Sample Strength and Power Programs			Sample Endurance Program		Recovery
Approx. Load (% 1RM)		Approx. Load (% 1RM)	<u>Strength</u>	<u>Power</u>	Approx. Load (% 1RM)		
Goal Sets	3-6	Goal Sets	≥85%	75-90%	Goal Sets	≤67%	PASSIVE RECOVERY
Goal Reps	6-12	Goal Reps	≤6	1-5	Goal Reps	≥12	
Goal Rest	30 s - 1.5 min	Goal Rest	2-5 mins	2-5 mins	Goal Rest	≤30 s	
Session 1	UE push	Session 1	Heavy Day - UE push w/ LE pull		Session 1	UE push w/ LE pull	
Session 2	LE push & pull	Session 2	Medium Day - UE pull w/ LE push		Session 2	UE pull w/ LE push	
Session 3	UE pull	Session 3	Light Day - UE push w/ LE pull				

**\*\* NOTE: The above guidelines refer to a Marine's approximate load based on a percentage of her 1 repetition maximum (1RM). If a Marine doesn't already know her 1RM prior to pregnancy, this is not the time to identify it. Marines should reach out to their force fitness instructor (FFI) to get guidance on proper weight, reps and sets to meet their goals.**

**PROGRAM REFINEMENT**

- o Injury monitoring and avoidance are critical components of a successful PT program, especially for pregnant/postpartum Marines who have an increased risk to injury.
  - Proper progression and regression of exercises can assist in avoiding injuries related to PT.
    - **Exercise regression** - the process of gradual modification of exercise toward less advanced activities
      - Typically utilized for recovery or injury prevention.
      - During the pregnancy period, exercise regression techniques will help Marines continue PT as changes occur to the structures and functions of their bodies.
      - Techniques include reducing the external load, dropping to a lighter resistance by use of resistance bands or using body weight (BW) against gravity, modifying body position, using a stability ball (SB), utilizing prone vs supine (stomach vs back), leaning against a wall or holding something for support, or decreasing repetitions and/or sets.
    - **Exercise progression** - the process of gradual modification of exercise towards more advanced or challenging activities
      - During the postpartum period, exercise progression techniques will help Marines return to pre-pregnancy physical performance.
      - Techniques include increasing external loads (weight), adjusting body position, adding props or additional equipment, or increasing repetitions and/or sets.

**\*\* NOTE: examples below are not specific to any particular phase of pregnancy or postpartum. They are samples to demonstrate how to regress or progress a particular exercise. Keep in mind, neuromotor and agility activities should be avoided in 3<sup>rd</sup> trimester of pregnancy, and the MCL phase of postpartum. Additionally, core exercises may not be conducted depending on the Marine's physical condition. Consult with HCP first.**

**Regression & Progression of Exercises**

<b>Upper Extremity Push</b>	Push-ups against wall	Push-ups onto a bench	Push-ups off floor	Push-ups on half-ball	Decline push-ups (feet on bench)
<b>Upper Extremity Pull</b>	Banded pull to face	Kneeling lat pulldown w/resistance band	Lat pulldown	BW pull-ups	Pull-ups w/weight (attached by belt)
<b>Lower Extremity Push</b>	Wall squats leaning against a SB (no weight)	Squats while holding a med ball	Barbell squats	Squats off half-ball (no weight)	Overhead barbell squats
<b>Lower Extremity Pull</b>	Standing straight-leg extensions w/resistance band	Prone weighted leg curls	TRX hip bridging	Barbell good-mornings	SL DB Romanian deadlifts
<b>Core (Abdominal &amp; Back)</b>	TA exercises (e.g. 90/90 hold, supine marching, or dead-bug)	Crunches - seated on half-ball	Sit-ups off ground	Decline sit-ups (with feet tucked)	Roman chair knee tucks
<b>Agility &amp; Plyometrics</b>	Ladder drills (quick footwork, high knees, carioca, and jumping)	Box cone drills w/reverse, diagonal, or lateral movements	Long jumping to cones	Double-knee tuck jumps	Box jumps from ground onto a 12" (or higher) plyo box

**Abbreviation Key: SB: stability ball TA: transverse abdominal BW: body weight SL: single-leg DB: dumbbell**

**Figure 2: Sample ways to regress or progress an exercise**

**NOTE: All following tables are only examples of possible routines and should not be taken at face value. Modifications may be necessary based on the individual, or their stage of pregnancy or postpartum. If a Marine is unfamiliar with the exercise, and it does not stem from the FFRC exercise libraries, she should search for it on the internet for a description, video, and/or pictures.**

**PREGNANCY: 1<sup>ST</sup>- 3<sup>RD</sup> TRIMESTERS - Weeks 1-40**

- If a Marine is consistently physically active prior to her pregnancy, she should review her current training program with her FFI and HPC before continuation.
  - Once routine is reviewed and approved, she may stick with her current fitness program; however, **she may need to modify the exercises as her pregnancy advances.**
  - Follow fitness guidelines as provided in Table 7 demonstrated above.
- If a Marine was not active before becoming pregnant, she should seek further assistance and guidance with an FFI during her pregnancy.

**Table 8: Sample 1<sup>st</sup> - 3<sup>rd</sup> trimesters microcycle (total training time may range btwn 0-280 mins.)**

**\*\*AVOID NEUROMOTOR ACTIVITIES DURING 3rd TRIMESTER\*\***

Focus on maintaining pre-pregnancy fitness levels (total sample training time 280 minutes)						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>Resistance/ Neuromotor (40 mins)</b> <b>UE push:</b> * Barbell bench press 3x10 * Overhead DB press 4x8 <b>LE pull:</b> * Seated leg curl 3x10 * Standing hip flexion 3x10 <b>Core:</b> * Back extension 3x10 * Seated crunch 3x20 <b>Neuromotor:</b> * DL squat jump 4x8 * Ladder drills 2x6  <b>Vigorous Aerobics (20 mins)</b> * Running @ ≥7 mph for ≥20 mins	<b>Flexibility/ Mobility (10 mins)</b> * Stretches to muscles in UE & LE, 3x30" ea. * Foam rolling to UE & LE  <b>Moderate Aerobics (30 mins)</b> * Bicycling @ 10-12 mph	<b>Resistance/ Neuromotor (40 mins)</b> <b>UE pull:</b> * Lat pulldown 3x10 * DB Biceps curl 3x12 <b>LE push:</b> * Barbell squat 4x8 * TRX lunge 4x8 * Heel raise on leg press 3x10 <b>Core:</b> * Standing rotary twist 2x15 * Plank 3x30" <b>Neuromotor:</b> * SLB 5-cone toe tap 3x5 * TRX sprinter 3x20"	<b>*Active Recovery*</b> <b>Light - Moderate Aerobics (20 mins)</b> * Walking on treadmill @ 3 mph with 4% incline  <b>Flexibility/ Mobility (20 mins)</b> * Yoga class * Foam rolling to UE & LE	<b>Resistance/ Neuromotor (40 mins)</b> <b>UE push:</b> * Military press 4x8 * Triceps skull crusher 3x10 * DB lateral shldr raise 3x10 <b>LE pull:</b> * Glute hip extension 3x10 * Hip bridge w/SB knee tuck 4x8 <b>Core:</b> * Roman chair knee tuck 3x20 <b>Neuromotor:</b> * Lateral step-over w/hurdle 3x5 * FWD box jump (ground to box) 4x5  <b>Vigorous Aerobics (20 mins)</b> * Running @ ≥6 mph for ≥20 mins	<b>Flexibility/ Mobility (10 mins)</b> * Stretches to muscles in UE & LE, 3x30" ea. * Foam rolling to UE & LE  <b>Moderate Aerobics (30 mins)</b> * Swimming laps	<b>**Passive Recovery**</b>
Abbreviation Key:	UE: upper extremity LE: lower extremity	SL: single-leg DL: double-leg	SLB: single-leg balance DB: dumbbell	Shldr: shoulder SB: stability-ball	Fwd: forward	



**POSTPARTUM: MATERNITY CONVALESCENT LEAVE (MCL) - Weeks 1-6**

- **Active Recovery** – first 6 weeks of postpartum; focusing on lightweight resistance and higher reps
- **Marines who had cesarean or complicated vaginal deliveries should consult a HCP prior to resuming a PT plan, as additional recovery is warranted.**
  - Use of resistance bands is recommended in this phase.
  - **Endurance training** is performed during weeks 1-6, at 50-65% of 1RM strength.
    - Structured with 2 total body workouts combining both upper extremity (UE), and lower extremity (LE) push and pull exercises.
    - Reps are ≥12, in 2-3 sets, with ≤30 seconds of a rest period between sets (ordered back to back as a circuit training program).

**Table 9: Sample maternity convalescent leave (MCL) microcycle (total training time may range btwn 0-180 mins)**

*\*\*If Marine experienced a cesarean birth (C-section) or abdominal separation, she should consider waiting to start abdominal exercises. Consult HCP first.*

Focus on recovery and rehabilitation (total sample training time: 180 minutes)						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>*Active Recovery*</b>		<b>*Active Recovery*</b>		<b>*Active Recovery*</b>		<b>**Passive Recovery**</b>
<b>Flexibility/ Mobility (10 mins)</b> * Stretches to muscles in UE & LE, 3x30" ea. * Foam rolling to UE & LE  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises * TA squeeze 20x	<b>Light - Moderate Aerobics (20 mins)</b> * Walking w/baby in stroller (~ 3 mph)  <b>Resistance (20 mins)</b> <b>UE pull:</b> * RB Biceps curl 2x15 * RB straight-arm fwd flex 2x15 * RB straight-arm lat raise 2x15 * RB Triceps ext 2x15 <b>LE push:</b> * SB wall squat 2x15 * Walking lunge 2x15  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises	<b>Flexibility/ Mobility (20 mins)</b> * Yoga * Foam rolling to UE & LE  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises * Supine marching 2x10	<b>Light - Moderate Aerobics (20 mins)</b> * Walking w/baby in stroller (~ 3 mph)  <b>Resistance (20 mins)</b> <b>UE push:</b> * RB OH press 2x15 * Bench push-up 3x12 <b>LE pull:</b> * Hip bridging 2x15 * RB clamshell 2x15  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises	<b>Flexibility/ Mobility (20 mins)</b> * Pilates * Foam rolling to UE & LE  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises * TA squeeze 20x	<b>Light - Moderate Aerobics (20 mins)</b> * Walking w/baby in stroller (~ 3 mph)  <b>Core/Pelvic Floor (5 mins)</b> * Kegel exercises * SB crunch 2x15	

Abbreviation Key:

UE: upper extremity  
LE: lower extremity

RB: resistance band  
SB: stability ball

Fwd: forward  
Lat: lateral (to the side)

Flex: flexion  
Ext: extension

OH: overhead  
TA: transverse abdominal

**POSTPARTUM: PRIMARY CAREGIVER LEAVE (PCL) - Weeks 7-12**

- o Progress to splitting workouts into 3 days per week.
- **Hypertrophy training** is performed during weeks 7-9, at 67-80% of 1RM strength.
  - Structured with one day designated for UE push exercises, one for leg exercises and one for UE pull exercises.
  - Reps range between 6 and 12, in 3-6 sets, with rest of 30 seconds to 1.5 minutes between sets.
- **Strength training** is performed during weeks 10-12, at ≥85% of 1RM strength.
  - Structured with one heavy day, one medium day, and one light day.
  - Reps of ≤6, in 2-6 sets, with rest of 2-5 minutes between sets.

**Table 10: Sample primary caregiver leave (PCL) microcycle (total training time may range btwn 150-265 mins.)**

**\*\*Initiate after consultation with HCP**

Focus on re-building base level fitness (total sample training time: 260 minutes)						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<p><b>Resistance/Neuromotor (30 mins)</b>  <b>UE push:</b>                      * Bench chest press 4x12                      * Shldr press 4x12                      * DB Triceps ext 4x12</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * Dead bug 5x6</p> <p><b>Moderate Aerobics (20 mins)</b>                      * Stationary bicycling @ 10-12 mph</p>	<p><b>Flexibility/ Mobility (20 mins)</b>                      * Stretches to muscles in UE &amp; LE, 3x30" ea.                      * Foam rolling to UE &amp; LE</p> <p><b>Vigorous Aerobics (20 mins)</b>                      * Stroller jogging @ 5-6 mph</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * SB back ext 3x10</p>	<p><b>*Active Recovery*</b></p> <p><b>Light - Moderate Aerobics (20 mins)</b>                      * Walking w/baby in stroller (~ 3 mph)</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * 90/90 knee hold 10x10"</p>	<p><b>Resistance/Neuromotor (30 mins)</b>  <b>LE push &amp; pull:</b>                      * Squats on TRX 3x10                      * Seated calf raise 4x12                      * Deadlift 3x10</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * Bird dog 5x6</p>	<p><b>Flexibility/ Mobility (20 mins)</b>                      * Yoga                      * Foam rolling to UE &amp; LE</p> <p><b>Moderate Aerobics (20 mins)</b>                      * Water aerobics</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * SB crunch 3x20</p>	<p><b>Resistance/Neuromotor (30 mins)</b>  <b>UE pull:</b>                      * DB curls on half-ball 3x10                      * Lat pulldown 4x12                      * Bent-over row 4x12</p> <p><b>Core/Pelvic Floor (5 mins)</b>                      * Kegel exercises                      * Scissor kick 3x30"</p> <p><b>Vigorous Aerobics (20 mins)</b>                      * Bicycling @ ≥ 13 mph</p>	<p><b>**Passive Recovery**</b></p>

Abbreviation Key:

Shldr: shoulder  
 DB: dumbbell

UE: upper extremity  
 LE: lower extremity

Ext: extension  
 SB: stability ball

**POSTPARTUM EXEMPTION (PPE) - Weeks 13-39**

- Add a power training phase here, and introduce agility drills with neuromotor training.
  - **Power training** is performed during weeks 13-15, at 75-90% of 1RM strength.
    - Structured with one heavy day, one medium day, and one light day.
    - Reps range between 1 and 5, in 3-5 sets, with rest of 2-5 minutes between sets.
  - **Endurance training** is performed during weeks 16-18, at 50-65% of 1RM strength.
    - Structured with two total-body workouts with both upper body, and lower body push and pull exercises.
    - Reps of  $\geq 12$ , in 2-3 sets, with  $\leq 30$ -second rest periods between sets (ordered back to back as a circuit training program).
- Make week 19 of postpartum a week of active recovery, performing only light aerobic exercise.
- Repeat hypertrophy, strength, power, & endurance phases with 3 weeks of training each, until termination in the 39<sup>th</sup> week of the postpartum period.
- Make week 40 another active recovery week, again performing only light aerobic exercise.
- Return to pre-pregnancy fitness levels and workout routines starting in week 41.

**Table 11: Sample postpartum exemption (PPE) microcycle (total training time may range btwn 150-315 mins.)**

Focus on returning to pre-pregnancy fitness levels (total sample training time: 290 minutes)						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<p><i>Resistance/Neuromotor (30 mins)</i>  <b>"HEAVY DAY"</b>  <b>UE push w/ LE pull:</b>                      * Barbell incline bench press 5x5                      * Triceps skull crusher 5x5                      * Reverse lunge w/wt. 4x6                      * Romanian DB deadlift 4x6                      * DL lateral hurdle hop 5x5</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Kegel exercises                      * Roman chair knee tuck w/wt. 5x5                      * Weighted crunch 3x15</p> <p><i>Moderate Aerobics (30 mins)</i>                      * Swimming laps</p>	<p><i>Flexibility/ Mobility (10 mins)</i>                      * Stretches to muscles in UE &amp; LE, 3x30" ea.                      * Foam rolling to UE &amp; LE</p> <p><i>Vigorous Aerobics (20 mins)</i>                      * Running @ <math>\geq 7</math> mph</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Kegel exercises                      * Scissor kick 3x30"                      * SB crunch 3x20</p>	<p><i>Resistance/Neuromotor (30 mins)</i>  <b>"MEDIUM DAY"</b>  <b>UE pull w/ LE push:</b>                      * Lat pulldown 5x5                      * DB Biceps curl 5x5                      * Barbell front squat 4x6                      * Broad jump w/sprint 5x25 yds</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Weighted back ext 4x6                      * Kegel exercises                      * Flutter kick 3x30"</p>	<p><i>Flexibility/ Mobility (10 mins)</i>                      * Stretches to muscles in UE &amp; LE, 3x30" ea.                      * Foam rolling to UE &amp; LE</p> <p><i>Vigorous Aerobics (20 mins)</i>                      * Running @ <math>\geq 7</math> mph</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Kegel exercises                      * Russian rotary twist 2x20                      * SB crunch 3x20</p>	<p><i>Resistance/Neuromotor (30 mins)</i>  <b>"LIGHT DAY"</b>  <b>UE push w/ LE pull:</b>                      * DB Pec fly 5x5                      * DB lat shldr raise 5x5                      * Seated HS curl 5x6                      * 10-yd. resisted carioca shuttle 3x5                      * Ladder drills 2x5 (down &amp; back)</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Kegel exercises                      * Scissor kick 3x30"                      * Plank 3x30"</p> <p><i>Moderate Aerobics (30 mins)</i>                      * Bicycling @ 10-12 mph</p>	<p><b>*Active Recovery*</b>  <i>Light - Moderate Aerobics (20 mins)</i>                      * Walking w/baby in stroller (~3 mph)</p> <p><i>Core/Pelvic Floor (10 mins)</i>                      * Kegel exercises                      * SB crunch 3x20                      * Plank 3x30"</p>	<p><b>**Passive Recovery**</b></p>
Abbreviation Key:	UE: upper extremity LE: lower extremity	w/wt.: with weight DB: dumbbell	DL: double-leg SB: stability ball	Lat: Latissimus and/or lateral Shldr: shoulder	HS: Hamstring	

## **OTHER CONSIDERATIONS AFFECTING PHYSICAL TRAINING**

A successful fitness program considers components of health and well-being affecting the performance of daily routines and the results of PT cycles. The following sections review the most common components of health and wellness directly and indirectly affecting PT during all periods of life, including pregnancy and postpartum periods.

- **Nutrition**
  - Nutrition is an integral component of a successful PT program.
  - The ability of a Marine to perform physically demanding programs will be limited without proper nutrition. Minimum considerations should include proper nutrient dense caloric intake, meal/snack timing, and proper hydration.
  - Marines should not double their caloric intake. An expectant mother is **NOT eating for two** (as is often stated). **\*\* According to the 2<sup>nd</sup> Edition of Exercise for Special Populations, by Peggie Williamson, within the 2<sup>nd</sup> trimester a pregnant woman's daily energy needs only increase by about 340 kcal; and only 450 kcal a day during the 3<sup>rd</sup> trimester.**
    - Making healthy food choices during pregnancy will have major benefits to both the mother and her unborn child.
      - It is important to find the right balance between getting enough nutrients to fuel the unborn child's growth and development while maintaining the mother's healthy pregnancy weight.
      - Healthy food choices include lean proteins, fresh fruits and vegetables of all colors, whole grains rich in fiber and healthy fats, and low fat dairy choices.
    - \*\* This is not the time for a Marine to start, or continue, any fad diets, restrictive eating, or dietary supplements that are not specifically prescribed by a HCP.**
    - Pregnant/postpartum Marines are particularly susceptible to becoming overheated during PT and should be encouraged to drink water before, during, and after exercise.
    - Pregnant Marines experiencing severe morning sickness must be cognizant of the impact on hydration status and overall nutritional status and the effect that takes on the body and unborn child.
    - Weight gain is normal during pregnancy and Marines should make certain to consume enough calories to prevent weight loss.
    - If they are breastfeeding, lactating women may need to increase their caloric intake from their pre-pregnancy intake in order both to produce enough milk for the baby and to meet the mother's own energy needs.
    - For additional guidance and information, pregnant/postpartum Marines should seek assistance from local HCPs, qualified Semper Fit personnel (Health Promotion and Fitness), and Naval Dietitians; or visit:
      - <https://www.acog.org/Patients/FAQs/Nutrition-During-Pregnancy>; <https://www.eatright.org/health/pregnancy/>; <https://www.llni.org/breastfeeding-info/>.
- **Sleep**
  - **Sleep Hygiene** – behavioral interventions to promote and maintain proper sleep.
  - Sleep is imperative for restoring both physical and mental health and repairing the body.
  - Lack of sleep, or sleep deprivation, may cause difficulty with concentration and memory, mood disturbances, impaired reaction time and judgment, fatigue, poor physical coordination, and diminished recovery from PT.
  - The National Sleep Foundation and American Academy of Sleep Medicine, recommend that adults age 18-64 sleep 7 or more consecutive hours daily. For some individuals, as few as 6 hours and as many as 10 hours may be appropriate.
  - Pregnant and postpartum women commonly struggle with obtaining proper sleep.
    - The postpartum period may be particularly challenging with minimizing sleep disruptions. During the convalescent period, sleep when the baby sleeps. Fig. 3 has sleep hygiene tips that may help increase sleep quantity and quality.
    - Sleep deprivation can increase the risk of postpartum depression. A Marine should be encouraged to speak with her obstetrician or HCP about signs of postpartum depression (see table below).
    - Disruptions in sleep quality or poor nutrition due to morning sickness for example can be a cause for temporary reductions in training volume or overall intensity.
      - Note: All stressors (including poor sleep) accumulate and affect the body and its training ability. If environmental stress or stress caused by pregnancy increases (stuck in traffic after work, didn't sleep the night before, or can't keep food down), then Marines should expect to make modifications to their training program for that day.

<b>Sleep Tips</b>
* Maintain a consistent sleep schedule
* Set a bedtime that ensures at least 7 hours of sleep
* Don't go to bed unless you are sleepy
* If you don't fall asleep after 20 minutes, get out of bed
* Establish a relaxing bedtime routine
* Use your bed only for sleep and sex
* Make your bedroom quiet, dark and relaxing
* Keep the room at a comfortable, cool temperature
* Limit exposure to bright light in the evenings
* Turn off electronic devices at least 30 minutes before bedtime
* Don't eat a large meal before bedtime
* If you are hungry at night, eat a light, healthy snack
* Exercise regularly and maintain a healthy diet
* Avoid consuming caffeine in the late afternoon or evening
* Avoid consuming alcohol before bedtime
* Reduce your fluid intake before bedtime

**Figure 3: Recommendations for Proper Sleep**

o **Mental Well-Being**

- Good mental health and emotional well-being are important throughout all stages of life and are characterized by a person’s ability to fulfill various key functions and activities, including the ability to learn, the ability to feel, express and manage a range of positive and negative emotions, and the ability to form and maintain good relationships with others.
  - Seventy percent of all new mothers experience an emotional condition known as the “baby blues.”
    - Although not considered a mental illness because it does not interfere with daily activities or require medical attention, the “baby blues” may cause irritability, restlessness, anxiety, and crying for no reason for up to 2 weeks following delivery.
    - **If a Marine has a history of depression or PTSD prior to pregnancy, she is at increased risk of postpartum depression. She should consider talking to her obstetric provider prior to delivery on about signs and symptoms of postpartum depression and ways it can be prevented.**
      - Postpartum depression is a serious, but treatable mental illness that directly affects an estimated 14% of pregnant/postpartum women and carries additional risk for the child, mother, and family.
      - Postpartum depression is emotionally and physically debilitating and left untreated may continue for several months or more.
        - Receiving treatment is vitally important for the mother and child.
        - Pregnant and postpartum women should seek immediate assistance if they are experiencing multiple symptoms, have thoughts of suicide or self-harm, have thoughts of harming their child or family, have trouble with daily tasks or taking care of their child, or experience worsening depression symptoms.

Symptoms of Peripartum Depression
* Sluggishness, fatigue
* Feeling sad, hopeless, or worthless
* Difficulty sleeping/sleeping too much
* Changes in appetite
* Difficulty concentrating/confusion
* Crying for "no reason"
* Lack of interest in the baby
* Not feeling bonded to the baby
* Feeling very anxious about the baby
* Feelings of being a bad mother
* Fears of harming the baby or oneself
* A loss of interest or pleasure in life

Figure 4: Peripartum Depression Symptoms

**\*\*NOTE: For all resources of this handbook, please review the references listed in the Appendix of the Pregnancy & Postpartum PT Guidebook.**