Pregnancy and Post-partum Physical Training Guidebook

Published December 2019

Force Fitness Division

Disclosure

The content of this document is not intended to be taken as medical advice; each Marine should consult a healthcare provider for their individual medical care and all medical concerns should be addressed with their healthcare provider. Any advice from a healthcare provider that this document appears to contradict should not be interpreted as such.

When participating in any physical training, there is risk of injury, strains, fractures, and other physical ailments that could cause serious injury or death. It is also possible that some participants would suffer mental anguish, trauma or other injuries from this experience. This list is not an exclusive or exhaustive list of possible injuries, trauma, or accidents that may occur. Injuries are rare and you are not likely to encounter them. However, injuries have occurred in the past, and you need to be aware of both the injuries listed and other possible injuries not mentioned above. These injuries occur more often when the participants are not physically able to undertake the activity.

Overview

This document provides Marines, Commanders, and fitness personnel guidance for conducting physical training (PT) with pregnant and post-partum Marines. PT is vastly important and beneficial in all stages of a Marine's life, to include pregnancy and post-partum periods. Physical activity during pregnancy and post-partum periods has minimal risks and has been shown to consistently benefit most women. During pregnancy, PT helps Marines maintain fitness levels and regain fitness during the post-partum period. Consultation with a qualified health care provider (HCP) is required for a pregnant or post-partum Marine to participate in PT. While the health and safety of the Marine and unborn child are the utmost priority, PT programs can be adapted and modified to account for fetal requirements and normal physiological and anatomical changes. The ability to conduct PT should be guided by the pregnant/post-partum Marine without exceeding limitations established by the HCP.

Commanders shall ensure that pregnant and post-partum Marines have support and access to appropriate fitness resources and understand the value of physical activity during these stages. The information contained in this document is based on current recommendations from the American College of Obstetrics and Gynecology (ACOG), American College of Sports Medicine (ACSM), the World Health Organization (WHO), the US Department of Health and Human Services (DHHS), American Academy of Sleep Medicine (AASM), the National Sleep Foundation (NSF) and the American Psychiatric Association (APA). The guidebook is intended as an overview, and provides guidance and clarity for adaptation of a PT program that empowers a pregnant or post-partum Marine to design her own PT program. For additional assistance with pregnancy and post-partum PT program design and modification contact your local fitness personnel including: HCPs and qualified Semper Fit personnel. Semper Fit staff have a variety of educational credentials to permit conducting PT with special populations to include pregnant and post-partum Marines. Unit Force Fitness Instructors (FFI) serve as oversight for PT programs and provide referrals to external PT resources.

Table of Contents

I. Introduction

A healthy lifestyle throughout all stages of life is essential to maintain and improve fitness, reduce risk of obesity and related medical conditions, improve psychological condition, and increase life expectancy. This applies to pregnancy and post-partum life stages as well. Marines engaged in a healthy lifestyle, one that includes consistent PT, good nutrition, and proper sleep habits prior to pregnancy are encouraged to continue. If a Marine is not already engaged in healthy lifestyle practices, the pregnancy and post-partum time periods should be viewed as opportunities to adopt healthier lifestyle practices.

In 2010 and 2016, the WHO and ACSM respectively issued evidence-based position statements that indicate:

- the beneficial effects of PT for adults are indisputable
- the benefits of PT far surpass the risks

PT is an essential component of a healthy lifestyle. Following consultation with an HCP, pregnant/post-partum Marines are encouraged to engage in PT. In 2018, DHHS recommended healthy pregnant and post-partum women, *at a minimum,* to participate in a total of 150 minutes of moderate-intensity aerobic training (e.g. very brisk walking at 4 mph) a week. Marines that regularly engage in vigorous-intensity aerobic training or are highly active prior to pregnancy may continue vigorous-intensity training during pregnancy and post-partum stages provided they remain healthy and consult with their HCP. Additionally, ACOG recommends healthy women engage in resistance training *at a minimum* 2 days a week before, during, and after pregnancy. Physical inactivity and excessive weight gain during pregnancy have been recognized as independent risk factors for maternal obesity and related medical complications, such as gestational diabetes.

II. Pregnancy/Post-partum Considerations

During pregnancy, profound anatomical and physiological changes occur to provide sufficient nourishment and space for the development of the unborn child. As changes occur during pregnancy, women may become at risk of developing various medical conditions or complications that may prohibit or limit their ability to participate in PT. PT during all pregnancies can be beneficial, but requires consultation from an HCP. For complicated pregnancies, PT programs must be individualized, and requires additional oversight by a Marine's HCP.

During the post-partum period, significant anatomical and physiological adaptations continue to occur as the body recovers from pregnancy and the birth event, and continues to support the growth and development of the child. Some women may experience complications during the post-partum period that may limit, prohibit, and/or postpone PT. In the event of post-partum complications, Marines should consult their HCP.

Regardless of the health of the Marine or wellness during the pregnancy and post-partum periods, Marines require healthcare consultation prior to conducting PT. See *Appendix A* for an example of an HCP consultation form.

a. Common Anatomical and Physiological Changes

Pregnancy results in changes to the structure, function, and activity of the human body that must be considered when developing PT for this time period. The most apparent change occurs structurally in the form of weight gain and results in a forward shift of the body as the abdomen distends and joints increase movement. These structural changes lead to increased force across various joints, especially the spine, which may be increased during PT. Strengthening the core (e.g. abdominal and back muscles) during pregnancy may reduce the stress and pain to the low back and spine but should be implemented with precaution and with consultation from an HCP. Flexibility training may also reduce pain and discomfort during pregnancy and assist with correction of posture in the post-partum period. Use caution when conducting flexibility training throughout pregnant and post-partum periods especially during the 3rd trimester, the period immediately following the birth event, and the convalescent period. Motionless postures like lying flat on the back, a common position during flexibility training, may decrease the return of blood to the heart and lower blood pressure, and should be avoided as much as possible. Structural changes during pregnant/post-partum periods may also affect balance and body awareness in space. Use caution when conducting neuromotor training (see *Section III.c.3*) during the 1st and 2nd trimester, and consider avoiding during the 3rd trimester and convalescent period.

As structural changes become more significant, physiological changes like cardiac and respiratory outputs change too. Blood volume, heart rate, and cardiac output increase to provide adequate blood flow to the unborn child, and to prepare the pregnant woman for delivery. Breathing volumes (the amount of air with each breath) decrease due to hormonal changes and as the diaphragm compresses with the growth of the unborn child. Due to these changes and an increase in oxygen consumption, pregnant women breathe faster (respiratory rate increases). The end result is that up to 70% of pregnant women may feel short of breath with physical activity. However, pregnant women preserve their aerobic working capacity even in late gestation. Therefore, aerobic training is safe during pregnancy, but a pregnant woman may not be able to sustain their pre-pregnancy workout intensity and find they feel more short of breath than usual.

During the post-partum period, structural and functional changes continue to occur that will impact PT. The body's priorities post birth event are recovery from the birth event, reverting to the pre-pregnancy state, and continued sustainment of the child through production of breast milk.

Temperature regulation, or the activity of the body to sustain a relatively constant core body temperature, is dependent on hydration and environmental conditions. Pregnant and post-partum Marines are recommended to wear loose-fitting clothing, avoid high heat and humidity during PT, and consume water before, during and after physical activity to minimize risk of heat stress. PT alone has not been shown to substantially increase core body temperature.

b. Precautions and Contraindications

During pregnancy and post-partum 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 (see *Section III.c*). While both complicated and healthy pregnancies require healthcare consultation prior to conducting PT, complicated pregnancies may need additional healthcare oversight of PT programs and activities to ensure the well-being of the Marine and unborn child. If a pregnant/post-partum Marine suffers from any of the signs or symptoms listed below prior to or during PT, activity should be halted, treated as a medical emergency, and the Marine should immediately seek medical attention. *Table II.1* below, summarizes the various precautions, symptoms, activities, and conditions that must be considered by the individual Marine, Commander, and the PT instructor throughout the pregnancy/post-partum periods. For a consolidated resource of pregnancy/post-partum considerations, see *Appendix B*.

	Pregnancy PT Stages			Post-partum PT Stages		
	1ST TRIMESTER (Weeks 1-13)	2ND TRIMESTER (Weeks 14-27)	3RD TRIMESTER (Weeks 28-40)	CONVALESCENT LEAVE (Weeks 1-6)	PCG LEAVE (Weeks 7-12)	POSTPARTUM RTD (Weeks 13-39)
Precautions During PT	* Avoid dehydration * Avoid overheating, especially during the first trimester * Avoid standing or lying on back for extended periods * Avoid low blood-sugar			* Avoid dehydration * Avoid overheating		
Warning Signs and Symptoms to Discontinue PT	* Dizziness * Feeling faint * Shortness of breath before physical training * Chest pain * Headache * Muscle weakness affecting balance * Calf pain or swelling * Regular, painful contractions * Bleeding or fluid leaking from the vagina			* Pain * Dizziness * Feeling faint * Severe headache		
NOT ADVISED Enviromental Conditions & Activities	* Contact sports or training that increases risk of contact to the abdomen * Activities that increase risk of falls, including neuromotor training * Training conducted above 6,000 feet (unless a Marine already lives at high altitude) * Skydiving * Scuba diving * Hot, humid environments			* Swimming or submersion in water during the convalescent period		
Medical Conditions: PT NOT ADVISED	* Certain types of heart and lung disease * Cervical insufficiency or cerclage * Pregnant with twins or more with risk factors for preterm labor * Placenta previa after 26 weeks of pregnancy * Premature labor or water has broken during current pregnancy * Preeclampsia or pregnancy-induced high blood pressure * Severe anemia * Persistent second- and third- trimester bleeding			* Preeclampsia or pregnancy-induced high blood pressure requires clearance from a medical provider to resume exercise. * Cesarean birth (C-section) 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. Medical clearance is recommended.		

Note 1: All pregnant and postpartum Marines must be cleared by a medical provider prior to participation in physical training.
Note 2: In the event a Marine experiences any of the contraindicated symptoms prior to or during physical training, it should be treated as a medical emergency and referred immediately to a medical provider.

Table II.1 Pregnancy/Post-partum Precautions and Contraindications

c. Benefits of Physical Training

PT throughout a Marine's life is beneficial and important for the maintenance and improvement of physical fitness and body composition, and prevention of various health and medical conditions and complications. In addition, regular and consistent PT has been proven to increase longevity. PT during pregnancy and post-partum is equally as beneficial and necessary. Due to the various complications and

conditions that may arise from pregnancy, PT should be encouraged to reduce the risk and occurrence of these complications. Additionally, PT during pregnancy can maintain, sustain, and/or improve a Marine's overall fitness and strength; and better ensure a safe, steady, and effective recovery during the post-partum period. *Table II.2*, summarizes the specific benefits of PT during the pregnancy and post-partum periods.

Pregnancy	Post-partum
* Decreases back pain * Reduces constipation * Promotes healthy weight gain * Improves overall general fitness * Strengthens heart and blood vessels * Improves ability to lose weight post birth event * Greater longevity * Reduces risk of gestational diabetes, preeclampsia, and cesarean delivery	* Strengthen and tone abdominal muscles * Boost stamina and metabolism (energy) * Promotes better sleep * Promotes healthy weight loss * Reduces stress * Greater longevity * May prevent post-partum depression * Decrease risk of deep vein thrombosis

Table II.2 Benefits of Physical Training

After consultation with an HCP, a Marine should meet with their SNCO/OIC to review relevant policies, exemptions, and resources in regards to pregnancy, post-partum, and PT. See *Appendix C* for the Commander's Pregnancy/Post-partum Preparation Tool.

III. Physical Training Program Design

The Marine Corps Physical Fitness Program recommends developing a structured and progressive program, based on current and relevant methodology, for maintenance and enhancement of health and physical fitness. PT program design begins with understanding the individual's ability, and is further refined by the intended end state and goals of the mission and unit. In addition to individual performance on the PFT and CFT, utilizing the Pregnancy and Post-partum PT Pre-Participation questionnaire (*Appendix D and E*) will assist in determining the ability and needs of the pregnant or post-partum Marine(s). The physical fitness measurements (e.g. PFT and CFT) and pre-participation questionnaire serve as the baseline in designing and developing a PT program for the pregnant and post-partum Marine, and define the overall needs and form the foundation for developing goals. Given the information in this guidebook and consultation with an HCP, an individual Marine can design her own physical fitness program and/or consult with a physical fitness expert to develop a PT program. For an example of a physiologically approved PT program for pregnant women reference the Army's Pregnant and Post-partum Training Program at www.fitness.marines.mil.

a. Goal Setting

Goal setting is an important component of all program development and imperative for development of a structured, progressive and safe PT program. During pregnancy, goals should emphasize maintenance of pre-pregnancy fitness levels rather than gradual and progressive overload. During the post-partum period, goals should emphasize the return to pre-pregnancy fitness levels through safe, gradual and progressive overload.

When goal setting utilize the SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) principle to clearly define PT program goals. Create short- and long-term goals based on the various training cycles throughout the PT program, and consider regularly reviewing and reassessing to ensure safe and honest results. See *Appendix F* for assistance with developing SMART short- and long-term goals.

- **Specific** goals are simplistically written and clearly define the what, why, and how of the physical fitness program. These qualities are answered by the mission and the assessment of individual unit members.

- **Measurable** goals provide tangible evidence, such as maintain aerobic and/or strength performance, achieve same PFT/CFT class post pregnancy, and avoid PT related injuries and complications during pregnancy/post-partum.

- **Achievable** goals are challenging, but are defined well enough that the goal may be reached. The intent is to use sound science and logic to define goals that do not defy human physiology and anatomy, and account for Marines that require the greatest improvement.

- **Relevant** goals focus on the needs of the unit and individuals, and do not stray from the mission. The bottom line is to keep the focus on the individuals being trained.

- **Time-bound** goals define a time frame that creates a practical sense of urgency. They may be categorized into short-term and long-term goals to better structure outcomes. Short-term goals are the stepping stones to achieve long-term goals, or desired end state.

Sample Goals
***Long-term Goal*:** Marine returns to full duty and achieves at least previous PFT/CFT class at the conclusion of her exemption time period. ***Short-term Goal*:** Participate in 30 minutes of moderate-intensity aerobic exercise 5 days/week during the first trimester.

b. Perceived Effort

It is vitally important to understand the needs and abilities of each Marine when developing a structured physical fitness program to account for inherent differences and responses to training, especially during pregnancy and post-partum periods. There are a few ways to accurately measure exercise intensity; the most common being heart rate monitoring. However due to physiological changes in pregnant women, the use of perceived exertion is a more effective way to monitor exercise exertion and intensity.

It is imperative that the pregnant or post-partum Marine conducts honest, periodic check-ins with herself during any physical activity to ensure the overall safety and well-being of herself and the unborn child. The use of the Borg 15-Grade Rating of Perceived Exertion (RPE) scale, *Figure III.1*, is an effective and reliable scale that provides the individual the ability to self-assess and self-advocate during a PT session. When presented with the scale during PT, the individual will self-select their level of perceived intensity on a scale of 6-20. For example, a moderate intensity exercise should equate to a self-selected 13 or 14.

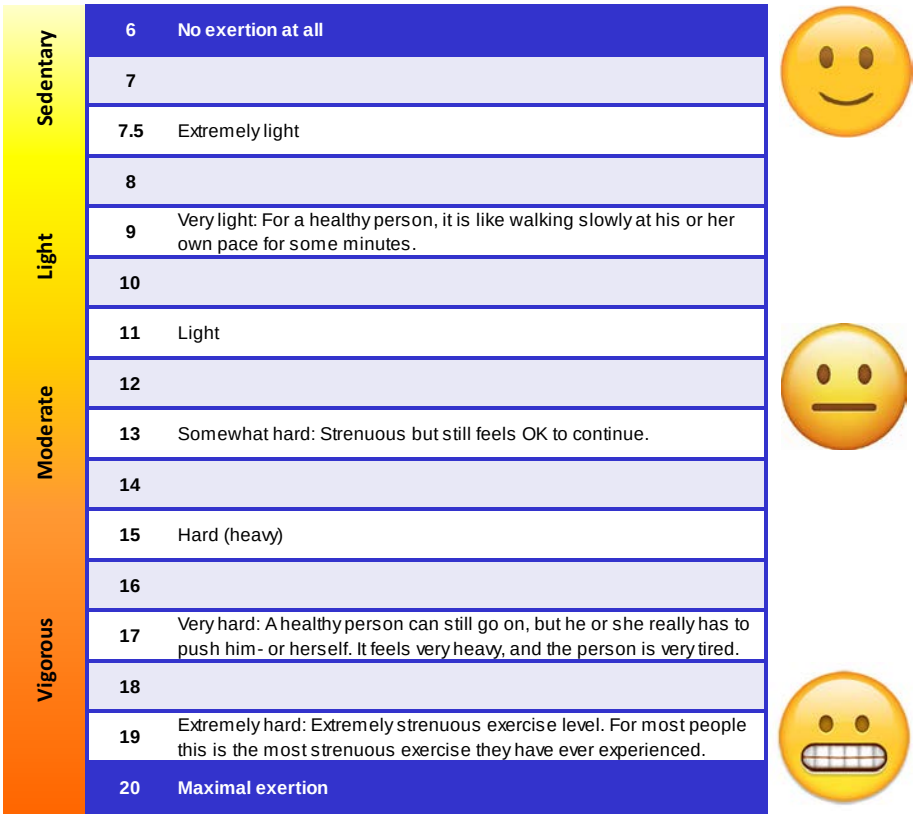


Figure III.1 Borg 15-Grade Rating of Perceived Exertion scale

c. Physical Training Components and Recommendations

The following guidelines are based on current recommendations from the ACSM. They are intended for achieving and maintaining a good quality of health and physical fitness for adults age 18-65 years. The

recommended frequency for each physical component may not improve every Marine's physical conditions, but are intended to develop and maintain healthful longevity while reducing risk of injury and illness. In addition, the recommended duration, intensity, and sets/reps are not a requirement, and may vary widely per individual. A comprehensive and effective PT program should include all of the following recommended PT components. *Table III.1* below, summarizes the following recommendations for pregnant/post-partum Marines and introduces the concept of PT progression, or periodization (see *Section III.d*), for the various components of PT programs. Prior to engaging in any one physical training component, a pregnant or post-partum Marine should consult with her HCP. FFIs can provide a general overview for development of physical fitness programs and discuss the importance of incorporating all components of PT in a physical fitness program. For specific guidance regarding PT in relation to pregnancy and post-partum periods, consult your local Semper Fit personnel.

	Pregnancy PT Stages			Post-partum PT Stages		
	1ST TRIMESTER (Weeks 1-13)	**2ND TRIMESTER (Weeks 14-27)**	**3RD TRIMESTER (Weeks 28-40)**	**CONVALESCENT LEAVE (Weeks 1-6)**	**PCG LEAVE (Weeks 7-12)**	**POSTPARTUM RTD (Weeks 13-39)**
Cardiorespiratory Training Goal	Initiate or Maintain pre-pregnancy Moderate- and Vigorous- Intensity Aerobic Training	Maintain Moderate- and Vigorous- Intensity Aerobic Training	Maintain Moderate- and Vigorous- Intensity Aerobic Training	Rest	Initiate Moderate-intensity Aerobic Training and initiate Vigorous- Intensity Aerobic Training	Advance Moderate- and Vigorous- Intensity Aerobic Training
Resistance Training Goal	Initiate or Maintain pre-pregnancy Resistance Training	Maintain Resistance Training	Maintain Resistance Training	Rest	Introduce to Foundational Phase (Hypertrophy)	Introduce to Max Strength/ Endurance Phase
Neuromotor Training Goal	Train with Caution	Train with Caution	Not Advised	Not Advised	Introduce as component of Resistance Training	Introduce Agility Drills
Flexibility/ Mobility Training Goal	Initiate or Maintain pre-pregnancy Flexibility/Mobility Training	Maintain Flexibility/Mobility Training	Train with Caution	Rest	Reinitiate Flexibility/Mobility Training	Maintain Flexibility/Mobility Training
Specific Training Component Goal	Maintain individually relative pre-pregnancy PT Levels	Maintain individually relative pre-pregnancy PT Levels	Maintain individually relative pre-pregnancy PT Levels	Initiate pelvic floor strengthening (Kegel exercises)	Maintain pelvic floor strengthening (Kegel exercises)	Maintain pelvic floor strengthening (Kegel exercises)
PT Preparation	* Wear loose-fitting clothing * Wear a supportive sports bra * Consider wearing abdominal support, especially later in pregnancy * Drink water before, during and after physical training * Eat 1 hour prior to physical training * Consistently sustain adequate caloric intake to prevent weight loss during pregnancy			* Wear loose-fitting clothing * Wear a supportive sports bra * Wear abdominal support when necessary * Drink water before, during, and after physical training * If breastfeeding, feed your baby or express milk prior to physical training		

Table III.1 Pregnancy/Post-partum PT Recommendations

Components and Frequency:

1. **Cardiorespiratory Training**: Cardiorespiratory or aerobic training develops, maintains, and improves the functions of the cardiovascular and respiratory systems. Aerobic training generally consist of activities that maintain a constant pace, or intensity, for a specified duration. ACSM and HHS recommend duration for aerobic training as no more than 30 minutes per day for maintenance and development of the cardiorespiratory systems, and mitigation of musculoskeletal injuries. Note the intensity of the training (i.e. moderate- vs vigorous-intensity) changes the duration and frequency necessary to maintain or improve aerobic fitness. Aerobic training is considered safe to conduct during the pregnancy and post-partum periods provided the Marine remains healthy and consults with her HCP.

Light-Intensity	Moderate-Intensity	Vigorous-Intensity
* Walking—slowly * Sitting—using computer * Standing—light work (cooking, washing dishes) * Fishing—sitting * Playing most instruments	* Walking—very brisk (4 mph) * Mowing lawn (walking power mower) * Cleaning—heavy (washing windows, vacuuming, mopping) * Bicycling—light effort (10–12 mph) * Badminton—recreational * Tennis—doubles	* Hiking * Jogging at 6 mph * Running at 7 mph * Carrying heavy loads * Shoveling * Bicycling fast (14–16 mph) * Tennis—singles

Table III.2 Aerobic Training Activities by Intensity

a. **Moderate-Intensity Aerobic Training**: Generally considered activities equivalent to very brisk walking (at 4 mph) that noticeably increases heart rate. A Marine's current training status or condition may require alternative activities, pace or intensity to safely and effectively achieve the desired training results.

b. **Vigorous-Intensity Aerobic Training**: Typically considered activities equivalent to jogging (at 6 mph) and running (at 7 mph), which substantially increase heart rate and produce rapid breathing. A Marine's current training status and condition may require alternative activities, pace or intensity to safely and effectively achieve the intended training results.

Key Points
• **Moderate-Intensity Aerobic Training**: ▪ ≥ 5 days/week for ≥ 30 minutes/day ▪ Total ≥ 150 minutes/week • **Vigorous-Intensity Aerobic Training**: ▪ ≥ 3 days/week for ≥ 20 minutes/day ▪ Total ≥ 75 minutes/week • **Or** use a combination to achieve ≥ 100-120 minutes/week

*For additional information and a list of more activities categorized by aerobic intensity visit:

https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf

2. **Resistance Training**: Resistance training maintains and increases the strength and endurance of muscles and tendons. In addition, resistance training can stimulate an increase in bone formation in young adults, and slow bone loss in middle age adults. It is recommended to perform a minimum of 8-10 exercises using major muscle groups on two or more nonconsecutive days each week. *Table III.3*, list exercises categorized by the primary extremity(s) and action. Selecting exercises from each of the categories can assist with developing a balanced and comprehensive resistance training program that utilizes all major muscle groups. During the late second trimester through the third trimester, single leg exercises should be modified to improve stability and balance of the pregnant Marine. Modifications may include: bracing with a free arm on a stable object such as a wall or squat rack, and/or resting the passive leg on a stable object such as the floor or plyometric box.

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 Deadlift (Single Leg)
Dumbbell Arnold Press	Deadhang Pull-Up	Barbell Front Squat	Barbell Romanian Deadlift
Dumbbell Bench Press	Dumbbell Bent Over Row	Dumbbell Lateral Lunge	Deadlift
Dumbbell Incline Bench Press	Kettlebell Row (Single Arm)	Dumbbell Split Squat	Dumbbell Romanian Deadlift
Dumbbell Shoulder Press	Sandbag Bent Over Row	Kettlebell Goblet Squat	Dumbbell Single Leg Deadlift
Kettlebell Military Press	TRX Inverted Row	Sandbag Shoulder Lunge	Sandbag Deadlift
Military Press	TRX Low Row	Sandbag Shoulder Squat	Sandbag Goodmorning
TRX Chest Press	TRX Mid Row	TRX Lunge	TRX Hamstring Curl
TRX Incline Press	TRX Pull-Up	TRX Squat	

For access to a more extensive exercise library and videos visit: https://www.fitness.marine.mil/Workout-Of-The-Day/

Table III.3 Upper-/Lower-Body Resistance Exercises

The weight, or intensity, should result in muscle fatigue after 8-12 repetitions for each exercise. Greater than or equal to 2 sets are effective in improving muscular strength, power, and endurance. Note these are general recommendations for achieving and maintaining a good quality of health and physical fitness for Marines of all abilities and conditions.

Key Points
• ≥ 2-3 days/week for each major muscle group • 8-10 exercises using major muscle groups • 8-12 repetitions for each exercise • ≥ 2 sets for improving muscular strength, power, and endurance

During the pregnant and post-partum periods resistance training is helpful to maintain the health and wellness of the Marine and unborn child. Pregnant/post-partum resistance training should focus on minimizing loss of muscle strength and endurance during pregnancy, and then regaining muscle mass and strength during the late post-partum periods. In addition to routine resistance training, Kegel exercises are beneficial for pregnant and post-partum women to improve the strength and control of the pelvic floor musculature. For more information on Kegel exercises contact your HCP.

Maximizing benefits of Kegel Exercises
To improve pelvic floor strength Kegel exercises should be conducted daily for at minimum 12 weeks, and incorporate: • Quick flick exercise: 3x/day for 30 repetitions • Sustained (10 second) hold exercise: 3x/day for 30 repetitions

3. **Neuromotor Training**: The term neuromotor specifically pertains to the body's nerves and muscles, and the development of nerve impulses to the muscles. Neuromotor training maintains and improves body control through balance, agility, coordination, gait, and proprioception. Current literature recommends training ≥ 2-3 days per week with exercise sessions of ≥ 20-30 minutes, or total of ≥ 60 mins per week. Commonly, 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 effects body control and various motor skills. Always use caution when conducting neuromotor training with pregnant and post-partum Marines. Pregnancy results in changes to the structure, function, and activity of the human body that may affect overall body control and increase the risk for falls. As the Marine progresses through pregnancy consider avoiding neuromotor training, especially during the 3rd trimester, unless PT will be directly monitored.

Key Points
• ≥ 2-3 days/week • ≥ 20-30 minutes/session, or total of ≥ 60 minutes/week • Typically trained in combination with Resistance Training • Avoid Neuromotor training in the late second trimester and during third trimester

4. **Flexibility and Mobility Training:** Flexibility training improves and maintains range of motion in muscle-tendon groups, and associated joints. Research has shown consistently that joint range of motion, or mobility, is improved briefly after flexibility exercises, and constantly following 3-4 weeks of regular stretching at least 2-3 times per week. Literature recommends holding a stretch for 10-30 seconds at the point of tightness or slight discomfort for a total of 60 seconds per flexibility exercise for each major muscle-tendon group. Various types of flexibility exercise can improve range of movement, but may not be advisable for pregnant Marines. Dynamic, or slow movement stretching, and Ballistic, or "bouncing" stretches, show the greatest benefit when used prior to activity to assist in preparing muscles for movement. Static stretching is best applied post-activity, or on recovery days and has been shown to elicit greater gains in joint range of motion. Always use caution when conducting flexibility and mobility training during pregnancy and post-partum periods. As a result of anatomical and physiological changes, motionless posture, especially lying flat on the back, is not advised for pregnant Marines.

Key Points

• **Dynamic Stretching**:
  ▪ Slow movement stretching involving gradual transition from one body position to another
  ▪ Repeated several times with gradual increase in reach and range of motion
  ▪ Greatest benefit pre-activity
• **Ballistic Stretching**:
  ▪ Bouncing stretches that use momentum of the moving body segment to produce stretch
  ▪ Greatest benefit pre-activity
• **Static Stretching:**
  ▪ ≥ 2-3 days/week
  ▪ 10-30 seconds/stretch for a total of 60 seconds/muscle-tendon group
  ▪ Greatest benefit post-activity/recovery

5. **Recovery Training:** Recovery is an important component of PT programs during all stages of life, but is commonly negated or overlooked for various reasons. During development of a PT program for pregnancy and post-partum 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), or 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. The common theme is to temporarily reduce the training intensity to provide time for the body to repair and rebuild tissue. The general classifications of recovery training are: Passive and Active recovery.

   Passive recovery is identified by periods that drastically limit or entirely restrict activity following strenuous physical events. Although passive recovery provides the necessary time for the body to repair and rebuild, literature has shown consistently that active recovery is more beneficial in healthy individuals. As pregnancy progresses, passive recovery days may be more ideal and beneficial.

   Active recovery is defined by a period that reduces the intensity of training, and focuses on creating a more ideal environment within the body for recovery to occur. Unlike passive recovery, active recovery 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 their recovery day to increase blood flow and temperature of sore leg muscles, and then conduct a few flexibility and mobility exercises to reduce stiffness. The recovery exercises should focus on the parts of the body affected by the previous day(s) strenuous events (e.g. stretching the sore muscle-tendon groups, and mobilizing stiff joints), and should not create excessive fatigue themselves.

d. Structuring a Physical Training Program

When structuring a PT program it is important to begin with periodization. Periodization is the strategic implementation of PT components and phases. In general, training phases are defined in macrocycle, mesocycles, and microcycles. The macrocycle refers to the overall training cycle. The macrocycle for the pregnant/post-partum Marine is the 18 month period beginning with conception and ending with return to full duty. Mesocycles are shorter training phases within the macrocycle that focus on particular PT targets and incorporate multiple microcycles. For example, mesocycles for the pregnant/post-partum Marine could be: (1) the 9 months leading up to the birth event that targets maintaining overall physical fitness, and (2) the 9 months leading up to return to duty without exemptions that targets improvement of overall physical fitness. Microcycles are the shortest phases of periodization that focus on the gradual progression of PT with the goal of achieving the desired end result of the mesocycle. *Figure III.3* below is a sample periodization intended to illustrate the various

phases and events that occur during the pregnancy and post-partum period. This may be used to develop an individualized PT program.

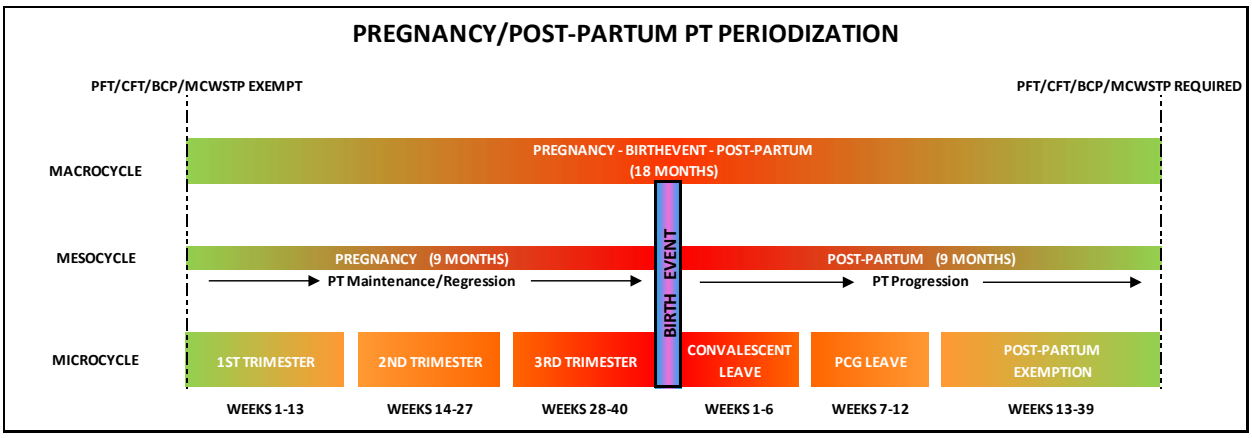


Figure III.3 Pregnancy/Post-partum Periodization

Once the periodization is established, development of the microcycle may begin by incorporating the PT components. The sample microcycles below incorporate all PT components and frequency; and illustrate possible PT progression throughout different microcycles during the pregnancy and post-partum periods. By adjusting the duration, frequency and intensity of PT components, gradual progression is achieved.

Sample: 1st – 2nd Trimester Microcycle: Focus on maintaining pre-pregnancy fitness levels (Total Training Time: 0-275 minutes)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins)	Moderate Aerobic (40 mins) Flexibility/ Mobility (20 mins)	Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins)	Active/Passive Recovery	Moderate Aerobic (30 mins) Flexibility/ Mobility (20 mins)	Moderate Aerobic (45 mins)	Active/Passive Recovery

Sample: Convalescent Leave Microcycle: Focus on rehabilitation and recovery. The first six weeks following the birth event are essential for the mother to rest, recover, and bond with her baby. The focus of physical training during this time is rest, recovery, and rehabilitation. An example for moderate aerobic activity could be taking the baby for a walk.
*Initiate after consultation with an HCP. (Total Training Time: 0-180 minutes)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Moderate Aerobic (30 mins) Core/Pelvic Floor (Kegel exercises)	Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Rest Core/Pelvic Floor (Kegel exercises)	Rest Core/Pelvic Floor (Kegel exercises)	Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (30 mins) Core/Pelvic Floor (Kegel exercises)	Rest Core/Pelvic Floor (Kegel exercises)

Sample: Primary Care Giver (PCG) Leave Microcycle – Focus on re-building a base level of fitness. *Initiate after consultation with an HCP. (Total Training Time: 265 minutes)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Moderate Aerobic (45 mins) Core/Pelvic Floor (Kegel exercises)	Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins) Core/Pelvic Floor (Kegel exercises)	Active/Passive Recovery Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (30 mins) Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins) Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (30 mins) Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Active/Passive Recovery Core/Pelvic Floor (Kegel exercises)

Sample: Post-partum Exemption Microcycle – Focus on returning to pre-pregnancy fitness levels (Total Training Time: 315 minutes)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Resistance/ Neuromotor (30 mins) Vigorous Aerobic (30 mins) Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (30 mins) Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins) Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (30 mins) Flexibility/ Mobility (20 mins) Core/Pelvic Floor (Kegel exercises)	Resistance/ Neuromotor (40 mins) Vigorous Aerobic (20 mins) Core/Pelvic Floor (Kegel exercises)	Moderate Aerobic (45 mins) Core/Pelvic Floor (Kegel exercises)	Active/Passive Recovery Core/Pelvic Floor (Kegel exercises)

e. Program Refinement

Injury monitoring and avoidance are critical components of a successful PT program, especially when training groups with increased risk to injury such as pregnant/post-partum Marines. Tracking injuries, regardless of severity, can indicate potential complications and areas requiring change for individuals and units. Utilizing proper progression and regression of exercises may assist in mitigation of injuries related to PT.

Exercise regression is the process of gradual modification of exercise towards less advanced activities, and is typically utilized for recovery or injury prevention. During the pregnancy period, exercise regression techniques will assist Marines to continue PT as changes occur to the structure and function of the body. Exercise regression techniques include: reduce external load or add assistance, modify body position, and decrease repetitions.

Examples of exercise regression techniques with the pull-up are:

Exercise	Regression Option 1	Regression Option 2	Regression Option 3
Pull-up	Decrease repetitions per set	Add heavy band for assistance	Switch to inverted row or Lat pulldown

Exercise progression is the process of gradual modification of exercise towards more advanced or challenging activities. During the post-partum period, exercise progression techniques will assist Marines with returning to pre-pregnancy physical performance. Exercise progression is achieved by increases in external loads, adjustment of body position, and increases in repetitions. Examples of applying exercise progression techniques for pull-ups are:

Exercise	Progression Option 1	Progression Option 2	Progression Option 3
Pull-up	Add heavy band for assistance to increase repetitions per set	Increase repetitions per set by 10%	Increase pull-up descent time to 3 seconds

Above all, the priorities during the pregnant/post-partum 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 for the Marine to seek assistance from their HCP.

IV. Other Considerations Affecting Physical Training

A successful fitness program considers components of health and well-being which affect the performance of daily routines and the results of PT cycles. Generally, simple and effective modifications can be introduced to these various components that create substantial benefits in PT and wellness. The following sections review the most common components of health and wellness that directly and indirectly affect PT during all periods of life, including pregnancy and post-partum periods.

a. 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. A conscious effort should be made to tie physical demands with scientifically proven performance nutrition concepts. Minimum considerations should include proper nutrient dense caloric intake, meal/snack timing, and proper hydration. Making healthy food choices during pregnancy will have major benefits to both the mother and 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 a healthy pregnancy weight. If a Marine has not previously had optimal fueling habits this is an opportunity to make healthful choices which include lean proteins, fresh fruits and vegetables of all colors, whole grains rich in fiber, healthy fats, and low fat dairy choices to safeguard overall health. This is not the time for a Marine to start or continue

engagement in any fad diets, restrictive eating, or dietary supplements that are not specifically prescribed by an HCP.

Pregnant/post-partum Marines are particularly susceptible to becoming overheated during PT and should be encouraged to drink water before, during, and after exercise. Pregnant Marines experiencing hyperemesis or severe "morning sickness" must be cognizant of the impact on hydration status and overall nutritional status. Additionally, increased weight gain is normal during pregnancy and Marines should make certain to consume enough calories to prevent weight loss. If the post-partum Marine is breastfeeding, she may require additional nutritional counseling to establish and maintain an adequate milk supply. Lactating women may need to increase their caloric intake from their pre-pregnancy intake in order to produce enough milk and meet their own energy needs. It is recommended a woman consult a lactation specialist if she has questions about caloric or dietary needs while breastfeeding, particularly if she is trying to lose excessive weight gained during pregnancy.

For additional guidance and information, pregnant/post-partum Marines should seek assistance from local SMEs including: HCPs, qualified Semper Fit personnel (Health Promotion and Fitness), and Naval Dietitian; or visit:

- https://www.acog.org/Patients/FAQs/Nutrition-During-Pregnancy
- https://www.eatright.org/health/pregnancy/
- https://www.llli.org/breastfeeding-info/

b. 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 judgement, fatigue, poor physical coordination, and diminished recovery from PT. According to the National Sleep Foundation and American Academy of Sleep Medicine, adults age 18-64 are recommended to sleep 7 or more consecutive hours daily. This sleep range permits adequate time for the adult to complete several sleep cycles, and restore and repair various structures and functions of the human body. For some individuals, as few as 6 hours and as many as 10 hours may be appropriate.

Pregnant and post-partum women commonly struggle with obtaining proper sleep durations. The post-partum period may be particularly challenging with regards to minimizing sleep disruptions. Napping in the convalescent period when the infant naps, and optimizing sleep hygiene may help ensure that the sleep a post-partum Marine does achieve is quality sleep. Sleep deprivation may also increase the risk of post-partum depression (see *Section IV.c*). A Marine should be encouraged to speak with their obstetric or healthcare provider about signs of post-partum depression.

To promote and maintain proper sleep several behavioral interventions, known as sleep hygiene, may be utilized. In *Table IV.1* below, various sleep hygiene and sleep environment recommendations are made that may be easily implemented. Utilizing the Sleep Tips below will help assure the pregnant/post-partum Marine is practicing proper sleep hygiene and maximizing the benefits of sleep.

Additionally, a pregnant/post-partum Marine may experience discomfort in the hips, low back, and abdomen as these periods progress. Utilizing pillows to support these areas may assist with reducing discomfort and improving sleep. Also, during the 3rd trimester lying on the left side is ideal to maximize blood flow to the uterus (e.g. placenta and unborn child) while sleeping.

Sleep Tips
* 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

Table IV.1 Recommendations for Proper Sleep

These recommendations should assist all Marines, including those who are pregnant and post-partum, develop appropriate sleep habits and durations. In addition, these guidelines are beneficial as a starting point for Marines to discuss their sleep habits with HCPs.

c. 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
- the ability to form and maintain good relationships with others

PT throughout life is beneficial for maintaining good mental health, and may prevent and assist with recovering from various mental conditions. The state of mental health is affected by changes in a person's social and/or financial status, emotional state, and physical or biological condition. During the pregnancy and post-partum periods, most women experience immense changes in each of these areas, elevating risk for poor mental health and development of a mental illness. For example, up to 70% 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.

Far more concerning is peripartum, or post-partum, depression. Peripartum depression is a serious, but treatable mental illness that directly affects an estimated one in seven (14%) pregnant/post-partum women, and carries additional risk for the child. Peripartum depression incorporates depression that may occur during pregnancy and during the post-partum period. *Table IV.2* lists the common symptoms of peripartum depression.

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

Table IV.2 Peripartum Depression Symptoms

Peripartum 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 post-partum woman should seek assistance, if you:

- are experiencing multiple symptoms (*Table IV.2*) for more than two weeks
- have thoughts of suicide or thoughts of harming your child
- are having trouble with daily task or taking care of your child
- are experiencing worsening depression symptoms

For more information and assistance contact your HCP or visit your local Semper Fit and Health Promotions personnel.

V. Conclusion

Pregnancy and post-partum periods are complex and include numerous and variable changes to the structure and function of the human body. Those changes must be considered when developing and conducting PT with pregnant/post-partum Marines. Healthy pregnant and post-partum Marines should be encouraged to engage in PT following consultation with their HCP. For complicated pregnancies, PT is beneficial and safe, but requires individualization of the PT program and additional consultation from HCPs.

In the appendix, tools are provided for the Marine, Commander, and PT instructor to ensure the proper implementation and education of PT programs with pregnant/post-partum Marines. For additional information on PT with pregnant and post-partum Marines contact local fitness personnel to include: HCPs, qualified Semper Fit personnel, and FFIs.

Appendix A

Healthcare Provider Consultation Form (EXAMPLE)

Marine's Name & Rank: _____

Unit: _____

Gestational Age: _____

Estimated Due Date: _____

Weight at Pregnancy Diagnosis: _____

Medical Consultation
This Marine may participate in physical training at her own pace. _____

This Marine may only participate in the following activities:

AEROBIC EXERCISE:
____Walking
____Jogging
____Running
____Swimming
____Cycling
____Callisthenic Drills
____Low Impact Aerobics
____Cardio Exercise Machine*

STRENGTH EXERCISE:
____Free Weight
____Body Weight
____Machine Weight

FLEXIBILITY EXERCISE:
____Upper Body
____Lower Body

AGILITY EXERCISE:
____ Ladder Drills
____ Cone Drills
____ Stair Drills

*elliptical or cross-trainer machine, treadmill, recumbent or upright bicycle

_____ _____
Health Care Provider's Signature/ Stamp Date

*For an extensive Pregnancy Physical Activity Readiness Questionnaire (Pregnancy PAR-Q) visit: www.csep.ca/cmfiles/publications/parq/parmed-xpreg.pdf

Appendix B

Pregnancy/Post-partum PT Recommendations and Considerations

		Pregnancy PT Stages				Post-partum PT Stages			
		1ST TRIMESTER (Weeks 1-13)	2ND TRIMESTER (Weeks 14-27)	3RD TRIMESTER (Weeks 28-40)		CONVALESCENT LEAVE (Weeks 1-6)	PCG LEAVE (Weeks 7-12)	POSTPARTUM RTD (Weeks 13-39)	
Cardiorespiratory Training Goal	PFT/CFT/BCP/MCWSTP EXEMPT	Initiate or Maintain pre-pregnancy Moderate- and Vigorous- Intensity Aerobic Training	Maintain Moderate- and Vigorous- Intensity Aerobic Training	Maintain Moderate- and Vigorous- Intensity Aerobic Training	BIRTH EVENT	Rest	Continue Moderate-intensity Aerobic Training and initiate Vigorous- Intensity Aerobic Training	Advance Moderate- and Vigorous- Intensity Aerobic	PFT/CFT/BCP/MCWSTP REQUIRED
Resistance Training Goal		Initiate or Maintain pre-pregnancy Resistance Training	Maintain Resistance Training	Maintain Resistance Training		Rest	Introduce to Foundational Phase (Hypertrophy)	Introduce to Max Strength/ Endurance Phase	
Neuromotor Training Goal		Train with Caution	Train with Caution	Not Advised		Not Advised	Introduce as component of Resistance Training	Introduce Agility Drills	
Flexibility/ Mobility Training Goal		Initiate or Maintain pre-pregnancy Flexibility/Mobility Training	Maintain Flexibility/Mobility Training	Train with Caution		Rest	Reinitiate Flexibility/Mobility Training	Maintain Flexibility/Mobility Training	
Specific Training Component Goal		Maintain individually relative pre-pregnancy PT Levels	Maintain individually relative pre-pregnancy PT Levels	Maintain individually relative pre-pregnancy PT Levels		Initiate pelvic floor strengthening (Kegel exercises)	Maintain pelvic floor strengthening (Kegel exercises)	Maintain pelvic floor strengthening (Kegel exercises)	
PT Preparation		* Wear loose-fitting clothing * Wear a supportive sports bra * Consider wearing abdominal support, especially later in pregnancy * Drink water before, during and after physical training				* Wear loose-fitting clothing * Wear a supportive sports bra * Wear abdominal support when necessary * Drink water before, during, and after physical training			
Benefits of PT		* Decreases back pain * Reduces constipation * Promotes healthy weight gain * Improves overall general fitness * Strengthens heart and blood vessels * Improves ability to lose weight post birthevent * Greater longevity * Reduces risk of gestational diabetes, preeclampsia, and cesarean delivery				* Strengthen and tone abdominal muscles * Boost stamina and metabolism (energy) * Promotes better sleep * Promotes healthy weight loss * Reduces stress * Greater longevity * May prevent post-partum depression * Decrease risk of deep vein thrombosis			
Precautions During PT		* Avoid dehydration * Avoid overheating, especially during the first trimester * Avoid standing or lying on back for extended periods * Avoid low blood-sugar				* Avoid dehydration * Avoid overheating			
Warning Signs and Symptoms to Discontinue PT		* Dizziness * Feeling faint * Shortness of breath before physical training * Chest pain * Headache * Muscle weakness affecting balance * Calf pain or swelling * Regular, painful contractions * Bleeding or fluid leaking from the vagina				* Pain * Dizziness * Feeling faint * Severe headache			
NOT ADVISED Enviromental Conditions & Activities		* Contact sports or training that increases risk of contact to the abdomen * Activities that increase risk of falls, including neuromotor training * Training conducted above 6,000 feet (unless a Marine already lives at high altitude) * Skydiving * Scuba diving * Hot, humid environments				* Swimming or submersion in water during the convalescent period			
Medical Conditions: PT NOT ADVISED		* Certain types of heart and lung disease * Cervical insufficiency or cerclage * Pregnant with twins or more with risk factors for preterm labor * Placenta previa after 26 weeks of pregnancy * Premature labor or water has broken during current pregnancy * Preeclampsia or pregnancy-induced high blood pressure * Severe anemia * Persistent second- and third- trimester bleeding				* Preeclampsia or pregnancy-induced high blood pressure requires clearance from a medical provider to resume exercise. * Cesarean birth (C-section) 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. Medical clearance is recommended.			

Note 1: Pregnant and Postpartum Marines must be cleared by a medical provider prior to participation in physical training.
Note 2: In the event a Marine experiences any of the contraindicated symptoms prior to or during physical training, it should be treated as a medical emergency and referred immediately to a medical provider.

Appendix C

Pregnancy/Post-partum PT Preparation Tool

This checklist serves as a Commander/OIC/SNCOIC resource to provide advice and guidance to a pregnant/post-partum Marine on the importance of physical fitness throughout pregnancy and post-partum periods.

- Receive Health Care Provider PT Consultation Form (Appendix A)
- Review relevant policies:
  - MCO 5000.12E W/CH 1-2 (Pending release of MCO 5000.12F) – Marine Corps Policy Concerning Parenthood and Pregnancy
  - MCO 6100.13A Ch-1 – Physical Fitness Program
  - MCO 6110.3A w/ CH1 and Admin Change – Body Composition and Military Appearance Program
- Review previous PFT/CFT performance:
  - PFT Score: _____
    - 3-mile Run/5k Row: _____
    - Crunches: _____
    - Pull-ups/Push-ups: _____
  - CFT Score: _____
    - Movement to Contact: _____
    - Ammo-can Lift: _____
    - Maneuver Under Fire: _____
  - Last Semi-annual:
    - Height: _____
    - Weight: _____
    - Taped: Yes No
    - Assigned to BCP: Yes No
- Review Marine's SMART goals for pregnancy and post-partum physical training
- Review PT precautions and contraindications (Appendix B)
- Review Pregnancy Pre-PT Participation Questionnaire (Appendix D)
- Review Post-partum Pre-PT Participation Questionnaire (Appendix E)
- Review Pregnancy/Post-partum Nutrition resources:
  - https://www.acog.org/Patients/FAQs/Nutrition-During-Pregnancy
  - https://www.eatright.org/health/pregnancy/
  - https://www.llli.org/breastfeeding-info/
- Review all existing resources and installation specifics:
  - Semper Fit personnel (Health Promotion and Fitness)
  - Athletic Trainers (ATs) where applicable
  - Installation specific pregnancy fitness classes (Baby Boot Camp, New Parent Support Program)
  - Force Fitness Instructor

Appendix D

Pregnancy Pre-PT Participation Questionnaire

Participant Questionnaire – Marine should complete this form prior to starting a PT program and review with their fitness instructor to ensure the development of an effective and safe PT program. The fitness instructor should retain this document until the Marine has returned to full duty and cleared her exemption status. All responses are provided at the discretion of the Marine.

1. Name & Rank: _____

2. Age: _____

3. Due date (mm/dd/yyyy): _____

. Work phone number: _____

. Work e-mail: _____

. Unit and work address: _____

4. Did you have a consultation with your Health Care Provider (HCP) in order to participate in physical training? Yes No

If **yes**, provide HCP consultation document.

5. Are you currently on light or limited duty for something other than pregnancy that would impact the design of a PT program? Yes No

6. If **yes**, what activities are you prohibited from conducting: *(check all that apply)*

- o Run
- o Swimming
- o Aerobics
- o Walk
- o Other: _____

- o Push-ups
- o Flexibility exercises
- o Resistance training
- o Core/Pelvic floor exercises

7. Last PFT/CFT score **prior** to pregnancy:

PFT score/class: _____
Number of crunches: _____
Number of pull-ups/push-ups: _____
Run/Row time (min:sec): _____
Date of PFT test (mm/yyyy): _____

CFT score/class: _____
MTC time (min:sec): _____
Number of ACL: _____
MANUF time (min:sec): _____
Date of CFT test (mm/yyyy): _____

8. Last Weigh-in **prior** to pregnancy:

Weight: _____ Height: _____
Taped? Yes No
Assigned to BCP? Yes No

9. Are you currently taking any prescription medication? Yes No

10. On average, how many hours are you sleeping per night? _____ hrs

11. Do you have any physical training goals?

_____

_____

Appendix E

Post-partum Pre-PT Participation Questionnaire

Participant Questionnaire- Marine should complete this form after this 6-week medical follow-up prior to starting a PT program and review with their fitness instructor, via phone or email, to ensure the development of an effective and safe PT program. The fitness instructor should retain this document until the Marine has returned to full duty and cleared her exemption status. All responses are provided at the discretion of the Marine.

1. Name & Rank: _____

2. Today's date (mm/dd/yyyy): _____

3. Delivery date (mm/dd/yyyy): _____

4. Delivery type (*circle one*): vaginal cesarean

5. Weight (in pounds) on or near your delivery date: _____

6. Were there any delivery complications? Yes No
(Example: episiotomy, abnormal position of the unborn child, premature delivery, and so forth.)

7. Have you experienced any of the following symptoms prior to or since the birth event? An affirmative answers may prohibit exercises or require modification of your physical training program. *(Circle most appropriate response for each symptom.)*

a. headaches/lightheadedness	*Pre-birth*	*Post-birth*	*Unsure*
b. nausea/vomiting	*Pre-birth*	*Post-birth*	*Unsure*
c. frequent urination	*Pre-birth*	*Post-birth*	*Unsure*
d. swelling	*Pre-birth*	*Post-birth*	*Unsure*
e. problems sleeping	*Pre-birth*	*Post-birth*	*Unsure*
f. leg cramps	*Pre-birth*	*Post-birth*	*Unsure*
g. fatigue	*Pre-birth*	*Post-birth*	*Unsure*
h. shortness of breath	*Pre-birth*	*Post-birth*	*Unsure*
i. heartburn	*Pre-birth*	*Post-birth*	*Unsure*
j. constipation	*Pre-birth*	*Post-birth*	*Unsure*

8. How often did you participate in PT prior to the birth event? (*circle one*)

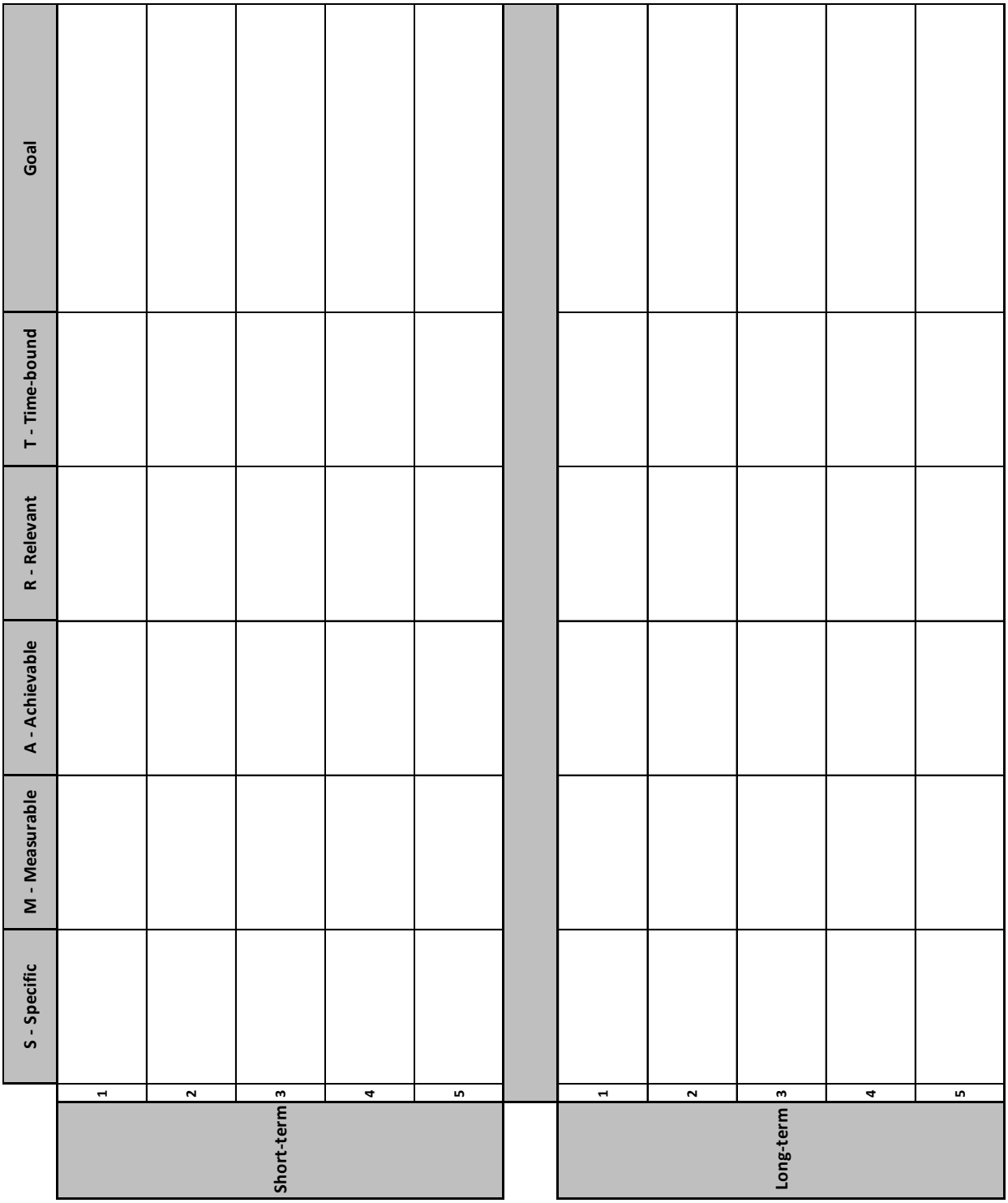
a) 1-3 times/week
b) 3-5 times/week
c) 5-7 times/week

9. 6 week Post-partum weight: _____

10. Are you currently on light or limited duty that prohibits you from engaging in any physical training? Yes N

Appendix F

SMART Goal Worksheet



Appendix G

Effects of Exercise on Pregnancy/Post-partum Effect on Maternal Performance	Article
Women are encouraged to exercise most days of the week during a normal pregnancy and soon after delivery. Women can perform cardiovascular, muscular strength and endurance, and flexibility activities.	Pivarnik, J.M., Mudd, L. Oh Baby! Exercise during pregnancy and the post-partum period. *American College of Sports Medicine Health and Fitness Journal* 2009; Vol. 13/ No. 3: 8-12.
Women who continue weight-bearing exercise during pregnancy maintain their long-term fitness and have a low cardiovascular risk profile in the perimenopausal period.	Clapp, J.F. Long-term outcome after exercising throughout pregnancy: fitness and cardiovascular risk. *Am J ObstetGynecol* 2008:199/5:489.1-489.6
Studies focused on the safety of physical activity during pregnancy have shown few negative effects, but rather, to be beneficial to the maternal-fetal unit. Begun to consider the role of maternal physical activity on chronic disease risk.	Pivarnik, J.M., Chambliss, H.O., Clapp, J.F., Impact of physical activity during pregnancy and post-partum on chronic disease risk. *Med Sci Sports Exerc*. 2006: 38:989-1006.
Exercise during pregnancy continues to demonstrate marked benefits for mother and fetus. The type, intensity, frequency, and duration of the exercise seem to be important determinants of its beneficial effects. Maternal benefits include improved cardiovascular function, limited weight gain and fat retention, improved attitude and mental state, easier and less complicated labor, quick recovery, and improved fitness. Fetal benefits include decreased growth of the fat organ, improved stress tolerance, and advanced neurobehavioral maturation	Clapp, J.F. Exercise during pregnancy. A clinical update. *Clinical Sports Med*. 2000 Apr;19(2):273-86
Post-partum women who were active before and after pregnancy retained less weight; Remained socially active; More able to adapt to challenges of motherhood	Sampselle C.M., Seng J., Yeo S., Killion C., Oakley D. Physical activity and post-partum well-being. *J OBGyn Neonatal Nurs* 1999; 28: 41- 49.
Improved VO2max (or maximal oxygen uptake) at 6 months post-partum Recovered more rapidly from birth process Fewer physical complaints during pregnancy	Clapp J.F. The effect of continuing regular endurance exercise on the physiologic adaptations to pregnancy and pregnancy outcome. (Third IOC World Congress on Sports Sciences) *Am J Sport Med* 1996; 24: S28 – 30.
Fewer discomforts during pregnancy Promotes well-being	Horns P.N., Ratcliffe L.P., Leggett J.C., Swanson M.S. Pregnancy outcomes among active and sedentary primiparous women. *J Obstet Gynecol Neonat Nurs* 1996; 25: 49-54. & Wallace A.M., Boyer D.B., Dan A., Holm K. Aerobic exercise, maternal self-esteem, and physical discomforts during pregnancy. *J of Nurse-Midwifery* 1986; 32:277-90.
Significant improvement in aerobic fitness	Marquez-Sterling S., Perry A.C., Kaplan T.A., Halberstein R.A., Signorile J.F. Physical and psychological changes with vigorous exercise in sedentary primigravidae. *Med Sci Sport Exerc* 2000; 32: 58-62.

VIII. Glossary

Anemia: abnormally low levels of blood or red blood cells in the bloodstream. Typically associated with an iron deficiency.

Breath Volume: the amount of air inhaled with each breath.

Cardiac Reserve: the difference between the rate at which a heart pumps blood at a particular time and its maximum capacity for pumping blood.

Cerclage: a procedure in which the cervical opening is closed with stitches in order to prevent or delay preterm birth.

Cervical Insufficiency: inability of the cervix to retain a pregnancy in the second trimester.

Cesarean Delivery/Birth: delivery of a baby through surgical incisions in the abdomen and uterus.

Complication(s): diseases or conditions that occur as a result of another disease or condition.

Contraindication(s): a symptom or medical condition that makes a particular activity, treatment, or procedure inadvisable.

Deep Vein Thrombosis: a condition in which a blood clot forms in the leg or other area of the body.

Delayed Onset Muscle Soreness (DOMS): the pain and stiffness felt in muscles several hours to days after exercise. Typically peaks around 24-48 hours after training and makes exercise difficult.

Fetal Requirement: substances and functions provided by the mother for the unborn child that are necessary to sustain life.

Gestational Diabetes Mellitus (GDM): diabetes that arises during pregnancy.

Health Care Provider (HCP): an appropriately credentialed medical officer, nurse practitioner, independent duty corpsman, physician assistant, or certified nurse midwife.

Hyperemesis: excessive vomiting.

Hyperemesis Gravidarum: a severe type of nausea and vomiting during pregnancy. May cause impact on energy levels and hydration status.

Kegel Exercises: pelvic floor muscle exercises intended to help prevent or control urinary incontinence and other pelvic floor issues.

Mental Illness: a behavioral or mental pattern that causes significant distress or impairment of one's ability to function. Also called a mental disorder or psychiatric disorder.

Peripartum Depression: depression occurring during the pregnancy and/or post-partum periods.

Peripartum Period: the state or period including the pregnancy and post-partum periods.

Placenta Previa: a condition in which the placenta lies very low in the uterus, so that the opening of the uterus is partially or completely covered.

Post-partum Period: the state or period immediately following the birth event as the mother's body returns to a non-pregnant state.

Preeclampsia: a disorder that may occur during pregnancy or after the birth event in which the mother has high blood pressure and other signs of organ injury, such as abnormal amount of protein in the urine, low number of platelets, abnormal kidney or liver function, pain over the upper abdomen, fluid in the lungs, or severe headache or vision changes.

Pregnancy: the state or period of carrying a developing embryo, fetus, or unborn child within the female body. In humans, this is defined by the ~40 weeks from conception to the birth event.

Preterm: birth event prior to 37 completed weeks of pregnancy.

Proprioception: the awareness of the body or part of the body in space.

Respiratory Rate: the rate at which breathing occurs. Typically measured in breaths per minutes

Sedentary: a way of life characterized by much sitting and little physical exercise.

Sleep: a condition of the body and mind in which the nervous system and postural muscles are relaxed and inactive, eyes are closed, and recurs for several consecutive hours daily.

Sleep Hygiene: the behavioral habit and practices that are conducive to sleeping well on a regular basis.

Temperature Regulation: a function of the body to sustain a relatively constant core body temperature

Unborn child: a fetus more than 8 weeks after conception.

Uterus: a muscular organ located in the female pelvis that contains and nourishes the developing unborn child during pregnancy.

IX. References

1. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. 10th ed. Philadelphia (PA): Wolters Kluwer/Lippincott Williams & Wilkins; 2018.
2. American College of Obstetricians and Gynecologists. Committee Opinion. Physical Activity and Exercise During Pregnancy and the Post-partum Period. December 2015, Number 650. Available at: http://www.acog.org/ Resources- And- Publications/ Committee- Opinions/ Committee- on- Obstetric- Practice/ Physical- Activity- and -Exercise. (Accessed 6 May 2019).
3. American College of Obstetricians and Gynecologists. Frequently Asked Questions. Exercise After Pregnancy. October 2018, FAQ 131. Available at: https://www.acog.org/Patients/FAQs/Exercise-After-Pregnancy. (Accessed 6 May 2019)
4. American College of Obstetricians and Gynecologists. Frequently Asked Questions. Exercise During Pregnancy. October 2017, FAQ 131. Available at: https://www.acog.org/Patients/FAQs/ Exercise-During-Pregnancy. (Accessed 6 May 2019)
5. Andrews-Fike C. A review of post-partum depression. Primary Care Companion J Clin Psychiatry. 1999;1(1):9.
6. Department of Health and Human Services. 2018 Physical Activity Guidelines for Americans, 2nd edition. Washington, DC: DHHS; 2018. Available at: http://health.gov/paguidelines. (Accessed 15 April 2019)
7. Hirshkowitz M, Whiton K, Albert SM, Alessi C, Bruni O, et al. The National Sleep Foundation's sleep time duration recommendations: methodology and results summary. *Sleep Health*. 2015; 1(1):40–43.
8. MacDonald, L.A., Waters, T.R., Napolitano, P.G., Goddard, D.E., Ryan, M.A., et al. Clinical guidelines for occupational lifting in pregnancy: evidence summary and provisional recommendations. *Am J Obstet Gynecol*. 2013; 209(2):80-88.
9. Paruthi S, Brooks LJ, D'Ambrosio C, Hall WA, Kotagal S, Lloyd RM, et al. Recommended amount of sleep for pediatric populations: a consensus statement of the American Academy of Sleep Medicine. *J Clin Sleep Med.* 2016; 12(6):785–786.
10. Watson NF, Badr MS, Belenky G, et al. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. *Sleep*. 2015; 38(6):843–844.
11. World Health Organization. Global recommendations on physical activity for health. Geneva: WHO; 2010. Available at: http://www.who.int/dietphysicalactivity/publications/9789241599979/en. (Accessed 08 May 2019)