Sleep, Activity, and Nutrition

THE CANADIAN ARMY PERFORMANCE TRIAD GUIDE
Contents

Module 1  Sleep overview
Module 2  Activity overview
Module 3  Nutrition overview
Module 4  Technology overview
Module 5  Warrior Challenges
MODULE 1 - SLEEP
Introduction

Sleep is vital for health, performance, and well-being. It sustains the brain’s capabilities for success on and off the battlefield. With quality sleep, Soldiers are able to excel mentally and physically.

Sleep is a biological need for brain function. Soldiers require at least 7–9 hours of quality sleep every 24-hours to maintain their mental edge. When Soldiers do not get enough sleep, their mental acuity suffers—putting themselves and fellow Soldiers at risk for making errors that lead to accidents and mishaps. Insufficient sleep is a safety risk and a threat to mission success.

Why is Sleep Important?

Getting enough quality sleep helps to maintain your physical and psychological health, quality of life, and safety. Sleep is the only time when the brain can recover from the wear and tear of daily life—the brain cannot recover during wakefulness, even if you are resting.

Your brain needs sleep to restore and repair, grow new brain connections to work efficiently, form memories and process new information. So prioritize sleep when planning training or when learning a new skill or task. Sleeping well before learning will help with attention and understanding; sleeping well after learning, will improve your ability to both remember and use the newly-acquired skills and information.

The amount of sleep that a healthy individual needs is largely determined by two factors: genetics and age. Genetics plays a role in both the amount of sleep a person needs, as well as his or her preference for waking up early (these are the so-called "larks," or morning-type individuals) or staying up late (these are the "owls," or evening-type people). Our internal biological clock, which regulates the cycling of many functions including the sleep/wake cycle, can vary slightly from individual to individual. Although our internal clock is set to approximately 24 hours, if your clock runs faster than 24 hours, you tend to be a "lark" and wake up early; if your clock runs more slowly, you tend to be an "owl" and go to bed later. Most adults need 7–9 hours of sleep every 24 hours. Very few people can perform optimally on less than 7–8 hours.

Soldiers overestimate their own proficiency with insufficient sleep. This is, in part, because insufficient sleep impairs the brain’s fundamental ability to function efficiently—a physiological change that cannot be overcome by motivation, initiative, willpower or caffeine.
Sleep, It Does the Body Good
To obtain quality sleep for optimized performance there are some tried and true practices that can get you to dreamland. The first thing to do is establish and maintain a bedtime routine.

A routine is a predictable sequence of events. What is important is that bedtime activities follow each other in a regular and predictable pattern. The purpose of the routine is to optimize your sleep so you can be productive, mentally sharp, emotionally balanced, and full of energy all day. Tweak the timing of activities so that it works for you.

Sleep improves:
- Concentration
- Attention
- Health
- Mood
- Judgment
- Creativity
- Productivity

You are sleep deprived if you fall asleep:
- Immediately upon going to bed
- During routine low stimulus activity such as driving
- You need an alarm

How do I get good sleep?
- Select a bedtime
- Keep the same bed/wake time
- Maintain a comfortable, cool, quiet, dark & safe sleep area
- Practice wind down activities prior to sleeping
Twelve Effective Sleep Habits

If you want quality sleep you can count on night after night, well-planned strategies are essential. Discover and develop your personal tactics for a good night’s sleep. Stick with this routine and it will become a habit. Remember, a predictable approach will result in an easy transition to sleep. Also, learn to avoid common sleep thieves and try a variety of healthy sleep-promoting techniques.

- Create a quiet, dark, comfortable sleeping environment. Cover windows with darkening drapes or shades, or wear a sleep mask to block light. Minimize disturbance from environmental noises with foam earplugs or use a room fan to muffle noise. If you can, adjust the room temperature to suit you. If you cannot, use extra blankets to stay warm. Use a room fan both to muffle noise and keep you cool.

- Use the bedroom only for sleep and intimacy. Remove the TV, computer, laptop, and other electronic distractions from your bedroom. Do not eat or drink in bed. Keep discussions or arguments out of the bedroom.

- Caffeine stays in the body for 4–6 hours. Caffeine promotes wakefulness and disrupts sleep. Do not consume caffeine at least 6 hours prior to bedtime.

- Do not drink alcohol before bed. Alcohol initially makes you feel sleepy, but disrupts and lightens your sleep several hours later. In short, alcohol reduces the recuperative value of sleep. Nicotine, and withdrawal from nicotine in the middle of the night, also disrupts sleep. If you need help quitting drinking or using nicotine products, see your healthcare provider for options.

- Physical activity results in a cognitive boost that lasts up to 3 hours afterwards. Finish PT at least 3 hours before lights out.

- Avoid heavy meals within 2 hours of bedtime, but also do not go to bed hungry. A light bedtime snack (eg, milk and crackers) can be helpful, but do not eat a large meal close to bedtime. Empty your bladder just before you go to bed so that the urge to urinate does not disrupt your sleep.

- Maintain a consistent, regular routine. Start by setting a fixed time to wake up, get out of bed, and get exposure to light each day. Pick a time that you can maintain during the week and on weekends, then adjust your bedtime to target 7–8 hours of sleep.
Twelve Effective Sleep Habits - continued

- Get out of bed if you cannot sleep. Only go to bed (and stay in bed) when you feel sleepy. Do not try to force yourself to fall asleep; it will tend to make you more awake, making the problem worse. If you wake in the middle of the night, give yourself about 20 minutes to return to sleep. If you do not return to sleep within 20 minutes, get out of bed and do something relaxing. Do not return to bed until you feel sleepy.

- Read or listen to relaxing music instead of watching TV, computer or other electronics. Turn off, cover up, or better yet, remove electronics that will disrupt or interfere with your sleep.

- Use soft foam ear plugs or a fan to block sounds. Use a sleep mask or blackout curtains to block light.

- Nap wisely. Napping can be a good way to make up for poor or reduced nighttime sleep, but too much napping can cause problems falling asleep or staying asleep at night. If you need to nap for safety reasons such as driving, try to do so in the late morning or early afternoon, perhaps right after lunch, to take the edge off your sleepiness.

- Move the clock from your bedside. If you tend to check the clock two or more times during the night, and if you worry that you are not getting enough sleep, cover the clock face or turn it around so that you cannot see it (or remove the clock from the bedroom entirely).
**Bed Time**
When setting a bedtime, backwards plan to set the appropriate number of hours of sleep you need. This ensures your ability to have adequate time to wind down, bathe, brush your teeth, and prepare for the next day.

**Sleep Area**
Having a comfortable sleep area is essential for quality sleep. Comfortable means different things to different people. Take a look at your sleep area, is it soothing, relaxing, and comfortable? For some, comfort is a freshly made bed with soft sheets. For others it is a mattress and pillow that supports their sleep positions.

Whatever your interpretation, ensure your sleep area is sleep friendly for you. Your sleep area should be dark, cool, and quiet. Use room darkening curtains or blinds to block out distracting light. Have soft ear plugs or soothing white noise to assist with sleeping.

A safe sleep area will depend on where your mission takes you. In most garrisons in the western hemisphere, your accommodations are generally considered to be in a safe area. In a deployed setting, safe is a relative term. It will depend on your location, current operations, and operational environment. In such situations, getting as much sleep whenever you can will be important. Despite the danger, it is still important that you sleep in relative safety, taking appropriate force and individual protection measures.

In an operational or training environment, put safety first. Sleep away from vehicular traffic and do not sleep in front of or behind trucks, tracked vehicles, etc. Avoid and protect against environmental hazards and pests. Take care to ensure snakes, spiders etc., are not in your sleeping area, bag, or shoes.
Things to Consider in Your Sleep Area
Take the time to look at your room and determine if it is sleep friendly. Depending on where you live, there will be varying ability to make some changes to enhance sleep friendliness. Focus on what you can change and do it. Some areas to address when looking at sleep friendliness:

- **Light**: Make your room dark. Block unwanted light with curtains or blinds.
- **Sound**: Is there noise that is disrupting your sleep or is there sufficient disturbance that you need white noise to block unwanted sounds?
- **Touch**: Room temperature should be around 20°C. Think about your sheets, your bed, pillows, and pajamas. All should feel comfortable for you and your sleep positions.
- **Smell**: Offensive or soothing smell? Does the bedding smell fresh? Surveys show that you can get more comfortable night’s sleep on sheets with a fresh scent.

Your Bed
Getting good quality sleep may be less about your bed and more about your mattress. Research shows that people sleep better, suffer less back pain and experience fewer symptoms of stress when sleeping on newer beds. You may need a new mattress if:

- Your mattress is five to seven years old
- You wake up with stiffness, numbness, aches and pains
- You had a better night’s sleep somewhere other than your own bed (such as a hotel or friend’s guest room)
- Your mattress shows signs of overuse (it sags, has lumps, etc.)
Winding Down
Give yourself 30–60 minutes every night to transition to sleep. The process of winding down for the night may include a warm bath or shower, listening to relaxing music, or reading books. Other relaxing activities may include journaling, breathing exercises, meditation, or connecting with your partner. During this period, your routine should not include watching television, playing video games, getting online for endless hours, or using other electronics.

Lights Out
The last and most important part of the bedtime routine—turn out the lights and go to bed! Most people fall asleep within 15 minutes of going to bed. Adhering to a consistent bed and wake time is an equally important part of your bedtime routine. On the weekends it may be tempting to sleep in, however, this will disrupt your circadian rhythm, resulting in social jet lag. Social jet lag occurs when you stay up late on Friday and Saturday night and sleep in on Saturday and Sunday. This puts you body in a state similar to being in a different time zone or jet lag. It will make it even more difficult to get up on Monday morning and adjust to a regular weekday schedule.

When you get the right amount of sleep you are able to wake up without an alarm clock. Some people experience challenges getting to sleep or staying asleep. If this is you, review the sleep habits section below for additional suggestions on how to get the best possible sleep.

Winding Down Suggestions
- Take a warm bath or shower.
- Do some easy stretches.
- Wind down with a favorite hobby (knitting, drawing, puzzles).
- Listen to audio books or soft music.
- Read a book or magazine by a soft light (not electronic version).
- Make simple preparations for the next day.
- Lay out clothes for the next morning.
- Plan and prep for breakfast.
- Set the coffee maker timer to brew.
- Walk through the house and turn off all the lights one by one.
- Brush/pet your dog or cat; watch your fish swim.
Bedtime Routine
Establishing a bedtime routine helps you get quality sleep. Quality sleep supports your ability to be disciplined and to think clearly in order to meet all of your responsibilities as a Soldier, family member, and friend.

Adjust this recommended schedule according to your individual needs. Your schedule will depend on your unit, mission, operational environment, and the length of time required for your commute to work.

Example of a Bedtime Routine
Backward Planning Example

Morning:
- What time do you need to be at work? 6:00 AM
- When do you leave your home/room? 5:40 AM
- Time to get out of bed and get ready to leave? 5:15 AM
- Alarm goes off 5:00 AM

Evening:
- No Caffeine after 3:00 PM
- No Gym after (NLT 3 hours before bed) 6-7:00 PM
- Have dinner no later than 6-7:00 PM
- Stop TV/Emails/Facebook 7-8:00 PM
- Wind down (30–60 min) 8-9:30 PM
- Bed time (NLT for 7–8 hours of sleep) 9-10:00 PM

Things to consider when planning:
- Commute time.
- Personal hygiene, breakfast.
- How long does it take to PT or work out?
- Do you need a few minutes to become alert?
- Household chores.
- Putting children to bed.
- Taking the dog out for a walk.
- Time for yourself and/or partner.
- Prayers, meditation, relaxation etc.
Consequences of Sleep Deficiency
Common short term consequences of sleep deficiency include: decreased physical and mental performance, impaired memory, impaired concentration, decreased reaction time, poor decision-making, decreased testosterone production, and diminished emotional control. Over the long term, insufficient sleep has been linked to increased risk for developing several medical conditions such as obesity, diabetes, hypertension, and cardiovascular disease.

Insufficient sleep also impairs one’s ability to self-monitor. This means a person who is sleep-deprived tends to overestimate their ability to function. This is the same for Soldiers and leaders. Their own proficiency is overestimated under sleep-deprived conditions. This is because the ability to self-monitor also relies on sufficient sleep. These physiologic deficits cannot be overcome by motivation, initiative, or willpower—and can only be TEMPORARILY overcome by caffeine.

Performance and Safety
The so-called “adrenaline rush” during combat or training does not offset insufficient sleep. A sleep deprived Soldier might shoot a “friendly,” enter the wrong coordinates, or give the wrong dose of medicine. In general, sleep-deprived Soldiers have a higher potential to make wrong tactical decisions and this could mean the difference of life or death.

Soldiers who routinely get less than 7 hours of sleep perform much like a person who is legally drunk. They lose their situational awareness, lose the ability to exercise good judgment and increase risky behaviors. They also are at risk of uncontrolled and unintentional sleeping. Micro-sleep can occur during critical events such as driving, speaking and even walking. Put simply, accidents increase when the total amount of sleep you get each night decreases overtime.

Common combat tasks compromised by insufficient sleep include (but are not limited to):

- Requesting indirect fire
- Detecting and appropriately determining threat level
- Coordinating squad tactics
- Combat activity such as firing from bounding vehicle and observing the terrain for enemy presence
Drowsy Driving
Fatigue-related crashes are the leading cause of “fatal to the driver” truck crashes. Approximately 25% of motor vehicle accidents are related to drowsy driving.

The total number of the sleep-deprived crashes are equal to the number of drug and alcohol related crashes put together. This means drowsiness is the principal cause in at least 100,000 police reported traffic crashes each year.

In one survey, adults who reported unintentionally falling asleep during the day, were more likely to fall asleep when driving, snore, and slept less than, or equal to 6 hours per 24 hour period. The most common drowsy drivers are men, young drivers, binge drinkers, and people who rarely or never wear seatbelts. Adults between 18–24 years old are more likely to drive drowsy than any other age group and therefore are at high risk for being killed in drowsy driving-related accidents.

How Much Sleep Do I Need?
To determine how much sleep your body needs, certain conditions must exist to get the best picture possible. First, pick a time when there are no restrictions such as during a vacation or during an extended period of time off from work. Do the following to understand how much sleep you really need:
- Sleep until you feel rested and restored
- Repeat this until you can wake up without an alarm
- Once you know how many hours you need, begin to establish a sleep routine with the same sleep and wake times.
- Ensure you practice good sleep habits.

Sleep Debt and Performance
The demanding nature of military operations often creates situations in which obtaining enough sleep on a regular basis is difficult or impossible. Such chronic, insufficient sleep (anything less than 7–8 hours per 24 hours) produces a sleep debt—a chronic state of sleep need characterized by impaired performance and readiness. The rate at which the sleep debt (and performance deficits) grows depends upon how much nightly sleep is restricted and how much sleep an individual needs. The only way to eliminate the debt is to get sleep.
Sleep Debt
A sleep debt occurs when you get less sleep than you need. You can recover recent sleep loss by going to bed a little earlier each night. It is impossible to train your brain to function better with less sleep. There are no shortcuts for sleep. Your brain only work as well as the amount of sleep you feed it; the more sleep you get, the more mentally sharp you are. You cannot recover sleep lost as a result of chronic sleep deficiency in only one or two nights. The best recommendation for someone in this situation is to get as much sleep possible until the sleep need becomes stable. You will know this when you start thinking better, acting better and having more energy.

This figure shows the relationship between hours of sleep per night and performance. You can use this chart to gauge the impact of nightly sleep duration on performance. As shown, anything less than 7–8 hours of good-quality sleep per 24 hours negatively impacts performance—impairment increases as nightly sleep duration decreases.

With 7–8 hours of sleep per 24 hours, Soldiers sustain optimal performance for the entire waking day (Green zone).

When Soldiers get less than 7–8 hours sleep, performance degrades over time. Getting 4–6 hours of sleep every 24 hours will keep Soldiers in the Amber zone for several days, then they fall into the Red zone. Getting less than 4 hours of sleep guarantees that Soldiers immediately fall into the Amber Zone and quickly progress into the Red Zone.

Less than 5% of Soldiers can sustain performance on less than 7–8 hours sleep per 24 hours. Leaders must understand the impact inadequate sleep has on Soldier performance.
Signs of Inadequate Sleep
The best way to evaluate a Soldier’s status is to observe his or her behavior. Indications of inadequate sleep include:

- Struggling to stay awake during briefings, classes, etc.
- Difficulty understanding or tracking information.
- Lapses in attention.
- Decreased initiative or motivation.
- Irritability.

Or, ask the obvious question: “How much sleep have you had over the last 24 hours?” Leaders should also ask themselves this question.

Countermeasures for Sleep Deprivation
Soldiers who routinely get 5–6 hours of sleep perform much like a person with a blood alcohol content of 0.08. After just one week of sleeping five hours or less each night, a man’s testosterone levels drop as if he’s aged about 11 years. Testosterone fuels muscle and impacts decision-making abilities. Lapses in focus from sleep deprivation can result in accidents or injury. Alterations in mood affect our ability to acquire new information and subsequently to remember that information. Given the Army’s 24/7 operations, particularly during sustained or continuous operations, what is a leader or Soldier to do?

To achieve maximum sleep in a continuous operating environment there are several strategies that can be used to counter the effects of sleep deprivation.

Sleep Banking
Up to 2 weeks prior to operations or the start of mission, Soldiers can pay down their sleep debt AND bank sleep by getting 8 or more hours of sleep. This will help to start the mission with a full bank.
Naps
Naps should be used when you are not able to get 7–8 hours of sleep per 24 hours. Typically these are situations with extended wakefulness or where sleep is restricted.

➢ Research has shown that banking sleep slows the decline in performance and speeds sleep recovery.
➢ Use naps to achieve your 7–8 hours of sleep every 24 hours.
➢ A nap will improve alertness and performance. It also reduces mistakes and accidents.
➢ Sleep inertia (grogginess upon awakening) is almost NEVER a problem for most people and is NOT a good reason to avoid napping.
➢ If immediate responsiveness is required upon awakening, caffeine gum can be used immediately upon awakening to more rapidly restore performance.
➢ Only use naps to achieve 7–8 hours of sleep every 24 hours, otherwise it may disrupt your nightly sleep.
➢ In sustained or continuous operations, GET AS MUCH SLEEP AS POSSIBLE in as large chunks of time as operations or mission allows.
➢ Teens and adults may use naps to counter those times when sleep debt was incurred and to ensure maximum alertness.

Bottom line: Do not create schedules or situations in which Soldiers are forced to choose between adequate sleep and other off-duty activities (personal hygiene, calling home, etc.) They will always sacrifice sleep in these situations.
Caffeine
Caffeine is found to have positive effects on alertness, observation, and physical performance.

- Caffeine is the most widely used stimulant in the world and it has a proven track record. After taking in caffeine, it peaks in the blood after 1 hour, although if gum is used, caffeine peak time can be shortened.
- Caffeine is found in a wide variety of food items, so it is important to monitor caffeine intake to maximize your ability to sleep.
- Caffeine does NOT replace sleep. Only sleep can replace sleep.
- A caffeine dose of 200 mg is shown to be effective and is often utilized to sustain performance in the context of sleep deprivation, sedation, and sleep restriction.

It is highly recommended to not have caffeine 6 hours before bed time. “Sleep is ammo for the brain” and it is important to maximize the quality and quantity of sleep that can be obtained. It is equally important to understand that the effects of caffeine are reduced if it is over used.

Using caffeine to cover up sleep deprivation can create an unwelcomed cycle. For example, you may drink caffeinated beverages because you have trouble staying awake during the day, but the caffeine actually could disrupt your sleep (and create more sleep debt). Check to see if any foods or beverages you consume contain caffeine—many products that contain caffeine do not list exactly how much caffeine they contain.

If you notice any of the following, you may need to lower your daily caffeine intake.

- Problems falling asleep or staying asleep
- Nervousness
- Restlessness
- Irritability
- Stomach upset
- Fast heartbeat
- Muscle tremors
- Jitteriness

Managing Sleep Countermeasures
Countermeasures such as energy drinks, soda, supplements, and coffee can only provide so much stimulation and should be used in moderation. Over use or misuse of these countermeasures will ultimately have a negative impact on your performance and your sleep.
Strategies for Daytime Sleep for Shift Workers

Leaders and Soldiers who must sleep during the day need to allow more time in bed (e.g. 9–10 hours) to obtain 7–8 hours of sleep. This extra time is needed to compensate for sleep disruptions due to the brain’s biological clock.

Daytime sleep can be divided into 2 periods: one in the early morning shortly after coming off duty, and a second period in the afternoon during the mid-afternoon lull in alertness.

Sleep Recovery After Sustained Operations

Following any period of insufficient sleep, leaders and Soldiers need extra sleep to fully reset and pay down their sleep debt. Although exact amounts of sleep required to fully recover are unknown, we do know that the longer a Soldier goes or has gone without adequate sleep, the more nights will be needed to fully recover. We also know that recovery from sleep loss over a short period of time is faster than recovery from chronic insufficient sleep.

The following can serve as general rules:

- Most Soldiers will recover if allowed 1–2 nights of as much sleep as needed for recovery sleep.
- Chronic, inadequate sleep (4–5 hours) of sleep across 3–6 nights – Most Soldiers will fully recover following 3–4 nights of getting as much sleep as needed for recovery sleep.
Still NOT Sleeping Well?
Prioritize sleep need by task:
For most people, changing their sleep habits and adjusting their sleep environment will usually result in improved sleep to the point of developing healthy sleep habits. Sometimes there are environmental issues or even command needs that make it difficult to get good quality sleep. Besides working with your chain of command or those responsible for the area in which you live, what else can you do?

There are two ways you can help yourself improve your sleep. The first is within your control by making sleep a priority. The second is asking for help from your primary care doctor or possibly a sleep or behavioral health specialist.

In Your Control
There are several things within your control that can be done to help you get good quality sleep. However, there are “sleep thieves” as identified below:

Sleep Thieves
Despite good sleep habits, some people still find it hard to fall asleep.
- Thinking about things to be done tomorrow.
- Thinking about things that happened during the day.
- Emotionally upsetting conversations right before bed.
- Watching the clock.
- Wandering or busy minds.
Cognitive Techniques
Sleep and thinking are both behaviors, but doing them at the same time makes it difficult to do either well. Many Soldiers report they have tried but just can’t shut down their brains to fall asleep. They often replay the day’s events, identify things they have to do tomorrow, and worry about the “what ifs.” The inability to fall asleep and stay asleep often has an underlying component of stress, anxiety, or worry.

Practicing any of these recommended techniques can help any of us to enhance our relaxation response. These techniques can bring the same level of relaxation to the body that one experiences when asleep but with the twist of being fully alert. Almost all of the techniques have other benefits beyond relaxation and can make us more aware of our thoughts and feelings in a different way. In some cases, these techniques can enhance our performance through the regular practice of focusing our mind.

Fight or Flight
Most Soldiers have a highly developed survival response called the “fight or flight” response. It is the thing that helps to keep us alive in the face of danger. Everyone has experienced this response through a dangerous or unexpected experience. Our heart races, our breathing increases, and our blood pressure goes up along with other bodily changes. All of this supports our ability to survive in these situations.

Recovering from a “fight or flight” response is equally important, but is often overlooked. The relaxation response helps us to settle down and return our body to normal operations. Essentially, it helps us to gear down.
Go Ahead...Relax...

Just like exercising our muscles, we can exercise our relaxation response. Practicing any of these techniques, even just three times a week, can improve your body's relaxation response.

Try these out to help settle your mind:

- Journaling or writing things down
- Deep breathing exercises
- Relaxation exercises such as progressive muscle relaxation
- Visualization or guided imagery exercises
- Meditation
- Mental focusing exercises

Journaling or Writing Things Down

Writing things down or journaling helps people to sort out their thinking and feelings by recording the information in writing. Some very disciplined Soldiers journal every night before going to sleep. For others, just the act of writing down their thoughts or tasks allows them to gear down and go to sleep. So, write it all down:

- in a journal or on a tablet
- on a piece of paper or pad—put it aside for tomorrow or another time
Deep Breathing Exercises
Breathing is the essence of being and practicing rhythmic breathing exercises helps to regulate a lot of our bodily functions such as blood pressure, heart rate, and blood circulation among others. Consciously slowing our breathing down stimulates the relaxation response; it results in less tension and provides an overall sense of well being. There are many types of breathing exercises, so use the one that works for you. Tactical Breathing is one form of deep breathing.

Tactical Breathing
Tactical Breathing is also called abdominal breathing. We are born using this form of breathing naturally. If you have an opportunity, watch a baby breathe: with each breath, its entire belly rises and then returns to its initial position as the baby exhales. As adults, however, we get into the habit of shallow breathing, so that air never reaches the diaphragm. Shallow breathing can increase tension and anxiety. That is why, in stressful situations, it is important to know and practise abdominal breathing.

The diaphragm is like a movable partition separating the lungs from the liver, stomach, kidneys, genitals, etc. Its pressure on all of those organs stimulates them and ensures that they function properly. Therefore, abdominal breathing enables you to slow down the “acceleration” caused by intense stress when you have “your pedal to the metal,” which will probably happen during the mission.

With practice, abdominal breathing will get easier and eventually become your normal breathing pattern, so that you will only need to do abdominal breathing two or three times in a stressful situation in order to feel its calming effect. This offers several advantages:

- In intensely stressful situations, this breathing pattern will have an immediate effect, without depriving you of your vigilance.
- You will have a heightened, more accurate perception of your body
- You ability to relax your body will increase
- You will discover an increased capacity to deal with stress

Whenever you feel stressed, use abdominal breathing to calm yourself. Relaxing the body can help relax your mind. You can also use abdominal breathing during exercise or other intensive activities.
Tactical Breathing Instructions
To learn this type of breathing, you should start by locating your diaphragm and feeling it working inside you. We suggest that you lie down on the floor or on a firm but comfortable bed, or sit comfortably with your back straight. If you lie down on the floor, place a cushion or pillow under your neck and knees so that your back is resting comfortably.

Place one hand on your abdomen just beneath your rib cage. Inhale slowly through your nose and feel your diaphragm move under your hand. During inhalation, your diaphragm falls and your stomach inflates.

Exhale slowly while pulling your abdominal muscles toward your backbone (not your chest). During exhalation, your diaphragm rises and your abdomen deflates.

Place your other hand on your chest, just below your collarbone, while keeping the first hand on your stomach. Inhale slowly through your nose, allowing your abdomen to inflate, then exhale slowly, again pulling your abdominal muscles toward your backbone. When this exercise is performed properly, the hand on your diaphragm should feel the more pronounced movement, i.e., the hand placed on your chest should feel almost no movement, demonstrating that you have switched from chest breathing to abdominal breathing.

1. Breathe in through your nose to the count of 4.
2. Hold your breath to the count of 4.
3. Breathe out through your lips to the count of 4.
4. Hold your breath to the count of 4.

The cadence that works best for you is unique. There are many on-line videos available to demonstrate the technique and various breathing count options.
Meditation
Meditation is an ancient practice and it is found in both eastern and western religions and cultures. It is considered the cornerstone of spiritual development but you do not have to be religious to meditate. Most religions use prayer as the medium in which meditation is often used. There are different forms of meditation, but the essential element is being fully aware and paying attention. The process of meditation is to calm the mind by paying attention to the thoughts or images in our head.

Mental Focusing Exercises
Mental focusing exercises aid relaxation. These exercises help us focus and become aware of ourselves, our thoughts, and even our feelings. Use this exercise to quiet your mind. It is deceptively simple as the mind is busy and full of a variety of thoughts that are often outside of our awareness. As you begin your focusing exercise, your mind will drift from what you want to focus on. This is common—Don’t get upset! Just notice that your mind wandered and returned to your chosen focus.

Follow this guide to begin practicing mental focusing exercises. Identify what you would like to focus on. This can be the letters of the alphabet, a range of numbers, a poem, or a prayer. Say you choose the alphabet, focus on making the letters (all caps or lower case) in the same design.

1. Bring your focus to the letter you are creating, complete each one in a slow and deliberate manner.
2. Notice that your mind has wandered off.
3. Disengage from that train of thought.
4. Bring your focus back to the letters and continue.

When you notice you are in a relaxed state, you can stop and go to sleep. Other suggestions continued:

- Letters: Use all caps or all lower case letters. Draw the letters in your mind in the same style from A–Z. Repeat until you achieve your goal.
- Numbers: Pick a range of numbers, i.e. 20–40) Draw the numbers in your mind in the same style. Repeat until you achieve your goal
- Poem or prayers: Repeat each word in the prayer or poem until complete. Alternative: Find a synonym for each word in the poem or prayer or discern the meaning of the poem or prayer in way you could tell your child or friend.
Final Push
Despite your best efforts, even after using much of the information provided in this guide, you somehow still do not feel rested or are unable to achieve a good night’s sleep. It is time to see your primary care provider if:

- You have tried for over 2 weeks and/or:
  - Your roommate or bed partner report you snoring or having episodes where you stop breathing (apnea)
  - You have a sleep diary documenting information about your sleep, your sleep environment and your pre-bedtime activities.

You potentially may have a medical condition that needs to be evaluated and treated as soon as possible. Some of these conditions may need further valuation by sleep or behavioral health specialists or both. Your specialists may require tests to diagnose this properly.

Treatment also varies depending on the condition that is diagnosed. While medication may be required to treat some sleep disorders such as narcolepsy, there are many effective non-medication treatment regimens such as use of a Continuous Positive Airway Pressure (CPAP) machines or cognitive behavior therapy for Insomnia.

Regardless of the sleep disorder you may have, there is effective evaluation and treatment available. It is important that you seek help so you can address this problem. You deserve to get the best sleep you can.
Sleep Nuggets to Remember

- Maintain a consistent, regular routine that starts with a fixed bedtime and wake-up time. Set a fixed time to wake up, get out of bed at that time and get exposure to light each day. Pick a time you can maintain 7 days a week then adjust your bedtime so that you target 7–8 hours of sleep.

- Get out of bed if you can’t sleep. Only go to bed (and stay in bed) when you feel sleepy. Do not try to force yourself to fall asleep, it will tend to make you more awake, making the problem worse. If you do not return to sleep within 20 minutes, get out of bed and do something relaxing. Do not return to bed until you feel sleepy.

- Napping is a good way to make up for poor/reduced night-time sleep. But remember, naps that are longer than 1 hour and/or they are taken late in the day (after 1500 hours) can cause problems falling asleep or staying asleep at night. If you need to nap for safety reasons (e.g., driving), try to take a short (30–60 minute) nap in the late morning or early afternoon (e.g., right after lunch), just enough to take the edge off your sleepiness.

- Move your clock so you can’t see it. If you tend to check the clock two or more times during the night, and if you worry that you are not getting enough sleep, cover the clock face or turn it around so that you can’t see it. Better yet remove the clock from the bedroom entirely.

- If you experience sleep problems for more than 2 weeks, consult a healthcare provider.
Introduction
Physical activity is essential to your performance, your physical readiness, and your health. Your fitness level, your exercise and workout plan, and your movement throughout the day are all parts of activity. This section will describe your activity targets and includes fitness and exercise information you need to perform at your best!

Let’s start with your three activity targets:
1. Get at least 10,000 steps per day
2. Get at least 150 minutes of moderate or higher intensity aerobic activity per week
3. Do 2–3 sessions of total body strength training per week

Those targets too easy? Then challenge yourself with the Activity Plus Targets:
1. Get 10,000 steps + 5,000 additional for a daily total of 15,000 per day
2. Get at least 150 minutes per week of moderate aerobic activity + 75 minutes of vigorous aerobic exercise per week
3. Do 2–3 sessions per week of total body strength training + 1 day or more of agility training

Step Target: Sit Less and Move More!
Prolonged sitting increases your risk of an early death. Sitting a lot increases your risk of blood clots, diabetes, heart disease, cancer and obesity. Believe it or not, your daily workout does not protect you from the problems of prolonged sitting. Even people who are very fit have a higher risk of illness if they spend a long time sitting down every day.

Fitness alone isn’t enough! The key is moving throughout the day!
Moving during the day, in addition to physical training, is necessary to lower the risk of cardiovascular disease and other health conditions. If you can max your physical training test but still spend over 6 hours per day sitting down, then you are still at risk!

It can be as simple as taking a walk break, standing up to stretch, or taking the long route to the restroom at work. Walking 10–15 minutes every hour increases blood flow, burns calories and helps to maintain a healthy weight.
Did you know that a 1 kilometer walk is about 1,300 steps?

On average, adults take about 5,000 steps per day; however, researchers recommend taking at least 10,000 steps (about 8 kilometers) per day for a good health. Researchers suggest closer to 15,000 steps per day if you are trying to lose weight. Children need more—boys between the ages of 6–12 years need 15,000 steps per day, and girls in the same age range need 12,000 steps per day. If you take a 4 kilometer walk every night on top of your regular activity you probably are close to or above the 10,000 step target. For adults, and for most Soldiers, the 10,000 steps daily is a good baseline goal, and for those already reaching that, we have a plus goal of 15,000!

How can I Sit Less and Move More?

- If you sit at a desk, set a timer on your phone or computer that alerts you to get up and move and take a quick walk around the room (when possible). Most scheduling or calendar programs on a computer can be set up to remind you!
- Park your car farther away from the building when going to work or shopping—you can get more steps both coming and going!
- Avoid the drive-thru—walk inside the building.
- If you don’t have much time to exercise, build activity into your daily routine; take the stairs (not the elevator); walk and talk when you can, and find ways to keep moving!

But I’m a Soldier! I get 10,000 Steps Before Breakfast!

Great job! Soldiers in many units do required physical training—they have an easy time getting to 10,000 a day. However, the goal is to move throughout the day!

So, if you get more than 10,000 steps per day, it’s time to set your goal higher! You wouldn’t do just the minimum and quit, right? Set your sights on the Plus Goal of 15,000 or even take things a step higher to 20,000 per day if you can make it!

For example, if you run about 3 kilometers in the morning (about 4,000 steps) shoot for the Plus Goal of 15,000 steps that day. Your phone or Activity Tracker can help you log steps and track them over time to see if you are meeting your goals. Unit and group challenges can keep you motivated to continue exceeding the standard!
Aerobic target – A Fitness Foundation

Aerobic exercise is also called cardiovascular training because it helps build your body’s ability to pump blood and oxygen to your working muscles. This is critical for your endurance as a Soldier. Training your endurance and staying active with your weekly 150 minutes helps:

- Create staying power. Long days, long nights, and continuous work schedules are challenges every Soldier must face
- Maintain your physical performance throughout long missions and training events
- Build resistance to injury. Soldiers who have greater aerobic fitness are less likely to be injured

Increase the health and strength of your heart, lungs, and blood vessels. This makes fit Soldiers healthier in the long run.

What Counts for my Moderate 150 Minutes?
- Moderate is about a 40–60% effort level
- Brisk walking
- Light jogging, under about 6 mph
- Hiking or trail walking on easy flat surfaces
- Light cycling—indoors or out
- Light recreational swimming
- Light to moderate weight training or using long rest periods
- Endurance training machines on a low or light setting, like rowers, elliptical trainers, or step machines.
- Gardening, grass mowing and light outdoor chores
- Setting up/taking down tents and field equipment
- Loading and unloading gear continuously, about 40lbs or less

What Counts for my Vigorous 75 Minutes?
- Vigorous is about a 60–90% effort level
- Running or jogging, at about 6 mph or greater
- Hiking uphill
- Fast cycling—indoors or out
- Fast swimming laps
- Heavy weight training or with short rest periods
- Endurance training machines on a fast or difficult setting, like rowers, elliptical trainers, or step machines.
- Heavy outdoor work, shoveling or digging, moving higher loads of 40 lbs or more
- Competitive sports like soccer, flag football, basketball, wrestling, and combative training
- Loading and unloading heavy gear continuously; over about 40 lbs
Strength Target – Power & Resilience

Resistance training, or strength training, is defined as any exercise that causes muscles to contract against an external resistance with the expectation of increases in strength, endurance and/or size. Strength training can not only help you build strength and gain some muscle, but also boost your metabolism and help manage your weight.

➢ Resistance training can be a great way to maximize performance and prepare for any task. Physical fitness and activity are crucial to ensuring our Soldiers maintain and improve strength, agility, power, and speed. Adding resistance training to your regimen can help you perform like a Tactical Athlete.

➢ Strength training combined with aerobic exercise helps you carry heavy loads (like body armor and a rucksack) farther with less fatigue.

➢ Resistance training increases your bone density and is important for long term bone health—this makes Soldiers tougher and more resistant to injury.

➢ Improve your body composition to less fat and more muscle—strength training is especially important for heavier Soldiers who routinely are taped at height/weight assessments.

➢ Women gain strength from resistance training but do not typically add bulk because they have much lower testosterone levels than men. Female Soldiers will improve their strength but do not have to worry about gaining excessive amounts of muscle bulk through resistance training.

➢ Balance your strength program to reduce the risk of overuse injuries like tendonitis. Make sure you are working all major muscle groups of your whole body and not just working the ‘mirror muscles’ that are most visible! Later in the guide, we will show you the Essential Seven exercise variations to use.

Essential Seven For Strength

Try the exercises listed to build functional strength as a Tactical Athlete.

1. Push
   - Pushups
   - Bench Press

2. Pull
   - Rowing
   - Carrying

3. Vertical Push
   - Pike Push-Up
   - Military/Overhead Press

4. Vertical Pull
   - Chin-Up, Pull-Up
   - Straight Arm Pull

5. Squatting
   - Squats – Step Ups
   - Leg Press

6. Lunging
   - Lunges
   - Deadlifts

7. Core/Abdominals
   - Planks, Side Planks
   - V-ups, Leg Tucks
ESSENTIAL 7 FOR STRENGTH

Strength training is a fundamental part of your physical fitness. Perform strength training 2-3 times per week using all 7 major muscle groups to develop the strength you need.

1 PUSH
- Push-Ups
- Bench Press

Try the exercises shown to build strength.

2 PULL
- Push-Ups
- Bench Press
- Rowing
- Carrying

3 VERTICAL PUSH
- Pike Push-Up
- Overhead Press

4 VERTICAL PULL
- Pull-Ups

5 SQUAT
- Dumbbell Squat
- Body Weight Squat

6 LUNGE
- Bulgarian
- Standard Deadlift

7 CORE
- Side Plank
- V-Up
- Bridge
- Supine Twist
What counts for Resistance Training?

- Weight machines at a gym or in a home setup
- Free weights like dumbbells, barbells, kettlebells, and medicine balls
- Elastic resistance bands or straps for ‘suspension training’.
- Bodyweight resistance training or climbing drills, including push-ups, pull-ups, lunges and squats.
- Some kinds of challenging yoga and gymnastic strength moves.

Strength Training—The Basics:

- Working out just 2–3 days per week for a whole body program effectively builds strength and muscle.
- Resistance training can use different kinds of weights (dumbbell, barbell, kettlebell, etc), resistance bands, medicine balls, or your body weight.
- Rest muscle groups about 48 hours between workouts. Get 7–8 hours of sleep to maximize recovery and improvement.

Safety:

- Strength training has a fairly low injury rate—you won’t get hurt if you train smart!
- Warm up with lighter resistance to get your muscles ready. It’s easy to do one or two ‘warm-up sets’ to get yourself ready. Gradually increase the weight and/or reps. Don’t always lift to muscle failure—it can increase your risk of injury and is NOT necessary to get stronger or build muscle!
- Lift with slow, controlled motions—most experts recommend taking about one second to lift the weight up and about 3 to lower it down. Exhale when you lift the weight up and inhale when you lower it down.
- Use a ‘spotter’ or assistant for safety with free weights when you are lifting a weight over your head or face, going to muscle failure, or testing yourself by lifting close to your maximum.
- If you don’t know how to use a machine or perform an exercise, then ask a PSP staff or another fitness trainer.
But I like to do bodybuilding, I lift way more than twice a week!

- That’s great! Just make sure you have a balanced program that works your whole body, you get adequate rest so your muscles can benefit from the training, and you are being smart if you choose supplements!
- There are many ‘split’ routines that Soldiers can use to rotate strength exercises so they can lift more often while giving themselves enough rest and recovery.
- Make sure you are not neglecting the ‘Endurance’ and ‘Mobility’ aspects of your

I’d like to start strength training, but I just don’t know where to begin.

- Get started with the CAP3! The information on strength training will introduce you to the Essential Seven approach to building a balanced program.
- Remember that consistency in training is more important than exactly what you end up doing—stick with it!
- Use the ideas in this guide to start smart.
- Consult a PSP staff and/or start a DFit training program.

How many sets and repetitions (reps) should I do?

- Select a weight you can lift from 6–12 times—that is a starting point.
- If you are a beginner to strength training, then one set of each exercise is a good start.
- More experienced Soldiers should use multiple (3–5) sets to get the most out of their program.
- Use 3–5 sets of 6–12 repetitions as a base to build strength and muscle.
- There are many ways to progress your program. One method is the ‘8/10/12’ approach. Pick a weight you can do a set of 8 repetitions for, and then move to 10 and then 12 in the workouts to come. When you can do 3–5 sets of 12 reps, advance your weight and start at sets of 8 reps again.

What counts for Agility Training?

- Plyometric or jumping exercises, like the Tuck Jump and Alternate-Staggered Squat Jump box jumping and other leaping and hopping exercises used in sports training.
- Explosive strength exercises like:
  - Medicine ball throws
  - Olympic-style weightlifting with a barbell
  - Long jumps and high jumps
  - High intensity conditioning exercise
- Shuttle runs, military movement drills, obstacle courses
Preparation and Injury Prevention

In order to keep the unit ready, Soldiers need to be injury-free. Appropriate warm-up and exercise preparation and following good injury prevention practices are as important in the Army as they are to a pro sports team. All effective workouts begin with an appropriate warm-up. Dynamic warm-ups use controlled movements to take the body through a large range of motion—lengthening and warming up tissues and preparing the body for activity. Most injuries are due to inappropriate training and inadequate fitness—train safe and stay in the fight.

To implement warm-up and injury prevention practices:

- A focused and tailored warm-up can increase your performance and decrease the risk of injury. Determine the warm-up based on the workout or mission: Use a few ‘warm up sets’ of lower weight before you do heavy strength training, do light jogging before a run, etc.
- Consider total daily training requirements in your planning. For example, don’t schedule lower body weight training, endurance running and a road march on the same day or on two consecutive days.
- Stretching exercises are good for improving mobility but are best used after your workout when muscles are warmed up.
- Stretching before activity is okay but it can’t replace a dynamic warm-up!
- Wear a mouth guard for high-risk activities like combative and contact sports.
- Wear a semi-rigid ankle brace for high risk activities such as basketball or soccer if you have had a previous ankle injury.
- To minimize injury risks, gradually increase intensity, duration, frequency, and variety of training.

What Leaders Can Do to Reduce Soldier Injuries

- Know that this is an important problem!
  - Most injuries like this are due to poor training practices and inadequate fitness, and they can be prevented.
- Select NCOs who model healthy behavior and can teach others.
- When planning the intensity and duration of PT, consider factors such as the training cycle, block leave, and new Soldiers.
- Collaborate with healthcare and fitness providers to ensure Soldiers have the right information and tools to conduct fitness activities.
**Safe Running and Shoe Selection**

Physical fitness, especially cardiovascular stamina, is a major factor that optimizes Soldier performance. Running greatly increases aerobic stamina, which in turn increases the chance of survival and decreases the risk of physical injury for military personnel. Running can be done in virtually any environment and location and is an excellent way to achieve cardiovascular fitness. The Army has a long history of running for physical fitness and for unit cohesion. But running, like any other activity, should be done appropriately.

- Various studies of recreational and competitive runners have estimated that between 27% and 70% of runners sustain overuse injuries during any 1 year period. Be alert for signs of overuse (pain in your knees, shins or feet) and modify your program or seek help right away.
- A majority of the injuries Soldiers get from physical training are related to running!

**Appropriate Use of Running**

- Run for 30 minutes, 3 days per week. Cross train to build strength, endurance, agility, balance and coordination. Running more than 30 minutes, 3 days per week has been shown in military studies to increase risk of injury without continued improvement in fitness.

**Running Shoe Selection**

- **Typical Running Shoes and Heel Strikers:**
  - Most running shoes have a standardized design: they have an elevated heel to help you move forward, cushioning material built in to soften the impact, and a stiff supportive heel cup area.
  - These shoes are designed for the most common type of running pattern, landing on your heel first (called ‘rear foot striking’ or ‘heel striking’).
  - A standard running shoe that fits you well and is comfortable when you run is most important. If the shoes are not comfortable—they won’t become more comfortable with time!
  - While some runners prefer cushioning or motion control shoes, the typical stability running shoe works for most runners.

- **Minimalist Running Shoes and Forefoot Strikers:**
  - Lately, shoes called “minimalist” have been popular.
  - Minimalist running shoes (MRS) are lightweight, low to the ground, flexible shoes with very little cushioning and support.
  - Typical MRS have no elevated heel, no real cushioning material and a very flexible heel cup area.
  - These shoes are thought to simulate barefoot running and promote a different running pattern, landing on the middle of the foot or the toe area (called ‘midfoot striking’ or ‘forefoot striking’).
  - Some shoes are in-between MRS and regular shoes and they are sometimes called ‘transitional shoes.’
Running Shoe Replacement

- Replace shoes about every 6 months or 500-800 kilometers.
- Replace them if an examination shows they are worn out.
  - When you place your old shoes on a table and look at them from behind, they are worn and leaning to one side.
  - The midsole material (cushioning) is creased in areas of high load (under the heel or the ball of the foot).
  - The shoe twists more easily than a new shoe (worn out cushioning).
  - The tread or sole is worn (usually the cushioning wears out first, so if the tread is worn, your shoes need to be replaced!).

![Diagram of running shoe replacement criteria]
Extreme Conditioning Programs (ECPs)

Extreme Conditioning Programs (ECPs), like CrossFit, P90X, and Insanity are workout programs that combine high-intensity exercises with short rest periods between sets. They are also known as high intensity circuit training or high intensity interval training (HIIT). ECP workouts are often popular and can help improve physical performance in a shorter period of time.

ECPs and HIIT can help Soldiers burn calories, build muscle, decrease body fat, increase strength and stamina, and improve coordination and agility. However, like any new training activity, if done improperly they can lead to injuries such as muscle strains, torn ligaments, stress fractures, tendinitis or other serious conditions. Here are some general rules of thumb before engaging in an ECP. First, study the movements and exercises if they are new to you.

Benefits of ECPs:
- Burn calories quickly with a continued caloric “after burn”
- Improve aerobic conditioning in a shorter duration of time than traditional endurance activities
- Build tolerance for high intensity exercise
- Improve coordination, agility, and athleticism
- Often include functional movements
- Combine cardio and resistance training in one workout
- Some require little equipment and can be done almost anywhere

Risks of ECPs:

Injuries may include:
- Muscle strains
- Torn ligaments
- Fractures
- Tendonitis
- Other serious or life threatening conditions

- Some exercises or lifts are challenging and require training from a certified professional to do safely. These include Olympic Weightlifting exercises (snatch, clean, jerk and related explosive barbell movements).
- Many ECP workouts have a short duration of rest or recovery, which can cause early fatigue and may increase the risk of injury.
Extreme Conditioning Programs (ECPs)

ECPs, when done well, can provide an exciting new exercise regimen that many Soldiers can participate in together. However, it’s important to remember that if they are done poorly without appropriate coaching and supervision, they can push Soldiers beyond their limits and can lead to injuries. Don’t be overzealous and push Soldiers beyond their capabilities.

Remember it is not about “smoking” Soldiers, it’s about improving fitness and having fun. Also, if your Soldiers do ECPS in addition to regular physical training, they could be at risk for overtraining.

- Overtraining can cause fatigue, sickness, a decrease in performance, and injury.
- Avoid training the same muscles groups in consecutive workouts. Require at least 48 hours before retraining that muscle group.
- Consider avoiding back-to-back training days or alternating between high and low intensity training days.
Wearing Body Armor and Road Marching

During field training, career courses and/or operational or combat deployments, you will be wearing body armor and carrying equipment. Many Soldiers struggle with the extra load and get injuries and pain problems that make them ‘combat ineffective’ during this time. Why does this happen? They were not fit and trained for the task!

Soldiers must practice carrying loads and wearing equipment just as they practice marksmanship and tasks. For Soldiers who aren’t used to road marching or are returning to the unit after injury, having a suggested program to start with is important—try this sample once per week schedule to get started. You can build up distance and weight as you go—but don’t increase both weight and distance at the same time. Start slow and work yourself and your team up as you adapt. Don’t do a lot of distance running the day before or after a foot march.

<table>
<thead>
<tr>
<th>WEEK</th>
<th>WEIGHT</th>
<th>DISTANCE (in Km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fighting Order Only</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Fighting Order Only</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Fighting Order Only</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Fighting Order + Small Pack (10lbs)</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Fighting Order + Small Pack (15lbs)</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Fighting Order + Small Pack (20lbs)</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Fighting Order + Small Pack (20lbs)</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Fighting Order + Small Pack (25lbs)</td>
<td>5</td>
</tr>
</tbody>
</table>
MODULE 3 - NUTRITION
Nutrition and Performance

Soldiers form the centerpiece of our formations; they require sleep, activity and nutrition to perform optimally for sustained periods of time. Napoleon’s famous quote, “An Army marches on its stomach,” refers to the importance of the supply line, however, it also refers to the fact that Soldiers can only fight or function effectively if they have been well fueled.

A Tactical Athlete is an expert in the profession of arms who constantly strives to improve one’s skills and abilities. Tactical Athlete is also totally fit—physically ready, nutritionally sound, mentally strong, and confident in their own abilities and in those of the members of the team. The CAP3 is designed to fuel, enhance, and sustain human performance. Soldiers are like a complex weapons system. They need to understand both the performance benefits of positive nutrition behaviors and the loss of performance caused by poor nutrition habits.

Soldiers must perform and excel at a professional level, just like any world-class athlete. Performance is a word Soldiers hear frequently throughout their military careers. They are rated on performance in training, on the job, and on their physical fitness performance. Fueling for success optimizes Soldiers’ training and performance in combat or garrison.

Transforming the Service member into the most effective weapon requires “performance fueling” to maximize mental and physical performance and resiliency without compromising long-term health. Soldiers are our most complex weapons. Eating or fueling for performance enables top level training, increases energy and endurance, shortens recovery time between activities, improves focus and concentration, and helps Soldiers look and feel better.

You can’t out-exercise a bad diet.
**Nutrition and Performance**

The quality and quantity of food you eat plays a role in your physical, mental and emotional performance in the gym, during the mission, at home, and everywhere in between. Your body is like a high performance car—premium fuel gets you premium results.

Performance fueling requires “nutrient rich meals” and builds on nutritional fitness. Choosing nutrient rich foods supports muscle growth, recovery, tissue repair, immune function, and will improve mental and physical performance. In addition, good nutrition can help Soldiers maintain an appropriate weight and help reduce the risk of chronic disease. By eating the right balance and variety of foods, Soldiers will get all the nutrients (carbohydrate, protein, fat, water, vitamins, and minerals) they need for performance and health.

Another component of performance fueling is “nutrient timing,” which applies to the tactical timing of fuel (nutrients and fluids) matching the work performed. Eating regular meals along with pre/post training (exercise) fueling helps your brain and muscles receive the energy they need to perform at their best.
**Nutrients**

The types of nutrients consumed pre, during and post training are important to ensure adequate energy stores and recovery that sustains performance. Timing of intake of nutrients can play a role in performance. “Nutrient timing” or tactical timing of fuel (nutrients and fluids) intake during periods of varying levels of activities and duration that matches the work performed is essential for optimal performance. Eating regular meals along with pre/post training (exercise) fueling helps fuel your brain and body. Regular fueling delays fatigue prevents injury and improves morale all contributing to the soldier performing at their best.

**Energy**

Appropriate energy intake is essential to support optimal body function. Dietary intake affects performance and Inadequate energy intake will lead to loss of performance if the energy expenditure is higher than the energy intake.

Three of the six nutrients provide your body with energy or calories-carbohydrates, protein, and fat. These three nutrients are known as macro nutrients. Fueling with Carbohydrate, Protein and Fat promotes energy for performance, endurance, stamina and muscle growth and repair. A performance nutrition plan considers intake pre, during and post activity and provides a proper balance of these three nutrients known as the recommended macro nutrient distribution (MNDR). Between 45-65% of the kilocalories (energy) in your diet should be from carbohydrates. While protein is important to healthy active bodies, you need much less protein than carbohydrate, only 10-35% of your daily energy intake. It is recommended that 20-35% of our energy in our diet come from fat. Information provided on each specific macronutrient will provide you with more detail on how to ensure the food you eat and when you eat it reflects these recommended macro nutrient amounts.

**How many calories does your body require per day?**

Energy requirements vary greatly between people. Energy requirements depend on the level and duration of activity, body size, gender, and exposure to cold, heat, fear, stress, high altitude, and injury.
Energy balance is achieved when total energy (calories) intake (EI) equals total energy expenditure (TEE).

Your energy output (energy expenditure) is made up of three components:

1. **Resting Energy Expenditure (REE)** – the energy needed to keep you breathing, your heart beating and your body doing all the basic things that keep you alive.

   A number of factors have an effect on REE: Age.; body composition (how muscular you are); height; gender; intake (overeating increases REE while food restriction lowers it). An equation is used to determine your REE that considers these factors.

   Men: Weight in KG: $\text{kg} \times 24 = \underline{\text{kcal per day}}$
   
   Women: Weight in KG: $\text{kg} \times 22 = \underline{\text{kcal per day}}$

2. **Thermic Effect of Food** – energy is used to digest and absorb your food and some energy is lost in the form of heat.

3. **Physical Activity**: Increase activity increase energy expenditure and therefore energy requirements.

<table>
<thead>
<tr>
<th>Activity Factor</th>
<th>Activity Level *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sedentary</td>
</tr>
<tr>
<td>Men</td>
<td>1.35</td>
</tr>
<tr>
<td>Women</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Activity Levels:

- Sedentary: You sit down most of the day and drive or ride whenever possible. You may be standing still as part of your work duties or house activities.
- Low (Light): You move around some of the time, you may sit for seven hours, stand for five, walk for two, and you spend 2 hours in light physical activity.
- Moderate: You engage in some intentional exercise such as one hour of fast walking or running five times per week or your work or daily duties calls for some physical work.
- Hard (Heavy): Your job requires much physical labour, includes hauling heavy loads uphill, heavy sustained manual digging and prolong vigorous exercise such as marching with a pack, soccer, running.
Estimation of Energy Expenditure in kcal/hr by Intensity based on a 70 kg (155 lb) soldier.

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Activity</th>
<th>Kcal/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Light/Sedentary</td>
<td>At rest, lying down</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Riding in a truck</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Guard duty</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Driving a truck</td>
<td>140</td>
</tr>
<tr>
<td>Light</td>
<td>Cleaning a rifle</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Walking on a hard surface at 1 metre/sec (3.6 km/h):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No load</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>With 20 kg load</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td>With 30 kg load</td>
<td>251</td>
</tr>
<tr>
<td></td>
<td>Lift and carry 45 kg artillery shell 2/min</td>
<td>244</td>
</tr>
<tr>
<td>Moderate</td>
<td>Walking on loose sand at 1 metre/sec (3.6 km/h) No load</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>Rifle fire, prone</td>
<td>291</td>
</tr>
<tr>
<td></td>
<td>Walking on a hard surface at 1.6 m/sec (5.6 km/h):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No load</td>
<td>310</td>
</tr>
<tr>
<td></td>
<td>With 20 kg load</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>Lift and carry 45 kg artillery shell 3/min</td>
<td>318</td>
</tr>
<tr>
<td></td>
<td>Lift and carry 45 kg artillery shell 4/min</td>
<td>383</td>
</tr>
<tr>
<td></td>
<td>Scouting patrol</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>Working with pick/shovel or crawling with a pack</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>Field assaults</td>
<td>410</td>
</tr>
<tr>
<td>Heavy</td>
<td>Walking on a hard surface:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 1.6 m/sec (5.6 km/h) with 30 kg load</td>
<td>436</td>
</tr>
<tr>
<td></td>
<td>At 2.0 m/sec (7.2 km/h) with no load</td>
<td>451</td>
</tr>
<tr>
<td></td>
<td>Digging emplacements</td>
<td>465</td>
</tr>
<tr>
<td></td>
<td>Combat Diving*</td>
<td>478</td>
</tr>
<tr>
<td></td>
<td>Walk on loose sand at 1.6 m/sec (5.6 km/h), with no load</td>
<td>552</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>100</td>
<td>130</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>walk, 3.5 mph (generally flat course)</td>
<td>430</td>
<td>559</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>480</td>
<td>624</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>570</td>
<td>741</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>630</td>
<td>819</td>
</tr>
<tr>
<td>walk, 4.0 mph (generally flat course)</td>
<td>500</td>
<td>650</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>600</td>
<td>780</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>700</td>
<td>910</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>780</td>
<td>1014</td>
</tr>
<tr>
<td>walk/jog, 5.0 mph (generally flat course)</td>
<td>830</td>
<td>1079</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>900</td>
<td>1170</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>1000</td>
<td>1300</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>1070</td>
<td>1391</td>
</tr>
<tr>
<td>moving/lifting heavy objects</td>
<td>750</td>
<td>975</td>
</tr>
<tr>
<td>general physical work</td>
<td>450</td>
<td>585</td>
</tr>
<tr>
<td>calisthenics (push up, pull up, etc)</td>
<td>380</td>
<td>494</td>
</tr>
<tr>
<td>walk, 3.5 mph (uphill)</td>
<td>670</td>
<td>871</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>690</td>
<td>897</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>830</td>
<td>1079</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>900</td>
<td>1170</td>
</tr>
<tr>
<td>walk, 4.0 mph (uphill)</td>
<td>770</td>
<td>1001</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>810</td>
<td>1053</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>890</td>
<td>1157</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>1000</td>
<td>1300</td>
</tr>
<tr>
<td>brisk walk/jog, 5.0 mph (uphill)</td>
<td>980</td>
<td>1274</td>
</tr>
<tr>
<td>0-25 lb. load</td>
<td>1030</td>
<td>1339</td>
</tr>
<tr>
<td>25-49 lb. load</td>
<td>1130</td>
<td>1469</td>
</tr>
<tr>
<td>≥50 lb. load</td>
<td>1190</td>
<td>1547</td>
</tr>
</tbody>
</table>
Impact of environmental settings on energy requirements

- Hot environment – Energy requirement is increased by 10%
- Cold environment – Energy requirement is increased by 25 to 50% (Energy requirement over 5000 kcal/day)
- High Altitude environment – Energy requirement is increased by 15 to 50% (Energy requirement exceeds 5000 kcal/day)

Estimating Energy Needs:

Example: 70 kg Soldier on exercise in -35 C environment.

Overall daily activity is Heavy.

**Resting Energy Expenditure (REE)**

Men: Weight in KG: 70kg X 24 = 1680 kcal per day
Activity Factor :2.0
1680 kcal/day X 2.0= 3362 kcal per day

Environment: Cold
3362 X 25% = 4203 kcal/day
3362 X 50 % = 5043 kcal/day

Total daily energy requirement is 4200 to 5000 kcals per day.

What does this mean in food?

To understand, let’s look first at the nutrients that provide energy - Carbohydrate, Fat and Protein.
Carbohydrate: The Energy Nutrient

Adequate carbohydrates are critical for optimal physical and mental performance. Carbohydrate is the ultra–premium energy fuel and is vital for endurance and strength activities.

Carbohydrates are the preferred energy source for soldiers because they:
- Provide a quick start
- Deliver endurance fuel
- Increase alertness
- Fuel short bursts of energy
- Ensure quick recovery
- Provide energy that lets you do the work to build muscle size and strength

Carbohydrates can be found in food in two forms:
- Simple carbohydrates (sugars);
- Complex carbohydrates

Sources of carbohydrates

**Simple Carbohydrates:** Fruits and juice; milk; table sugar; syrup and honey; jam and jelly; candy.

**Complex Carbohydrates:** grains (rice, barley, whole grain bread, pasta, cereal), seeds; legumes, potatoes; vegetables (spinach, zucchini, broccoli), and fruits (blueberries, bananas, and cantaloupe).
All carbohydrate foods we eat are broken down in our digestive tract and our liver to glucose or blood sugar. The glucose circulates in the bloodstream to provide energy for all cells. The brain and red blood cells use only glucose for fuel. Only during starvation can these cells use a form of fat as fuel. Small amounts of carbohydrate are stored as glycogen in the liver and in the muscles. The liver glycogen is used as your body’s premium source of available energy to maintain blood glucose level from one meal to the next.

Glycogen is a high performance fuel but it burns quickly—and your body can’t store that much of it. After about 90 minutes of continuous exercise or during a day of intermittent strenuous physical activity, your muscle glycogen gets low. High heat and high intensity activity also increase the rate of glycogen depletion.

On the other hand, training increases your body’s ability to store glycogen. As you get into better shape, your muscles are able to store more glycogen to keep you going longer. When you are fit, your muscles are also better at replacing glycogen right after exercise. That’s one reason why when you are in better shape, you don’t seem as tired as you did when you began training.

Your body makes glycogen from unprocessed carbohydrate-rich sources. Good sources of unprocessed carbohydrates include grains (rice, barley, whole grain bread, pasta, cereal), legumes, vegetables (spinach, zucchini, broccoli), and fruits (blueberries, bananas, and cantaloupe).

**How much Carbohydrate is enough?**

Between 45-65% of the kilocalories (energy) in your diet should be from carbohydrates.

- 45 % of 2000 kcal = 900 kcal
- 65 % of 2000 kcal = 1300 kcal

1 gram of Carbohydrate = 4 kcals

- 900 kcal = 225 grams of Carbohydrate
- 1300 kcal = 325 grams of Carbohydrate

Therefore a 2000 kcal diet should contain 225 to 325 grams of Carbohydrates, with Carbohydrate intake over 24 hours typically not exceeding 650 grams.
**Example carbohydrate requirement calculation:**

Using the example 70 kg Soldier on exercise in -35 C environment with an overall activity level of high with a daily energy requirement of 4200 to 5000 kcals per day.

**Based on energy requirement:**

473-650* grams per day:

4200 X 45% = 1890 kcal from carbohydrate per day
472.5 grams of Carbohydrate (1890/4)

4200 X 65% = 2730 kcal from carbohydrate per day or 682 grams of Carbohydrate

**Based on Activity:**

420-650* grams per day

6 gram/kg body weight= 6X70= 420 grams of Carbohydrate per day
10 gram/kg body weight= 10X70= 700 grams of Carbohydrate per day

*Carbohydrate intake over 24 hours will typically not exceed 650 grams

**Excess**

It takes energy to change the chemistry of glucose to fat. Some people are capable of increasing body temperature to waste carbohydrate rather than storing it. However, too many calories from any source will be stored as fat.
What does this mean in food and when should it be consumed?

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving Size</th>
<th>Carbohydrate (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit or Juice</td>
<td>125 ml (1/2 cup) 1 medium</td>
<td>15-35</td>
</tr>
<tr>
<td>Bread</td>
<td></td>
<td>15-20</td>
</tr>
<tr>
<td>Cereals (unsweetened)</td>
<td></td>
<td>15-20</td>
</tr>
<tr>
<td>Pasta, rice, potato, corn, (cooked)</td>
<td></td>
<td>15-20</td>
</tr>
<tr>
<td>Milk or Yogurt</td>
<td>250 ml (1cup)</td>
<td>15</td>
</tr>
<tr>
<td>Chocolate Milk or flavoured yogurt</td>
<td>250 ml (1cup)</td>
<td>30</td>
</tr>
<tr>
<td>Legumes</td>
<td>175 ml (3/4Cup)</td>
<td>10</td>
</tr>
<tr>
<td>Sugar, honey, syrup</td>
<td>15 ml (1T)</td>
<td>15</td>
</tr>
<tr>
<td>Sports drink</td>
<td>250 ml (1cup)</td>
<td>15</td>
</tr>
<tr>
<td>Granola Bar (fruit and nut), cereal bars</td>
<td>1 bar</td>
<td>25- 30 g</td>
</tr>
<tr>
<td>Candies, cookies, granola bars and sweets</td>
<td>Servings vary</td>
<td>15-30</td>
</tr>
<tr>
<td>Raisins</td>
<td>1 cup</td>
<td>130</td>
</tr>
</tbody>
</table>

When carbohydrates should be consumed will be discussed in the section on nutrient timing.
Low Carbohydrate Diets
Despite the lack of scientific evidence to support them, many fad diets encourage low carbohydrate intake blaming them for causing weight gain. Since carbohydrates are a vital energy source restricting carbohydrates can affect performance.

Results of not eating enough carbohydrates include:
- Lack of endurance: you might fall out before an activity ends
- Decreased muscular strength
- Harder to recover: no energy left for later in the day or for the next day
- Slower speed: you have to slow down to make it to the end
- Reduced concentration: your brain gets fuzzy
- Reduced coordination
- Chronic fatigue
- Lack of motivation
- General fatigue and increased irritability

Consuming enough carbohydrate each day is necessary to meet the demands of physical training and refill muscle and liver glycogen supplies in between training sessions. Use the chart below to determine how many grams of carbohydrate you need each day.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Carbohydrate targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Low intensity or skill-based activities</td>
<td>3-5 g/kg of body weight /day</td>
</tr>
<tr>
<td>Moderate Moderate activity e.g. approx 1 hour per day</td>
<td>5-7 g/kg of body weight /day</td>
</tr>
<tr>
<td>High  Endurance activity (e.g. 1-3 h mod- high intensity activity)</td>
<td>6-10 g/kg of body weight /day</td>
</tr>
<tr>
<td>Very High Extreme – (e.g. &gt; 4-5 hours/day mod-high intensity activity)</td>
<td>8-12 g/kg of body weight /day</td>
</tr>
</tbody>
</table>
Protein: For Working Muscles

Protein provides energy however it is not a main source of energy like carbohydrate is. When you burn protein it is because you are low on carbohydrates. Too few carbohydrates and calories causes you to burn valuable lean tissue, which weakens your muscles and can decrease overall strength.

Dietary protein is considered the body’s building blocks and helps repair the body’s tissues. Protein is a necessary component of any performance nutrition plan because it:

- Builds and repairs muscles and connective tissue
- Builds red blood cells
- Builds hormones and enzymes
- Is a back-up source of energy

Protein is essential for performance. When you are physically active, you work your muscles and connective tissues hard. You need protein to build and repair injuries to those tissues. In addition, when you run out of carbohydrate stores, your body burns protein for energy. Those who are physically active need more protein than those who are more sedentary.

How much protein is enough?

Recommended Daily intake: 0.8-1 gram per kilogram body weight. Factors affecting protein requirements:
- age
- body size
- activity level

Individuals with increased activity levels may need up to 1.5–2 times the daily recommended amounts of protein to repair tissues and build the muscle strength and size required for top performance.

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Protein (grams)/kg body weight/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedentary to moderately active</td>
<td>0.8-1.0</td>
</tr>
<tr>
<td>Moderate activity or endurance activity</td>
<td>1.2-1.4</td>
</tr>
<tr>
<td>Elite endurance</td>
<td>1.6</td>
</tr>
<tr>
<td>Power sports- Special forces</td>
<td>1.4-2.0</td>
</tr>
<tr>
<td>Females</td>
<td>15% lower than males</td>
</tr>
</tbody>
</table>
Does this mean you need to eat twice the amount of protein that you do when you are not on exercise or deployments?

No. Most people eat this amount and more without even trying.

Will an intake of more protein lead to increased muscle size?

Many soldiers believe that if they eat more protein, it will lead to increased muscle size. Actually excess calories from protein is converted to fat and stored in the body. Quantities of protein greater then required can put stress on the liver and kidneys.

Example protein requirement calculation:

Using the example of 70 kg Soldier on exercise in -35 C environment with an overall activity level of high with a daily energy requirement of 4200 to 5000 kcals per day.

10-35% of your daily caloric intake should be as protein
1 gram of protein = 4 Kcals

Protein requirement based on Energy intake:
4200 kcal X 10 % = 420 kcals as protein – or 105 grams of protein

Protein requirements based on body weight and activity level
70 kg X 1.6=112 grams
70 Kg X 2.0=140 grams
What does this mean in food and when should it be consumed?
Sources of protein in food:
✓ Meat and alternatives (beans, legumes, nuts)
✓ Milk and alternatives
✓ Grain products
✓ Vegetables and fruit (small amounts)

How much protein does each food group provide?

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving Size</th>
<th>Protein (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>75 g (2.5 oz)</td>
<td>21</td>
</tr>
<tr>
<td>Tuna</td>
<td>75 g (½ can)</td>
<td>19</td>
</tr>
<tr>
<td>Legumes</td>
<td>175 ml</td>
<td>10</td>
</tr>
<tr>
<td>Nuts</td>
<td>60 ml</td>
<td>10</td>
</tr>
<tr>
<td>Egg</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Cheese</td>
<td>50 g</td>
<td>13</td>
</tr>
<tr>
<td>Cottage Cheese</td>
<td>125 ml (1/2 cup)</td>
<td>15</td>
</tr>
<tr>
<td>Peanut Butter</td>
<td>30 ml</td>
<td>8</td>
</tr>
<tr>
<td>Milk</td>
<td>250 ml (1 cup)</td>
<td>8</td>
</tr>
<tr>
<td>Yogurt</td>
<td>175 g</td>
<td>6</td>
</tr>
<tr>
<td>Bread</td>
<td>1 slice (35 g)</td>
<td>2</td>
</tr>
<tr>
<td>Vegetable</td>
<td>125 ml (1/2 cup)</td>
<td>1</td>
</tr>
<tr>
<td>Fruit</td>
<td>125 ml (1/2 cup)</td>
<td>1</td>
</tr>
</tbody>
</table>
Some fat is necessary for performance. Fat supplies energy, but it takes a while to kick in. Body fat doesn’t burn easily—it needs more oxygen than carbohydrates to be used for energy, so it is not an ideal fuel for high-intensity activity. It also takes time for your body to transport fat from your fat cells to your muscles. This means that fat cannot fuel quick bursts of activity. Fat does, however, provide an important fuel source for prolonged activities. Unlike glycogen, your body can store more fat than you will ever need.

The bad news is that too much fat, especially saturated fats, can hurt your performance and health. Highly processed, fatty foods, such as fast food, stay in your stomach longer than carbohydrates. This means that if you eat a high-fat meal before heading out to the obstacle course, the fat will sit heavy in your stomach and make you feel sluggish.

A high-fat diet also contributes to obesity. Excess body fat can lower your potential to reach optimum performance and negatively affect your physical appearance. Excessive dietary fat also increases your risk of developing heart disease, stroke, and cancer—being physically active (or meeting the Army weight standards) does not make you exempt from these conditions.

For top performance and to maintain a healthy body weight, you should limit your fat intake to 20 to 25 percent of your daily calorie intake, or the amount of calories remaining after carbohydrate and protein needs have been accounted for. Choose healthier sources of fat such as nuts, olive oil, peanut butter, and avocados, which not only provide important nutrients, but also have added health benefits.
Micronutrients

Micronutrients are those nutrients that are required only in small amounts such as milligrams or micrograms daily.

Types of Micronutrients:

- Vitamins
  - Examples – Riboflavin, niacin, thiamine, Vitamin C, B6, B12, D, folate
- Minerals
  - Examples – Calcium, Iron, Sodium, Potassium, Zinc

Micronutrients perform vital functions in the body such as recovery from exercise, production of energy, formation of red blood cells, immune function, maintenance of healthy muscles and joints, provision of oxygen to exercising muscles. Our bodies cannot make vitamins and minerals (except Vitamin D) therefore we must get them from our food. If you are eating enough to meet your energy needs and choosing wholesome healthy food you are likely getting all the micronutrients your body needs. If however high calorie nutrient poor foods (such as pop, candy, cakes etc.) contribute a significant amount to your daily energy intake then you may not be getting the vitamins and minerals you need. By eating a variety of foods from all food groups you will likely consume all the micronutrients your body normally needs.

Activity and the environment in which you are working can impact your requirements for some micronutrients. Sweating can result in the loss of some micronutrients from your body such as sodium and potassium. These nutrients are also known as electrolytes. Hydration or fluid and electrolyte balance in the body is essential for optimal performance. Sweat rates vary during exercise and can be affected by the environment, the intensity of the exercise, fitness level, heat acclimatization and normal variances in individuals. This is discussed in more detail in the section on hydration.
Hydration

Maintaining proper hydration contributes to performance. Soldiers must ensure adequate fluid intake before, during, and after military exercises and operations.

One can become easily dehydrated regardless of fitness level, body composition, or age. It happens quickly with physical activity, especially in extreme climates. The slump one feels in the mid-afternoon could be from the consumption of a large meal or the affect of inadequately hydrating throughout the morning.

Weight loss can be used to measure water loss. Weight lost over several hours of physical activity is body water lost in the form of sweat. In a 150 lb person, a 1.5 lb weight loss would be a loss of 1% of body weight and about 3 cups of sweat.

It doesn’t take much water loss for performance to suffer. A 1% dehydration (as measured by change in body weight) has been shown to have a slightly negative influence on mental function—slowed working memory, increased tension/anxiety and fatigue, and increased errors on visual vigilance. A 2% dehydration more severely impacts mental function, mood, and fatigue. A 3-5% loss will result in decreased performance in high intensity activities and technical skills. 6-10 % has a pronounced effect on exercise tolerance, cardiac output, muscle blood flow etc.

What are the signs of dehydration? Thirst, dry lips and mouth, flushed skin, fatigue, irritability, fainting and low blood pressure can all warn you that your fluid balance is low. The frequency, colour and smell of your urine are also indicators.

You can become dehydrated even before signs appear. Drink fluids regularly, even before you feel thirsty.
**General Tips**

- Monitor fluid loss (weighing before/after physical activity, urine color).
- Consume water throughout the day regardless of the environment or situation.
- Avoid use of energy drinks.

To avoid dehydration that can harm your performance and health, you might have to make yourself drink when you are not thirsty. Follow these steps to prevent dehydration:

- Make water your first choice of fluids. Cool, plain water is the best performance fluid replacer for any physical activity that lasts less than 60–90 minutes. Water is always better than soda, energy drinks, coffee, beer or full-strength fruit juice, and equal to sports drinks for replacing the fluid you lose. Cool water is absorbed into your bloodstream quickly and has none of the drawbacks that other fluids can have.
- Don’t wait until you are thirsty to drink. By the time you feel thirsty you are already dehydrated. Drink beyond your feeling of thirst. If you stop drinking when your thirst is satisfied, you have replaced only about two-thirds of the water you have lost.
- Sip frequently rather than gulp all at once; drinking small amounts of fluids at a time is more effective than large amounts only occasionally.

**Monitor Fluid Loss**

- Monitor urine color—when you are hydrated, urine is clear or pale yellow. It is dark yellow or brown when you are dehydrated.
- Weigh yourself before and after activity to see how much water you have lost. Drink 2–3 cups for every pound you lose during physical activity.
- Drink regularly and frequently. Drink at least 8–10 cups of water a day at regular intervals. In extreme climates you will need even more water to prevent dehydration.
Alcohol

Alcohol (beer, wine, or spirits) is not a performance-enhancing beverage and contributes to dehydration. Alcoholic beverages add empty calories that may contribute to weight gain and some nutrient deficiencies.

If you decide to drink alcohol, do so in moderation. The Canada’s Low-Risk Alcohol Drinking Guidelines recommend that to reduce your long-term health risks, drink no more than 10 drinks a week for women, with no more than 2 drinks a day most days, and no more than 15 drinks a week for men, with no more than 3 drinks a day most days.

A standard drink is equal to 12 ounces of beer, 8 ounces of malt liquor, 5 ounces of wine, and 1.5 ounces or a “shot” of 80–proof distilled spirits or liquor (e.g., gin, rum, vodka, or whiskey).

Safer drinking tips

✓ Set limits for yourself and stick to them.
✓ Drink slowly. Have no more than 2 drinks in any 3 hours.
✓ For every drink of alcohol, have one non-alcoholic drink.
✓ Eat before and while you are drinking.
✓ Always consider your age, body weight and health problems that might suggest lower limits.
✓ While drinking may provide health benefits for certain groups of people, do not start to drink or increase your drinking for health benefits.
Nutrient Timing for Peak Performance

Nutrient timing involves proper fueling strategies before, during and after physical training sessions and other strenuous activity. Solid strategies for eating and hydrating before, during and after exercise are essential to sustaining performance by supporting training and operational goals and recovery. Nutrition strategies must address a number of goals that support or promote optimal performance. A number of factors related to nutrition can cause fatigue and deterioration in outputs of performance. These factors include:

- Dehydration
- Electrolyte imbalances
- Hypoglycemia (low blood sugar) and
- Gastrointestinal discomfort/upset

Foods and fluids consumed before during and after activity can reduce or delay these.

Nutrient needs and strategies pre, during and post activity depend on a variety of factors such as: the type or intensity of the activity, the environment, appetite, and individual preferences and tolerances.

Nutrient Intake Based on Activity

The table on the next page provides guidelines for “Nutrient Timing”
<table>
<thead>
<tr>
<th>Timing</th>
<th>Goal</th>
<th>Carbohydrate</th>
<th>Protein</th>
<th>Fat</th>
<th>Fluid</th>
</tr>
</thead>
</table>
| Before activity        | Prevent Dehydration  
Prevent Hunger during exercise  
Provide Energy | Balanced meal consisting of Carbohydrate, protein and low fat- 2-4 hrs before  
1-2 hour before carbohydrate or liquid meal |         |     | 200-600 ml 2-4 hours before  
150-350 ml about 15 mins before |
| During Activity        |                                                                      |                                                    |         |     |                                                                       |
| <45 min                | Stay hydrated  
Provide energy (activity 1-3 hours) | Not needed  
30-60 g/hr if activity lasts longer than 1 hour (juice, cereal bar, bananas, dates) |         |     | Low fat  
125 ml- 250 ml every 15-20 mins                                      |
| ¾ hr to 2.5 hr-endurance including stop and start | Replace electrolytes (activity > 3 hrs) | Up to 90 g/h                                      |         |     | Increase fluid intake  
Sodium- .5-.7 g or ¼ tsp per liter of fluid                       |
| 2.5 to 3 hours - endurance | Replace fluid, refuel(carbohydrate ) and repair and rebuild muscle (protein) | 60-90 g within 30 min  
Aim for Carb:Protein ratio of 3:1 to 4:1 |         | 15-20 g | 1.5 times fluid lost through sweating |
Follow these tips and recommendations for nutrient timing.
BEFORE strenuous activities, build up your energy stores and hydrate 2–4 hours before by:

- Eat a snack or small meal
  - Note: if training first thing in the morning, eat a small carbohydrate snack, such as a banana one hour before exercise
- Drink a minimum of 2–3 cups of water.

DURING your workout:

**Sessions lasting 45 minutes or less:**
- Drink . to 1 cup of water for every 15–20 minutes during your workout. If you are sweating heavily, consume fluids at the rate lost (not to exceed 1.5 liters or 1. canteens per hour) or as much as you can tolerate.

**For sessions lasting 45 minutes to 2.5 hours:**
- Glycogen levels start to dwindle, especially if you are only drinking water. Starting at the 20–minute mark, consume 30-60 grams of carbohydrate (banana, sports drink, commercial sports bar or granola bar, gel shot, etc...) every hour minutes.
- Continue drinking .5 to 1 cup of fluid every 15–20 minutes. Sports drinks can have added performance benefits during activity lasting longer than 60 minutes as they provide carbohydrates that help refuel glycogen stores and blood sugar levels. They also contain electrolytes like salt (sodium ), which help you retain body water.

**For sessions 2.5 to 3 hours or more:**
- Higher intakes of carbohydrate are associated with better performance. Consume up to 90 g/ hour. Consume high carbohydrate drink or food ( soldier Fuel bar, raisins, meal). Fluid and electrolyte replacement important. Consider sports drink or alternate source of fluid, carbohydrate and electrolytes. Carbohydrate and protein based snacks are suggested for activity longer then 4 hours.

**Alternatives to sports drinks:**
Dilute any 100% fruit juice with an equal amount of water. Add 1/8 teaspoon salt per quart (four 8 oz cups). This mix closely approximates the carbohydrate, sodium, and potassium of commercially available sport drinks.
Mix 1/3 cup sugar and 1/8 teaspoon salt per quart (four 8 oz cups) of water. Flavor with unsweetened beverage base.
Refuelling/Recovery Nutrition

The Physiology of Refueling AFTER Exercise:
Exercise is catabolic (it breaks things down)—energy is used and micro tears occur in the muscle. The recovery phase is the anabolic or building phase. During this phase, you recover what was used (muscle is refueled, repaired, and built). Exercise and proper recovery nutrition makes the body stronger through this breaking down and building up process.

During the recovery phase, hormone levels (like testosterone) are in the right combination and at the right levels to help the body’s rebuilding and refueling process. If this window of opportunity is missed (30–60 minutes after a workout), recovery will take longer, performance will be degraded, and it will negatively impact the next day’s performance. Repeatedly missing this recovery window will limit your performance gains.

Carbohydrate and protein based snacks are suggestions for recovery. Consuming approximately 15-20g of total protein after exercise contributes to muscle repair - and the ability to perform the next day. Co-ingestion of carbohydrate plus protein together during the recovery period improved net protein balance and subsequent strength. Optimal recovery will occur if food and beverage consumed consists of a 3:1 to 4:1 ration of carbohydrate to protein.

Example: Chocolate milk: 250 ml (1 cup):

Carbohydrate: 33 grams
Protein: 8.6 grams
Carbohydrate: Protein ratio = 33/8.6 = 3.8:1

Peanut Butter Sandwich:
Carbohydrate: 38 grams
Protein: 12 grams
Carbohydrate: Protein ratio = 38/12 = 3.2:1
AFTER your workout:
After heavy work or exercise, refuel to replenish your energy and start preparing your body for the next training session.

Fuel: Focus on eating protein and a carbohydrate–rich food within 30–60 minutes after exercise. Suggested carbohydrate/protein snacks include low–fat chocolate milk, 100% fruit juice (8 oz) and a handful of nuts, whole–grain bread with peanut butter and banana, low–fat yogurt plus fruit, or a commercial sports bar.

Optimize glycogen refueling by consuming 60-90 grams of carbohydrate in your beverage or food within 30–60 minutes of exercise and every 2–4 hours thereafter.

Fluids: Continue to drink fluids and rehydrate.

Drink 2–3 cups of fluid for every pound lost during activity. Drinking small amounts of fluid at a time is more effective than large amounts occasionally.

Drink until urine is clear or light yellow.

Avoid alcohol as a fluid replacement. If you do drink beer after activity, drink 1–2 cups of water or diluted juice at the same time to counter the dehydrating effects of alcohol.

The post-workout fuel choices along with a complete balanced meal within 3–4 hours of activity will replace electrolytes.
Mission Nutrition

Eating for Performance will:

- Enable you to train and perform at your top level
- Increase your energy
- Increase your endurance
- Shorten your recovery time between activities
- Increase your focus
- Enable you to stay calm
- Increase your motivation
- Increase your concentration

Just as it takes weeks or months to build your strength and endurance, nutritional fitness is the result of consistent good eating habits. An ideal eating plan supports you through daily activities and exercise. An ideal plan will incorporate the correct type and amount of food as well as your personal eating habits (how often, how fast, and how consistently you eat).

Having a strategy to eat for performance and health doesn’t mean giving up the foods you like, and it doesn’t mean you have to eat foods you dislike.

An eating strategy means:

- Knowing what foods and eating habits contribute to optimal performance
- Evaluating your food choices
- Building a performance nutrition plan that fits your schedule, training regimen, food availability, and preferences
- Knowing what barriers are preventing you from eating right and how to overcome them
The Strategy:

- Fuel your engine. Eat enough calories to be lean and energetic but not gain undesired body fat. Your body needs enough calories to support your minimum health requirements (called the resting metabolic rate).
- Estimate this calorie need by taking your weight in kilograms and multiplying by 24 (for men) or 22 (for women). Then include the calories needed for daily activities and exercise to estimate your total for the day.
- Eat carbohydrates (especially complex carbohydrates). They are your body’s first choice for energy.
- Choose healthy fats in moderation: They are good for your heart, your cholesterol levels and your overall health. Too much of the bad fat feeds your fat cells, not your muscles or brain.
- Fine tune your protein intake; enough, but not too much. Protein is required to support growth, repair, and maintenance of body tissue. Studies have shown that you can only absorb about 20–30 grams of protein at a time, so spacing it out is important.
- Stay hydrated with water to maintain body fluid levels.
- Shoot for three meals and two planned snacks a day. Try not to skip meals or go more than 4–5 hours go by without refueling.
- Escape the rut: Eat a variety of foods to get a balance of nutrients.
Nutrition in the Field
Deployments and field operations demand a properly fueled and nutritionally maintained body—this could mean the difference between top performance and mission failure. Poor nutrition in extreme conditions (hot, cold, or high altitude) can lead to fatigue, rapid weight loss, injury, illness, and dehydration. Focus on eating foods that provide top mental and physical performance without compromising long-term health. View your mind and body as a weapon system. To be the most lethal weapon in the arsenal you need to be “nutritionally” fit.

Readiness Begins in Garrison/Field: Maintain a performance diet and a healthy weight by practicing healthful dining. The foods you choose to eat affect energy, concentration, and memory. Optimize your nutrition before, during, and after deployment/field operations.

Primary ways to be nutritionally prepared for all missions:
- Maximize energy stores! Low energy stores = fatigue!
  - Eat a high carbohydrate diet.
  - Avoid skipping meals—refuel every 4–5 hours at a minimum.
- Stay well hydrated.
- Minimize intake of heavily processed, high fat foods.

Performance Nutrition Tactics During Missions: When on continuous operations it is important to fuel (eat). Energy stores run down after several hours and need to be restored with food regularly. Ideally, fueling should occur every 3–5 hours—avoid going more than 5 waking hours without eating. Warfighting requires you to expect the unexpected. An “empty tank” after a strenuous mission will be detrimental to the next mission.
Nutrition tactics during missions include:

- Make time to fuel. Energy stores run down after several hours and need to be restored with food regularly. Refuel often—every 3–5 waking hours.
- If you don’t have a lot of time to eat or won’t get a break for a while, make it a point to eat a small amount when you have the chance. Focus on eating the most calorie-dense items in your ration, such as the main entree.
- Snack when you can—including carbohydrate and energy-rich choices such as dried fruits, nuts, and trail mixes.
- Eating calorie-dense and nutrient-rich foods is even more critical when you’re exposed to cold and high altitudes. Your energy needs will be higher and your appetite may decrease.
- Drink fluids frequently, even when you are not thirsty. Monitor the color of your urine and watch for signs of dehydration. In extreme environments such as hot, cold, and high altitudes, increase your fluid intake.

Meeting Nutritional Needs in the Field Environment

Often during deployments and field training, calorie needs are higher due to increased physical demands and completing missions in extreme environments. Soldiers need to be aware of their need for more calories and ensure they are properly fueling their bodies. Use the charts below to estimate daily nutrition needs and additional calorie requirements for field-related activities.

**ESTIMATE YOUR DAILY ENERGY NEEDS**

1. **Step 1:**
   - Men: Weight (kg) × 24 = __________
   - Women: Weight (kg) × 22 = __________

2. **Step 2:**
   - Answer from Step 1: __________ × AF × ENV = __________ = daily energy needs

   **Activity Factor (AF):**
   - 1.35 Male, 1.3 Female - Sedentary
   - 1.6 Male, 1.5 Female - Light
   - 1.7 Male, 1.6 Female - Moderate
   - 2.0 Male, 1.9 Female - Heavy

   **Environment Factor (ENV):**
   - 1.0 Normal
   - 1.1 Heat
   - 1.25-1.5 Cold
   - 1.15-1.5 Altitude
   - 1.2 Water Immersion

**Example:** (male): 80 kg × 24 = 1920 kcal × 1.5 × 1.1 = 3168 kcal per day
Performance Food Choices
Whether you are eating at home, in the CAF dining facility, at a restaurant or in the field, you can maintain a performance diet with proper planning and tools to help you make the best nutrition choices. The following pages provide information to help you make performance nutrition choices anytime, anywhere.

Tips to Save Money at the Grocery Store
- Plan menus and make a grocery list: Make it fun and involve your family or friends and helping you design a healthy menu.
- Shop seasonally: Buy fresh fruits and vegetables that are in season to help you get the freshest produce at the lowest cost. Visit your local farmer’s market. For produce that is not in season, frozen and/or canned fruits and vegetables (with little or no added salt or sugar) are a nutritious option.
- Shop the perimeter; then think meatless: Stick to the outer edge of the supermarket where you will find fresh produce, meats, dairy products, and breads. Then, shop the aisle(s) with meatless alternatives like beans. Aim for at least one meatless meal/week.
- Use coupons and inserts: Clipping coupons or printing them from websites can save you 10–15% on your grocery bill. Consider joining your supermarket’s shoppers club to enjoy price specials or to receive additional coupons.
- Use the Canadian Food Guide to help guide your choices at the grocery store.
A Soldier's Guide to Recommended Daily Servings

<table>
<thead>
<tr>
<th>Recommended Daily Servings by Food Group**</th>
<th>What Counts as a Serving?*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8 Cups of Fruit and Vegetables</strong>**</td>
<td>What Counts as 1 Cup of Fruit?*</td>
</tr>
<tr>
<td></td>
<td>• 1 medium-sized fresh fruit</td>
</tr>
<tr>
<td></td>
<td>• 1 cup of fresh or canned fruit</td>
</tr>
<tr>
<td></td>
<td>• ½ cup dried fruit</td>
</tr>
<tr>
<td></td>
<td>What Counts as 1 Cup of Vegetables?*</td>
</tr>
<tr>
<td></td>
<td>• 2 cups of leafy greens</td>
</tr>
<tr>
<td></td>
<td>• 1 cup of cooked or raw veggies</td>
</tr>
<tr>
<td></td>
<td>• 1 small baked potato</td>
</tr>
<tr>
<td>**3–8 oz. Grains **</td>
<td>What Counts as 1 oz.?*</td>
</tr>
<tr>
<td></td>
<td>• 1 cup dry cereal</td>
</tr>
<tr>
<td></td>
<td>• ½ cup cooked cereal, pasta, rice</td>
</tr>
<tr>
<td></td>
<td>• 1 slice of bread</td>
</tr>
<tr>
<td></td>
<td>• ½ bun or ½ English muffin</td>
</tr>
<tr>
<td><strong>5–10 oz. Proteins</strong>**</td>
<td>What Counts as 1 oz.?*</td>
</tr>
<tr>
<td></td>
<td>• 1 oz. cooked meat, fish, poultry</td>
</tr>
<tr>
<td></td>
<td>• ¼ cup cooked beans</td>
</tr>
<tr>
<td></td>
<td>• 1 egg</td>
</tr>
<tr>
<td></td>
<td>• ¼ cup tofu</td>
</tr>
<tr>
<td></td>
<td>• 1 tbsp. nut butter</td>
</tr>
<tr>
<td></td>
<td>• ½ oz. nuts (11-12 whole almonds, 24 pistachios, 7 Walnut halves)</td>
</tr>
<tr>
<td><strong>3–4 Cups of Dairy</strong>**</td>
<td>What Counts as 1 Cup.?*</td>
</tr>
<tr>
<td></td>
<td>• 1 cup (8 oz) of milk, yogurt</td>
</tr>
<tr>
<td></td>
<td>• 1 ½ oz. hard cheese</td>
</tr>
<tr>
<td></td>
<td>• 2 slices of processed cheese</td>
</tr>
<tr>
<td></td>
<td>• 1/3 cup shredded cheese</td>
</tr>
<tr>
<td><strong>Added Oils: Use sparingly (5–8 tsp./day)</strong>**</td>
<td>What Counts as Added Oils?*</td>
</tr>
<tr>
<td></td>
<td>• Vegetable oil, margarine, butter, salad dressing, mayonnaise, coffee creamer, etc.,</td>
</tr>
<tr>
<td>3 tsp. = 1 tbsp.</td>
<td>1 tsp. = approx. 5 g total fat</td>
</tr>
</tbody>
</table>

** Recommended daily servings vary according to caloric requirements.
* For other examples of servings by food group, please visit http://healthcanada.gc.ca
# Chose Your Fuel

## HIGH OCTANE FUEL: 93

### CARBS
- Beans (Black, Kidney, Navy)
- Black-eyed peas
- Brown rice
- Corn
- Green peas
- High fiber crackers
- Lentil, black bean and pea soup
- Low fat refried beans
- Sweet potato/Yam
- Whole grain bread
- Whole grain bagels
- Whole grain cereal
- Whole grain tortillas
- Whole grain waffles

### PROTEIN
- 95% Ground beef or turkey
- Beans & peas
- Chicken (white meat/skinless)
- Deli meat (turkey, ham, beef)
- Eggs (especially omega 3 eggs)
- Egg whites
- Lean beef steak
- Lean ham steak
- Lean jerky
- Low-fat cottage cheese
- Yogurt
- Milk: Non-fat and 1%, Nut butters: Almond/peanut
- Non-fried fish
- Tofu
- Trimmed pork chops
- Tuna (in-water)
- Turkey, white meat/skinless

### FAT
- Avocado
- Flax seed and flax oil
- Natural almond butter
- Natural peanut butter
- Olive oil
- Canola Oil
- Peanuts
- Pumpkin seeds
- Raw almonds
- Raw cashews
- Raw pecans
- Raw pistachios
- Raw walnuts
- Sunflower seeds
# Regular Octane Fuel: 89

**Carbs**
- Baked beans
- Baked chips
- Boiled new potatoes
- Cereal bars
- Corn tortillas
- Cornmeal/combread
- Crackers
- Cream of wheat
- Flour tortillas, French bread
- French toast, Hamburger/hot dog buns
- Macaroni, Pancakes, Pasta, Pita bread Pretzels, Ravioli, Rice cakes
- Spaghetti, Waffles, White bread, and White rice

**Protein**
- 85% Ground beef/turkey
- Chicken (dark/skinless)
- Milk: 2% and low-fat flavored
- Turkey (skinless/dark)

**Fat**
- Butter (in small amounts)
- Dry roasted nuts/seeds
- Reduced fat mayo
- Reduced fat salad dressing
- Reduced fat sour cream
- Reduced fat cheese
- Regular peanut butter

# Low Octane Fuel: 87

**Carbs**
- Biscuits
- Croissants
- Doughnuts
- Fettuccini alfredo
- French fries
- Hash browns
- Mashed potatoes
- Muffins
- Pop tarts
- Refried beans
- Sugary cereals

**Protein**
- 75% Ground beef/turkey
- Bacon
- Beef or pork ribs
- Bratwurst
- Chicken (with skin)
- Fried Chicken
- Fried fish/seafood
- Frozen pizza
- Ham on bone
- Regular cottage cheese low-fat
- Whole milk/chocolate milk

**Fat**
- Fried foods
- Honey roasted nuts/seeds
- Margarine
- Mayonnaise
- Ranch & other salad dressing
- Regular cheese
- Sour cream
- Coconut oil
Optimal Fueling for Performance
Your body is like a high performance vehicle. It needs to be filled with high quality fuel and the right fluids to get maximum performance. Maximize your performance by properly fueling your body before, during, and after your workout.

<table>
<thead>
<tr>
<th>CHOOSE THIS</th>
<th>NOT THAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start Strong</strong></td>
<td></td>
</tr>
<tr>
<td>Turkey Sandwich on Whole Wheat Bread and an Orange</td>
<td>Greasy Burger and French Fries</td>
</tr>
<tr>
<td>Cheerios with Banana Slices and 1% Milk</td>
<td>Glazed Donut</td>
</tr>
<tr>
<td><strong>Stay Strong</strong></td>
<td></td>
</tr>
<tr>
<td>Water or Sports Drink</td>
<td>Energy Drink</td>
</tr>
<tr>
<td><strong>Finish Strong</strong></td>
<td></td>
</tr>
<tr>
<td>Banana and Chocolate Milk</td>
<td>Beer and Chicken Wings</td>
</tr>
<tr>
<td>Fruit Smoothie</td>
<td>Bag of Chips</td>
</tr>
<tr>
<td>Oatmeal with Fruit and Nuts, Hard-boiled Egg and low-fat Milk</td>
<td>Pancakes with Butter and Syrup with a side of Bacon</td>
</tr>
</tbody>
</table>
Tips For Cooking At Home

➢ Plan ahead:
  ✓ Write out a weekly menu and corresponding grocery list
  ✓ Try recipes with 5 ingredients or less to save time
  ✓ Use phone apps which includes menus and corresponding grocery lists

➢ Purchase staples to have on-hand:
  ✓ Protein Foods: Boneless, skinless chicken breasts, lean ground beef, frozen fish filets, low-sodium canned beans, eggs, yogurt, cottage cheese, canned chicken or fish
  ✓ Grains: Brown rice, whole-wheat pasta, whole-grain breads, baked potatoes
  ✓ Veggies: Frozen, canned, or fresh veggies, pre-packaged salad greens, Lower-sodium pasta sauce
  ✓ Fruits: Fresh, frozen, or canned fruit in their own juice or water.
  ✓ Miscellaneous: Low-fat dressings (or make your own to save money and store in the refrigerator), low-sodium soups (< 600 mg sodium).

➢ Invest in good-sealing storage containers to keep leftovers:
  ✓ Pyrex containers, Tupperware, Zip-lock bags

➢ Choose healthy frozen meals to have on hand for dinner: Read the food label and choose a meal that meets the following criteria:
  ✓ 300–450 calories, <600 mg of sodium, <10 g of total fat.

➢ Pack your lunch: This saves you money and time in the long-run.

➢ Find and utilize a cooking buddy (spouse, friend, your child): This is a great time to bond and learn together!

➢ Break out the slow-cooker:
  ✓ For some meals, you can prep them the night before and then just dump the ingredients in the slow-cooker the next morning.
  ✓ Cook large batches on the weekend and freeze or refrigerate leftovers to use during the work-week.
Tips to Increase Fruit and Vegetable Consumption

Vegetables
- Plan or choose at least one main meal centered around vegetables (plain baked potato, veggie soup, veggie stir-fry, or a bean dish). Then, add other healthy foods to round out your nutrition intake.
- Order or pack a main dish veggie salad for lunch topped with lean protein (hard-boiled egg, lean chicken, low-fat cottage cheese, turkey, or ham). Go easy on the dressing.
- Include a cup of green salad and a cup of cooked vegetables (fresh, frozen, or canned) at dinner every night.
- Substitute a green salad or a baked potato with low-fat toppings for your fried vegetable when dining out.
- Pack raw, hardy veggies for a snack (carrot sticks, celery sticks, grape tomatoes, raw broccoli, bell-pepper strips). Bring a side of low-fat dressing, hummus, or nut butter for dipping if desired.
  - Save Money: Prepare veggies ahead of time (peel and/or cut). Store them in zip-lock bags or a well-sealed container.
  - Splurge: Purchase already peeled and cut veggies.
- Make your own veggie smoothie at home using spinach or kale. Store extras in the freezer for up to 2 weeks or in the refrigerator for up to 3 days.

Fruits
- Top your cereal or yogurt with fresh, frozen, or dried fruit. Drink <8 oz. of 100% juice per day with breakfast (choose mostly whole fruits).
- Pack or choose a fresh fruit at lunch or for your snack. Substitute it for your usual afternoon candy-bar!
  - Save Money: Buy fresh fruit in-season and/or frozen fruit. Wash and prep ahead of time.
  - Splurge: Purchase pre-peeled and/or pre-cut fresh fruit.
- For dessert, have a fruit salad, a piece of fresh fruit, or a serving of canned fruit (packed in its own juice or water).
- Prepare your own fruit smoothie at home using frozen or fresh fruit. Store extras in the freezer for up to 2 weeks or in the refrigerator for up to 3 days.
- Make your own trail mix. Combine 1/4 cup of dried fruit with 1 oz. of nuts or seeds. Take it with you for a healthy, mid-afternoon snack.
### Tips to Increase Fruit and Vegetable Consumption

#### When you’re shopping for...

<table>
<thead>
<tr>
<th>Vegetables and Fruits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy a wide variety of fruits and vegetables.</td>
<td></td>
</tr>
<tr>
<td>When fresh foods aren’t available, choose frozen or canned vegetables and fruits in water without added sugars, saturated and trans fat, or salt.</td>
<td></td>
</tr>
<tr>
<td>Buy fruits and vegetables that are good sources of fiber, such as beans, peas, oranges, bananas, strawberries and apples.</td>
<td></td>
</tr>
<tr>
<td>Buy more vegetables to snack on including carrot and celery sticks, broccoli, cherry tomatoes and cauliflower.</td>
<td></td>
</tr>
<tr>
<td>For desserts, buy fresh or canned fruits (in water without added sugars), dried fruit (without added sugars), and gelatin that contains fruit, instead of baked goods and sweets.</td>
<td></td>
</tr>
<tr>
<td>Avoid buying a lot of fruit juice. It doesn’t provide the fiber whole fruit does and it’s not as good at satisfying hunger.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milk, Cheese, Butter &amp; Eggs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Select fat-free (skim) or low-fat (1%) milk.</td>
<td></td>
</tr>
<tr>
<td>Choose fat-free, low-fat or reduced-fat cheeses.</td>
<td></td>
</tr>
<tr>
<td>Use egg white or egg substitutes instead of egg yolks. (Substitute two egg whites for each egg yolk in recipes that call for eggs.</td>
<td></td>
</tr>
<tr>
<td>Instead of buying butter, choose margarines that contain “0 grams trans-fat” (these usually come in in tubs).</td>
<td></td>
</tr>
<tr>
<td>Stay away from buying butter, cream, and ice cream. Save it for special occasions and, even then, limit how much you consume. These items contain more saturated fat than whole milk.</td>
<td></td>
</tr>
<tr>
<td>Watch out for the saturated and/or partially hydrogenated fats hidden in casseroles, bakery goods, desserts and other foods.</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Tips</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Meat, Poultry, Fish & Nuts     | Buy and prepare more fish. You should eat one serving of grilled or baked fish at least twice a week. Avoid fried fish.  
Instead of using cream sauce with fish, use lemon juice and spices to add flavor.  
Buy “choice” or “select” grades of beef rather than “prime,” and be sure to trim off the fat before cooking.  
When buying or eating poultry, choose the leaner light meat (breasts) rather than the fattier dark meat (legs and thighs). Try the skinless version or remove the skin yourself.  
Choose substitutes for red meat such as dried beans, peas, lentils, or tofu and use them as entrees or in salads and soups. A one-cup serving of cooked beans, peas, lentils or tofu can replace a two-ounce serving of meat, poultry or fish. |
| Bread & Baked Goods            | Choose whole-grain, high-fiber breads, such as those containing whole wheat, oats, oatmeal, whole rye, whole grain corn and buckwheat. Choose breads and other foods that list whole grains as the first item in the ingredient list.  
Limit the amount of bakery products you purchase, including doughnuts, pies, cakes and cookies. Look instead for fat-free or low-fat and low-sodium varieties of crackers, snack chips, cookies and cakes.  
Check for store-baked goods that are made with polyunsaturated or monounsaturated oils, skim or reduced-fat milk, and egg whites.  
Instead of buying a raisin bran muffin, buy a loaf of raisin bread and enjoy a slice for breakfast or lunch. |
| Oils, Dressings & Shortenings  | Buy and use fats and oils in limited amounts.  
When buying oils for cooking, baking or in dressings or spreads, choose the ones that has lowest saturated fats, trans fats and cholesterol—including canola oil, corn oil, olive oil, safflower oil, sesame oil, soybean oil and sunflower oil.  
Stay away from buying palm oil, palm kernel oil, coconut oil and cocoa butter—these are high in saturated fats.  
Buy a nonstick vegetable spray or nonstick pan.  
Choose reduced-fat, low-fat, light or fat-free salad dressings (if you need to limit your calories) to use with salads, for dips or as marinades. |
Sample meal plans

### EXAMPLE OF A 2200 CALORIE MEAL PLAN

<table>
<thead>
<tr>
<th>BREAKFAST</th>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Banana</td>
<td>105</td>
<td>27</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1 Orange</td>
<td>87</td>
<td>22</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1/2 cup of 100% Apple Juice</td>
<td>60</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1 cup of Unsweetened Cereal</td>
<td>100</td>
<td>20</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1 slice of 100% Whole Wheat Bread</td>
<td>80</td>
<td>15</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>1 cup of Skim Milk</td>
<td>90</td>
<td>12</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>1 Scrambled Egg (large)</td>
<td>91</td>
<td>1</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>1 tsp. Margarine</td>
<td>34</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>1 cup of Black Coffee</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Water</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Breakfast TOTALS:** 649 113 14 23

<table>
<thead>
<tr>
<th>MID-MORNING SNACK</th>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fruit</td>
<td>72</td>
<td>19</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Snack TOTALS:** 72 19 0 0
## LUNCH

<table>
<thead>
<tr>
<th></th>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 cups of Leafy Greens for Salad</td>
<td>15</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1/2 cup Fresh Cucumber (sliced or chopped)</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1/2 cup Fresh Tomato (sliced or chopped)</td>
<td>19</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 Grains</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 small Whole Wheat Bun</td>
<td>120</td>
<td>22</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>1 Dairy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 oz. Roasted, Skinless, Boneless Chicken Breast</td>
<td>103</td>
<td>0</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>1 oz. Protein</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 cup of Skim Milk</td>
<td>90</td>
<td>12</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>3 Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 tbsp. Reduced-Fat Ranch Dressing</td>
<td>80</td>
<td>7</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>1 tsp. Yellow Mustard</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Water</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Lunch TOTALS:** 437 49 10 35

## MID-AFTERNOON SNACK

<table>
<thead>
<tr>
<th></th>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 Fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4 cup Raisins (not tightly packed)</td>
<td>109</td>
<td>29</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 oz. Protein and 2 tsp. Oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 oz. Dry-Roasted Almonds (22 whole kernels)</td>
<td>169</td>
<td>5</td>
<td>15</td>
<td>6</td>
</tr>
</tbody>
</table>

**Snack TOTALS:** 278 34 15 7
<table>
<thead>
<tr>
<th>DINNER</th>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 cups of Leafy Greens for Salad</td>
<td>15</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1 cup of Steamed Broccoli</td>
<td>55</td>
<td>11</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>1 small Baked Potato</td>
<td>128</td>
<td>29</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1 cup of Fresh Strawberries</td>
<td>46</td>
<td>11</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6 oz. Grilled Tilapia</td>
<td>162</td>
<td>0</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td>1 cup of Skim Milk</td>
<td>90</td>
<td>12</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>2 tbsp. Oil &amp; Vinegar Dressing</td>
<td>150</td>
<td>1</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>1 tbsp. Regular Margarine</td>
<td>101</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Water</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Dinner TOTALS:</strong></td>
<td><strong>747</strong></td>
<td><strong>67</strong></td>
<td><strong>32</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CALORIES</th>
<th>CARBS (G)</th>
<th>FAT (G)</th>
<th>PROTEIN (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily TOTALS:</strong></td>
<td><strong>2183</strong></td>
<td><strong>282</strong></td>
<td><strong>71</strong></td>
</tr>
</tbody>
</table>
### Daily Energy Requirement

<table>
<thead>
<tr>
<th>Food Group</th>
<th>1,500 kcal</th>
<th>2,000 kcal</th>
<th>2,500 kcal</th>
<th>3,000 kcal</th>
<th>3,500 kcal</th>
<th>4,000 kcal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables &amp; Fruit</td>
<td>7-8</td>
<td>8-9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Grain Products</td>
<td>5-6</td>
<td>7-8</td>
<td>9-10</td>
<td>11-12</td>
<td>13-14</td>
<td>15-16</td>
</tr>
<tr>
<td>Milk &amp; Alternatives</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Meat &amp; Alternatives</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Fats &amp; Oils</td>
<td>1 T</td>
<td>2 T</td>
<td>2 T</td>
<td>3 T</td>
<td>3 T</td>
<td>4 T</td>
</tr>
<tr>
<td>Water</td>
<td>1.5 L (6 c) per day or more</td>
<td>2 L (8 c) per day or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Other Foods**: Choose other foods in moderation after you have eaten enough from the four food groups.
- If you find it difficult to eat a large enough volume of food to meet your energy needs, try adding more healthy oils or a few concentrated carbohydrates (juices, dried fruit, sweetened cereals or drinks).
Healthy Snacking
A well-balanced performance meal plan should include three nutritious meals with snacks in between. Choose healthy snacks to boost energy maintain your mental edge.

<table>
<thead>
<tr>
<th>Choose this</th>
<th>Not That</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granola Bar</td>
<td>Chocolate Chip Cookies</td>
</tr>
<tr>
<td>Cup of Fresh Vegetables</td>
<td>Potato Chips</td>
</tr>
<tr>
<td>Banana</td>
<td>Candy Bar</td>
</tr>
<tr>
<td>½ Peanut Butter Jelly (low sugar jelly) Sandwich</td>
<td>Cheese-flavored Crackers</td>
</tr>
<tr>
<td>Yogurt Parfait</td>
<td>Buttered Popcorn</td>
</tr>
<tr>
<td>Natural Flavored Sparkling Water</td>
<td>Soda</td>
</tr>
</tbody>
</table>
Food and Ingredient Label Reading

Be a smart shopper! With so many options available in the grocery store, it is hard to know which ones are the healthiest choice. Before making your food selection, take a few moments to read and compare the Nutrition Facts labels and the ingredient lists. The Nutrition Facts label can help you determine foods lowest in sodium and sugar, and those highest in fiber, vitamins, and minerals. Ingredient lists are a great way to learn what is in a packaged food item. Foods and beverages that are minimally processed and contain whole-food ingredients are always the best choice. The following examples can help you identify what to look for when reading and comparing labels.

Notes
Ingredients: Look for food with less than five ingredients, no added sugar.
Tips for Eating Healthier When Dining Out

General Tactics
Your target is to eat for performance, whether you are eating in the dining facility, restaurant, snacking in front of the TV, or sitting at the dinner table. Here are some tactics you can use to eat for performance:

- Choose quality carbohydrates like whole grain breads and cereals, pasta, rice, beans, lentils, fruit, milk, and yogurt.
- Make half your plate full of fruits and vegetables.
- Choose lean protein.
- Choose low–fat and fat–free dairy products.
- Eat heart healthy fats like vegetable oil (olive or canola oil), nuts, seeds, and avocados.
- Get vitamins and minerals through food first—don’t rely on supplements.
- Make water your first choice for hydration.

At Fast Food, Food Court, or Sit-Down Restaurants

- Choose grilled or baked sandwiches and entrees:
  - Choose sandwiches with < 300 calories (skip the mayonnaise or substitute mustard for mayonnaise/ special sauce and save 100–300 calories)
  - Choose entrees with < 500 calories
  - Look for menu items designated as healthier
- Order 1 slice of veggie pizza or thin-crust cheese pizza
- Substitute a side-salad with low-fat dressing, fresh fruit, or baked potato in place of a not-so-healthy side (french fries, onion rings)
- Drink water instead of a sugary beverage
- Order a kids’ meal rather than a “value meal” with “light” lemonade, white milk, or ice-water
- Skip or ask for salad dressing and other high-fat condiments on the side (sauces, butter) to better control portions and calories
- Split entrees with a friend, relative, or spouse
Weight Loss Tips

- Set reasonable, achievable and measurable goals. Write them down and post them where you see them every day.
- Weigh yourself at least once a week. Weigh the same time each day, preferably first thing in the morning, and use the same scale. Track your progress.
- Replace junk food in your diet with healthier foods—whole grains, fruits and vegetables, lean proteins, and healthy fats from foods like nuts and seeds.
- Don’t skip meals and keep healthy snacks like fruits and vegetables handy.
- Drink 2 cups of water right before a meal. This helps you feel full and may help reduce caloric intake.
- Listen to your body. Eat when you feel the first pangs of hunger. Stop as soon as you start to feel satisfied (neither full nor hunger).
- Eat slowly. Taking at least 20 minutes to eat gives your “fullness signal” a chance to kick in.
- Reduce the number of times you eat foods prepared away from home. Pack your lunch and cook dinner at home.
- Reduce calories by decreasing portions a little at each meal.
- Decrease high calorie food and increase lower calorie foods like vegetables. Try eating on a 10-inch plate or smaller.
- Learn how to read and interpret food labels.
Tips for Maintaining Weight Loss

- Keep your eating patterns consistent. Try to eat meals and snacks at roughly the same time each day.
- Eat breakfast every day.
- Don’t skip meals. Plan ahead and keep healthy snacks handy.
- Building exercise into your daily routine. Regular exercise helps prevent weight re-gain.
- Weigh yourself regularly. Once per week is sufficient.
- Keep a food diary. Evaluate your calorie intake at least once every two weeks.
- Stay committed to a healthy diet. Use your food diary to evaluate your daily nutrition choices.
- Minimize screen time. This promotes sitting and inactivity. Commit to moving more and sitting less throughout the day.
- Exercise at least an hour a day, almost every day. Vary your routine by trying different exercises.
- Watch your calorie intake because as your body becomes smaller, it burns fewer calories. Reassess calorie needs every few months.
- Eat a variety of foods from all of the food groups to get the nutrients you need. A well balanced diet will help keep you healthy and your weight in check. Try and choose foods from at least 3–4 food groups at each meal and snack.
Natural Health Products

Natural health products (NHPs) are naturally occurring substances that are used to restore or maintain good health. They are often made from plants, but can also be made from animals, microorganisms and marine sources. They come in a wide variety of forms like tablets, capsules, tinctures, solutions, creams, ointments and drops.

Natural health products, often called "complementary" or "alternative" medicines, include:
- vitamins and minerals
- herbal remedies
- homeopathic medicines
- traditional medicines like traditional Chinese and Ayurvedic (East Indian) medicines
- probiotics
- other products like amino acids and essential fatty acids

All natural health products (NHPs) sold in Canada are subject to the Natural Health Products Regulations, which came into force on January 1, 2004. To be legally sold in Canada, all natural health products must have a product licence, and the Canadian sites that manufacture, package, label and import these products must have site licences. Once Health Canada has assessed a product and decided it is safe, effective and of high quality, it issues a product licence along with an eight-digit Natural Product Number (NPN) or Homeopathic Medicine Number (DIN-HM), which must appear on the label.

The Regulations help give Canadians access to a wide range of natural health products that are safe, effective and of high quality.

Many Soldiers use natural health products to enhance their performance or for weight loss. Natural health products cannot offset the unfavorable effects of poor food choices. Consume whole foods as the best source for an edge on performance. If you do decide to take a supplement, be smart! Check for the NPN on the label. Educate yourself and seek advice from a healthcare professional first.
Dietary supplements are often used by military personnel because of the perception they will improve performance, increase muscle mass, optimize energy levels, increase alertness etc. Some products may be helpful but they can also be harmful, especially when used excessively or in combination with other products. This section will provide information on commonly used supplements- their benefits and risks.

**Caffeine:**

**Claim:** Improved performance, alertness, reaction time, endurance and weight loss.

**Adverse Affect:** Anxiety, sleep difficulties, increased blood pressure, irregular heart beat, calcium loss, jitters.

**Research:** Caffeine can enhance performance if taken in the right amount and for the right activities. Benefits are seen with caffeine intake of 100–200 mg or 1–3 mg/kg body weight. Higher doses are of no benefit. There is no evidence to support caffeine as a weight loss aide.

**Energy Drinks**

Many Soldiers reach for energy drinks for a mid-day pick-me-up or to make it through a long night shift. But do energy drinks help Soldiers do their job, or do they hinder their ability to perform? Energy drinks are not the same as sports drinks and should never be used for hydration — cool, plain water should always be a first choice for hydration. Energy drinks generally contain large quantities of caffeine and may contain other ingredients, most of which do absolutely nothing to enhance health. Also, the large quantities of caffeine and other stimulants many energy drinks contain can actually increase dehydration, can mask the signs of dehydration and may also lead to increased anxiety, upset stomach, shakiness, headaches, and sleep issues. These potential side effects can actually reduce Soldiers’ ability to perform, NOT enhance it.

Energy drinks should not be confused with sports drinks such as Gatorade® or Powerade®. Sports drinks re-hydrate the body and provide sugars, which the body burns to create energy and replenish electrolytes. Electrolytes maintain salt and potassium balances in the body. Energy drinks may increase dehydration and /or mask the signs of dehydration.
Energy Drinks - continued
The main active ingredient in these products is caffeine. Caffeine is a drug and should be respected, not abused. Caffeine can be used to enhance and extend performance, however, too much can degrade performance.

The level of caffeine in energy drinks is different in each product, but can range anywhere from 50 mg per can to above 200 mg per can, well above the recommended maximum daily intake for most children and teens.

If you are consuming something that advertises itself as an energy product, such as energy drinks or energy shots, you are probably helping yourself to a hefty dose of stimulants.

Beware, “energy” products contain other stimulants besides caffeine, such as guarana, taurine, ginseng, i-carnitine, creatine and/or glucuronolactone.

Performance degradation from too much/many stimulants:
- Dehydration and upset stomach (readiness)
- Anxiety (mental health)
- Shakiness (marksmanship)
- Headaches (mental ability)
- Death from overdose (some may not vomit before they reach toxic levels)

Instead of reaching for energy drinks, it’s best to feed your body energy throughout the day:
- Snack on carbohydrates and energy-rich foods such as dried fruits, nuts, trail mix, a commercial sports bar or low-fat chocolate milk.
- Drink cool, plain water frequently, even if you aren’t thirsty.
- Get at least 8 hours of sleep if you anticipate a long work day or a late night shift the following day. With a full sleep bank, you’ll feel more alert and able to stay awake naturally.

If you do decide to use caffeine, be smart about it. Caffeine is most effective when taken in 100–200 mg doses, although much less may be effective for individuals who do not regularly consume caffeine. Take one hour before needed and discontinue taking within 6 hours of sleep time (lights out). Choose natural sources of caffeine, such as coffee, or sources where caffeine is the only ingredient and the amount per serving is clearly indicated (e.g., caffeine gum).
Plan for the Operational Use of Caffeine

Caffeine in moderate doses improves mental performance, mood, and marksmanship in the most stressful environments and has operational utility.

If you want to use caffeine for extended operations and you normally have a high caffeine intake, it won’t help you when you need it. Caffeine is not useful to those already consuming over 300 mg per day.

The recommended “optimal dose” for caffeine is 200 mg—more is not better. Doses over 200–300mg may produce initial symptoms of restlessness, anxiety, increased heart rate, and insomnia.

Higher doses can lead to more severe adverse reactions to include increased blood pressure, heart palpitations, dizziness, irritability, nausea, nervousness, jitters, and in some cases, death from caffeine overdose.

The chart below provides guidance about proper caffeine dosing. If you decide to use caffeine dosing, remember to limit dose to approximately 200mg and stop dosing at least 6 hours prior to sleep.
Protein Powders
The protein requirements of some soldiers doing extreme activity can be double that of the average person. The protein content of the average North American diet is usually in excess of this and protein intake in excess of these needs will not stimulate increased muscle growth. Only resistance training activities will stimulate muscle growth. If a balanced diet is consumed, using protein powder is a waste of money and can contribute to the building of fat stores not muscle and can cause an upset stomach and diarrhea.

Whey Protein:
Claim: Increases muscle mass and promotes weight gain.
Adverse effects: May cause nausea, thirst, bloating cramps, fatigue, poor appetite and headache.
Research: Shows no benefit in supplementing with whey protein for healthy people. The best protein source is real food because they provide essential nutrients.

Branch Chain Amino Acids
Structurally, all proteins are made up of amino acids. Branch Chain Amino Acids (BCAA) are essential amino acids which means your body cannot make them therefore they have to come from food.
Claim: Increase muscle tissue and reduce protein breakdown after a workout.
Adverse effect: BCAA are generally considered safe however doses higher than 60 grams per day can increase blood ammonia level leading to fatigue and loss of motor coordination.
Research: Shows the benefits of using BCAAs are seen primarily in untrained individuals who are starting out a new strength/resistance training program.
**Creatine**
Creatine is a substance made by the body from amino acids and provides fuel for your muscles. It is also available through the diet from meat and fish. Creatine is stored in muscle, where it plays a role in energy production that can power muscle contractions for repetitive activities lasting less than 30 seconds. The body can only store a small amount of creatine and more than this is excreted from the body in urine.

**Claim:** Improves performance for repetitive high-intensity and short-duration (<30 seconds) activities, increases how long you can perform at maximum intensity for short durations; increases muscle cell volume; and enlarges muscle fibres.

**Adverse Effect:** Generally safe to use for healthy individuals. Side effects include water retention, stomach and/or muscle cramps, nausea, diarrhea, headaches and muscle tightness.

**Research:** Improves short bouts of exercise lasting < 30 seconds. Will not build muscle. There are no training benefits for endurance activities.

---

**Glucosamine**
Produced in the body and is part of the joint cartilage.

**Claim:** Reduces symptoms associated with osteoarthritis, joint pain, back pain and other musculoskeletal problems.

**Adverse Effect:** Gas, abdominal bloating and cramps.

**Research:** Mixed results. Recent studies show no benefit. Some studies show a reduction in the degree of joint pain in active individuals, which may help to postpone and/or prevent joint problems. Glucosamine has been shown to improve the joint function of some people with osteoarthritis. However, some people experience no benefit.

---

**Anabolic Steroids**
Anabolic steroids have very few legitimate medical uses. Most sold on the street are produce on the black market where there is no quality control.

**Claim:** Build muscle and improve performance.

**Adverse Effect:** Liver disease, cancer, heart problems, sudden cardiac death, high blood pressure, mood disorders, depression, reduced fertility, aggressive behaviour etc.

**Research:** While anabolic steroids work to build muscle and increase endurance they should be avoided because of the serious side effects and the potential of containing harmful contaminants.
**Omega Three Fatty Acids**

**Claim:** Increase fat breakdown and improve muscle synthesis; reduce exercise induced muscle soreness/ inflammation; reduce heart rate and improve oxygen delivery to the heart; and improve mental focus and concentration.

**Adverse Effect:** High doses of omega-3 fatty acids may decrease the ability of your immune system to destroy disease-causing agents (such as viruses or bacteria) and may prolong bleeding times.

**Research:** Inconclusive as to the their effectiveness.

**Bottom Line on Supplement Use:**
The CAF does not endorse the use of supplements but recognizes that many CAF members use these products.

The supplement industry is a multi-billion dollar industry with new products introduced regularly making it difficult for government regulatory bodies to monitor and insure only safe products are on the market. Despite being labelled as “natural,” dietary supplements can, and often do cause undesirable side effects. Supplements for sale outside Canada are largely unregulated.

Before considering the use of a supplement consider the following:
Do you need the supplement or can I get the same thing from food?
Who benefits financially from me buying this product?
Is the product safe? Just because it is natural does not necessarily mean it is safe.
Does it have a Natural Product Number (NPN)
Is there trustworthy information on the product available on the claims, side effects and research (don’t trust studies that only report in percentages- maybe a study of only two people)? Testimonials don’t count.
Did you know that technology can help reach one ’s fitness and health goals?

Using technology can help you reach your Performance Triad target goals. You can get feedback, social engagement, motivation, and additional information. There are numerous mobile apps and other technology tools that you can use—find the one that works for you!

- Your smartphone is a powerful partner in enhancing performance and personal readiness. Over 50% of smartphone users search for health information on their phones and one out of five has at least one health app on their phone. Most individuals surveyed on this topic like apps that focus on exercise, nutrition, and weight loss.

- Leveraging social media for health and readiness: Virtual support groups help keep you motivated to meet weight loss goals. People who listened to podcasts, read daily health-related posts, and posted daily Twitter updates on weight loss experienced greater weight loss than those who just reviewed podcasts. Researchers found every 10 tweets posted resulted in ~0.5% weight loss.

- Wireless Activity Trackers (WAT): Devices that track user activity, nutrition, and sleep can help them meet their health and performance goals. These devices combine biosensors, web or smartphone applications, and online communities so users can track personal progress, create online competition between friends, and use the data to help motivate change.

- Evidence supporting the effectiveness of activity monitoring technology for promotion of physical activity behavior is emerging. Self-monitoring through the use of pedometer-based interventions has increased awareness and physical activity during 1–6-month trials. Individuals who used tracking devices increased their physical activity by 26.9% over the baseline.
**Warrior Challenges**
Take a Warrior Challenge! This area of the guidebook has 18 challenges for you and your team to choose from. You can challenge yourself, your team, or a unit. The Challenges can also push you to dig deep and achieve what seems difficult. They can help train you to find the mental, emotional and physical reserve when you are in harms way.

Always remember, though, to be careful and stay safe. Do your risk assessment and treat it like any other training event. Check your ego at the door and don’t push it when your body is in pain. Have fun, but be smart and remember, Safety First!

**Organizing Individual, Team and Unit Challenges**
These challenges can be done individually or as a team.

*Individual Challenges:*
These are designed to be done on their own but can also be done in a group to receive immediate feedback.

*Team Challenges:*
- **Option 1:** Break down the challenges into distinct pieces. For example, if you have a team of 3 and the challenge is a Sprint Triathlon, you can have 1 person swim, 1 bike and 1 run.
- **Option 2:** Form teams of 8–10 that perform the entire event, but score only the best 4 or 5 towards the challenge score

**Scoring Suggestions**
Here are some suggestions to score your events and make them even more competitive and fun.

*Individual and Team Events*
Score each participant in a rank order fashion. For example, whoever finishes first is given a score of “1.” The next person is then given a score of “2,” and so on. If you have 10 people in your group, you will have 10 total scores ranging from 1 to 10 (you can also assign the scores the other way: 10 for the first and 1 for the last). Ensure you have rules for tie-breakers for each event!
# Weekly Challenge Options

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Description</th>
<th>Level (Individual, Team)</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Double Marathon”</td>
<td>Get 104,800 steps in one week (2 marathons)</td>
<td>Individual</td>
</tr>
<tr>
<td>Walking Lunge</td>
<td>400m walking lunge (time)</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Bench Press</td>
<td>Max repetition bench press at a goal weight of the Soldier’s body weight</td>
<td>Individual</td>
</tr>
<tr>
<td>Run</td>
<td>10 km run (Goal = under 50 minutes)</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Deadlift</td>
<td>Max repetition deadlifts at a goal weight of [Soldier’s body weight x 1.5]</td>
<td>Individual</td>
</tr>
<tr>
<td>Kettlebell Push Press</td>
<td>100 Kettlebell Push Press 35lb for time</td>
<td>Individual</td>
</tr>
<tr>
<td>Row</td>
<td>Rowing Machine 5 km for time</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Ruck March</td>
<td>13 km ruck march with 35lb minimum load</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Bike</td>
<td>10/20/30 km</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Core Challenge</td>
<td>Longest time in 4 plank positions (front/side x2/bridge)</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Pull-ups</td>
<td>Max repetition pull-ups</td>
<td>Individual</td>
</tr>
<tr>
<td>Functional Fitness Workout</td>
<td>400m Run, 53 lb kettlebell squats, 12 pull-ups. 3 rounds</td>
<td>Individual</td>
</tr>
<tr>
<td>Shuttle Run</td>
<td>300m shuttle run</td>
<td>Individual</td>
</tr>
<tr>
<td>Burpees</td>
<td>7 minutes of Burpees</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Powerlifting</td>
<td>1-repetition maximum of Bench Press, Deadlift, Back Squat</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Sprint Triathlon</td>
<td>Swim 500 m/bike 20 km/run 5k</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Swim</td>
<td>15 consecutive minutes for distance</td>
<td>Individual, Team</td>
</tr>
<tr>
<td>Ground to Overhead</td>
<td>30 reps for time with a goal weight of [Soldier’s body weight x .75]</td>
<td>Individual</td>
</tr>
</tbody>
</table>
The Finish Line
You can also give other non-fitness “bonus” points for promoting health and wellness.

Bonus Points:
- Attendance at PSP and Health Promotion training events and lectures that promote health
- Greatest % weight loss
- Greatest % gain on the weight lifting portion
- Family Involvement—double the points for involving Family members in any of the challenges
- Lead, organize or participate in a community “fun run,” health fair or other local event
References/Resources:
Canadian Society for Exercise Physiology CSEP – 24-hr movement guidelines
http://csep.ca/home

Nutrition and Athletic Performance- Position of Dietitians of Canada, the Academy of Nutrition and Dietetics and the American College of Sports Medicine.

Warfighter Nutrition Guide- Human Performance Resource Center- US Military
http://hprc-online.org/nutrition/performance-nutrition/copy_of_warfighter-nutrition-guide

Top Fuel for Top Performance Nutrition Workshop - Strengthening the Forces
https://www.cafconnection.ca/Kingston/Adults/Health/Health-Promotion-en/Core-Programs.aspx

Performance Enhancers Facts and Bottom line- The Canadian Forces Health Services Group-Strengthening the Forces

The Dietary Supplement Dilemma- Helpful or Harmful- The Canadian Forces Health Services Group-Strengthening the Forces