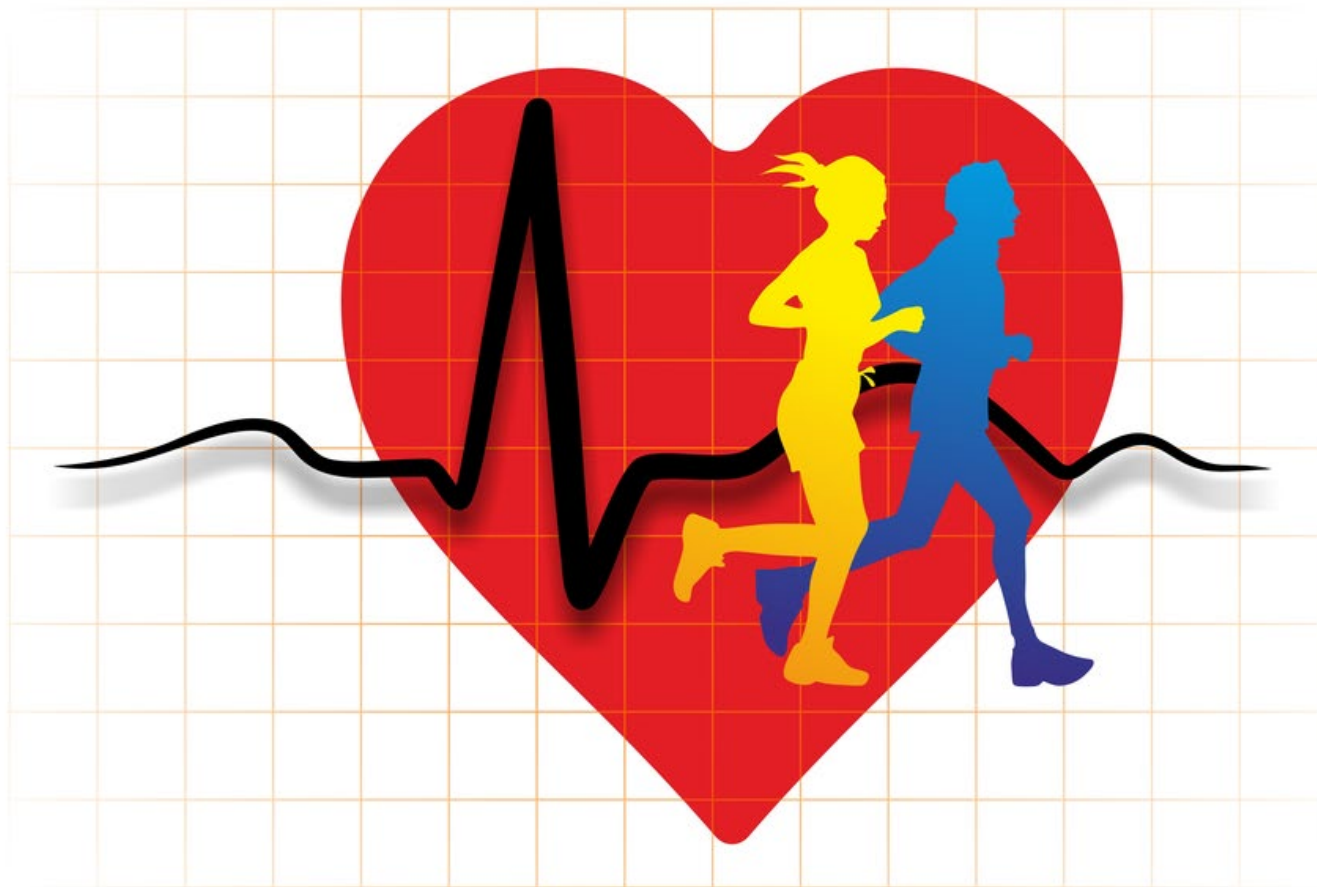


Exercise for your Heart

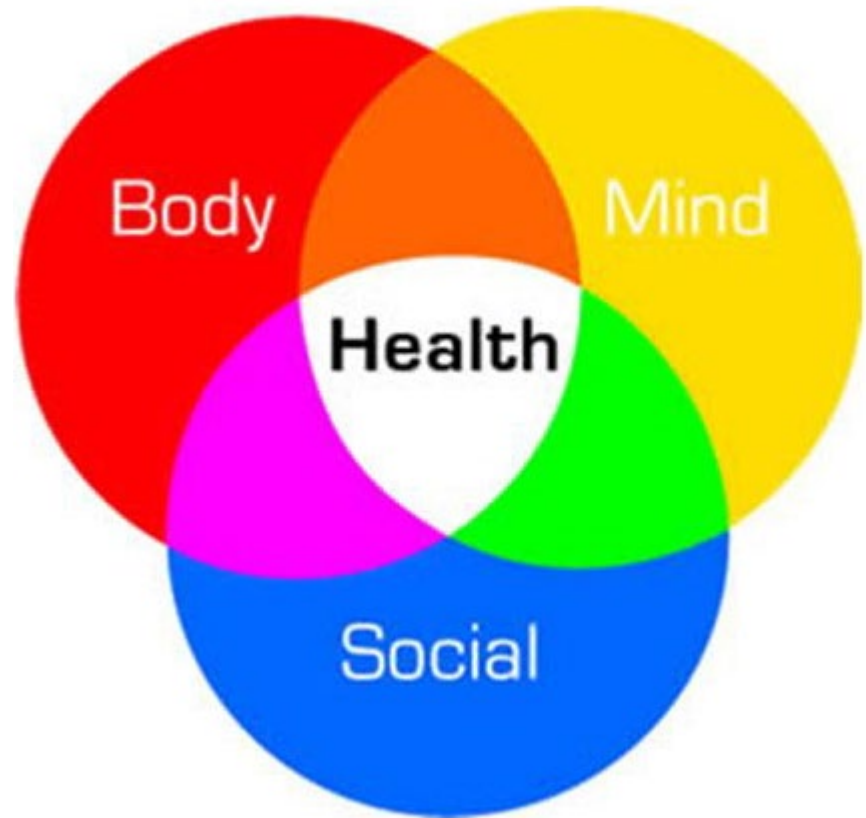
Linda Paumer MA

February 2024



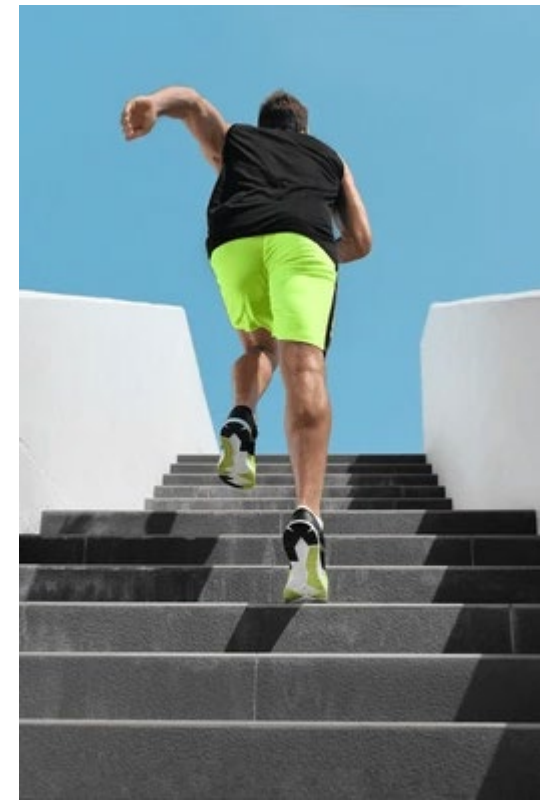
Reasons to Workout are Myriad

- Physical fitness
- Physical health
- Mental fitness
- Mental health
- Emotional fitness
- Social fitness
- Spiritual fitness



Cardiovascular Fitness

- Cardiovascular fitness says a lot about your health and the potential for health outcomes. Simply put, CV fitness is how well your body takes in oxygen and delivers it to your muscles and organs during prolonged periods of exercise.
- Generally, the higher your CV fitness level, the lower your risk for developing a variety of conditions.
- Low levels of CV fitness are associated with a high risk of cardiovascular disease, certain cancers and higher mortality rates, according to the AHA.



Cardiovascular Fitness

This is the ability of the heart and lungs and blood vessels to work together efficiently. Blood is pumped, transporting oxygen, nutrients and waste products to and from the working muscles. It is these systems working together in an integrated fashion that enables a cardiovascularly fit person to perform high levels of work



Cardiovascular Activities

- sustained
- large muscle groups
- oxygen is needed to sustain the activity (“aerobic”)
- heart rate elevates

Because of these requirements, cardiovascular activities improve cardiovascular fitness.



Cardiovascular Activities *(Examples)*

Using legs as primary muscle group:

walking, running, cycling, stepping, skating, recreational activities incorporating these skills (basketball, soccer, hockey, etc.)

Using arms as primary muscle group:

swimming, rowing, propelling a wheel chair, arm ergometry

Using both arms & legs:

cross-country skiing, stationary cycling with arm component, rowing if done right

Aerobic Capacity (CV fitness)

- Your aerobic capacity is your body's ability to deliver oxygen to working muscles.
- Non-exercising people lose about 1% a year of this capacity, or 10% per decade.
- Long-term exercise training studies show that you can cut this loss in half by staying active (5%/decade).
- Most of the health benefits of exercise stem from improved fitness, so if you remember nothing else, building aerobic capacity is your most important reason to exercise.



Metabolic Cost

- Every physical activity has a metabolic cost.
- The more intense the activity, the greater the metabolic cost (takes more METs)
- Tolerance for activities is a function of their cost relative to a person's capacity
 - A 3 MET activity (eg. walking 3 mph on level ground) represents a maximal activity (100%) for someone with a 3 MET capacity but is low level (~33%) for someone with a 10 MET capacity.

Levels of Activity - Got METs?

MET = metabolic equivalent

1 MET = energy cost of rest

1 MET = approximately 70 calories/hour

3 METs = an exercise intensity equivalent to
3 times the metabolic rate at rest

6 METs = an exercise intensity equivalent to
6 times the metabolic rate at rest, etc.

Levels of Activity

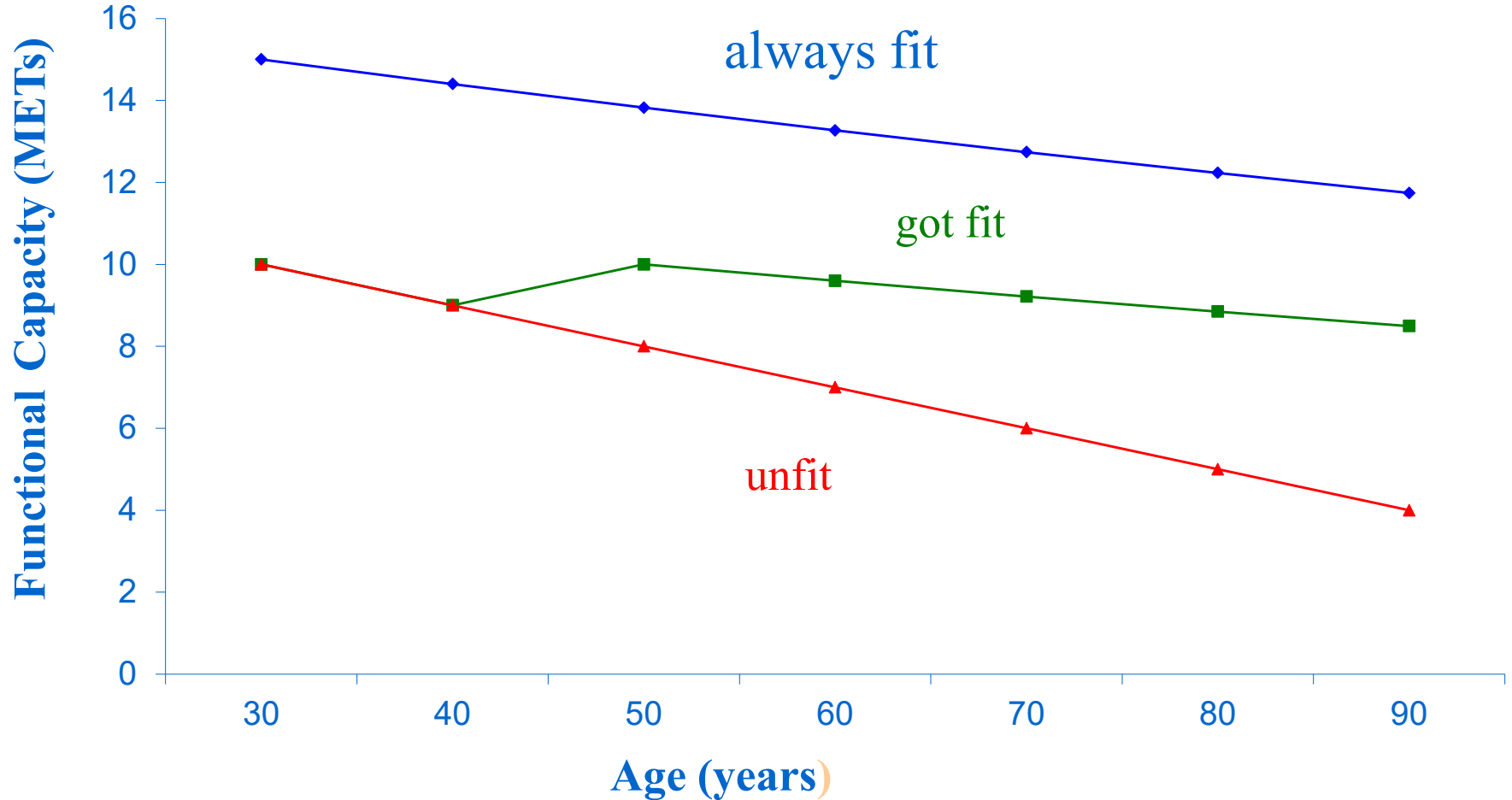
	cal/hr	cal/min
1 MET	70	1.2
2 METs	140	2.3
3 METs	210	3.5
4 METs	280	4.7
5 METs	350	5.8
6 METs	420	7.0
7 METs	490	8.2
8 METs	560	9.3

Equating METS With Activity

1 MET	3 METs	8 METs	16 METs
<hr/>			
1 mph	3 mph	5 mph	10 mph



Aerobic Capacity & Aging



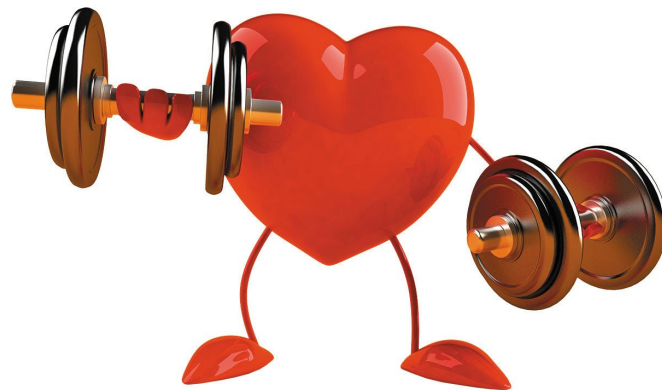
Exercise Benefits

- Reduce risk of cardiovascular disease
- Control body weight
- Reduce risk for type 2 diabetes/metabolic syndrome
- Reduce risk of some cancers
- Strengthen bones and muscles
- Improve mental health and mood
- Improve ability to do daily activities and prevent falls
- Increase chances of living longer



Reduces Blood Pressure.

- Exercise helps reduce your blood pressure as the arteries widen, the blood flows through more freely, and your blood pressure eventually starts to drop.
- Hypertension also decreases as the result of exercise because your heart, a muscle, is getting a workout. The stronger your heart muscle gets, the greater its ability to pump blood through the arteries, which also helps to reduce your blood pressure.



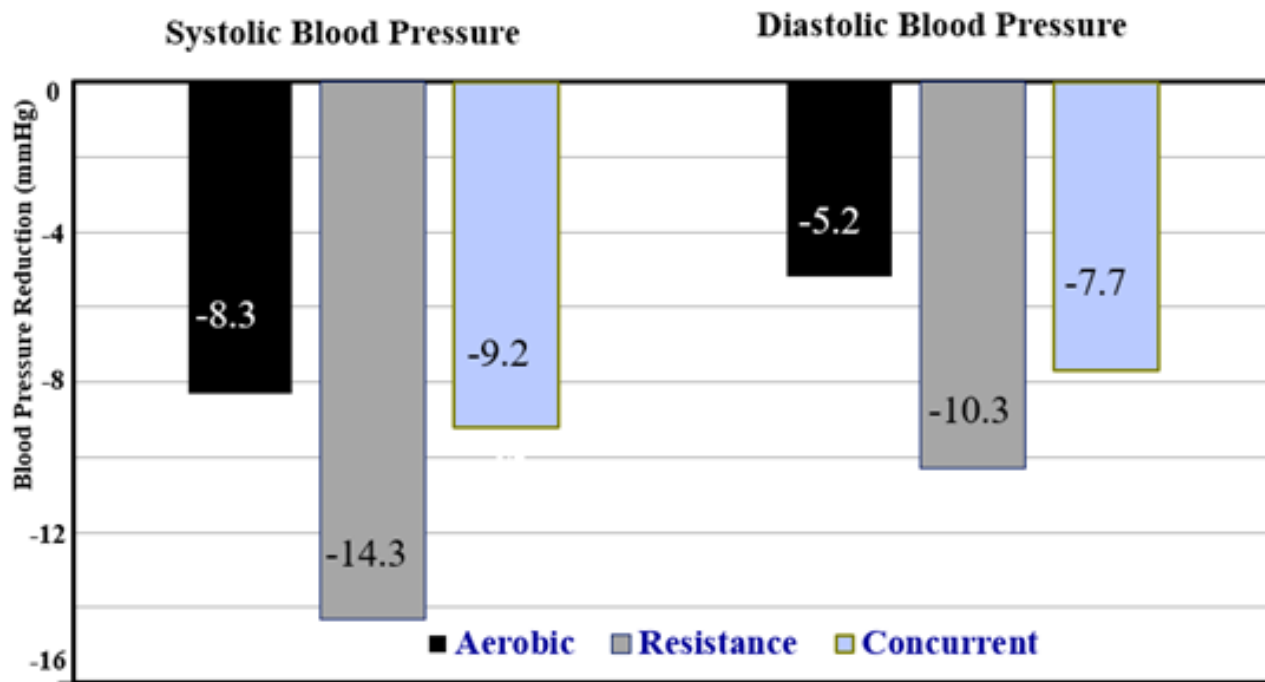
Acute BP Changes With Exercise

- Resistance exercise will show more profound increases in SBP than aerobic activity
- Arm work will increase SBP more than leg work
- Hypertensive people will have more profound increases in BP than normotensives
- Training state will affect elevations In BP
- Heart function will affect ability to elevate BP
- Take advantage of opportunities to know your BP



Chronic BP Changes

Figure. The *Greatest Potential* Blood Pressure Reductions Following Aerobic, Resistance, & Concurrent Exercise Training among Adults with Hypertension (adapted from 11-13*)



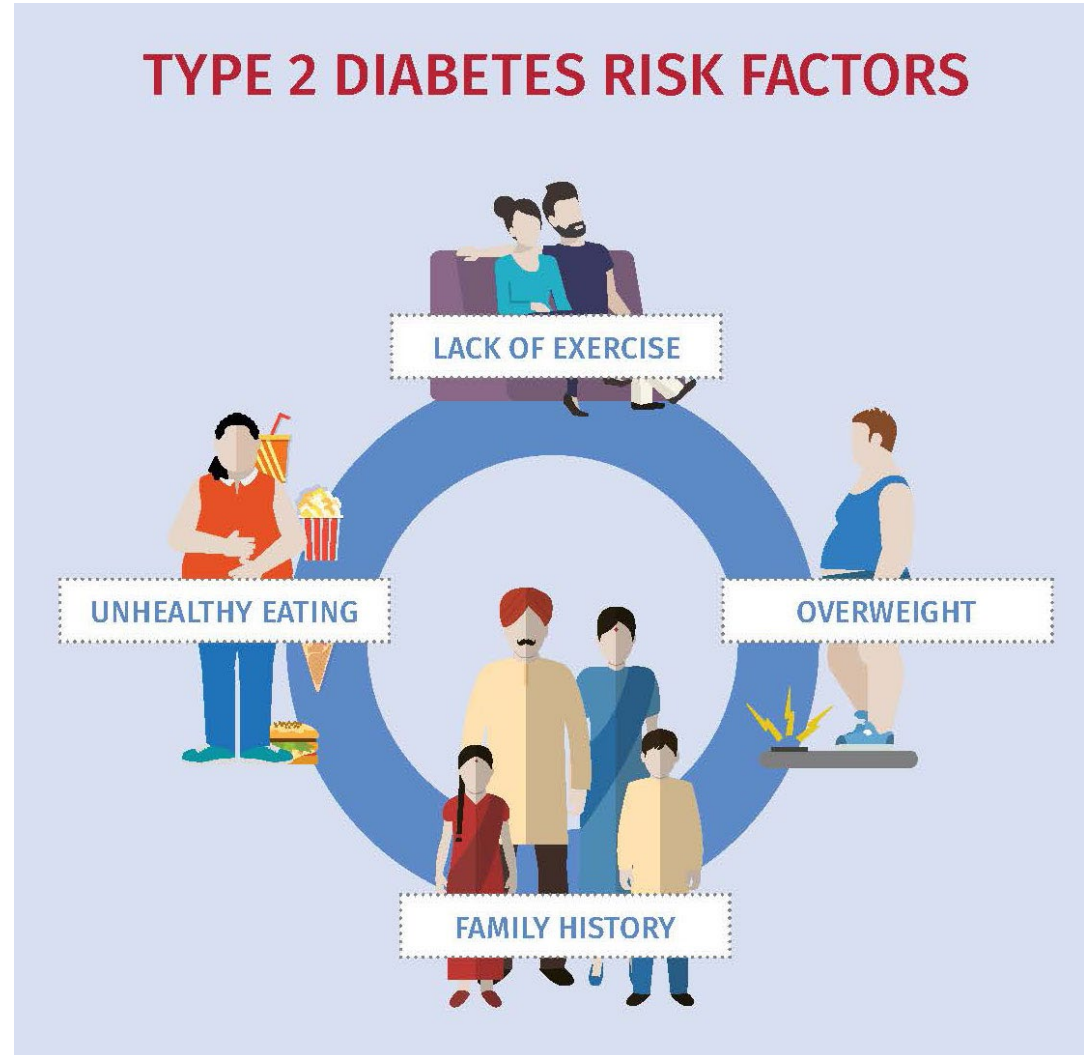
*The BP reductions after resistance (12) and concurrent (13) exercise were generated from additive statistical models that capture the combination of study-level moderators that elicit the optimal BP benefits.

The good news is the greatest BP improvements following exercise are seen in those with the highest resting BP.

Cornelissen and Smart (11), MacDonald et al. (12), and Corso et al. (13)

Lowers Type 2 Diabetes Risk

- By engaging in regular physical exercise, you improve your body's ability to metabolize glucose, the key to staying off this disease.



Blood Sugar & Exercise

Blood Glucose Level	Guidelines
Lower than 100 mg/dL (5.6 mmol/L)	Your blood sugar may be too low to safely exercise. Eat a carbohydrate containing snack.
100 to 250 mg/dL (5.6 to 13.9 mmol/L)	You're good to go! This is a safe pre-exercise zone.
> 250 mg/dL (13.9 mmol/L) or higher	Your blood sugar may be too high to exercise safely. Postpone your workout until your blood sugar drops to a safe pre-exercise range.

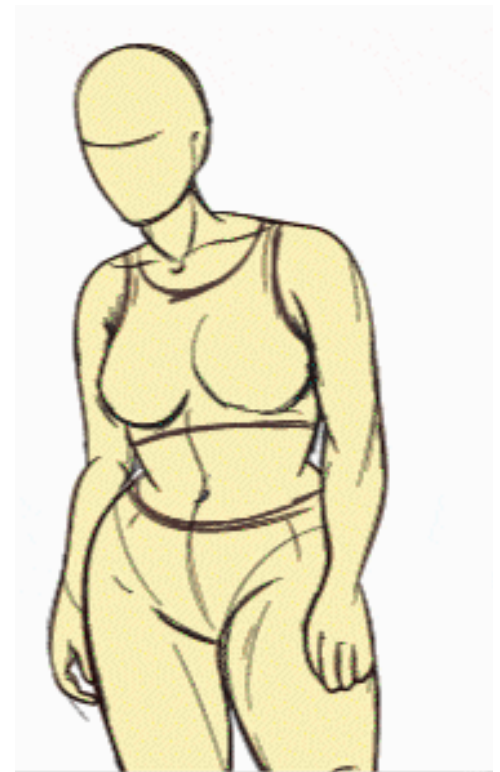
Boosts Energy

- Blood flow benefits from exercise help carry oxygen and nutrients to muscles. When your body is functioning more efficiently, you've got more oxygen to fuel your body's cells. You can go about your daily activities without fatigue.
- Metabolism raised by exercise stays elevated long after workout is over.



Weight Control

- Exercise burns calories, effectively speeding up metabolism, and play a large role in maintaining ideal body weight.
- Keeping body weight at a healthy level has positive effects on multiple risk factors (blood pressure, serum lipids, diabetes, stress) and improved fitness is a big part of that picture.



Builds muscle mass

- Without regular strength activities, muscle strength will decline at the rate of – guess what – $\sim 1\%$ /year.
- Keeping your muscles strong also helps you stay more aerobically fit and helps you maintain a healthy lean (or fat-free) body mass.
- Adequate strength is a key determinant of maintaining function – the ability to tasks of daily living (getting up, etc).



Bones Strengthening

- Exercise is the key to maintaining bone health.
- Weight bearing activities (walking/jogging/stepping) and resistance exercise (weight lifting) are the things considered to be most helpful in keeping bones strong.



Improves breathing

- Exercise can improve breathing by strengthening the muscles that help your lungs open up to bring in oxygen and compress to push out carbon dioxide.
- Exercise also improves the efficiency with which oxygen permeates the cells of your body through its effects on aerobic capacity.



Boosts Immunity

- When exercising, natural killer cells that destroy tumors and viruses increase. Gamma-interferon (a disease-fighting protein), T-cells (part of the immune response), and B-cells (part of disease-destroying antibodies) all increase. This all boosts immunity.
- Exercise improves the quality of sleep, which aides in recovery.
- Elevated body temperature during exercise can also help fight infection.



Better Sleep

- Physical exertion during the day keeps the body's circadian rhythm in tune.
- Exercise reduces stress and tires us out so that we're able to sleep longer and better.
- Sleeping better at night also improves immune function, helping lower risk for heart disease, diabetes, and cognitive impairment.

Even when they get the same amount of sleep (average weeknight 6 -7 hours), people who exercise report getting better sleep than those who don't work out. They're also much less likely to report sleep problems, including waking up too early or trouble falling asleep in the first place.



WORKOUT TIPS FOR A GREAT SLEEP

Plan your workout to ensure you'll get the best results both in the gym, and while you sleep.



MORNING

Suggested workout:
Cardio

When working out in the morning – allow more time to warm up to get muscles ready.



AFTERNOON

Suggested workout:
Strength

Try to allow your body 4-5 hours to fall asleep after a strenuous strength workout.



EVENING

Suggested workout:
Yoga

Avoid high impact workouts late in the evenings. They stimulate the brain, preventing us from falling asleep.

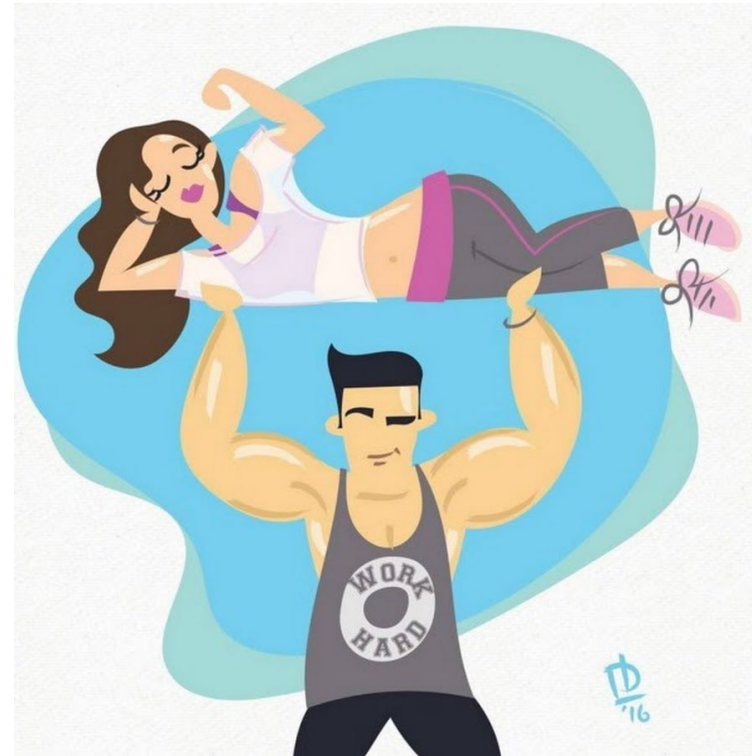
Improves Sex Life

- Keeping your muscles active through use helps promote the demands placed on your endocrine glands to produce more hormones.
- With more muscle mass comes greater stimulation to produce androgens, which help both men and women maintain their sexual functioning.
- You are also likely to feel more fit and *be* more fit, which in turn will benefit your interest in and ability to carry out sexual activity.
- Your emotional resilience will also be greater if you exercise, which also benefits your relationship health.



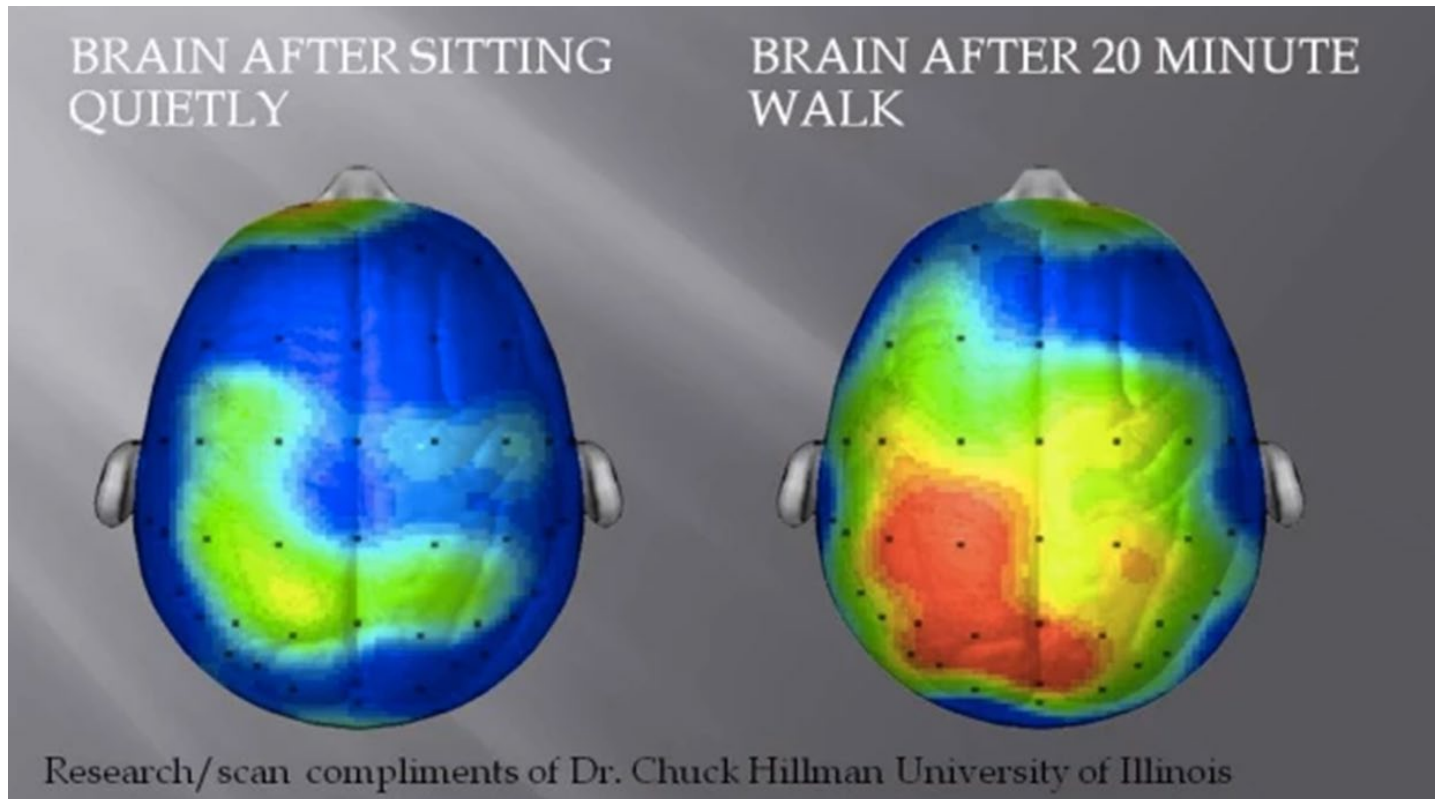
Intimate Activities

- The average energy cost of sexual activity is ~ 1.5 to 3 METs, the lower being for kissing and hugging and the upper limit for more intense activities
- Sex doesn't count as serious exercise although 30 minutes of vigorous sex every day could possibly contribute to improved fitness. Such a high level of intense sexual activity is unlikely to be sustainable however.



Mental Effects

Exercise causes a surge in endorphins--the body's natural painkillers. They give a feeling of euphoria. They stimulate the brain's frontal lobe, leading to increased focus and attention span.



Boosts memory

- The effects of exercise on many of your bodily systems ultimately pays off in improving your cognitive functioning.
- Moderate walking can help the brain's memory center, the hippocampus, maintain its health and vitality.
- Memory also benefits from a general lowering of cortisol, the stress hormone, associated with the improved mood and anxiety levels experienced with exercise.



Lowers Dementia Risk

- Exercise lowers your chances for developing dementia based on cardiovascular illness because you're improving the flow of blood throughout your body, including your brain.
- Researchers have found recently that lowering a person's risk for diabetes can lower the risk of Alzheimer's disease.



Risk of Arthritis

- Unlike the other physical benefits of exercise, reducing the chances of arthritis doesn't depend on aerobic activity or weight training.
- You may actually heighten your risk of arthritis if you do too much of the wrong kind of exercise (excessive “high impact” activities).



Risk of Arthritis

- Flexibility training with stretching, through yoga, Tai Chi, or other ways to increase the range of movement of your joints is what is helpful.
- Improved flexibility will lower the risk of injury through muscle tears or torn ligaments, and in the process protect your joints from damage caused by overuse.



Improves Mood

- People who exercise regularly also have lower risk of depression.
- Exercise is an established behavioral treatment for anxiety & depression.
- Regular exercise-related boosts in mood eventually improve your overall mental health over the long term.
- Those who engage in physical activity claim to be happier than those who are inactive.



Stress Management

- Aerobic exercise reduces levels of stress hormones like cortisol and adrenaline. In so doing, it provides a safety valve that shuts off the fight-or-flight effect our bodies undergo when we experience stress, anger, or hostility.
- It also ups the calming, good-mood brain chemicals serotonin and dopamine. So the physical stress of exercise can be very mentally relaxing.



Lowers Anxiety

- As levels of endorphins increase, feelings of worry diminish. When exercising, attention is focused away from daily problems to the workout itself.
- You can gain a fresh perspective on preoccupying concerns in life by taking an exercise break.
- When you return to these daily problems, you approach them with renewed energy and even some new ways to figure out solutions.



Mental Strength

- Feeling success with a good workout can lead to success outside of the gym, too. When training, you learn about yourself, about discipline, about pushing your limits and about your capabilities.
- These traits are very easily carried over to your job, your relationships, your abilities as a parent and so many of life's daily challenges.



The Mental Release

- A good workout clear the mind of past and future stress and helps one focus more on the here and now.
- Walking/hiking/exercise can be form of moving meditation – a way to focus on the present moment and not waste mental energy worrying about the future or replaying the past.



Boosts Confidence

- Completing a tough workout can give you a serious confidence boost.
- Sticking to a plan—getting to the end of the workout—can make you feel like you can take on the world.
- Seeing progress is a morale booster -- measured with lifting heavier weights, doing more Watts on the bike, and also by giving you the feeling you can take on anything.



Exercise shows your body some love

- No matter what your reasons for doing a workout, there's no doubt that exercise is a way to respect your body.
- When you take care of yourself, you can handle the challenges that your day throws at you.
- Nothing beats that post-workout pride high: You came, you saw, you conquered. Getting a workout accomplished is definitely a reason to pat yourself on the back, so be proud! Especially if you had to dig deep for the motivation to do it in the first place.



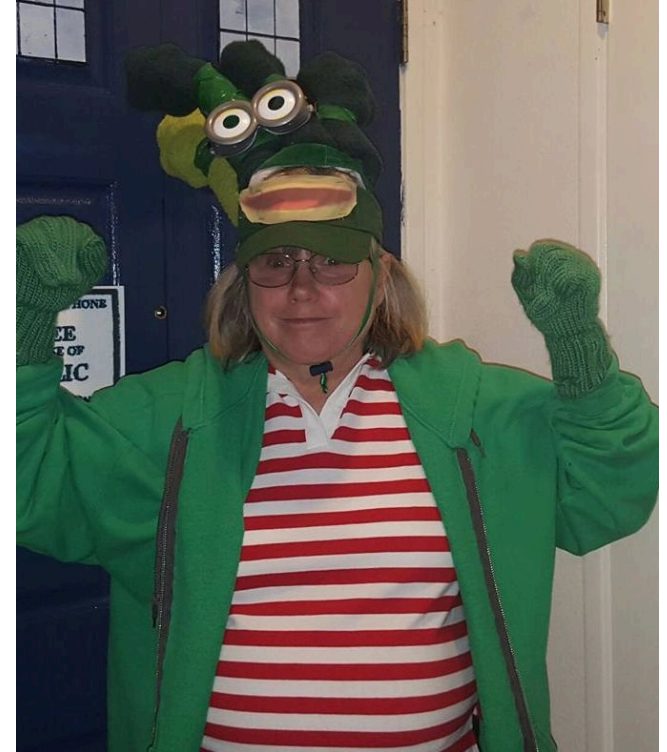
It's fun

- Some people like to exercise in a group class because they enjoy the social opportunities it provides.
- Some people like to exercise alone to to have time to themselves away from the stress of work and family.
- Whatever your exercise style, once you get into a routine, you'll find that the activity itself becomes rewarding.
- The fulfilling nature of the activity is fun and healthful and since you will want to keep doing it, it will enrich the quality of your life.



An excuse to wear something fun

- Workout clothes are just plain fun—bright colors, wild patterns, comfortable fabrics. So take inventory of what you have, see how many amazing new outfit possibilities you can create.
- Challenge yourself to mix colors, combine patterns, and try something you may not have dared at a crowded gym. We all need a little bright spot right now, so why not make your leggings one of them?



The Ability to Say ‘Yes’ to Adventure

Many cool opportunities in life are out there if you are fit enough to try.

- “Go for a hike?” “Backpack across Europe?” “Mountain bike with grandkids?” “Canoe like Lewis & Clark?” “Fly a kite at the beach?”
- Without a strong foundation of health, fitness and wellness, the ability to do the things we want most in life becomes more and more difficult.
- Don’t miss out, allow yourself the power to choose what you do, rather than letting your health decide for you.



The Power to Inspire Others

- You will inspire others to work hard when they see you do the same.
- Your fitness habits may influence your friends and peers, and they also have a direct impact on the next generation, meaning think of the example you are setting for your children & grandchildren



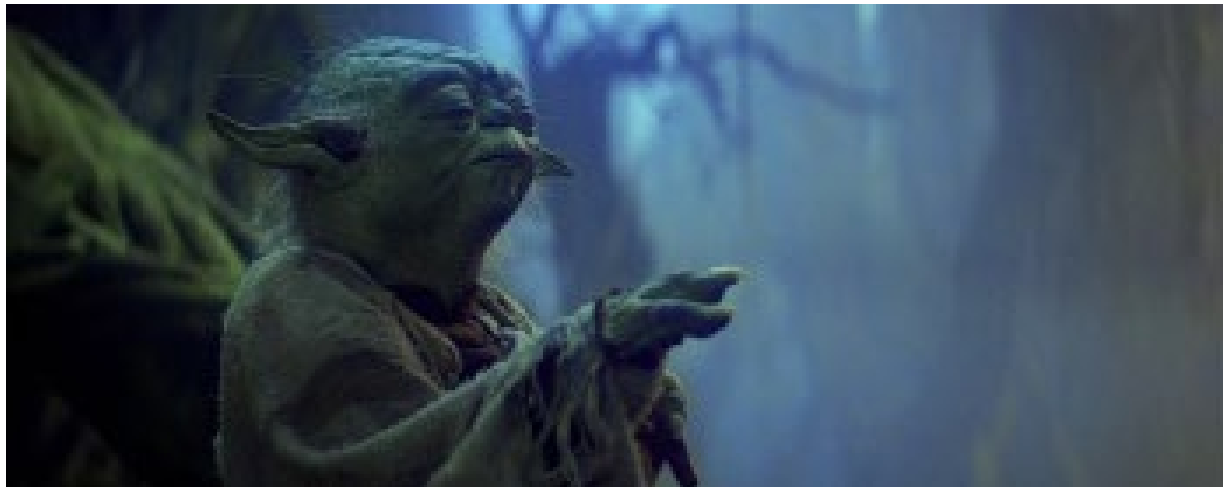
Social Connections

- Sometimes working out isn't just about the exercise. It's about the company you keep. It's a nice way to get some real, human interaction when you workout with others.



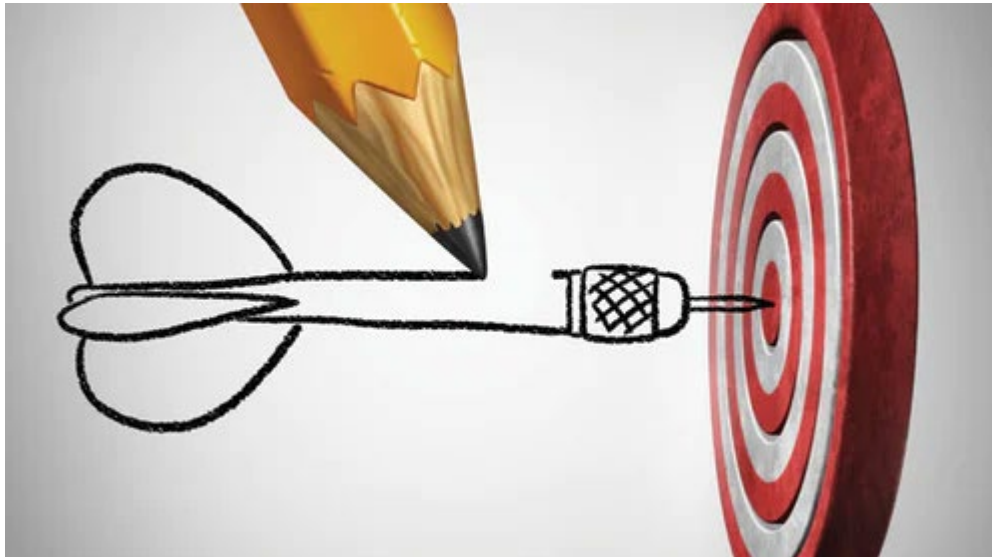
Because You Can

- We all know people who suffer because they can no longer do the physical things they used to. Over time, we likely all will have to give up things we really love to do.
- Hold on to your function the best you can. Accept your losses and strive to maintain your abilities the best you can. Don't let go without some effort!

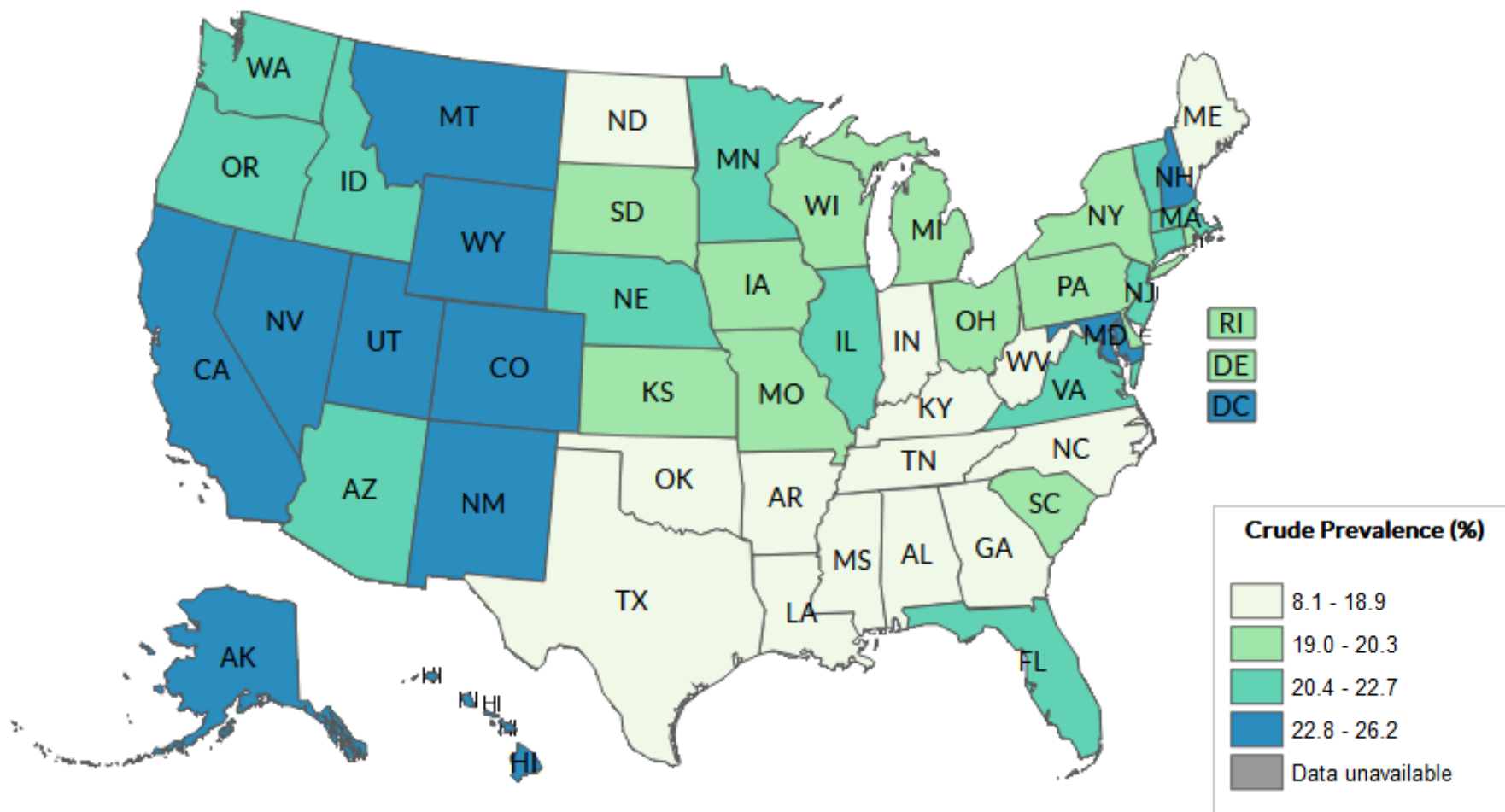


CWP Training Goals

- 30-60 minutes sustained cardiovascular activity 3-5 days per week
- At least 2 strength training workouts per week
- Flexibility activities daily
- Balance training activities if warranted



2015: Prevalence of participation in enough Aerobic and Muscle Strengthening exercises to meet guidelines (CDC)



Progressive Loading

Increase the duration and intensity of your exercise sessions little by little

~5 minutes/week, ~ 50-60% intensity level for 1st few weeks

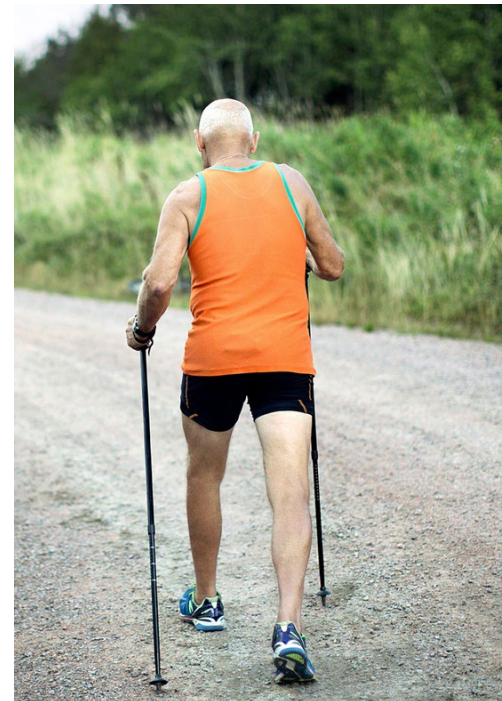
Long term goal is a regular exercise program

- 30-60 minutes/session
- 3-5 sessions/weeks
- 60-90% intensity level



Specificity of Training

Adaptations occur most specifically when loads are applied in a direct manner. The biceps muscle becomes stronger when you do biceps exercises. Your tolerance for walking improves the more you walk.



Crossover Training

Adaptations that have occurred can improve your tolerance for other activities. Improving your cardiovascular fitness with consistent bike riding should improve your walking or jogging tolerance. Strengthening your legs through weight training should improve your biking tolerance.





Any activity with a walking component will provide some cardiovascular training.



