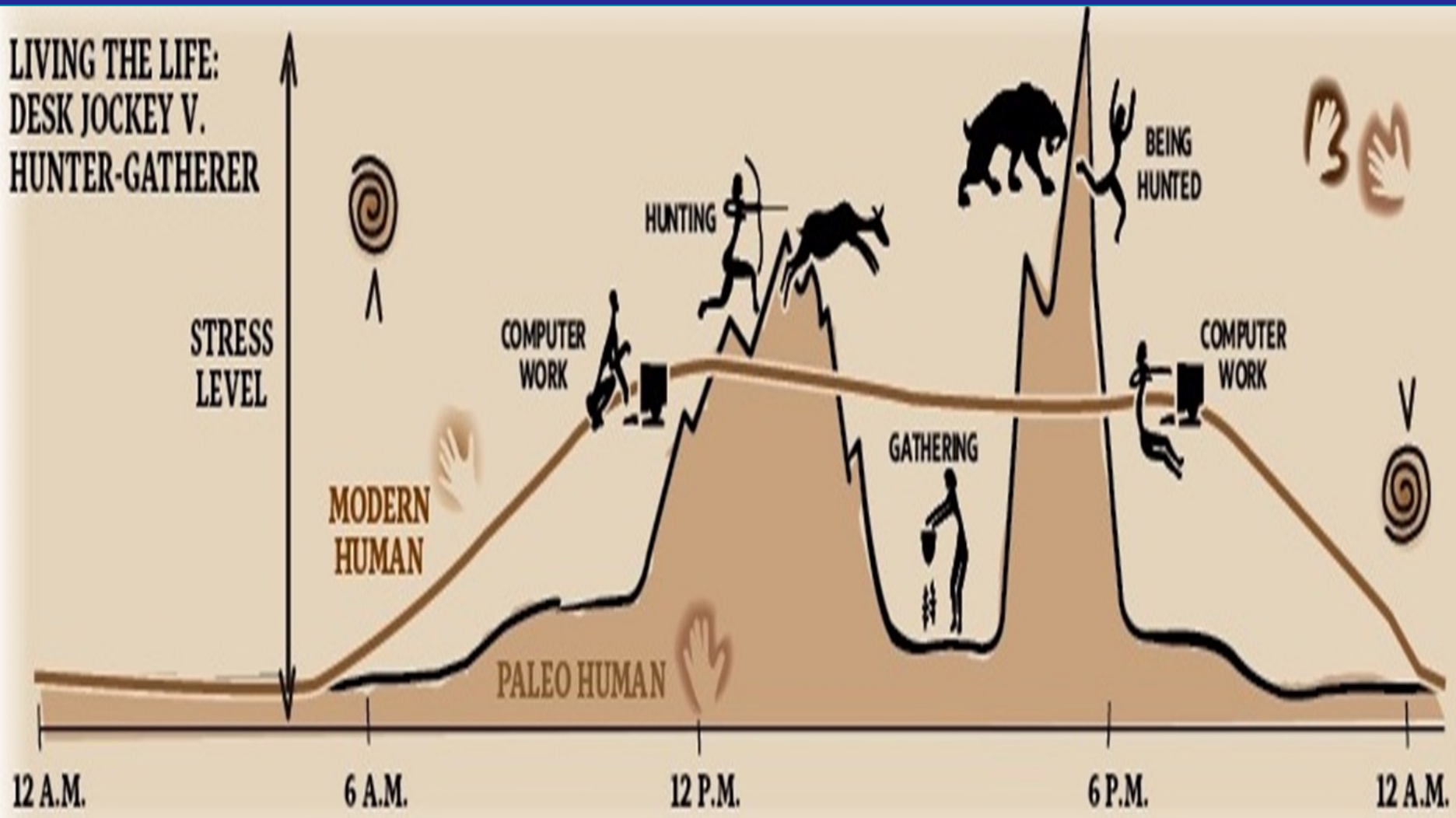


# *Get Your Move On: The New Science of Exercise*

James F. Loomis, MD, MBA, DipABLM,  
FACLM

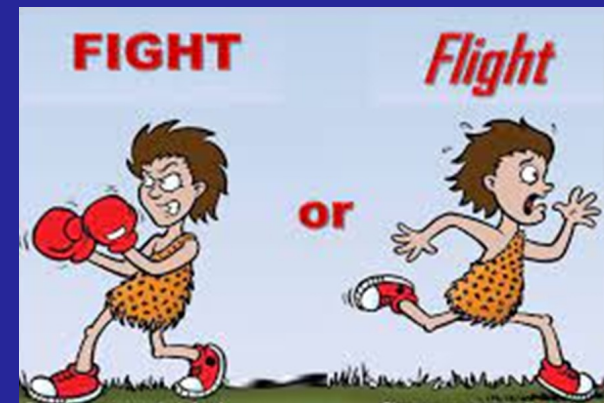
Medical Director, Barnard Medical Center  
Washington, DC

# LIVING THE LIFE: DESK JOCKEY V. HUNTER-GATHERER



- Like any living creature, we are designed to try and live long enough to find a mate and pass on our DNA
- Two primary tasks for that to occur:
  - Find food when were starving
  - Not be someone else's food when they are starving

- **This was the origin of most of our stress**
  - Adrenaline gets us ready
  - Cortisol helps us recover
- **We had to respond to that stress by being physical active**
  - Gather and hunt food
  - Run away from or fight the leopard



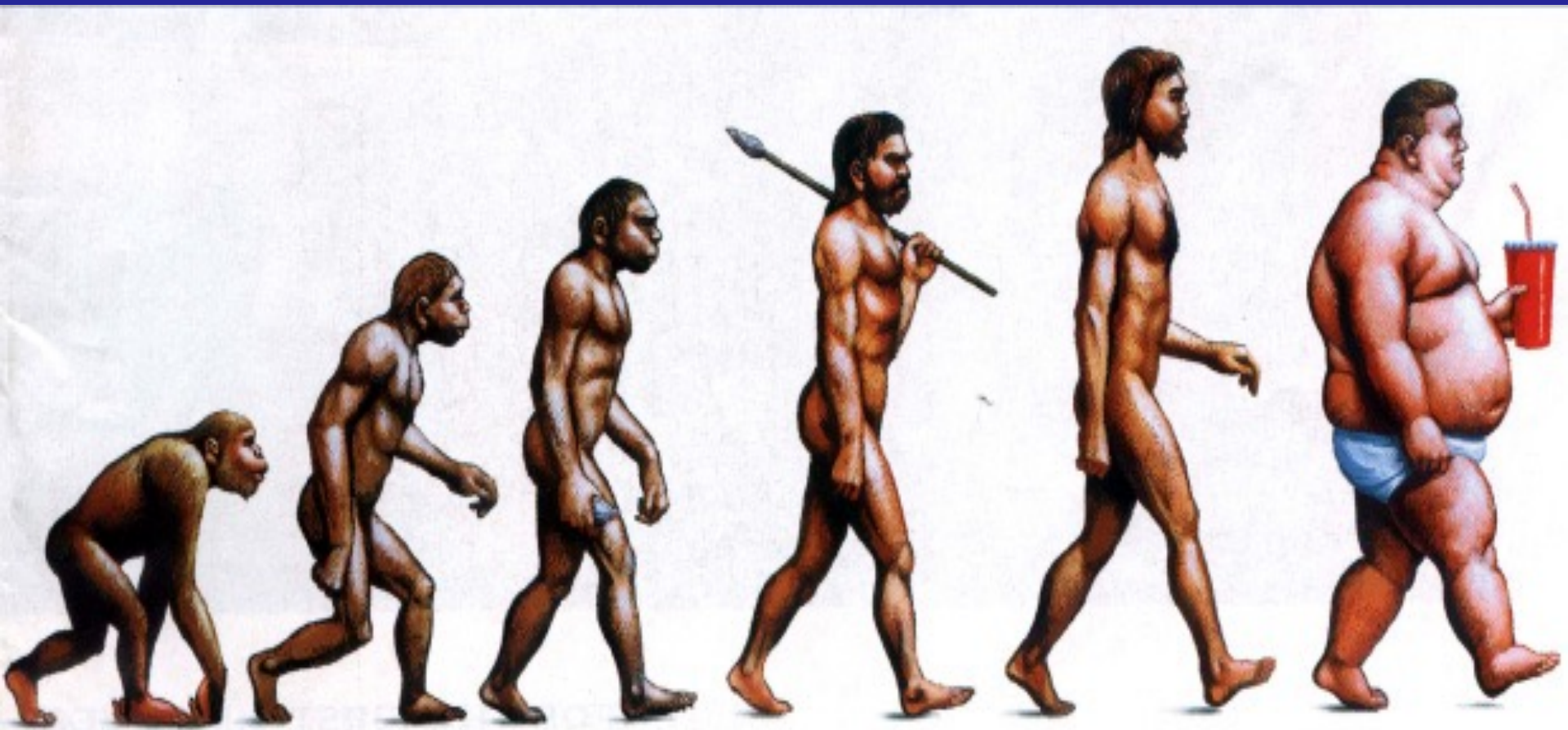
- **Assuming we survived, that's when we would rest, recover and refuel**
  - We refueled with whatever we could find around us on a given day
  - The less energy we had to spend, the less energy we had to find
  - Mostly plants!
- **Repetitive stress, activity, recovery = resilience**
  - Stronger, Faster, Longer

- **We are designed to be physically active**
  - Anatomy and physiology
  - Biomechanics
  - Metabolism and nutritional needs
  - Stress response



# WE ARE ALL ATHLETES!







- **Don't eat what we are designed to eat**
  - Too much meat, dairy, processed foods



- **Don't recover from stress**
  - Too much alcohol, caffeine and tobacco
  - Not enough sleep





- No longer required to spend energy to get energy



- Sedentary lifestyle more prevalent with advances in technology



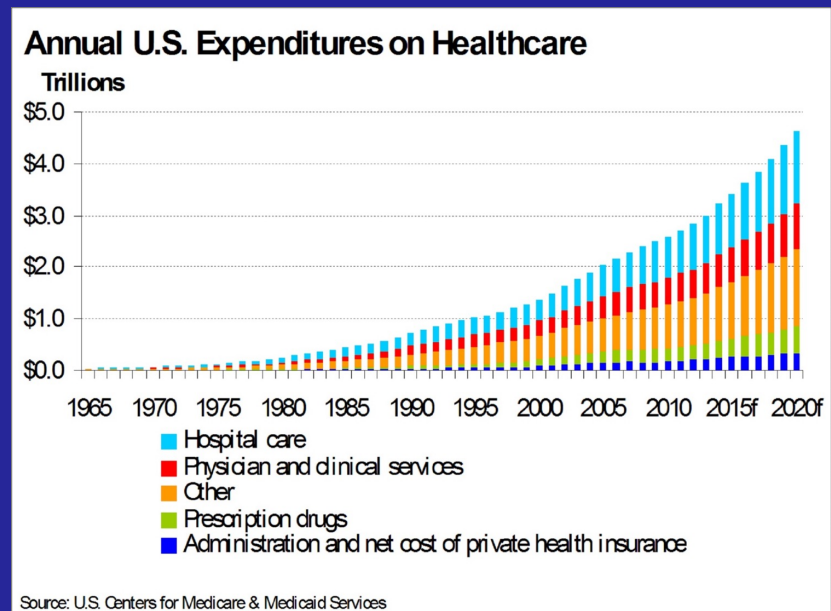
- Physical activity has “devolved” into exercise
  - Viewed as discrete event
    - Put on special clothes
    - Go to a special place
    - Has beginning and end
  - We either exercise or we don't



# PREVALENCE OF INACTIVITY

- 1 out of every 4 adults is physically inactive
- Caused 9% of premature deaths worldwide
  - 10 percent reduction in inactivity could avert 533,000 deaths every year

- 90% plus of the cause of 90% plus of the chronic health problems I see every day are caused by this mismatched lifestyle
- Chronic disease rates and health care costs related to these lifestyle related disease skyrocketing







- **Limit Exposure to Environmental Toxins**
  - Mainly tobacco, alcohol
  - Pesticides, herbicides, antibiotics residue, hormones, heavy metals
- **Emotional Wellness**
  - Coping with stress, recovering from stress (sleep)
- **Nutritional Wellness**
  - Eat what we are supposed to eat, don't eat what we are not supposed to eat
- **Physical Wellness**



# DIET AND EXERCISE

- You don't park your car for a year, but still put gas in 5 x a day
- Even if emptying gas tank, you don't put 30 gallons of gas in a 15 gallon gas tank
- You don't put diesel gas in your car if it runs on regular unleaded

We often take better care of our cars than we do of ourselves!

# EXERCISE AND STRESS

- The more stress you have the more physical activity you need
- Your brain equates worrying about COVID with seeing a leopard
  - Same stress response
  - Too much adrenaline = anxiety, increased blood pressure, difficulty sleeping
  - Too much cortisol = stress eating , weight gain



## Adults and Older Adults

- Lower risk of all-cause mortality
- Lower risk of cardiovascular disease mortality
- Lower risk of cardiovascular disease (including heart disease and stroke)
- Lower risk of hypertension
- Lower risk of type 2 diabetes
- Lower risk of adverse blood lipid profile
- Lower risk of cancers of the bladder, breast, colon, endometrium, esophagus, kidney, lung, and stomach
- Improved cognition\*
- Reduced risk of dementia (including Alzheimer's disease)
- Improved quality of life
- Reduced anxiety
- Reduced risk of depression
- Improved sleep
- Slowed or reduced weight gain
- Weight loss, particularly when combined with reduced calorie intake
- Prevention of weight regain following initial weight loss
- Improved bone health
- Improved physical function
- Lower risk of falls (older adults)
- Lower risk of fall-related injuries (older adults)

## Cancer Survivors

- Improved health-related quality of life
- Improved fitness

## Breast Cancer Survivors

- Lower risk of dying from breast cancer
- Lower risk of all-cause mortality

## Colorectal Cancer Survivors

- Lower risk of dying from colorectal cancer
- Lower risk of all-cause mortality

## Prostate Cancer Survivors

- Lower risk of dying from prostate cancer

## People with Osteoarthritis (knee and hip)

- Decreased pain
- Improved physical function
- Improved health-related quality of life
- No effect on disease progression at recommended physical activity levels

## People with Type 2 Diabetes

- Lower risk of cardiovascular disease mortality
- Reduced progression of disease indicators: hemoglobin A1c, blood pressure, body mass index, and lipids

## People with Dementia

- Improved cognition

## People with Multiple Sclerosis

- Improved physical function, including walking speed and endurance
- Improved cognition

## People with Spinal Cord Injury

- Improved walking function, muscular strength, and upper extremity function

## People with diseases or disorders that impair cognitive function (including ADHD, schizophrenia, Parkinson's disease, and stroke)

- Improved cognition



# TYPES OF ACTIVITY

- **Aerobic exercise**
- **Strength exercise**
- **Mobility exercises**
- **Warm up/cool down**

# AEROBIC EXERCISE

- **FITT**

- **F = Frequency**

- Most days (at least 3 days a week)

- **I = Intensity**

- RPE
- Heart rate ( $220 - \text{age} = \text{theoretical max HR}$ ; 60-80% of max)

RPE Scale	Rate of Perceived Exertion
10	<b>Max Effort Activity</b> Feels almost impossible to keep going. Completely out of breath, unable to talk. Cannot maintain for more than a very short time.
9	<b>Very Hard Activity</b> Very difficult to maintain exercise intensity. Can barely breath and speak only a few words.
7-8	<b>Vigorous Activity</b> Borderline uncomfortable. Short of breath, can speak a sentence.
4-6	<b>Moderate Activity</b> Breathing heavily, can hold short conversation. Still somewhat comfortable, but becoming noticeably more challenging.
2-3	<b>Light Activity</b> Feels like you can maintain for hours. Easy to breathe and carry a conversation.
1	<b>Very Light Activity</b> Hardly any exertion, but more than sleeping, watching TV, etc.

## – T = Time

- 75-150 minutes per week of moderate to vigorous aerobic activity each week
- Can be performed in 30- to 60-minute blocks, or accumulated throughout the day in 5- to 10-minute periods

## – T = Type

- Any activity that develops cardiovascular and pulmonary fitness

## Moderate-Intensity Activities

- Walking briskly (2.5 miles per hour or faster)
- Recreational swimming
- Bicycling slower than 10 miles per hour on level terrain
- Tennis (doubles)
- Active forms of yoga (for example, Vinyasa or power yoga)
- Ballroom or line dancing
- General yard work and home repair work
- Exercise classes like water aerobics

## Vigorous-Intensity Activities

- Jogging or running
- Swimming laps
- Tennis (singles)
- Vigorous dancing
- Bicycling faster than 10 miles per hour
- Jumping rope
- Heavy yard work (digging or shoveling, with heart rate increases)
- Hiking uphill or with a heavy backpack
- High-intensity interval training (HIIT)
- Exercise classes like vigorous step aerobics or kickboxing

# STRENGTH TRAINING

- Any activity that place loads on muscles forcing them to work harder

- Machine or free weights



- Resistance bands



- Body weight



- **Should involve major muscle groups of the body**
  - Legs, hips, back, chest, abdomen, shoulders, and arms
- **Perform at least 2 days a week**
- **No specific amount of time**
- **Should be performed to the point at which it would be difficult to do another repetition**
  - One set of 8 to 15 repetitions of each exercise is effective
  - 2 or 3 sets may be more effective



SIDE SHOULDER



BACK



FRONT SHOULDER



BACK OF ARM



CHEST



FRONT OF ARM



LEGS



STOMACH



# BODYWEIGHT EXERCISES

## 7 DAILY MOVES



DOWNLOAD THE FREE APP @ [www.7dailymoves.com](http://www.7dailymoves.com)

# MOBILITY EXERCISE

- Important for maintaining functional capacity
- **Flexibility**
  - Stretching
  - Increases range of motion
  - May help prevent injury
- **Balance**





# WARM UP/COOL DOWN

- Moderate and vigorous exercise is best preceded by a warm-up and followed by a cool down period
- Usually involves doing the planned exercise at a lower intensity and speed and allows the body to prepare for more vigorous activity
- A cool down is done to aid recovery and following vigorous exercise can prevent exercise-associated postural hypotension



# RISK OF EXERCISE

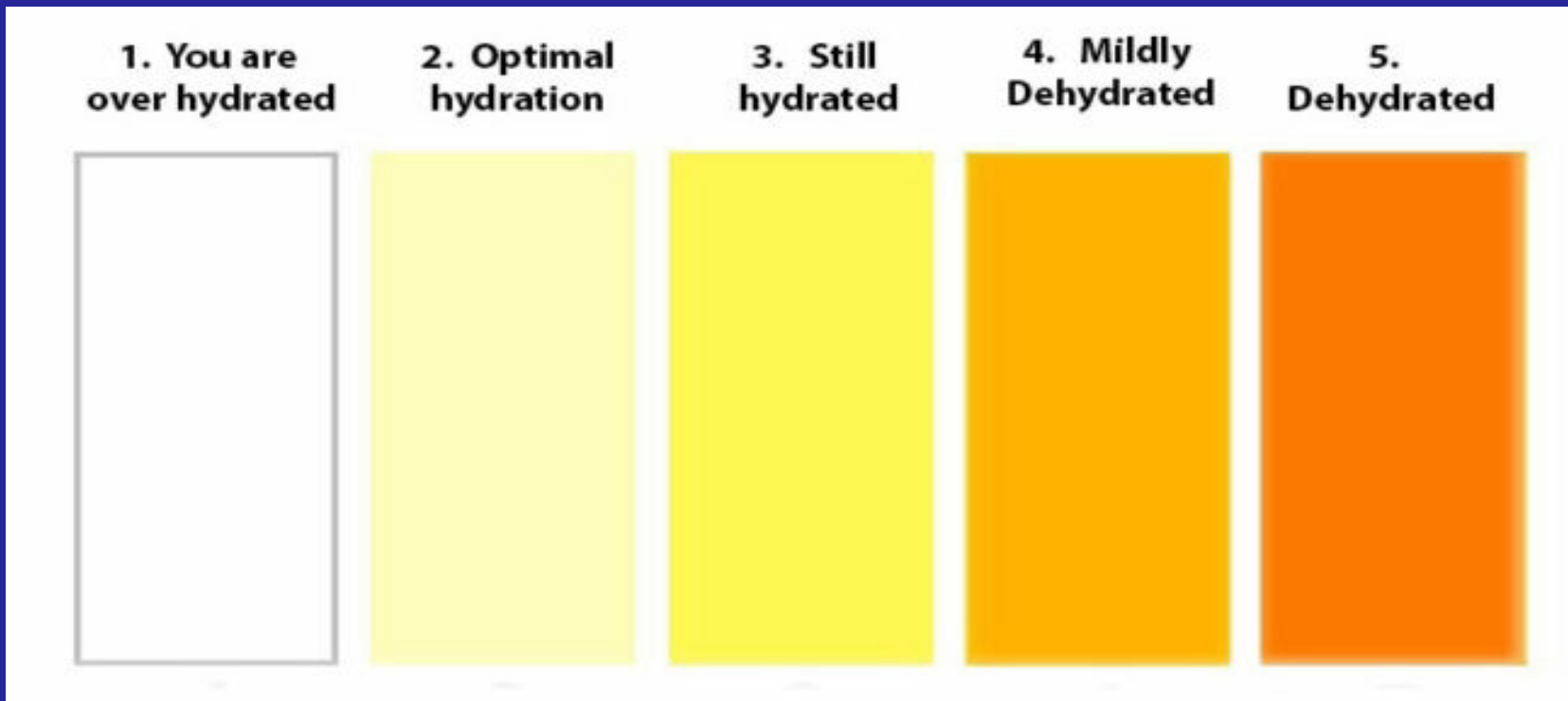
- **Musculoskeletal injury**
  - Increased with age and total time per week spent exercising
- **Heart Events**
  - Heart attack
  - Arrhythmia
  - Sudden death

**Check with your health care provider before beginning an exercise program**

- **Heat-related illness**

- Ensure proper hydration

- Thirst not a good indicator

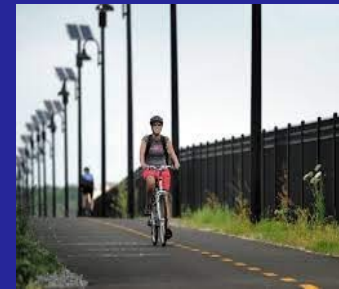


- Understand the risks, yet be confident that physical activity can be safe for almost everyone
- Choose types of physical activity that are appropriate for your current fitness level and health goals
- Increase physical activity gradually over time
  - Inactive people should “start low and go slow”
  - Start with lower intensity activities
  - Gradually increase how often and how long activities are done

- Use appropriate gear and sports equipment



- Choose safe environments



- Be under the care of a health care provider if you have chronic conditions or symptoms







# ADIPOSE TISSUE

# BLOOD-PLASMA

# MUSCLE

Triglyceride  
(50,000-100,000 kcal)

glycerol

Intramuscular  
Triglyceride  
(2,000-3,000 kcal)

GLYCOGEN

FFA

FFA—Albumin → FFA

Fatty Acids

FFA

Acetyl-CoA

Mitochondria

Krebs Cycle &  
Electron Transport

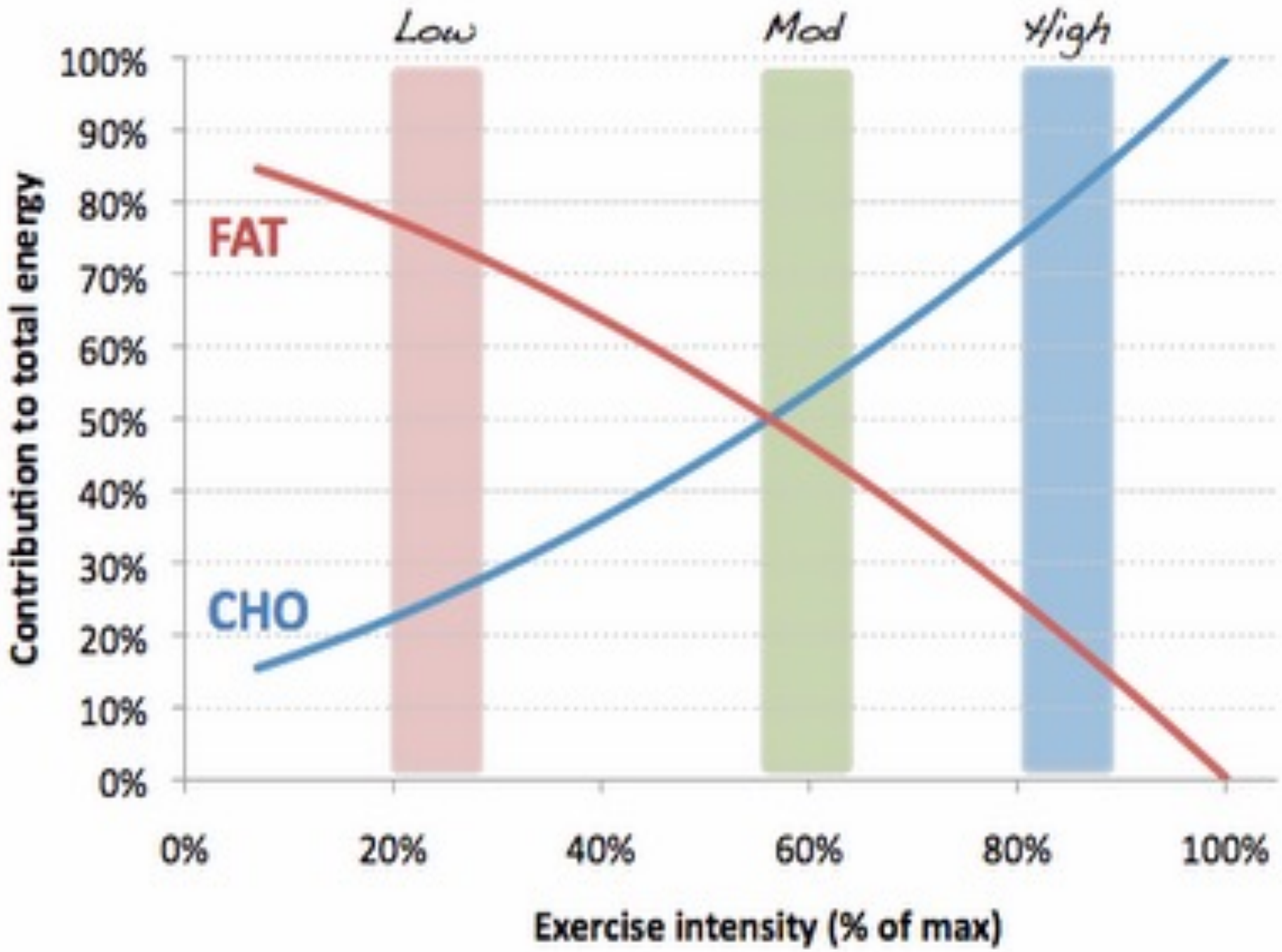
ATP  
Energy

O<sub>2</sub>

	<u>kcal</u>
<b>Carbohydrates</b>	
Liver glycogen	451
Muscle glycogen	1,025
Glucose in body fluids	62
	<hr/>
<b>Total</b>	<b>1,538</b>

## **Fat**

Subcutaneous	70,980
Intramuscular	1,465
	<hr/>
<b>Total</b>	<b>72,445</b>



- Running expends about 720 kcal/hr
  - Glycogen = **2 hrs** running
  - Fat stores = **100 hrs** running



# OPTIMAL NUTRITION

- Mirrors our plant-strong ancestral diet
  - 75-80% unprocessed carbohydrate
    - High fiber
    - Optimum for glycogen repletion
  - 10-15% plant-based protein
  - Low fat
    - 10% fat

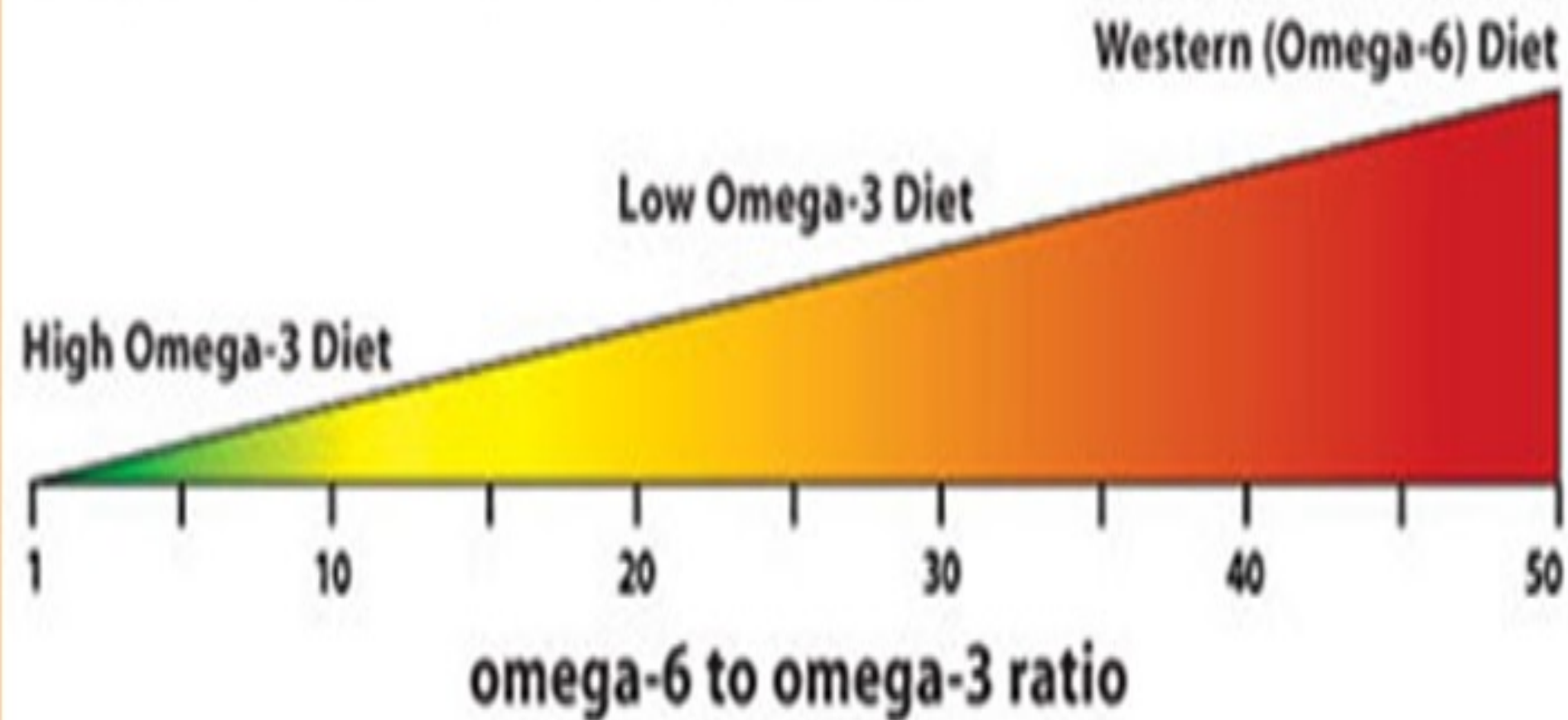
# OPTIMAL NUTRITION

- **Anti-inflammatory**
  - High intake of dietary anti-oxidants
  - Low omega 6/omega 3 ratio (less than 5/1)



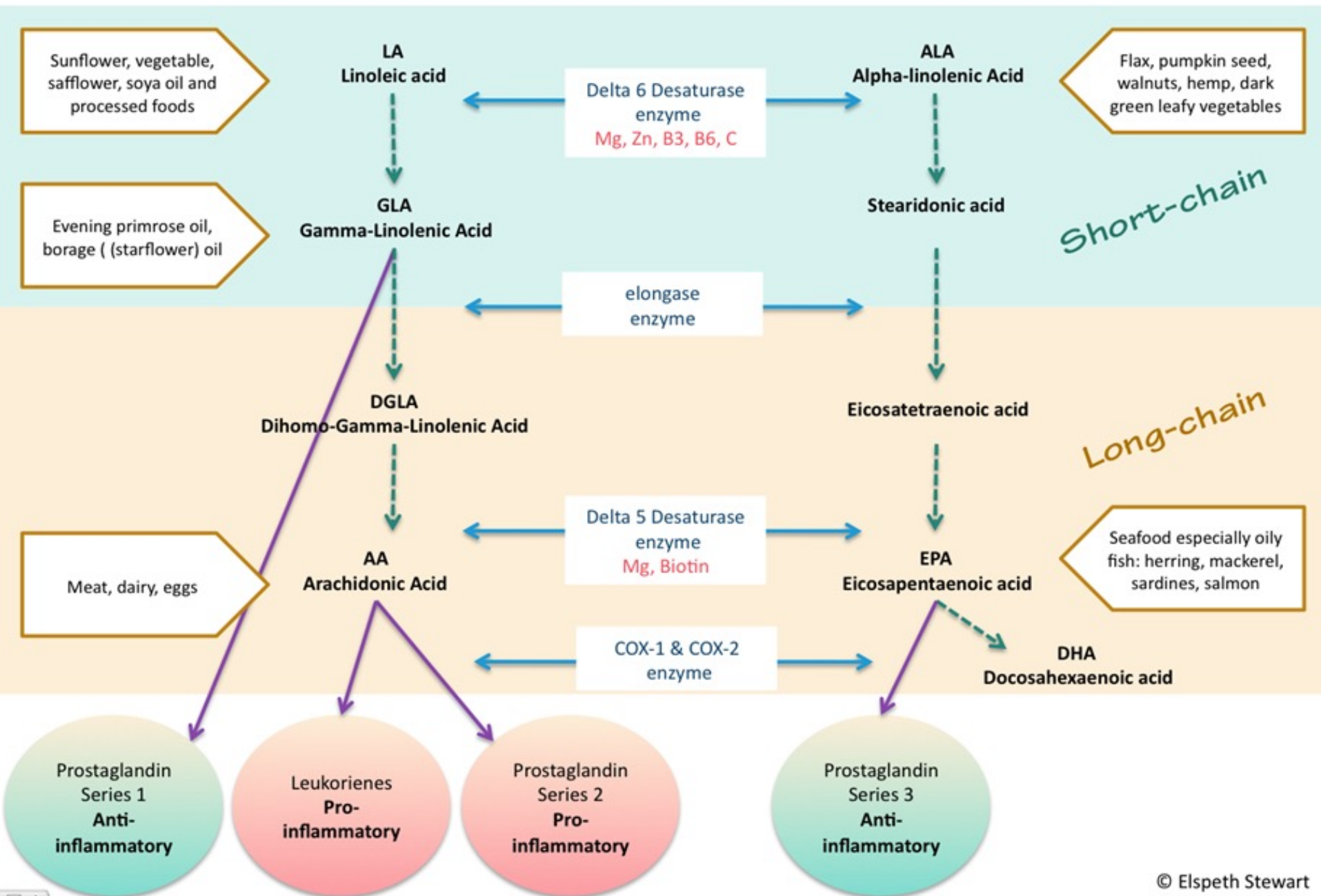


# Omega 6 to Omega 3 Ratio in Different Populations



## Omega 6 pathway

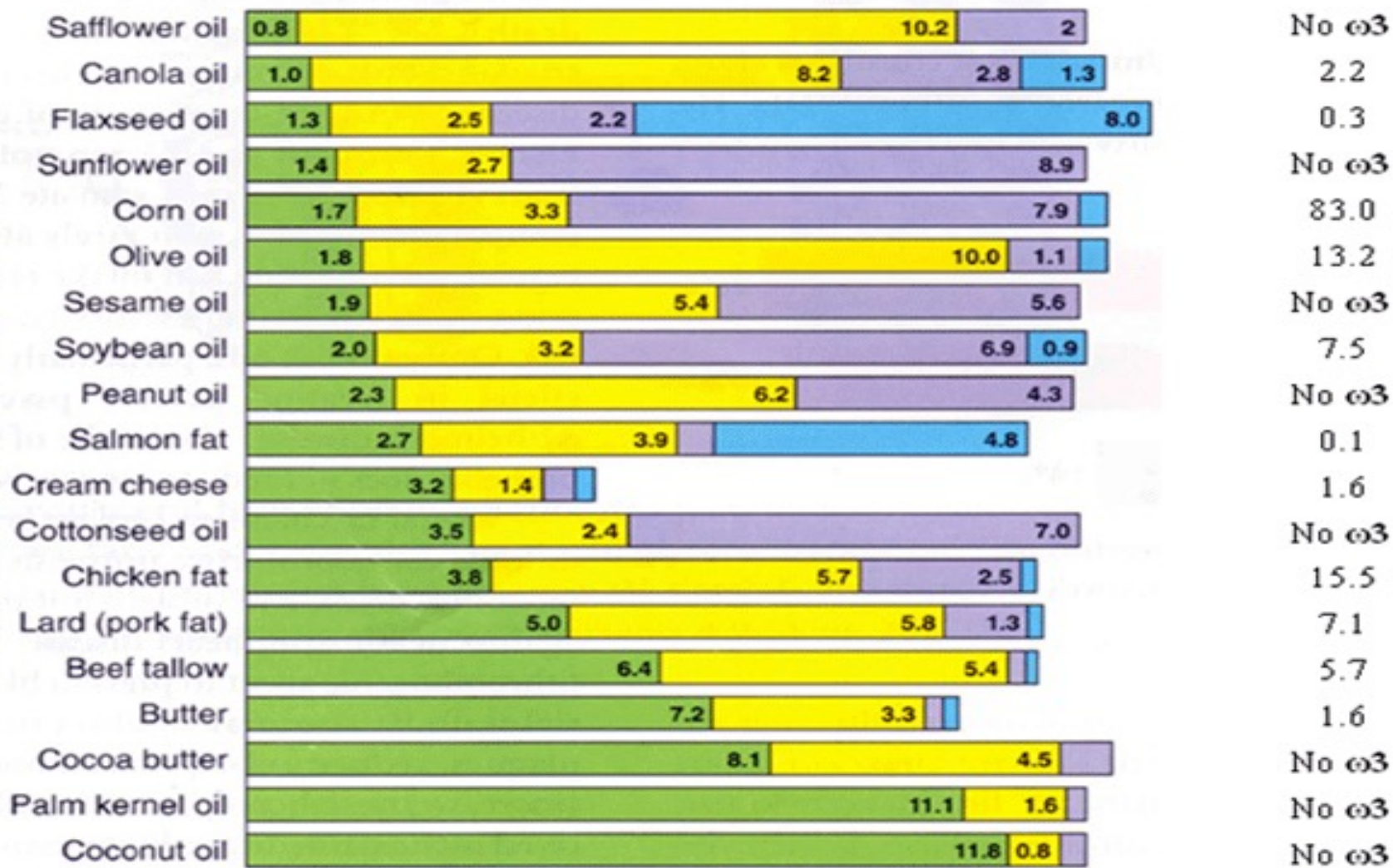
## Omega 3 pathway



# Fatty Acid Content (grams per tablespoon)

$\omega$ -6:  $\omega$ -3 ratio

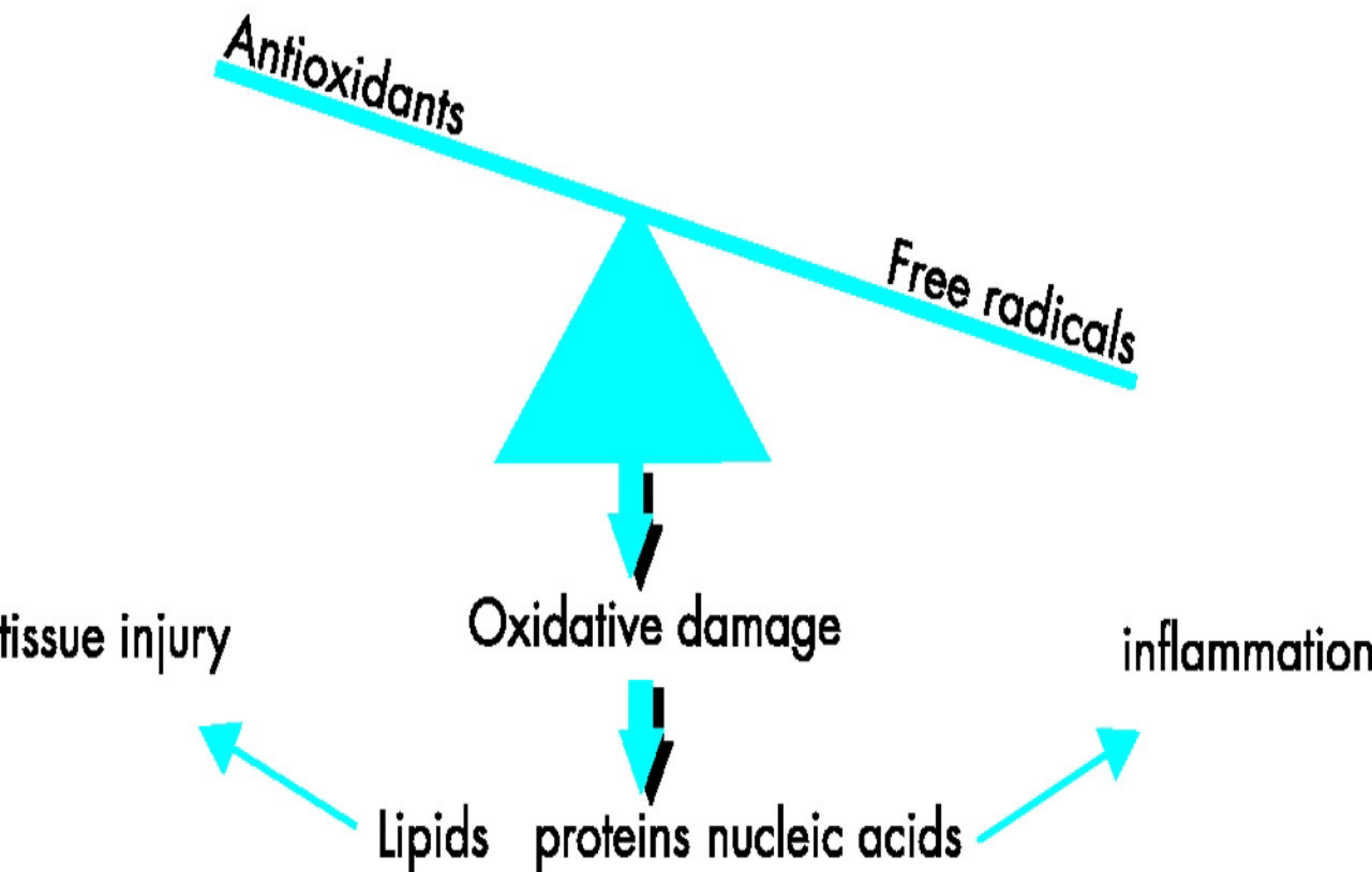
Sources of Dietary Lipid



■ Saturated    ■ Monounsaturated

**Polyunsaturated:**  
■ Omega-6    ■ Omega-3

# Oxidative stress



# OXIDATIVE STRESS

## Beneficial Effects

- Healthy immune system
- Wound healing
- Cell signaling

## Harmful Effects

- Muscle damage
- Damage mitochondrial proteins and DNA
- Cancer, diabetes, cataracts
- Lipid peroxidation which contributes to atherosclerosis

Rank	Food	Serving Size	Total Antioxidant Capacity per serving size
1	Small Red Bean	1/2 cup dried beans	13727
2	Wild blueberry	1 cup	13427
3	Red kidney bean	1/2 cup dried beans	13259
4	Pinto bean	1/2 cup	11864
5	Blueberry	1 cup cultivated berries	9019
6	Cranberry	1 cup whole berries	8983
7	Artichoke hearts	1 cup cooked	7904
8	Blackberry	1 cup	7701
9	Prune	1/2 cup	7291
10	Raspberry	1 cup	6058
11	Strawberry	1 cup	5938
12	Red Delicious apple	1	5900
13	Granny Smith	1	5381
14	Pecan	1 ounce	5095
15	Sweet cherry	1 cup	4873
16	Black plum	1	4844
17	Russet potato	1 cooked	4649
18	Black bean	1/2 cup dried beans	4181
19	Plum	1	4118
20	Gala apple	1	3903



- **Tart cherry juice**

- High in anthocyanins
- Powerful anti-inflammatory and antioxidant properties



- **Watermelon and watermelon juice**

- Rich in the amino acid L-citrulline
- Has antioxidant effects and increase the production of nitric oxide (NO)



- **Pomegranate juice**

- Source of polyphenols







# Nitrate Content of Vegetables

Vegetable	Serving Size	Nitrate (mg)
Rhubarb	1 cup diced	343
Butterleaf Lettuce	2 cups shredded	220
Agurula	2 cups	192
Salad mix, beet greens	2 cups leaves	135
Swiss Chard	2 cups leaves	109
Beets	.5 cup slices	94
Spinach	2 cups leaves	47
Cilantro	1 cup leaves	40
Basil	.5 cup leaves	22
Broccoli	1 cup chopped	18
Potato	.5 cup diced	8



SOURCES: The EFSA Journal (2008) 689, 1-79. Serving Size Information from USDA, 2011.

- **Beets/Beet juice**

- High in dietary nitrates and pigments called betalains
- Increases performance
- Decreases DOMS



- **Watercress**

- High in dietary nitrates
- Increases performance
- Decreases DOMS



**WHERE DO YOU GET  
YOUR PROTEIN?**



WZ



- **Protein requirements**

- Average level of activity = 0.8 gm/kg
- Athletes = 1.2 to 2.0 (higher end for strength trained athletes)

	LB	Kg		
Weight	180	82		
Total Calories	<b>2000</b>			
	macro ratio	calories	gms	gm/kg
Protein	15%	300	75	<b>0.9</b>
Fat	10%	200	22	
Carbs	75%	1500	375	

	LB	Kg		
Weight	180	82		
Total Calories	<b>4000</b>			
	macro ratio	calories	gms	gm/kg
Protein	15%	600	150	<b>1.8</b>
Fat	10%	400	44	
Carbs	75%	3000	750	

**If you consume enough calories, you don't need to worry about protein intake!**

# THE PROTEIN-DEFICIENCY WING OF THE HOSPITAL



**Same diet prevents most  
chronic diseases!**







# SUMMARY

- Physical inactivity is a risk factor for many chronic diseases
- You don't need to "exercise" to be physically active
- Eating a plant-strong diet is the optimal diet for performance and health
- Get your MOVE ON!

“People are fed by the Food Industry,  
which pays no attention to health,



and are treated by the Health Industry,  
which pays no attention to food.”

Wendell Berry