



## LEADERS IN OCCUPATIONAL HEALTH & SAFETY AND ENVIRONMENTAL SOLUTIONS

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# GET UP AND MOVE: THE SCIENCE BEHIND SITTING DISEASE

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“Those who do not find time for  
exercise today will have to find time  
for illness.”

The Earl of Derby, 1873





1

HOW DO YOU  
SPEND YOUR DAY?

2

HAVE YOU  
CONSIDERED...

3

NEAT

4

WHERE WILL YOUR  
FEET TAKE YOU  
TODAY?



1

HOW DO YOU SPEND YOUR  
DAY?

# CLASS WORKSHEET PART 1





# HOW DO YOU SPEND YOUR DAY?

- Driving to/from work or sitting on a bus
- Sitting at a desk for 8 hours
- Sitting at lunch
- At home, sitting at dinner
- Sit and pay bills
- Sit and watch TV





2

HAVE YOU CONSIDERED?

# HAVE YOU CONSIDERED

- What happens to your body when you sit for more than 80% of your day?
- What happens to your heart?
- What happens to your muscles?
- What happens to your metabolism?





# WE WERE DESIGNED TO...

- Hunt and gather
- Sow and reap
- Spend the day in constant motion



# WE WERE NOT DESIGNED TO...

- Run on a treadmill for 20-30 minutes a day
- Lift weights for a few minutes
- Burning maybe 200 calories in a 3X per week exercise session
- THEN sit motionless for the rest of the day

**“We’ve become so sedentary that 30 minutes a day at the gym may not counteract the detrimental effects of 8, 9 or 10 hours of sitting.”**  
**Genevieve Healy, PhD**



# 50 YEARS AGO...

- There we no gyms
  - People rarely exercised
  - Very few people struggled with being over weight
  - Sitting Disease/Metabolic Syndrome didn't exist
- BECAUSE WE MOVED!**



# STEPS

- The Amish man walks 18,000 steps a day
- The Amish woman walks 14,000 steps a day
- Those of us who are desk bound walk less than 5,000 steps a day



# THE 1970'S OFFICE

- Open floor plans
- Need to do research – walk to the library
- Having a billing problem – walk to the accountant
- Need to ask a question – walk to your colleagues desk
- Need a document – walk to the filing cabinet and open it and then close it again
- Need to make copies – walk to the copy machine and stand there while making copies
- Lunch time – walk around the office gathering your colleagues and walk to lunch or the cafeteria



# THE 1970'S HOME

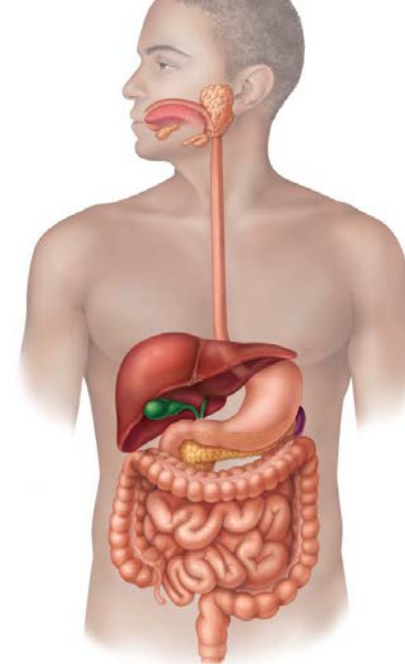
- Wind up alarm clock
- Grind coffee by hand
- Iron clothes
- Get up to change the TV channel
- Get up to answer the phone
- Get up to check on a sleeping baby



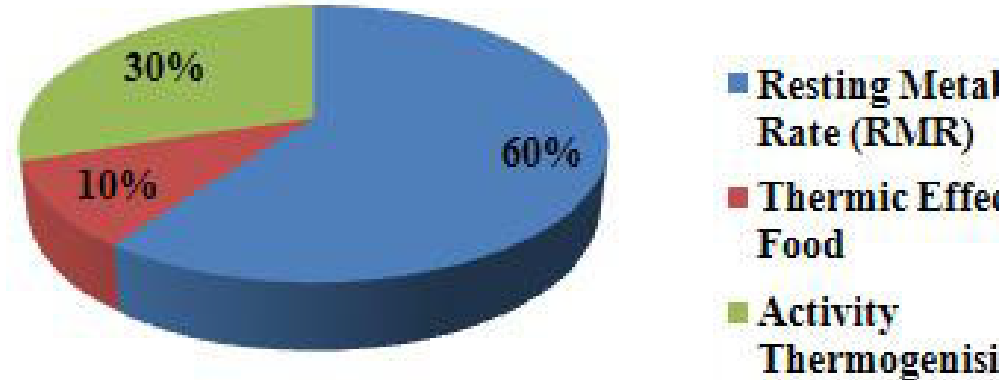


# THE COST OF SITTING

- Out internet driven, electronic age has robbed us of 1,500-2,000 calories per day!
- 60% of your daily calories goes toward your Basal Metabolic Rate (BMR)
- 10% goes to the Thermal Effect of Food – digestion
- 30% goes toward the rest of your movement (or lack of it)



**Percentage Contribution to Daily Caloric Expenditure**



# HOW DOES YOUR BODY RESPOND TO THE LACK OF MOTION?



"For people who sit most of their day, their risk of a heart attack is about the same as smoking." Martha Grogan, Mayo Clinic Cardiologist

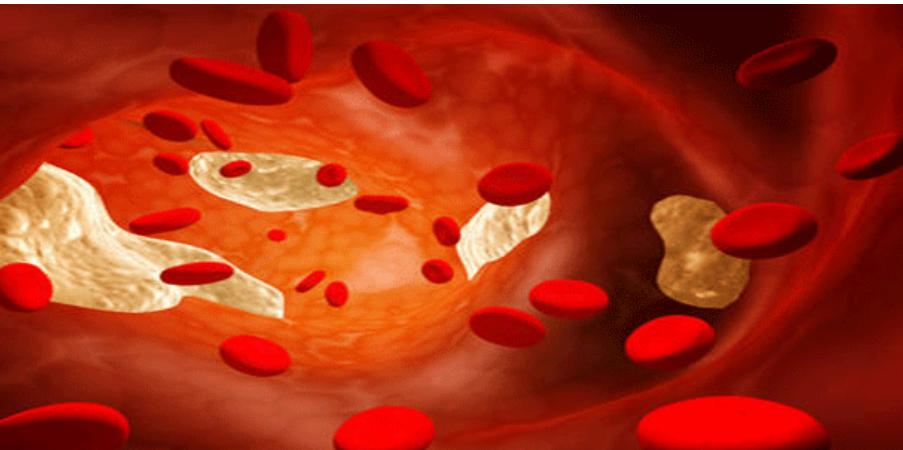
# OUR BODIES ARE BREAKING DOWN FROM...

- **Obesity**
  - Coronary heart disease
  - High blood pressure
  - Type 2 Diabetes
  - Gallstones
  - Breathing problems
  - Dyslipidemia (abnormality of blood lipids)
  - Stroke
  - Osteoarthritis
  - Sleep apnea
  - Endometrial, breast, prostate and colon cancer
- High blood pressure
- Diabetes
- Cancer
- Depression
- Malaise (fatigue)



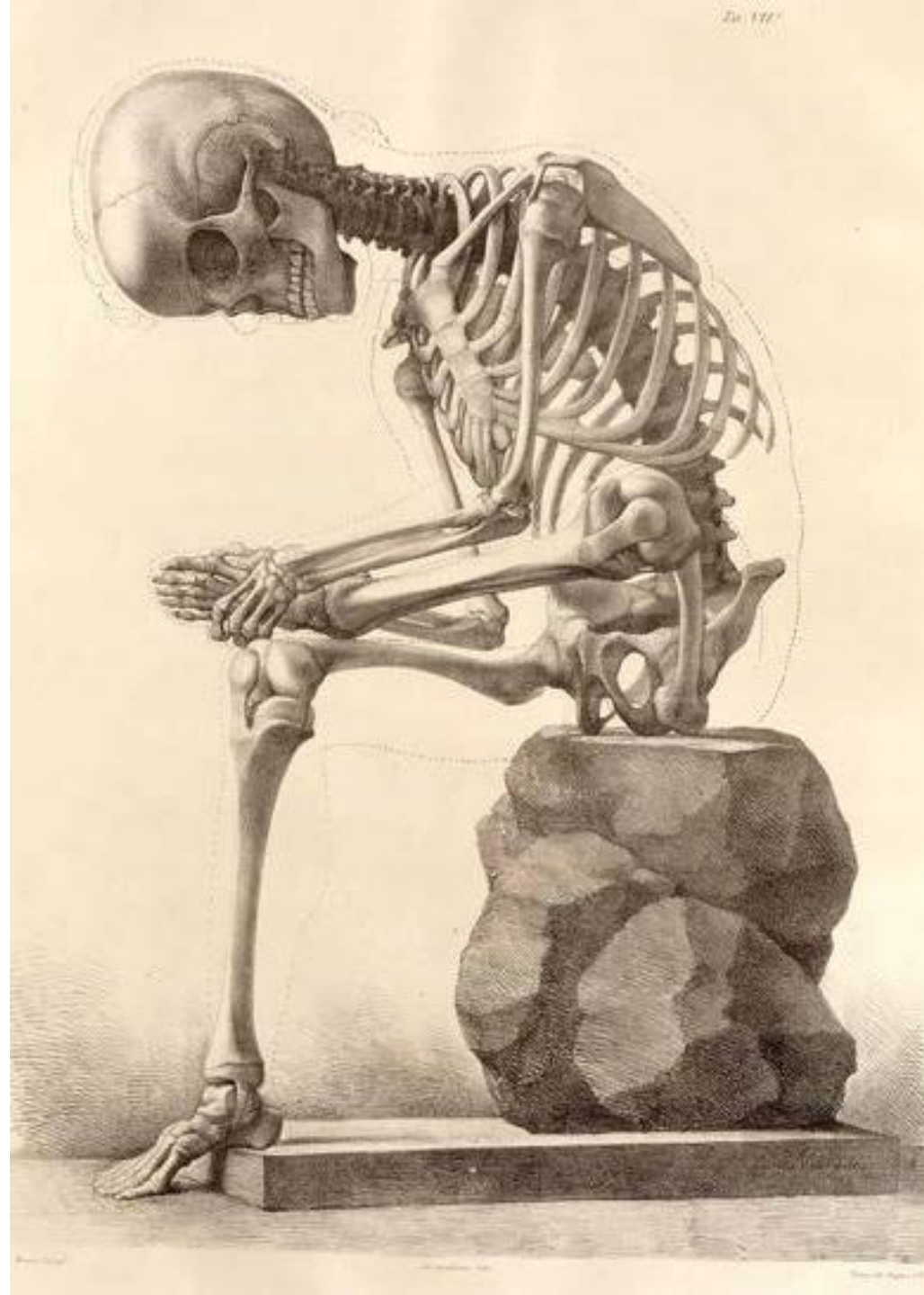
# WHAT HAPPENS WHEN YOU SIT?

- Endothelial cells in capillaries normally produce an enzyme called Lipoprotein Lipase
- Production of Lipoprotein Lipase slows down to 50%
- Eat a meal high in fats – triglycerides skyrocket without the enzyme
- Light activity and standing reactivates enzyme production



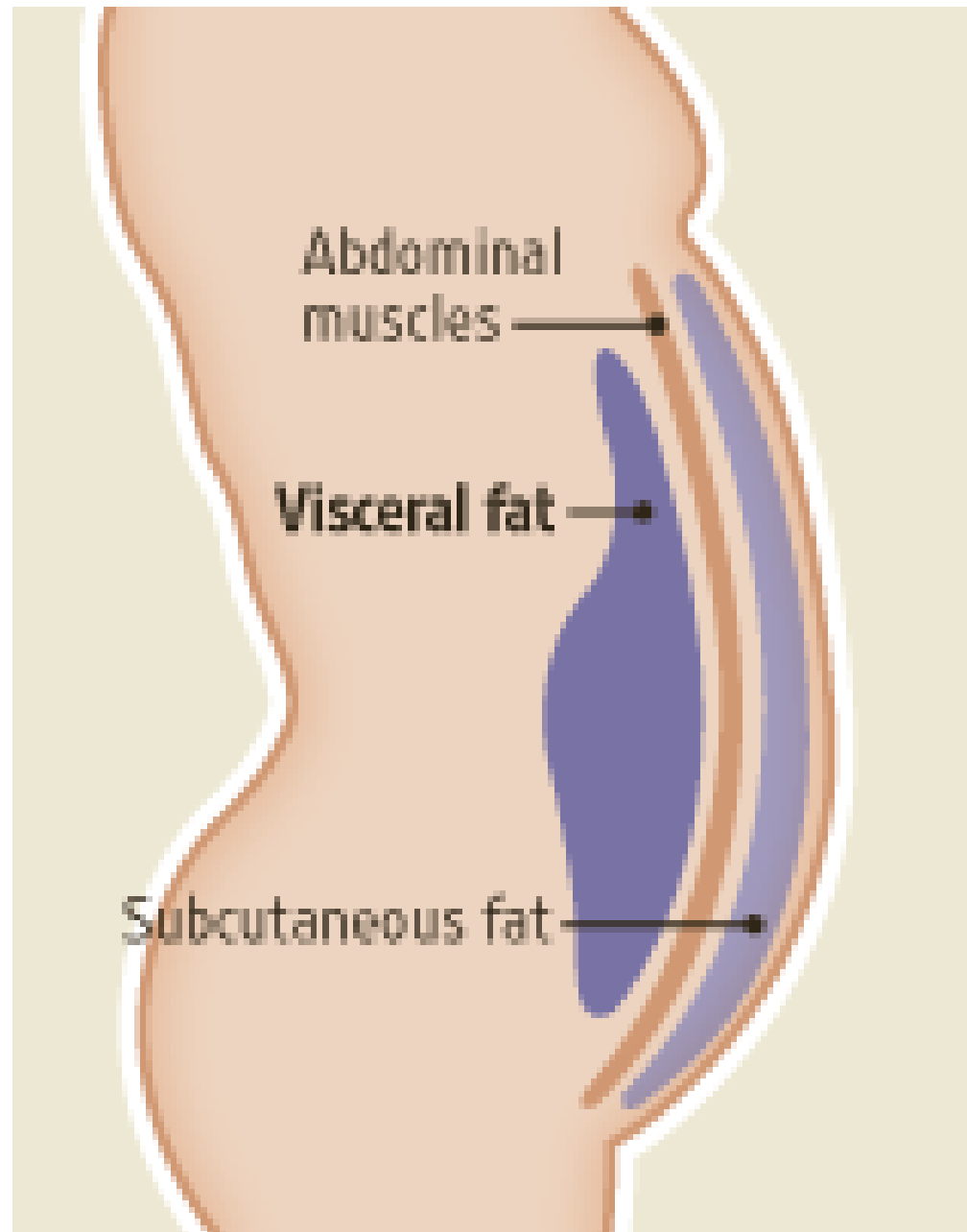
# SITTING

- Muscles in your back loosen as you sit thus no spine support when you stand
- Hips tighten and pull on the spine causing you to hunch
- Legs stiffen causing knees and ankles to be weak



# SITTING ADDS VISCERAL FAT

- Visceral fat (abdominal fat) pumps out hormones and interferes with liver function causing high triglycerides, high cholesterol and high blood sugar
- Raises your risk of dying from heart disease 3X even if you exercise at the gym
- Doubles your risk of Metabolic Syndrome (heart disease, diabetes, high blood pressure, cholesterol, blood sugar, and triglycerides)





A photograph of a field of yellow and red flowers, likely Gaillardia, with a blurred red structure in the background. The text "WHAT SOLUTIONS DO WE REALLY HAVE?" is overlaid in the center.

**WHAT SOLUTIONS DO WE  
REALLY HAVE?**



# 3 NEAT

# NEAT

- The energy you burn simply living
  - Washing your car
  - Walking to lunch
  - Running errands
  - Climbing the stairs
  - Folding laundry
  - Tapping your toes
  - Chewing gum

IT IS THE ENERGY WE EXPEND SIMPLY LIVING



# DAILY MOVEMENT

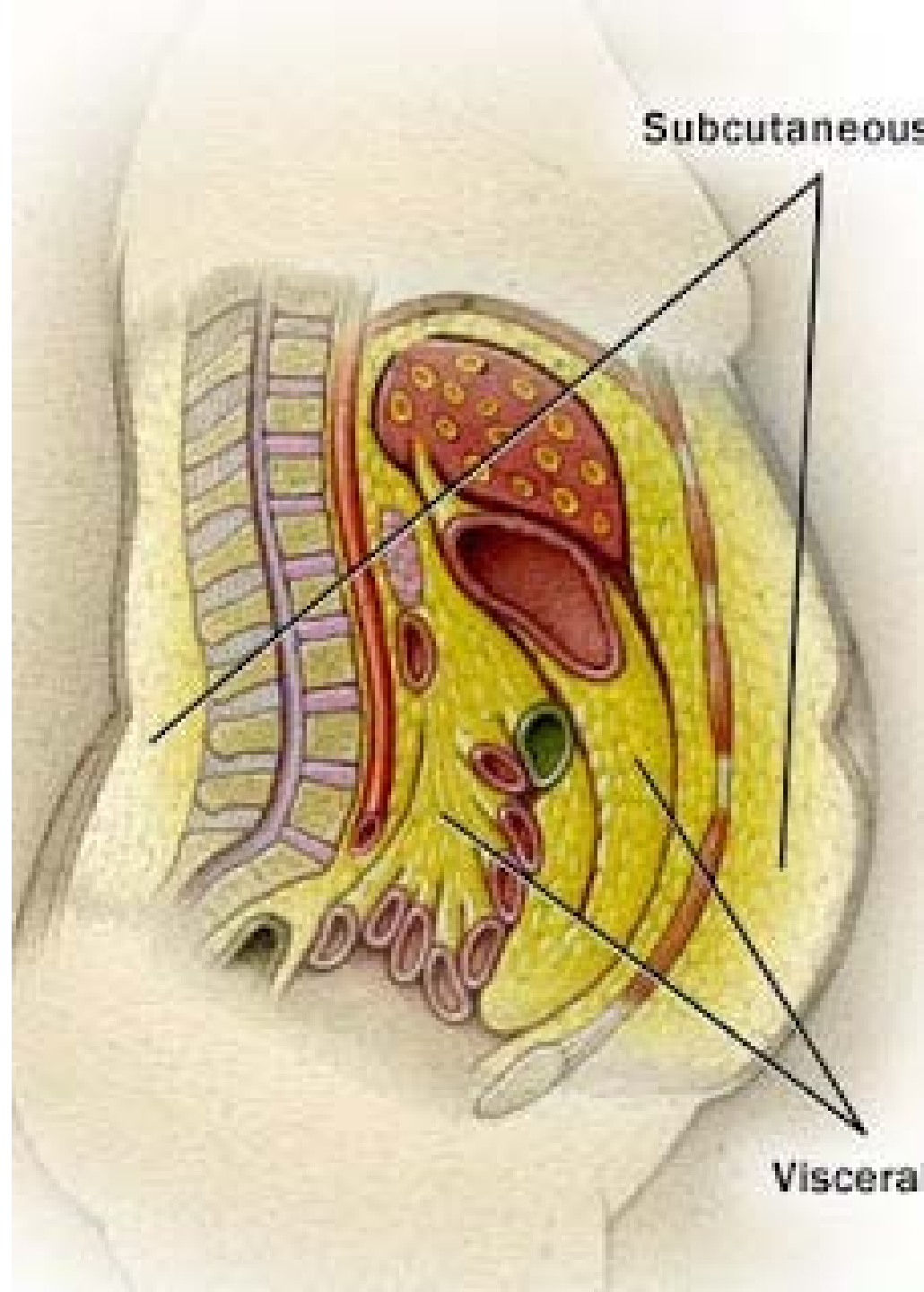
- Light daily activity activates the red/slow twitch muscles
  - Uses oxygen efficiently to generate fuel
  - Extended muscle contractions over a long period of time
  - Long distance running and bicycling
- Vigorous activity activates the white/fast twitch muscles
  - Short bursts of strength or speed
  - Fatigue quickly
  - Sprinters





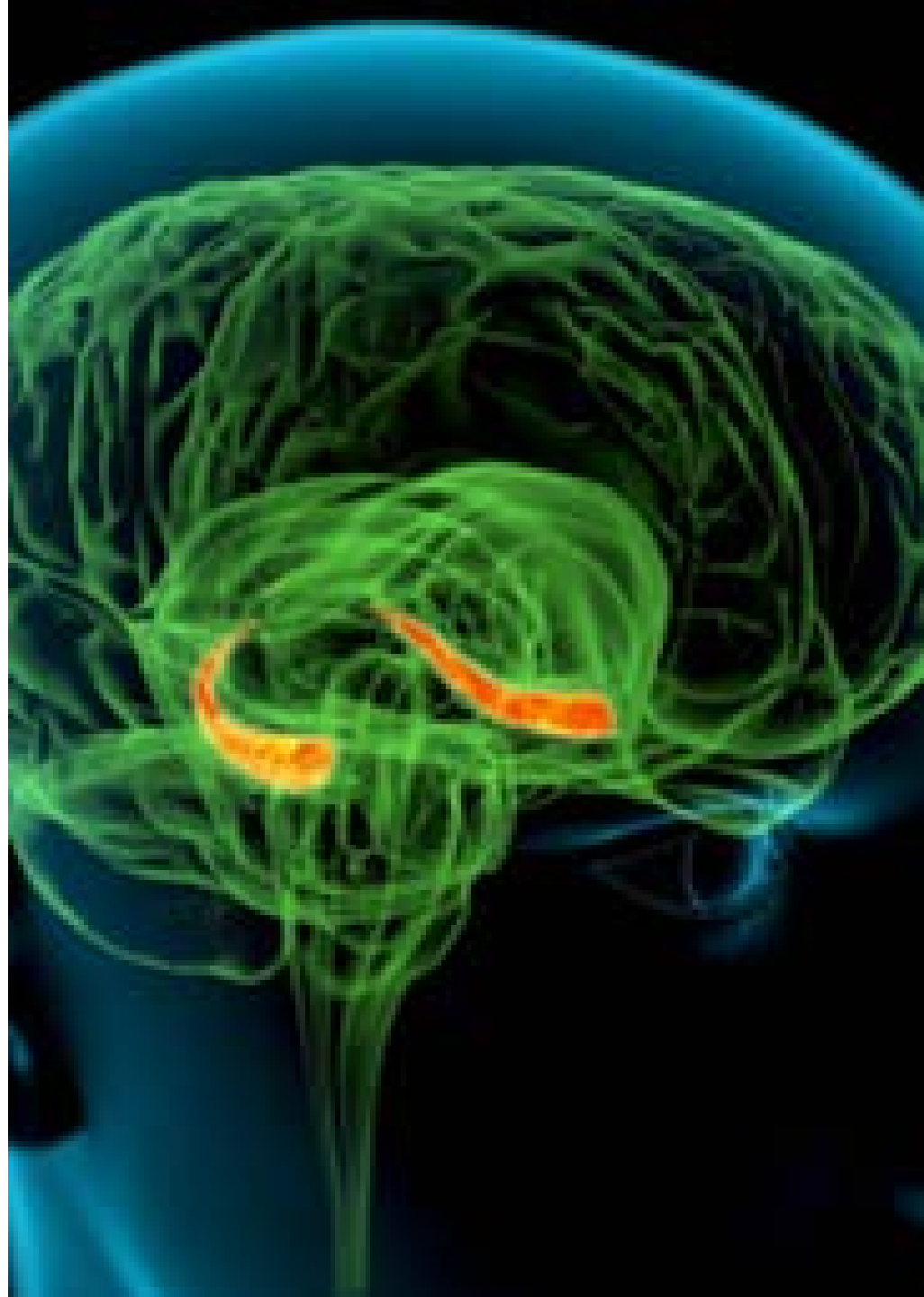
# NEAT ACTIVITY

- Reduces visceral fat – metabolically active belly fat
  - Pumps out hormones
  - Interferes with liver function
  - Causes high triglycerides
  - High cholesterol
  - High blood sugar
  - Regulates hormones that interfere with appetite causing you to eat more and store fat
- Visceral fat responds quickly to NEAT



# NEAT ACTIVITY IMPROVES BRAIN FUNCTION

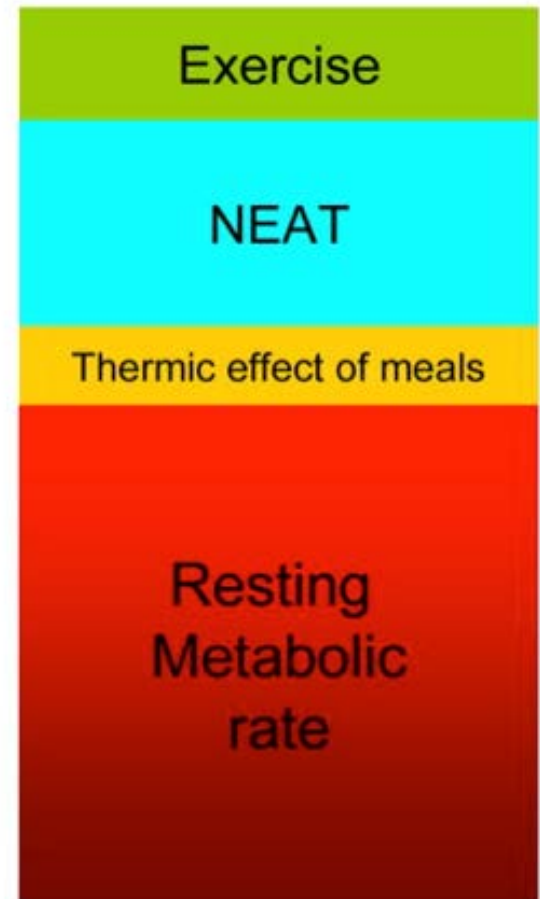
- Improves blood circulation to the brain
- Sharpens thinking
- Increases serotonin availability to the brain
- Lowers stress and anxiety
- 30% less likely to develop Alzheimer's
- Slows cellular changes associated with aging
- 3 hours of walking triggers biochemical changes causing new neurons to grow
- New neurons grow in the frontal lobe and hippocampus which are responsible for:
  - Memory
  - Multitasking
  - Decision making
  - Organizing





# NEAT ACTIVITY...

- Gives you more energy
- Stimulates the central nervous system
- Builds ache-free joints



# NEAT CALORIES SPENT

- Sitting 5 Kcal/hour
- Standing 15 Kcal/hour
- Gum Chewing 20 Kcal/hour
- Stair Climbing 200 Kcal/hour
- Walking at 1 mph 100 Kcal/hour
- Walking at 2 mph 150 Kcal/hour
- Walking at 3 mph 230 Kcal/hour



# 4 WHERE WILL YOUR FEET TAKE YOU TODAY?

It is up to you!



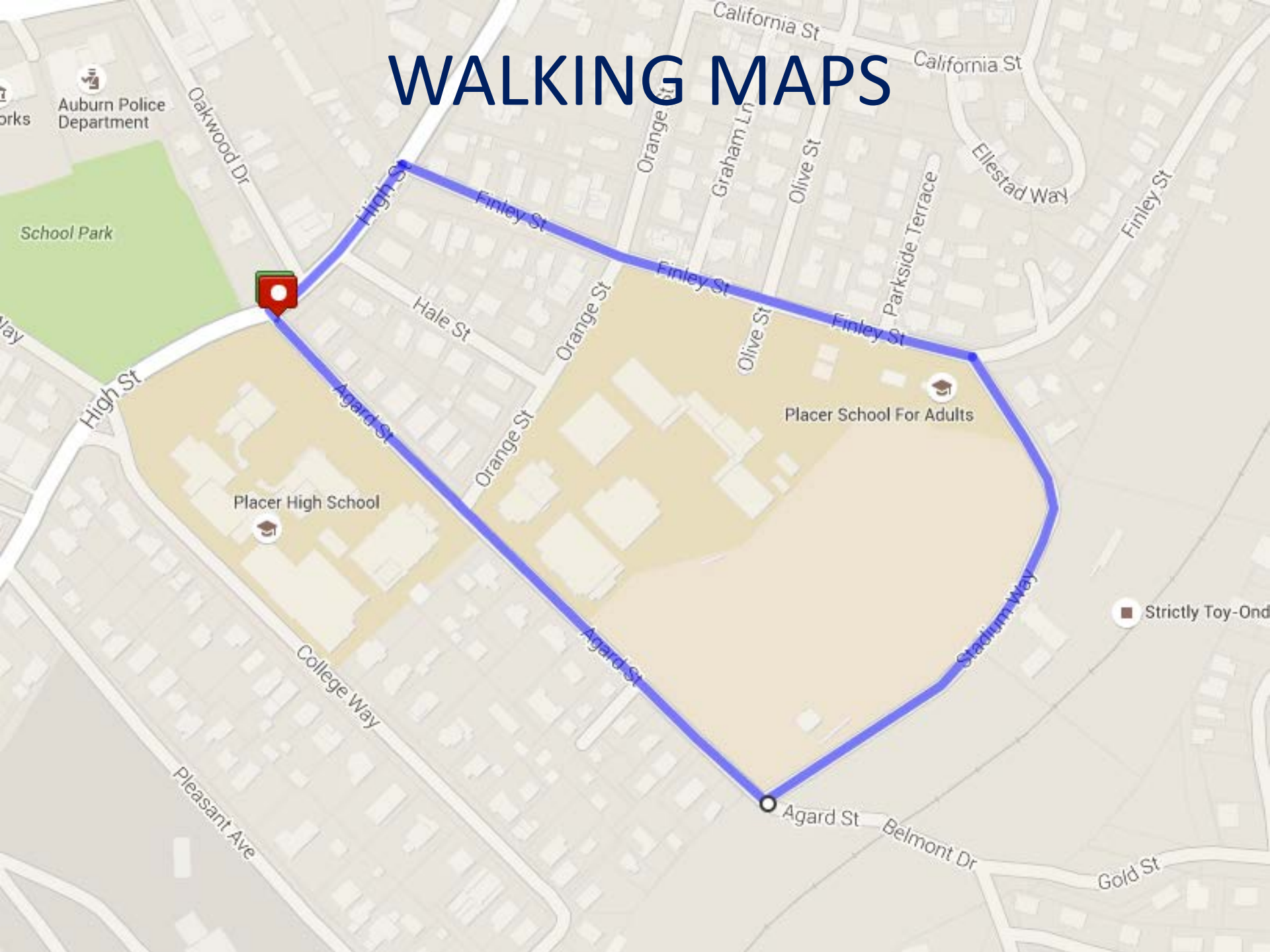
# ADD 2 ½ HOURS OF NEAT INTO YOUR DAY

- Park in a spot farther away from the building
- Take the stairs (up and down)
- Walk to lunch
- Eat lunch while walking around the building





# WALKING MAPS



# OFFICE AREA

- Place reference materials farther away from your computer
- Need to ask someone a question? Walk to their work area and DON'T sit down
- Convert sit down meetings to walking meetings
- Stand and pace while on the phone
- Use a mini cycle while sitting
- Use a mini stepper/elliptical while standing





# Stand Desk

- Manufactured by Steelcase



## Sit/Stand Options



## Sit/Stand Options





# Treadmill Desk



# BUY SUPPORTIVE SHOES

- You need adequate support to stand and walk more.





# AT HOME

- Treadmill or cycle while watching TV
- Stand to read the mail
- Park in a central location when shopping and walk to each store
- Make dinner
- Use a broom to sweep
- Do laundry
- Pull weeds by hand
- Rake leaves by hand
- Use a watering can to water plants
- Walk the dog
- Play with your kids (outdoors)





## WORKSHEET PART II

Thank you from Health Science  
Associates

