

Series: Activities to enhance the quality of life as you age

- Presentations are accessible at:
- <https://onlineacademiccommunity.uvic.ca/elderacademy/>

- **Four presentations:**

- *Factors that influence quality of life in older people (Sept 7th): Dr. Anastasia Mallidou*
- *Sex and seniors-a physicians view (Sept 14th): Dr. Patricia Gunton*
- *Exercise as Medicine (Sept 21st): Dr. David Docherty*
- *The benefits of volunteering (Sept 28th): Dr. Neena Chappell*

Exercise as Medicine!

David Docherty, Ph.D.

Professor Emeritus,

*School of Exercise Science, Physical and
Health Education*

Physical activity: The Elixir of Life!

David Docherty
Professor Emeritus
School of Exercise Science, Physical and Health
Education

Physical Activity and the Gut: The Elixirs of Life!

David Docherty

Professor Emeritus

School of Exercise Science, Physical and Health Education

With thanks to Ed Ishiguro!

The bad news: most systems decline as we get older!

- Aging is associated with a decline in most physiological systems that culminates in **limited physical capacity**.
- Aging is also associated with a **decline in some cognitive functions**, such as memory.



However

- **THE GOOD NEWS** is moderate levels of physical activity can impact the decline and help us lead more independent and enjoyable lives.
- Physical activity can help **manage** some of the conditions that occur as we age and....
- Offer an alternative or adjunct to **other therapies!**



Times Colonist, Sat. Oct 15th, 2005

In fact:

“.....exercise and activity are the fountain of youth”

(Colin Milner, CEO, International Council on Aging)

In fact:

Physical *inactivity* is a high risk factor and one of the strongest predictors of mortality

(equal to smoking!!!)

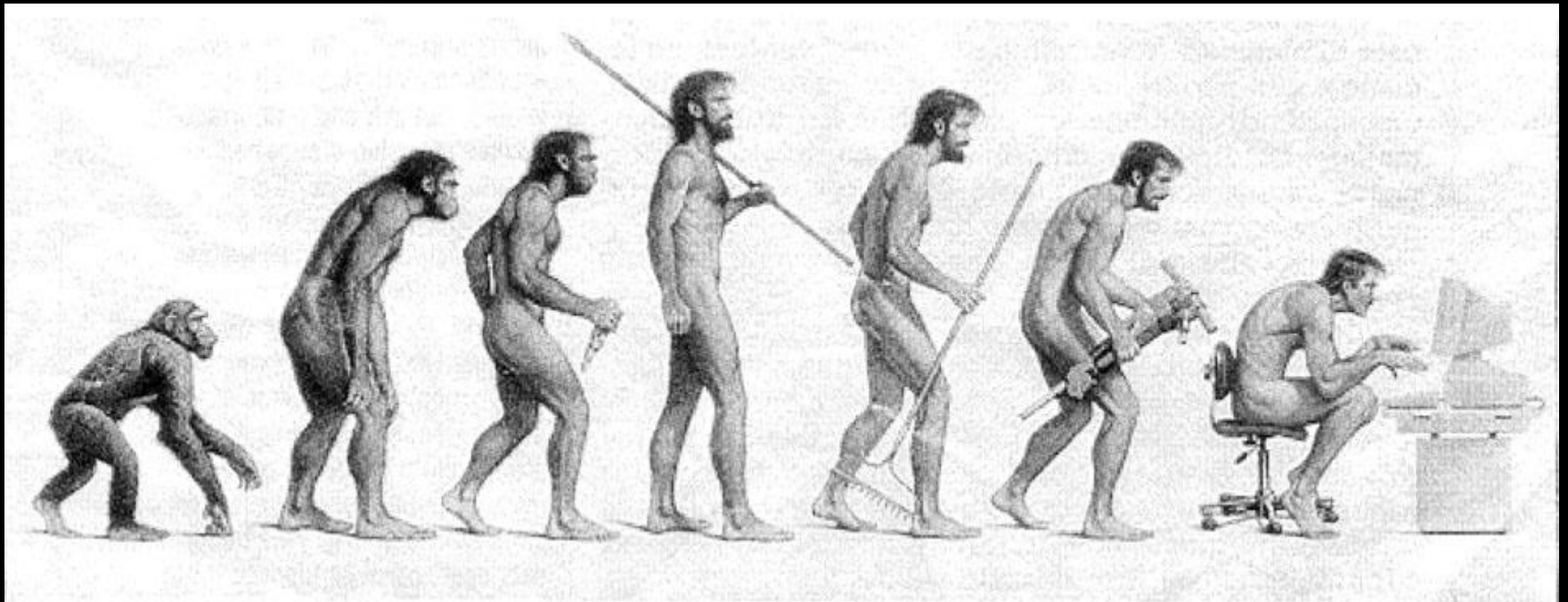
Surgeon General's Report, 1996

However....

- The Canadian Health Measures Survey found only **15%** of Canadian adults achieve the minimal level of PA per week!
- **This percentage drops after age 65!**

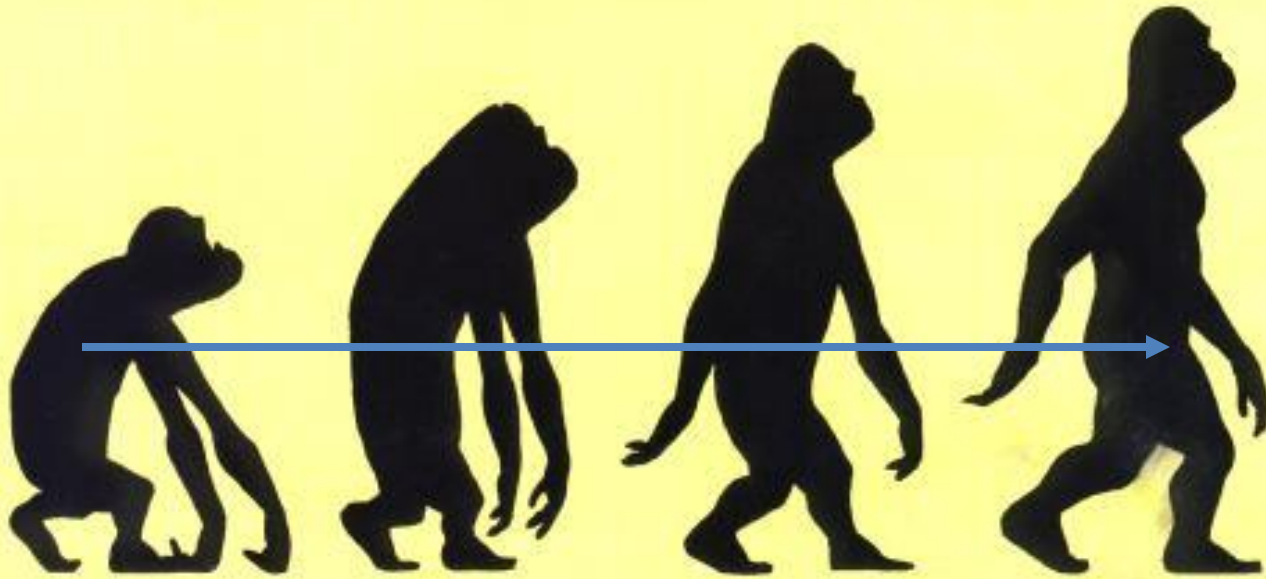
The human body was designed to be active.





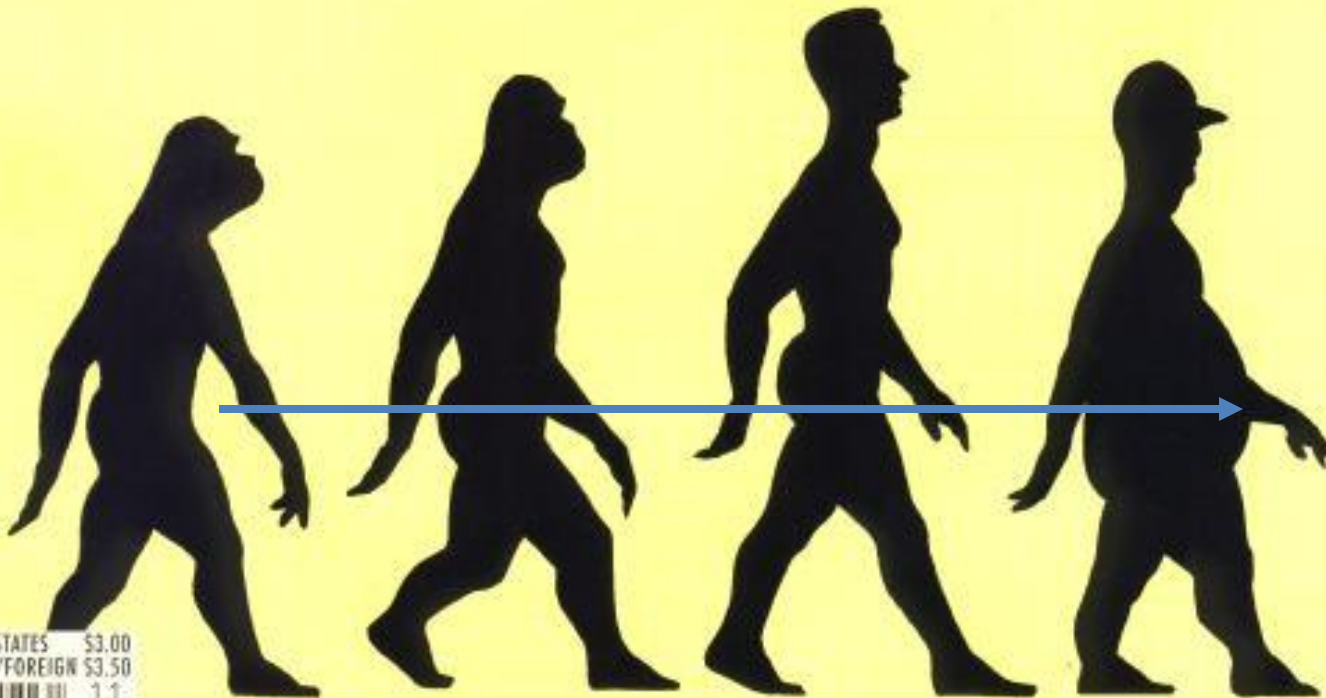
Increase in sedentary behaviour. Even more so now!

Leading to an increase in hypokinetic diseases (Kraus & Raab, 1961)



The
evolution
of man!

Increase in
body mass
(fat!)



Statue of David's tour of U.S.A.

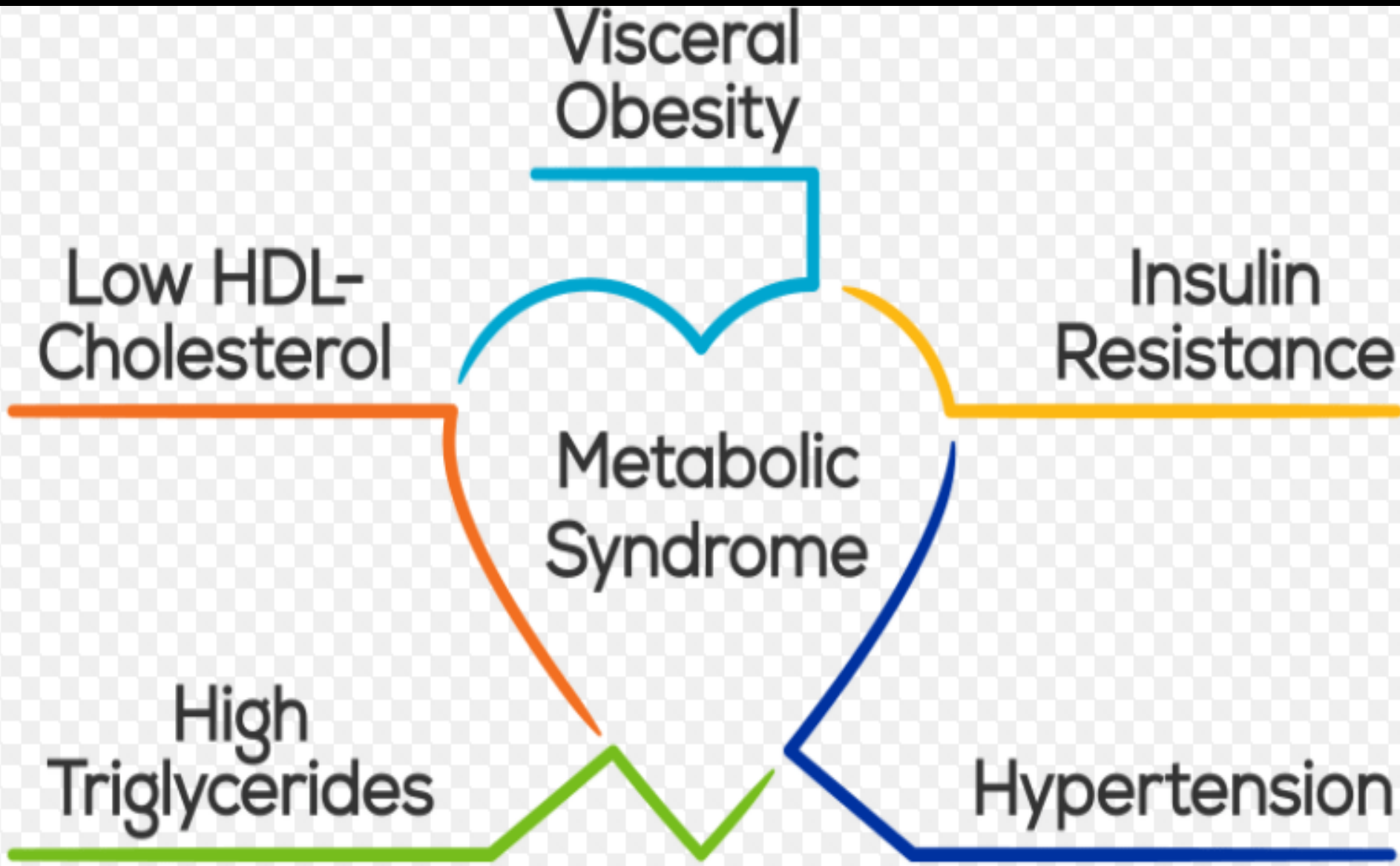


Before



After

Metabolic syndrome

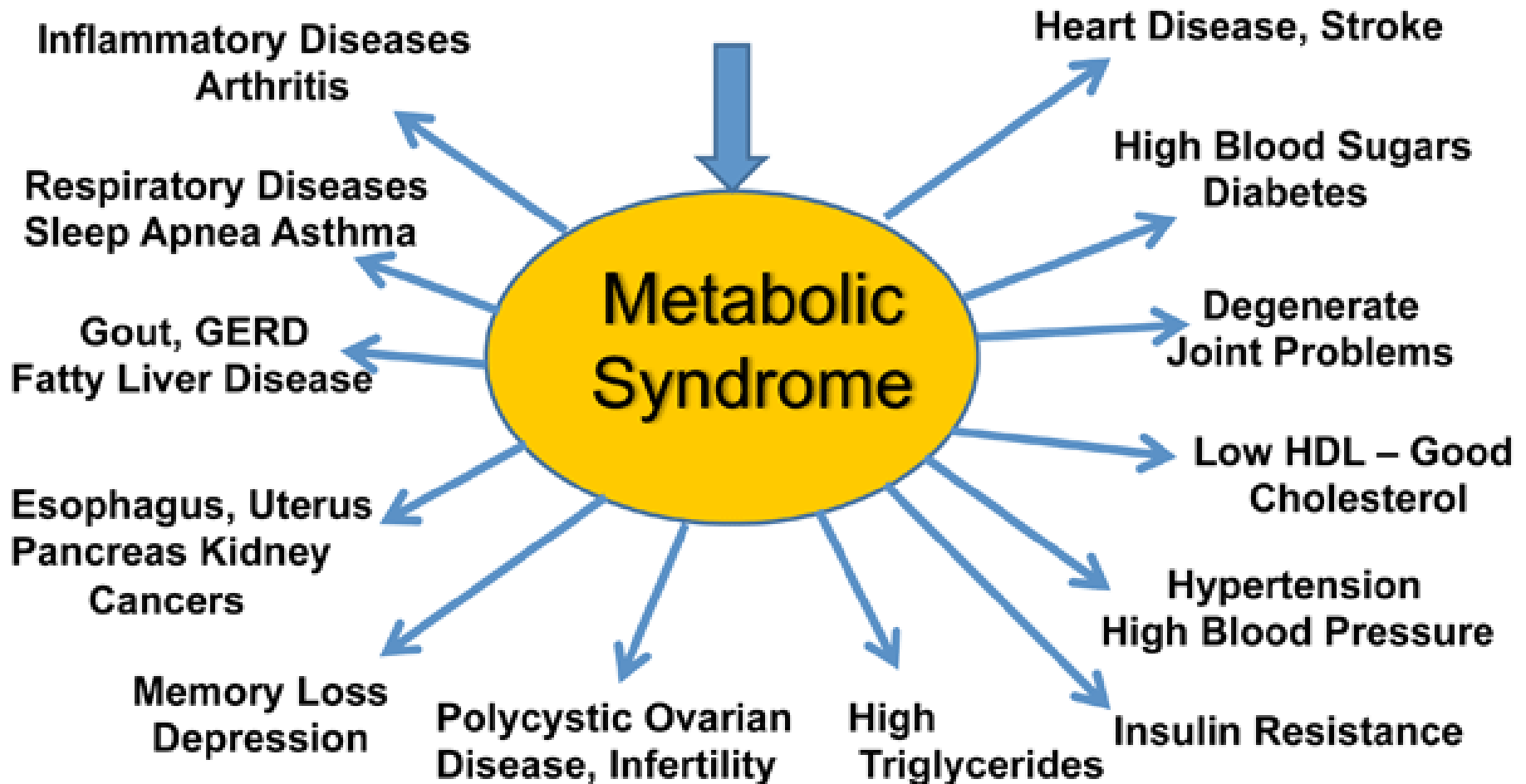


Metabolic Syndrome is diagnosed when a patient has three of the following conditions:

- High blood pressure ($\geq 130/85$ mm Hg, or receiving medication)
- High blood glucose levels (≥ 5.6 mmol/L, or receiving medication)
- High triglycerides (≥ 1.7 mmol/L, or receiving medication)
- Low HDL-Cholesterol (< 1.0 mmol/L in men or < 1.3 mmol/L in women)
- Large waist circumference (≥ 102 cm in men, 88 cm in women; ranges vary according to ethnicity)

Overweight - Over Fat Related Diseases

Diet - Lifestyle
Aging - Genetics



How do know if you are too fat??

1. The Body Mass Index ($BMI = \text{kg}/\text{m}^2$)

>25 = overweight

>30 = clinically obese

www.mayoclinic.org/bmi-calculator/itt-20084938



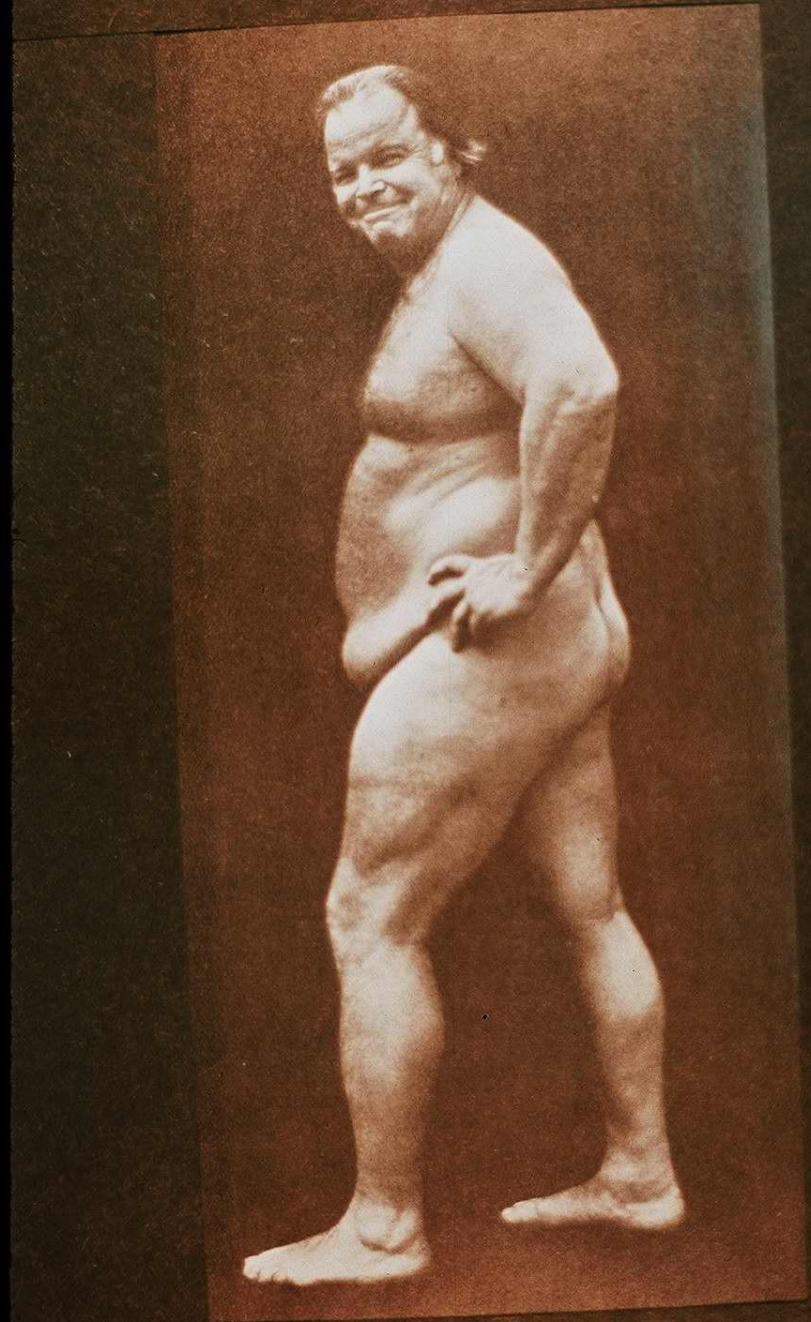
"Whadyer mean the needle's broken off?"

2. The UVic fat test:

- simple
- cheap
- and quick

All you need is a

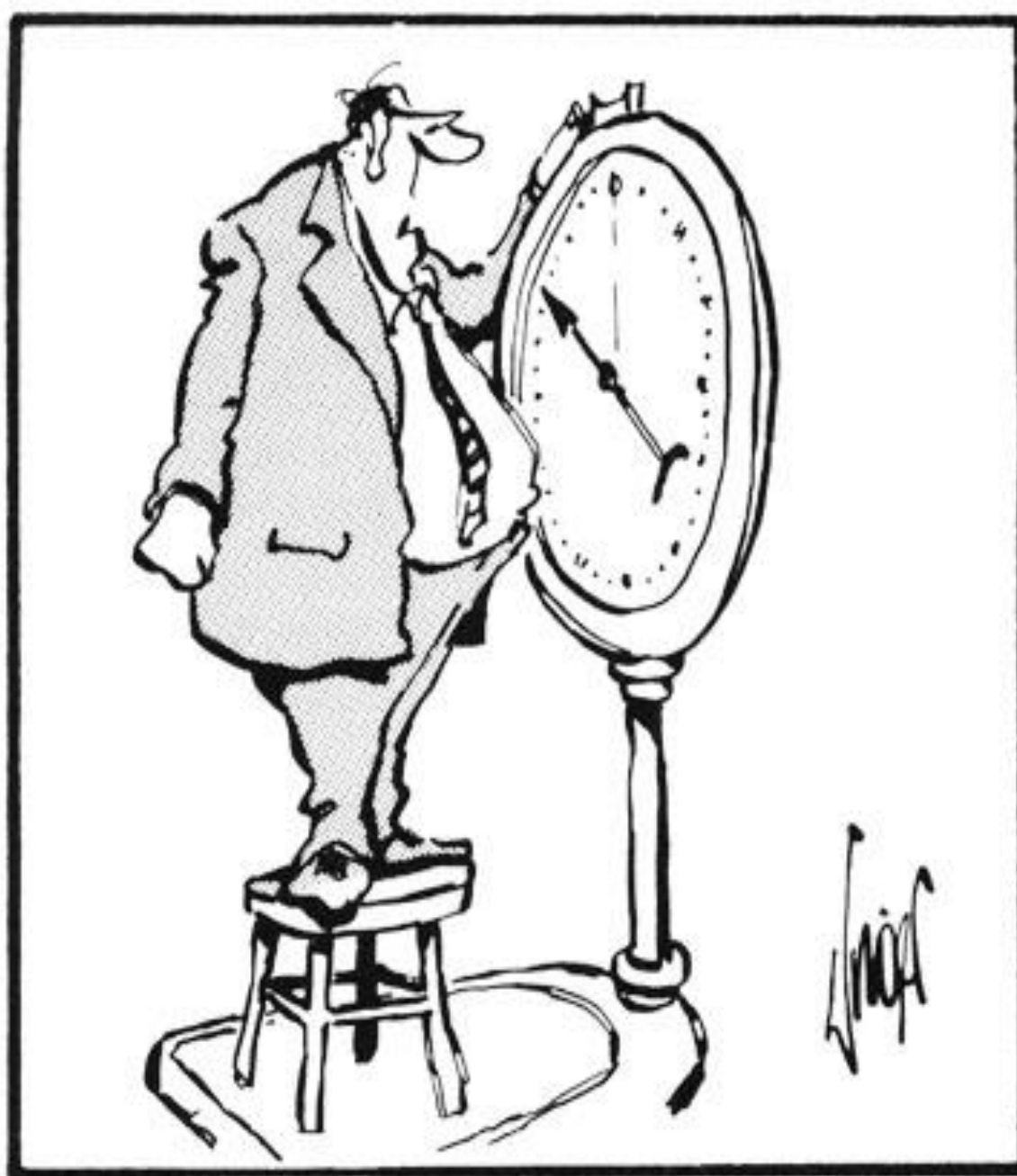
- Stop watch
- A mirror



How are we doing on weight?

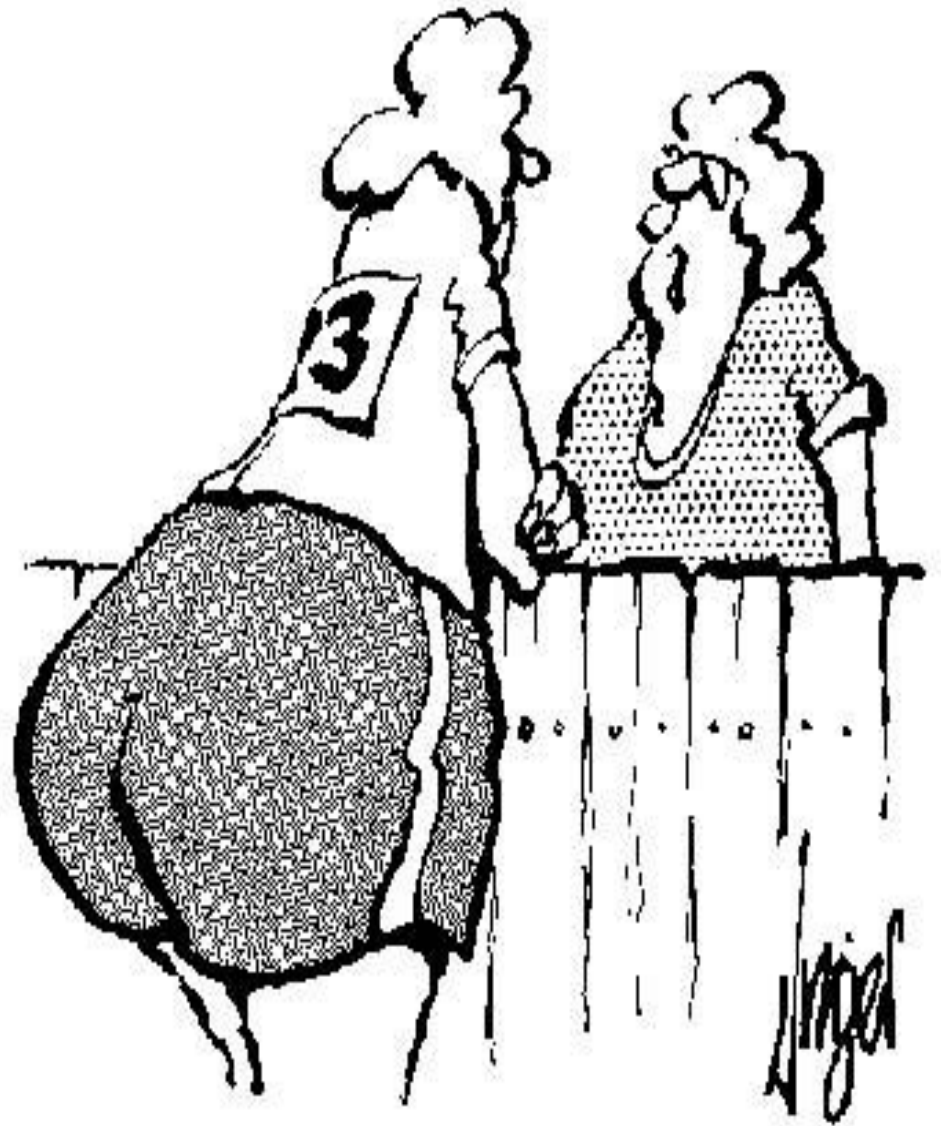
- In 2015, **61.3%** of the Canadian population exceeded the guidelines for healthy weight!!
- Not very well!!

However, most people **over** report their height and **under** report their weight!



“Perfect! Six feet two inches and 195 lbs.”

The distribution of the fat mass is related to health risks (add in waist girth)



“That jogging certainly seems to be getting your weight down.”

Adding Waist girth

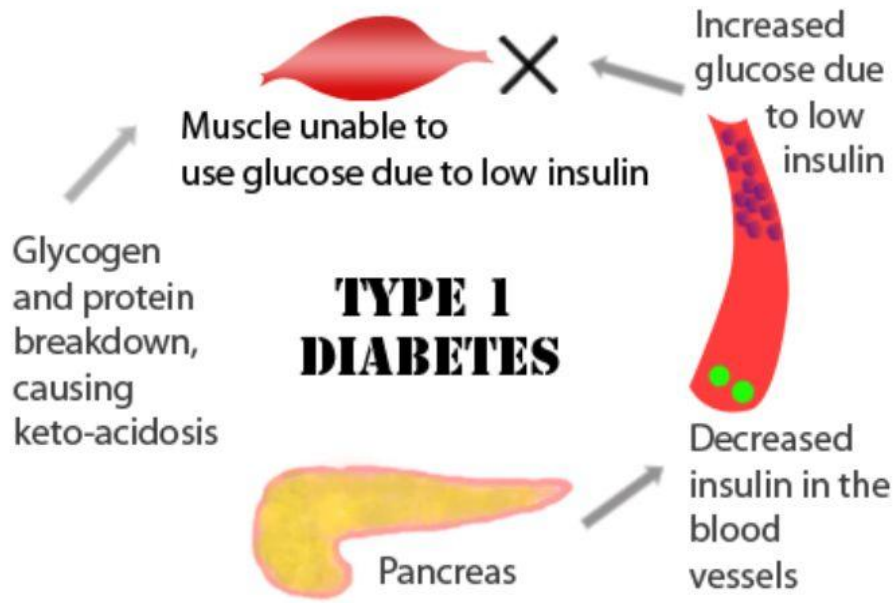
Tape measure replacing the stethoscope in doctors' offices?

- **Waist girth:**
 - Males (>102 cm/40 inches)
 - Females (>88 cm/35 inches)

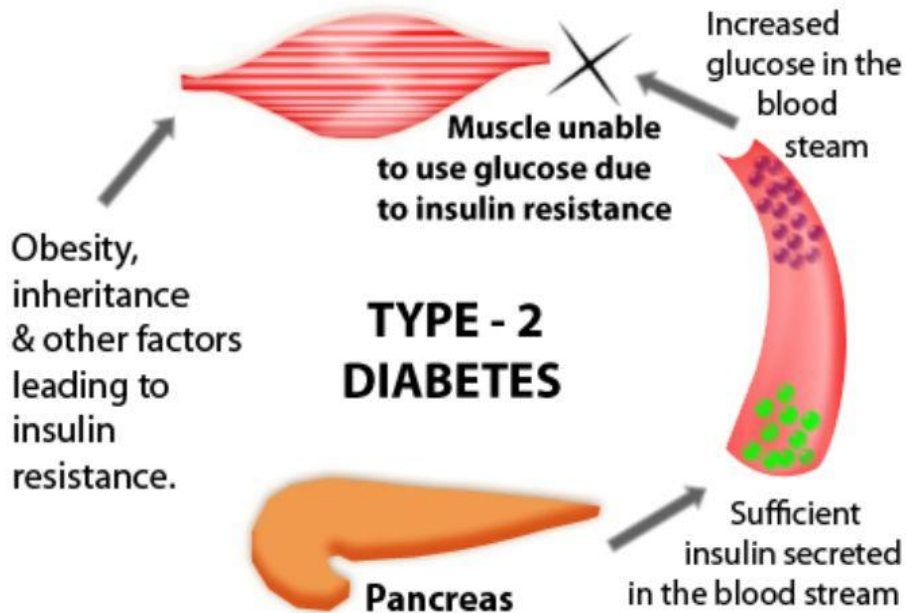
Heart and Stroke Foundation



Type 1 Diabetes



Type 2 Diabetes



Controlling diabetes

Type 1

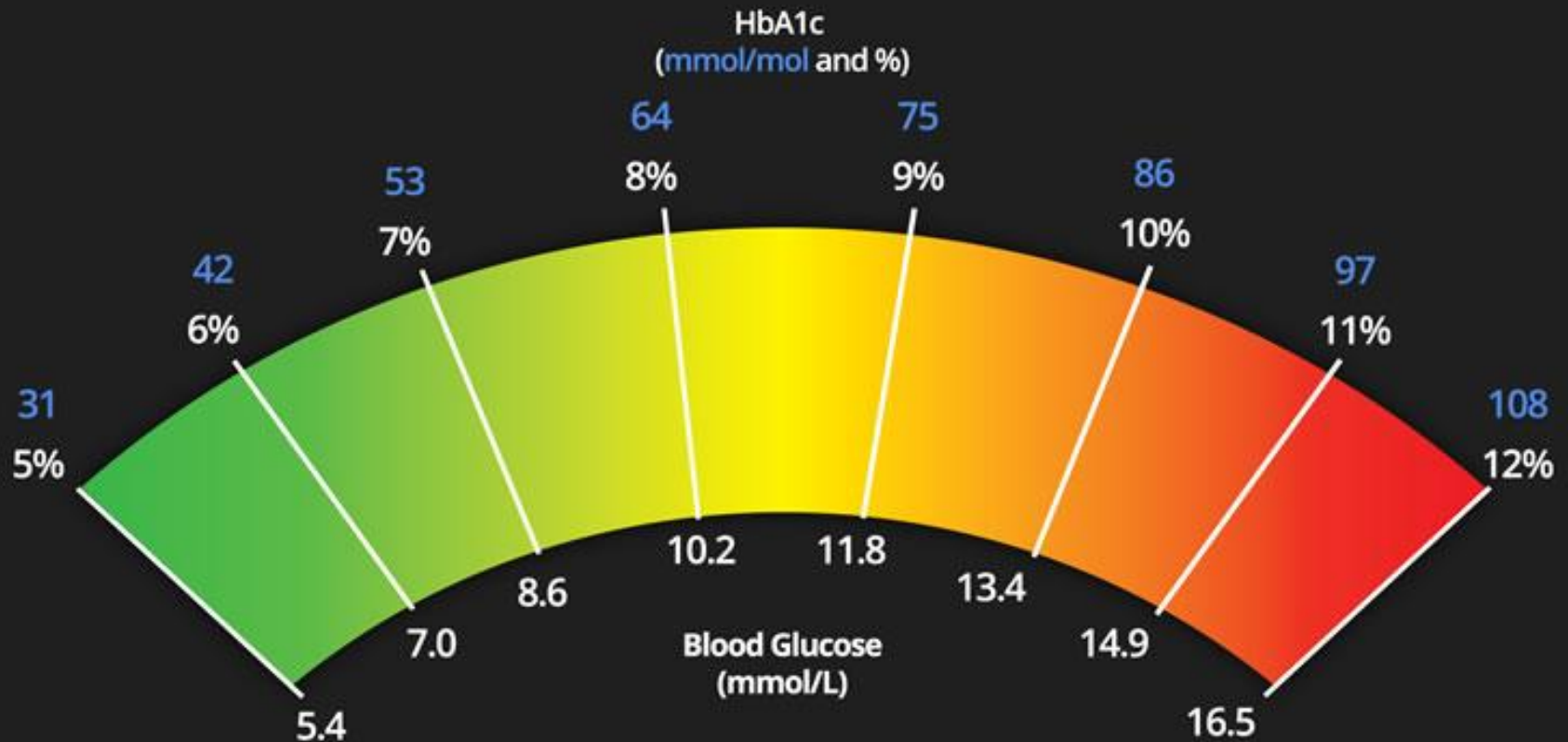
and

Type 2

Prophylactic effects

The glycated haemoglobin test

HbA1c as an indicator of Diabetes Control



Understanding blood sugar levels.

- **Diabetes Canada** (formerly the **Canadian Diabetes Association**) suggests the following A1c and **blood glucose** ranges as a general guide. **Blood glucose: Fasting** and before meals: **4.0 to 7.0 millimoles per litre (mmol/L)**; 2 hours after meals: **5.0 to 10.0 mmol/L**.
- *In the US* normal blood sugar levels are less than 100 mg/dL after not eating (fasting) for at least eight hours. And they're less than 140 mg/dL two hours after eating.

Diabetes Canada, 2018

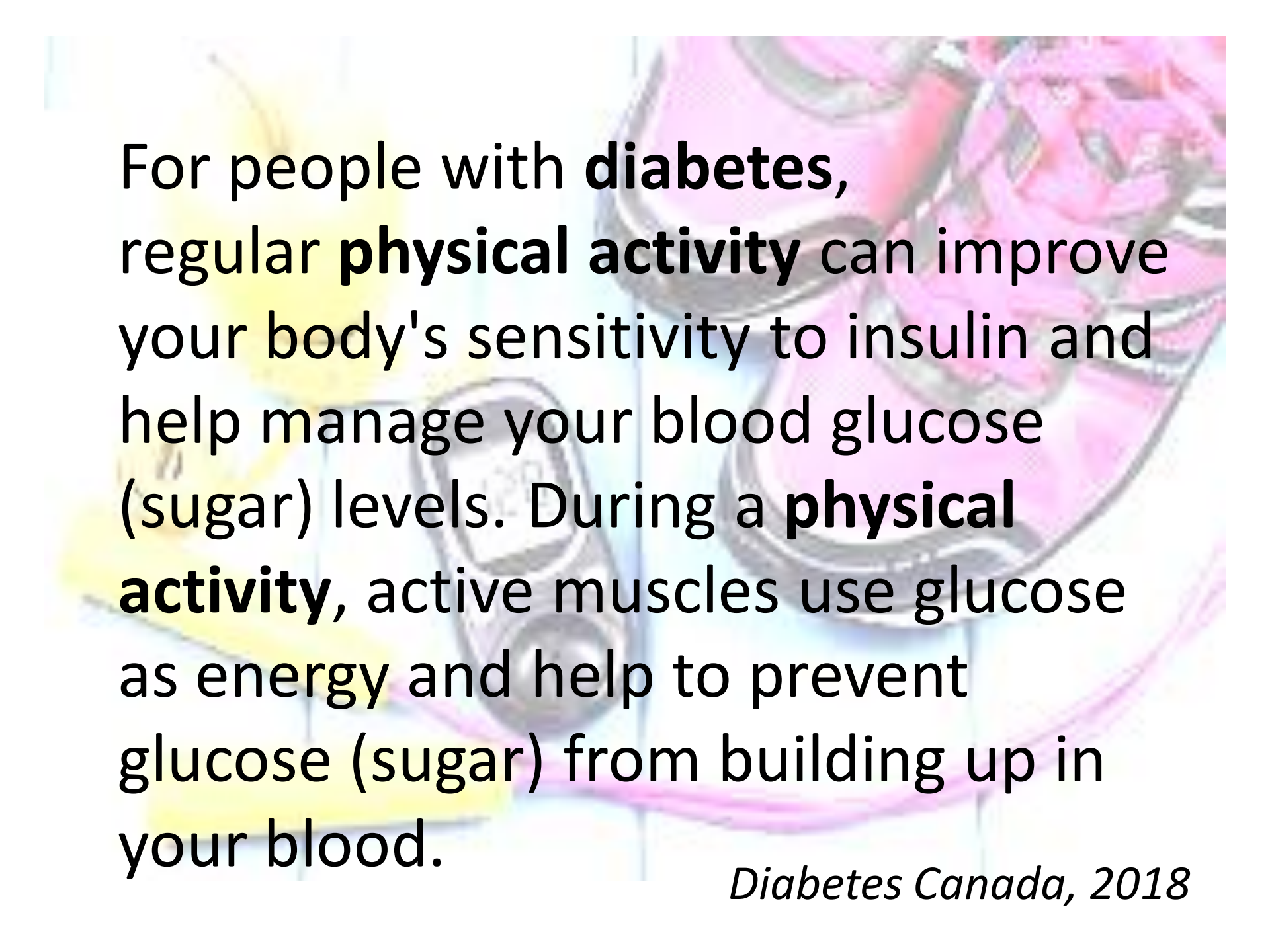


Harvard Health Publishing

HARVARD MEDICAL SCHOOL

Trusted advice for a healthier life

- All forms of exercise — aerobic, resistance, and a combination of both — have been shown to be equally good at lowering HbA1c values.
- Resistance training and aerobic exercise both helped to lower insulin resistance in previously sedentary older adults at risk for diabetes. Combining the two was better than either one alone.
- People with diabetes who walked **at least two hours** a week were less likely to die of heart disease than their sedentary counterparts, and those who exercised three to four hours a week cut their risk even more.
- Women with diabetes who spent at least four hours a week doing moderate or vigorous exercise had a 40% lower risk of developing heart disease than those who didn't exercise.



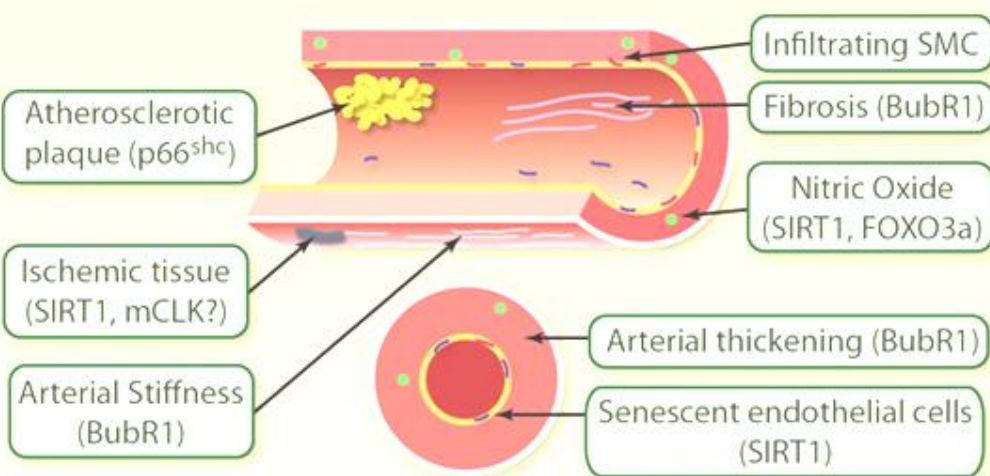
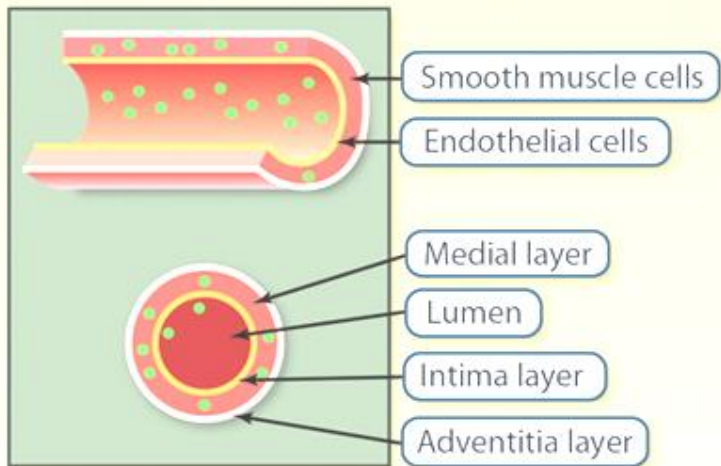
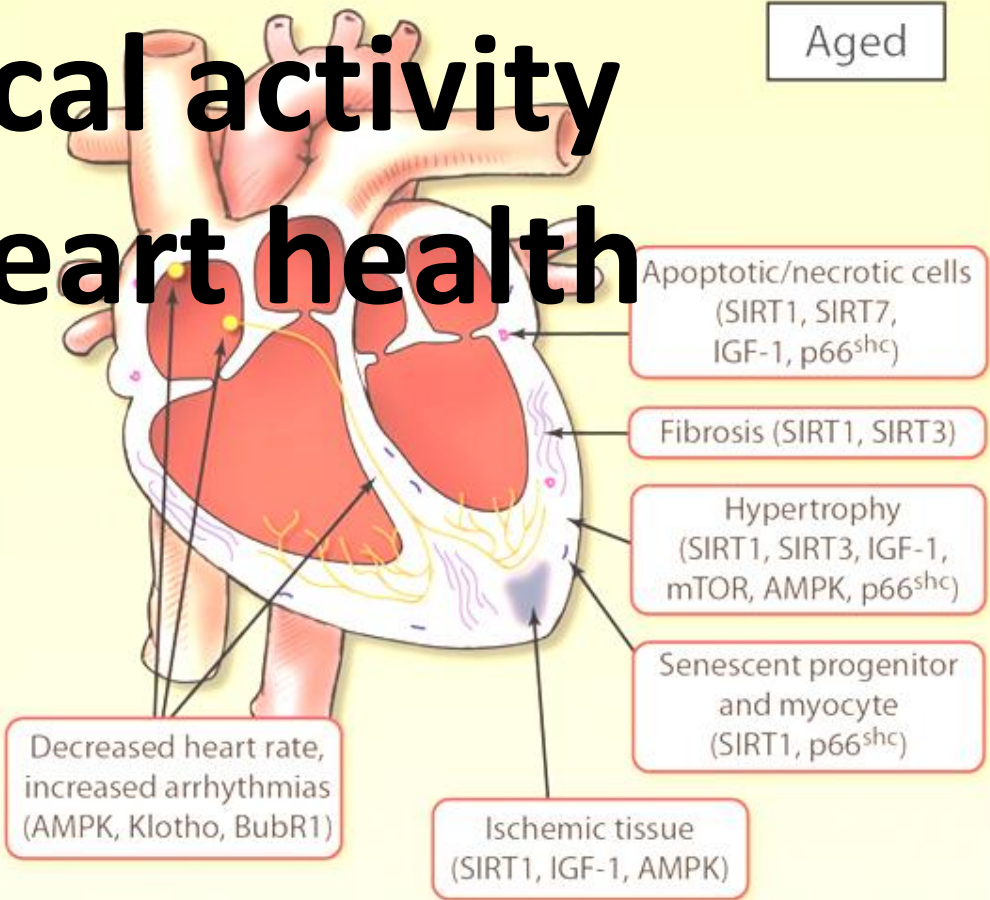
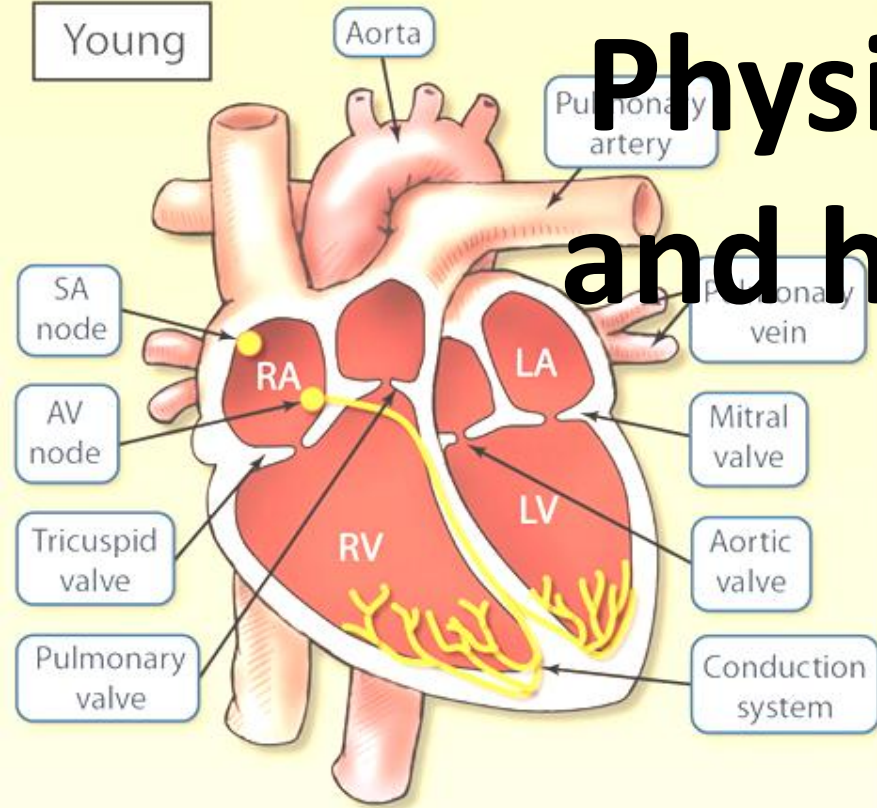
For people with **diabetes**, regular **physical activity** can improve your body's sensitivity to insulin and help manage your blood glucose (sugar) levels. During a **physical activity**, active muscles use glucose as energy and help to prevent glucose (sugar) from building up in your blood.

Diabetes Canada, 2018

Physical activity and heart health

Young

Aged



Benefits of Regular Physical Activity

- *Reduction in cardiovascular disease risk factors*
 - Increases HDL and decreases TG (LDL)
 - Reduces total body fat including intra-abdominal fat
 - Reduces insulin needs, improved glucose tolerance
 - Reduced platelet adhesiveness and aggregation
 - Reduced inflammation
 - Secondary prevention re MI's
 - ***Reduces resting systolic/diastolic pressure (BP)***

Controlling hypertension (high blood pressure)-role of nitric oxide (NO)



Role of nitric oxide (NO)

- Its most important function is vasodilation, meaning it relaxes the inner muscles of the blood vessels, causing them to widen and increase circulation.
- Exercise really does get your blood pumping, largely because it improves endothelial function.
- Endothelium refers to the thin layer of cells that line the blood vessels. These cells produce nitric oxide, which keeps blood vessels healthy.

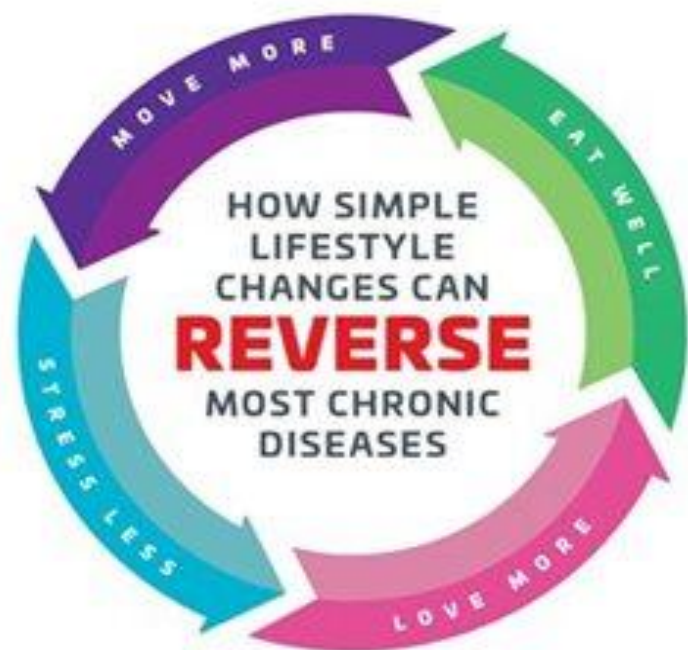
Role of NO (continued)

- Insufficient nitric oxide production results in endothelium dysfunction, which can contribute to atherosclerosis, high blood pressure and other risk factors for heart disease
- Exercise keeps your endothelial cells and blood vessels healthy by increasing your body's natural ability to produce nitric oxide.
- Several studies have shown that regular physical activity increases endothelial vasodilation in people who have high blood pressure and heart disease, as well as in healthy individuals.
- Studies have also shown that exercise increases antioxidant activity, which helps inhibit the breakdown of nitric oxide caused by free radicals

NEW YORK TIMES BESTSELLING AUTHOR

Dean Ornish, M.D., and Anne Ornish

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"Dr. Dean Ornish pioneered the revolutionary field of lifestyle medicine: using lifestyle changes to prevent and reverse—UNDO!—heart disease, type 2 diabetes, prostate cancer, high blood pressure, depression, weight gain, high cholesterol, and other chronic diseases. His new unifying theory is truly game-changing and can save your health and your life."

—KIM A. WILLIAMS, M.D., President Emeritus, American College of Cardiology

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Now
with a new
introduction

Named "Best Heart Health" diet by
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Dean Ornish, M.D.

The four pillars!

Eat
well

Move
more

Stress
less

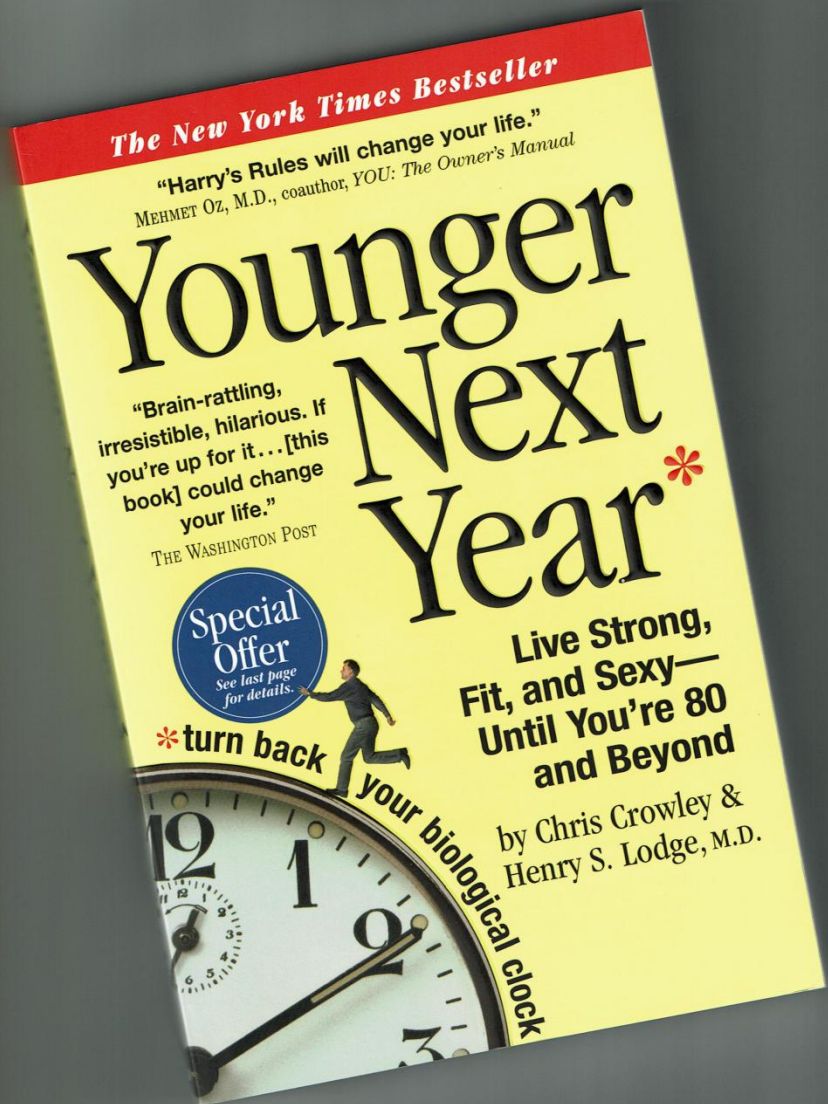
Love
more!

A photograph of two women in a swimming pool. The woman in the foreground is a Black woman with her hair in a bun, wearing a black and purple swimsuit, smiling broadly while holding a white water dumbbell with pink and red stripes. The woman in the background is a white woman with blonde hair, also smiling, holding another similar water dumbbell. The water is clear blue.

Regular exercise helps reverse age-related changes in your heart
Moderate workouts on most days of the week may be enough for heart-healing benefits.

Published: January, 2019

https://www.health.harvard.edu/newsletters/harvard_womens_health_watch/2019/january



- The role of inflammation (the positive C10 and the negative C6!)
- Cell regeneration
- We break down and rebuild 1-2% of our muscle every day (van Loon, 2012)

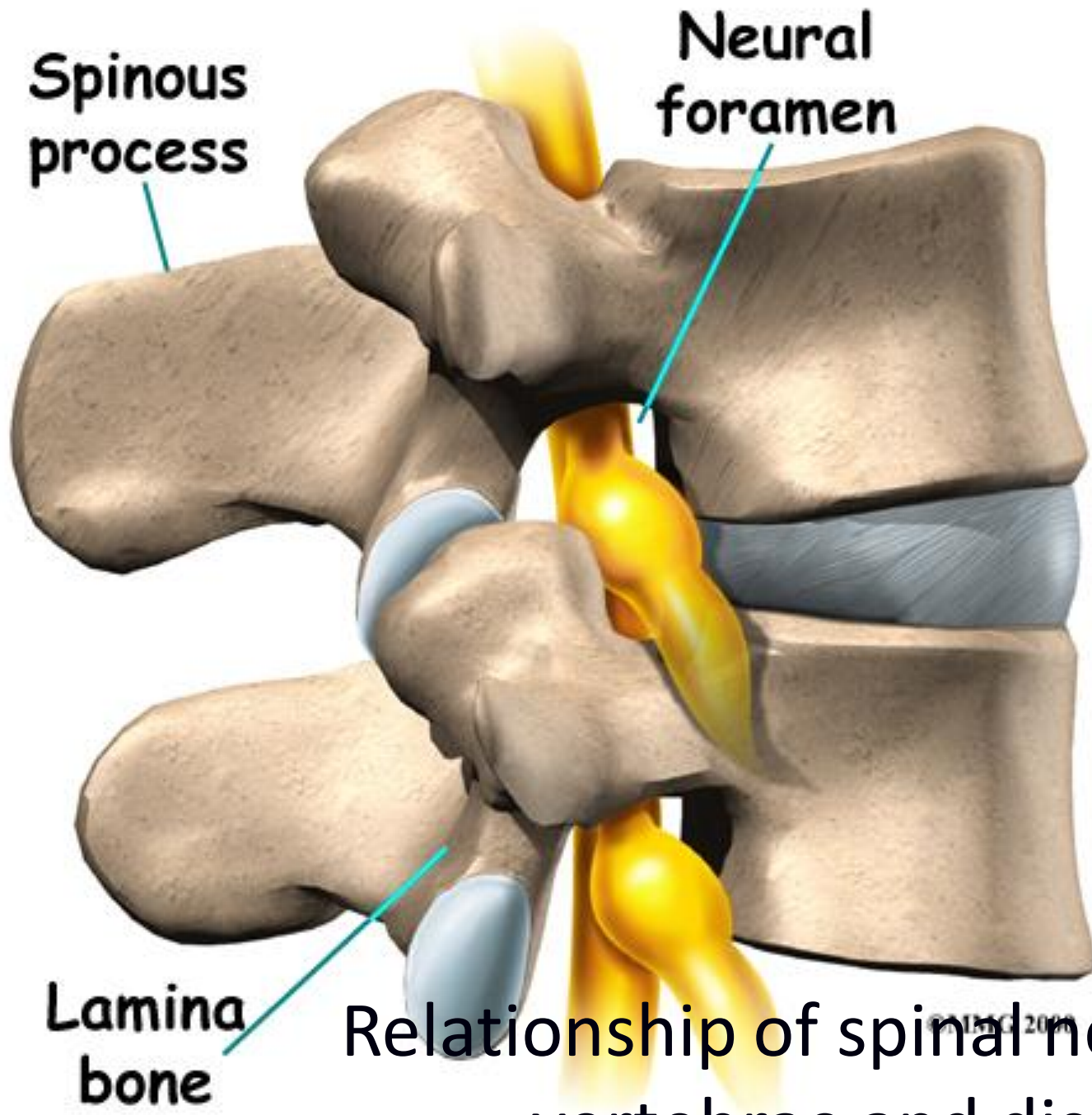
Other benefits or **therapeutic effects** of physical activity



**Low back
pain!**



**Stacking of
the vertebrae**



Spinous process

Neural foramen

Lamina bone

Relationship of spinal nerves to vertebrae and discs

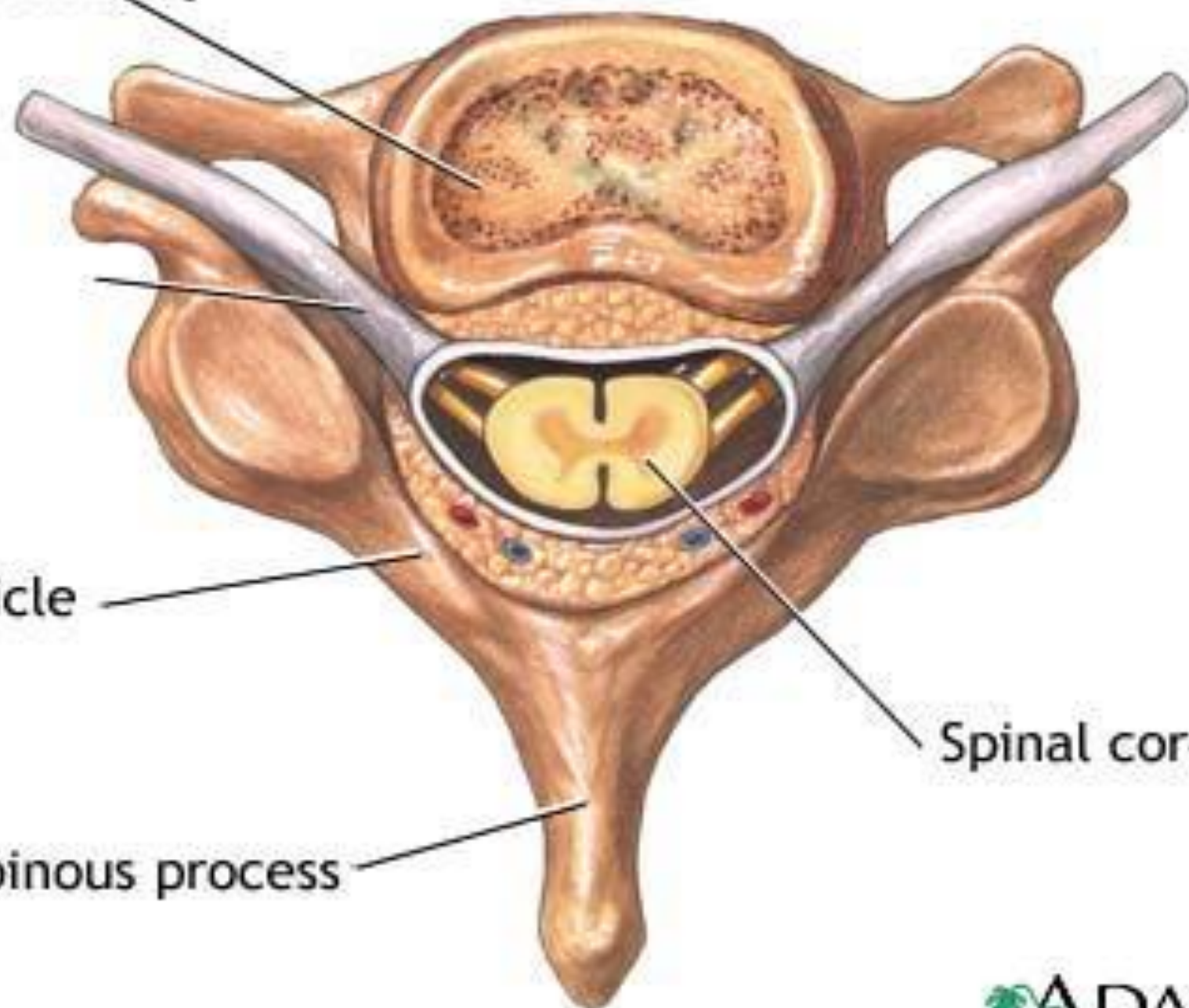
© 2000

Vertebral body

Spinal nerve

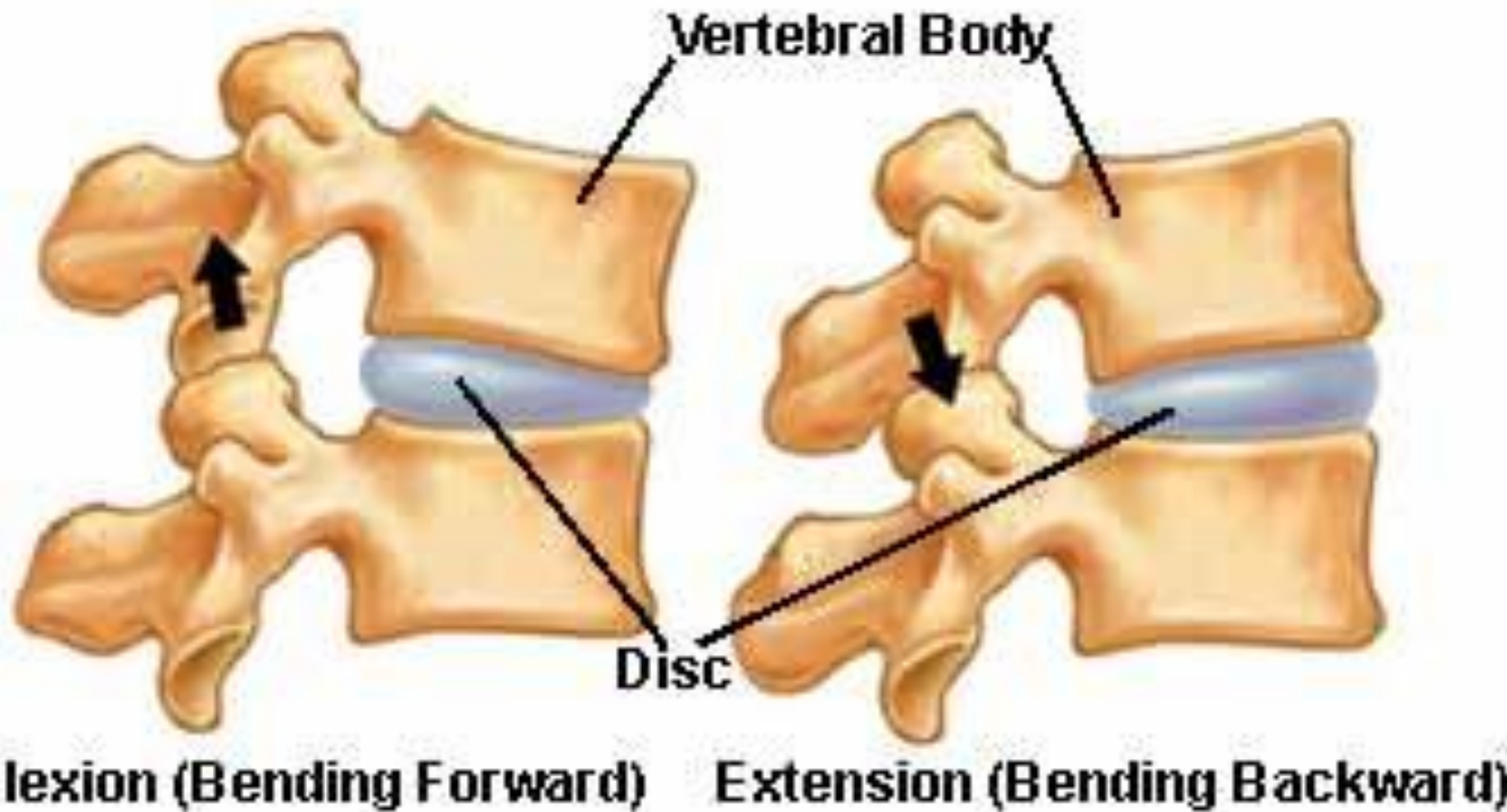
Pedicle

Spinous process

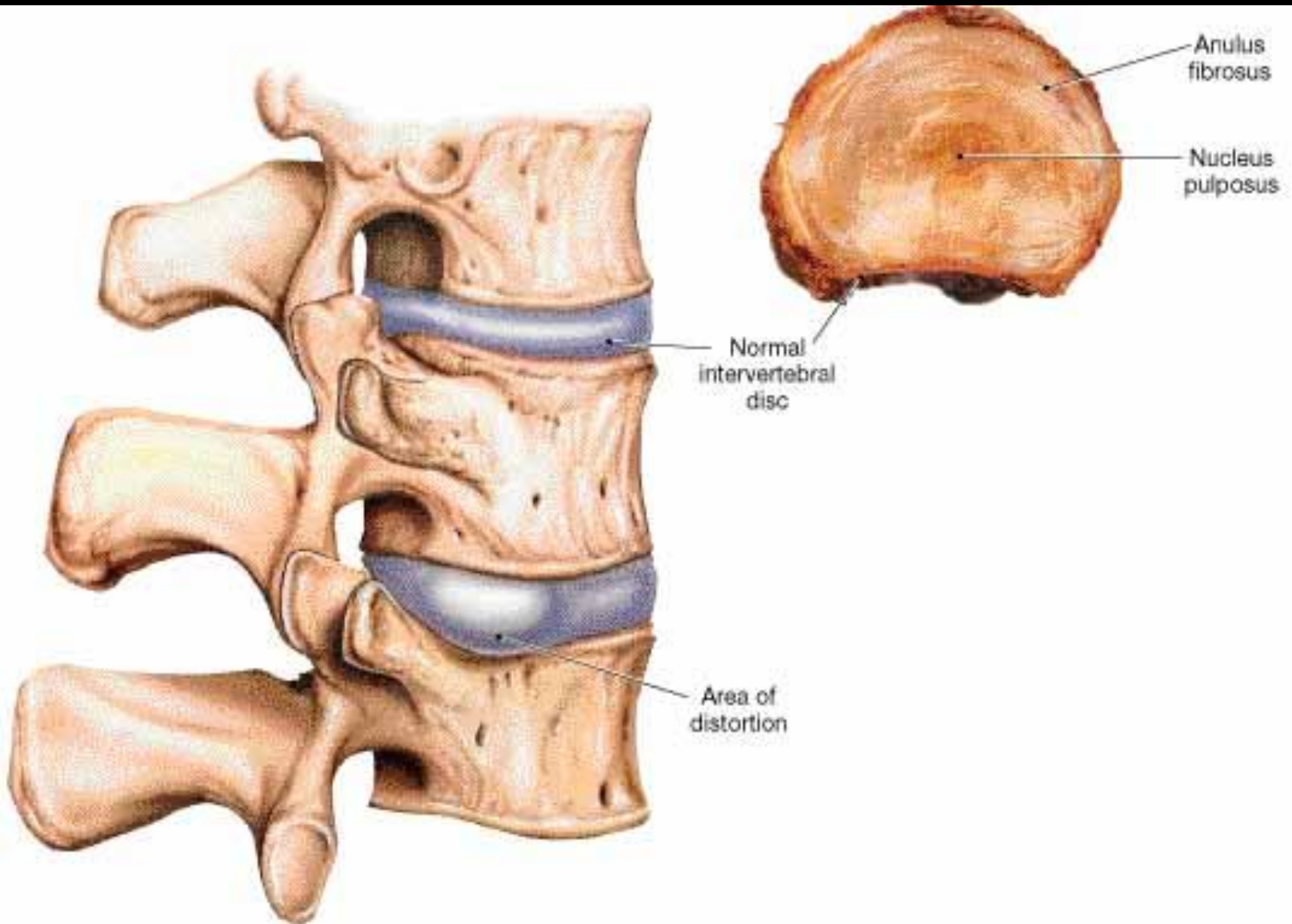


Spinal cord

Facet Joints in Motion

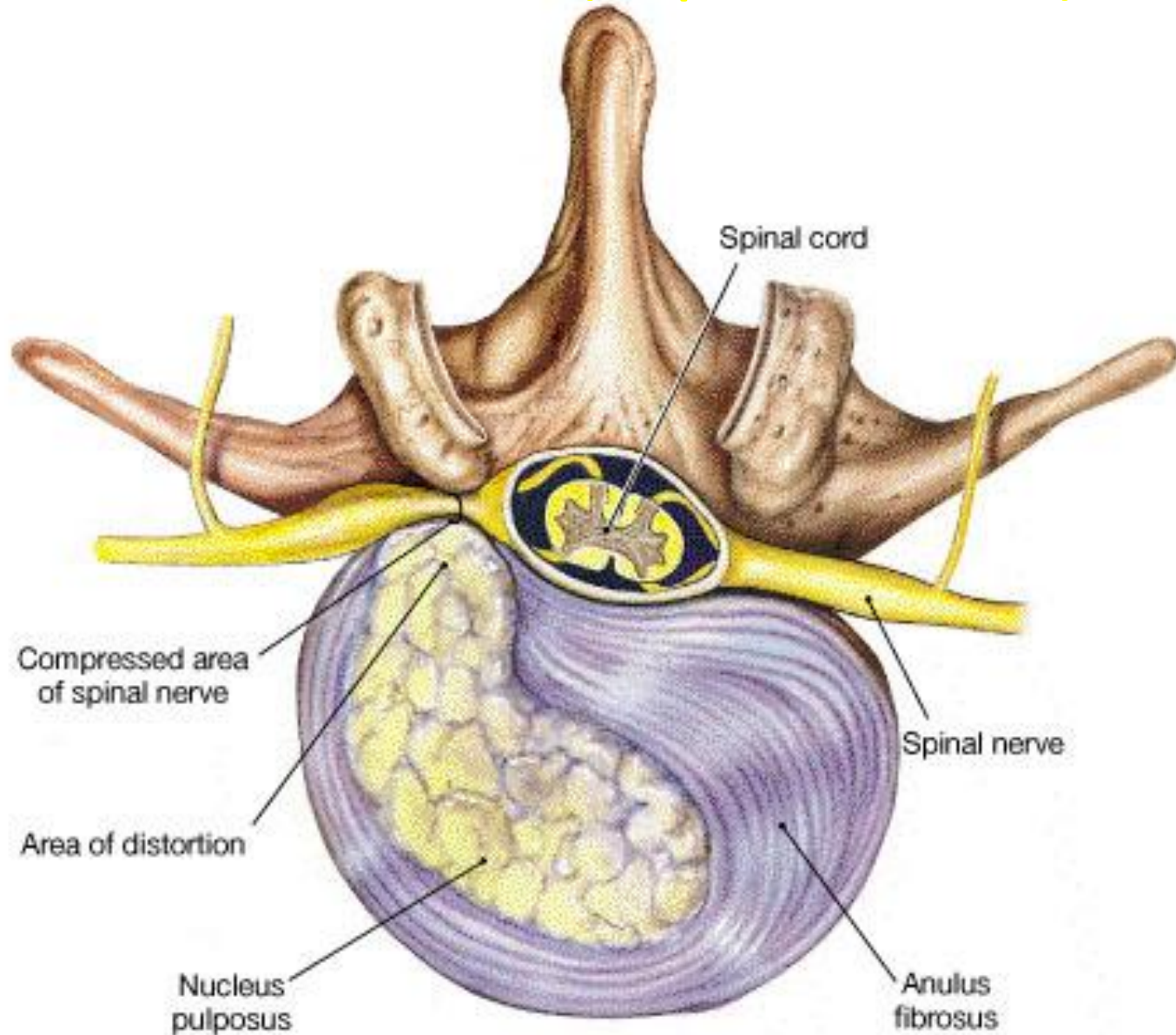


Vertebrae (lateral view of distorted intervertebral disc)



(a) Lateral view of distorted intervertebral disc

Herniated disc (superior view)



(b) Herniated disc, superior view



Living With Osteoarthritis

Osteoarthritis: Chronic degeneration of the cartilage that cushions the joints



Risk Factors

45
and
Over



More
common
in *women*
than men

Symptoms

- 33% of patients report pain in early stages
- Stiffness
- Swelling
- Sensation/rubbing of bone on bone
- Crunching / popping sounds during movement
- Difficulty walking
- Limited movement, especially in the hips

Treatments



Weight loss



Treatments



Rest



Pain creams



Assistive devices



Low-impact exercise



Medications



Injections



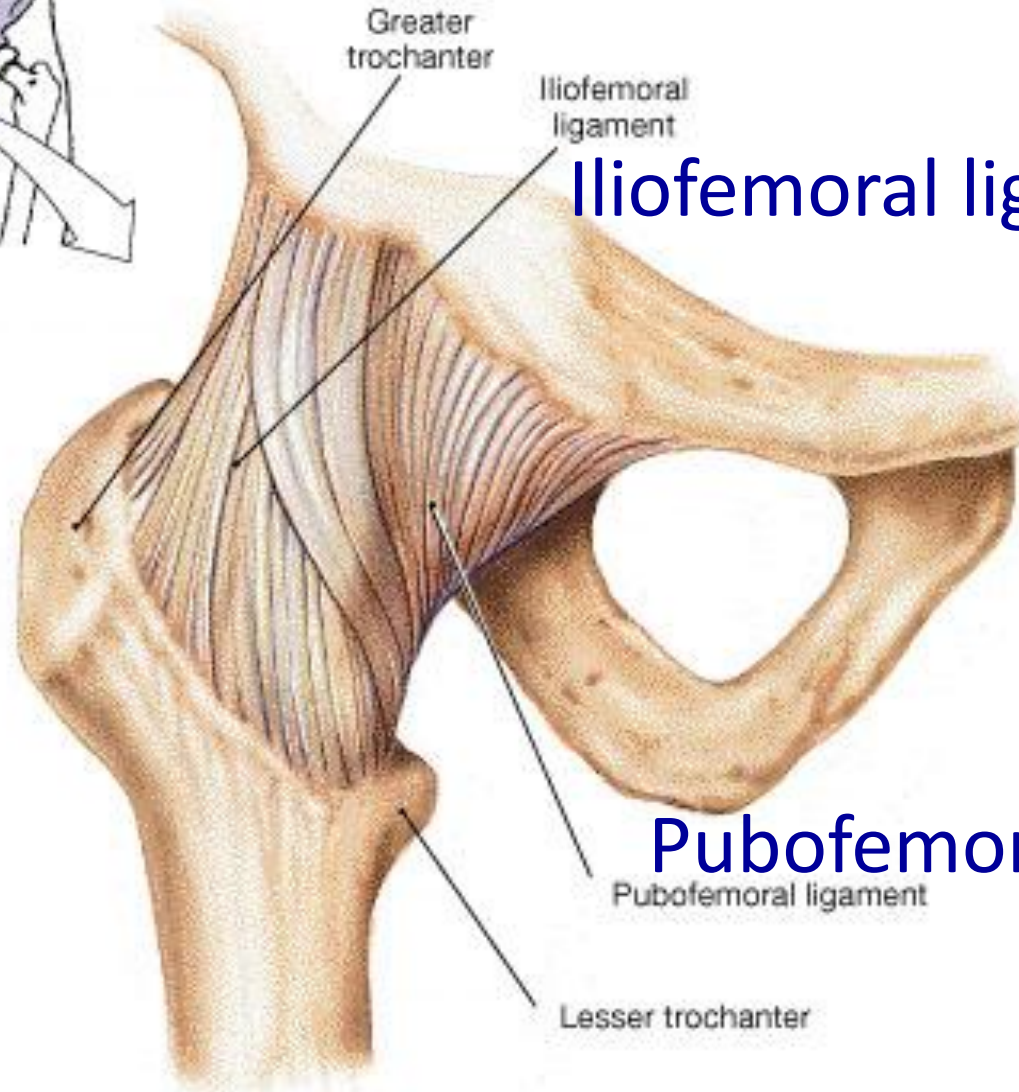
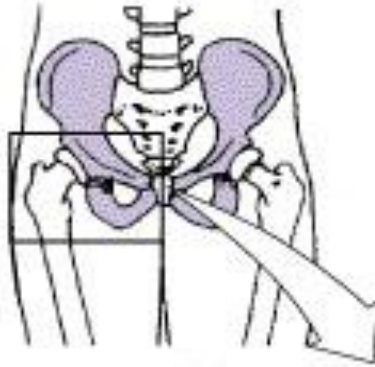
Joint replacement
(Severe cases)

Joints!



"I still think I'd like a second opinion."

Ligaments



Greater trochanter

Iliofemoral ligament

Iliofemoral ligament

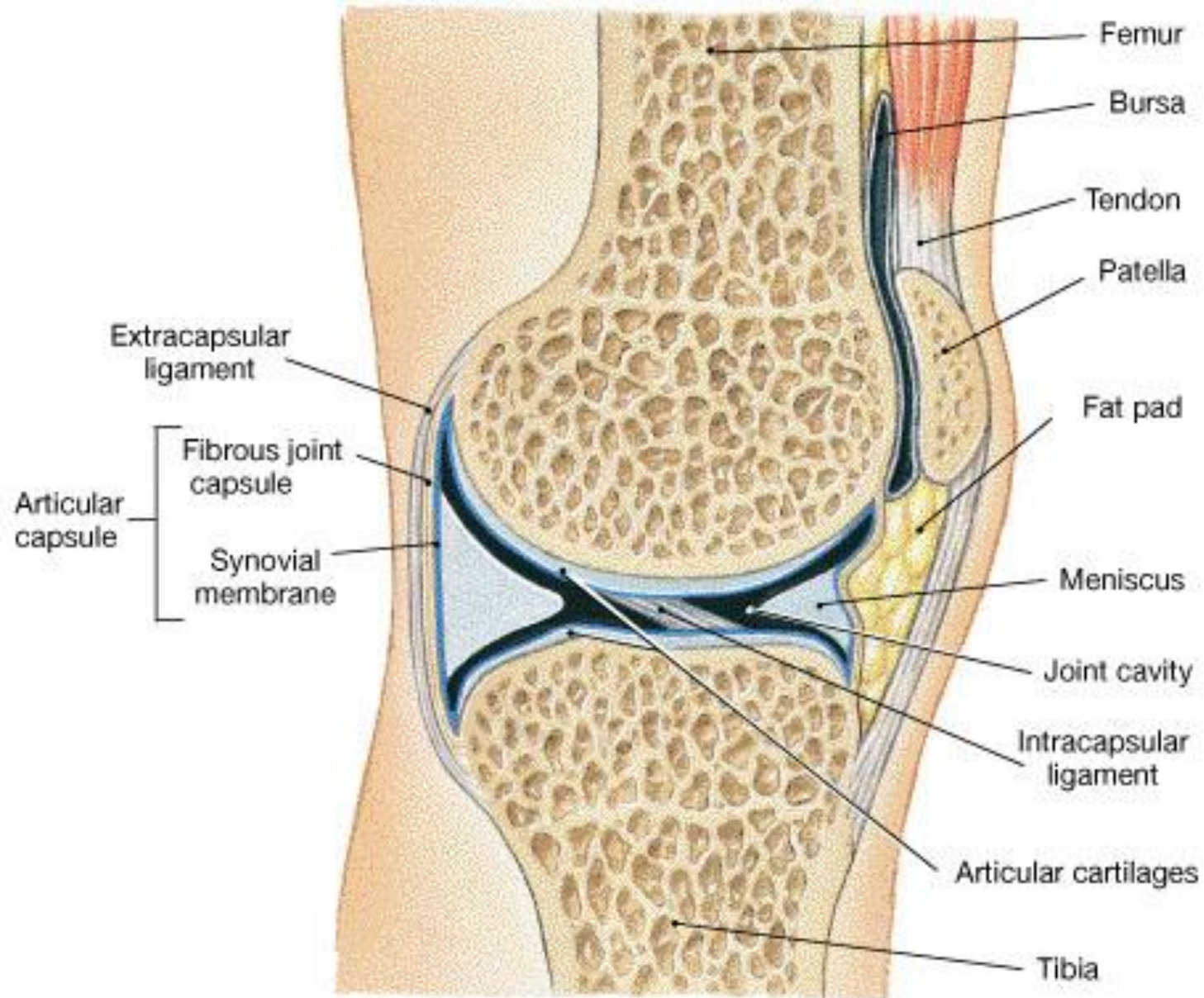
Pubofemoral lig.

Pubofemoral ligament

Lesser trochanter

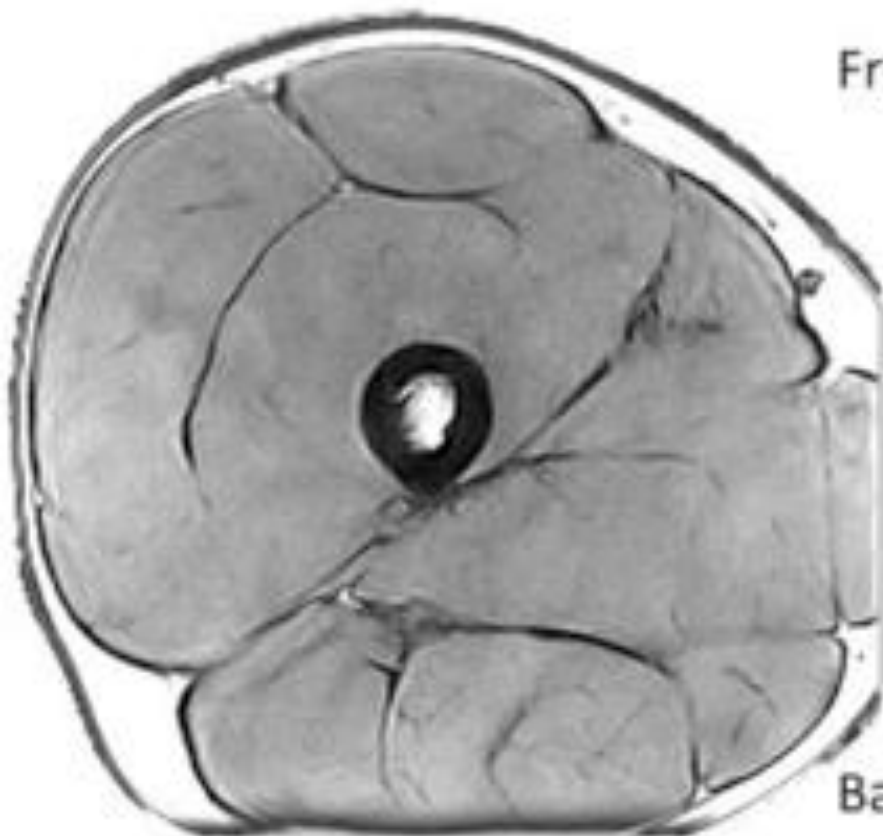
(b) Anterior view

Synovial joint



(b) Knee joint, sagittal section

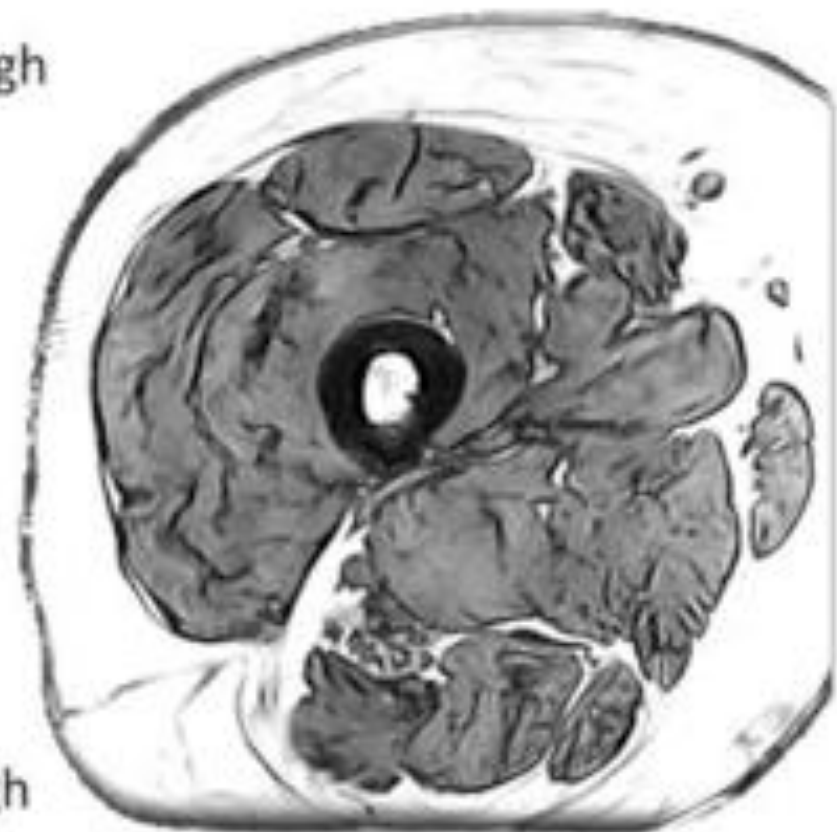
Muscle wastage as we age



23 year old man

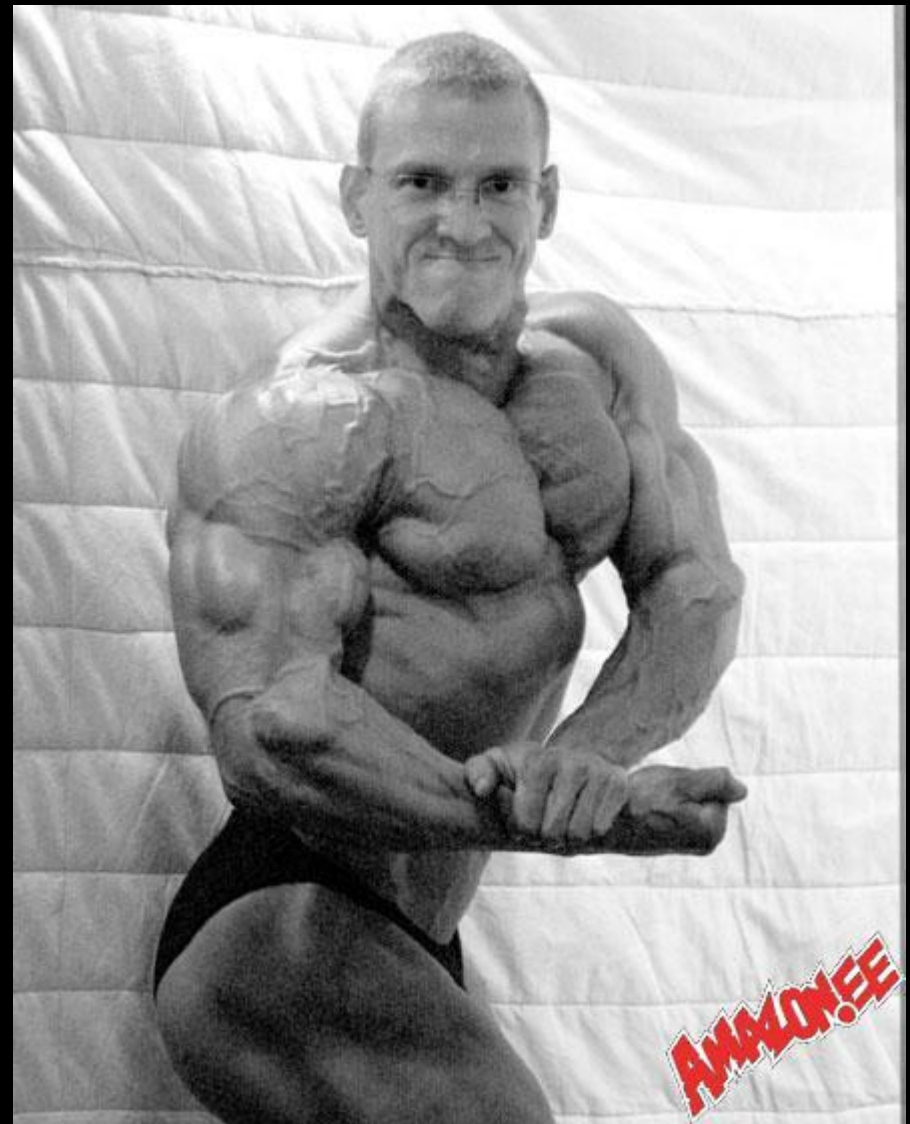
Front thigh

Back thigh



78 year old man

Strength and muscle mass!

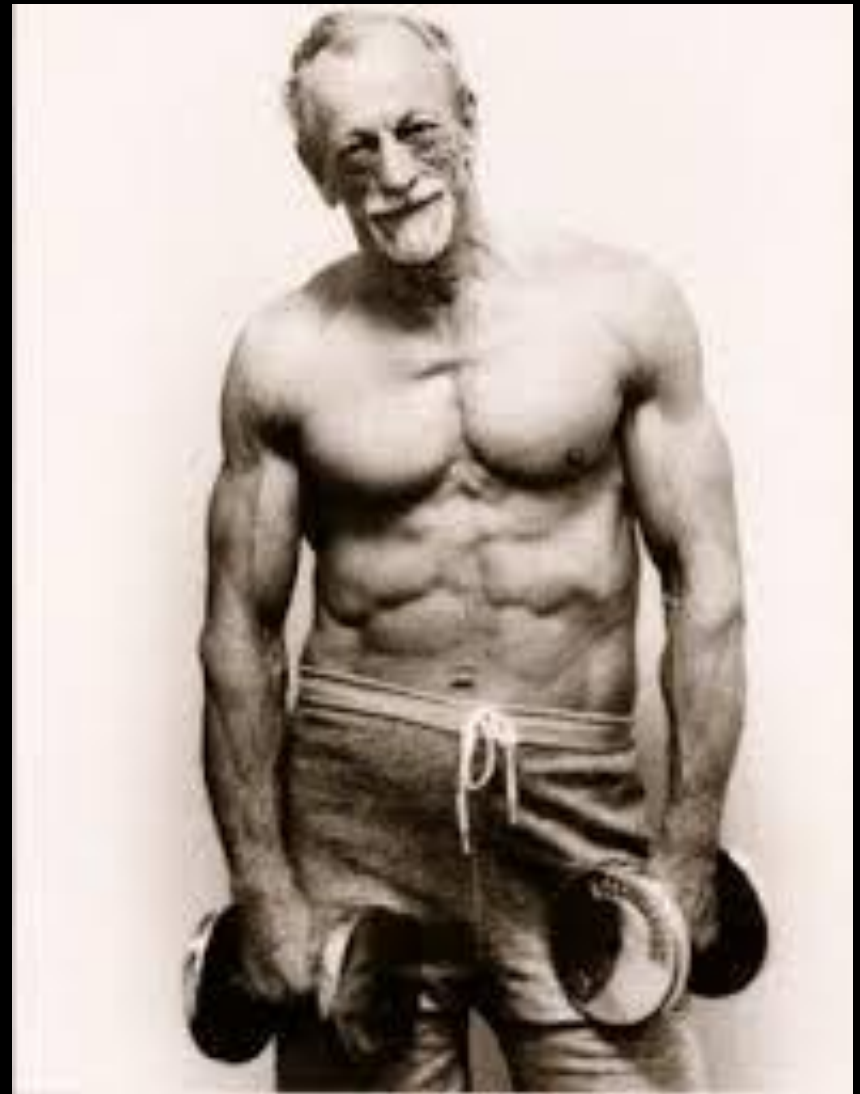


Effect of hormones on hypertrophy

- Testosterone is a strong anabolic steroid that enhances muscle growth
- It declines in males with age (after 30!)
- However, hypertrophy of skeletal muscle is still possible in women and older individuals through the release of Growth hormone (GH), IGF-1
- Skeletal muscle can also synthesize testosterone, estradiol, dehydroepiandrosterone (DHEA), and dihydrotestosterone (DHT).

- "Resistance-training–induced increased muscular sex steroid hormones may positively affect age-related concerns such as accidental falls, diabetes, sarcopenia, and osteoporosis and may improve the quality of life for older individuals,"

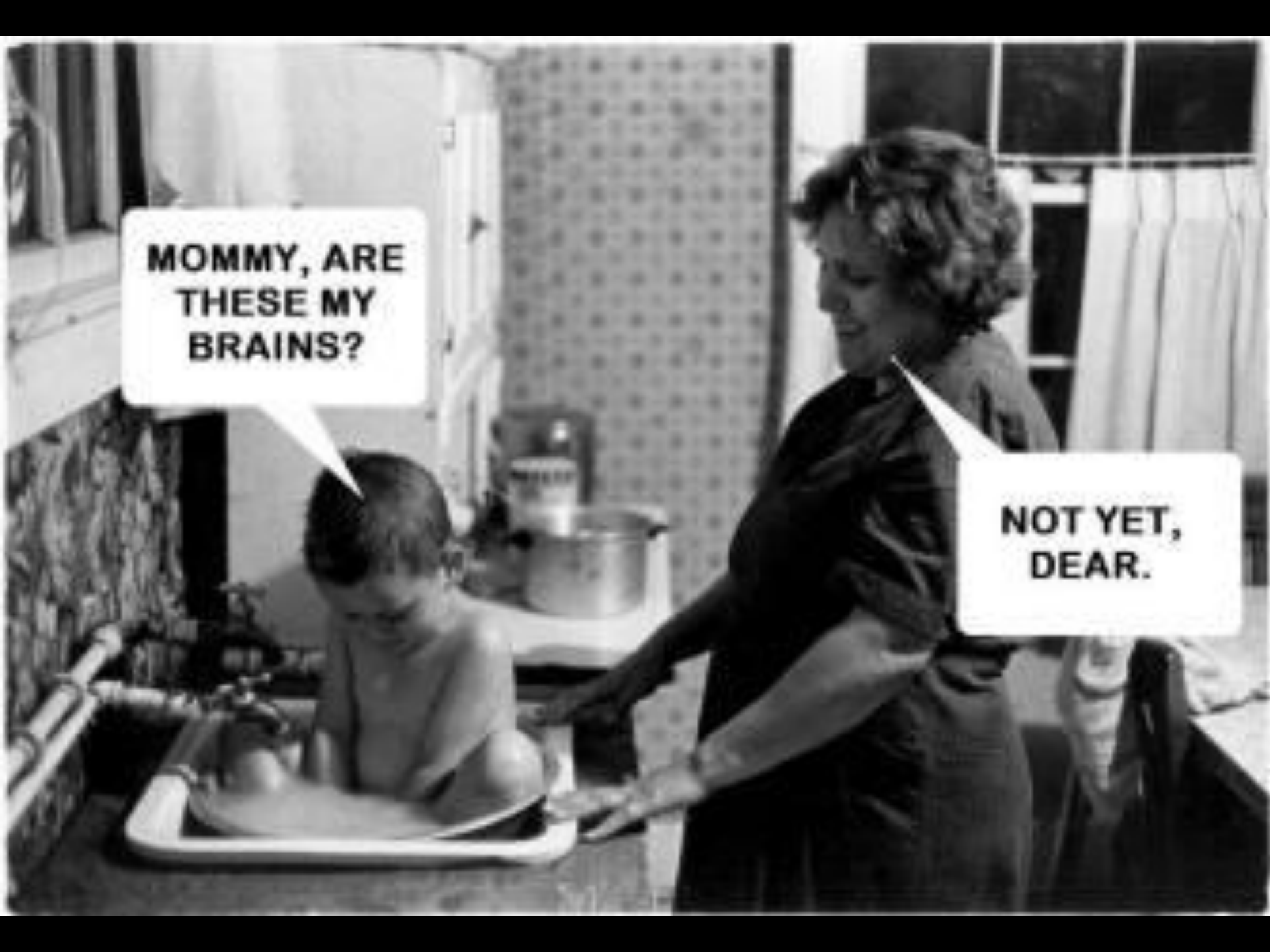
Sato et al., 2014



In addition.....

“The No. 1 reason people are admitted into nursing care is a loss of leg strength. Exercising can restore that [strength], mobility, balance, allow you to get out more and exercise and stay independent.”

(Colin Miller, CEO, International Council on Aging, Times Colonist, Oct. 15th, 2005)



**MOMMY, ARE
THESE MY
BRAINS?**

**NOT YET,
DEAR.**

Anxiety and depression

<https://www.medscape.com/viewarticle/892621>



The Effects of **Acute** Exercise on Mood, Cognition, Neurophysiology, and Neurochemical Pathways: A Review :

- ... the three most consistent cognitive/behavioral effects of *a single bout* of exercise in humans are improved **executive functions, enhanced mood states, and decreased stress levels**
- One of the most dramatic effects seen after **acute** exercise is the change in **neurochemical levels** including neurotransmitters, metabolites, growth factors, and neuromodulators

“Just a little exercise can reduce onset of Alzheimer’s” *(National Post, March 8th, 2013)*

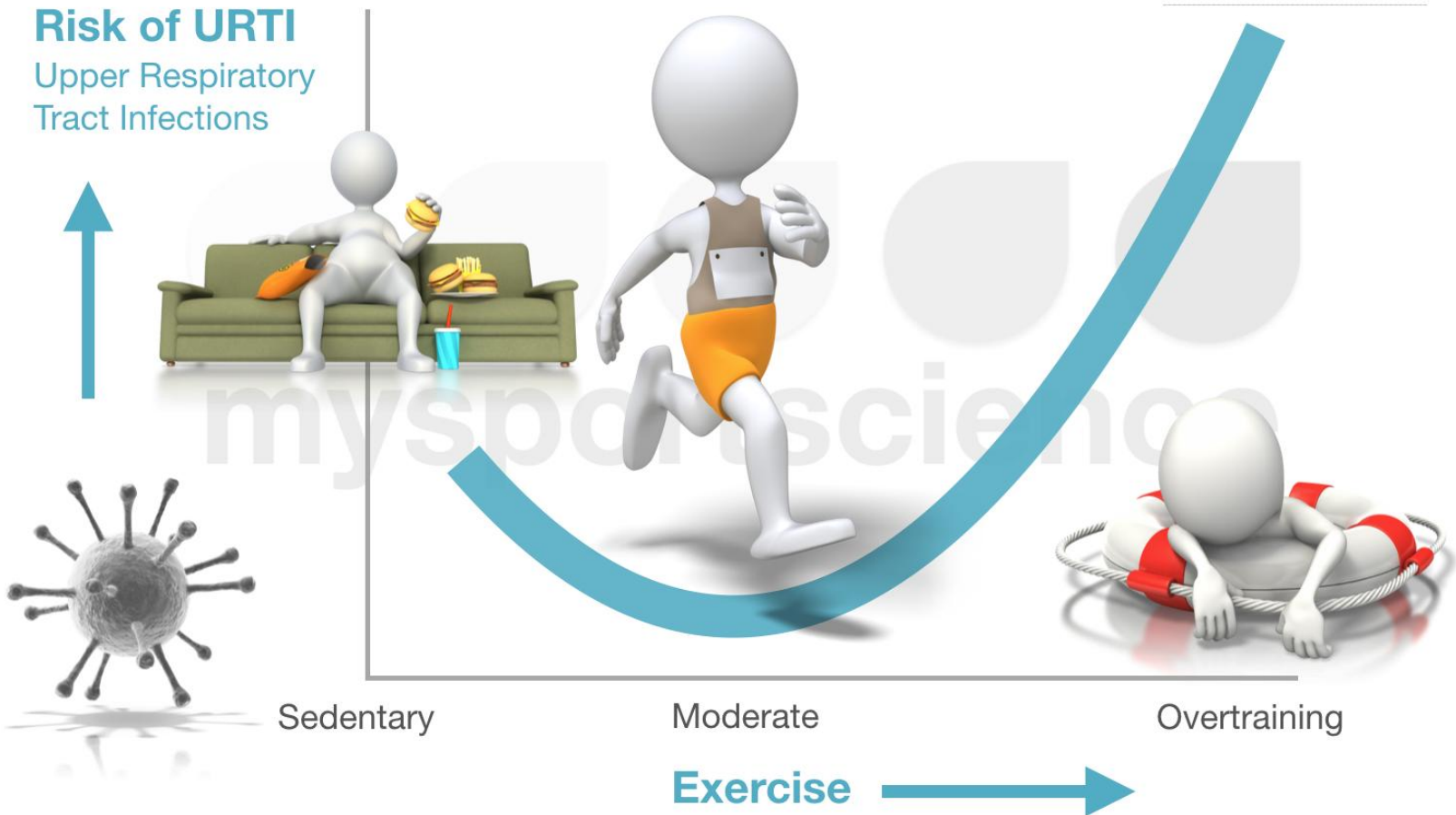
- Taking brisk walks in **10 minute** bouts a few times a day can significantly delay onset of dementia and even prevent it!
- Regular physical activity also helps people with Alzheimer’s and other forms of dementia better manage their disease!

(Ontario Brain Institute [2013]-published a report based on almost 900 studies done in the last 50 years)

Boosting the immune system



Effect of exercise on immune function



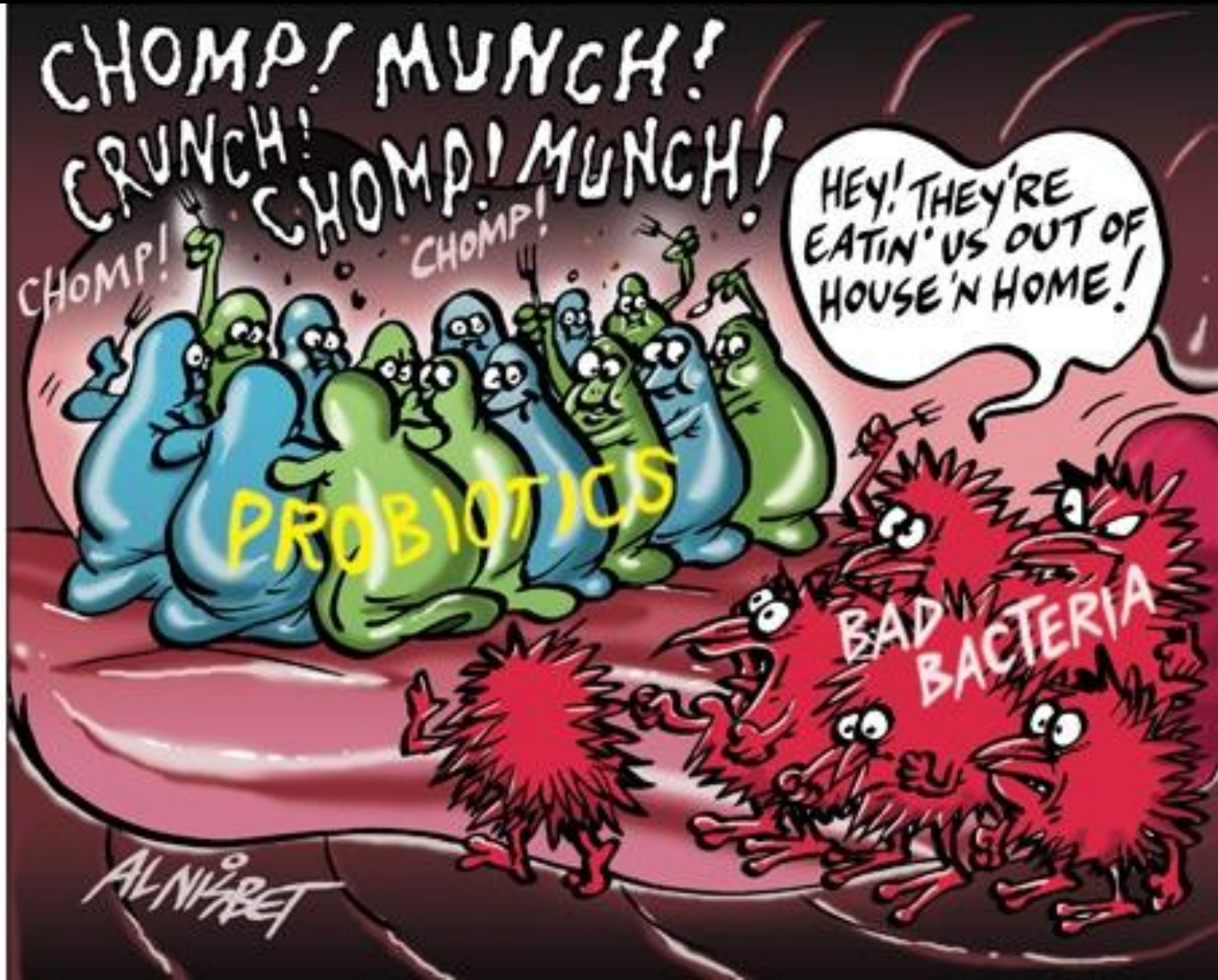
In summary: Therapeutic affects of physical activity

- Cardiovascular/heart health (Blood pressure/hypertension)
- Neurological benefits
 - Mood state/depression
 - Cognitive/executive functioning
- One moderate exercise session of **20 min stimulates the immune system** and sets off a cellular response that may help to suppress inflammation in the body

Therapeutic affects of physical activity *(continued)*

- Decreased risk of Metabolic Syndrome (29%)
- Arthritis
- Improved body image
- Obesity/weight control
- Diabetes
- All of the above = better sex life!
- 22% decrease in death! (15 min per day).
- Certain cancers (not covered)

Can the gut do all that?



TIME 😊
FOR A
BREAK

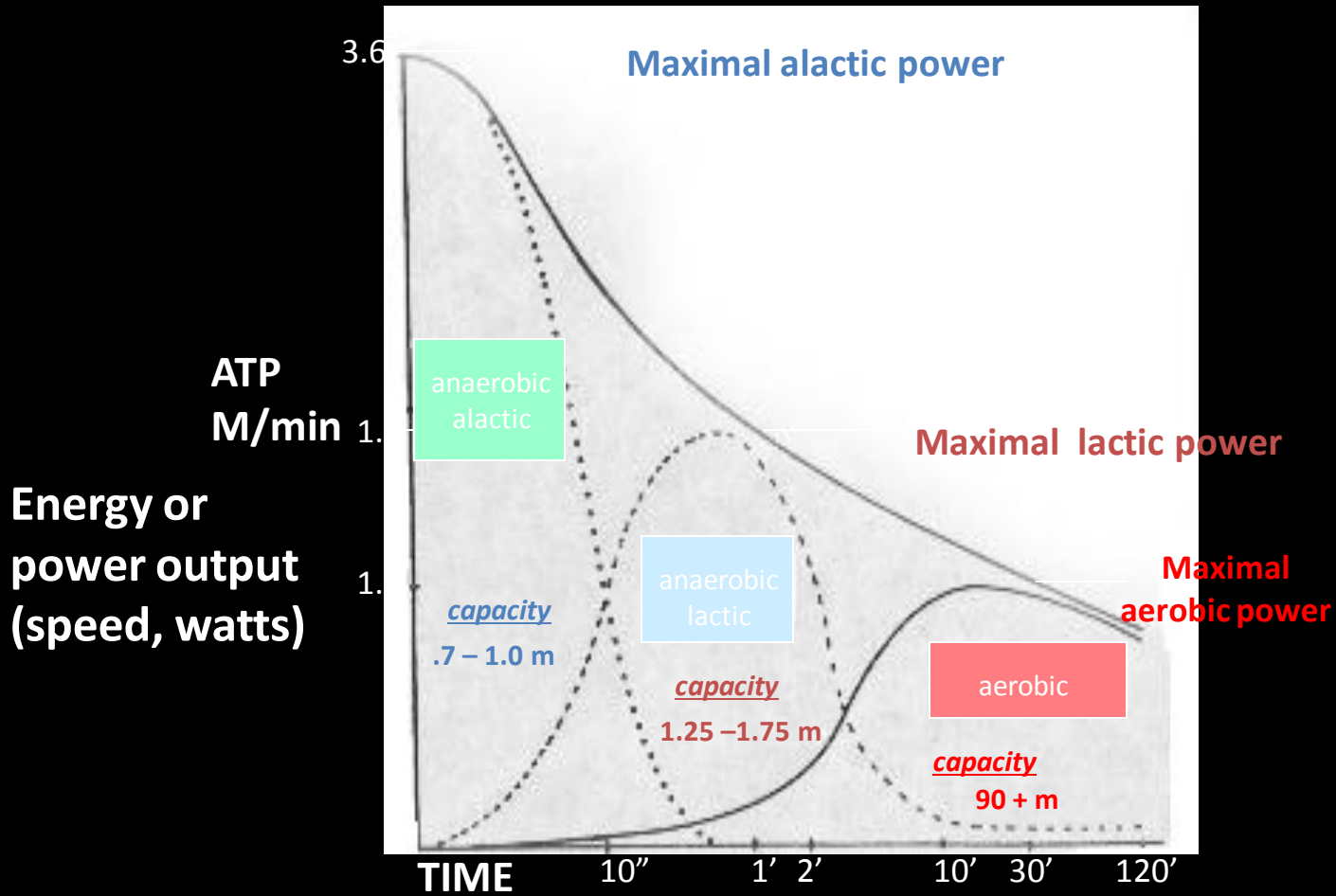
Now the physical activity part!



TABLE 8.5 Perceived Exertion Category Scales

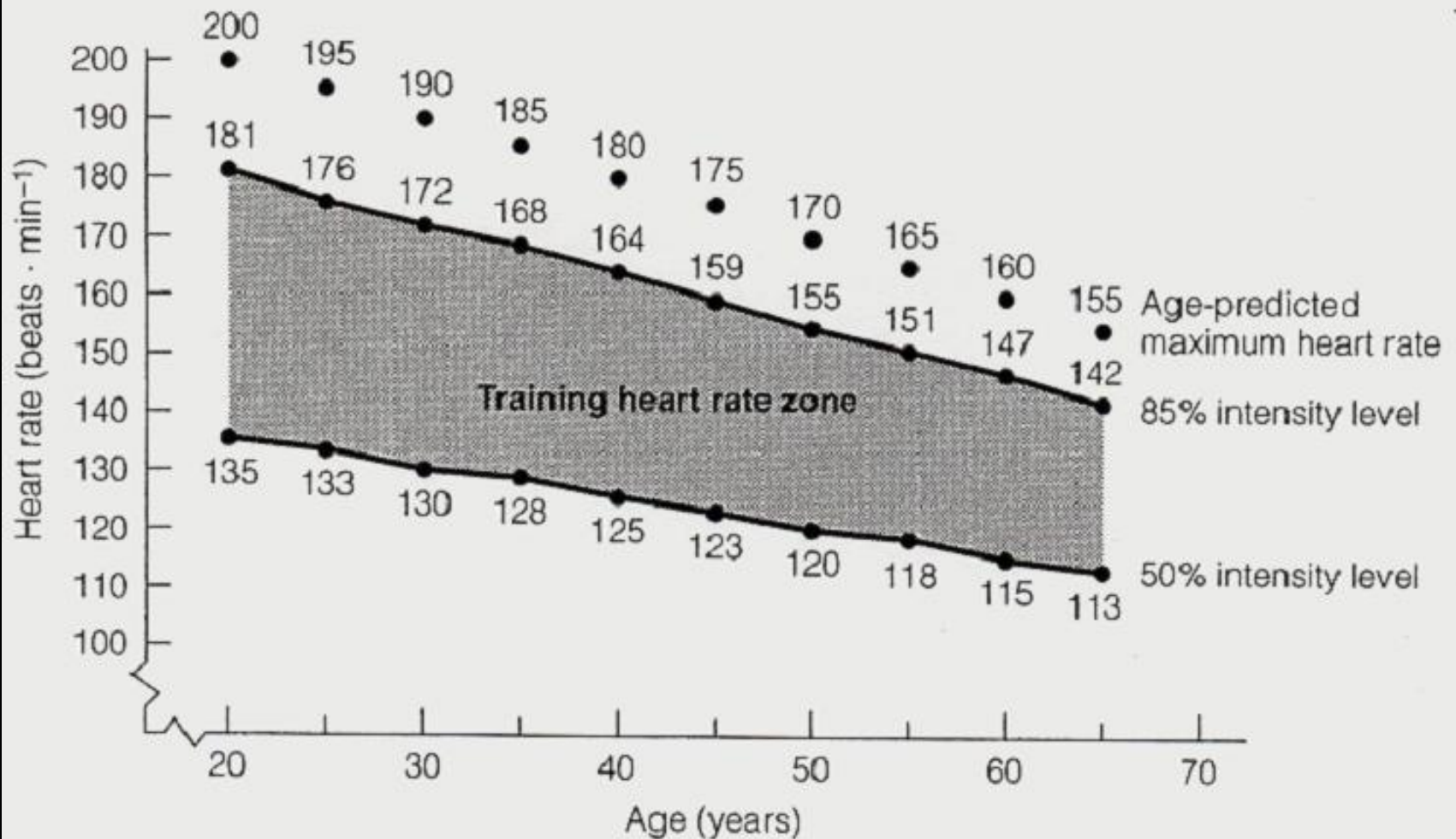
Fifteen-Category RPE Scale		Category-Ratio RPE Scale	
Light Intensity			
6	No exertion at all	0	Nothing at all
7	Extremely light	0.5	Very, very weak (just noticeable)
8			
9	Very light	1	Very weak
10		2	Weak (light)
11	Light	3	Moderate
Moderate Intensity			
12		4	Somewhat strong
13	Somewhat hard	5	Strong (heavy)
14		6	
Vigorous Intensity			
15	Hard (heavy)	7	Very strong
16		8	
17	Very hard	9	
18		10	Very, very strong (almost max)
19	Extremely hard		
20	Maximal exertion	•	Maximal

THE ENERGY SUPPLY CONTINUUM

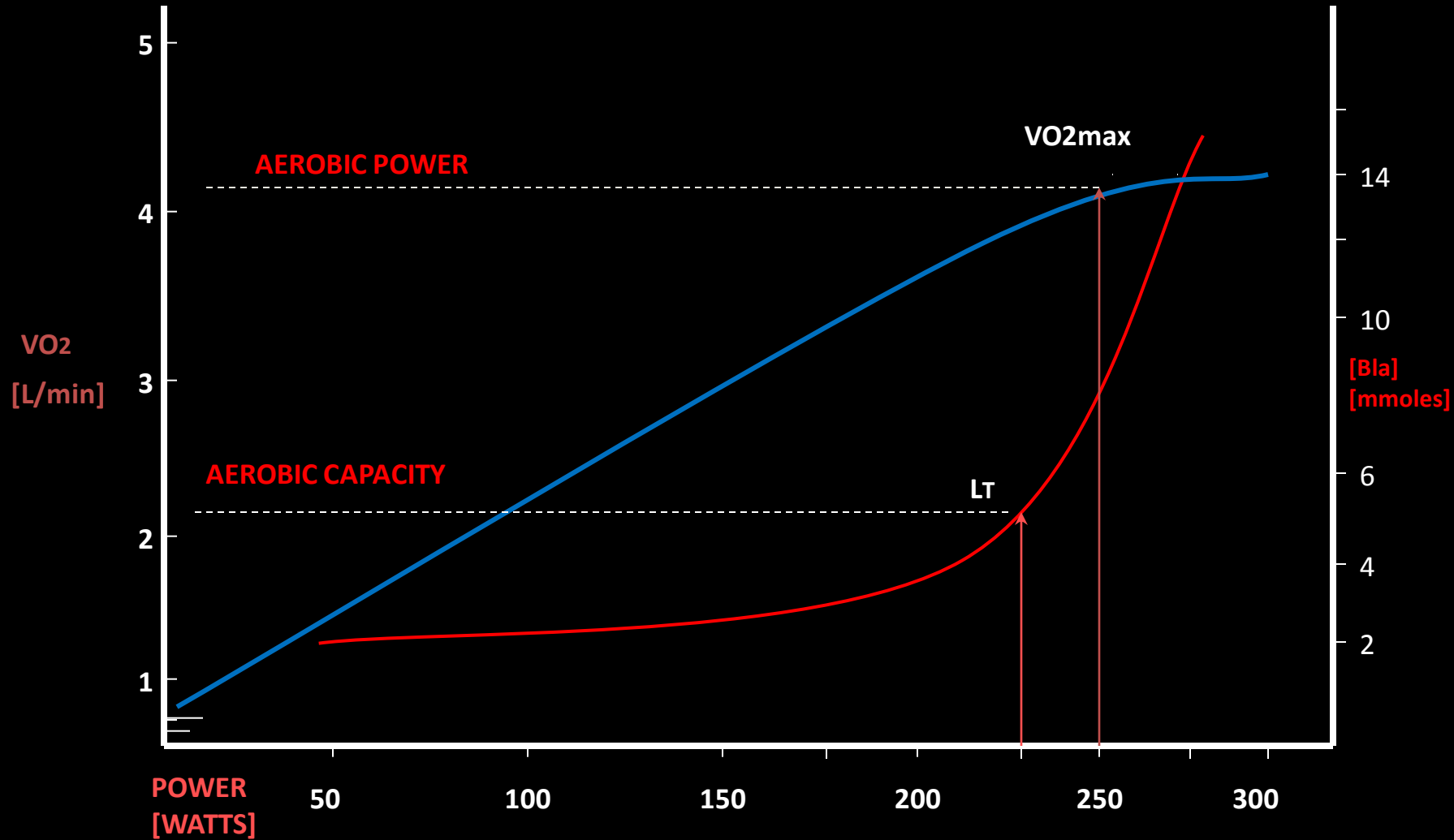


Adapted from
Howald et al. 1978

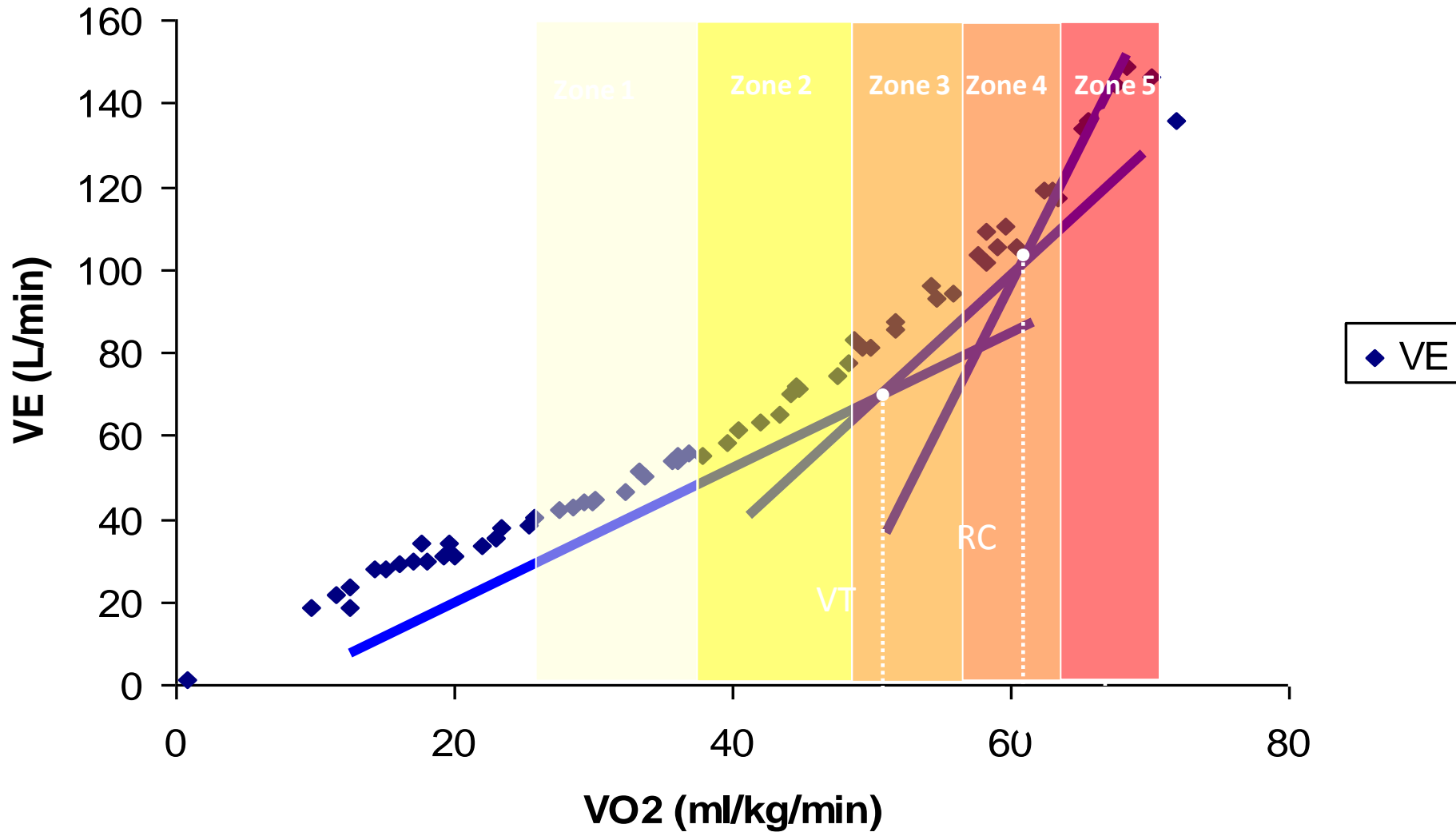
HR Training Zones



DETERMINING AEROBIC POWER AND CAPACITY IN RELATION TO VO_2 AND BL_a



VE vs. VO2



Exercise prescription: engage in..

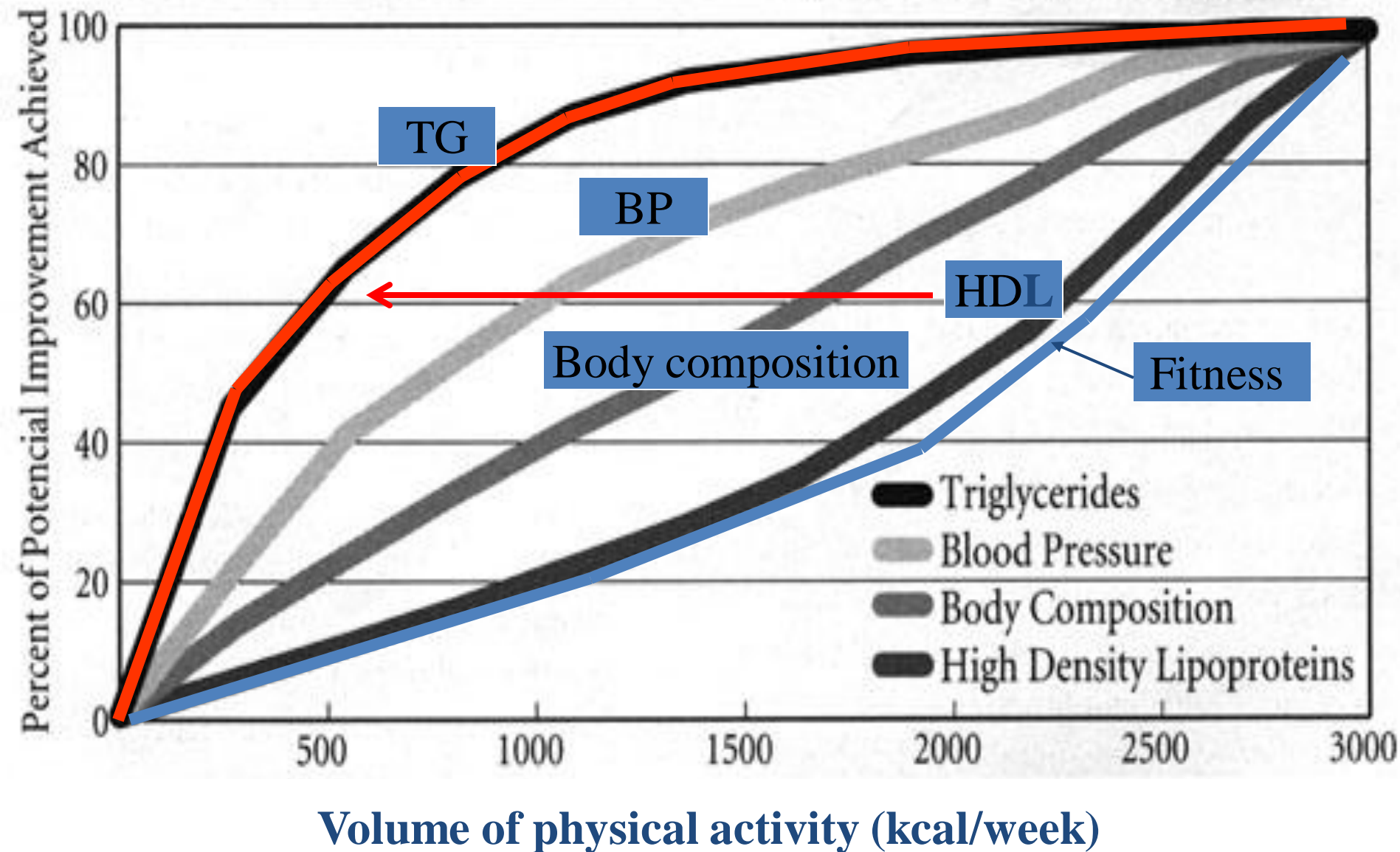
- 30 min of continuous **moderate** physical activity per day for 5-6 days per week or
- 20 min of **continuous vigorous** physical activity 3 days per week or
- 10 min of continuous moderate physical activity **3 times** per day for 5-6 days per week or
- 10,000 steps a day (fact or myth?)



FIGURE 1-3

DOSE-RESPONSE RELATIONSHIP

for Health Benefits and Volume of Physical Activity Participation



Prescription or guidelines for Physical Activity: Endorsed by

- American Heart Association
- American College of Sports Medicine
- World Health Organization
- Canadian Society of Exercise Physiology
- Heart and Stroke Foundation (Canada)
- British Medical Association

??????????

Aerobic interval training

- Interval training involves a period of high intensity effort (30s-3min) followed by an equal or greater time of active rest (30s-3min) repeated 5-10 times
- Suggested it targets the oxidative mechanisms in muscle by making the muscle hypoxic (increases oxidative enzymes and number of mitochondria). Also considered to offset some of the effects of aging (*from Cell Metabolism, 2017*)

Astrand, Rodahl, Dahl, & Stromme, 2003, Bell & Wenger, 1986. Gaiga & Docherty, 1995. Rhodas et al., 2000, MacDougall et al., 1998.

Original aerobic interval training guidelines.

- 1:1 work to recovery ratios
- 1-3 min work intervals
- Active recovery (60% VO₂ max)
- Number of work intervals (6-10)
- Optimal 30-35 min at or close to VO₂ max.

Astrand ,Rodahl, Dahl, & Stromme, 2003, Bell and Wenger, 1986

More recent approaches

(high intensity interval training: HIIT)

- What is HIIT?
- High intensity efforts with short recovery periods
 - 10 maximum efforts of 60s work with 60s active recovery (total time=20 min)
 - 4-6 maximum efforts of 30s work with 4 min active recovery (total time=20-27 min)
 - 3 maximum efforts of 20s work with 2 min active recovery (total time=7 min!)
 - ***8 maximum efforts of 20s work with 10s active recovery (total time=4 min!)**

Tabata Intervals

- 20 sec **full out** effort (170% VO₂ max)
- 10 sec active recovery
- Repeat **8** times
- **Total training time = 4 min**

- Found to produce 7 mL (11%) increase in VO₂ max (52-59 mL) and 28% in anaerobic performance!!

- Used with many different populations including those with **CHD and other chronic conditions (diabetes, obesity)**
- Produces equal or better fitness and health outcomes compared to long duration endurance training (**e.g. 45-60 min at moderate intensity**)

Little et al., 1985, Currie et al., 2013, Gibala & Jones, 2013, Gillan et al., 2013, Currie et al., 2012, Kessler et al., 2012

Mode of activity

- Cycling ergometer (stationary bike!)
- Running (treadmill or track)
- Whole body activity (e.g. burpees, jumping jacks, push ups etc.)
- Resistance exercise (e.g. body weight squats)

Tabata, 1996, Gillan, , Gabala, McCrae et al., 2012, Rozenek et al., 2007, and Kates, 2014

Exercise machines:

- Cycle ergometers
- Rowing ergometers
- Treadmills
- Step machines



"Herman, don't go too far you'll miss Gunsmoke."

Exerpeutic 1000X



\$300: Walmart (4.5 stars)

But...the best
exercise
machine is:

Taking **Rex**
for a walk



"SIT!"

Water exercises?

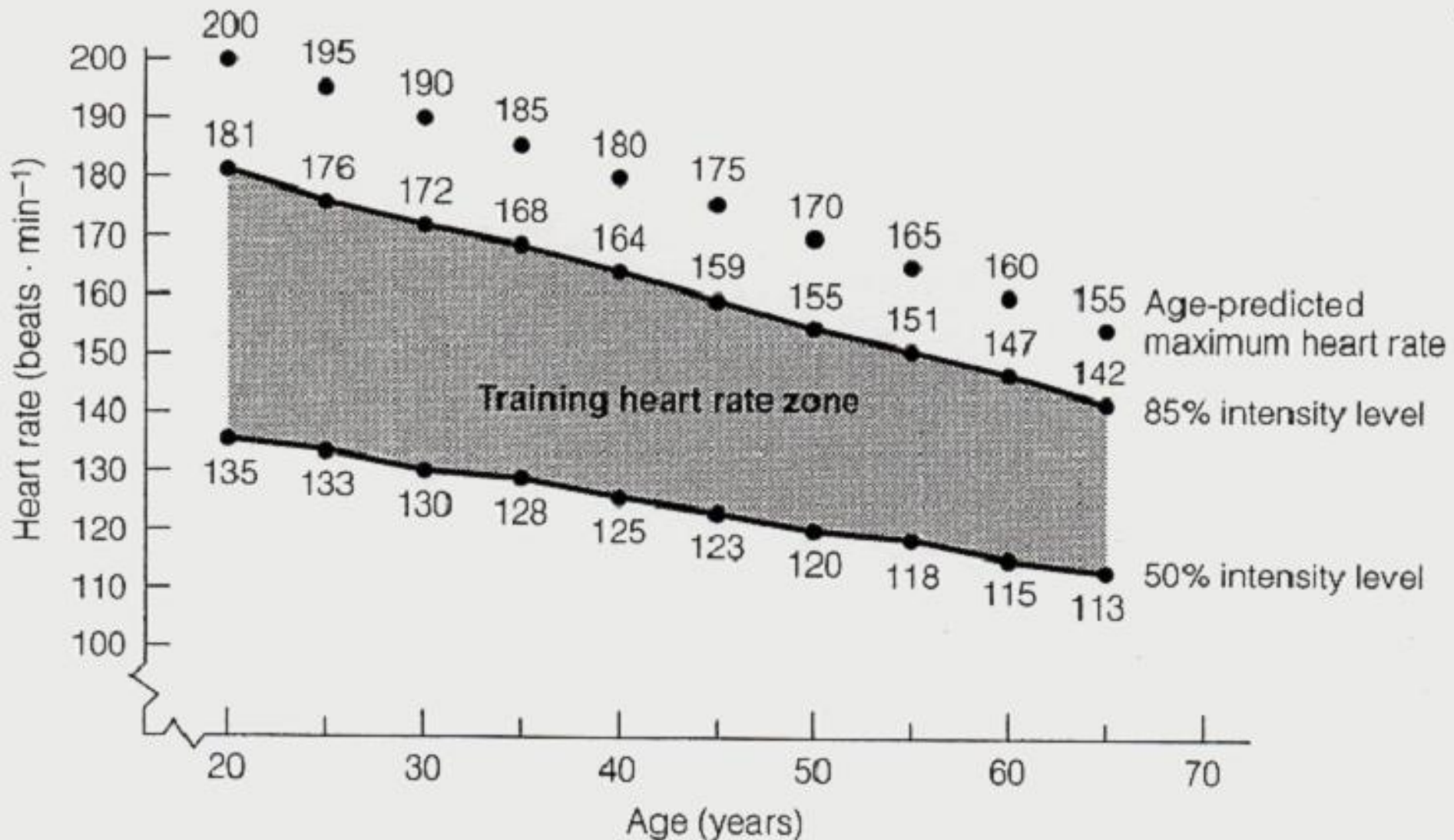


Is water-based exercise training sufficient to improve physical fitness in the elderly?

- Strong evidence supports the use of water-based exercise for the improvement of aerobic capacity and strength.
- Moderate evidence highlights the benefits on flexibility, and inconclusive evidence was found supporting the modification of body composition.

Bergamin et al., European Review of Aging and Physical Activity 9, 129–141 (2012).

Some specific findings related to volume and intensity



“Boosting your brain power could be as easy as a walk in the park!”

- *Paul Taylor, Globe and Mail, Oct 14th, 2010*
- *Alan Mozes, Healthfinder.gov (US Dept of Health and Human Services)*



Study by Kirk Erickson, *University of Pittsburgh* (Epub in *Neurology*, Oct 13th, 2010)

- Followed 299 seniors over 9 years in regard to the distances they walked in a week
- Did **MRI** scans of their brains to measure size (brain shrinks with age which is associated with memory problems and dementia)
- Tested for **cognitive impairment or dementia**

Erickson, K., *Neurology*, 75(16), 1415-1422, 2010.

Results:

- People who walked between **6-9 miles (9.7- 14.5 km)** a week had
 - less brain shrinkage
 - **Cut risk of developing cognitive problems in half!**



Also another study by Kirk Erickson et al.
(*Proceedings of the National Academy of Sciences*, on line Jan
31, 2011).

- 120 older people who were not regular exercises.
- Half walked around a track 3 days per week for 40 min for 12 months. Others did stretching and some weights.
- Increased hippocampus volume in aerobic exercise group and fitter subjects (associated with improved memory and spatial navigation).

However: “Just a little exercise can reduce onset of Alzheimer’s, report says”
(National Post, March 8th, 2013)

- Taking brisk walks in **10 minute** bouts a few times a day can significantly delay onset of dementia and even prevent it!
- Regular physical activity also helps people with Alzheimer’s and other forms of dementia better manage their disease!

(Ontario Brain Institute [2013]-published a report based on almost 900 studies done in the last 50 years)

More support.....

- regular aerobic exercise, the kind that gets your heart and your sweat glands pumping, appears to boost the size of the hippocampus, the brain area involved in verbal memory and learning (recent study at UBC)
- briskly walking for one hour, twice a week at moderate intensity exercise for 6 months is associated with an increase in the volume of selected brain regions (Scott McGinnis, Harvard Medical School)

Running or jogging:

- *Escargots*
- *Rabbits*
- *Waltons*



"You must have run a mile this time—you've been gone four minutes."

A study published in JAMA
(January 12, 2010) found that:

- Aerobic activity four times per week for 45-60 min (**running** on a treadmill, elliptical running machine, stationary cycling) **reversed** the decline in cognitive ability (memory)
- This was **especially true for women**

“Dance your way to healthier, happier living”

(Times Colonist, April 3rd, 2011)

- Improved balance and gait and reduced factors associated with falls
- Associated with reduction in dementia (attributed to neuroplasticity and rewiring of neurons)



Krampe, 2010 (Dissertation, University of Missouri)
Verghese et al., 2003 (New England Journal of Medicine)

The many forms of dance:

Line dancing

Scottish dancing

Aerobic dancing

Jazzercise

Tap dancing

Steps

Ballroom dancing

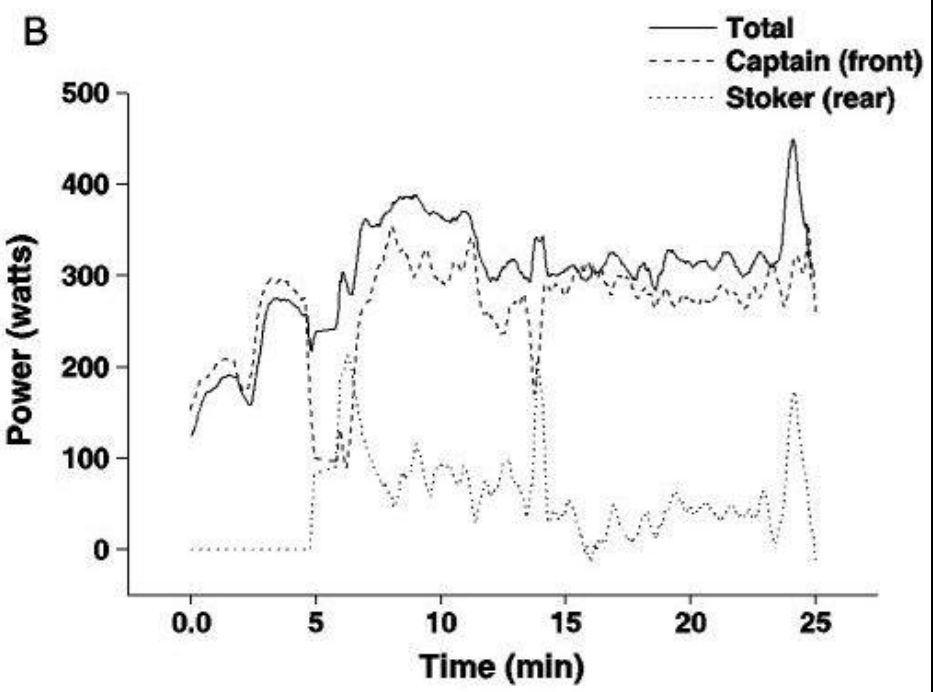
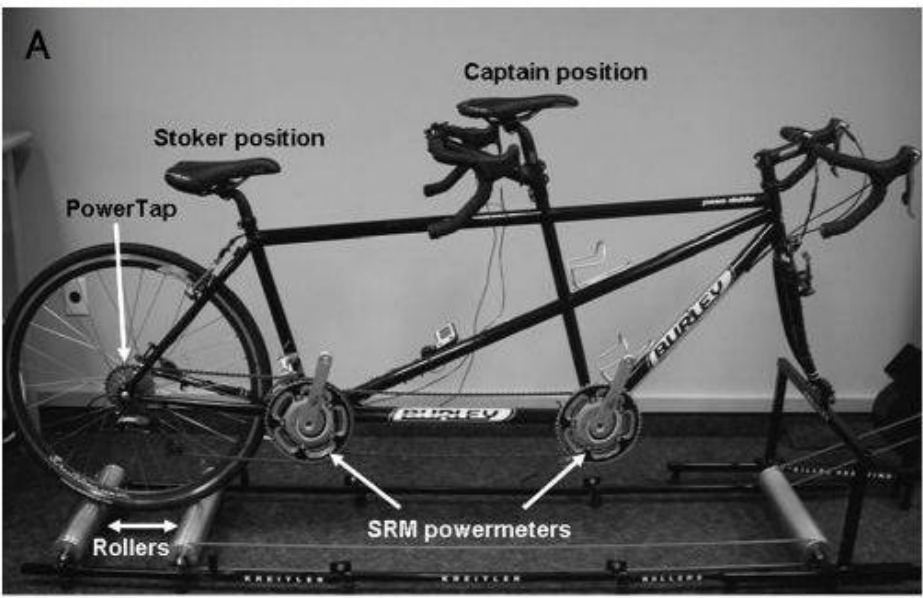
Pole dancing!

Dirty dancing!

*Dancing by
yourself!*



"When we say 'parents invited' we usually mean to sit and watch."



It is not about the bike, it is about the pedalling

Alberts, J.L., et al. *Exerc Sport Sci Rev.*, 2011, 39(4):177-186

- Results show forced exercise (FE) leads to improvement in PD motor function and in alterations in CNS function.
- The evidence suggests that patients with PD derive motor benefits from exercise, assistance is required to achieve a rate of exercise that **triggers the release of neurotrophic factors or possibly dopamine.**

Mandolesi et al. *Frontiers in Psychology*, 2018 (9). A review (1)

- Physical exercise (PE) determines positive biological and psychological effects that affect the brain and the cognitive functioning and promote a condition of wellbeing. PE plays an important role to counteract normal and pathological aging.
- *Recent evidences have shown that PE triggers potent neuroplastic phenomena, partly mediated by epigenetic mechanisms. In fact, PE cause profound alterations in gene expression and its protein products in the form of epigenomic manifestations (Fernandes et al.,2017).*

How does exercise improve brain health?

- Direct means:
 - improved cardiovascular system
 - reduced insulin resistance
 - reduced inflammation
 - the release of growth factors—chemicals in the brain that affect the health of brain cells, the growth of new blood vessels in the brain, and even the abundance and survival of new brain cells
 - an increase in the volume of selected brain regions (pre-frontal cortex, hippocampus, medial temporal cortex)

How does exercise improve brain health?

- Indirect means:
 - exercise improves mood and sleep
 - and reduces stress and anxiety.
 - problems in these areas frequently cause or contribute to cognitive impairment.

Hot off the press!

- Older adults (71 yrs plus) “who engage in **strenuous exercise** are more mentally nimble and have better memory function than their more sedentary peers”
- Followed over 5 year period

From LA Times “Science Now”(March 23, 2016), Melissa Healy citing recent study by Clinton B. Wright, recently published in Neurology

The Effects of **Acute** Exercise on Mood, Cognition, Neurophysiology, and Neurochemical Pathways: A Review

- ... the three most consistent cognitive/behavioral effects of a **single bout** of exercise in humans are improved executive functions, enhanced mood states, and decreased stress levels
- One of the most dramatic effects seen after **acute** exercise is the change in neurochemical levels including neurotransmitters, metabolites, growth factors, and neuromodulators

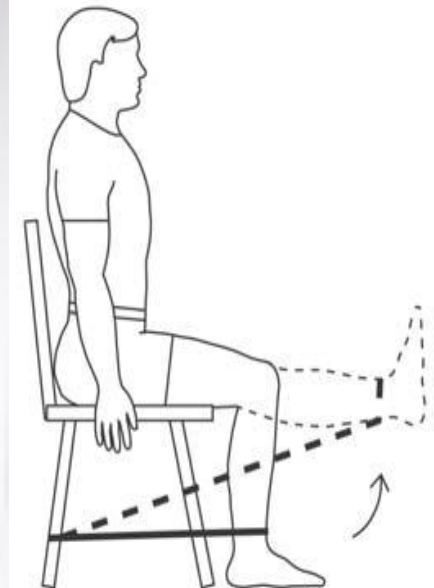
Weight training improves cognitive function in seniors

(Arch Intern Med. 2010;170(2):170-178.)

- 12 months of **once** or **twice** weekly resistance training (free weights and air pressure machine) **improved cognitive function in women aged 65-75 years.**
- The program also led to **increased walking speed**, a predictor of considerable reduction in mortality.
- Proposed as an attractive alternative for seniors with limited mobility.
- Suggested a relationship between **cognitive function and falls.**



Therabands: <http://www.thera-bandacademy.com/>



Workout structure

- You can also come up with your own variations
- Usually plan on 30 min of some form of aerobic work (5 min warm up) and about 20 min of strength exercises
- 5 min cool down and stretching
- Workout generally takes 50-60 min

Recommendations

- 30 min of moderate aerobic physical activity **3/5X** per week (**90/150** min)

OR

- 20 min of **vigorous** activity 3X per week (60 min)

OR

- HITT * (Intervals training)

AND

- 20-30 min of some form of resistance training 2X per week (60 min)

- ***Caveat: Role of intensity, especially for PD.**



However, remember

- Any amount of exercise is better than no exercise!!



"ONE."

What activities do you like?





“Is that your idea of exercise — buying a book on jogging?”

Thank you

Questions?

Final Caveat!

“No magic bullet in fight against old-age dementia”

- The Minnesota Evidence-based Practice Centre concluded that:
 - **Cognitive training** has not been shown definitely to work
 - Neither have **prescription medications** or **over the counter dietary supplements**
 - Nor a single **exercise** regimen

*Based on four reports published in the **Annals of Internal Medicine** (V168:1, Jan 2018)*

However!

- Common sense actions throughout life may help to avoid or delay Alzheimer's and related dementias:*
 - Not smoking
 - Engaging in regular physical activity
 - Controlling diabetes , hypertension, and cholesterol
 - Maintaining a healthy diet and weight

*Dr. Eric Larson, *Annals of Internal Medicine* (V168:1, Jan 2018)

Internist, Clinical Professor, University of Washington, Expert in Healthy Aging

Sample Program

- In general do a program of about **8-10** exercises and try to do at least twice per week.
- **A simple program would consist of:**
 - A. An exercise for biceps (e.g. bicep curl)
 - B. An exercise for triceps (e.g. forearm extension, dumbbell press overhead, Arnie press)
 - C. An exercise for chest (bench press or push up)
 - D. An exercise for back (e.g. lat pull downs, arm pulls, or seated row)

Sample program (continued)

- E. An exercise for quads (leg extension on a machine or front. You can do these holding dumbbells)
- F. An exercise for hamstrings (leg curl machine or back lunges or walking lunges. You can also do these with dumbbells).
- G. Side arm lifts
- F. Side arm pull downs
- *Note: These exercises are **in pairs** as it is important to work the muscles both sides of a joint. The suggestion is to do them in pairs.*

Hard to change old habits!

- My approach trying to apply the research:
 - Do 8-12 repetitions to muscle failure/fatigue
 - Slow contractions (1-2s both parts)
 - Do two sets
 - Short rest between sets (20-30s)
 - Do as many reps as possible on 2nd set
 - Do 3-4 exercises per session (5 days per week).
Some repeat of muscle group

Dave`s workouts

- Monday:
 - 3-5 min warm up. 30 min steady state cycling
 - Chins, bar dips, and knee raises and lowers (abs)
 - Stretch 5 min
- Tuesday:
 - 3-5 min warm up. 3min:3min; 2min:2min; 1min:1min work:recovery (twice)
 - Inclined bench, seated rows, side arm raises
 - Stretch 5 min
- Wednesday:
 - 3-5 min warm up. 1min:1min work:recovery (10 times)
 - Arm curls, arm push downs, upright row
 - Stretch 5 min

- Thursday:
 - 3-5 min warm up. 1min:1min;2min:2min work:recovery (5 times)
 - Pec deck (chest), lat pull downs, shoulder shrugs
 - Stretch 5 min
- Friday:
 - 3-5 min warm up. 20sec:2 min work:recovery (3 times);
Tabata intervals 20sec:10sec work:recovery (8 times);
1min:1min work:recovery (5 times)
 - Stretch 5 min
 - Standing bench press and upright row, ab workout (100 ab exercises and 30 leg raises and lowers (twice)



Thank you

Questions?

Think
positive



Be sociable



Eat healthily



Keep your mind active and
learn new things



Be physically active

Keeping a healthy brain

Regular moderate physical activity:

- Decreases the risk of CVD and CHD
- Decreases the risk of colon cancer
- Decreases the risk of developing non-insulin dependent diabetes (Type II)
- Prevents or delays development of high blood pressure→CKD!!
- Enhances the immune system
- *Relieves symptoms of depression and anxiety*

But research also tells us that being moderately physically active:

- maintains bone health (preventing or offsetting osteoporosis)
- prevents muscle loss (sarcopenia)
- decreases the risks of falls and associated health problems
- helps maintain functional activities for daily living (e.g. getting in and out of chairs, reaching for objects, going up and down stairs)
- **preserves cognitive function (preventing cognitive impairment and dementia)**