

MINI MED SCHOOL EXERCISE SERIES

Talk 3: Mental Health + Cancer

JULIA DE PIERI, BSCHK, UBC MD CLASS OF 2024



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Faculty of Medicine



University
of Victoria

let's talk  science

TERRITORIAL ACKNOWLEDGEMENT

I would like to begin by acknowledging that I am joining you from the unceded territory of the Coast Salish Peoples, including the territories of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō and Səlílwətaʔ/Selilwitulh (Tsleil- Waututh) Nations.



I would also like to acknowledge the Lekwungen peoples on whose traditional territory the University of Victoria stands and the Songhees, Esquimalt and Wsanec peoples whose historical relationships with the land continue to this day.

DISCLOSURE

I am a medical student. These talks do not constitute or substitute for medical advice. Please consult with your healthcare provider before making any modifications to your current treatment plan.



Trigger warning: mentions of depression, suicide, Alzheimer's and cancer.

TOPICS

- Depression
- Anxiety
- Dementia/Alzheimer's
- Cancer



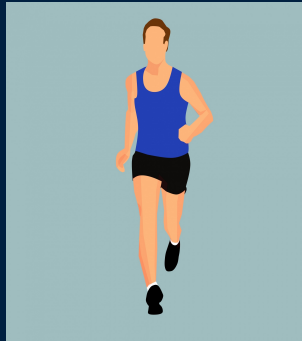
AEROBIC EXERCISE



Aka "cardio"

Any form of exercise that will lead to cardiovascular (heart) improvement.

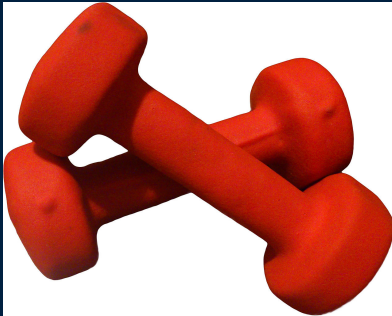
Your heart rate and respiratory rate will increase!



RESISTANCE/STRENGTH EXERCISE



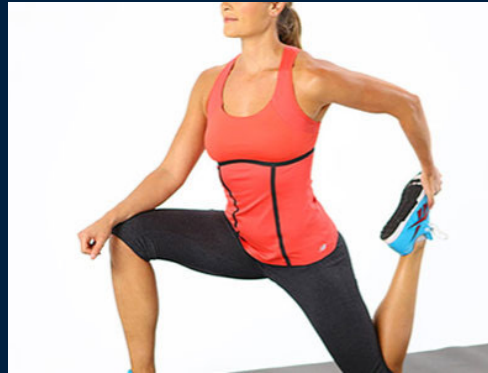
Any form of exercise that will increase muscular strength and endurance.



FLEXIBILITY



Aka "stretching". Goal is to lengthen your muscles.



POLL

Depression is a normal part of aging?

- A) True
- B) False



POLL

Depression is a normal part of aging?

A) True

B) False



DEPRESSION

An illness that causes you to feel sad or hopeless much of the time.

It is NOT normal with age.



SIGNS AND SYMPTOMS OF DEPRESSION

- does not get dressed
- does not answer the phone or the door
- loses interest in activities he or she used to enjoy
- expresses feelings of worthlessness and sadness
- has unusual outbursts of crying, agitation or anger, or shows little emotion
- sleeps poorly or too much
- eats more or less than usual
- complains about physical symptoms that do not have a cause
- lacks energy, is often tired
- seems confused
- has difficulty concentrating
- has trouble remembering things
- has trouble making decisions or following through with plans
- spends more time alone
- talks about suicide.



CAN EXERCISE IMPACT DEPRESSION

YES! – helps prevent and reduce duration of depressive episodes

- Reduces depression symptoms in less time than traditional therapy
- Helps with sleep, increases endorphins (feel good hormones) and improves mood and self-esteem
- Helps the brain develop new connections
- Helps reduce loneliness (group activities)



Exercise presents a great opportunity to relieve disease burden in resource poor communities (or any community...)

ANXIETY

The body's natural response to stress.

If your feelings of worry or fear occur most of the time, keep you awake at night or impact your daily life, it may be an anxiety disorder.



SIGNS AND SYMPTOMS OF ANXIETY

- Feeling physically ill (nausea, muscle tension, headaches, dizziness, racing heart, shallow breathing, trembling, sweating)
- Irrational and excessive worry or fear
- Checking and rechecking for safety
- Avoiding routine situations
- Avoiding social situations



CAN EXERCISE IMPROVE ANXIETY?

Yes – helps with coping and symptoms

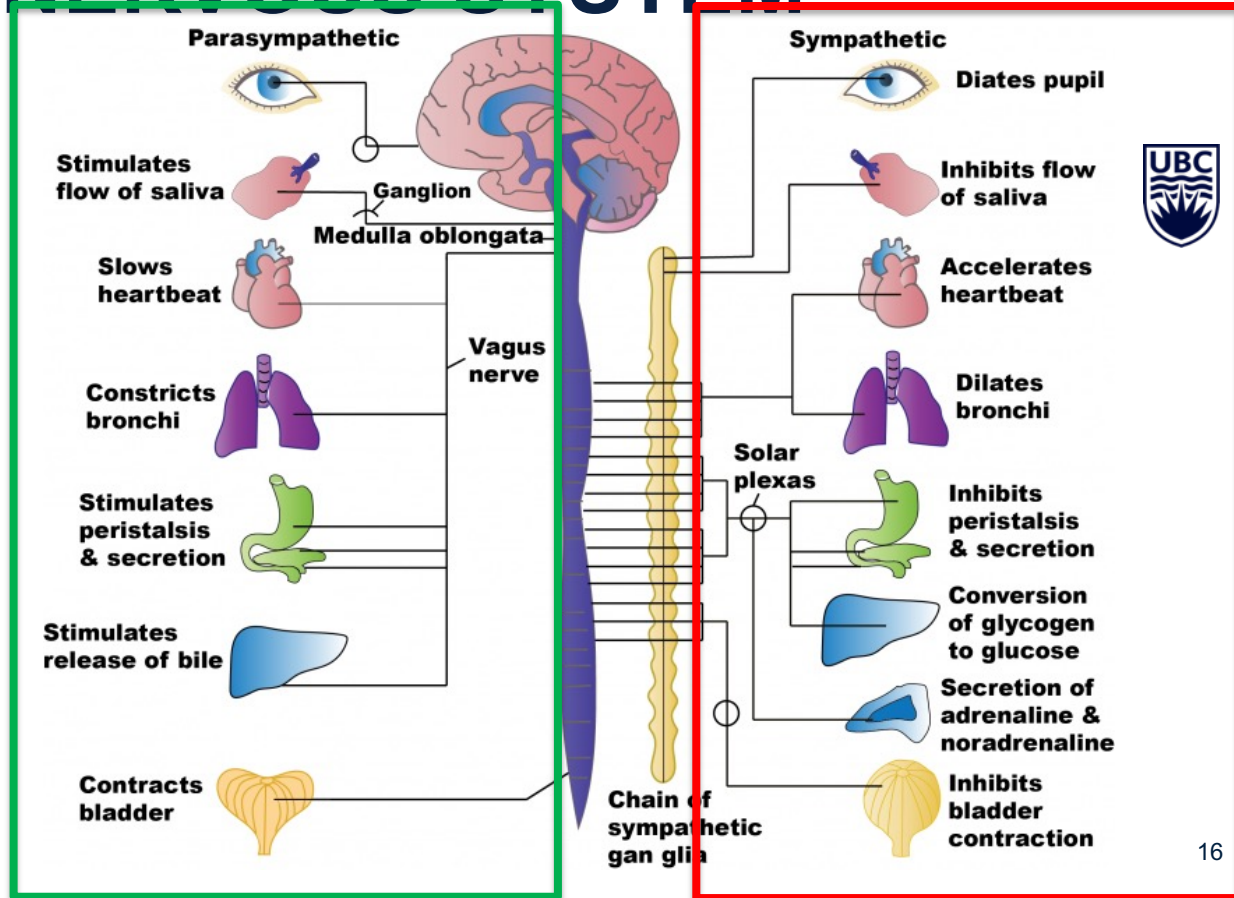
- Good distraction
- Release of ‘happy’ neurotransmitters such as serotonin and endorphins
- Increase in self confidence
- Improves sleep and energy
- Relieves tension (especially if you stretch or do yoga)
- Increases heart rate variability (more relaxed)



AUTONOMIC NERVOUS SYSTEM

Parasympathetic:
“rest and digest”

Sympathetic:
“fight or flight”



HOW DOES LONELINESS AFFECT HEALTH

- Increased risk of depression and anxiety
- Decreased cognitive function (dementia/Alzheimer's)
- Increased fall risk
- Increased risk of cardiovascular disease
- Increased risk of cancer
- Greater susceptibility to infection
- Poor lifestyle behaviours (inactivity, poor diet, smoking)



Loneliness rivals smoking, physical inactivity and obesity when it comes to contributing to poor health outcomes.

EXERCISE FOR MENTAL HEALTH

Aerobic Exercise: walking, biking, running, classes etc

- 3-5+ days/week for 150 min/week+
- Moderative/vigorous intensity



Resistance Exercise:

- 6-8 exercises, increase to 12 overtime
- Major muscle groups – arms, back, legs
- Body weight, bands, dumbbells, machines etc



Flexibility: stretching, massage, yoga

POLL

Is serious mental decline a normal part of aging?

- A) True
- B) False



POLL

Is serious mental decline a normal part of aging?

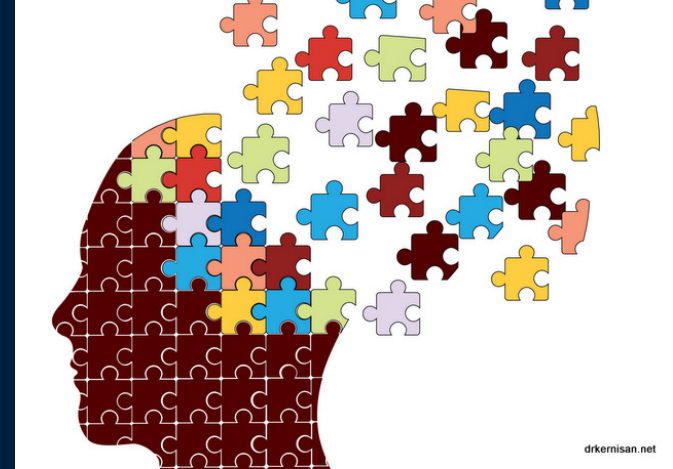
A) True

B) False



DEMENTIA

A broad term that describes a loss of thinking ability, memory and other mental abilities.



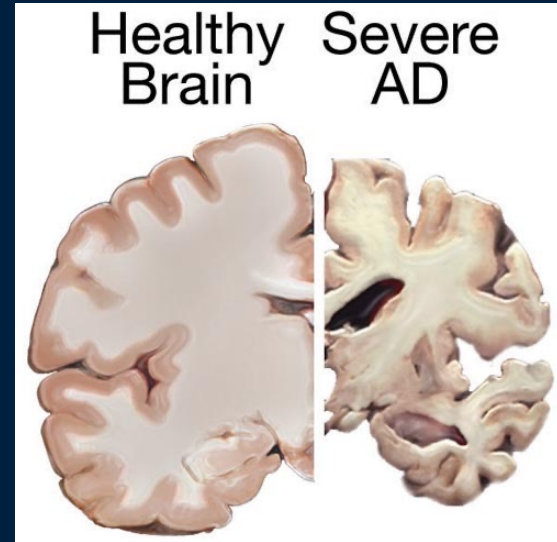
DEMENTIA: An umbrella term



ALZHEIMER'S

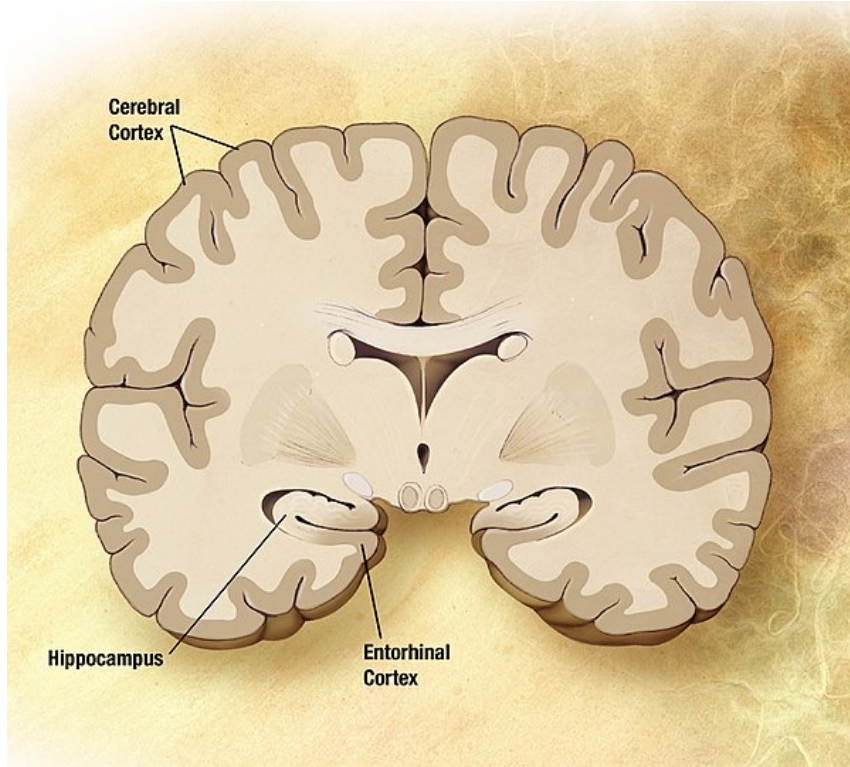
Most common cause of dementia.

A progressive neurologic disorder that causes the brain to shrink and neurons to die. It slowly destroys memory and thinking skills, and eventually the ability to carry out simple tasks.

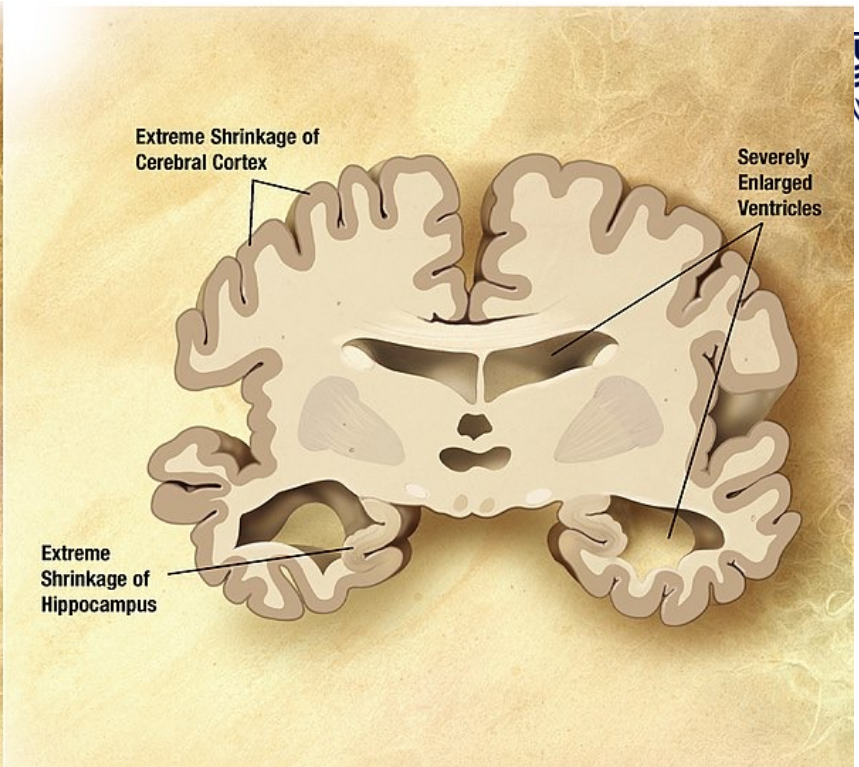


WHAT HAPPENS TO THE BRAIN?

Normal Brain

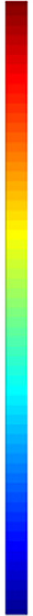


Alzheimer's Brain

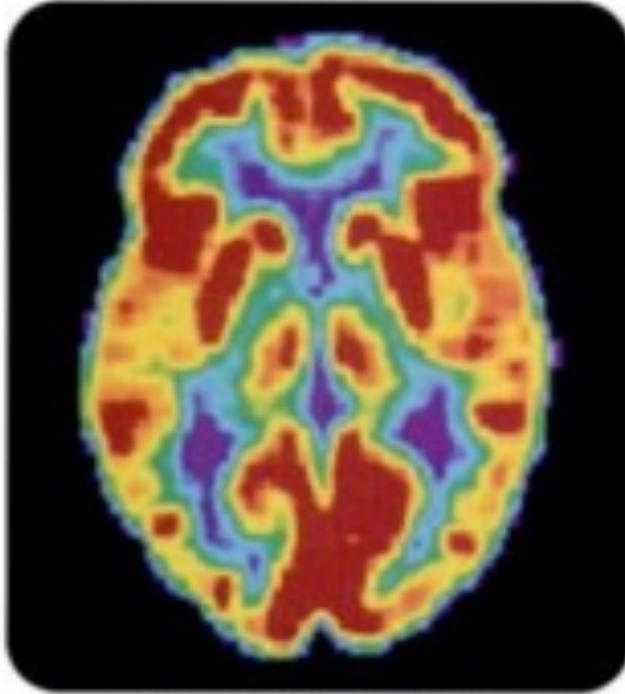


WHAT HAPPENS TO THE BRAIN?

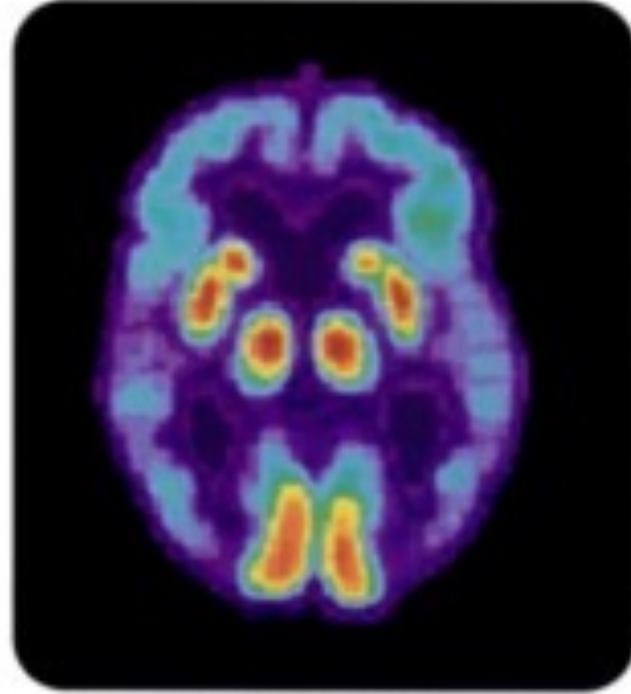
High
Activity



Low
Activity



PET Scan of Normal Brain



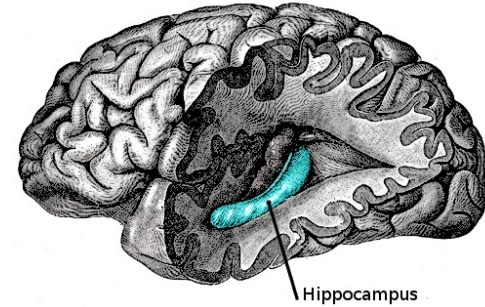
PET Scan of Alzheimer's Disease Brain



CAN EXERCISE PREVENT COGNITIVE DECLINE?

Yes – to an extent

- Exercise improves brain blood flow
- Reduces loss of hippocampus (brain area associated with memory)
- Improvements in brain function (attention, processing speed, memory, executive function)

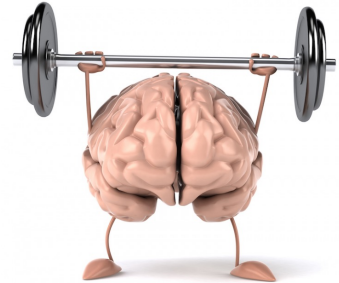


Lower rates of Alzheimer's are seen in people who are more physically active.

CAN EXERCISE TREAT ALZHEIMER'S?

Maybe? – big lack of studies

- Helps with ability to perform activities of daily living
- Might help working memory (short term memory, 10-15 sec)
- Might help behavioural functioning
- It's worth a shot...

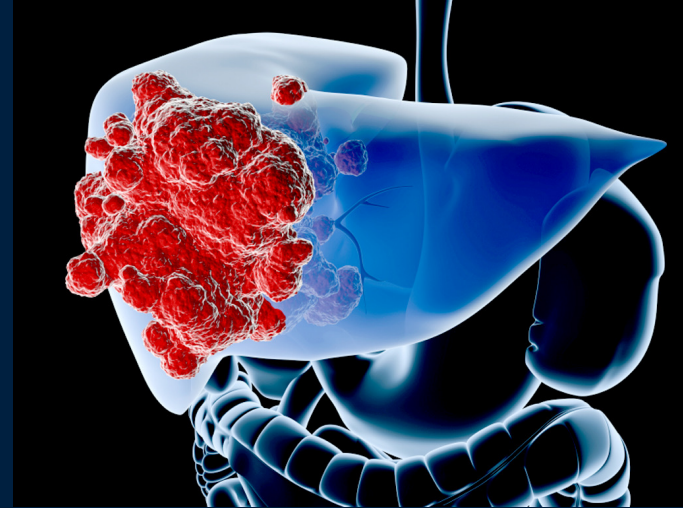


BREAK TIME FOR 10 MIN!

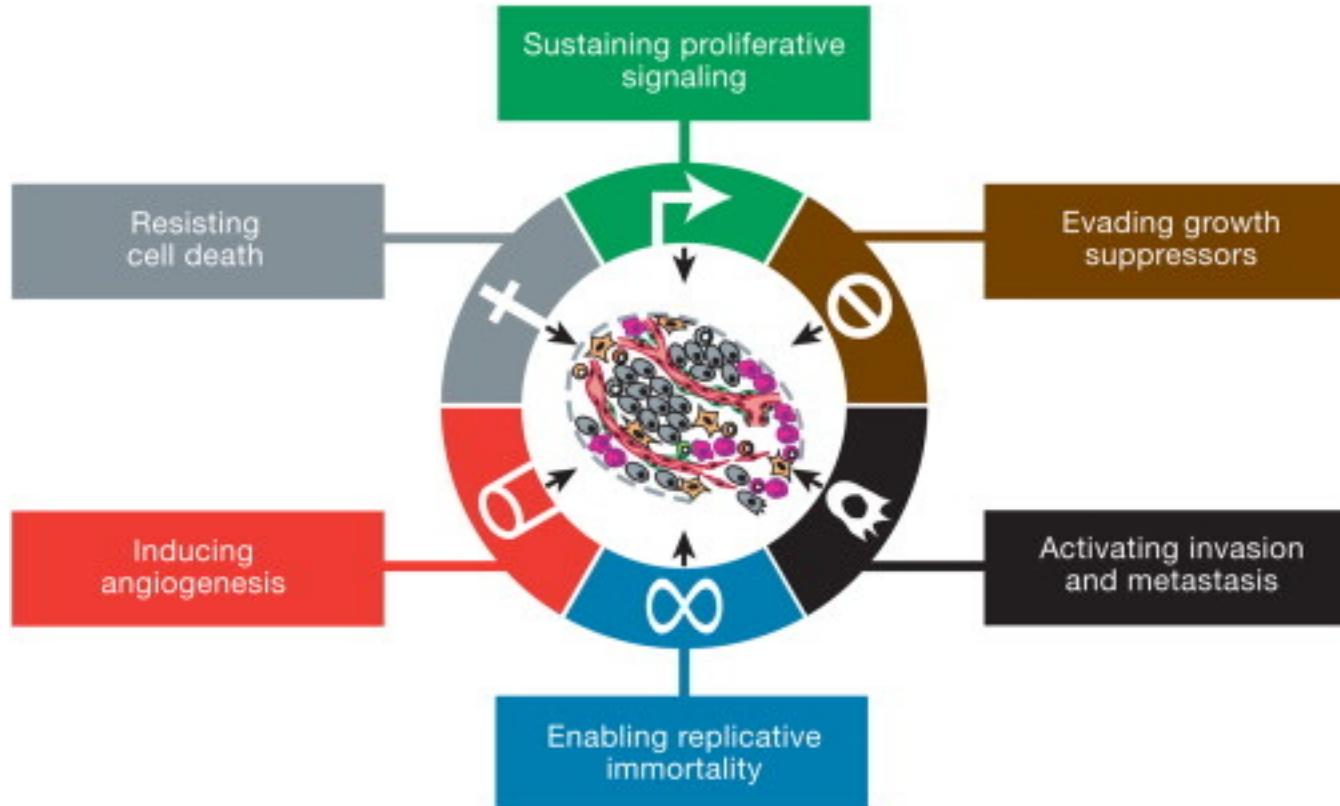


CANCER

A disease caused by uncontrolled cell proliferation that can spread to the rest of the body. It can happen in any tissue in the body.

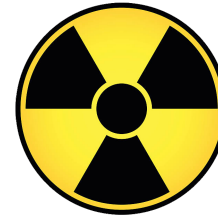
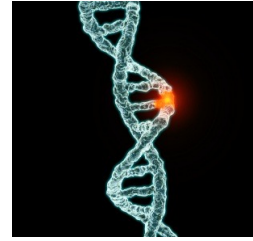


WHY DOES CANCER HAPPEN?



WHAT CAUSES CANCER?

- Age
- Genetics / family history
- Where you live
- Smoking (especially lung cancer)
- Sun damage (melanoma/skin cancer)
- Obesity
- Poor diet
- Excessive alcohol consumption
- Chemical/radiation exposure
- Certain infections (ie. HPV)
- **Physical inactivity**



POLL

Which of the following cancer screening programs exist in BC (select all that apply)

- A) Breast
- B) Colon
- C) Cervical
- D) Lung



POLL



Which of the following cancer screening programs exist in BC (select all that apply)

- A) Breast
- B) Colon
- C) Cervical
- D) Lung (coming in 2022)

WHY SCREEN FOR CANCER?

- In BC, provincial screening programs exist for breast (mammogram), cervical (PAP smear) and colon (FIT test) cancer. Lung cancer screening starting in 2022.
- Screening detects cancer before you would typically identify it
- Cancers that are detected and treated earlier typically have better outcomes → less treatment + better survival



CAN EXERCISE PREVENT CANCER?

Yes? - Likely lowers your risk of certain types by about 20%



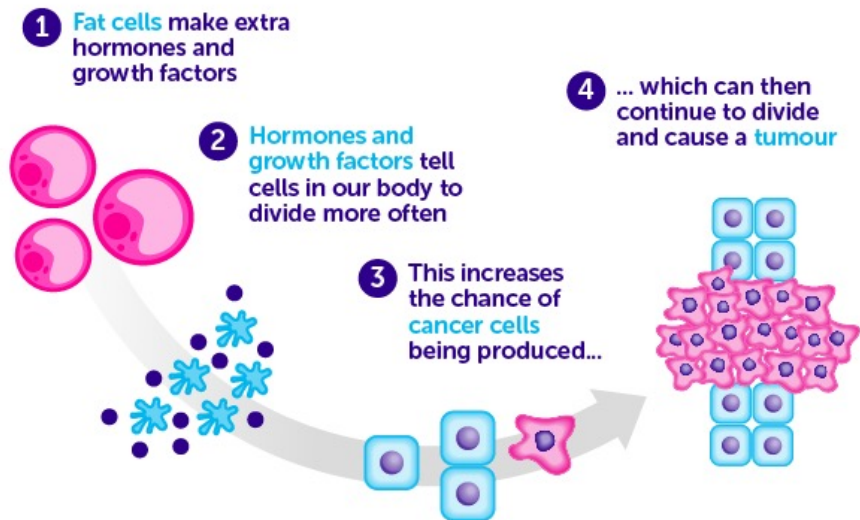
- Changes concentrations of hormones and growth factors
- Reduces risk factors (diabetes, physical inactivity)
- Reduces obesity
- Improved lifestyle?

OBESITY AND CANCER

Being overweight or obese
increases your risk of cancer
because you're more likely to have:

- Poor diet
- Insulin resistance
- Low physical activity
- Increased inflammation
- Increased blood vessel formation
- Reduced immune function

HOW COULD BEING OVERWEIGHT CAUSE CANCER?



POLL

Exercise is potentially dangerous during cancer treatment?

- A) True
- B) False



POLL

Exercise is potentially dangerous during cancer treatment?

A) True

B) False



CAN EXERCISE IMPROVE TREATMENT?

Yes? Definitely improves symptoms and quality of life



- Reduces fatigue and improves energy
- Reduce anxiety and depressive symptoms
- Maintain muscle mass
- Maintain bone health
- Improve balance and prevent falls

CAN EXERCISE IMPROVE OUTCOMES?

Yes – reduced mortality and morbidity

- Improved functionality after treatment → maintained independence
- Reduced risk of other health conditions (heart disease, diabetes, high blood pressure)
- Improved mental health



BC CANCER RECOMMENDATIONS

BEFORE TREATMENTS

Goal: Build physical function & strength

- Avoid inactivity
- Increase aerobic exercise time & intensity
- Perform muscle strengthening exercise 2+ times weekly and include all major muscles
- Seek advice from an exercise specialist about specific exercises that may benefit you prior to treatment

DURING TREATMENTS

Goal: Maintain physical function & strength, prevent declines & manage treatment side effects (e.g. fatigue or joint stiffness)

- Avoid inactivity
- Follow any activity restrictions given to you by your surgeon, oncologist or medical team
- Be consistent and try to exercise daily
- Include aerobic exercise on most days of the week (small, tolerable amounts to start - aim for 30 minutes per day, 3 days of the week)
- Perform muscle strengthening exercise 2+ times weekly
- If treatment side effects are limiting your ability to exercise (e.g. fatigue), speak to an exercise specialist



BC CANCER RECOMMENDATIONS

AFTER TREATMENTS

Goal: Re-build physical function & strength, manage and reduce treatment side effects

- Follow the 'during treatment' guidelines and slowly increase exercise time and intensity
- Build towards meeting the exercise guidelines of 150 or more minutes of moderate-to-vigorous aerobic exercise & 2+ strength sessions / week.
- Treatment side effects may be present for weeks or months after your treatment ends. If these are interfering with or limiting your ability to exercise, speak to an exercise specialist or your medical team

LONG-TERM SURVIVORSHIP

Goal: Maintain physical function & strength, prevent other health issues

- Build towards meeting the exercise guidelines of 150 or more minutes of moderate-to-vigorous aerobic exercise & 2+ strength sessions / week.
- Once you are meeting the exercise guidelines, work to maintain these each week



SAMPLE AEROBIC PROGRESSION

Program Stage	Week	Frequency (days/week)	Intensity		Duration (min)
			Exertion Level	RPE (10 pt)	
Improvement	1 - 4	4	Somewhat hard	4	25 - 30
	5 - 7	4	Somewhat hard	4	30 - 35
	8 - 10	4	Somewhat hard	4	35 - 40
	11 - 13	4	Somewhat hard - Hard	4 - 5	40 - 45
	14 - 16	4 - 5	Somewhat hard - Hard	4 - 5	45 - 50
	17 - 20	4 - 5	Hard	5 - 6	50 - 55
	21 - 24	4 - 5	Hard	5 - 6	55 - 60
Maintenance	25 +	4 - 5 +	Moderate - Hard	4 - 6	30 - 60

Table adapted from: Warburton, et al. 2006

0 Rest

1 Very light

2 Light

3 Moderate

4 Somewhat hard

5 Hard (breathing deeply)

6

7 Very hard (out of breath)

8

9

10 Maximal

Intensity is Important

Light (RPE 1 - 2)

easy walking, golf, gardening, dusting, laundry, stretching, yoga, curling, bowling

Moderate (RPE 3 - 6)

brisk walking, climbing stairs, mowing the lawn, swimming, dancing, biking

Vigorous* (RPE ≥ 7)

running, fast cycling, hockey, basketball, gym workouts



SAMPLE RESISTANCE WORKOUT

Begin with 6-8 exercises. As you feel comfortable, add 1-2 exercises a week (up to 12 exercises).

☐ Hips & Thighs

1



Start: Sit at the front of the chair, chest up, and feet hip width apart. Slowly lift out of the chair with your knees directly over your toes. Keep your back straight and arms out.
Finish: Hold the top position with knees bent. Slowly bend knees to lower yourself to the chair. Don't drop to the chair.

☐ Chest

2



Start: Place the band around your upper back. Grab the ends of the band with elbows bent and palms facing down or inward.
Finish: Press out, extending your elbows forward to shoulder level. Slowly return to starting position.

☐ Upper Back

3



Start: Grasp the band with both hands in front of your chest with the elbows slightly bent and shoulders down.
Finish: Keep elbows slightly bent and pull band outward until the band reaches across your middle chest. Hold the end position briefly, squeezing the shoulder blades together. Slowly return to starting position.

☐ Middle Back

4



Start: Wrap the middle of the band around an extended foot. Grasp both ends of the band at the outside of your knee with your outside hand.
Finish: Pull band backwards and slightly up until your outside hand is beside your ribcage. Pause. Slowly lower to starting position.

☐ Shoulders

5



Start: One foot and hand anchor one end of the band. The other hand is beside the shoulder grasping the band, hand level with the chin, and arm straight up from the floor.
Finish: Extend the arm overhead until directly over the shoulder. Try not to lean to one side. Pause. Slowly lower to starting position.

☐ Shoulders

6



Start: Anchor as per #5 with slightly shorter band. Grasp the band at position just outside the knee. Can have palm down or palm forward (easier on the shoulders).
Finish: Lift arm to side with elbow slightly bent. Lift to shoulder height or slightly below shoulder height if you have shoulder problems. Pause. Slowly lower to starting position.

☐ Upper Arm - Front

7



Start: Keep same anchor position as #6, except slightly shorter band length. Grasp band with palm facing up.
Finish: Curl hand to shoulder keeping your elbow at your side at the lower ribs. Pause. Slowly lower to starting position.

☐ Upper Arm - Back

8



Start: Seated at the front edge of the chair and chest up. Place the band around your knee, anchoring the band with one hand on the opposite thigh and holding the other end of the band down at your side with your elbow bent.
Finish: Extend your elbow until your arm is straight down by your side. Pause. Slowly return to starting position.

☐ Legs - Front

9



Start: Tie the band in a knot and wrap around your feet, or tie the band around one leg of the chair with your foot through the loop.
Finish: Extend one leg out, keeping your knee in the same position. Keep your posture. Pause. Slowly return to starting position.

☐ Legs - Back

10



Start: Stand behind the chair holding the back for support. Wrap the tied band around your ankles, or tie the band around a leg of the chair with your foot through the loop.
Finish: Curl one ankle up. Keep the knee in the same position and your back stable. Pause. Slowly return to starting position.

☐ Lower Back

11



Start: Stand behind the chair holding the back for support, with knees slightly bent, and leaning forward with back straight. You can wrap a band around your ankles, or do the exercise without a band.
Finish: Extend one leg out so that it is in line with your body. Don't over-extend the leg or arch in the low back. Pause. Slowly return to starting position.

☐ Abdominals

12



Start: Seated comfortably in the chair, chest up, and both knees bent with the feet on the ground in front of you.
Finish: Lift one knee so that it is higher than the opposite knee, or slightly rock back with both feet on the ground. Tighten your abdominals. Keep your chest up. Pause. Slowly return to starting position.



SAMPLE RESISTANCE PROGRESSION

Program Stage	Week	Frequency (days/ week)	Intensity	# of sets x repetitions
			Exertion Level	
Initial stage	1	2	Light	1 x 8
	2	2	Light	1 x 10
	3	2	Moderate	1 x 12
	4	2	Moderate	2 x 8
Improvement*	5 - 7	2	Moderate	2 x 10
	8 - 10	2	Moderate	2 x 12
	11 - 13	3	Moderate	2 x 8
	14 - 16	3	Somewhat Strong	2 x 10
	17 - 20	3	Somewhat Strong	2 x 12
	21 - 24	3	Somewhat Strong	2 x 15
Maintenance	25 +	2 - 3	Moderate – Strong	2 x 15 or 3 x 8

Table adapted from: Warburton, et al. 2006



EXERCISE TIPS

- The best type of exercise is the one that you will do
- Any movement is better than no movement
- Prevent injuries
 - Start low and go slow
 - Get the right equipment and get it properly fitted
 - Learn proper technique
- Bring a friend!
- Schedule it into your calendars
- Set goals (and reward yourself when you meet them 😊)
- Have fun!!



HELPFUL RESOURCES

- www.sportmedbc.com
- Learn to Walk or Learn to Run 10K (Vancouver Sun Run)
- <https://www.healthlinkbc.ca/physical-activity>
- <http://guidelines.diabetes.ca/patient-resources>
- Community centers, walking/running/cycling groups (ie. Running room), personal trainers etc.
- Workout apps (ie. Nike Training Club)



FUTURE TALKS

- Thursday May 27 at 9:30AM : Nature. (Alexandra)
- Tuesday June 1 at 9:30AM : Prehabilitation prior to Surgery. (Nicole)



We hope to see you there!

Those who think they have no time for bodily exercise will sooner or later have to find time for illness.

Earl of Derby^{[39](#)}



THE UNIVERSITY OF BRITISH COLUMBIA

Thank you!

Any questions?