

# EXERCISE & CANCER CARE: WHEN, WHY, WHAT AND HOW OFTEN?

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InspireHealth  
SUPPORTIVE CANCER CARE



# Conflict of Interest and Disclosure

Dr. Don McKenzie is a Chair, Canadian Centre for Ethics in Sport, an independent, national non-profit association.

Rachel Mark is a Clinical Exercise Physiologist and the Lead Exercise Therapist at InspireHealth, a non-profit supportive cancer care organization.



# Objectives

1. Summarize the benefits and associated evidence for exercise in patients with cancer
2. Quote the recommended exercise guidelines
3. Discuss the gaps in care that limit patients with cancer from obtaining qualified exercise support
4. Review the role of a qualified exercise professional
5. Describe a framework for referral, collaboration and support of patients with cancer in exercise programs





**Physical activity in cancer populations represents**

**STANDARD OF CARE**





# Abreast in a Boat









## Two RCTs: START and CARE

### Supervised Trial of Aerobic vs Resistance Training

- AE, R, UC during chemotherapy
- AE>UC aerobic fitness, self-esteem, %body fat
- R>UC strength, self-esteem, lean body mass and CCR
- Changes in cancer specific QOL, fatigue, depression, anxiety favored exercise groups

JCO 2007, 25:4396-4404

### Combined Aerobic and Resistance Exercise Trial

- STAN, HIGH, COMB during Rx
- STAN=HIGH=COMB for physical functioning
- HIGH>STAN SF-36 bodily pain, endocrine symptoms
- COMB>STAN +HIGH for muscular strength
- HIGH>COMB for bodily pain and aerobic fitness

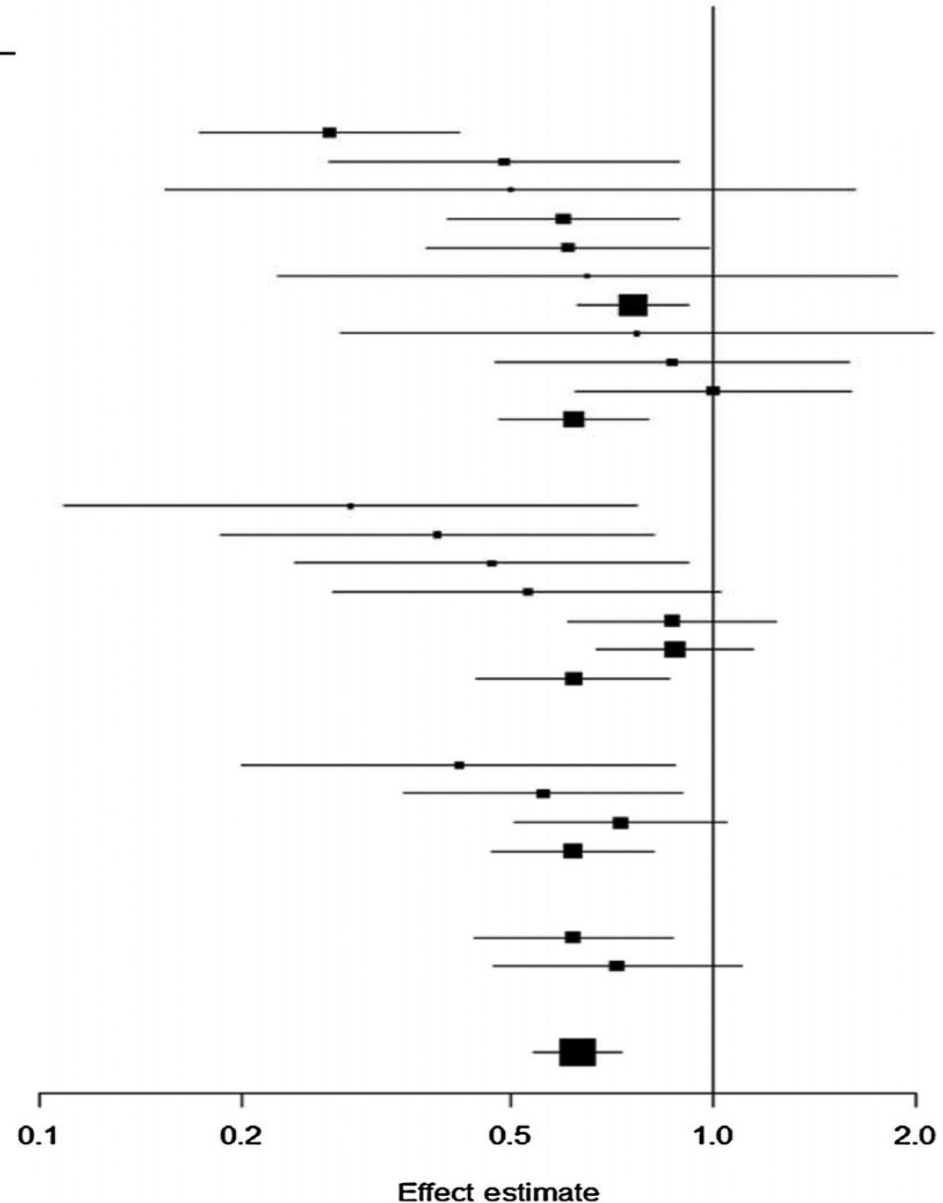
J Natl Cancer Inst 2013, 105(23):1821-32.



# Individual and pooled risk estimates from prospective cohort studies that related **post-diagnosis physical activity to cancer-specific mortality**

(Friedenreich CM, HK Neilson, MS Farris , KS Courneya. Physical Activity and Cancer Outcomes. Clin Cancer Res. 2016; 22(19); 4766-77.)

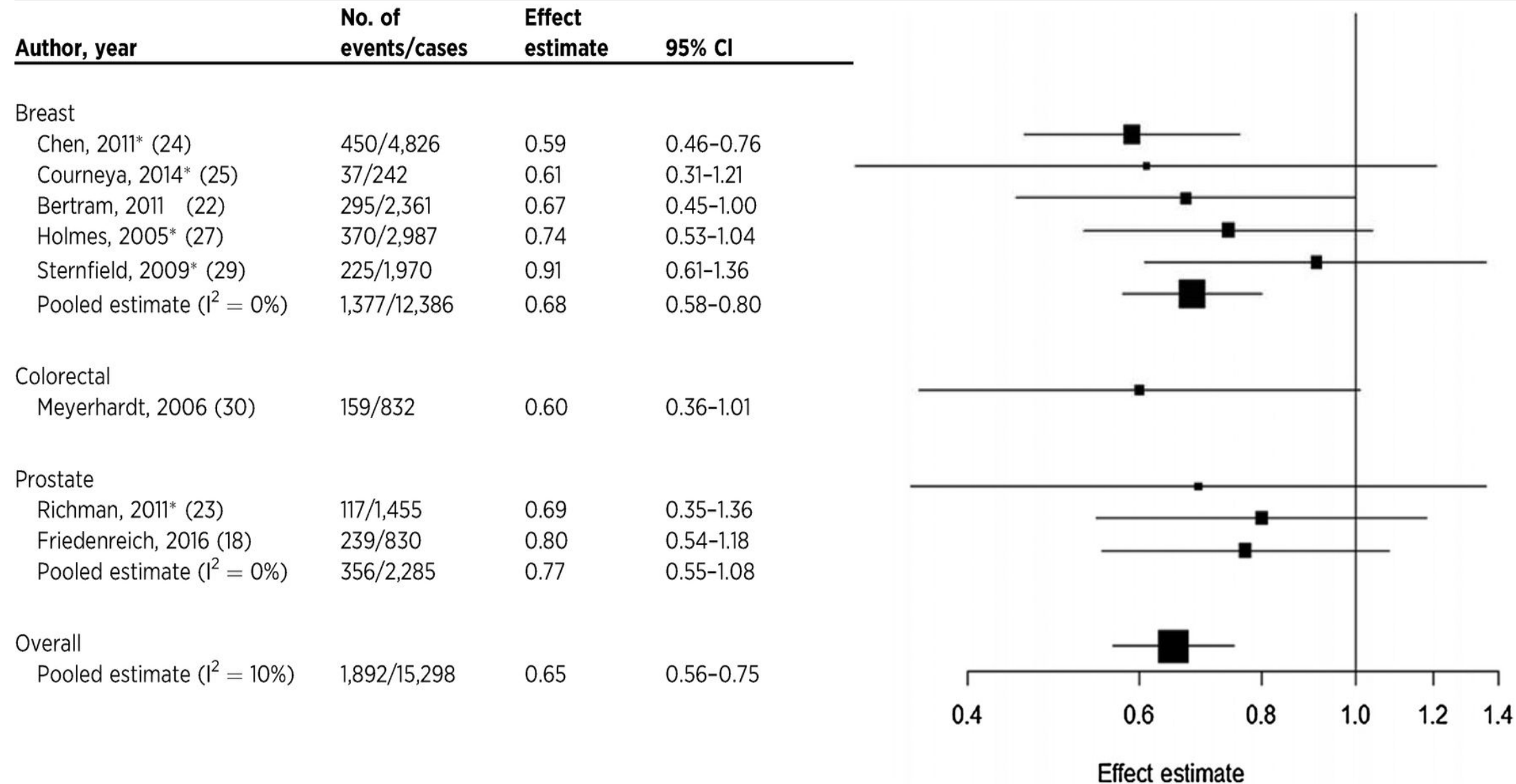
Author, year	No. of events/cases	Effect estimate	95% CI
<b>Breast</b>			
Bradshaw, 2014 (10)	195/1,033	0.27	0.17-0.42
Holick, 2008 (26)	109/4,482	0.49	0.27-0.89
Borch, 2015 (9)	155/1,327	0.50	0.15-1.62
Holmes, 2005 (27)	280/2,987	0.60	0.40-0.89
Irwin, 2011 (11)	86/2,910	0.61	0.38-0.99
Irwin, 2008 (28)	115/933	0.65	0.23-1.87
Williams, 2014 (8)	46/986	0.76	0.63-0.92
de Glas, 2014 (12)	39/435	0.77	0.28-2.12
Sternfield, 2009 (29)	102/1,970	0.87	0.48-1.59
Borugian, 2004 (7)	112/603	1.00	0.63-1.60
Pooled estimate ( $I^2 = 61.3\%$ )	1,239/17,666	0.62	0.48-0.80
<b>Colorectal</b>			
Kuiper, 2012 (13)	51/606	0.29	0.11-0.77
Meyerhardt, 2006 (30)	80/573	0.39	0.19-0.82
Meyerhardt, 2009 (31)	88/661	0.47	0.24-0.92
Arem, 2015 (14)	128/3,797	0.53	0.27-1.03
Campbell, 2013 (15)	379/2,236	0.87	0.61-1.24
Baade, 2011 (16)	345/1,825	0.88	0.67-1.15
Pooled estimate ( $I^2 = 56.6\%$ )	1,071/9,698	0.62	0.45-0.86
<b>Prostate</b>			
Kenfield, 2011 (17)	112/2,705	0.42	0.20-0.88
Friedenreich, 2016 (18)	170/830	0.56	0.35-0.90
Bonn, 2015 (19)	194/4,623	0.73	0.51-1.05
Pooled estimate ( $I^2 = 0.8\%$ )	476/8,158	0.62	0.47-0.82
<b>Any</b>			
Lee, 2014 (20)	337/1,021	0.62	0.44-0.87
Inoue-Choi, 2013 (21)	184/2,017	0.72	0.47-1.10
<b>Overall</b>			
Pooled estimate ( $I^2 = 47.9\%$ )	3,307/38,560	0.63	0.54-0.73





## Individual and pooled risk estimates from prospective cohort studies that related **post-diagnosis physical activity to cancer recurrence or progression**

(Friedenreich CM, HK Neilson, MS Farris , KS Courneya. Physical Activity and Cancer Outcomes. Clin Cancer Res. 2016; 22(19); 4766-77.)



NOTE: Asterisks indicate studies in which recurrences/progressions and cancer-specific deaths were combined and analyzed as a single outcome



# The Cancer Gym





## Side Effects: Lessening the symptomatic burden

- ↓ fatigue
- ↓ hospitalizations
- ↓ neutropenia
- ↓ pain
- ↓ depression/anxiety

- ↑ immune function
- ↑ → fitness, muscle bulk, bone health
- ↑ sleep
- ↑ chemotherapy completion rate





# 2018 Physical Activity Guidelines Advisory Committee Evidence

## Relationship Between Physical Activity and Risk of Developing Invasive Cancer

<b>Cancer</b>	<b>Evidence</b>	<b>% Risk Reduction</b>	<b>Dose-Response?</b>
Bladder	Strong	15%	Yes, moderate
Breast	Strong	12 – 21%	Yes, strong
Colon	Strong	19%	Yes, strong
Endometrium	Strong	20%	Yes, moderate
Esophagus	Strong	21%	No, limited
Gastric	Strong	19%	Yes, moderate
Renal	Strong	12%	Yes, limited
Lung	Moderate	21-25%	Yes, limited
Ovary	Limited	8%	Yes, limited
Pancreas	Limited	11%	No, limited

Anne McTiernan et al., Physical activity in cancer prevention and survival: A systematic review. Med Sci Sports Exerc 2019 June; 51(6):1252-1261.



# 2018 Physical Activity Guidelines Advisory Committee Evidence

## Relationship Between Physical Activity and Mortality in Cancer Survivors

### All-Cause Mortality

<b>Cancer</b>	<b>Evidence Grade</b>	<b>Approximate % Relative Risk Reduction</b>
Breast	Moderate	48%
Colorectal	Moderate	42%
Prostate	Limited	37-49%

### Cancer-Specific Mortality

Breast	Moderate	38%
Colorectal	Moderate	38%
Prostate	Moderate	38%

McTiernan, A. et al., Physical activity in cancer prevention and survival: A systematic review. Med Sci Sports Exerc 2019 June; 51(6):1252-1261.





# Physical Activity Guidelines

**Avoid inactivity!**

**To improve general health:**

- 150 minutes of moderate intensity aerobic exercise/week
- Resistance training 2 times/week focusing on major muscle groups

**Additional recommendations evidence-based health-related outcomes**



Campbell KL, et al. (2019). Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. *Med Sci Sports Exerc.* 51(11):2375-2390



# Effects of Exercise on Health-Related Outcomes in Those with Cancer









## What can exercise do?

- **Prevention of 7 common cancers\***  
Dose: 2018 Physical Activity Guidelines for Americans: 150-300 min/week moderate or 75-150 min/week vigorous aerobic exercise
- **Survival of 3 common cancers\*\***  
Dose: Exact dose of physical activity needed to reduce cancer-specific or all-cause mortality is not yet known; Overall more activity appears to lead to better risk reduction

\*bladder, breast, colon, endometrial, esophageal, kidney and stomach cancers

\*\*breast, colon and prostate cancers

Overall, avoid inactivity, and to improve general health, aim to achieve the current physical activity guidelines for health (150 min/week aerobic exercise and 2x/week strength training).

Outcome	Aerobic Only	Resistance Only	Combination (Aerobic + Resistance)
<b>Strong Evidence</b>	Dose	Dose	Dose
 <b>Cancer-related fatigue</b>	3x/week for 30 min per session of moderate intensity	2x/week of 2 sets of 12-15 reps for major muscle groups at moderate intensity	3x/week for 30 min per session of moderate aerobic exercise, plus 2x/week of resistance training 2 sets of 12-15 reps for major muscle groups at moderate intensity
 <b>Health-related quality of life</b>	2-3x/week for 30-60 min per session of moderate to vigorous	2x/week of 2 sets of 8-15 reps for major muscle groups at a moderate to vigorous intensity	2-3x/week for 20-30 min per session of moderate aerobic exercise plus 2x/week of resistance training 2 sets of 8-15 reps for major muscle groups at moderate to vigorous intensity
 <b>Physical Function</b>	3x/week for 30-60 min per session of moderate to vigorous	2-3x/week of 2 sets of 8-12 reps for major muscle groups at moderate to vigorous intensity	3x/week for 20-40 min per session of moderate to vigorous aerobic exercise, plus 2-3x/week of resistance training 2 sets of 8-12 reps for major muscle group at moderate to vigorous intensity
 <b>Anxiety</b>	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
 <b>Depression</b>	3x/week for 30-60 min per session of moderate to vigorous	Insufficient evidence	2-3x/week for 20-40 min of moderate to vigorous aerobic exercise plus 2x/week of resistance training of 2 sets, 8-12 reps for major muscle groups at moderate to vigorous intensity
 <b>Lymphedema</b>	Insufficient evidence	2-3x/week of progressive, supervised, program for major muscle groups does not exacerbate lymphedema	Insufficient evidence
<b>Moderate Evidence</b>			
 <b>Bone health</b>	Insufficient evidence	2-3x/week of moderate to vigorous resistance training plus high impact training (sufficient to generate ground reaction force of 3-4 time body weight) for at least 12 months	Insufficient evidence
 <b>Sleep</b>	3-4x/week for 30-40 min per session of moderate intensity	Insufficient evidence	Insufficient evidence

Citation: [bit.ly/cancer\\_exercise\\_guidelines](https://bit.ly/cancer_exercise_guidelines)

Moderate intensity (40%-59% heart rate reserve or  $VO_2R$ ) to vigorous intensity (60%-89% heart rate reserve or  $VO_2R$ ) is recommended.

Exercise  
is Medicine

AMERICAN COLLEGE  
of SPORTS MEDICINE



# Putting it into Practice: Exercise is Medicine Framework

## Step 1: Assess

- Ask patients if they are currently active

## Step 2: Advise

- Advise patients that exercise is important and that adding activity will be beneficial

## Step 3: Refer

- Refer patient to a Qualified Exercise Professional for further assessment and prescription

Exercise  
is Medicine<sup>®</sup>





# The Qualified Exercise Professional

## Fitness/Personal Trainer

- Not a qualified exercise professional in a cancer care setting
- No university degree required
- No specialized training in cancer

## Kinesiologist

- Required university degree required in Exercise Science
- Some training specific to cancer

## Clinical Exercise Physiologist

- University degree required in Exercise Science
- Additional licensing and certification exams
- Training specific to cancer and other clinical conditions

Physiotherapists, occupational therapist, psychiatrists can support with manual therapy, rehabilitation and pain management related to specific concerns (i.e. lymphedema and axillary web syndrome) but typically don't monitor patients with exercise on an ongoing basis



# Cancer-Specific Training

Increased evidence has led to increased demand for cancer-specific training for exercise professionals

Multiple certifications and continuing education programs are now available

These support the need for individualized care of cancer patients and the ability to assist all patients with activity regardless of cancer diagnosis, stage, and current treatment protocol







# Not a One Size Fits All Approach

There are few absolute contraindications and individualized exercise prescription will support most relative contraindications

## **Patient Case #1**

49 year old woman

Dx: Stage 4 breast cancer with mets to sternum, T/S, ilium

Tx: Bilateral mastectomy w/ sentinel node biopsy, taxol-based chemotherapy, letrozole, bisphosphonate

Previous activity: running, yoga, strength training

Co-morbidities: none

## **Patient Case #2**

78 year old male

Dx: Stage 2 prostate cancer

Tx: radical prostatectomy and LN dissection

Previous activity: sedentary

Co-morbidities: type 2 diabetes, hypertension, previous hip replacement





# Behaviour Change & Implementation

Less than 50% of cancer patients are meeting PA Guidelines

- Over 80% have indicated wanting to receive exercise guidance or further information from their oncology team

Behaviour change is often complex and individualized support is needed to promote success

Working with a qualified exercise professional:

- Assesses health status and medical history
- Addresses perceived barriers to activity
- Personalizes activity based on history and preferences
- Provides individualized and personalized support
- Provides regular follow-up and program adjustments
- Supports long-term adherence





# InspireHealth's Exercise Programs

InspireHealth is a non-profit supportive cancer care organization operating throughout British Columbia

Exercise programs are led by qualified exercise professionals with advanced cancer and exercise training

Exercise programs include:

- Initial screening, consultation and assessment
- Development of an individualized exercise prescription
- Weekly classes including exercise and yoga





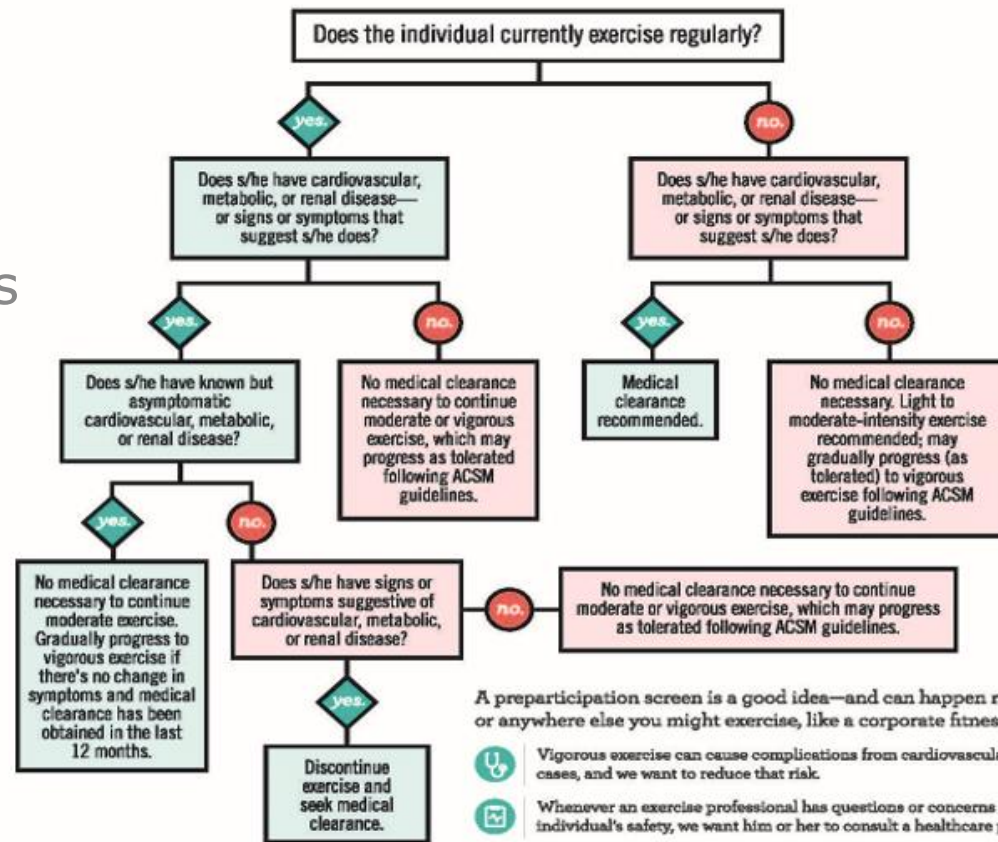
# Safety Screening and Assessment: ACSM Pre-Participation Health Screening

Screening tool based on:

- Current PA participation
- Diagnosis or suggestive signs and symptoms of cardiovascular, metabolic and/or renal disease

## PREPARTICIPATION HEALTH SCREENING

Updated for 2015 and beyond



A preparticipation screen is a good idea—and can happen right in the gym or anywhere else you might exercise, like a corporate fitness program.



Vigorous exercise can cause complications from cardiovascular disease in rare cases, and we want to reduce that risk.



Whenever an exercise professional has questions or concerns about an individual's safety, we want him or her to consult a healthcare provider.





# Safety Screening and Assessment:

## Adapted National Comprehensive Cancer Network Triage Approach

<b>Description of Patients</b>	<b>Evaluation, prescription, and programming recommendations</b>
No comorbidities	No further pre-exercise evaluation Follow general exercise recommendations
Peripheral neuropathy, arthritis/MSK issues, poor bone health (osteoporosis or osteopenia), lymphedema	Recommended pre-exercise medical evaluation Modify general exercise recommendations based on assessments Consider referral to trained personnel
Lung or abdominal surgery, ostomy, cardiopulmonary disease, ataxia, extreme fatigue, severe nutritional deficiencies, worsening/changing physical condition (e.g. lymphedema exacerbation), bone metastases	Pre-exercise medical evaluation and clearance by physician before exercise Referral to trained personnel

Campbell KL, et al. (2019). Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. Med Sci Sports Exerc. 51(11):2375-2390





# Safety Screening and Assessment: CSEP Get Active Questionnaire (GAQ)

Screening tool based on:

- Potential cardiovascular disease
- Co-morbidities
- Current blood pressure reading
- Potential symptoms experienced while active and at rest (i.e. dizziness, shortness of breath, fainting)
- Presence of pain or swelling
- Healthcare provider activity recommendations

If further medical clearance is required from a specialist (e.g. oncologist, cardiologist, etc.), we will request it with patient's consent from that provider



## Get Active Questionnaire

CANADIAN SOCIETY FOR EXERCISE PHYSIOLOGY –  
PHYSICAL ACTIVITY TRAINING FOR HEALTH (CSEP-PATH®)

		PREPARE TO BECOME MORE ACTIVE
<input checked="" type="checkbox"/> YES ... ↓	<input checked="" type="checkbox"/> NO ... ↓	<p>The following questions will help to ensure that you have a safe physical activity experience. Please answer <b>YES</b> or <b>NO</b> to each question <u>before</u> you become more physically active. If you are unsure about any question, answer <b>YES</b>.</p> <p><b>1</b> Have you experienced <b>ANY</b> of the following (A to F) <b>within the past six months</b>?</p> <p><b>A</b> A diagnosis of/treatment for heart disease or stroke, or pain/discomfort/pressure in your chest during activities of daily living or during physical activity?</p> <hr/> <p><b>B</b> A diagnosis of/treatment for high blood pressure (BP), or a resting BP of 160/90 mmHg or higher?</p> <hr/> <p><b>C</b> Dizziness or lightheadedness during physical activity?</p> <hr/> <p><b>D</b> Shortness of breath at rest?</p> <hr/> <p><b>E</b> Loss of consciousness/fainting for any reason?</p> <hr/> <p><b>F</b> Concussion?</p> <hr/> <p><b>2</b> Do you currently have pain or swelling in any part of your body (such as from an injury, acute flare-up of arthritis, or back pain) that affects your ability to be physically active?</p> <hr/> <p><b>3</b> Has a health care provider told you that you should avoid or modify certain types of physical activity?</p> <hr/> <p><b>4</b> Do you have any other medical or physical condition (such as diabetes, cancer, osteoporosis, asthma, spinal cord injury) that may affect your ability to be physically active?</p>
		... > <b>NO</b> to all questions: go to Page 2 – ASSESS YOUR CURRENT PHYSICAL ACTIVITY > ... >>
		<b>YES</b> to any question: go to Reference Document – ADVICE ON WHAT TO DO IF YOU HAVE A YES RESPONSE >>>



# InspireHealth's Exercise Programs

All programs are offered **free of charge**

Programs are offered virtually to all cancer patients in BC

Post-COVID, programs will function as a hybrid between physical centres (Vancouver, Victoria, Kelowna) and online

Ways to refer:

- Visit [www.inspirehealth.ca](http://www.inspirehealth.ca)
- Pathways ([www.pathwaysbc.ca](http://www.pathwaysbc.ca))

## INSPIREHEALTH SUPPORTIVE CANCER CARE PATIENT REFERRAL FORM FOR PHYSICIANS

- Individual and group support for cancer patients in exercise therapy, stress management, mental health, nutrition, and counselling
- Physicians, Dietitians, Clinical Counsellors, Exercise Therapists
- All services are free of charge and currently offered virtually

Date of Referral: \_\_\_\_\_

### Referring Physician:

Name: \_\_\_\_\_ Specialty: \_\_\_\_\_

Organization: \_\_\_\_\_ Billing Number: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

### Patient Information:

Name: \_\_\_\_\_ Address: \_\_\_\_\_

City: \_\_\_\_\_ Prov: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ PHN: \_\_\_\_\_

Cancer Diagnosis: \_\_\_\_\_  Pre-treatment  In-treatment  Post-treatment

*\*If referring a patient to exercise therapy, please provide the following information:*

### Patient Comorbidities:

Cardiovascular Disease  Hypertension  Diabetes  Kidney Disease  COPD

Osteoporosis/Osteopenia

Exercise Considerations and/or Contraindications (e.g.: bone metastases): \_\_\_\_\_

Recent Blood Pressure Reading (if available): \_\_\_\_\_

**By signing below, I am providing clearance for this patient to participate in exercise.**

\_\_\_\_\_  
Physician Signature

\_\_\_\_\_  
Date Signed



**InspireHealth**  
SUPPORTIVE CANCER CARE

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# Questions?

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