Physical Activity and Rehabilitation

Cancer Prevention and Wellness Promotion for Cancer Survivors

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Cancer: Burden of Disease in the US

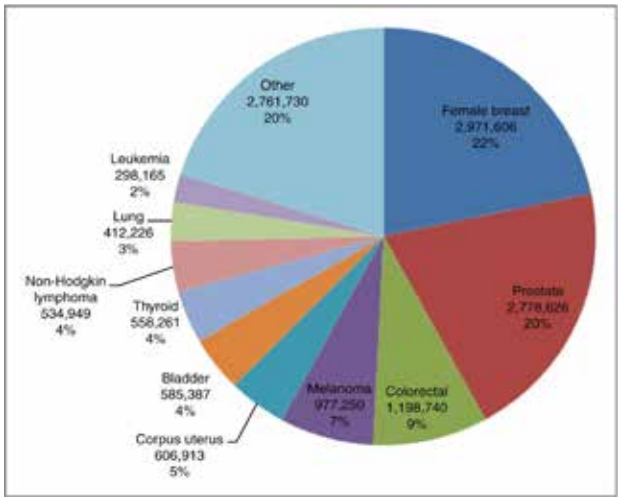
Cancer Incidence Rates

Estimated New Cancer Cases* in the US in 2018

		Males 856,370	Females 878,980		
Prostate	19%			30%	Breast
Lung & bronchus	14%			13%	Lung & bronchus
Colon & rectum	9%			7%	Colon & rectum
Urinary bladder	7%			7%	Uterine corpus
Melanoma of skin	6%			5%	Thyroid
Kidney & renal pelvis	5%			4%	Melanoma of skin
Non-Hodgkin lymphoma	5%			4%	Non-Hodgkin lymphoma
Oral cavity & pharynx	4%			3%	Pancreas
Leukemia	4%			3%	Leukemia
Liver & intrahepatic bile duct	4%			3%	Kidney & renal pelvis
All other sites	22%			21%	All other sites

*Excludes basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.

Cancer Survivors



Cancer Prevention

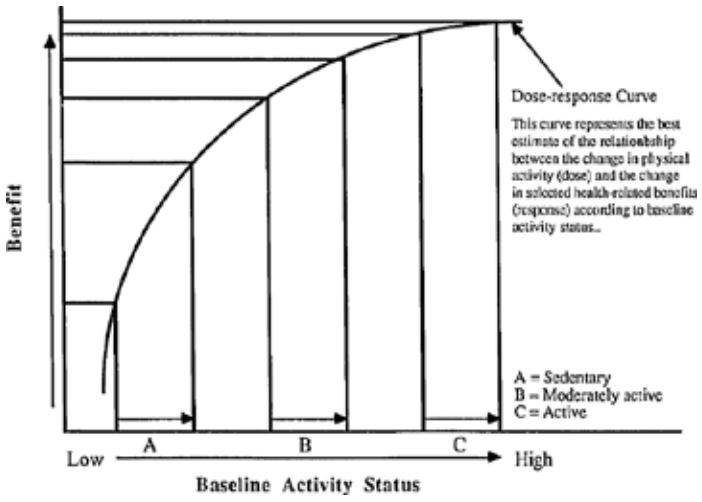
Seven cancers with "strong" evidence*

- Evidence of "dose-response" implied

Colon
Breast
Endometrial

Kidney
Bladder

Esophageal adenocarcinoma
Gastric



*Physical Activity Guidelines Advisory Committee Report (2018)

Haskell MSSE 26:649, 1994

Dose-response: Translational Questions

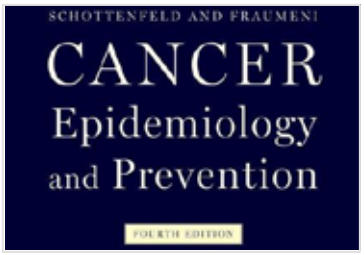
I want to lower my risk of developing cancer…

What type of PA should I do?	*Exercise! Best/most evidence for LTPA*
How much is enough?	Current recommendations = significantly lower risk for several cancers
Is there an optimal amount?	Doing more than recommended associated with even lower risk (linear relations)
Can I do too much?	No erosion of benefit up to 30 MET- hrs/wk
How many ways can I get there? - different types (mixtures) - big bouts vs. short frequent bouts	A broad range of activities associated with lower risk (work, household, transport, walking)

Original Investigation

Association of Leisure-Time Physical Activity With Risk of 26 Types of Cancer in 1.44 Million Adults

Steven C. Moore, PhD, MPH; I-Min Lee, MBBS, ScD; Elisabete Weiderpass, PhD; Peter T. Campbell, PhD; Joshua N. Sampson, PhD; Cari M. Kitahara, PhD; Sarah K. Keadle, PhD, MPH; Hannah Arem, PhD; Amy Berrington de Gonzalez, DPhil; Patricia Hartge, ScD; Hans-Olov Adami, MD, PhD; Cindy K. Blair, PhD; Kristin B. Borch, PhD; Eric Boyd, BS; David P. Check, BS; Agnès Fournier, PhD; Neal D. Freedman, PhD; Marc Gunter, PhD; Mattias Johannson, PhD; Kay-Tee Khaw, MD, MsC, PhD; Martha S. Linet, MD; Nicola Orsini, PhD; Yikyung Park, ScD; Elio Riboli, MD; Kim Robien, PhD; Catherine Schairer, PhD; Howard Sesso, ScD, MPH; Michael Spriggs, BS; Roy Van Dusen, MS; Alicja Wolk, DMSc; Charles E. Matthews, PhD; Alpa V. Patel, PhD



2018 PhysicalActivity Guidelines Advisory Committee Scientific Report

5

Types of physical activity included

Leisure-time

Moderate intensity e.g. walking

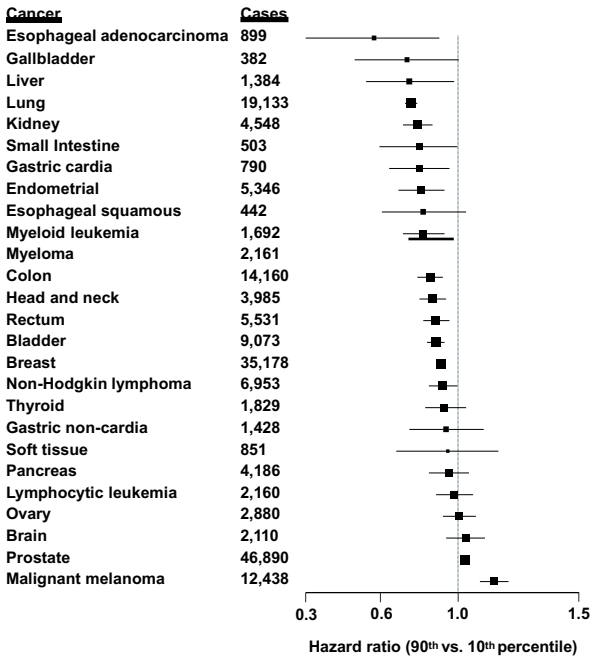
and/or

Vigorous intensity e.g. hiking, jogging

6

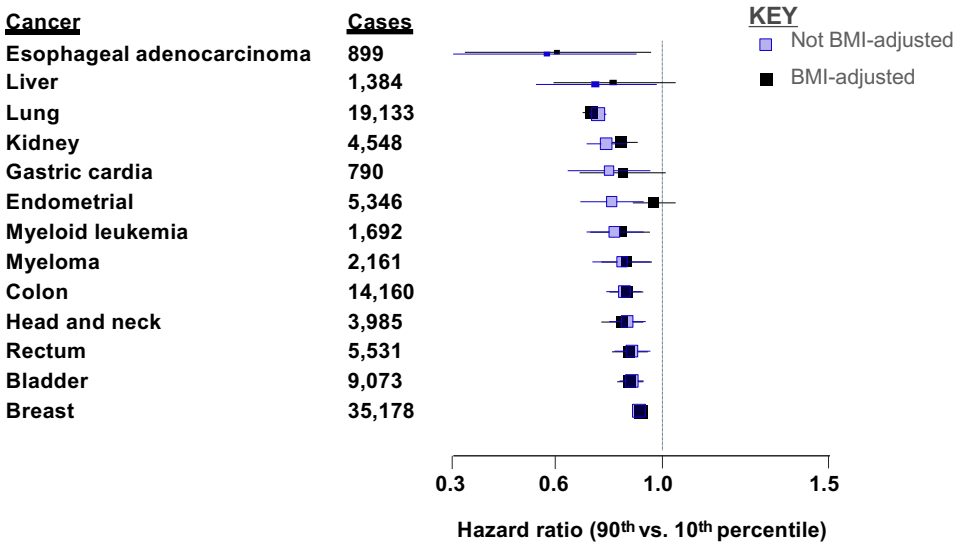
Main results

(Not adjusted for BMI)



What role does obesity play?

Associations after BMI adjustment



Conclusions on Cancer Prevention (Risk Reduction)

- In the past decade, considerable evidence has accumulated suggesting that physical activity has a broad protective effect on cancer risk.
- There are 8 cancers for which physical activity is currently believed to be protective
- Additional studies are needed to further refine our understanding of dose-response relationships and the role of physical activity type.

Exercise for Cancer Survivors

Cancer Survivor

Anyone diagnosed with, being treated for, or with a history of cancer.

*American College of Sports Medicine Exercise Guideline for Cancer Survivors**

Moderately intense cardio 30 min/day, 5 x/week
Or

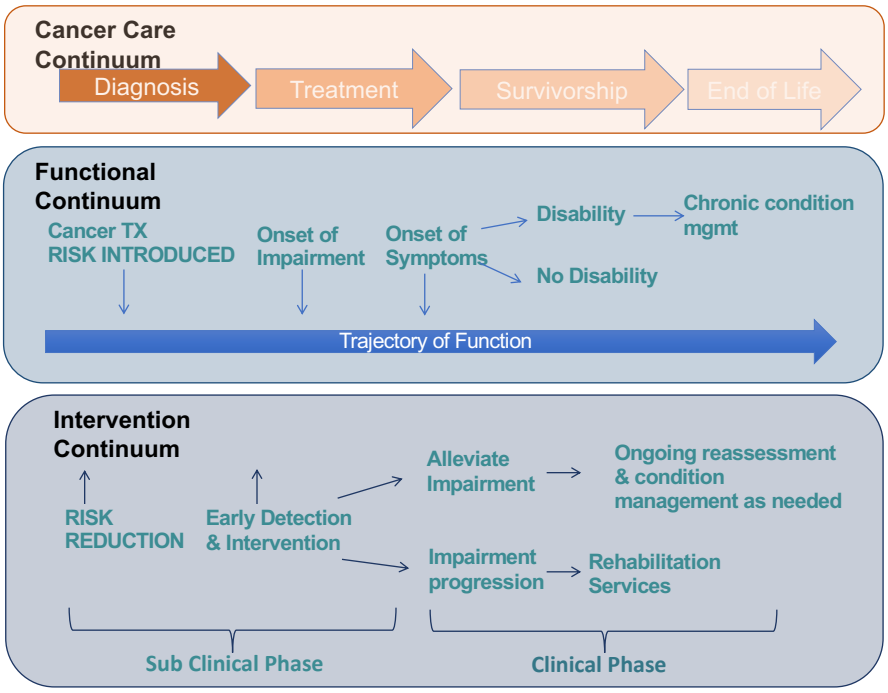
Vigorously intense cardio 20 min/day, 3 x/week
And

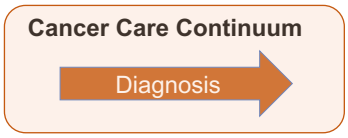
Eight to ten strength-training exercises, 8-12 repetitions of each, twice a week.

Moderate-intensity physical activity: working hard enough to raise your heart rate, break a sweat, carry on a conversation.

**For the average healthy adult to maintain health and reduce the risk for chronic disease.*

Exercise along the continuum of cancer care





Prehabilitation: *"…occurs between the time of cancer diagnosis and the beginning of acute treatment and includes physical and psychological assessments that establish a baseline functional level, identify impairments, and provide interventions that promote physical and psychological health to reduce the incidence and/or severity of future impairments."*

Enhanced Recover After Surgery (ERAS)

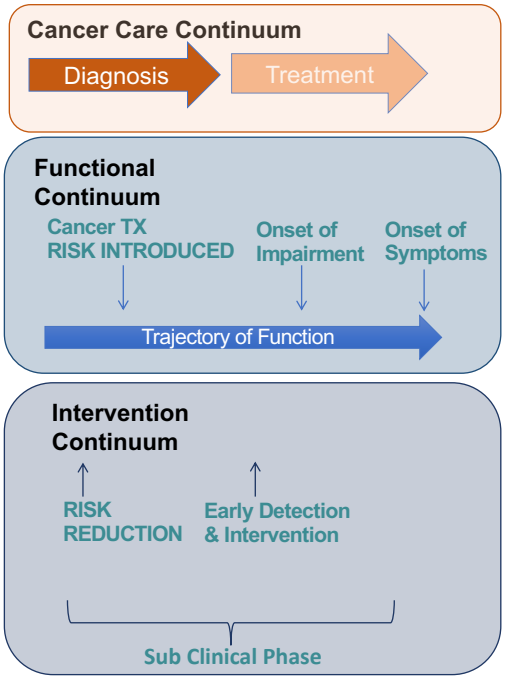
Multimodal perioperative care pathway that enhances early recovery after surgical procedures by reducing the stress of surgery components include:

- Family and care giver education
- Nutrition interventions
- Prehabilitation exercise and mobility protocols
- Pain medication management
- Smoking cessation

Prehabilitation Indications

Cancer Population	Exercise Prescription	Outcomes
Lung	Supervised program 3-4 weeks 2-3 x/week (30-40 minutes) Moderate intensity exercise	• Improves pulmonary function prior to surgery • Reduction in hospital LOS • Reduced rate of infection • Improved tolerance to chemotherapy
Colorectal and other GI	Supervised program 2-3 weeks 2-3 x/week (30-40 minutes) Moderate intensity exercise	• Reduced hospitalization and reduced rate of readmission after discharge • Enhanced physical performance in elderly patients preoperatively • Improves functional capacity prior to chemotherapy
Gynecological Cancers	Supervised program w/home component 2-3 weeks 2-3 x/week (40-60 minutes) Moderate intensity exercise Pelvic floor muscle training	• Improves time to return to continence • Improves cardiorespiratory fitness • Improves functional walking capacity

Sebio Garcia et al 2016 Interact Cardiovas Thorac Surg, Singh et al 2013, Surg Oncol, Boereboom Tech Coloproctol. 2015 Carli F et al PM&R Clinics NA 2017



Exercise to maintain functional performance

ACSM Guideline for Cancer Exercise

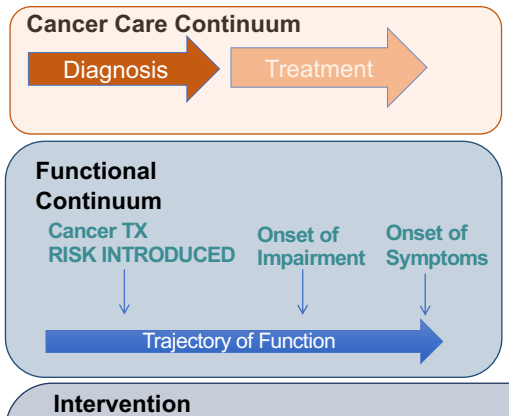
Exercise for reconditioning

Shorter duration activities (e.g. 2-3 low intensity/low resistance PRE's)

Adequate monitoring of vital signs and self-reported response to exercise.

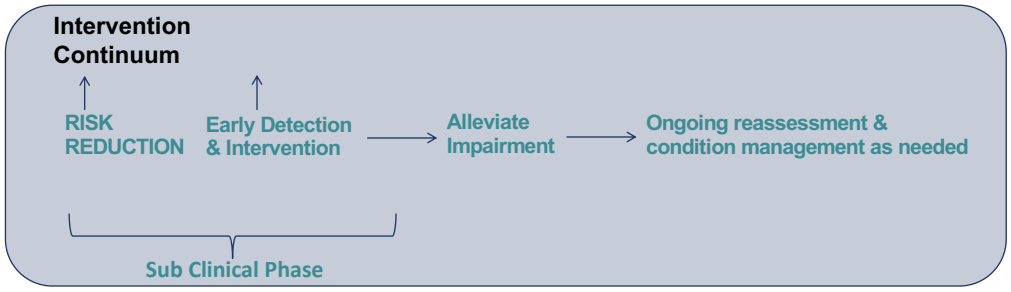
Exercise to alleviate functional impairment

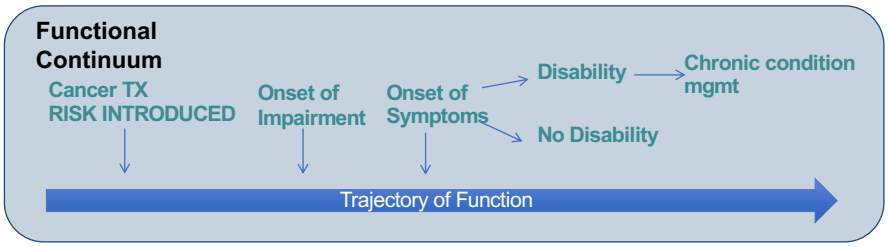
Prospective surveillance to monitor for early onset of impairment and promote early intervention



Prospective Surveillance

- Screening and Repeat of Baseline Measures
  - Risk-based
  - Frequency of Interval Assessment
  - Trajectory of Cancer Care
- Triage
  - Exercise and Rehabilitative Interventions
  - Home-based exercise
  - Monitoring
- Education





Exercise to restore functional performance

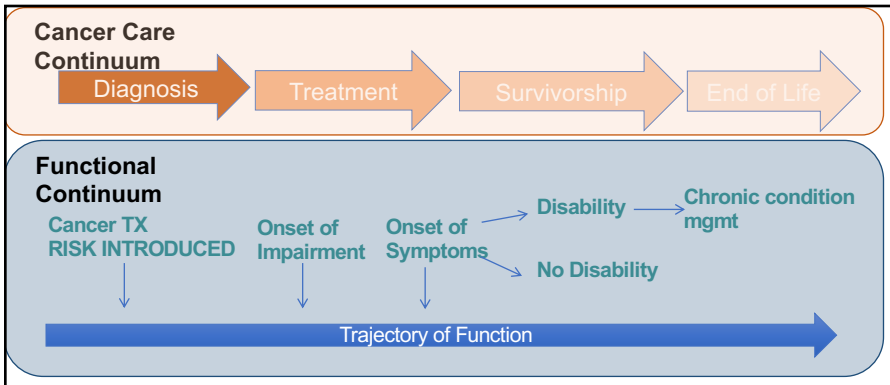
ACSM Guideline for Cancer Exercise

Impairment-based, targeted interventions

Survivorship is essentially the remaining lifespan of the individual

Ongoing prospective monitoring for optimal physical function and to enable targeted exercise.

Adherence to exercise and healthy lifestyle behaviors is key.



Exercise Indications:

- Maintain independence
- Enhance safety through better endurance and strength
- Prevent falls
- Optimize patient self-management

Exercise Prescription:

- Low to moderate intensity aerobic or resistive exercise, symptom limited with consideration of disease status
- Frequent reassessment and prescription adaptations when medical treatment changes or disease status progresses

Preliminary Framework for Exercise Guideline

At Cancer Diagnosis Pre-Treatment/ Prehabilitation	During Cancer Treatment	After Cancer Treatment
ALL Patients • Assess physical activity level • Clinical measures of endurance and function	**ALL Patients** • Repeat baseline endurance and functional measures • Screen for side effects causing impairment	**ALL Patients** • Repeat baseline endurance and functional measures • Screen for late effects and emerging impairment
Prehabilitation Exercise • Moderate intensity aerobic, 3-5x/week, +/- Resistive exercise for populations of interest • Supervised individual or group setting or unsupervised	**Exercise to Maintain** • Moderate aerobic exercise, +/- resistive exercise, 3-5x/week (150 min/wk) • Supervised or unsupervised **Exercise for Reconditioning** • Movement-based exercises/PRE's • Supervised	**Exercise to Maintain** • Moderate aerobic exercise, +/- resistive exercise, 3-5x/week (150 min/wk) • Home-based or community-based **Exercise for Reconditioning** • Movement-based exercise • Supervised • Intensity specific to level of deconditioning
Therapeutic Exercise • Indicated based on impairments • Supervised • Preconditioning for select populations	**Therapeutic Exercise** • Indicated based on impairments • Supervised • Proactive for select populations	**Therapeutic Exercise** • Indicated based on impairments • Supervised • Screening and triage based

Stout NL, Baima J, et al 2017 *PMR*

Impairment-driven exercise indications

Cancer treatment-related Impairments
Common and Persistent

Systemic Changes	Surgery	Chemotherapy	Radiation	Hormonal	Exercise Benefit
Pain					
Fatigue					
Cardiovascular					
Pulmonary					
Neuropathic					
Cognitive changes					
Increased adiposity					
Lean mass loss					
Bone fragility					
Lymphatic congestion					
Soft tissue scarring					
Cytopenia					

Exercise Prescription: Cancer-Related Fatigue

Indication: Self-reported fatigue >4/10 on Visual Analog Scale*

Intervention: Moderate intensity exercise +/- resistance exercise through the duration of cancer adjuvant treatment

- 14 week duration, 2-3 x/week
- 60 minute exercise sessions
- Supervised

Exercise during adjuvant therapy has greater impact than following treatment completion

Clinical Measures:

- Modified Brief Fatigue Inventory
- Cancer-related Fatigue Distress Scale
- 10 point Visual Analog Score
- Multidimensional Fatigue Symptom Inventory

*National Comprehensive Cancer Network Guideline

Exercise Prescription: Lymphedema

Indication: Cancer-related deconditioning or loss of strength

Intervention: Moderate intensity exercise +/- resistance exercise

- Fit for, and advise use of, compression garment during all exercise interventions
- Close monitoring for limb pain or swelling exacerbation with exercise program
- Load progression over time only when tolerated without symptoms

Clinical Measures:

- Lymphedema Life Inventory Score (LLIS)
- Circumferential limb measures
- Bioelectrical impedance spectroscopy

Exercise Prescription: Depression and Anxiety

Indication: Clinical diagnosis based on reported feelings of sadness or mood change, sleep disturbance, feelings of guilt, extreme fatigue.

Intervention: Low intensity exercise, supervised and guided

- Yoga, Qui gong with meditation and breathing
- 8 – 12 weeks, 3-4 x/week

Clinical Measures:

- NCCN Distress Thermometer
- Subscales of European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ)
- Patient-Reported Outcomes Measurement Information System (PROMIS)

Shneerson et al 2013 Complement Ther Med, Pan et al 2015 Asia-Pac J Clin Oncol

Exercise Prescription: Bone Fragility

Indication: Osteopenia, Osteoporosis, or clinically diagnosed bone metastasis with ongoing active treatment, deconditioning or loss of strength

Intervention: Weight bearing aerobic exercise and resistance training.

- Load tolerance directed, pain free, and with consideration for osseous risk
- Slowly progressive and supervised

Clinical Measures:

- Grip strength
- 6 minute walk test
- Timed up and go
- Physical Performance Battery (or short PPB)

Exercise Prescription: Sarcopenia

Indication: Loss of strength or muscle mass related to prolonged disease treatment or other interventions such as Androgen Deprivation Therapy

Intervention: Resistance training exercise, following ACSM guideline with 8-10 exercises.

- Self-directed load tolerance, progressive
- Protein supplementation and nutrition intervention

Clinical Measures:

- Grip strength
- 6 minute walk test
- Timed up and go
- Physical Performance Battery (or short PPB)

Exercise Dosing

Frequency, Intensity, Time, Type

The questions isn't "Should we prescribe exercise for individuals with cancer?"

The questions is:
"How do we optimally prescribe exercise in the context of cancer treatment and survivorship?"

When?

How much?

How frequently?

What is safe?

Who should prescribe?

Who should monitor?

Exercise Prescription

Moderate to High Intensity

Safe and effective for most individuals with cancer
Mitigates side effect impact on function
May prevent some late effects

Aerobic +/– Resistive

Low Intensity

Effective to impact fatigue, anxiety, mood, and affective domains.

Yoga / Qi gong / Tai Chi

Stout NL et al 2017 PMR, Cormie P et al 2017 Epidemiol Rev, Buffart L et al Cancer Treat Rev 2017

Exercise Prescription

Aerobic

50 – 70 % HR max
Vital sign and RPE monitoring
Progressive
Supervised or unsupervised
Duration ranges 4– 30 wks

Resistive

8 – 10 strength training exercises
Load tolerance dependent
Progressive
Supervised
Duration ranges 8 -20 wks

Low Intensity

Walking program
Yoga/Tai Chi
Freq Range: 3 – 6 days/wk
Duration ranges 4 to 30 wks

Stout NL et al 2017 PMR, Cormie P et al 2017 Epidemiol Rev, Buffart L et al Cancer Treat Rev 2017, Mustian et al 2017 JAMA Oncology, Schmitz et al 2010 Med Sci Sports and Exercise

Exercise Prescription

Provider	Engagement Level
Physician	Aware, supportive. Prescription improves participation.
Physical therapist	Establishes and directs program. Advances exercise based on safety profile. Monitors response to exercise. Education for self management.
Exercise Physiologist	Monitors response to exercise program. Education for safety with exercise, education for self management.
Community-based exercise center	Monitors participation in exercise program. Documents any changes in status and refers to health care provider with status changes.
Self-Directed exercise	Home monitoring, phone call follow up for tolerance and adherence, video and skype follow up.

Safety Considerations

Exercise Safety

Exercise is safe and effective for all individuals going through cancer treatment or with a history of cancer therapies.

Be aware of current disease status, ongoing and anticipated medical treatments.
Understand systemic treatment side effects and impact on function.
Adapt exercise program to accommodate changes in medical therapies, systemic changes and individual needs.
Include family and care givers when possible.
Assure patient understanding of precautions and risks.
Recognize precautions and contraindications to exercise based on treatment responses.

Maltser S et al 2017 *PMR*

Blood Counts

Thrombocytopenia (<150K 10^9/L)

Platelet deficiency. Risk for bleeds, abnormal clotting.

Neutropenia (ANC <1.5 10^9/L)

Suppressed immune response. Infection risk.

Anemia (Hgb ♀ <12 g/dL / ♂ <14 g/dL)

Hemoglobin deficiency. Reduced oxygen to cells.

Goodman C 2015, Pathology 4th Ed.

Thrombocytopenia

Blood Count (10^9/L)	Considerations	Exercise Activities
50K - 150K	Symptom-based approach, monitor response to exercise and tolerance to activity.	Resistive or aerobic exercise
20K – 50K	Monitor for symptoms of bleeding, assess fall risk and implement mobility safety plan.	Movement-based exercise without resistance (walking, biking, swimming)
<20K	Fall prevention, monitor for symptoms of bleeding.	ADL's and ambulation
<10K*	Exercise withheld, close monitoring with ADLs, transfers, and mobility.	Restricted mobility

*Highest risk is below 10,000- internal bleeding or brain bleeding

Neutropenia

Blood Count (10^9/L)	Clinical Presentation	Exercise Activities
<1.5*	Mild neutropenia, monitor for fever. Reduce infection risk.	No restrictions
0.5– 1.0	Moderate neutropenia, monitor for fever.	Symptom-based approach for exercise prescription.
<0.5	Severe neutropenia	Symptom-based approach for exercise prescription.

*follow facility guidelines for infection prevention

Anemia

Blood Count (g/dL)	Clinical Presentation	Exercise Considerations
<11	Anemia. Reduced tolerance to activity, low endurance. Maybe tachycardic at baseline.	Symptom-based approach for exercise prescription. Monitor self-reported exertion. Encourage energy conservation strategies.
<8	Severe anemia. Significantly reduced tolerance to activity.	Supervision with exercise, monitor vital signs. Short bouts of exercise. Low exertion activities. Encourage energy conservation strategies.

Osseous Fragility

- Osteoporosis with prolonged hormonal therapy use
  - Breast Cancer – Aromatase Inhibitors
  - Prostate Cancer – Androgen Deprivation Therapy
- Bone metastasis
  - Bone avid primary cancers
    - Breast
    - Lung
    - Thyroid
    - Kidney
    - Prostate

Fracture Risk Assessment

Factors	Risk Stratification		
Presence of Osteoporosis	Osteoporosis + hx of osteoporotic fracture Osteoporosis + hx radiotherapy >45 Gy	Osteoporosis (< -2.5 SD)	Osteopenia (-1 to -2.5 SD)
Type of Metastatic Lesion	Lytic	Mixed: Lytic and Blastic	Blastic
Location of Metastatic Lesion	Weight bearing bone		Non-weight bearing bone
Bone Loading	Torque-like forces	Compression forces	
% Bone Erosion	>60%	25% to 60%	< 25%
Lifestyle/Behavior	Smoker	Alcohol consumption	Sedentary

General Activity Guidelines

- **0 – 25 % cortex involved**
  - Full weight bearing
- **25 – 50 % cortex involved**
  - No resistive or isometric stretching
  - Light aerobic activity
  - Partial weight bearing
  - Lifting precautions – avoid strain on long lever arm
- **> 50 % cortex involved**
  - No exercises
  - Touch down or non-weight bearing (pain dependent)
  - Assistive devices for mobility
  - AROM only, no torsional forces

O'Toole et al. in Stubblefield Cancer Rehabilitation Principles and Practice

Red Flags with Exercise

Symptoms	Considerations
New onset of pain with exercise	Localized with resistive exercise- assess bone stability Diffuse abdominal – consider blood counts Neuropathic – consider treatment side effects, positioning with exercise. Localized to the limb – consider thromboembolic issue
New onset of swelling with exercise	Compromised cardiac status, new onset lymphedema, deep vein thrombosis, cellulitis infection
Loss of balance/gait stability during exercise	Visual or vestibular compromise, proprioceptive deficits related to chemotherapy induced neuropathy, overstimulation from surroundings,
Change in cognitive status with exercise	Hydration status, oxygen saturation, overstimulation from surroundings
Rate of Perceived Exertion >17 and symptomatic	Blood counts, compromised cardiac or pulmonary status, oxygen saturation, immunosuppression

Guidelines for implementation

Cancer Care Ontario

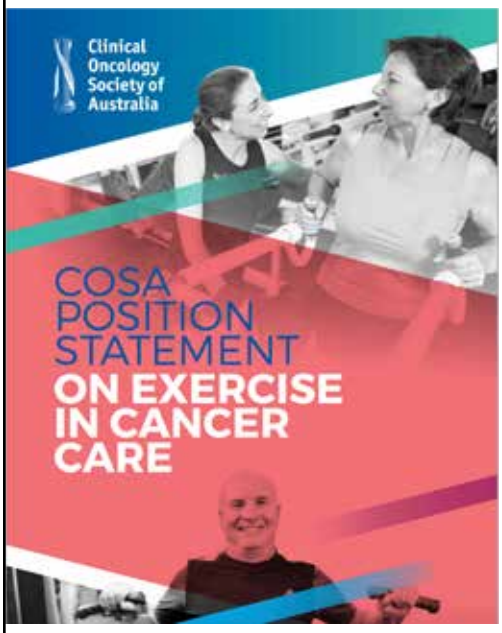
It's Time to Move:
Exercise for People With Cancer: a clinical practice guideline

February 2017

Program in Evidence-Based Medicine (PBEC)
Guideline Development

Segal R, Zwaal C et al. Current Oncology (2017) 24(1), 40-46.

- Exercise is recommended to improve quality of life, and muscular and aerobic fitness in individuals with cancer.
- *Pre-Exercise Assessment* should be conducted to evaluate effects of disease treatment or comorbidities that require tailored interventions.
- Exercise in *group or supervised settings* improves outcomes.
- *Moderate Intensity exercise is recommended* ongoing throughout cancer treatment and through survivorship.



- Exercise to be *embedded as a part of standard practice in cancer care* and to be viewed as an adjunct therapy that helps counteract the adverse effects of cancer and it's treatment;
- All members of the multidisciplinary cancer team should *promote physical activity and recommend that people with cancer should adhere to exercise guidelines*; and
- Best practice cancer care should include *referral to an accredited exercise physiologist or physiotherapist with experience in cancer care*.

Cormie P, Atkinson M, et al. (2018) MJA, published online 07/05/2018

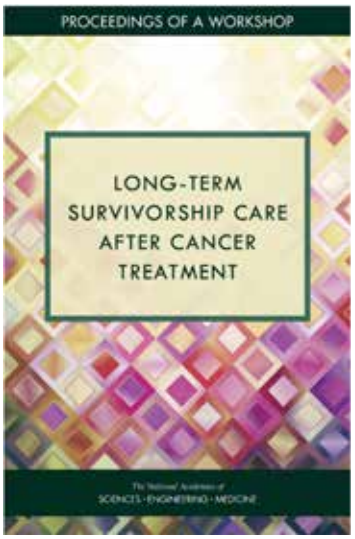
ASCO 2018: Practical Assessment and Management of Vulnerabilities in Older Patient's Receiving Chemotherapy.

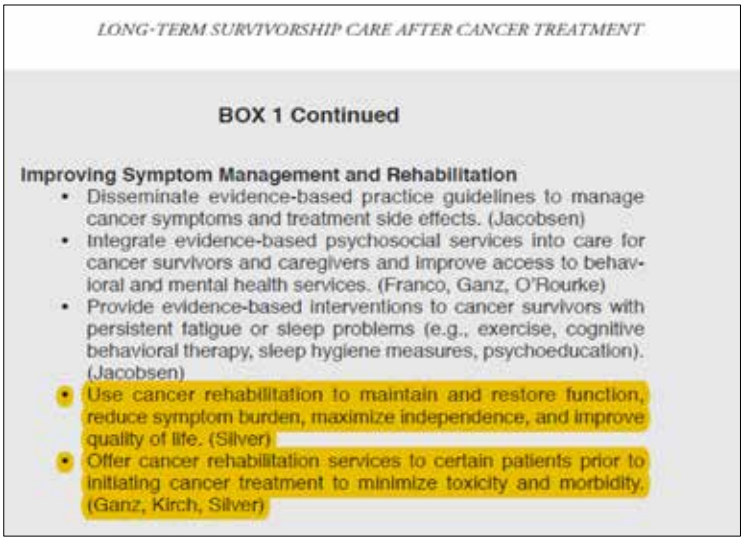
- Pre-treatment assessment of:
  - Function
  - Falls
  - Comorbidity
  - Cognition
  - Depression
  - Nutrition
- Repeated interval assessment

ASCO: Geriatric Assessment – Guided Interventions

Geriatric Assessment Measure	Guided Interventions
Function and Falls • IADL deficit • History of Falls	Referral to PT/OT for strength & balance training, assistive device, home program and safety evaluation Fall prevention discussion
Comorbidity • Comorbidity and polypharmacy considerations	Involvement of care giver/primary care provider for management of comorbidities, medications, and medical treatment decision making
Cognition • Deficits validated on screening	Assess decision making capacity and need for proxy Review medications to minimize risk of delirium Referral to geriatrician or cognitive specialist
Depression • Geriatric Depression Scale >5	Referral for psychiatry or cognitive-behavioral therapy Social work involvement Assess for pharmacological intervention
Nutrition • Weight Loss > 10 %	Referral to nutritionist/dietician Assess need for supportive meal preparation

National Academies of Sciences, Engineering, and Medicine Report





LONG-TERM SURVIVORSHIP CARE AFTER CANCER TREATMENT

BOX 1 Continued

Improving Symptom Management and Rehabilitation

- Disseminate evidence-based practice guidelines to manage cancer symptoms and treatment side effects. (Jacobsen)
- Integrate evidence-based psychosocial services into care for cancer survivors and caregivers and improve access to behavioral and mental health services. (Franco, Ganz, O'Rourke)
- Provide evidence-based interventions to cancer survivors with persistent fatigue or sleep problems (e.g., exercise, cognitive behavioral therapy, sleep hygiene measures, psychoeducation). (Jacobsen)
- Use cancer rehabilitation to maintain and restore function, reduce symptom burden, maximize independence, and improve quality of life. (Silver)
- Offer cancer rehabilitation services to certain patients prior to initiating cancer treatment to minimize toxicity and morbidity. (Ganz, Kirch, Silver)

Call to Action:

- Implement models of prospective care.
- Develop targeted education and training initiatives to assure the knowledge and skills of our workforce.
- Understand the effectiveness of rehabilitation services in improving costs, utilization, and meaningful functional outcomes.

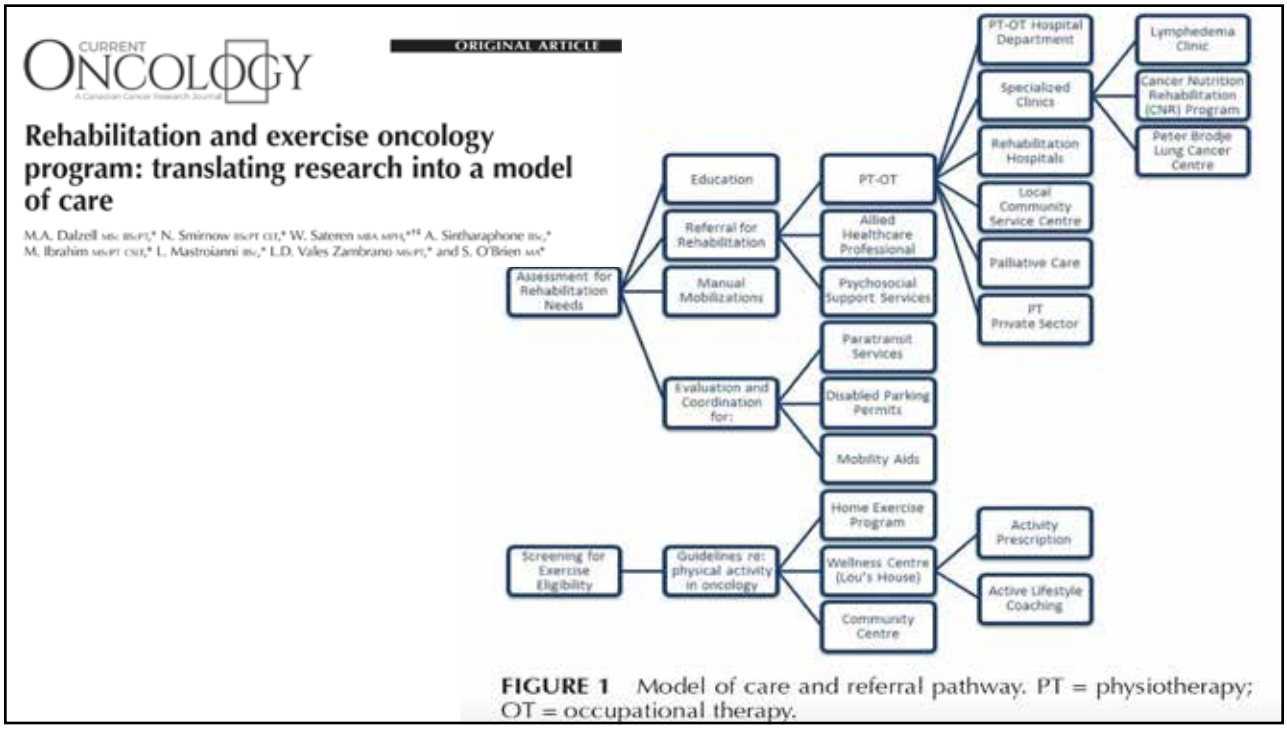


FIGURE 1 Model of care and referral pathway. PT = physiotherapy; OT = occupational therapy.

Proposed Framework for Risk Stratification

Santa Mina D, Sabiston C. et al (2018) Current Oncology 25(2).

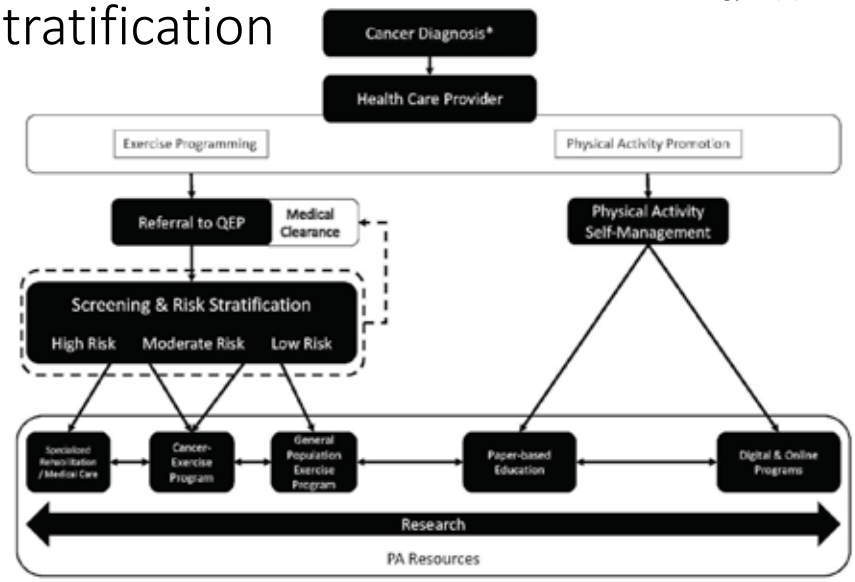


FIGURE 1 Cancer survivors can enter the pathway at any point after diagnosis. In addition, for those receiving palliative care or living with advanced cancer, the pathway could be instrumental for well-being and overall quality of life. QEP = qualified exercise professional; PA = physical activity.

SPECIAL COMMUNICATIONS

Roundtable Consensus Statement

American College of Sports Medicine Roundtable on Exercise Guidelines for Cancer Survivors

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DOI: 10.1249/MSS.0b013e3181e0c112

2010 Roundtable Recommendations Limitations

- Primarily research focused on early stage breast cancer
- Little evidence to provide insight on other cancer sites, phase of treatment, or in advanced cancers
- The outcome recommendations are very general – a public health based health maintenance recommendation
- Driven solely by ACSM with no input from other exercise or medical professional disciplines

American College of Sports Medicine Cancer and Exercise Roundtable

- Review new evidence since 2010 Roundtable
- Role of exercise in:
  - Cancer prevention
  - Cancer treatment-related side effects
  - Survivorship and end of life
- Models of care for implementation
- Anticipate new publications for exercise guideline and prescription Spring of 2019

APTA and AAPM&R
Cosponsored the event

Rehabilitation Representation

- Kristin Campbell PT, PhD
- Lynn Gerber MD
- Stephen Morris PT, PhD
- Catherine Alfano PhD
- Leighton Chan MD
- Andrea Cheville MD
- Jonas Sokolof MD
- Joachim Wiskemann PT
- Martijn Stuiver PT, PhD
- David Zucker MD
- Julie Silver MD
- Nicole Stout PT, DPT, FAPTA

Characterizing the Evidence

"Cancer treatment has one outcome: Survival

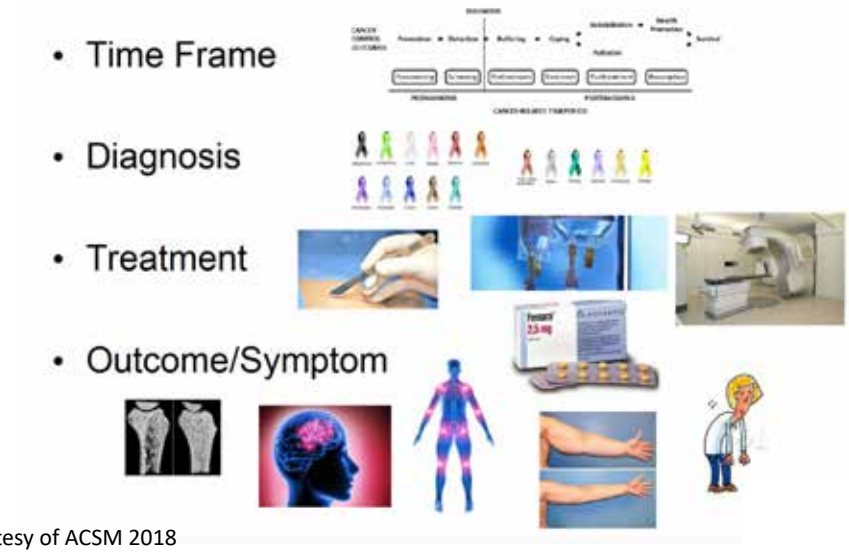
Cancer prevention has one outcome: Incidence

Cancer survivorship has > 100 outcomes!" ~ Kerry Courneya

How do we characterize the evidence?
What is important, yes…but what is most useful?

What is primary?

- Time Frame
- Diagnosis
- Treatment
- Outcome/Symptom



Slide courtesy of ACSM 2018

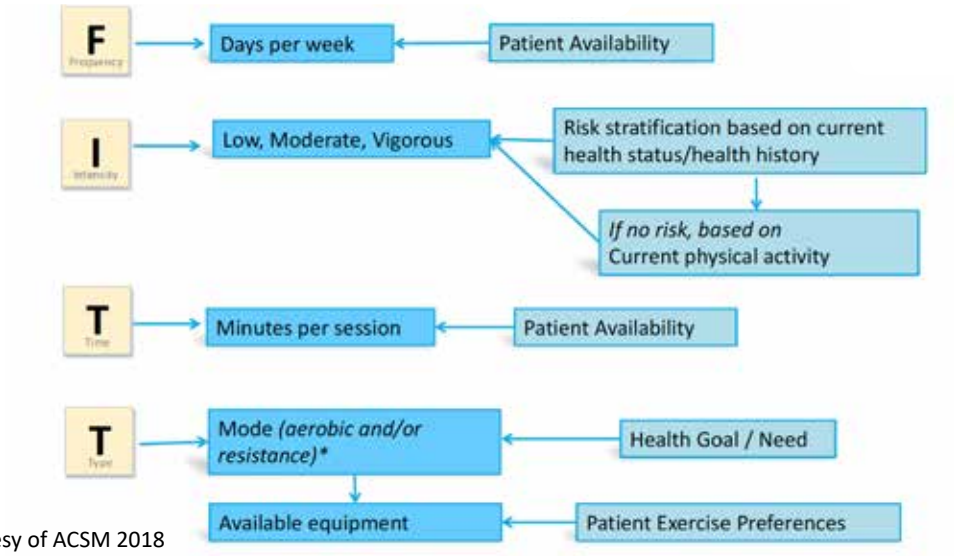
Guiding principles

Triage & Risk Stratification

- More of a safety / implementation recommendation
- We can modify based on best practices, but probably less on evidence in cancer
- Risk stratification emerging area in literature
- Collaboration with rehabilitation medicine and physical therapy

Slide courtesy of ACSM 2018

Guiding principles



Slide courtesy of ACSM 2018

Guiding principles

Specificity

General mode: aerobic, resistance, flexibility, agility, balance

- How do we categorize multi-modal exercise? Is aerobic + resistance its own mode?
- What do we do with 'non-traditional' modes such as tai chi, pilates, soccer, etc.

Specific mode: cycling vs. walking, free vs. machine weight, etc.

Level of evidence

- Head to head trials
- Comparison across trials / Systematic reviews

Slide courtesy of ACSM 2018

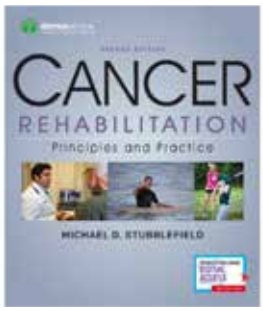
Where do you go from here?

Go To Resources

Special Issue
September 2017

Special Issue
February 2017

Quarterly Journal



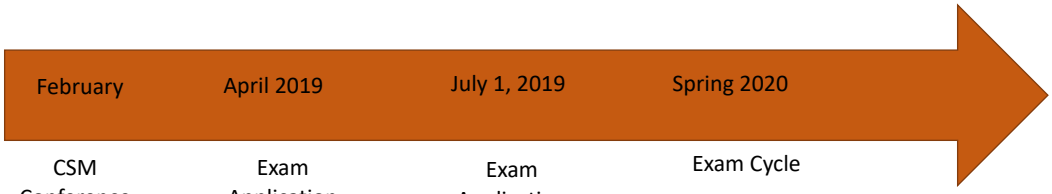
Cancer Rehabilitation Text

Special Issues:
April 2012
May 2013

Special Issues:
October 2015
July 2011

Oncology Board Specialty Certification

ABPTS



CSM Conference Programming

"Exploring Specialization" Saturday January 26, 2019 7:30 am – 9:00 am

Exam Application Available on-line

Criteria:
- *Current US PT License*
- *Evidence of 2000 hours of clinical practice in Oncology*
- *Clinical case reflection demonstrating specialty practice in Oncology*

Exam Application Deadline

Upon application submission you will receive a free copy of the Oncology Description of Specialty Practice

Exam Cycle

More Information is Available and Applications Can Be Accessed at the ABPTS website:
http://www.abpts.org/Certification/Oncology/

Despite Uncertainty…

Never doubt that you:

- can diagnose problems and progression that other caretakers will miss
- have the capacity to do great good and to bring much comfort and relief

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Brief Case #1
Cervical Cancer

46 y/o woman with locally advanced cervical cancer. Has received 2 cycles of chemotherapy with concurrent radiation therapy.
Chemotherapy agents: Cisplatin and 5 Fluorouracil
Developed neutropenic fever and was hospitalized for antibiotic treatment after 2nd cycle.
Upon discharge from the hospital, a referral was made for a rehabilitation consult due to fatigue and difficulty walking.
Self-reported fatigue: 6-7/10 most days, napping 1-2 hours daily
Reports constant 'buzzing sensation' in hands and feet

Chemotherapy-Related Symptoms:

- Chemotherapy-induced peripheral neuropathy
- Clinically significant fatigue
- History of neutropenia

Prior to being diagnosed with cervical cancer, she was extremely active participating in daily cross fit classes and training for her next triathlon.
She breaks down in tears explaining to you how frustrated she is with her treatment and how her body is responding. *"The more I try to do things, the worse I feel" "I can't remember anything, I forget simple things"* She shares her fear of being disabled for the rest of her life. She is married with two daughters; 5 and 8 yrs old and she feels disgusted with knowing that they see her struggling and weak.

Questions for Discussion:
What cancer treatment-related impairments are you identifying?
Are there any red flags?
What are some points of education that you might consider?
What assessment tools will you choose?
Are other referrals indicated?

Brief Case #2
Ovarian Cancer

A 76 year-old woman has completed 4 of 6 cycles of chemotherapy (carboplatinum and Taxotere) for ovarian cancer. You are seeing her for consultation in her home, where she lives alone and reports that she is having difficulty going up and down the stairs since her last chemotherapy infusion (10 days ago).
She feels unsteady on her feet, especially in the afternoon when she says she is too tired to get off of the sofa.

She used to walk to her mailbox at the end of the street every day to get the mail, but stopped after her first chemotherapy cycle as she felt less safe walking outside.
She has also given up her bridge group, which she used to play in twice weekly at her club.

Clinical Findings:

- Hgb 8.4 g/dL
- Platelets 145K
- White Blood Cells 0.75 10^9/L
- Resting heart rate 102, BP 105/70, O_2 sat 95%
- Height 5' 2", Weight 96 lbs
- Timed up and go test 24 seconds (age reference value: 9.2 sec)
- Self-reported pain 0-2/10 mostly in her knees when doing stairs
- Self-reported Fatigue 5-6/10 (VAS)

Upon assessment of her living conditions, you identify that she has moved all of her artifacts of interest (her knitting materials, her check book, a stack of magazines, the TV remote, several books, a deck of cards, her phone) into the living room surrounding her sofa. There are dishes piled in the sink which she notes she 'tries to get to on her good days'.

Questions for Discussion:
What cancer treatment-related impairments are you identifying?
Are there any red flags?
Indications and special considerations with exercise?
What would an exercise prescription look like?
What strategies might you try to encourage adherence to exercise?

Brief Case #3
Breast Cancer

Part 1
A 62 year-old post-menopausal woman completed chemotherapy and radiation therapy 18 months ago for Stage III ER/PR + breast cancer.
She has been on Anastrozole since completing radiation.
Her recent DEXA scan reveals a Z score drop of 2.5 SD and she is now osteoporotic. She is very upset as she has been walking 45 – 60 minutes most days in her neighborhood and is devastated that this has happened.

Clinical Findings:

- Pain 0-1/10 (VAS), Self-reported joint stiffness, generalized throughout shoulders, hips, and knees. Her walking program seems to alleviate the stiffness.
- BMI = 19.8
- Short Physical Performance Battery demonstrates minimal limitations
- 6 min walk test is within age-matched means

Questions for Discussion:
What does your assessment entail today?
Are there any red flags?
What would an exercise prescription look like?

Part 2
6 months later she returns, noting that she was doing well with the program until last week when she started having new pain symptoms in her left hip.
Pain is greater later in the day and standing or walking makes it worse. Pain symptoms at worst are 5-6/10.
She has stopped the rest of her exercises and is hopeful that there are some stretches or some advice that you can give her to help with these symptoms.

Questions for Discussion:
What are the differential diagnoses for her presentation?
What do you do for her continued exercise program?
Is medical referral indicated? To whom? And what test do you recommend?

Brief Case #4
Prostate Cancer

A 69 year-old man with stage II prostate cancer underwent a prostatectomy 6 months ago and has been on Lupron (a primary anti-androgen therapy) monthly.
A recent medical oncology exam reveals elevated prostate-specific antigen (PSA) levels. He is slated to start chemotherapy (Taxotere) in 2 weeks and will start Casodex (a secondary anti-androgen therapy).
Prior to being diagnosed with prostate cancer he was active, playing in a tennis league weekly and volunteering at the library helping with internet searches for patrons. Over the last 6 months he plays tennis less frequently but still keeps up with his volunteer work.

Clinical Findings:

- Clinically significant fatigue 5/10 (VAS)
- 6 minute walk test: 1 standard deviation below age-matched means
- Sensation: normal in distal upper and lower extremities
- Static balance deficits when visual input is limited
- Cognitive changes: minimal memory recall deficits with complex scenarios
- Lower extremity strength: 4-5/5 throughout
- DEXA reveals osteopenia, with reduced Z score (less than 0.5 SD) from his initial diagnosis
    - No evidence of metastatic disease

Questions for Discussion

- What baseline measures do you want to take today?
- What other cancer treatment-related information would you like to have prior to initiating a plan of care?
- What does your plan of care entail as far as exercise?
- How frequently will you see him?
- Are other referrals indicated?

Brief Case #5
Head and Neck Cancer

68 y/o man diagnosed with regionally advanced stage III head and neck cancer. He completed radiation therapy 7 days ago to the right lateral cervical, supraclavicular, chest wall, and right axillary regions. He developed cellulitis in his right arm and is 5 days into an antibiotic regimen. Over the course of the last 3 weeks he has experienced progressive weight loss, (>18 lbs in 3 weeks) he reports night sweats and worsening neck and mid back pain.

Clinical Findings:

- Elevated liver function tests
- Dressed open wound in the right axilla
- Radiation-related teleangectasia to the lateral cervical region
- Marked decrease in cervical ROM in all planes
- Self-reported fatigue 7-8/10, worse as the day progresses

Questions for Discussion

- What do you think is happening here?
- Are other referrals indicated?
- Is rehabilitation indicated?
- What assessment would you conduct today?
- What would an exercise program look like for him? Frequency? Intensity?
- What other information will inform your plan of care?

Brief Case #6
Hematological Cancer, post hematopoietic stem cell transplant (HSCT)

A 45 year-old man 9 months s/p HSCT due to acute lymphocytic leukemia. He is being tapered gradually from his immunosuppression drugs but remains on prednisone. He is very motivated to return to work as he and his brother own a construction company. He has tried to get back onto job sites for ½ days, but finds that his fatigue is limiting him from work. He is also noting that he has trouble following conversations at work, and difficulty keeping his attention focused in planning meetings. He is able to go into work in the morning until about 11/12:00 then has to come home. In the afternoon, he naps for 2-3 hours and says that he is sleeping 9 hours at night.

Clinical Findings:

- Hgb: 8.9
- Platelets: 145K
- Self-reported pain 0/10
- Self-reported fatigue, 4/10 in the morning and progressing to 6-7/10 in the afternoon
- Cognitive assessment reveals attention deficit and short-term memory lapses
- State-Trait Anxiety Inventory reveals high measures of anxiety about his cancer diagnosis and current situation

Questions for Discussion:

- What is the primary cancer treatment-related impairment?
- Are there any red flags?
- What type of exercise program is indicated base on these findings?
- How would you structure his exercise prescription? Timing? Dose? Frequency?
- Are other referrals indicated and if so, to whom?