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Treatment • Prevention • Research

Exercise, Rehabilitation & Function

Physical Activity Recommendations For Cancer Patients

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Cancer Rehabilitation Services
Swedish Cancer Institute

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Oncology Nursing Symposium
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Overview

- Physical activity recommendations for cancer patients
- Reduced functional health is common in cancer patients
- Exercise improves functional health during and after cancer treatment
- Rehabilitation may be necessary for safe independent exercise programming

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Forskning och utvärdering

Physical Activity Recommendations for Cancer Patients

- **2009: American College of Sports Medicine Roundtable on Exercise Guidelines for Cancer Survivors**

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Schmitz 2010
NCCN 2016
ACSM 2018

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Forskning och utvärdering

ACSM Expert Panel Physical Activity (PA) Exercise Recommendations

- **Adults aged 18 to 64 years**
 - ≥ 150 minutes per week of moderate intensity or
 - ≥ 75 minutes per week of vigorous intensity aerobic PA or
 - An equivalent combination of moderate & vigorous intensity PA
 - ≥ 10 minutes per session
 - ≥ 2 days per week of muscle strengthening – all major muscle
- **Adults > 64 years**
 - Follow above recommendations if possible
 - Encourage physical activity as able if functional health limited
- **All – avoid long periods of physical inactivity**

Schmitz 2010

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ACSM Expert Panel Objectives & Goals of Exercise Prescription

- **To regain and/or improve physical & physiologic function, aerobic capacity, strength and flexibility**
- **To improve:**
 - Body image & composition and QOL
 - Emotional, psychological & physiologic resilience
- **To reduce:**
 - ...attenuate or prevent treatment-related adverse effects
 - ...or potentially delay recurrence or a second primary cancer


Schmitz 2010


ACSM Expert Panel
Objectives & Goals of Exercise Prescription


BOTTOM LINE
Improve Functional Health & QOL




Schmitz 2010



ACSM Expert Panel
Objectives & Goals of Exercise Prescription

BOTTOM LINE
Improve Functional Health & QOL





Schmitz 2010



What is "Functional Health"?

Functional health is defined by:


- > What the person can do: Physical function, role function and social function
- > How the person feels: Bodily pain, vitality and mental health

Each person's functional health is determined by interactions across "doing" and "feeling" domains.

...and functional health status determines the person's ability to participate (or not) in everyday activities.





Ness 2006


Functional Health:
Sample "Doing" and "Feeling" Domains

- > ADLs
- > IADLs
- > Pain
- > Balance
- > Ambulation / Locomotion
- > HRQL
- > Fitness
- > Cognitive Functioning
- > Executive Functioning
- > Memory
- > Cancer-related distress
- > Well-Being

Modified from Granger et al 2010





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Reduced Functional Health is Common in Cancer Patients







Reduced Functional Health is Common in Cancer Patients

- > **Up to 20% of childhood onset and 53% of adult onset cancer survivors have impaired functional health**
 - Musculoskeletal, cardiopulmonary, integumentary, neurological and endocrine systems
- > **Greater than 60% of breast cancer survivors had one or more persistent adverse effects 6 years after treatment** (N=287)

Fatigue	Stiffness
Radiation fibrosis syndrome	Numbness/tingling
Axillary web syndrome	Reduced ROM
Weakness	Lymphedema
Pain	Weight gain

Stubblefield 2013
Schmitz 2012




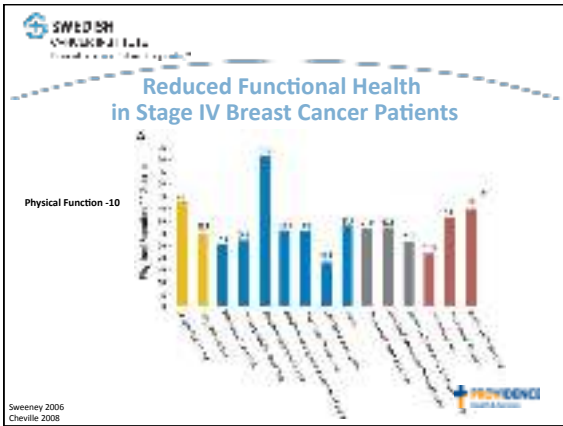


Reduced Functional Health is Common in Cancer Patients

- > **Significantly reduced functional health noted in elderly long-term women cancer survivors:**
 - Inability to do heavy housework (OR=1.47)
 - Unable to walk a half mile (OR=1.31)
 - Unable to walk up and down stairs (OR=1.34)
- > **~90% of community dwelling Stage IV breast cancer patients deemed eligible for rehabilitation interventions** (N=163)
 - Only 20% - 30% received rehabilitative interventions

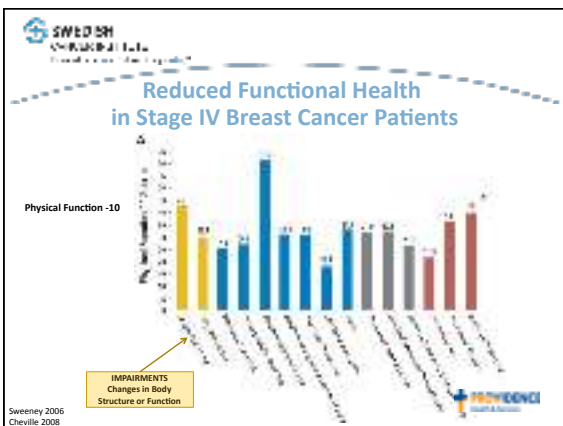
Sweeney 2006
Cheville 2008

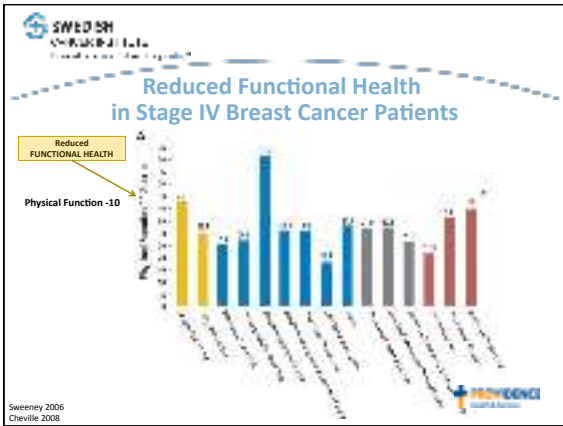




Item
Walking 100 meters in 10 minutes
Walking 100 meters in 15 minutes
Walking 100 meters in 20 minutes
Walking 100 meters in 25 minutes
Walking 100 meters in 30 minutes
Walking 100 meters in 35 minutes
Walking 100 meters in 40 minutes
Walking 100 meters in 45 minutes
Walking 100 meters in 50 minutes
Walking 100 meters in 55 minutes

Bohannon RW 2010





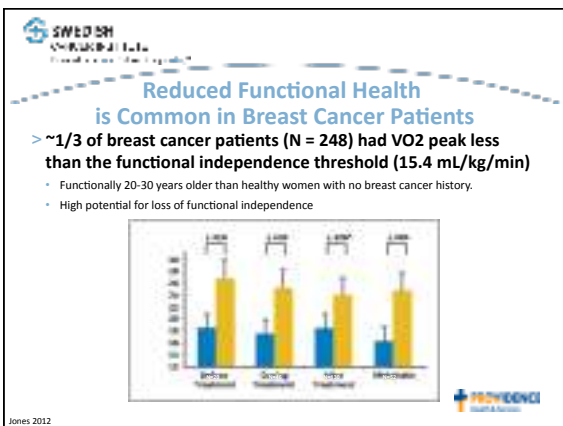
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 Healthcare Technology


Reduced Functional Health is Common in Breast Cancer Patients

> **Significant decrease in moderate-vigorous physical activity and sedentary activity 2 & 8 months post-breast cancer diagnosis ($P < 0.0001$)**

- **MVPA:** Household activities, running, jogging, aerobic dance, exercise class, tennis, climbing stairs, bicycle riding
- **Sedentary PA:** Attending group events, socializing, crafts, reading, playing games, watching TV

Kwan 2013







↓↓Functional Health
 Associated with↑↑Death Risk

- > Women are more likely to die from CVD than from breast cancer 9 years breast cancer post-treatment
- > Functional limitations in cancer survivors ≥ 60 years old associated with increased risk of death
 - Functional limitations:
 - Walking ¼ mile
 - Climbing 10 steps
 - Standing from armless chair
 - Stooping, crouching or kneeling
 - Carrying up to 10 pounds
 - Each limitation associated with significantly slower gait speed (P <0.001)
- > Each additional functional limitation associated with 19% increase in risk of death (P <0.001)

Kadamsa 2009
Brown 2016







↓↓Functional Health is
 Associated with↓↓QOL

- > Reduced functional health most important risk factor for depression in lung cancer patients in the palliative setting
 - Depression increased by 41% for each increment on a 5-point functional impairment scale
- > Higher negative impact of Cancer (IOC) scores 5-10 years post-treatment associated with:
 - Worse physical functioning (p<0.0001)
 - Worse mental health (p<0.0001)
 - Lower overall QOL (p<0.0001)
 - Functional health & QOL may influence or be influenced by both positive & negative perceptions of cancer impact

Hopwood et al 2000
Zebrack et al 2008






↓↓Functional Health is
 Associated with↓↓QOL

- > Poor performance status in ovarian cancer patients significantly related to:
 - Poorer QOL
 - Depression
 - Anxiety
 - 74% of participants had advanced disease
- > ...but poor performance status was **not** significantly related with social and well-being domains
 - Well-being and social engagement may be independent of functional health

Bodurka-Beyers 2000




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Functional Health Program

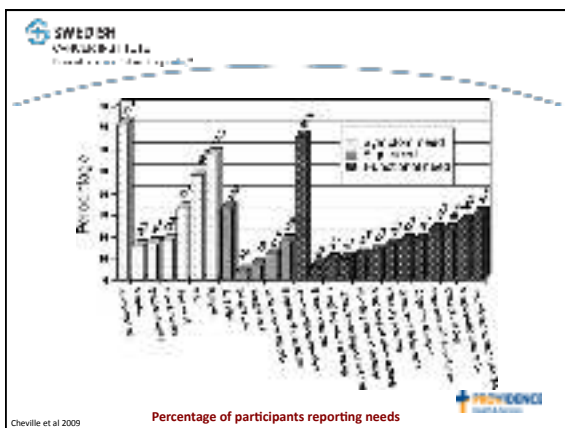
↓ Functional Health
Rarely Documented by Oncology Clinicians

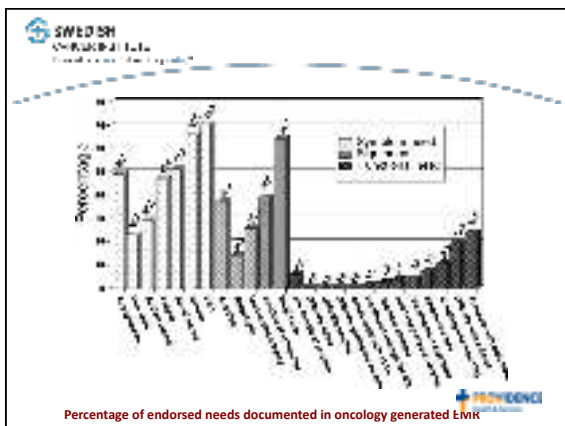
> Cancer patients completed a survey prior to an oncology visit and reported multiple symptom-, sign- or function-related needs (N=244)

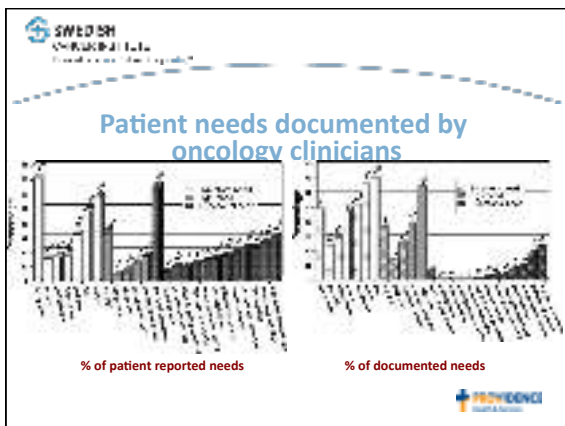
- 72% endorsed symptom-related needs
- 33% endorsed sign-related needs
- 66% endorsed function-related needs

Chevillat et al 2009












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Translating Research into Practice
- ↓ Functional Health
Common in the Outpatient Cancer Setting
- > Difficulty lifting, bending or getting in/out of bed
 - > Needs assistance with ADLs
 - > Insufficient strength for ADLs
 - > Cognitive changes
 - > Need support when walking
 - > Needs help standing from chair/toilet
 - > Speech changes
 - > Coughing when drinking
 - > Difficulty with balance
 - > Problems with ambulation
- PROVIDENCI**
Health & Science
- Chevillat 2009

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- SWEDISH**
ONCOLOGICAL CARE
Translating Research into Practice
- ### Cancer Patients May Benefit from Coordinated Oncology & Rehabilitative Care
- > ↓ Functional Health is:
 - Prevalent among outpatient cancer patients
 - Rarely documented by oncology clinicians
 - > Barriers to initiating rehabilitative care
 - Similar to patient reluctance to report pain?
 - Clinical demands in caring for cancer patients
 - Lack of easily available rehabilitation resources
 - > A more aggressive search for, and treatment of, functional health problems may be beneficial in the outpatient oncology setting
- PROVIDENCI**
Health & Science
- Chevillat 2009




Exercise ↑↑ Functional Health
During and After Cancer Treatment






Exercise ↑↑ Functional Health
During & After Cancer Treatment


- > **During treatment**
 - Positive impact on HRQOL including physical functioning, role functioning, social functioning and fatigue (Mishra 2012)
 - Aerobic fitness, upper and lower body strength, body weight (Speck 2010)
 - Functional quality of life, anxiety, and self esteem (Speck 2010)
 - Aerobic walking and aerobic cycling can reduce fatigue during treatment (Cramp 2012)
- > **After treatment**
 - Upper & lower body strength, physical activity levels, aerobic fitness, fatigue, symptoms and side effects (Speck RM 2010)
 - Overall quality of life, breast cancer concerns (Speck 2010)
- > **The NCCN's #1 recommendation for mitigating cancer related fatigue is exercise (Patnaik 2013)**





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Research Center for Exercise and Health

Association Between Exercise & Post-Traumatic Growth (PTG)

- > **Higher PTG scores for GCS noted for those meeting exercise guidelines compared to those who do not**
 - Higher PTG scores for meeting aerobic exercise guidelines alone as well as for meeting combined strength and aerobic exercise guidelines ($P < 0.001$, $p < 0.001$)
 - Resistance exercise alone was not associated with any aspects of PTG
 - Exercise is a modifiable lifestyle factor associated with post-traumatic growth (PTG) in gynecological cancer survivors

PROVIDENCI
Health & Science

Crawford 2015

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Rehabilitation May Be Necessary for Safe Independent Exercise Programming

PROVIDENCI
Health & Science

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Research Center for Exercise and Health

Rehab Intervention Need for Safe Independent Exercise

- > **Exercise studies exclude patients with significantly impaired functional health or co-morbidities**
- > **What about the cohort of patients *who do not meet inclusion criteria*?**
 - Only 21% - 42% of CRC survivors deemed able to participate in unsupervised exercise 6 months after treatment without further screening
 - Only 14% - 21% of EAC patients deemed able to exercise without supervision based on health status at diagnosis without further screening
- > **What is the middle way between creating barriers to independent exercise and putting survivors in harms way?**
 - Prescreening and triage to rehabilitation interventions as needed

PROVIDENCI
Health & Science

Brown 2014
Zhang 2014
Hayes 2012

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Rehab Intervention Needed for Safe Independent Exercise

CASE
 FF: 63-year-old white woman with a history of stage IV B cell lymphoma transformed to follicular lymphoma, completed 6 cycles of chemotherapy in spring 2014 and in complete remission. Autologous stem cell transplant pending.

Adverse treatment sequelae:

- Physical deconditioning. 90% of waking hours in sedentary activities. Did not meet national conditioning exercise guidelines prior to diagnosis.
- Severe cancer-related fatigue (8-9/10 average) aggravated by walking and suboptimal pacing
- Painful chemotherapy-induced peripheral neuropathy, motor and sensory components
- Bilateral lower extremity weakness. Unable to get up from floor without help or use of environmental objects
- Balance impairment. History of falling.

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Rehab Intervention Needed for Safe Independent Exercise

CASE
 FF: 63-year-old white woman with a history of stage IV B cell lymphoma transformed to follicular lymphoma, completed 6 cycles of chemotherapy in spring 2014 and in complete remission. Autologous stem cell transplant still pending.

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- Balance impairment. History of falling
- Follow up 2 years later – exercising independently – doing “Burpees” in CrossFit

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Common Cancer/Treatment Related Impairments

<ul style="list-style-type: none"> Neurological Cardiovascular Respiratory Endocrine Renal Immunological Hematological Psychological Genetic Reproductive Other 	<ul style="list-style-type: none"> Chemotherapy-induced peripheral neuropathy Cardiomyopathy Pulmonary toxicity Endocrine dysfunction Renal dysfunction Immunosuppression Hematologic abnormalities Psychological distress Genetic predisposition Reproductive toxicity Other
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 Health & Science


Gamble 2011



Clinical Challenges in Predicting Functional Health


- > Time since surgery, comorbidities, fatigue and depression predicted function better than type of treatment or stage (Campbell 2013)
- > Absolute number of impairments explained only 50% of variance in survivor & clinician functional health scores in Stage IV Br Ca patients (Cheville 2008)
- > Known risk factors for upper body impairment did not distinguish b/w Br Ca patients who did and did not develop impairments (Hayes 2012)
- > Function changes rapidly across disease trajectory; therefore, predicting rehabilitation needs is challenging (Stubbsfield 2013)






Next Steps in Developing Physical Activity Recommendations

- > National collaboration
 - AAPM&R
 - ACRM
 - ACS
 - Others...
- > Use of patient reported outcomes (PROs) and objective measures
- > Consider consensus based approaches to identifying best instruments for triage
 - ACS/NCI collaborative project completed, manuscript submitted






Suggestions for Oncology Nurses Recommending Physical Activity

- > Assess current functional health status
 - ONS Putting Evidence into Practice?
 - Gordon's Functional Health Patterns?
 - Or ???
- > Refer to rehabilitation providers as needed and available
 - Identify local physiatrists, PTs, OTs, Speech Therapists, Fitness Trainers, etc. trained in working with cancer patients
 - Advocate for additional rehabilitation resources if needed
- > Educate patients on exercise guidelines and energy conservation strategies

https://en.wikipedia.org/wiki/Gordon%27s_functional_health_patterns#Further_reading




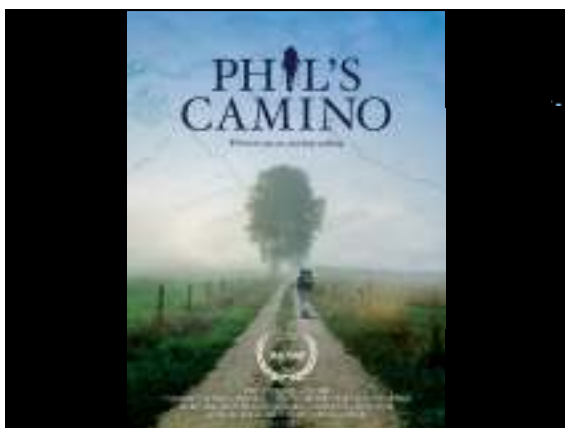
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- **Adults > 64 years**
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- **All – avoid long periods of physical inactivity**

Schmitz 2010





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