


COURAGE KENNY REHABILITATION INSTITUTE

# Exercise Across the Cancer Continuum


*Kelly Sturm, PT, DPT, CLT-LANA, OnCS*  
 Physical Therapist  
 Cancer Rehabilitation and Lymphedema Program Co-Chair  
 Courage Kenny Rehabilitation Institute – Allina Health  
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## Disclosures


- 2021-2022: Clinical Education Presenter/Speaker for Concordia University
- 2022: Clinical Education Presenter/On a Speakers Bureau for Airos Medical



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## Objectives


- 1 Introduce oncology-related functional impairments and side effects that can be addressed in cancer rehabilitation
- 2 List the goals of cancer rehabilitation throughout the cancer care continuum
- 3 Describe how exercise and physical activity affects individuals living with and beyond cancer
- 4 Identify the current recommended exercise guidelines for cancer survivors



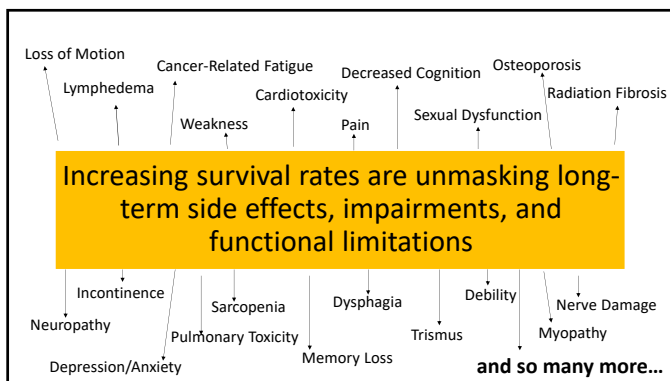
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## Current Cancer Statistics

- In 2022, there will be an estimated **1.9 million new cancer cases** diagnosed in the US (35,000 in MN) (Siegel, 2022)
- 5-year relative survival rate in all cancers is 63-68%, depending upon cancer type, ethnicity etc. (Siegel, 2022)
- More than **18 million** cancer survivors alive in the US today, and that number will grow to more than 20 million by 2026 (Miller, 2022)



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## Cancer Rehabilitation

Who can help address these functional impairments and limitations?

# Cancer Rehabilitation!

**Cancer rehabilitation** helps individuals with cancer obtain optimal physical, social, psychological, and vocational functioning within the limits created by cancer and its treatments (Stubblefield, 2019)



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### Common Impairments Addressed in Cancer Rehab

- Lymphedema
- Deconditioning, Debility, Weakness
- Balance (neuropathy, CNS)
- Eating (swallowing, chewing, oral motor)
- Communication
- Cancer-related fatigue
- Mild Cognitive Impairment (Chemo Brain)
- Musculoskeletal Pain
- Joint Stiffness or Loss of Range of Motion
- Scar Tissue and Radiation Fibrosis Syndrome
- Bowel or Bladder Dysfunction

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### Common Impairments Addressed in Cancer Rehab

Exercise and Physical Activity are supported in literature to have positive effects for individuals living with and beyond cancer on:

- Aerobic capacity (VO2)
- Physical function
- Muscular Strength
- Lymphedema
- Cancer-related fatigue
- Bone health
- Health-related quality of life
- Physical, emotional and functional well-being
- Depression and Anxiety
- Cancer mortality
- Pain
- Return to work and societal costs

(Stout, 2017) (Wallen, 2020) (Padilha, 2017) (McTiernan, 2019) (Campbell, 2019) (Li, 2015) (Mijwel, 2018)

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### The Cancer Rehabilitation Team

Currently at Courage Kenny Rehabilitation Institute, part of Allina Health, our Cancer Rehabilitation and Lymphedema Program is made up of:

- 4 MD/NP's at 5 locations across the metro
- 1 Nurse Care Navigator
- 90+ trained therapists (PT/OT/SLP) in 27 locations throughout the metro and regional hospitals
- Dedicated Scheduling team

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### The Need for Cancer Rehab

- >50% of cancer survivors have at least 1 physical impairment **6 years** after finishing cancer treatment (Stubblefield, 2013)
- **63%** of individuals diagnosed with cancer self-report a need for rehabilitation services, but **40% had this need unmet** (Thorsen, 2011)  
Highly correlated with employment status change and receiving chemotherapy
- **93%** of women with metastatic breast cancer have at least 1 physical impairment, but **less than 30% get help** to address it (Cheville, 2009)

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### The Need for Cancer Rehab

In one study, patients who were diagnosed with nonmetastatic breast cancer within the last year (mean=10.8 months) reported the following:

<p>92% reported <b>at least 3</b> long-term side effects (avg of 9.2 side effects)</p> <ul style="list-style-type: none"> <li>• Fatigue (90%)</li> <li>• Pain (66%)</li> <li>• Numbness and Tingling (54%)</li> <li>• Swelling in limbs (26%)</li> <li>• Difficulty Remembering Things (68%)</li> <li>• Pain with Intercourse (37%)</li> <li>• Aching Muscles (60%)</li> <li>• Problems with Urination (36%)</li> </ul>	<p>51% reported <b>at least 1</b> unmet need, but wanting intervention (avg of 2.6)</p> <ul style="list-style-type: none"> <li>• Fatigue (33%)</li> <li>• Pain (32%)</li> <li>• Numbness and Tingling (44%)</li> <li>• Swelling in limbs (39%)</li> <li>• Difficulty Remembering Things (26%)</li> <li>• Pain with Intercourse (28%)</li> <li>• Aching Muscles (41%)</li> <li>• Problems with Urination (43%)</li> </ul>
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(Palmer, 2016)

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### The Cancer Care Continuum

Where Cancer Rehabilitation Plays a Role

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### Before Treatment (Prehabilitation)

After diagnosis, before treatment(s) begin

**Before Treatment**

Goals of Cancer Rehabilitation:

- Address pre-existing impairments
- Improve physical health in order to safely complete treatment
- To establish a baseline to help prevent or minimize side effects

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### Exercise Before Treatment

Supervised exercise for 2-3 weeks, at a moderate intensity with strength and aerobic interventions has shown positive benefits in:

- [Lung Cancer](#) (Garcia, 2016) (Singh, 2013)
  - Reduction in hospital Length of stay; Improves pulmonary function; reduces rate of infection; improves tolerance to chemotherapy
- [Colorectal Cancer](#) (van Rooijen, 2019)
  - Reduces hospitalization and rate of readmission; Improved physical performance in older adults; Improves functional capacity
- [Gynecologic Cancers](#) (Singh, 2013)
  - Decreases incontinence; Improves cardiorespiratory fitness
- [Pancreatic Cancer](#) (Singh, 2013)
  - Reduces surgical complications; Accelerates recovery; Facilitate the delivery of other necessary cancer treatments

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### Exercise Before Treatment

- In a systematic review and meta-analysis (Palma, 2021),
  - Significant improvement of peak oxygen consumption (VO<sub>2</sub>peak) was achieved with high-intensity interval training (HIIT) compared to usual care
  - HIIT was safe, showing low risk of adverse events and positive effects on health-related outcomes in prehab settings
- Exercise can reduce surgical complications, accelerate recovery, and facilitate the delivery of other necessary cancer treatments. (Parker, 2019)
  - Example: is the patient a candidate for surgery based on physical condition?

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### During Treatment

In the same timeframe that treatment is ongoing

**During Treatment**

Goals of Cancer Rehabilitation:

- Address physical and functional impairments
- Minimize and prevent side effects and symptoms related to treatment
- To monitor for developing impairments
- Assist in tolerance of treatment

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### Exercise During Treatment

- **Exercise during treatment** positively impacts cancer-related fatigue, depression, anxiety, sleep, physical function, quality of life, immune function, and tolerance to chemotherapy (Stout, 2017)
- **Exercise during chemotherapy** has not only shown the benefits of reduced fatigue, improved strength, and less physical side effects, it has also shown to reduce societal costs associated with prolonged sick leave for patients, with a larger proportion returning to work (Mijwel, 2018)

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### Exercise During Treatment

- Supervised exercise is safe for this population with systematic reviews noting no adverse effects associated with blood counts or lymphedema (Stout, 2017)
- Current Exercise Recommendations:
  - Moderate-to-vigorous aerobic 3-5x/week (150 minutes/wk), with resistance exercise 2x/week (Stout et al, 2017)

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### Exercise During Treatment

- A well-known RCT, called the PACES trial (van Waart, 2015), compared:
  - low-intensity, home-based activity (OncoMove)
  - a moderate- to high-intensity, combined supervised resistance and aerobic exercise program (OnTrack)
  - usual care (UC)
 for patients undergoing adjuvant chemotherapy for breast cancer
- The participants were assessed before treatment, at the end of chemotherapy, and at the 6-month follow-up

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### Exercise During Treatment

Results of the PACES trial (van Waart, 2015) found:

- Onco-Move and OnTrack resulted in less decline in cardiorespiratory fitness ( $P < .001$ ), better physical functioning ( $P \leq .001$ ), less nausea and vomiting ( $P = .029$  and  $.031$ , respectively) and less pain ( $P = .003$  and  $.011$ , respectively) compared with UC.
- OnTrack had better outcomes for muscle strength ( $P = .002$ ) & physical fatigue ( $P < .001$ ) compared to UC.
- A smaller percentage of participants in OnTrack required chemotherapy dose adjustments than those in the UC or Onco-Move groups ( $P = .002$ ).
- Both intervention groups returned earlier ( $P = .012$ ), as well as for more hours per week ( $P = .014$ ), to work than the usual care/control

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### After Treatment

Immediately after treatment is completed

Goals of Cancer Rehabilitation:

- Restore function
- Reduce side effects and symptoms related to treatment
- Assist in returning to prior level of function or adapt to new levels

After Treatment

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### After Treatment

- Exercise and physical activity provide positive improvements following cancer treatment for the following (Fuller, 2018):
  - cardiovascular fitness
  - muscle strength
  - cancer-related fatigue
  - health-related quality of life
  - depression
- Upper and lower body strength, as well as physical function, improve the greatest amount after the completion of treatment (Stout, 2017)

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### Exercise After Treatment

- A meta-analysis (Li, 2016) found that cancer survivors who completed 15 MET hours/week of physical activity had a 27% lower risk of cancer mortality
  - The physical activity has more of an effect post-treatment compared to pre-treatment with the 15 MET hour/week decreasing the risk 35% post-treatment and 21% pre-treatment.

Cleaning the Home 3.3 METS	Gardening 3.5 METS	Walking 3.8 METS
Dancing 4.5 METS	Physical Activity & Exercise METABOLIC EQUIVALENTS	Playing with Kids 5 METS
Weightlifting 6.8 METS	Biking 8 METS	Running 10 METS

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### Long-Term Survivorship

2+ years after treatment is completed  
May be even decades later

Long-Term Survivorship

Goals of Cancer Rehabilitation:

- Restore function
- Reduce chronic side effects and symptoms related to treatment
- Minimize the progression of long-term side effects

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**Exercise in Long-Term Survivorship**

- In breast cancer survivors, cardiovascular disease is the second leading cause of morbidity and mortality. It is 2 times higher than that of the general population compared to age-matched individuals (Henry, 2018)
- The rates for cardiovascular disease exceeds breast cancer as the leading cause of death, 7 years after breast cancer diagnosis (Patnaik, 2011)
  - it's essential to have strategies to maintain cardiorespiratory fitness and function as early as possible to minimize myocardial damage long-term.
- VO2peak has been shown to decline between 5 and 26% during exposure to anthracycline regimens, and **many individuals do not fully recover to baseline after treatment** (Beaudry, 2019)

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**Exercise in Long-Term Survivorship**

- Androgen deprivation therapy (ADT) in prostate cancer survivors can lead to reduced muscle strength, loss of muscle mass and impaired function.
  - Early physical exercise programs have a major role in reversing or mitigating muscle and bone loss and improving physical function, as well as quality of life (Newton, 2020) (Menichetti, 2016)(Gardner, 2014)
- Pediatric cancer survivors are at a 10 times increased risk for developing significant chronic diseases, including obesity, hypertension, type 2 diabetes mellitus, and secondary malignancies (Nathan, 2008)
  - Healthy lifestyle interventions for cancer survivors that incorporate regular physical activity may reduce the risk of late effects and comorbidities (Brunet, 2018)

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**Exercise in Long-Term Survivorship**

- In an article published recently in JAMA Oncology (Cao, 2022) on cancer survivors found:
  - Being physically active was associated with lower risks of all-cause and cancer-specific mortality compared with inactivity.
  - Sitting more than 8 hours a day was associated with higher risks of all-cause and cancer-specific mortality compared with those sitting less than 4 hours a day.
- Lower physical activity is a predictor of distress in breast cancer survivors, leading to lower quality of life (Syrowatka, 2017)
- Regular exercise may significantly reduce the risk of recurrence in cancer survivors (Morishita, 2020)

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**Exercise in Long-Term Survivorship**

- The 2018 roundtable, published in 2019 (Campbell, 2019) recommends exercise for overall health in cancer survivors as:

**Moderate intensity aerobic training at least 3 times per week, for at least 30 minutes**

+

**Resistance training at least 2 times per week, using at least 2 sets of 8–15 repetitions**

- Cancer Rehabilitation, done in a supervised setting can help create and build an individualized program, which can then be done independently, if cleared

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**Hospice/End of Life**

While in hospice or nearing end of life

Hospice/  
End of Life

Goals of Cancer Rehabilitation:

- Physical function symptom management
  - Example: transfer training, assistive device training
- Promote quality of life and independence
- Patient/caregiver/family education and training
  - Example: bandaging for lymphedema

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**Hospice/End of Life**

- If supervised, exercise may have a beneficial role in improving functional capacity in patients with advanced cancer (Avancini, 2022)
- Exercise is an effective intervention for those with advanced cancer to improve (Chen, 2020):
  - Physical Function
  - Social Function
  - Fatigue
  - Dyspnea
  - Insomnia
  - Quality of Life

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### Hospice/End of Life

- Another systematic review (Dittus, 2017) concluded that interventions which included exercise resulted in improvements in:
  - Aerobic capacity
  - Strength
  - Physical Function
  - Fatigue
    - 45% of participants reported improvement
  - Quality of life
    - 60% of participants reported improvement
- Exercise and physical activity interventions are consistently modified for patient safety and changes in medical status. The focus remains around the patient's goals and overall well-being

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### Cancer Rehab and Exercise Across the Cancer Continuum

- A goal of the oncology healthcare team is to provide high-quality, whole-person care. Exercise and physical activity are healthy ways to help address cancer's impact on overall physical, mental, emotional, and societal wellness.

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To Contact Me

**Thank You!**

Kelly Sturm, PT, DPT, OnCS, CLT-LANA  
[Kelly.Sturm@allina.com](mailto:Kelly.Sturm@allina.com)

For referrals or info to the CKRI Cancer Rehab and Lymphedema Program:  
 Scheduling: 612-863-2123  
 208839: AMB Consult to Cancer Rehabilitation MD/NP  
 208840: AMB Consult to Cancer Rehab Therapies

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