

REVITAL CANCER REHABILITATION

Get Loud: The Power of Cancer Rehabilitation & Why it Matters

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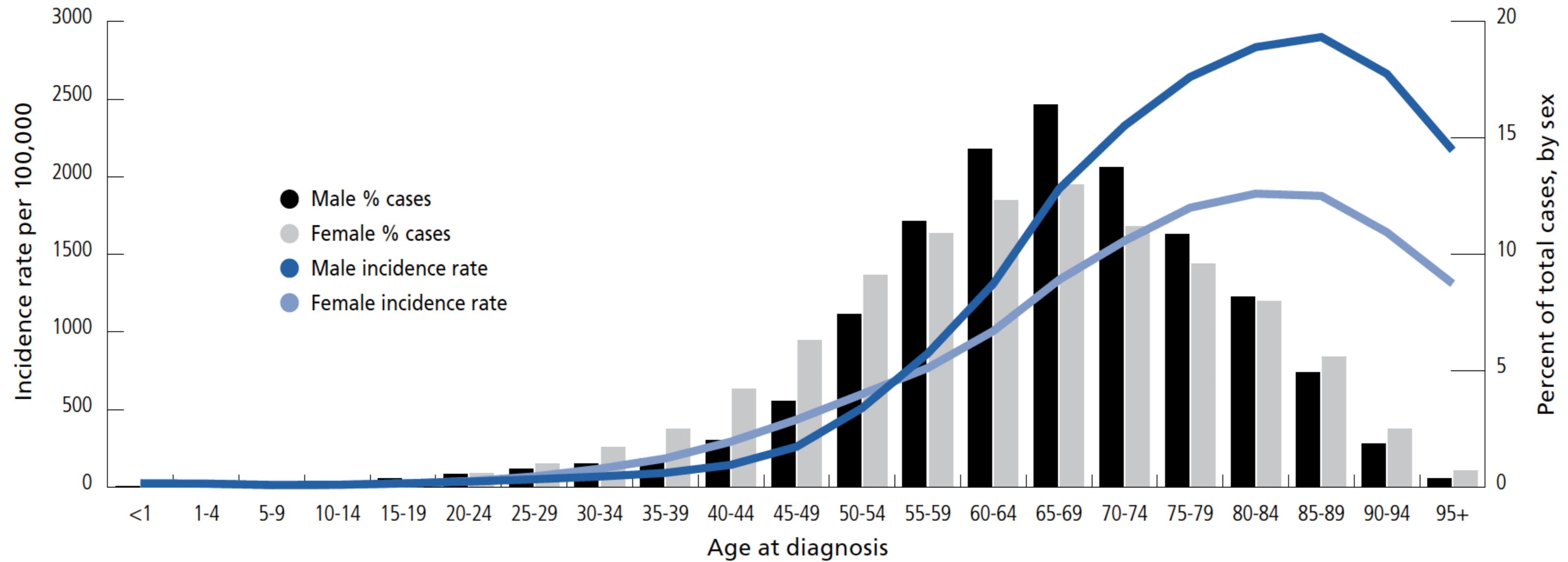
Disclosures

Dr. Pergolotti and Hillary Hinrichs receive salaries from Select Medical.

The Unmet Needs: Cancer Rehabilitation

A Rise in Survivorship

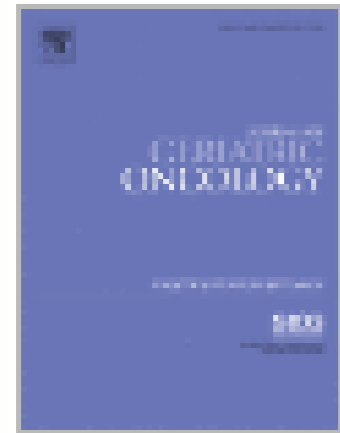
Figure S2. Average Annual Incidence Rates and Case Distribution by Age, US, 2011-2015



Sources: Surveillance, Epidemiology, and End Results (SEER) program, 18 SEER registries, custom data (2000-2015).

©2019, American Cancer Society, Inc., Surveillance Research

Acute, Late & Lasting Treatment Effects



Review article
Patient- and tumor-related predictors of chemotherapy intolerance in older patients with cancer: A systematic review
 Doris L. van Abbema^{a, b, 1}, Marjan van den Akker^{c, d}, Maryska L. Janssen-Heijnen^{e, f}, Franchette van den Berkmortel^g, Ann Hoeben^h, Judith de Vos-Geelenⁱ, Frank Buntinx^{c, d}, Jos Kleijnen^j, Vivianne C.G. Tjan-Heijnen^a

The Who, What, Why, When, Where, and How of Team-Based Interdisciplinary Cancer Rehabilitation
 Vishwa S. Raj, MD^{a, b, *}, Terrence M. Pugh, MD^{a, b}, Susan I. Yaguda, MSN, RN^b, Charles H. Mitchell, DO^{a, b}, Sarah S. Mullan, MS, OTR/L^b, Natalie S. Garces, BSN, RN^b
^a Department of Physical Medicine & Rehabilitation, Carolinas Rehabilitation, Charlotte, NC
^b Department of Supportive Care, Levine Cancer Institute, Charlotte, NC

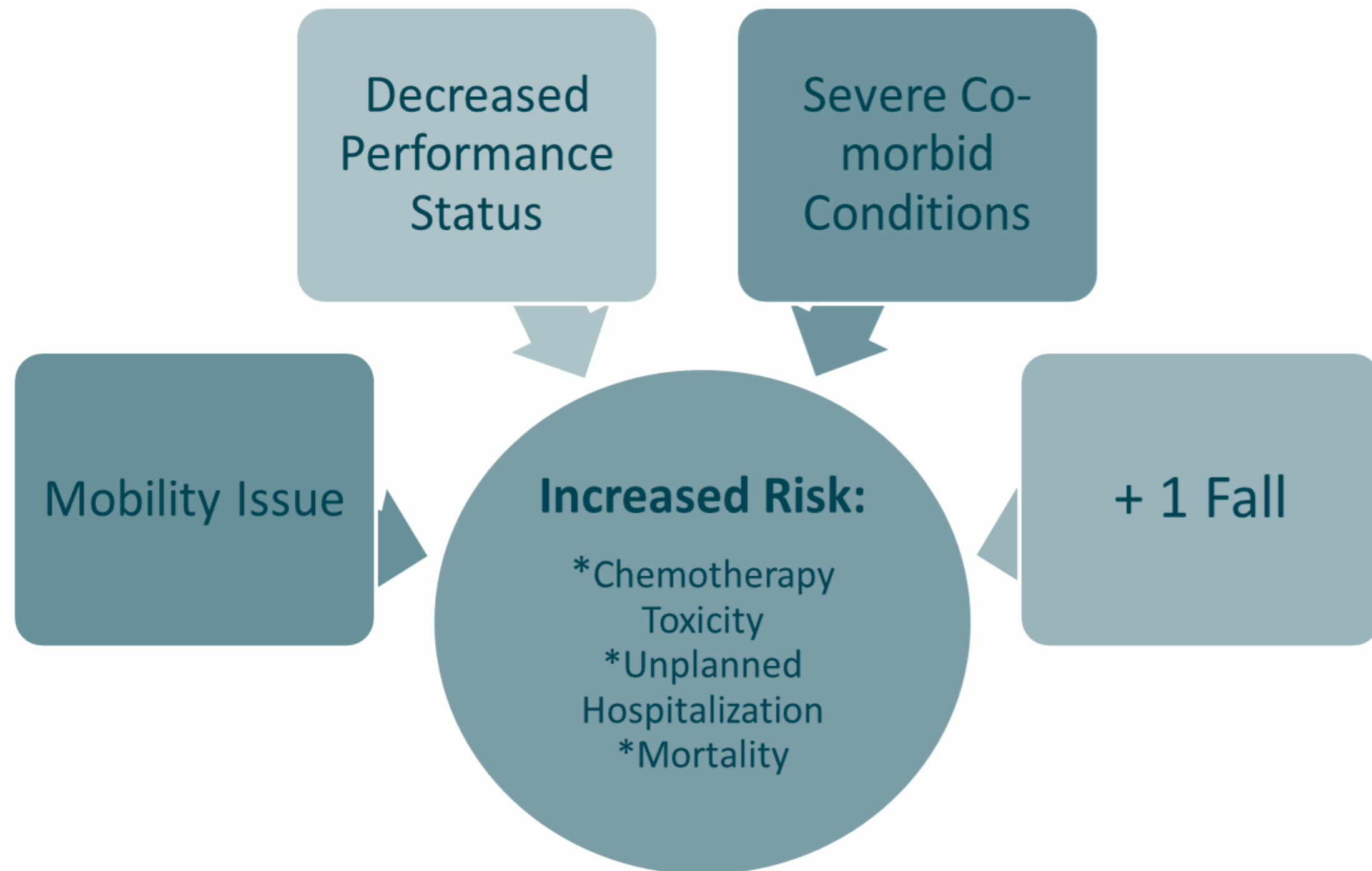


Table 2
 Complications from cancer and its treatment

Complication	Cancer and Treatment-Related Sources
Amputation	Sarcoma
Deconditioning	All cancers, chemotherapy, radiation, surgery
Gait disorders	Chemotherapy-induced peripheral neuropathy, surgery
Lymphedema	Breast, gynecological, prostate cancer, lymph node dissection
Muscle spasm	Chemotherapy-induced peripheral neuropathy, radiation fibrosis, surgery
Myelopathy	Radiation, pathological fracture of the vertebrae
Myopathy	Chemotherapy, steroids
Neuropathy	Chemotherapy
Pain	All cancers, chemotherapy, radiation, surgery
Plexopathy	Radiation therapy; tumor invasion
Radiculopathy	Chemotherapy, pathological fracture of the vertebrae
Shoulder dysfunction	Radiation, surgery
Spasticity	Chemotherapy-induced peripheral neuropathy
Weakness	All cancers, chemotherapy, radiation, surgery


Activities of Daily Living

Disability in activities of daily living among adults with cancer: A systematic review and meta-analysis


Josephine Neo ^{a,b,*}, Lucy Fettes ^b, Wei Gao ^b, Irene J. Higginson ^b, Matthew Maddocks ^{b,*}

^a Tan Tock Seng Hospital, 11 Jalan Tan Tock Seng, 308433, Singapore
^b Cicely Saunders Institute of Palliative Care, Policy and Rehabilitation, King's College London, Denmark Hill, London SE5 9PJ, United Kingdom

33%
difficulty with activities of daily living



50%
difficult with instrumental activities of daily living



Long-term Physical Function

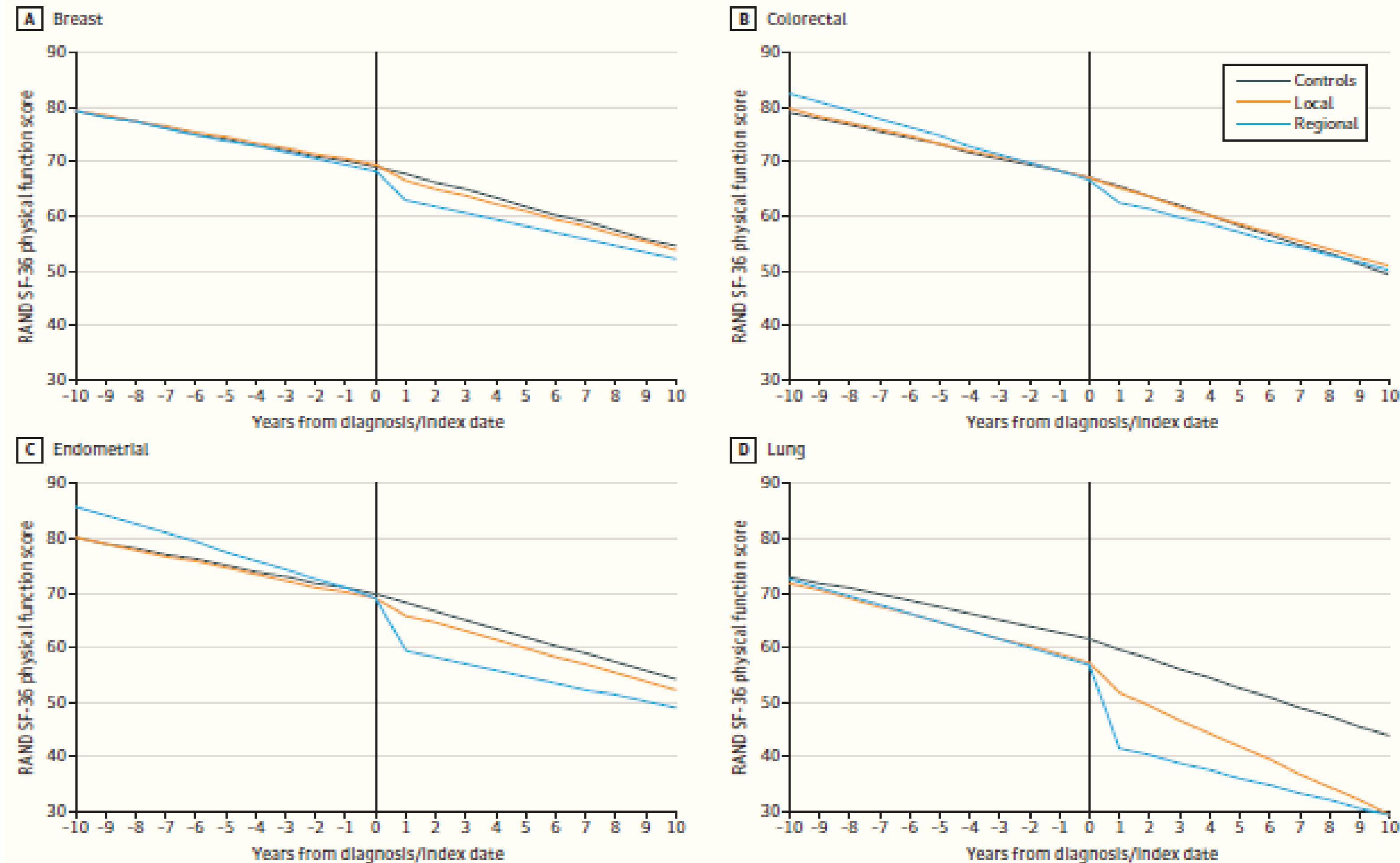
compared to non-cancer controls

JAMA Oncology | Original Investigation

Long-term Trajectories of Physical Function Decline in Women With and Without Cancer

Elizabeth M. Cespedes Feliciano, ScD, SM; Sowmya Vasan, MS; Juhua Luo, PhD; Alexandra M. Binder, ScD; Rowan T. Chlebowski, MD, PhD; Charles Quesenberry, PhD; Hailey R. Banack, PhD; Bette J. Caan, DrPH; Electra D. Paskett, PhD; Grant R. Williams, MD, MSPH; Ana Barac, MD, PhD; Andrea Z. Lacroix, PhD; Ulrike Peters, PhD; Kerry W. Reding, PhD, MPH; Kathy Pan, MD; Aladdin H. Shadyab, PhD, MS, MPH; Lihong Qi, PhD; Garnet L. Anderson, PhD

Figure. Long-term Trajectories of Physical Function From Prediagnosis to Postdiagnosis in Women With Cancer and Cancer-Free Controls by Cancer Type and Stage



Feliciano, E. M. C., Vasan, S., Luo, J., Binder, A. M., Rowan, S. ; Chlebowski, T., Quesenberry, C., Banack, H. R., Caan, B. J., Paskett, E. D., Williams, G. R., Barac, A., Lacroix, A. Z., Peters, U., Kerry, ; Reding, W., Pan, K., Shadyab, A. H., Qi, L., ... California, N. (2023). Long-term Trajectories of Physical Function Decline in Women With and Without Cancer. JAMA Oncology. <https://doi.org/10.1001/JAMAONCOL.2022.6881>



Cancer Survivors @ Higher Risk for Falls

Motor performance in survivors:

- Slower walking speed
- Shorter stride length
- Longer stride time
- Longer double support time
- Higher concern for falling

Risk factors for cancer survivors:

- Dependence in ADL
- Prior falls
- Poor physical function
- Poor cognitive function
- Sensory impairment
- Urinary incontinence

Health-related Quality of Life (HRQOL)



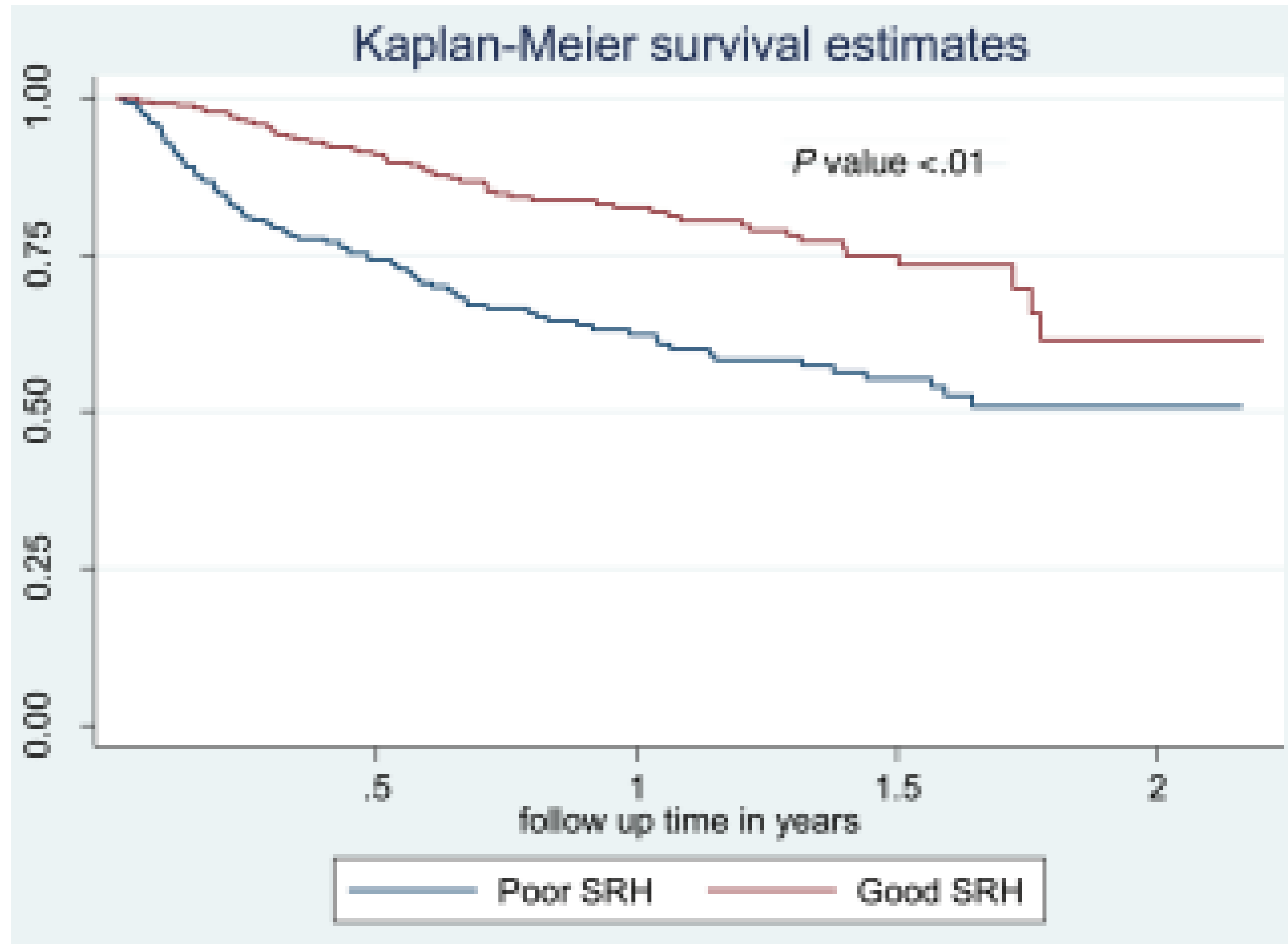
RESEARCH ARTICLES | NOVEMBER 06 2012
Mental and Physical Health-Related Quality of Life among U.S. Cancer Survivors: Population Estimates from the 2010 National Health Interview Survey ✓
Kathryn E. Weaver ✉; Laura P. Forsythe; Bryce B. Reeve; Catherine M. Alfano; Juan L. Rodriguez; Susan A. Sabatino; Nikki A. Hawkins; Julia H. Rowland

% REPORTING POOR PHYSICAL & MENTAL HRQOL

25% & 10%
cancer survivors

10% & 6%
without cancer

Relationship of HRQOL with Poor Survival



JOURNAL ARTICLE

Use of Single-Item Self-Rated Health Measure to Identify Frailty and Geriatric Assessment-Identified Impairments Among Older Adults with Cancer [🔗](#)

Smith Giri ✉, Nabil Mir, Mustafa Al-Obaidi, Deanna Clark, Kelly M Kenzik, Andrew McDonald, Crystal Young-Smith, Ravi Paluri, Lakshmin Nandagopal, Olumide Gbolahan ... [Show more](#)

Figure 2. Kaplan–Meier curve showing the comparison of survival distribution between patients with good or poor SRH. When compared with patients with good SRH, those reporting poor SRH had a significantly worse survival (1-year OS 62.4% vs 82.6%, log-rank P -value $<.001$).

Pain Increases Likelihood: Adverse Employment & Financial Outcomes

TABLE 3. Association Between Pain Category and Employment Outcomes (OR and 95% CI)^a

Study Employment Outcomes	Mild Pain			Moderate Pain			Severe Pain		
	OR	Upper CI	Lower CI	OR	Upper CI	Lower CI	OR	Upper CI	Lower CI
Took paid time off from work	1.588	2.723	0.926	1.016	1.780	0.580	1.576	3.277	0.758
Change to part-time or less demanding job	0.796	0.487	1.302	2.200	3.518	1.376	3.318	5.143	2.141
Don't pursue promotion	0.620	0.291	1.318	2.699	5.692	1.279	2.250	4.785	1.058
Retire early	3.695	8.397	1.626	10.489	25.796	4.265	15.577	35.986	6.743
Feel less productive	1.492	2.439	0.913	3.561	6.189	2.050	4.383	8.001	2.401
Stay at job to keep insurance	1.190	1.960	0.722	2.462	4.519	1.341	1.916	3.407	1.078

NOTE. ORs significant at $P < .05$ are in bold.

Abbreviation: OR, odds ratio.

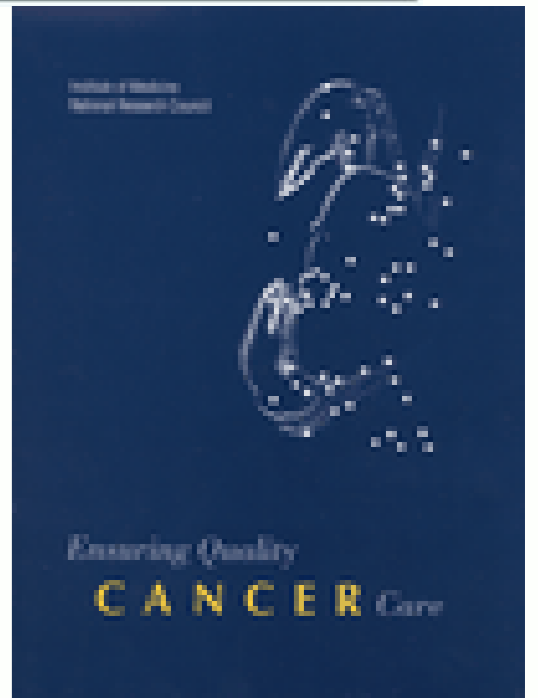
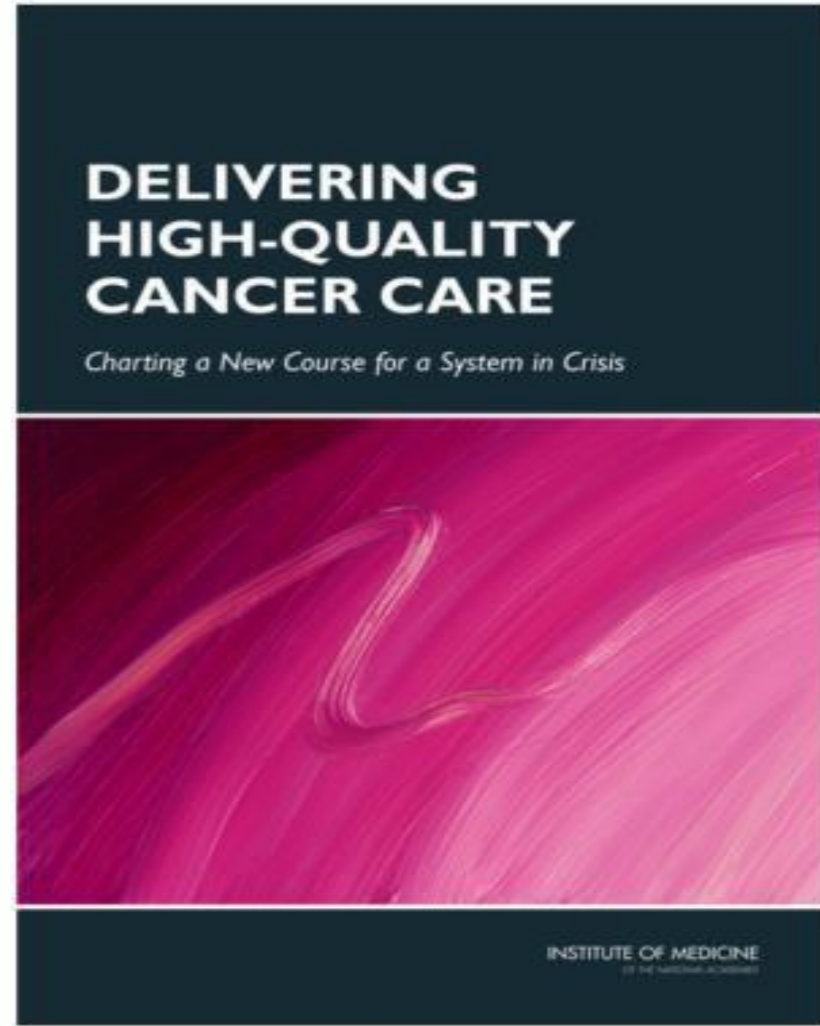
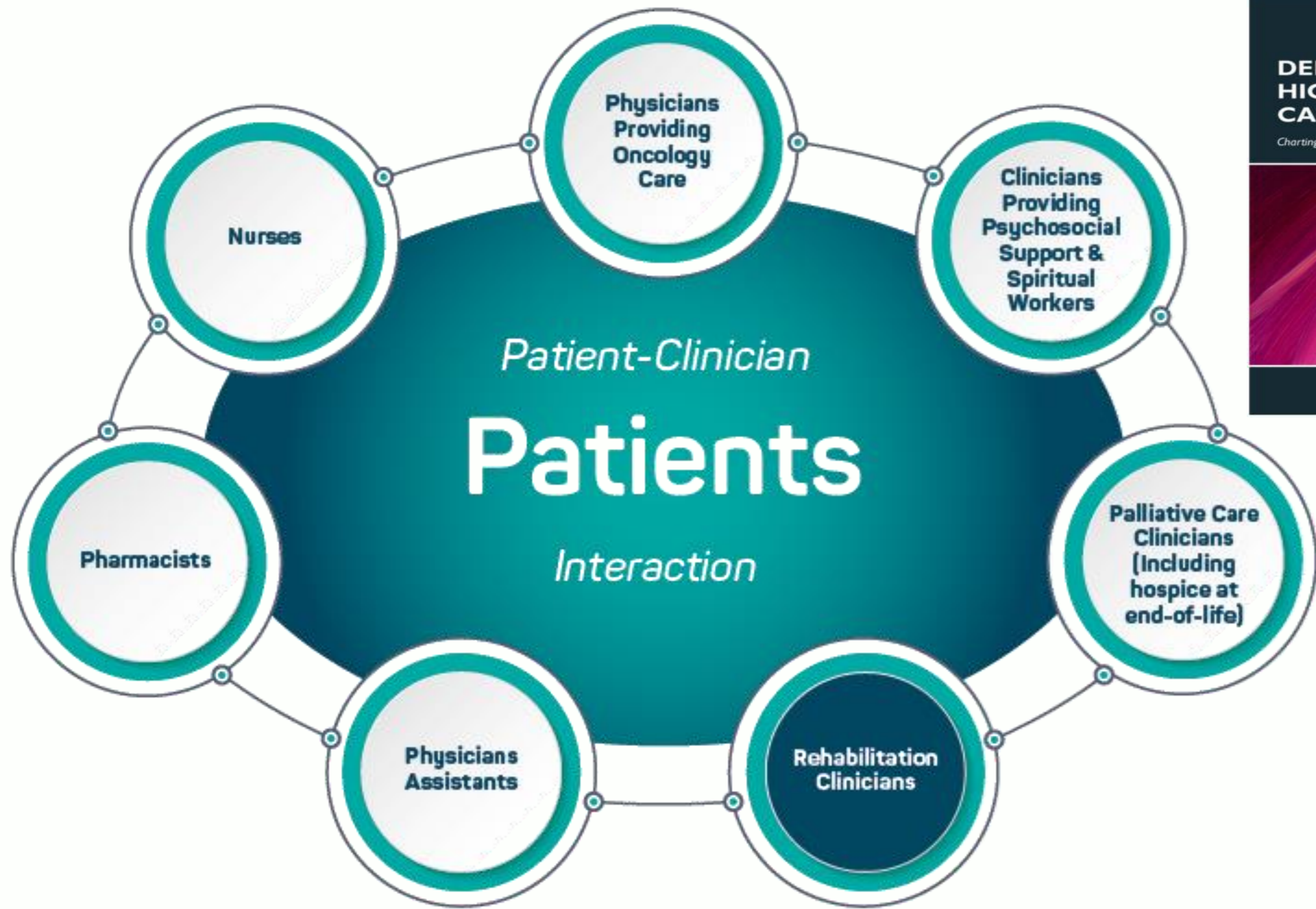
^aResults from multivariable logistic regression analyses (compared with those reporting no pain) controlled for sex, race or ethnicity, age, education (any college v no college), primary cancer site, multiple cancer sites involved, time since last cancer treatment, insurance during prior 12 months, and physician visits during prior 12 months. Questions on employment outcomes were answered only by respondents who indicated that they had worked for pay at a job or business at or following their first cancer diagnosis.

Survivors Health Values & Cancer Treatment Goals

- **Self-sufficiency**
- **Life enjoyment**
- **Connectedness and legacy**
- **Balancing quality and length of life**
- **Engagement in care**

A Potential Solution: Cancer Rehabilitation

Role of Cancer Rehabilitation Clinicians in Team



Institute of Medicine [IOM], 2013

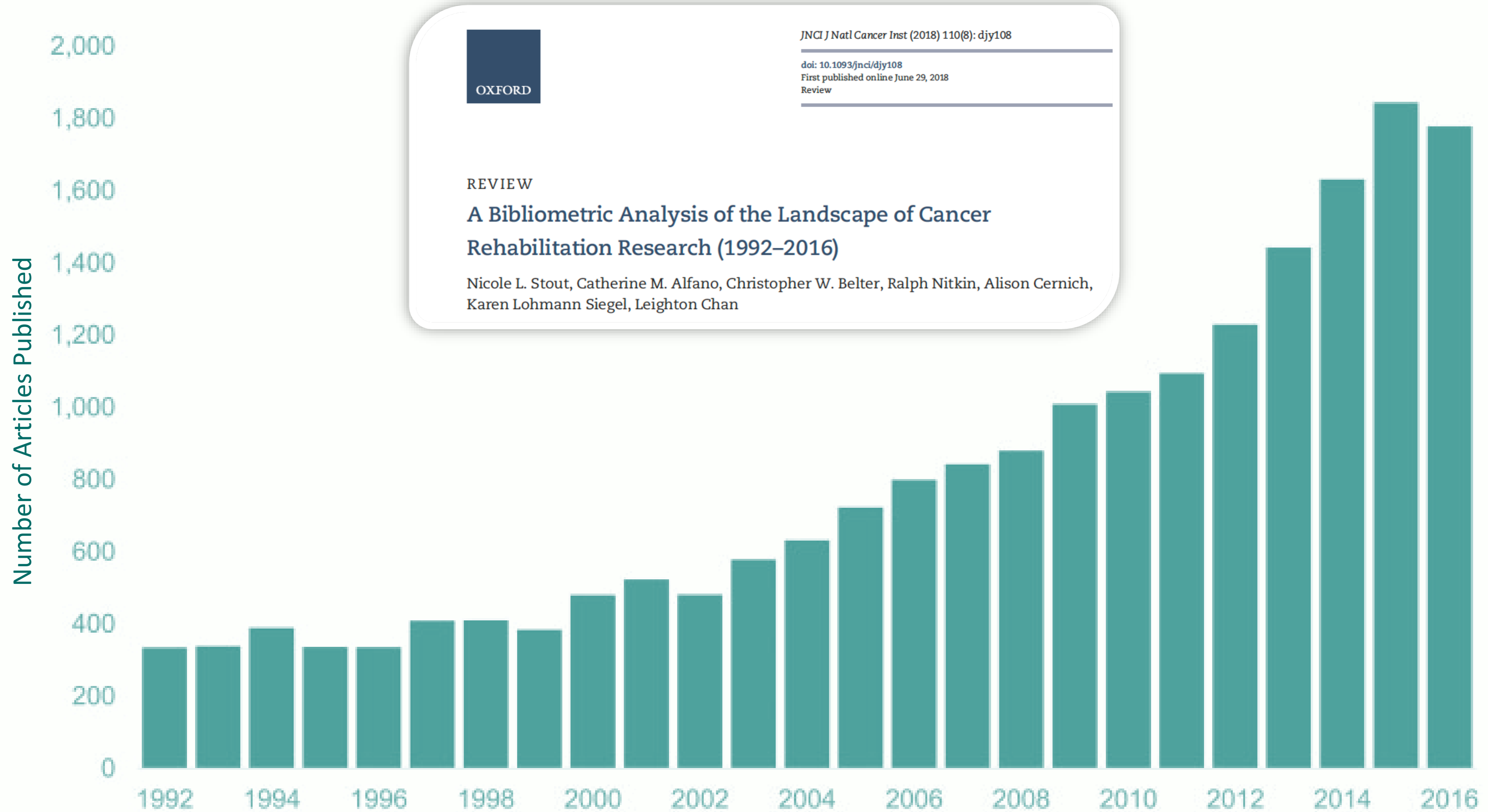
Cancer Rehabilitation



Goal → *Living well beyond cancer™*

Cancer Rehabilitation: The Evidence

Cancer Rehabilitation Research Exploding



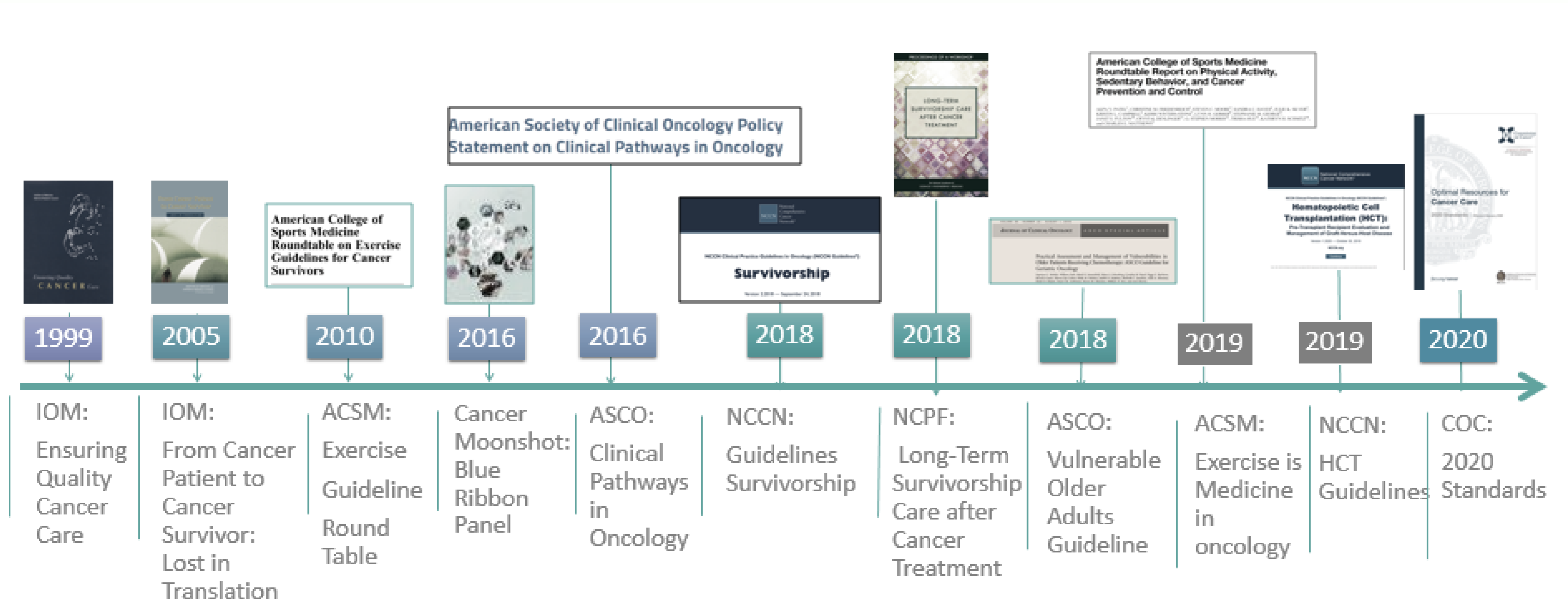
OXFORD

JNCI J Natl Cancer Inst (2018) 110(8): d jy108
doi: 10.1093/jnci/djy108
First published online June 29, 2018
Review

REVIEW
A Bibliometric Analysis of the Landscape of Cancer Rehabilitation Research (1992–2016)
Nicole L. Stout, Catherine M. Alfano, Christopher W. Belter, Ralph Nitkin, Alison Cernich, Karen Lohmann Siegel, Leighton Chan

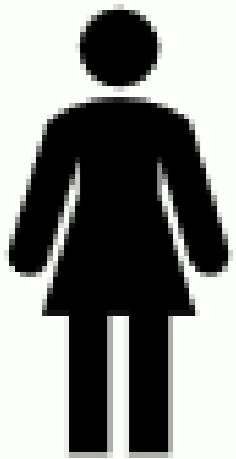
Cancer Rehabilitation: Guidelines

Growth Over Time



GYNECOLOGIC CANCER-RELATED FUNCTIONAL DISABILITY

Population & methods



84

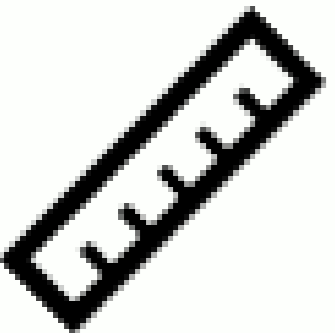
Women with history of gynecologic cancers; grouped by evaluation complexity (high/mod/low)



Attended

~13

PT/OT sessions (median)



- **17** patient reported outcomes (PRO)
- Net promoter score (NPS)

* Collected as standard of care, evaluated retrospectively

Key findings

PROs

- ✓ 4 PROs: significant improvement ($p < .05$)
 - Lower Extremity Functional Scale (LEFS)
 - Modified Fatigue Impact Scale (MFIS)
 - Patient-Specific Functional Scale (PSFS)
 - Lymphedema Life Impact Scale (LLIS)
- ✓ 53-61% of patients with high/mod complexity achieved clinically significant improvement

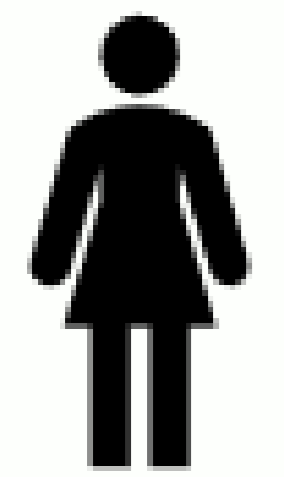
NPS

- ✓ High satisfaction
- ✓ 10/10 median score

CONCLUSION:
ReVital PT/OT improves PRO and is satisfactory for women with gynecologic cancer.

BREAST CANCER-RELATED UPPER EXTREMITY DISABILITY

Population & methods



417
breast cancer survivors with upper-extremity disability

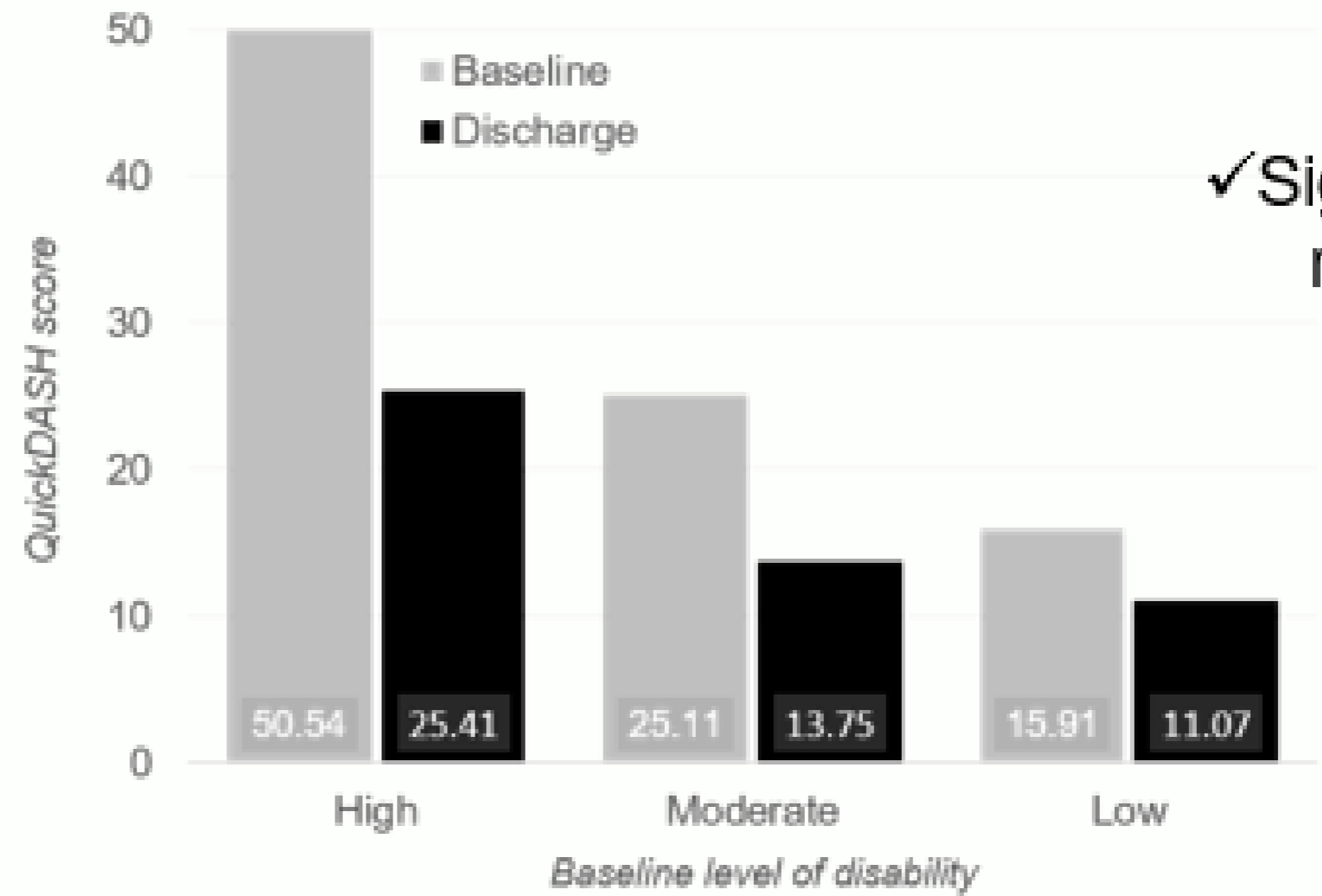


Attended
~10
PT/OT sessions (median)



- QuickDASH
 - Net promoter score (NPS)
- * Collected as standard of care, evaluated retrospectively

Key findings



QuickDASH
✓ Significant improvement regardless of disability level (p<.05)

NPS
✓ High satisfaction
✓ 10/10 median score


















CONCLUSION:
ReVital PT/OT improves upper extremity disability and is satisfactory for people with breast cancer.

RCT: Effectiveness and cost-benefit of physical therapy for women post breast cancer surgery

(Bruce et. al., 2022)

Exercise to prevent shoulder problems after breast cancer surgery: the PROSPER RCT

This trial found an early structured exercise programme improved upper limb function at 1 year in those at risk of shoulder problems after breast cancer surgery.

[Julie Bruce](#) , [Bruno Mazuquin](#) , [Pankaj Mistry](#) , [Sophie Rees](#) , [Alastair Canaway](#) , [Anower Hossain](#) , [Esther Williamson](#) , [Emma J Padfield](#) , [Ranjit Lall](#) , [Helen Richmond](#) , [Loraine Chowdhury](#) , [Clare Lait](#) , [Stavros Petrou](#) , [Katie Booth](#) , [Sarah E Lamb](#) , [Raghavan Vidya](#)  & [Alastair M Thompson](#) .

Clinical Trials Update

April 26, 2022

Exercise Improves Shoulder Function After Breast Cancer Surgery

Anita Slomski

JAMA. 2022;327(16):1539. doi:10.1001/jama.2022.6209

Two-arm, Pragmatic Randomized Control Trial

- PT – led program versus usual care
- Intervention:
 - Developed with patient input
 - 3-6 sessions

392 women with breast cancer

- Inclusion criteria: women with planned axillary node clearance, radiation or existing shoulder issues

Results

Compared to usual care:

- ↑ Shoulder function
- ↑ Health-related QOL
- ↑ Confidence returning to regular activities
- ↓ Pain
- ↓ Cost

HRQOL Improvement in Women with Breast Cancer

Journal of Clinical Oncology[®]

An American Society of Clinical Oncology Journal

Meeting Abstract | 2023 ASCO Annual Meeting I

HEALTH SERVICES RESEARCH AND QUALITY IMPROVEMENT

The broader impact of specialized outpatient cancer rehabilitation on health and quality of life among breast cancer survivors.



[Mackenzi Pergolotti](#), [Kelley C Wood](#), [Tiffany Kendig](#)

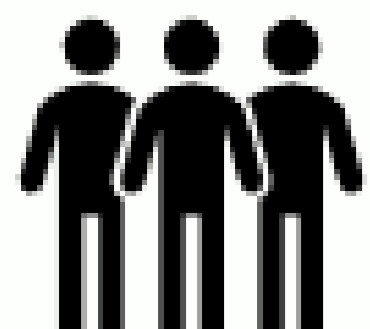
In 2,706 BCS who attended PT/OT we found..

- ✓ Prevalence of common treatment-related rehab needs
 - muscle atrophy, weakness or ataxia
 - lymphedema
 - upper extremity impairment
 - pain
 - scar tissue or fibrosis

- ✓ Significant improvement in PROMIS[®] outcomes at discharge for PT & OT ($p < .001$)
 - Physical health
 - Mental health
 - Physical function
 - Ability to participate and social roles & activities

HEALTH RELATED QUALITY OF LIFE & FUNCTION BY TREATMENT STATUS

Population & methods



115

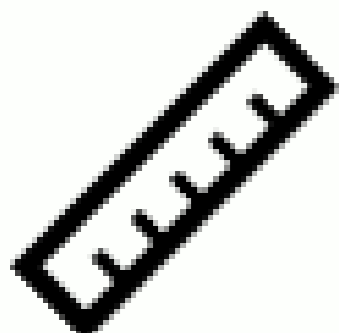
Adults who attended outpatient cancer rehab



Attended

~9

PT/OT sessions (median)



- PROMIS health related quality of life (HRQOL)
- PROMIS physical function
- PROMIS Social roles and activities
- Handgrip strength
- Timed up and go

* Collected as standard of care, evaluated retrospectively

Key findings

Significant improvement (p<.05)

- ✓ PROMIS physical health
- ✓ PROMIS social roles & ability
- ✓ Handgrip strength
- ✓ Timed up and go

No difference in the effect of rehab due to treatment status (p>.05)

CONCLUSION:

ReVital PT/OT improves HRQOL and functioning independent of treatment status.

Growing Evidence Across Disease Types

Systematic Reviews

The influence of telehealth-based cancer rehabilitation interventions on disability: a systematic review

Rachelle Brick¹  · Lynne Padgett² · Jennifer Jones³ · Kelley Covington Wood⁴ · Mackenzi Pergolotti⁴ · Timothy F. Marshall⁵ · Grace Campbell^{6,7} · Rachel Eilers⁸ · Sareh Keshavarzi^{9,10} · Ann Marie Flores^{11,12,13} · Julie K. Silver^{14,15,16,17} · Aneesha Virani¹⁸ · Alicia A. Livinski¹⁹ · Mohammed Faizan Ahmed³ · Tiffany Kendig⁴ · Bismah Khalid²⁰ · Jeremy Barnett²¹ · Anita Borhani³ · Graysen Bernard³ · Kathleen Doyle Lyons²²

- 71% of studies reported statistically significant results after cancer rehabilitation intervention(s) for at least 1 functional outcome
- Impact on physical functioning
- Impact on fatigue
- Statistically significant improvement from initial evaluation to discharge



ACRM
AMERICAN CONGRESS OF
REHABILITATION MEDICINE

Archives of Physical Medicine and Rehabilitation
Journal homepage: www.archives-pmr.org
Archives of Physical Medicine and Rehabilitation 2022;103:1807–26

REVIEW ARTICLE (META-ANALYSIS)

Systematic Review of Functional Outcomes in Cancer Rehabilitation

Alix Sleight, PhD, OTD, MPH, OTR/L,^{a,b,c,d} Lynn H. Gerber, MD,^{e,f}
Timothy F. Marshall, PhD, MS,^g Alicia Livinski, MA, MPH,^h Catherine M. Alfano, PhD,
Shana Harrington, PT, PhD,ⁱ Ann Marie Flores, PT, MSPT, MA, PhD,^{m,n}
Aneesha Virani, PhD, CCC, SLP,^o Yingsong Hu, MD, PhD,^{p,q} Gordon A. Mitchell, PhD, CPA,^r

Understanding Patient Experience with Outpatient Cancer Rehabilitation Care



Wood et al. 2023

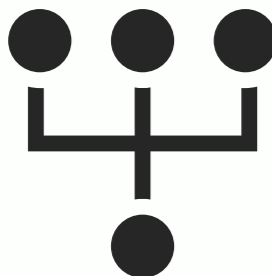
Methods & Population



Patients attended outpatient cancer rehab (N=383)



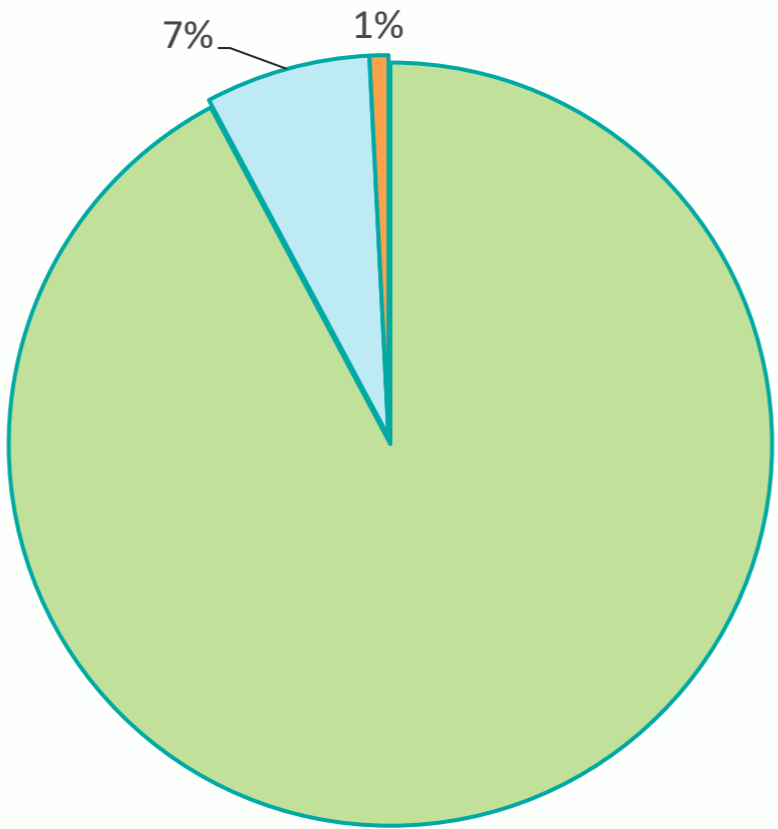
Completed Net Promoter Survey® (NPS)



Descriptive and thematic content analysis

Key Findings

“How likely are you to recommend rehabilitation to family/friends?”



92%
Promoters

“What is the most important reason for your score?”

“I felt comfortable with the rehabilitation process”

“I feel better”

- Themes influenced by:
- Staff affect & knowledge/skills
 - Clinical care qualities
 - Clinic environment

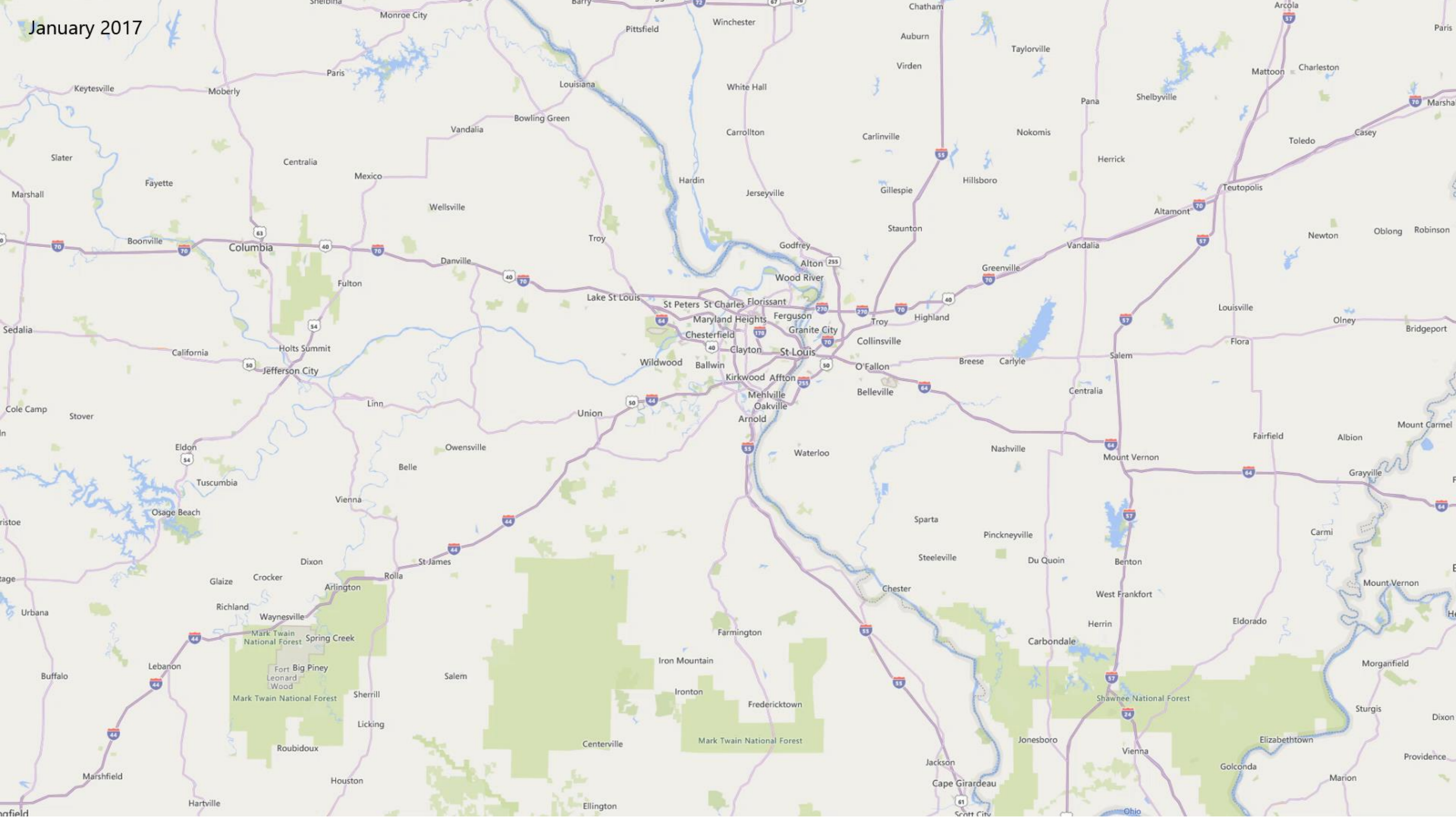
Cancer Rehabilitation: Tell Me More...



Do we have any Volunteers?

Cancer Rehabilitation: Advocacy

January 2017



**We need your help
to advocate**



Questions?

Contact:



mpergolotti@selectmedical.com



HHinrichs@ssm-select.com



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[Linkedin.com/in/hillary-hinrichs-031007212](https://www.linkedin.com/in/hillary-hinrichs-031007212)



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