Evidence and Implementation of Physical Activity Guidelines in Cancer Control and Survivorship

Prajakta Adsul, MBBS, PhD, MPH; Karen Basen-Engquist, PhD, MPH; Laura Rogers, MD, MPH; Kathryn Schmitz, PhD, MPH

Session Chair: Kathryn Schmitz, PhD, MPH

AICR’s Lifestyle and Cancer Symposium: Evidence Matters
Agenda for the session

• Presentation of the exercise oncology evidence base
• 3 Case Studies of Implementing Exercise Programs after Cancer
  • Strength After Breast Cancer (Schmitz)
  • BEAT Cancer (Rogers)
  • Active Living After Cancer (Basen-Engquist)
• Brief primer on Implementation Science (Adsul)
• Q&A among the panel and audience
• Closing
Exercise Oncology Evidence Base

Dr. Kathryn Schmitz
RCTs in the Field of Exercise Oncology since the first ACSM Round Table

PubMed Search / RCTs

EX + Cancer
EX + Cancer + rando*
PA + Cancer
PA + Cancer + rando*

Friedenreich Review 4 RCTs

PubMed search on March 4th 2018 via EndNote

ACSM 1st RT (151 + 76)
ACSM 2nd RT (556 + 308)

+ 281% (RCTs)
International, Multidisciplinary Roundtable on Exercise and Cancer Prevention and Control

March 12-13, 2018
San Francisco, California

Co-Chairs:
Kathryn H. Schmitz, Ph.D., M.P.H., FACSM, FTOS
Charles E. Matthews, Ph.D., FACSM

• Partner Organizations
  • ACS
  • NCI
  • APTA
  • AAPMR
  • ASCO
  • SSO
  • CARF
  • ACRM
  • ACLM
  • CSEP - Canadian
  • MacMillan - UK
  • ESSA - Australian
  • KDNP - Dutch
  • DVGS - German
Partners
### ACSM New Guidelines / Publications

Three peer-reviewed journal articles, Released 16 October 2019

<table>
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<tr>
<th>Journal</th>
<th>Topic</th>
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<tbody>
<tr>
<td>MSSE</td>
<td>• Exercise &amp; Cancer Prevention and Recurrence</td>
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<tr>
<td>MSSE</td>
<td>• Exercise During and After Treatment: FITT Prescriptions</td>
</tr>
<tr>
<td>CA</td>
<td>• Exercise Is Medicine in Oncology: • A Call to Action</td>
</tr>
</tbody>
</table>

ALPA V. PATEL1, CHRISTINE M. FRIEDENREICH2, STEVEN C. MOORE3, SANDRA C. HAYES4, JULIE K. SILVER2, KRISTIN L. CAMPBELL5, KERRI WINTERS-STONE7, LYNN H. GERBER8, STEPHANIE M. GEORGI9, JANET E. FULTON10, CRYSTAL DENLINGER11, G. STEPHEN MORRIS12, TRISHA HUE13, KATHRYN H. SCHMITZ14, and CHARLES E. MATTHEWS3

1Behavioral and Epidemiology Research Program, American Cancer Society, Atlanta, GA; 2Cancer Epidemiology and Prevention Research, Cancer Control Alberta, Alberta Health Sciences, Calgary, CANADA; 3Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda, MD; 4Institute of Health and Biomedical Innovation, Queensland University of Technology, Brisbane, AUSTRALIA; 5Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, MA; 6Department of Physical Therapy, University of British Columbia, Vancouver, CANADA; 7Oregon Health & Science University, Portland, OR; 8George Mason University, Fairfax, VA; 9Office of Disease Prevention, National Institutes of Health, Bethesda, MD; 10Physical Activity and Health Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA; 11Department of Horticulture/Oncology, Fox Chase Cancer Center, Philadelphia, PA; 12Department of Physical Therapy, Wingate University, Wingate, NC; 13Sunflower Wellness, San Francisco, CA; and 14Department of Public Health Sciences, Penn State College of Medicine, Penn State University, Hershey, PA

ABSTRACT

PATEL, A. V., C. M. FRIEDENREICH, S. C. MOORE, S. C. HAYES, J. K. SILVER, K. L. CAMPBELL, K. WINTERS-STONE, L. H. GERBER, S. M. GEORGE, J. E. FULTON, C. DENLINGER, G. S. MORRIS, T. HUE, K. H. SCHMITZ, and C. E. MATTHEWS. American College of Sports Medicine Roundtable Report on Physical Activity, Sedentary Behavior, and Cancer Prevention and Control. Med. Sci. Sports Exerc., Vol. 51, No. 11, pp. 2391–2402, 2019. Introduction: The American College of Sports Medicine convened an International Multidisciplinary Roundtable on Exercise and Cancer in March 2018 to evaluate and translate the evidence linking physical activity and cancer prevention, treatment, and control. This article discusses findings from the Roundtable in relation to the biologic and epidemiologic evidence for the role of physical activity in cancer prevention and survival. Results: The evidence supports that there are a number of biologically plausible mechanisms, whereby physical activity can influence cancer risk, and that physical activity is beneficial for the prevention of several types of cancer including breast, colon, endometrial, kidney, bladder, esophageal, and stomach. Minimizing time spent in sedentary behavior may also lower risk of endometrial, colon and lung cancers. Conversely, physical activity is associated with higher risk of melanoma, a serious form of skin cancer. Further, physical activity before and after a cancer diagnosis is also likely to be relevant for improved survival for those diagnosed with breast and colon cancer; with data suggesting that postdiagnosis physical activity provides greater mortality benefits than prediagnosis physical activity. Conclusions: Collectively, there is consistent, compelling evidence that physical activity plays a role in preventing many types of cancer and for improving longevity among cancer survivors, although the evidence related to higher risk of melanoma demonstrates the importance of sun safe practices while being physically active. Together, these findings underscore the importance of physical activity in cancer prevention and control. Fitness and public health professionals and health care providers worldwide are encouraged to spread the message to the general population and cancer survivors to be physically active as their age, abilities, and cancer status will allow.

Key Words: PHYSICAL ACTIVITY, SEDENTARY TIME, CANCER, PREVENTION, SURVIVAL
Exercise For Cancer Prevention and Treatment

For all adults, exercise is important for cancer prevention and specifically lowers risk of seven common types of cancer:

- colon cancer
- breast cancer
- stomach cancer
- endometrial cancer
- esophageal cancer
- kidney cancer
- bladder cancer

Exercising during and after cancer treatment:
- decreases fatigue, anxiety, and depression
- improves physical function and quality of life
- does NOT exacerbate lymphedema

For cancer survivors, incorporate exercise to improve survival after a diagnosis of breast, colon, and prostate cancer

Citation: http://bit.ly/moving-through-cancer

Exercise is Medicine®  AMERICAN COLLEGE of SPORTS MEDICINE
Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable

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1Department of Physical Therapy; Faculty of Medicine, University of British Columbia, Vancouver, CANADA; 2School of Nursing and Knight Cancer Institute, Oregon Health Sciences University, Portland, OR; 3Division of Medical Oncology, National Center for Tumor Diseases (NCT) and Heidelberg University Clinic, Heidelberg, GERMANY; 4Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht University, Utrecht, THE NEETHERLANDS; 5School of Nursing, Northern Arizona University, Flagstaff, AZ; 6Faculty of Kinesiology, Sport, and Recreation, University of Alberta, Edmonton, CANADA; 7Cancer Rehabilitation Medicine Services, Swedish Cancer Institute, Swedish Health Services, Seattle, WA; 8Metabolic Epidemiology Branch, Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, MD; 9Harvard Medical School, Boston, MA; 10Department of Medicine, Inova Fairfax Medical Campus, Falls Church, VA; 11Center for the Study of Chronic Illness and Disability, George Mason University, Fairfax, VA; 12Physical Therapy, Wingate University, Wingate, NC; 13Epidemiology Research, American Cancer Society, Atlanta, GA; 14Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA; 15Division of Cancer Control and Population Sciences, Behavioral Research Branch, National Cancer Institute, Rockville, MD; and 16Public Health Science, Penn State Cancer Institute, Penn State College of Medicine, Hershey, PA

ABSTRACT

CAMPBELL, K. L., K. M. WINTERS-STONE, J. WISKEMANN, A. M. MAY, A. L. SCHWARTZ, K. S. COURNEYA, D. S. ZUCKER, C. E. MATTHEWS, J. A. LIGIBEL, L. H. GERBER, G. S. MORRIS, A. V. PATEL, T. F. HUE, F. M. PERNA, and K. H. SCHMITZ. Exercise guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. Med. Sci. Sports Exerc., Vol. 51, No. 11, pp. 2375–2396, 2019. Purpose: The number of cancer survivors worldwide is growing, with over 15.5 million cancer sur- vivors in the United States alone—a figure expected to double in the coming decades. Cancer survivors face unique health challenges as a result of their cancer diagnosis and the impact of treatments on their physical and mental well-being. For example, cancer survivors often experience declines in physical functioning and quality of life while facing an increased risk of cancer recurrence and all-cause mortality compared with persons without cancer. The 2010 American College of Sports Medicine Roundtable was among the first reports to conclude that cancer survivors could safely engage in enough exercise training to improve physical fitness and restore physical functioning, enhance quality of life, and mitigate cancer-related fatigue. Methods: A second Roundtable was convened in 2018 to advance exercise recommenda- tions beyond public health guidelines and toward prescriptive programs specific to cancer type, treatments, and/or outcomes. Results: Overall findings retained the conclusions that exercise training and testing were generally safe for cancer survivors and that every survivor should “avoid inactivity.” Enough evidence was available to conclude that specific doses of aerobic, combined aerobic plus resistance training, and/or resistance training could improve common cancer-related health outcomes, including anxiety, depressive symptoms, fatigue, physical
Randomized Controlled Trials

N studies <5

Insufficient evidence
NO FITT Rx

N studies ≥5
N participants ≥ 150

Effect close to 0<sup>a</sup>

Effect unlikely
NO FITT Rx

Effect not close to 0<sup>a</sup>

Heterogeneity in direction

Emerging evidence of potential benefit in higher quality or newer RCTs

Moderate level of evidence
FITT Rx

No heterogeneity in direction

Effect unlikely
NO FITT Rx

Strong level of evidence
FITT Rx

Adapted from Dutch PA guidelines
<table>
<thead>
<tr>
<th>STRONG</th>
<th>MODERATE</th>
<th>INSUFFICIENT</th>
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<tbody>
<tr>
<td>Anxiety</td>
<td>Bone Health</td>
<td>Cardiotoxicity</td>
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<td>Depressive Sx</td>
<td>Sleep</td>
<td>CIPN</td>
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<td>Fatigue</td>
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<td>HR-QOL</td>
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<td>Lymphedema</td>
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<td>Treatment</td>
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<td>Tolerance</td>
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</tbody>
</table>
Infographic available at www.exerciseismedicine.org/movingthroughcancer
Exercise Is Medicine in Oncology: Engaging Clinicians to Help Patients Move Through Cancer

Kathryn H. Schmitz, PhD, MPH 1; Anna M. Campbell, PhD 2; Martijn M. Stuiver, PT, PhD 3,4,5; Bernardine M. Pinto, PhD 6; Anna L. Schwartz, PhD 7; G. Stephen Morris, PT, PhD 8; Jennifer A. Ligibel, MD 9; Andrea Cheville, MD 10; Daniel A. Galvão, PhD 11; Catherine M. Alfano, PhD 12; Alpa V. Patel, PhD 13; Trisha Hue, PhD 14; Lynn H. Gerber, MD 15; Robert Sallis, MD 16; Nira J. Gusani, MD, MS 17; Nicole L. Stout, PT, PhD 18; Leighton Chan, MD, PhD 19; Fiona Flowers, BS 19; Colleen Doyle, MS, RD 20; Susan Helmičk, PhD 21; William Bain, PhD 22; Jonas Sokolof, DG 23; Kerri M. Winters-Stone, PhD 24; Kristin L. Campbell, BSc, PT, PhD 25; Charles E. Matthews, PhD 26

Multiple organizations around the world have issued evidence-based exercise guidance for patients with cancer and cancer survivors. Recently, the American College of Sports Medicine has updated its exercise guidance for cancer prevention as well as for the prevention and treatment of a variety of cancer health-related outcomes (e.g., fatigue, anxiety, depression, function, and quality of life). Despite these guidelines, the majority of people living with and beyond cancer are not regularly physically active. Among the reasons for this is a lack of clarity on the part of those who work in oncology clinical settings of their role in assessing, advising, and referring patients to exercise. The authors propose using the American College of Sports Medicine’s Exercise Is Medicine initiative to address this practice gap. The simple proposal is for clinicians to assess, advise, and refer patients to either home-based or community-based exercise or for further evaluation and intervention in outpatient rehabilitation. To do this will require care coordination with appropriate professionals as well as change in the behaviors of clinicians, patients, and those who deliver the rehabilitation and exercise programming. Behavior change is one of many challenges to enacting the proposed practice changes. Other implementation challenges include capacity for triage and referral, the need for a program registry, costs and compensation, and workforce development. In conclusion, there is a call to action for key stakeholders to create the infrastructure and cultural adaptations needed so that all people living with and beyond cancer can be as active as is possible for them.

Keywords: exercise, physical medicine and rehabilitation, physical therapy, supportive care
Step 1: ASSESS
Question #1: How many days during the past week have you performed physical activity where your heart beat and your breathing is harder than normal for 30 minutes or more?
Question #2: How many days during the past week have you performed physical activity to increase muscle strength, such as lifting weights?

Question #3: Would this patient be safe exercising without medical supervision (e.g.; walking, hiking, cycling, weight lifting)

Question #3 answer is Yes.
(Patient is ambulatory, ECOG score 0-2)

• Step 2: ADVISE
  • EIM ExRx for Oncology, based on current report of activity to increase to guidelines recommendation

• Step 3: REFER to best available community program

Question #3 answer is No
Or
I’m not sure and I don’t have the capacity to evaluate.
(ECOG score 3+ or other complications present)

• Step 2: ADVISE
  • Advise patient to follow-up with outpatient rehabilitation healthcare professional for further evaluation

• Step 3: REFER
  • Outpatient rehabilitation health care professional will recommend best available program
Rx Pad

• Intended to ease referrals
  • Assess, advise, refer
  • Infographic available at:
  • www.exerciseisme.dine.org/movingthroughcancer
1630 Programs on this registry
U.S. Oncology Exercise Programs Distribution

The map illustrates the distribution of oncology exercise programs across the United States. Each state is colored according to the number of programs, with a color scale ranging from light to dark blue, indicating the number of programs available. States such as Texas and Pennsylvania have a high concentration, while others, like Wyoming and North Dakota, have fewer programs.

Key:
- Texas: 131 programs
- Pennsylvania: 82 programs
- New York: 65 programs
- Massachusetts: 74 programs

Notable states with significant numbers of programs include:
- California: 68 programs
- New York: 65 programs
- Pennsylvania: 82 programs
- Texas: 131 programs
- Massachusetts: 74 programs

The map provides a visual representation of the availability of oncology exercise programs, highlighting regions with higher demand for such programs.
Study 1: Physical Activity and Lymphedema trial (PAL trial)

Dr. Kathryn Schmitz
Evidence Based Intervention delivered in YMCAs
Evidence Base for the Intervention.....
Impact of Lymphedema and Arm Symptoms on Quality of Life in Breast Cancer Survivors


Departments of Epidemiology and Cancer Research Group, Center for Epidemiology and Cancer Research, University of California, San Francisco, USA.

Influence of weight training on skeletal health of breast cancer patients

Published Ahead of Print on May 11, 2015 as 10.1200/JCO.2014.57.7395
The latest version is at http://jco.ascopubs.org/cgi/doi/10.1200/JCO.2014.57.7395

Original Report

Weight Lifting and Physical Function Among Survivors of Breast Cancer: A Post Hoc Analysis of a Randomized Controlled Trial

Justin C. Brown and Kathryn H. Schmitz
What is the PAL Trial EBI?

• Pre-intervention evaluation to ensure safety
• Pre-intervention education about lymphatic system
• Supervised exercise sessions with well trained professional
  • Teaching
    • Proper biomechanics
    • ‘Start low, progress slow’
• Continued exercise in unsupervised setting
• Return to PT for evaluation if symptoms changes
Key Implementation Questions

- Could PAL be delivered in the Outpatient Rehabilitation setting?
  - Yes, over 800 women completed the program during the 18 month implementation period

- Will physicians refer to the program?
  - Yes, 40% of eligible women were referred into the program

- Will insurance pay for the revised program?
  - Yes!

- Will the intervention maintain efficacy in the new setting?
  - Yes it did!
Implementation methods and strategies used

• Identified champions
• Adapt intervention
• Assess readiness
• Develop and implement trainings for
  • Clinicians
  • PTs
• Technical assistance
  • EMR changes
• Audit and feedback
• Development of a toolkit
Developed an Online Training for Strength ABCs

- Partnership with Klose Training and Consulting
- Over 700 have completed the training!
- $125 for 4 hour training
- Certified Exercise Professionals are Eligible
Distribution of Strength ABCs in the USA in 2020
Evaluation of Dissemination (Calos et al. 2020)

• Survey of course completers (self-report)
  • 96 respondents
    • 67% had implemented SABC
      • 93% of these were still delivering it
        • Those delivering it were delivering all components
    • Average # of patients = 13/clinic
    • 50% Patient referrals were from oncology clinics
    • 72% were receiving reimbursement for services
    • 96% were delivering 1:1 sessions (not group)
Study 2: Beat Cancer

Dr. Laura Rogers
Better Exercise Adherence after Treatment for Cancer (BEAT Cancer)
Evidence base for the intervention...
BEAT Cancer efficacy (R01-CA1369859): Odds of meeting recommendations (≥ 150 weekly minutes ≥ moderate intensity physical activity)

<table>
<thead>
<tr>
<th></th>
<th>Month 3</th>
<th>Month 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet recommendations (accelerometer)</td>
<td>Adjusted* odds ratio (p value)</td>
<td>2.2 (.042)</td>
</tr>
<tr>
<td>Meet recommendations (self-report)</td>
<td>5.2 (&lt;.001)</td>
<td>4.8 (&lt;.001)</td>
</tr>
</tbody>
</table>

*Adjusted for baseline value, study site, breast cancer stage, history of chemotherapy, history of radiation therapy, comorbidities, current hormonal therapy, and marital status

Rogers et al., BCRT 2015
What is the BEAT Cancer EBI?

Intervention goal = 150 weekly minutes moderate intensity exercise (primarily walking)

<table>
<thead>
<tr>
<th>Week*</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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<tbody>
<tr>
<td>Supervised exercise</td>
<td></td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Home-based exercise</td>
<td></td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Update face-to-face counseling</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Discussion group</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</table>

*Participants also given an educational notebook and personal heart rate monitor.

Rogers et al., Contemporary Clinical Trials 2012
Find your BEAT: Toolkit to increase physical activity in rural cancer survivors (R21CA182601)

• Adapt the BEAT Cancer physical activity behavior change intervention:
  • Non-research setting implementation
  • Cancer types other than breast cancer
• Develop an implementation toolkit
• Proof of concept testing
• In collaboration with a rural cancer community network site
Key implementation questions

• Related to BEAT Cancer implementation by a non-research, community cancer care site:
  • Better understand factors to consider related to setting and delivery
  • Identify potential implementation barriers and facilitators
  • Determine contents for an implementation toolkit relevant for a broad range of settings (e.g., rural, urban, community, clinical, fitness settings)
Implementation methods and strategies used

• Cost – NCI funding
• Champions – identified through our institutional partnerships
• Leadership buy-in – multiple on-site meetings
• Stakeholder input – cancer survivors, potential interventionists, community/organizational stakeholders
  • Consolidated Framework for Implementation Research (CFIR)
• Readiness – training and toolkit
Understanding setting and delivery factors

- Intervention Characteristics (Design Quality and Packaging; Cost)
- Outer setting (Patient Needs and Resources; Cosmopolitanism)

Rogers et al., JCSU 2019, Qu et al., Imp Sci Com 2020, Adams et al., JSCC in press
Implementation barriers and facilitators

Barrier or facilitator (source)

Convenient location (cancer survivors)

Possible implementation strategy

Distance-delivery, collaboration with community organizations

Implementation outcome potentially influenced by strategy

Adoption, acceptability, penetration (reach)

Free transportation for participants (interventionists)

Gas cards, use existing public services

Acceptability, penetration (reach), adoption

Staff training, good communication tools, & physician buy-in (stakeholders)

Facilitation, toolkit, webinar training, physician champion, part of patient care plan

Fidelity, adoption

Rogers et al., JCSU 2019, Qu et al., Imp Sci Com 2020, Adams et al., JSCC epub
Implementation toolkit development

- Focus groups, NGT groups, photovoice
- Research Manual of Procedures
- Literature review

Implementation Toolkit
BEAT Cancer Program

Technical assistance

Eleven staff training videos
### Overview of the Core Components

The BEAT Cancer program Core Components also provide the basis for achieving benefits that are more retangular in nature. Participants of the BEAT program have reported that having support from staff and other participants, being held accountable and obtaining knowledge for safe and effective physical activity are among some of the benefits of the program.

Figure 4 below illustrates a breakdown of the benefits each component provides. It is important to optimize these core benefits as you adapt the Core Components before and during program implementation.

**Figure 4:**

**Core Components**
- Group discussion sessions
- Participated education materials (slides, workbook, curriculum)
- Exercise sessions with exercise specialist
- Update sessions with exercise specialist
- Independent exercise (e.g., home-based)  

**Core Benefits**
- Support, knowledge, engagement, accountability
- Facilitate learning and engagement, knowledge transfer
- Accountability, knowledge, benefits, barriers, confidence, motivation
- Reinforcement, barriers, support, engagement, motivation
- Confidence, increase with practice, barriers

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### Program Planning

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Suggested adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of treadmills for supervised exercise sessions not available</td>
<td>Use indoor or outdoor track/kin for supervised exercise sessions</td>
</tr>
<tr>
<td>Formal meeting space for group sessions not available or not preferred</td>
<td>Use a private room or space in a coffee shop, community center, church, or park for group sessions, use online/telephone media</td>
</tr>
<tr>
<td>Long travel distances for participants</td>
<td>Visual communication using available technology</td>
</tr>
<tr>
<td>Lack of transportation available to participants</td>
<td>Obtain support from local advocacy groups to cover travel costs, determine local transportation resources available for individuals on a limited income, offer gas vouchers</td>
</tr>
<tr>
<td>Lack of exercise facilities for home-based exercise</td>
<td>Develop list of local possibilities to distribute to participants, consider alternative home-based activities such as free online exercise and walking videos</td>
</tr>
<tr>
<td>I don’t have childcare</td>
<td>Identify stakeholders or other community services who can help</td>
</tr>
<tr>
<td>I can’t come more than twice a week</td>
<td>Evenly distribute the session timeline while maintaining the recommended number of sessions overall</td>
</tr>
<tr>
<td>Population may not be able to afford clothing appropriate for physical activity</td>
<td>Ask retailers to provide a discount for participants; identify advocacy groups who can help</td>
</tr>
<tr>
<td>Your facility has a nutritionist on staff</td>
<td>Utilize the nutritionist during the program, many previous participants expressed interest in improving their diet</td>
</tr>
<tr>
<td>Broader patient education to add topics that the participants express interest in learning</td>
<td>Recruit “specialists” who may have expertise in certain areas linked to cancer survivorship (e.g., patient advocates, dieticians, spiritual counselor, health counselors, etc.)</td>
</tr>
</tbody>
</table>

**Figure 5:**

Once all possible adaptations have been identified and planned for, you are ready to begin implementing the program in your location.
Study 3: Active Living After Cancer

Dr. Karen Basen-Engquist
Active Living After Cancer: Community Implementation

Karen Basen-Engquist, PhD, MPH
Director, Center for Energy Balance in Cancer Prevention and Survivorship
Annie Laurie Howard Research Distinguished Professor
Dept of Behavioral Science
Active Living after Cancer: Initial trials

Evidence-Based Intervention:

6 month Lifestyle Physical Activity intervention adapted from Project Active (Dunn AL et al, MSSE, 1998)

Cognitive and behavioral skills taught in group sessions, once/week for 16 weeks, bi-weekly for 8 weeks

Evidence in Cancer Survivors:

First trial with prostate cancer survivors on androgen deprivation therapy – negative trial

Second trial - 60 sedentary breast cancer survivors randomized to AFL or control

QOL benefits: Increased physical functioning, improvements in general health, pain, & role limitations

Intervention group had higher self-efficacy, lower cons, increased use of some changes processes

Intervention groups progressed in stage of change, but standard care did not. No difference in physical activity.

Basen-Engquist et al, Pat Ed & Couns, 2006
## Adaptations made for community implementation of ALAC

<table>
<thead>
<tr>
<th>Adaptation type</th>
<th>Original program</th>
<th>Adapted program</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context</strong></td>
<td>Taught by MD Anderson staff</td>
<td>Taught by health educators in a community organization</td>
<td>More potential for sustainability; better outreach to community</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td>Taught by Masters’ level staff, Brief training in curriculum</td>
<td>Taught by staff with high school or 2- or 4-year college degree, 20 hour structured training developed, Later used Project ECHO for ongoing support</td>
<td>Staff of original program familiar with teaching techniques provided by curriculum; health educators needed more training to ensure consistency</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>20 sessions</td>
<td>12 sessions – eliminated activities with redundancy</td>
<td>Feedback from community partners indicated a 20 session program would not be feasible</td>
</tr>
<tr>
<td><strong>Content – language and cultural relevance</strong></td>
<td>High reading level, Substantial text, Few photos of Latinas, English only</td>
<td>Applied methods to address low health literacy (simplified text, increased white space, reduced reading level), Increased diversity in photos, cultural relevance of stories, Translated into Spanish</td>
<td>Need to make program materials more accessible to participants with a range of health literacy and to Spanish speakers</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>Lengthy questionnaire battery, Physical functioning assessment battery administered by physical therapists</td>
<td>Brief questionnaires, Selected 2 physical functioning assessments and trained health educators to administer</td>
<td>Need to shorten evaluation and simplify, reduce participant and educator burden</td>
</tr>
</tbody>
</table>
Active Living After Cancer Program

- Funded by CPRIT, offered in Houston for the past 7 years
- 12 weekly group sessions, each session includes skill training, exercise, and survivorship discussion
- Currently offered via Zoom
- Over 1000 survivors and caregivers have enrolled in the program

<table>
<thead>
<tr>
<th>Week</th>
<th>Cognitive and Behavioral Skill (~45 min)</th>
<th>Activity (~10 min)</th>
<th>Survivorship Topic (~30 min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identifying Moderate Intensity</td>
<td>Walking</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Readiness to Change, Goal Setting</td>
<td>Walking</td>
<td>Nutrition</td>
</tr>
<tr>
<td>3</td>
<td>Benefits and Barriers</td>
<td>Zumba</td>
<td>Treatment side effects</td>
</tr>
<tr>
<td>4</td>
<td>Problem Solving Skills</td>
<td>Walking</td>
<td>Talking to Your Doctor</td>
</tr>
<tr>
<td>5</td>
<td>Goal Setting</td>
<td>Resistance Bands</td>
<td>Spirituality</td>
</tr>
<tr>
<td>6</td>
<td>Rewarding Yourself</td>
<td>Zumba</td>
<td>Emotional Distress/Fear of Recurrence</td>
</tr>
<tr>
<td>7</td>
<td>Time Management</td>
<td>Resistance Bands</td>
<td>Fatigue</td>
</tr>
<tr>
<td>8</td>
<td>Getting Confident</td>
<td>Zumba</td>
<td>Cancer Screening</td>
</tr>
<tr>
<td>9</td>
<td>Finding Social Support</td>
<td>Resistance Bands</td>
<td>Relationships</td>
</tr>
<tr>
<td>10</td>
<td>Cognitive Restructuring</td>
<td>Balloon Volleyball</td>
<td>Body Image</td>
</tr>
<tr>
<td>11</td>
<td>Relapse Prevention</td>
<td>Walking, Resistance bands</td>
<td>Nutrition Revisited</td>
</tr>
<tr>
<td>12</td>
<td>Identifying places to be physically active in your community</td>
<td>Zumba</td>
<td>Final Party</td>
</tr>
</tbody>
</table>
Active Living After Cancer increased physical activity and improved physical function in a diverse group of survivors


- Mean age: 61 years (range 20-91)
- 40% speak Spanish primarily
- 48% have a high school education or less
- 87% were survivors, 13% were caregivers

**Phase 2 Results**

- % with 150+ weekly min of MVPA
- % above the 50th percentile on the sit-to-stand test
Implementation strategies

Exploration
- Identify funding
- Develop relationships with community partners

Preparation
- Formal commitments
- Adapt intervention/training
- Train educators
- Pilot test

Implementation
- Promote program, inform opinion leaders
- Distribute materials
- Centralize technical assistance
- Ongoing training/support
**Implementation Take-away**

**Critical processes**

- Establishing relationships
- Adapting the intervention
- Providing support to implementers

**NOT “One-and-done” strategies**

**Partnerships**

**Adaptation**

**Ongoing support**
Knowing is not enough; we must apply. Willing is not enough; we must do.

-Johann Wolfgang von Goethe
Role of Implementation Science

Dr. Prajakta Adsul
Evidence is only as good as how and whether:

• It is adopted
• Providers are trained to deliver it
• Trained providers actually deliver it
• Eligible patients receive it

It takes 17 years to turn 14 percent of original research to the benefit of patient care!

What is implementation science?

• “the study of methods to promote the integration of research findings and evidence into healthcare policy and practice”

• Consider context, previous research, need for adaptations to fit different settings and populations, sustainability, and scaling-up

• Limited information, change is constant, implementation is complex
Theories, models and frameworks in implementation science

Over 100+ models on the D&I Models Webtool

(https://dissemination-implementation.org/)
An example, EPIS Framework...

EBP - Evidence based practice; More info on EPIS here - https://episframework.com/what-is-epis
Implementation strategies

• “methods or techniques used to enhance the adoption, implementation, sustainment, and scale-up of a program or practice"

• Several terms and inconsistent usage

• The Expert Recommendations for Implementing Change (ERIC study)
  • Taxonomy of 73 strategies, under 9 domains
# ERIC strategies

<table>
<thead>
<tr>
<th>1. Evaluation and iterative strategies</th>
<th>2. Interactive assistance</th>
<th>3. Adapting and tailoring to context</th>
<th>4. Develop stakeholder relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess for readiness</td>
<td>Facilitation</td>
<td>Tailor strategies</td>
<td>Identify and prepare champions</td>
</tr>
<tr>
<td>Identify barriers and facilitators</td>
<td>Technical assistance</td>
<td>Promote adaptability</td>
<td>Inform local opinion leaders</td>
</tr>
<tr>
<td>Audit &amp; feedback</td>
<td>Clinical supervision</td>
<td>Use data experts</td>
<td>Build coalitions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Conduct ongoing training</td>
<td>Remind clinicians</td>
<td>Involve consumers</td>
<td>Access new funding</td>
<td>Mandate change</td>
</tr>
<tr>
<td>Develop educational materials</td>
<td>Develop resource sharing agreements</td>
<td>and family members</td>
<td>Alter incentive/allowance structures</td>
<td>Change physical structures</td>
</tr>
<tr>
<td>Create learning collaborative</td>
<td>Revise professional roles</td>
<td>Intervene to</td>
<td>Develop disincentives</td>
<td>Start dissemination organization</td>
</tr>
</tbody>
</table>
How does this apply to exercise oncology?

• Tertiary benefits for cancer survivors and yet infrequently translated for broader use

• Limited information in peer-reviewed literature on what works? How does it works? Where and under what conditions does “it” work? For who does it work?

• Where do we begin?
Bringing together years of efforts from intervention to implementation...

• Three studies:
  • What is the evidence for the specific intervention?
  • What is the EBI? Where? Who?
  • What are the key implementation questions?
  • What methods and strategies were used?

• Mapped them on to the EPIS phases

• Operationalized each strategy per the ERIC study
EPIS + ERIC in Exercise Oncology

**Exploration**
- Access new funding
- Build a coalition

**Preparation**
- Obtain formal commitments
- Identify and prepare champions
- Assess readiness & implementation barriers and facilitators
- Develop educational materials
- Develop implementation blueprint

**Implementation**
- Inform local opinion leaders
- Change service sites
- Conduct ongoing training
- Centralize technical assistance
- Intervene to enhance uptake and adherence
- Distribute educational materials

**Sustainment**
- Develop educational materials
How can IS help moving forward? (pun intended)

• Focusing efforts on the systematic study of implementation strategies
• Considering strategies that might be particularly relevant for promoting health equity (i.e. stakeholder engagement, advisory boards)
• Generating evidence for implementation but also on sustainment and scale-up
Q & A for the panel

Audience questions in the chat
At what point did you become focused on “implementation” for your interventions?
How did you choose/select the specific strategies to focus on when thinking about implementation?
Audience questions?
How did you pragmatically assess readiness of organizations for implementation?
What are some ongoing focus areas in continuing to focus on implementation for your interventions?
Closing

Dr. Kathryn Schmitz
Closing

Lessons Learned

Key domains for future research

Application to other lifestyle interventions
Lessons learned

• Implementation has to be an intentional process

• Key considerations:
  • Setting
    • Location
    • Training
  • Cost
  • Referrals

• Missed opportunities
  • Advisory boards
  • Systematic testing of all implementation strategies
Key domains for future research

- Effectiveness of strategies across phases of implementation
- Creativity regarding sustainable funding
  - New payment models in healthcare
  - PA interventions as marketing tool
- Further evaluation of the non-linear nature of implementation
  - Return to earlier phases as barriers arise
- Systematic, rigorous evaluation of implementation strategies
Application to other lifestyle interventions

• Nutrition, Physical Activity, and other Lifestyle interventions share characteristics relevant to implementation
  • Physical activity is not a covered benefit
  • Strong evidence base supporting implementation
  • No space designated for these activities at cancer centers
• Key challenges
  • Referrals
  • Cost
  • Location