

## A. COVER PAGE

<b>Project Title:</b> Surviving at Work: Reducing Workplace and Clinical Barriers to Cancer Survivors Returning to Work	
<b>Grant Number:</b> 5K01OH011596-03	<b>Project/Grant Period:</b> 09/01/2020 - 08/31/2023
<b>Reporting Period:</b> 09/01/2022 - 08/31/2023	<b>Requested Budget Period:</b> 09/01/2022 - 08/31/2023
<b>Report Term Frequency:</b> Final	<b>Date Submitted:</b> 02/28/2024
<b>Program Director/Principal Investigator Information:</b> ALICIA DUGAN , BA MA MA PHD  <b>Phone Number:</b> 860-679-4813 <b>Email:</b> adugan@uchc.edu	<b>Recipient Organization:</b> UNIVERSITY OF CONNECTICUT SCH OF MED/DNT 263 FARMINGTON AVENUE FARMINGTON, CT 060305335  <b>DUNS:</b> 022254226 <b>UEI:</b> H6D6JMXJXDE6 <b>EIN:</b> 1521725543A1  <b>RECIPIENT ID:</b>
<b>Change of Contact PD/PI:</b> NA	
<b>Administrative Official:</b> PAUL HUDOBENKO University of CT Health Center Sponsored Program Services 263 Farmington Ave. MC 2806 FARMINGTON, CT 060302806  <b>Phone number:</b> 860 679 3951 <b>Email:</b> hudobenko@uchc.edu	<b>Signing Official:</b> TRACY M ROOT 263 Farmington Avenue Farmington, CT 060305335  <b>Phone number:</b> 860-679-2434 <b>Email:</b> troot@uchc.edu
<b>Human Subjects:</b> NA	<b>Vertebrate Animals:</b> NA
<b>hESC:</b> No	<b>Inventions/Patents:</b> No

## B. ACCOMPLISHMENTS

### B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?

The rationale for the proposed research is that cancer survivors are a growing segment of the workforce who are at risk for poor health and work outcomes, and are vulnerable to the competing demands of work and disease management (i.e., work-health conflict). Many survivors do not successfully return to work, and workplace factors may explain this. The primary objective of the research project is to investigate how formal and informal organizational support at work influences survivors' work-health conflict, quality of life, and intent to remain on the job. A secondary objective is to examine whether and how cancer clinicians address return to work issues with cancer patients.

The research project uses an exploratory sequential mixed methods design (focus groups, surveys) to gather data from breast and colorectal cancer survivors, as well as employers and clinicians. It also utilizes participatory research methods to involve design teams of stakeholders (survivors, employers, clinicians) in developing and disseminating interventions to enhance workplace and clinical practice and more effectively meet the needs of survivors returning to work. The major goals and objectives of the project are:

Aim 1: Determine if formal and/or informal organizational support at work are associated with quality of life in cancer survivors, and if organizational support affects disease management and work-health conflict. (Target dates: 9/1/2020 - 11/30/2021; 45% completed).

- o H1a/H1b: Survivors with high organizational support will have better work-related quality of life than those with low support, and those with better work-related quality of life will report higher intent to remain in their jobs.

- o H1c/H1d: Work-health conflict will mediate the relationship between cancer management behaviors and health-related quality of life, and organizational support will be a moderator such that cancer management will have a weaker association with work-health conflict when organizational support is high.

Aim 2: Facilitate design teams (consisting of survivors, managers, clinicians) using community-based participatory research methods to generate and recommend return-to-work interventions. (Target dates: 6/1/2021 - 11/30/2022; 0% completed).

- o H2: Survivors, workplace managers, and clinicians will provide different perspectives on the critical needs of survivors returning to work and whether those needs are being met in current workplace and clinical practice.

Aim 3: Package study outputs and disseminate to stakeholders using a design team-created dissemination plan, enhanced by knowledge of health-related social marketing and distribution systems. (Target dates: 6/1/2022 - 8/31/2023; 0% completed).

#### B.1.a Have the major goals changed since the initial competing award or previous report?

No

### B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?

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### B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS

**For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?**

No

### B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?

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**B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?**

NOTHING TO REPORT

**B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?**

Not Applicable

### Abstract

Dr. Alicia Dugan's training and research plan created a new career trajectory that addresses the problems of workers with chronic disease. Her training plan provided mentorship and education needed to redirect her to a new line of independent research on the secondary prevention of work disability. The research plan was to investigate cancer survivors, a growing segment of the workforce at risk for poor health and work outcomes. She investigated how formal and informal organizational support at work influence survivors' quality of life, intent to remain on the job, and sources of work-health conflict, as well as how cancer clinicians support patients' work-related concerns. The study used an exploratory sequential mixed methods design. Participants were breast and colorectal cancer survivors, as well as employers and clinicians. An intermediate outcome of the study is to inform workplace and clinical practice to more effectively meet the needs of survivors returning to work. For cancer survivors, end outcomes include improved balance between work and disease management, job retention rates, and quality of life. In addition to publications and presentations, study outputs and dissemination products for stakeholders include two tools for assessing clinician and workplace support, a research brief summarizing key findings, and recommended interventions to enhance workplace and clinical practice. The research project will inform a follow-up intervention study to be developed as a future R01 grant.

### Significant or Key Findings

**Aim 1.** We assessed employed cancer survivors' met and unmet need for organizational support at work, and found that the need for flexible arrangements and reduced workloads was mostly met, while unmet needs included navigation/coordination, understanding/empathy, and time off for treatment and recovery (findings published in *Journal of Occupational and Environmental Medicine*). Findings from this study and input from a survey design team of cancer survivors helped us to create a survey assessment tool to evaluate clinical and organizational support provided to meet survivors' needs. We found that (H1a-b) formal and informal organizational support are directly associated with survivors' intent to remain in their jobs, and indirectly associated with intent to remain through work ability (manuscript in preparation for submission to the *Journal of Cancer Survivorship*). We also found that (H1c-d) work-health conflict is directly associated with poorer health-related quality of life and anticipated turnover, and indirectly associated with both outcomes through cancer self-management behaviors (findings published in *Occupational Health Science*). In a follow-up study, we found that survivors' health role is used for self-care activities in addition to cancer self-management, with self-care activities taking the form of physical well-being practices (healthy eating, exercise, vitamins/supplements), psychological well-being practices (prioritizing relationships and leisure, positivity, psychotherapy), social well-being practices (support groups, community activities), and complementary health (massage, meditation, and yoga) (manuscript in preparation for submission to the *Psycho-oncology* journal).

**Aim 2.** We convened a design team of survivors and clinicians to address the topic of work-health conflict by using an intervention planning tool to identify root causes analysis of work- and health-related challenges, and to brainstorm and evaluate multi-determined intervention solutions. Although we hypothesized that survivors and clinicians would provide different perspectives on the critical needs of employed survivors and solutions for improving the provision of those needs in current workplace and clinical practice, they had a great deal of overlap. Final solutions ranged from the creation of new clinical materials (e.g., checklist of needs, screeners to track/flag needs), workplace materials (e.g., conversation guides, handout of expectations), and survivorship materials (e.g., information on health/appointments, mental health and community resources). Survivors tended to favor clinical enhancements to provide more staffing and services to meet work-related needs, while clinicians focused more on the need for workplace changes (e.g., flextime policies, employee health programs), as well as state/federal policy changes (e.g., mandates for paid time off,

universal access to quality healthcare). We convened another design team to use the intervention planning process to address a second topic, social disconnection (i.e., isolation, loneliness, lack of belonging), which we found to be common among survivors following the COVID-19 pandemic. The intervention that the team developed was a social media-based virtual peer support group with a guided set of discussions and activities to support specific aspects of survivors' personal well-being, social connection, and workforce engagement; this intervention was perceived to have the greatest potential for success based on having the most well-being benefits, reach, cost-effectiveness, and feasibility. We hope to implement interventions in a follow-up longitudinal R01 study.

**Aim 3.** To increase the capacity of employers and clinicians to assist survivors in remaining at and returning to work, we disseminated study outputs to all stakeholder groups. Study findings, interventions, and information about two assessment tools were presented in scientific publications, conference presentations, a research brief summarizing key findings, and information sheets containing inventories of (1) policies and programs that *employers* can use to support survivors, (2) practices that *clinicians* can use to provide psychosocial support and work-related care planning, and (3) information and resources that *survivors* can use to navigate the return to work transition.

**Goals Not Yet Met.** The recruitment process for this study was very slow and lasted for much of the grant period, despite planning to complete recruitment in Year 1. This was attributable to the COVID-19 pandemic in Year 1 during which we needed to shift from in-person to virtual/electronic recruitment methods and survey administration. COVID-19 also caused staffing shortages in the cancer clinics where we were recruiting, interfering with their ability to help us reach out to our targeted number of study participants as quickly as we had hoped. In terms of recruitment numbers, 125 cancer survivors completed surveys, which fell just short of our desired recruitment goal of having a minimum of 130 participants for that portion of the study (**Aim 1**). Further, we had a goal of recruiting 25 managers and 25 clinicians to provide a baseline of the support being offered in workplaces and cancer centers via brief self-report surveys (<10 minutes). We met our goal of 25 clinicians, but were only able to recruit 11 managers. Similarly, our intent (**Aim 2**) was to convene a design team of at least 6 survivors, clinicians, and managers to generate and recommend supportive interventions, and while we met with this goal for the survivors and clinicians, we were only able to recruit 1 manager for the design team. Despite Covid-19 related delays and difficulty recruiting managers, we largely met our recruitment goals by September 2023. Our goal to disseminate study findings, interventions, and assessment tools (**Aim 3**) to all stakeholder groups (survivors, clinicians, and managers) in the form of scientific publications, conference presentations, a research brief, and information sheets was delayed due to recruitment difficulties; however we will continue to prepare and disseminate materials in the months ahead.

### **References.**

- Dugan, A. G.,** Decker, R. E., Austin, H. L., Namazi, S., Bellizzi, K. M., Blank, T. O., Shaw, W. S., Swede, H., Cherniack, M. G., Tannenbaum, S. H., & Cavallari, J. M. (2023). Qualitative assessment of perceived organizational support for employed breast cancer survivors. *Journal of Occupational and Environmental Medicine, 65*(10), 868-879.
- Dugan, A. G.,** Decker, R. E., Austin, H. L., Namazi, S., Shaw, W. S., Bellizzi, K. M., Blank, T. O., Cherniack, M. G., Tannenbaum, S. H., Swede, H., Hundal, J., & Cavallari, J. M. (2024). Work-health conflict among breast cancer survivors: associations with cancer self-management, quality of life, and anticipated turnover. *Occupational Health Science*.

### **Translation of Findings**

- In addition to the two papers already published, I am currently preparing to submit two manuscripts for publication in March 2024 on (1) the self-care practices that employed survivors

use to enhance quality of life (*Psycho-oncology* journal), and (2) associations between organizational support, work ability, and survivors' intent to remain in their jobs (*Journal of Cancer Survivorship*).

- I am preparing to submit four additional manuscripts for publication in spring 2024 on (1) the two interventions developed by design teams on reducing work-health conflict and improving social connectedness, (2) the two assessment tools created to evaluate clinical and organizational support for survivors.
- In addition to giving seven conference presentations, I organized and submitted a three-paper full concurrent session entitled "Addressing Work-Related Challenges and Unmet Needs of Cancer Survivors" to the 2022 International Symposium to Advance Total Worker Health®. I was one of the session speakers, presenting a paper on "Work related quality of life, organizational support, and intent to stay among employed breast cancer survivors", and other speakers included a researcher from another TWH Center of Excellence, the Center for Health, Work and Environment (Dr. Fernando Diaz del Valle, Colorado School of Public Health, University of Colorado, Anschutz Medical Campus) and a recipient of NIOSH's NY/NJ Region ERC Pilot Research Grant (Dr. Lauren Ghazal, Postdoctoral Research Fellow, School of Nursing, University of Michigan Ann Arbor). The discussant was Dr. Robin Yabroff Scientific Vice President, Health Services Research, American Cancer Society.

### **Research Outcomes/Impact**

- Research outcomes are described in detail in the above under "*Significant or Key Findings*" as well as being summarized in "*Section I-1. Outcomes*".

My training plan was designed to create a new career trajectory that addresses the problems of workers with chronic disease and had four career development and training goals related to: (1) cancer survivorship and return to work, (2) chronic disease management and work-health conflict, (3) effective dissemination methods, and (4) career and leadership development. This plan provided the mentorship and training needed to redirect myself to a new line of independent research on the secondary prevention of work disability, building upon my existing strengths in worker health, self-care, and intervention design with the guidance of a multi-disciplinary mentoring team of four seasoned faculty members.

**Training Goal 1: Gain expertise in cancer survivorship and return to work issues** (100% completed).

I completed the Cancer Survivorship E-Learning Series of the George Washington University Cancer Institute, American Cancer Society, and the CDC; a one-week online course entitled *Work Disability Prevention: Bridging Research and Practice* at the Nordic Institute for Advanced Training in Occupational Health in Finland; two one-week online Return to Work courses at Canada's National Institute of Disability Management and Research, and structured tutorials on cancer survivorship, return-to-work experiences, work disability prevention, and organizational support.

**Training Goal 2: Gain expertise in chronic disease management and work-health conflict.** (100% completed). I completed a University of Connecticut Occupational Epidemiology course, a University of Massachusetts course on Mindfulness for Managing Pain, a structured tutorials on *Chronic Disease Prevention and Control, Living with Chronic and Life-Threatening Illness* and work-health conflict.

**Training Goal 3: Gain expertise in effective dissemination methods.** (100% completed). I completed the University of Michigan's *Community-Based Participatory Research* course, a University of Connecticut *Meta Bootcamp* course and a University of Massachusetts *Innovation Corps* course. I worked with Center for the Promotion of Health in the New England Workplace's Outreach Coordinator to package materials (i.e., critical study findings) for dissemination to all stakeholder groups.

**Training Goal 4: Career and leadership development.** (100% completed). I attended workshops, seminars, and groups at University of Connecticut School of Medicine's monthly Early Investigators Meeting and Breast Cancer Research Group, as well as the Connecticut Cancer Partnership's Survivorship Workgroup, the University of Wisconsin-Madison's *Science of Effective Mentoring* workshop, and the Center for the Promotion of Health in the New England Workplace's committee meetings and biannual symposia. I have obtained recognition in the US and internationally (the Netherlands, Scandinavia, the UK, and Canada) for my knowledge about cancer survivorship, work disability prevention, and return to work, and I am beginning to establish a leadership role in this area.

**Conference presentations.** Completed presentations include:

Austin, H., Dugan, A.G., Cavallari, J.M., Namazi, S., Swede, H., Shaw, W.S., Blank, T.O., Bellizzi, K.M., & Cherniack, M.G. (2023, November). Qualitative assessment of preferred self-care activities for employed breast cancer survivors [Poster presentation]. Work, Stress, and Health Conference, Virtual.

Hundal, J., Dugan, A., Namazi, S., Jones, Z., & Swede, H. (2023, November). Receipt of work accommodations related to longer job tenure among working breast cancer survivors. [Poster presentation]. American Society of Clinical Oncology (ASCO) Quality Care Symposium, Chicago, IL.

Dugan, A.G., & Austin, H.L. (2023, June). Using the intervention design and analysis scorecard to reduce social disconnection in cancer survivors. [Poster presentation]. Semi-annual Symposium of the Center for the Promotion of Health in the New England Workplace, Sturbridge, MA.

- Dugan, A.G., Austin, H.L., Cavallari, J.M., Namazi, S., Swede, H., Shaw, W. S, Blank, T.O., Bellizzi, K.M., Cherniack, M.G. (2023, May). Planning a social media-based peer support intervention with breast cancer survivors to improve social connectedness. [Poster presentation]. UConn Center for mHealth and Social Media's 7th Annual Conference, Storrs, CT.
- Dugan, A. G., Decker, R. E., Shaw, W. S., Cavallari, J. M., Austin, H.L., Namazi, S., Bellizzi, K. M., Blank, T. O., Tannenbaum, S. H., & Cherniack, M.G. (2022, October). *Work-related quality of life, organizational support, and intent to stay among employed breast cancer survivors*. [Paper presentation]. NIOSH 3<sup>rd</sup> International Symposium on Total Worker Health, Bethesda, MD. [Part of a three-paper full concurrent session I organized entitled *Addressing Work-Related Challenges and Unmet Needs of Cancer Survivors*].
- Hundal, J., Dugan, A., & Swede, H. (2022, September). *Sociodemographic and occupational factors associated with receipt of work accommodations among employed breast cancer survivors*. [Poster presentation]. 2022 American Society of Clinical Oncology (ASCO) Quality Care Symposium, Chicago, IL.
- Dugan, A. G., Decker, R. E., Shaw, W. S., Namazi, S., Cavallari, J. M., Cherniack, M. G., Bellizzi, K. M., & Blank, T. O. (2021, November). *Perceived organizational support for employed breast cancer survivors coping with work and health challenges*. [Poster presentation]. Bi-annual meeting of the APA/NIOSH Conference on Occupational Stress and Health, Virtual.

**C. PRODUCTS**

**C.1 PUBLICATIONS**

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

Yes

**Publications Reported for this Reporting Period**

Public Access Compliance	Citation
N/A: Not NIH Funded	Dugan AG, Decker RE, Austin HL, Namazi S, Bellizzi KM, Blank TO, Shaw WS, Swede H, Cherniack MG, Tannenbaum SH, Cavallari JM. Qualitative Assessment of Perceived Organizational Support for Employed Breast Cancer Survivors. Journal of occupational and environmental medicine. 2023 October 1;65(10):868-879. PubMed PMID: 37488771; DOI: 10.1097/JOM.0000000000002931.
N/A: Not NIH Funded	Dugan AG, Decker RE, Austin HL, Namazi S, Shaw WS, Bellizzi KM, Blank TO, Cherniack MG, Tannenbaum SH, Swede H, Hundal J, Cavallari JM. Work-health conflict among breast cancer survivors: Associations with cancer self-management, quality of life, and anticipated turnover. Occupational Health Science. 2024.

**C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)**

Not Applicable

**C.3 TECHNOLOGIES OR TECHNIQUES**

Not Applicable

**C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES**

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization? No

**C.5 OTHER PRODUCTS AND RESOURCE SHARING**

NOTHING TO REPORT

## D. PARTICIPANTS

### D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Country	SS
ADUGAN	Y	Dugan, Alicia	BA,MA,MA,PHD	PD/PI	9.0	0.0	0.0			NA
HANNAHAUSTIN	N	Austin, Hannah		Graduate Student (research assistant)	12.0	0.0	0.0			NA

#### Glossary of acronyms:

S/K - Senior/Key

Cal - Person Months (Calendar)

Aca - Person Months (Academic)

Sum - Person Months (Summer)

Foreign Org - Foreign Organization Affiliation

SS - Supplement Support

RS - Reentry Supplement

DS - Diversity Supplement

OT - Other

NA - Not Applicable

### D.2 PERSONNEL UPDATES

#### D.2.a Level of Effort

Not Applicable

#### D.2.b New Senior/Key Personnel

Not Applicable

#### D.2.c Changes in Other Support

Not Applicable

#### D.2.d New Other Significant Contributors

Not Applicable

#### D.2.e Multi-PI (MPI) Leadership Plan

Not Applicable

**E. IMPACT****E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**

Not Applicable

**E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?**

Not Applicable

**E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?**

Not Applicable

**E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?**

NOTHING TO REPORT

## G. SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

### G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

NOTHING TO REPORT

### G.2 RESPONSIBLE CONDUCT OF RESEARCH

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### G.3 MENTOR'S REPORT[CDA]

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### G.4 HUMAN SUBJECTS

#### G.4.a Does the project involve human subjects?

NA

#### G.4.b Inclusion Enrollment Data

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#### G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

### G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

Are there personnel on this project who are newly involved in the design or conduct of human subjects research?

### G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

### G.7 VERTEBRATE ANIMALS

Does this project involve vertebrate animals?

<b>G.8 PROJECT/PERFORMANCE SITES</b> Not Applicable
<b>G.9 FOREIGN COMPONENT</b> No foreign component
<b>G.10 ESTIMATED UNOBLIGATED BALANCE</b> <b>G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?</b>
<b>G.11 PROGRAM INCOME</b> Not Applicable
<b>G.12 F&amp;A COSTS</b> Not Applicable

## G.2 (Responsible Conduct of Research.pdf)

On September 19, 2023, I completed the web-based human subjects protection course offered by the Collaborative Institutional Training Initiative (CITI) and I am currently in compliance with the University of Connecticut Health Center (UCHC) Internal Review Board (IRB) requirements. The certification meets NIH training requirements for investigators conducting social/behavioral research with human subjects and covers topics including protection of research subjects, protected populations, informed consent, privacy and confidentiality, and ethical principles. As part of my ongoing education, I will maintain an up-to-date CITI certification throughout the award period, as I have continuously since 2005 when I received my first CITI certificate as a graduate student.

**Format:** The educational format includes online training modules and refresher courses provided by UConn, consultation and guided readings with mentors, and attendance at seminars and workshops offered through UCHC and at professional conferences.

**Subject Matter:** Topics include research misconduct, conflicts of interest, recruitment of subjects, data acquisition, ownership and management, responsible authorship and publication, and peer review.

**Faculty Participation:** My primary mentor (Dr. Shaw) and co-mentors (Drs. Cherniack, Bellizzi, and Blank) are all available for discussions concerning ethical issues that may arise throughout the award period, providing relevant readings, resources, and consultation as needed. They also maintain their own compliance with the University of Connecticut's Internal Review Board (IRB) requirements, including the Collaborative Institutional Training Initiative (CITI).

**Duration and Frequency of Instruction:** The duration and frequency of trainings are: 2 hours yearly for the CITI course, 1 hour bi-weekly mentor meetings, and 1 hour approximately 3 times per year for seminars and workshops.

**William S. Shaw, Ph.D.**  
**Associate Professor (retired)**  
**University of Connecticut School of Medicine**  
**263 Farmington Avenue**  
**Farmington, CT 06030-2945**

February 26, 2024

Center for Scientific Review  
National Institutes of Health  
6701 Rockledge Drive, Room 1040-MSC 7710  
Bethesda, MD 20892-7710

Subject: Dr. Alicia Dugan mentor letter, K01 final progress report

Dear colleagues:

It is my great pleasure to provide a final update on the progress of Dr. Alicia Dugan's Mentored Research Scientist Development Award (K01) from the National Institute of Occupational Safety and Health (NIOSH) on the topic of cancer survivorship and occupational outcomes. I am writing as her primary mentor on this K01 award. I recently retired from my position as Chief of the Division of Occupational and Environmental Medicine at the University of Connecticut School of Medicine, but I have retained my mentorship responsibilities throughout completion of Dr. Dugan's K01 award.

Dr. Dugan has maintained steady progress on her research and educational goals throughout the grant, and all milestones have been substantially met or exceeded except for lingering publications and dissemination activities that are still in progress. Over the life of the grant, Dr. Dugan and I have held quarterly formal meetings with her mentorship team, and I have met with Dr. Dugan individually for meetings and discussions on a bi-weekly basis. Despite some unexpected methodological challenges posed by COVID-19 restrictions and distractions, Dr. Dugan maintained steady progress and overcame barriers to complete her planned education and research. I believe these activities have been an important catalyst for her growth in the field of occupational health and have positioned her well for success as an independent researcher on future grants and projects.

During the grant period, she dedicated at least 75% of her time to her K01 project and coursework, and other organizational adjustments were made to limit distractions from this work (i.e., we reduced her teaching load and responsibilities on past research projects). Dr. Dugan has recently applied for promotion and tenure at the School of Medicine, and she will continue to dedicate a substantial amount of her time to specialized research in the interface between work and health. She plans to continue an active role in our NIOSH-funded Center for the Promotion of Health in the New England Workplace (CPH-NEW), and she is currently developing a new NIOSH R01 proposal to test intervention strategies conceptualized and piloted as part of this K01 award.

Dr. Dugan's K01 research has produced several key findings that have advanced our understanding of workplace challenges experienced by cancer survivors, and this research will serve as a critical foundation for new intervention strategies, whether offered by clinicians, employers, or peer groups. Most notably, her research has highlighted the need for organizational support from employers beyond traditional accommodation strategies and the need for continuing support and problem-solving for workers even after a full-duty return-to-work is achieved. Study results have been adeptly

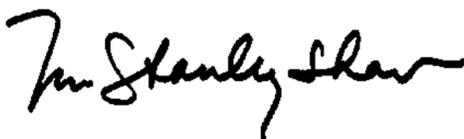
disseminated through journal publications, conference presentations, tools and resources for cancer survivors, and research briefs provided to study participants and clinicians.

Dr. Dugan made exceptional use of the educational opportunities provided by her K01 award to build on her expertise in occupational health psychology and gain new knowledge in occupational epidemiology, cancer survivorship, chronic disease management, and return-to-work. This included a combination of local, national, and international learning activities spanning formal coursework, workshops, e-learning, and guided independent study with notable experts. This also provided an important mechanism to link with other researchers, to understand more fully the policy and public health issues shaping employer and clinician practices in disability management, and to ensure that new intervention strategies are relevant and attentive to the most salient problems of workers. With these educational opportunities and the dissemination of her research, Dr. Dugan is now a recognized contributor in the fields of both Work Disability Prevention and Cancer Survivorship.

I have been especially impressed with Dr. Dugan's enthusiastic efforts to reach out to other international colleagues with related research interests to share theoretical and conceptual frameworks, methodological approaches, and survey designs. Her group of K01 mentors have been very active to direct her to other research teams, cancer interest groups, and content experts nationally and internationally. As can be seen from her list of publications, presentations, and workshops, Dr. Dugan continues to be amazingly productive and committed to improving work outcomes for workers with on-going health concerns.

These activities in research, coursework, and interdisciplinary mentorship have contributed in significant ways to Dr. Dugan's development as an independent investigator, and her interest in the work outcomes of cancer survivors has provided an important roadmap for future research in this area. As a full-time, permanent, tenure-track faculty member, Dr. Dugan has strong institutional support at the University of Connecticut School of Medicine to continue with independent research, and Dr. Dugan has demonstrated great leadership and collaboration in all elements of her work plan. This K01 award has provided a strong foundation for her to continue as a successful researcher, and I am extremely pleased with all aspects of her performance on this K01 career development award. I look forward to following her future success and leadership in the field of occupational health research.

Sincerely,

A handwritten signature in black ink that reads "William S. Shaw". The signature is written in a cursive, flowing style.

William S. Shaw, Ph.D., Associate Professor (retired)  
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Departments of Medicine and Public Health Sciences  
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### Inclusion Enrollment Report Info

Delayed Onset Study?	No
Enrollment Type	Cumulative
Using an Existing Dataset or Resource	No
Enrollment Location	Domestic
Clinical Trial	No

#### Ethnic Categories

Racial Categories	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			TOTAL
	Female	Male	Unknown/Not	Female	Male	Unknown/Not	Female	Male	Unknown/Not	
American Indian/ Alaska Native				1						1
Asian	4						1			5
Native Hawaiian or Other Pacific Islander										0
Black or African American	2						1			3
White	91	5					1			97
More Than One Race	3									3
Unknown/Not reported	8			5			2			15
<b>TOTAL</b>	<b>108</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>124</b>

## I. OUTCOMES

### I.1 What were the outcomes of the award?

This research project investigated how clinical and workplace support influences cancer survivors' quality of life and work retention. We used an exploratory mixed methods design, collecting qualitative data from (1) focus groups to identify survivors' critical needs for support to improve practice, and (2) surveys to assess hypothesized associations between key study variables.

Regarding workplace support, we found that survivors' need for flexible arrangements and reduced workloads was mostly met, while they received less support with navigating and coordinating benefits and paperwork, receiving understanding and empathy, and having sufficient time off for treatment and recovery. Further, we found that formal and informal organizational support are both associated with survivors' intent to remain in their current job, which may be explained by their perceived ability to continue meeting job demands. We also found that survivors who experienced conflict between their health and work role had poorer quality of life and more thoughts about leaving their job, and this association may be explained by survivors' constrained ability to engage in self-management behaviors needed to maintain health and reduce symptoms. Finally, we found that above and beyond cancer self-management, survivors engaged in specific self-care practices needed to support their own well-being and quality of life.

Social disconnection was found to be common among survivors following the COVID-19 pandemic, and we convened a group of survivors to plan interventions to improve social connection. A social media-based virtual peer support group with a guided set of discussions and activities was perceived to be the best potential intervention for supporting employed survivors' personal well-being, social connection, and workforce engagement, and was also perceived to have the greatest well-being benefits, reach, cost-effectiveness, and feasibility.

Similarly, we convened groups of survivors and clinicians to plan interventions for improving conflict between survivors' health and work role. We observed that both groups had similar perspectives on the support needs of employed survivors, as well as possible solutions for improving workplace and clinical support. Both populations identified the need for new clinical and workplace informational materials, enhanced clinical staffing and services to meet work-related needs, and improved work-related policy and practices (e.g., flextime policies, employee health programs, paid time off mandated, universal healthcare access).