

Overview of Accomplishments 2024

Research to Real Life

General Public
Communities
Clinicians
Researchers



Childhood Cancer & *the* Environment

A project to educate and activate health professionals to address environmental influences on childhood cancer



wspehsu.ucsf.edu

Dear Colleagues,



Highlights of where we have been and how our collaborative work during Year 2 has rippled out beyond our expectations.

I was honored to speak at a recent webinar for the Cancer Moonshot, a program of the Biden Administration with a goal to mobilize a national effort to end cancer as we know it. I emphasized that research in the last 25 years has greatly expanded our understanding of risk factors for childhood cancer. Risk factors include exposure to pesticides, traffic related air pollution, tobacco, and solvents. We also know more about protective factors including breast feeding, adequate folate early in pregnancy, and attending daycare.

Clinicians report that, though they regularly get questions about environmental exposures from their patients, they have little or no training about this and most are uncomfortable answering these questions. Only 6% said that they had been trained to take an environmental history. Fortunately, nearly all respond that they would like to know more.

In our work during this project we have discovered that clinicians want to know that the science supports a sound basis for including environmental risk factors in discussions, and they want clear action items they can implement in practice. For example, research suggests an increased risk of hospitalization for respiratory illnesses in childhood cancer survivors exposed to higher levels of particulate air pollution. Learning how to provide guidance on the use of the air quality index and home HEPA filtration provides clinicians with a way to translate the research into daily practice in survivorship clinic.

As you will see in the following report, our WSPESHU team and regional PEHSU Champions have been busy nationwide providing this information to clinicians, while we have also expanded our focus to reach out to communities and the public.

Mark Miller, MD MPH, *Project lead*

Introduction

Like ripples in a lake, we have significantly expanded our education and outreach on our *Childhood Cancer & the Environment Project*, from researchers to clinicians to communities during the second year of the project.

The scope of work has been far reaching, from developing a suite of innovative materials and trainings for community health workers (CHWs)/promotores de salud to conducting health professional workshops nationwide.

We have extended the ripples out to medical centers, hospitals, clinics and online, making the case to clinicians on why and how to reduce environmental risk factors for childhood cancer.

They broaden further to our seeding the establishment of the first-in-the-country childhood cancer and the environment consulting service at a major children's medical center.

Further yet, we have reached wider and diverse audiences via media interviews and presentations at specialty events on cancer open to parents and the public as well as scientists and clinicians.

This report will highlight where we have been and how our collaborative work during Year 2 has rippled out beyond our expectations.

Project Background

The PEHSU Network, led by the Western States PEHSU (WSPEHSU) and in collaboration with the American Academy of Pediatrics (AAP), conducted a groundbreaking education and training project *Childhood Cancer & the Environment* in 2022-2023 (officially known as POCES, the Pediatric Oncology Clinician Education Supplement). Evaluations from 50 participants from 14 states and all ten PEHSU regions were extremely positive, exceeding expectations.

Three months after the workshop, attendees' comments:

“I have a lot more respect and consideration for parental concerns about environmental factors.”

“For newly diagnosed patients, I do a more thorough history to look for environmental exposures and possible correlations between patients in similar areas.”



Three months after the workshops, 86% said that their perceptions regarding environmental risks and childhood cancer changed because of the workshop.

80%

of attendees said that they already had made changes to their clinical practice.

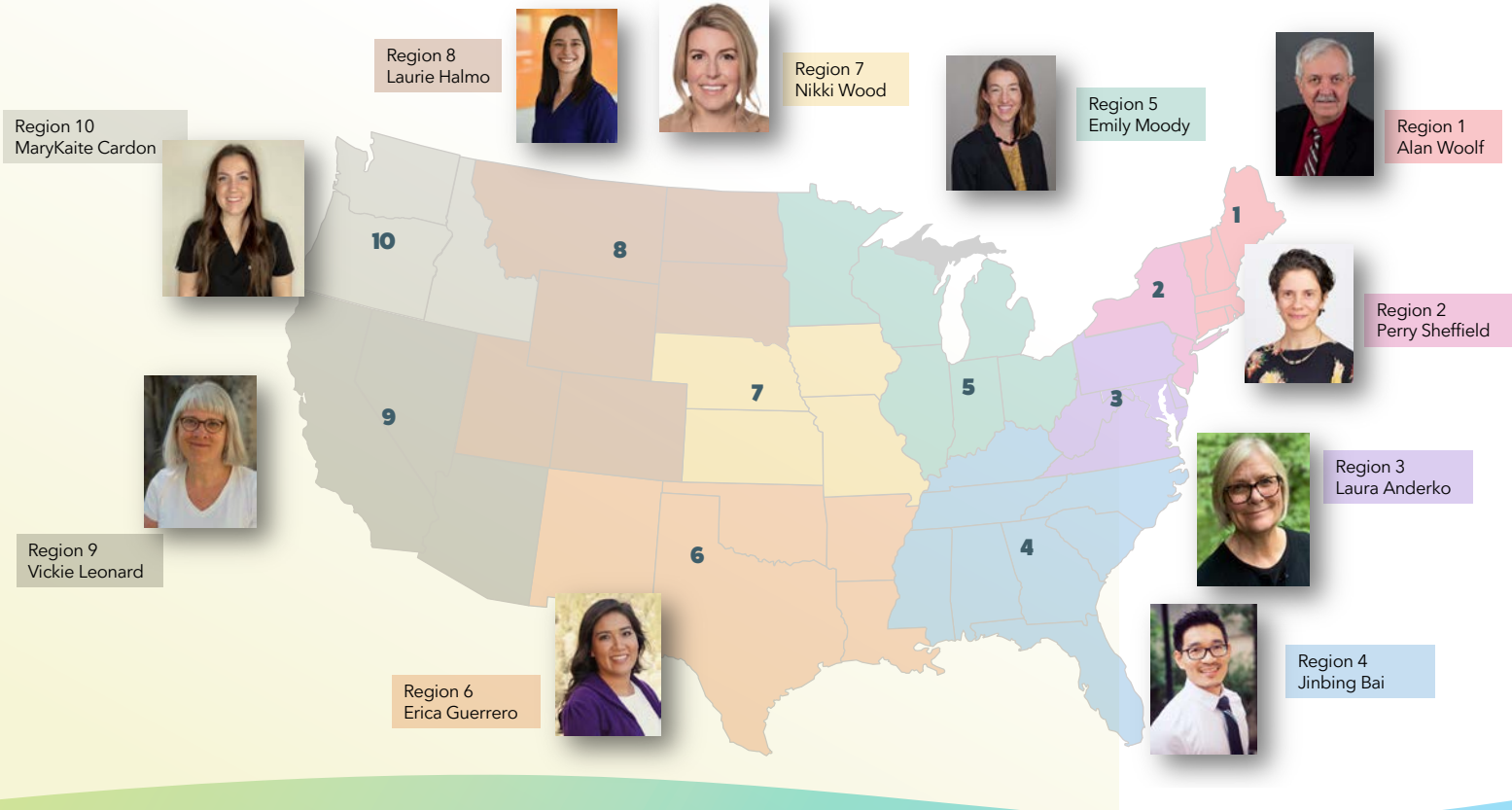


55%

55% had shared workshop materials with patients.



PEHSU Champions (by Region)



PEHSU Champions by Region

- | | | |
|---|---|--|
| 1) Alan Woolf, MD, MPH, FAAP
Boston Children’s Hospital, MA | 5) Emily Moody, MD, FAAP
Fairview M Health, Eagan, MN | 9) Vickie Leonard, NP
Western States PEHSU,
San Francisco, CA |
| 2) Perry Sheffield, MD, MPH, FAAP
Icahn School of Medicine at
Mount Sinai, NY | 6) Erica Guerrero, MS, MPAS, PA-C
Texas Tech Health Sciences Center
El Paso, TX | 10) Mary Kate Cardon, DNP, APRN, CPNP-PC
University of Washington/Northwest
PEHSU, Seattle, WA |
| 3) Laura Anderko, PhD, RN
Villanova University, PA | 7) Nikki Wood, DO, FAAP
Children’s Mercy, Kansas City, KS | |
| 4) Jinbing Bai, PhD, RN, FAAN
Emory University, Atlanta, GA | 8) Laurie Halmo, MD
Children’s Hospital of Colorado, CO | |

The initial project was designed to increase environmental health literacy among two groups:

- 1** Regional PEHSU staff to develop “champions” on this issue, and;
- 2** Pediatric oncology fellows and nurse practitioners, most of whom have had little training in environmental health and children’s cancers.

We achieved those goals and more and exceeded even our own hopes. The PEHSU Champions have been instrumental in achieving these goals.

Year 2 Goals

Year two of the project was designed to expand on the first year and to focus on the following goals:

- ▶ **Develop educational materials** and conduct “train-the-trainer” sessions for CHWs/promotores de salud to incorporate environmental health messaging into the content that is delivered in community health outreach;
- ▶ **Host regional educational events** in which regional PEHSU programs train regional clinical faculty including those involved in pediatric cancer care and general pediatrics and other clinicians;
- ▶ **Identify and invite one large, influential pediatric cancer center to participate** in a *Childhood Cancer & the Environment* training program, with the goals of:
 - 1) **Infusing environmental medicine** in the delivery of pediatric care; and
 - 2) **Creating a pediatric environmental health consulting team** within the institution’s pediatric oncology program to address families’ questions and concerns about environmental exposures as risk factors to serve as a demonstration of the value of providing this support;
- ▶ **Create a series of educational videos** distilling the *Childhood Cancer & the Environment* science curriculum into 10 to 15-minute segments for independent or blended learning.

Highlights on the following pages illustrate how we have achieved and surpassed these goals in just one short year.

Year 2 Achievements Research

screenshots from the presentation

Science Videos

Our work is built on the body of evidence that has accumulated over the past 25 years of research into environmental influences on childhood cancer. Leading researchers include Catherine Metayer MD, PhD, MPH and Joe Wiemels PhD of the [Children’s Integrative Research on Childhood Leukemia and the Environment \(CIRCLE\)](#) at the University of California, Berkeley, whose research has been key to informing the content of the *Childhood Cancer & the Environment Project*.

They have recorded a series of four 10-minute videos. They include these topics:

► **Descriptive Epidemiology and Biology of Childhood Cancers.**

This short video shows how the burden of childhood cancers varies by racial and ethnic group, suggesting the contribution of both the environment and genetic susceptibility. *Drs. Metayer and Wiemels*

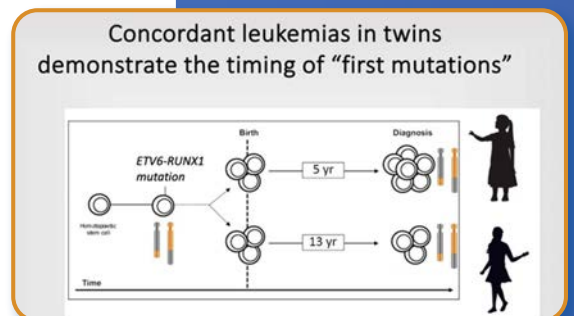
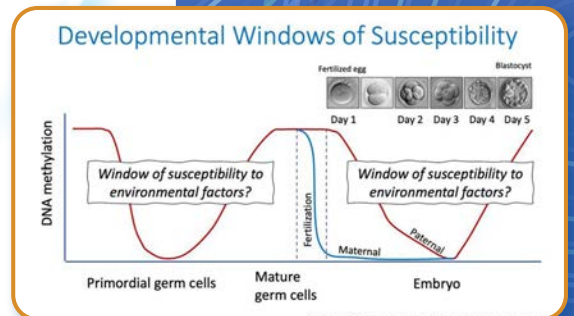
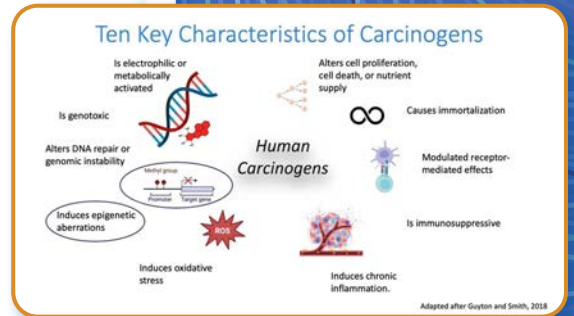
► **Indoor and Outdoor Air Pollution and Childhood Cancers.**

This video discusses how air pollution contains known carcinogens that have been linked to increased risk of several cancers in children. *Dr. Metayer*

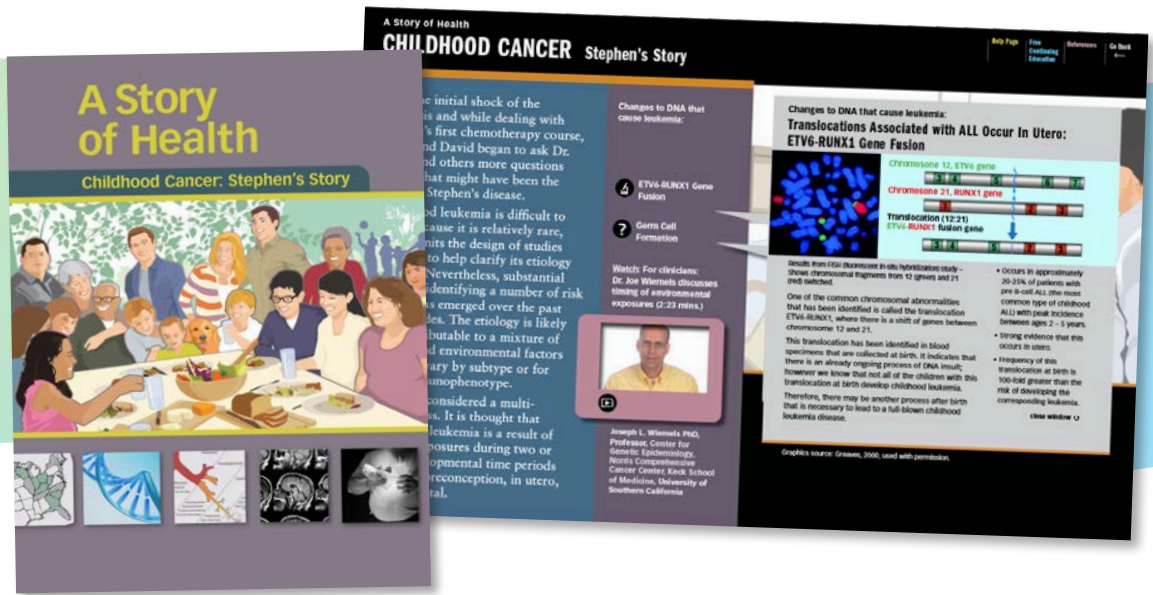
► **Germline Genetics and Childhood Cancers** – In this video we describe the two main types of genetic studies and what type of mutations such studies can discover. We also consider how an environmental exposure to tobacco can impact risk to leukemia. *Dr. Wiemels*

► **Biology of Carcinogenesis and Childhood Cancers**

This video discusses how carcinogens work via mutagenic and non-mutagenic pathways. *Dr. Wiemels*



*A Story of Health,
Childhood Cancer:
Stephen's Story*
ebook chapter



A Story of Health on Childhood Cancer

Drs. Metayer and Wiemels have also been integral to the development of our [*Story of Health* eBook chapter](#) and Continuing Education course on childhood cancer – Stephen's Story. It follows a young child with leukemia and his family as they deal with his disease. The detailed illustrated chapter with videos, additional resources and hundreds of references includes extensive reviews of the science on environmental risk factors for leukemia and other childhood cancers, from pesticides to radiation and much more. We are currently working with CIRCLE to translate the chapter into Spanish for outreach to Spanish-speaking health professionals in the US and abroad.

Clinicians

Rippling out to health professionals – educational products and presentations

The WSPEHSU and POCES Champions developed educational materials for clinicians and other health professionals including a PowerPoint presentation, scientific posters presented at two large medical meetings, and an environmental health intake form (under development) to assist health professionals in their outreach to educate and inform colleagues on environmental risks to childhood cancer.

PEHSU Champions have been using these materials to conduct presentations on childhood cancer and the environment across the country.

Health Professional PowerPoint

Drs. Nikki Wood, Emily Moody and Alan Woolf, (Champions from Regions 7, 5, and 1 respectively), led the effort to develop a PowerPoint presentation with speaker notes, *Childhood Cancer & the Environment*. The resource is designed to use in teaching presentations, grand rounds, and other sessions and covers incidence trends, vulnerabilities, and prevention strategies. With learning objectives ranging from the ‘two-hit’ theory to the impact of environmental chemicals, it provides a concise yet comprehensive understanding of childhood cancer’s environmental dimensions.

slides from the presentation

Children's Vulnerability

Why should these vulnerabilities matter to a pediatric oncologist?

Air Pollution

Embryonal Pediatric Cancer Type	OR (95% CI)
Unilateral Retinoblastoma	1.68 (0.96, 2.93)
Hepatoblastoma	1.60 (0.80, 3.20)
Neuroblastoma	1.23 (0.91, 1.67)
Wilms Tumors	1.14 (0.77, 1.68)
Bilateral Retinoblastoma	0.72 (0.33, 1.57)
ALL EMBRYONAL TUMORS	1.24 (1.00, 1.54)

Occupational and household exposures
20 studies, 1987-2014
Summary Relative Risk

Childhood leukemia	1.96	95% CI 1.53, 2.52
AML	2.34	95% CI 1.72, 3.28
ALL	1.57	95% CI 1.21, 2.05

Traffic related and gas station studies
12 studies, 1999-2014
Summary Relative Risk

Childhood leukemia	1.48	95% CI 1.10, 1.99
AML	2.07	95% CI 1.34, 3.20
ALL	1.49	95% CI 1.07, 2.08
Detail models of traffic pollution	1.70	95% CI 1.16, 2.49

Benzene

Simple aromatic hydrocarbon
Occurs naturally and from combustion
Human exposure is widespread

Group 1

Poster

The WSPEHSU developed a poster to present at the medical symposium *Updates in Occupational and Environmental Medicine* held in San Francisco. It describes Year 1 of the project and evaluation results from the workshops for pediatric oncologist fellows held in 2023. It addresses the need to improve clinicians’ environmental health literacy, and to create environmental health champions.

Dr. Wood also presented a similar poster at the *Midwest Pediatric Cancer Environmental and Survivorship Research Symposium* in Omaha, Nebraska.

Childhood Cancer & the Environment

Mark Miller MD, MPH • Victoria Leonard RN, NP, PhD • Maria Valenti
Western States Pediatric Environmental Health Specialty Unit

1 Background

The PEHSU Network, led by the Western States PEHSU (WSPEHSU), and in collaboration with the American Academy of Pediatrics (AAP), conducted a groundbreaking education and training project “Childhood Cancer & the Environment” in 2022-2023.

The project was designed to increase environmental health literacy among two groups:

- Regional PEHSU staff to develop “champions” on this issue;
- Pediatric oncology fellows and nurse practitioners, most of whom have had little training in environmental health and children’s cancers.

2 The Need

There is a growing body of literature that has implicated the role of several environmental hazards in childhood leukemia (the most common childhood cancer), including exposures to solvents, traffic air pollution, pesticides, and tobacco smoke. There are emerging connections to other cancers as well, including childhood brain cancer.

Despite the strength of these findings, clinician knowledge about this is limited.

- Though 88% of pediatric oncology providers reported getting questioned about environmental exposures, few were comfortable discussing the issues with patients.
- Over 90% said that more information on this topic would be helpful in issues with patients.

3 Methods

Five virtual trainings for champions led by experts were conducted.

Goals for the regional PEHSUs were to:

- Increase capacity to provide support to pediatricians and the public on environmental influences on childhood cancer and provide risk reduction guidance.
- Understand the approaches taken to identify cancer clusters and respond thoughtfully to community concerns about a potential cluster.

PEHSU Champions by Region

4 Results

PEHSU Champion Trainings: 100% positive response

- 100% of the ten attending said the quality was good to excellent
- 90% agreed the trainings improved their skills to provide support to pediatricians and the public on environmental influences on childhood cancer and provide risk reduction guidance to families, a major goal of the project.
- Champions have already given presentations at major clinical conferences expanding the project reach.

“My experience in the trainings has made me feel far more prepared to answer consults related to childhood cancer. I also gained really valuable information about all of the organizations that could provide support to pediatricians and the public.”

Three months post-workshop surveys revealed a 25% increase in knowledge about environmental health and childhood cancer.

Two workshops for 40 pediatric oncology fellows and nurse practitioners were held at a retreat center where they received 1 1/2 days of training by experts on environmental risk factors for childhood cancer, methods for exposure reduction, and environmental risk communication.

Goals for the pediatric oncology providers were to:

- Create a vanguard group of pediatric oncology providers with an improved awareness about environmental health contributors to children’s cancer.
- Increase efficacy amongst providers to provide information to families on environmental concerns, to respond adequately to their questions, and to identify resources to aid them in this process.

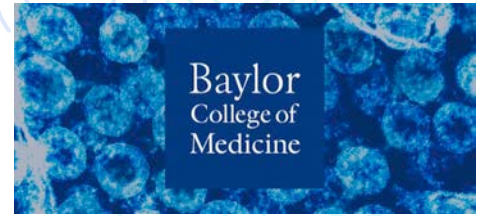
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Workshops, Clinical Presentations and Discussions

Childhood Cancer and the Environment: Practical Skills for Answering Patient & Family Questions (BCM/TCH Faculty Workshop)

Baylor College of Medicine/Texas Children’s Hospital (BCM/TCH) hosted a full day workshop conducted by POCES leaders on *Children’s Cancer & the Environment* in Houston, Texas. Speakers also included Ms. Charlie Smith, co-founder of Trevor’s Trek Foundation, who provided a parent and advocacy perspective; Nsedu Obot Witherspoon of the Children’s Environmental Health Network, who addressed environmental equity; and Suzanne Condon of the CDC who discussed unusual patterns of cancer.

Approximately 32 people attended including 22 BCM/TCH staff that included physicians, nurses and advanced practice professionals, social workers, and researchers. Since then, Drs. Nikki Wood, Alan Woolf, and Dr. Miller have met with the group led by Dr. Omar Shakeel, pediatric oncologist and head of the survivorship clinic at BCM/TCH, to help develop a childhood cancer specific environmental health history for intake. BCM/TCH has conducted a needs assessment that found that the pediatric oncology faculty and staff are very receptive to having a consultative service to help providers address environmental health questions.



“I will start taking environmental histories in survivor clinic and have better responses to my patients at diagnosis.”

“I can use this with my oncology patients and families.”

– BCM/TCH event attendees

While most faculty report getting environmental questions from patients and families, 71% report that they are not comfortable discussing environmental risk factors.



96% of faculty and staff surveyed said that a referral service will be helpful in addressing these questions and that they will use it.

Responses to Workshop Evaluation

95%
Agreement

- ▶ Information gained from the workshop will increase my ability to function in my professional role.
- ▶ I understand the potential contribution of environmental exposures to childhood cancer.
- ▶ I know about the CDC guidelines to investigate unusual patterns of cancer and environmental exposures.

"After hearing of the plan to develop the consultative service, four families (on our advisory council) reached out and expressed thanks for addressing this topic. One family even stated: 'I know many families have talked about it in the halls on the unit, but we could not find answers to this topic anywhere.'"

– Dr. Omar Shakeel
BCM/TCH Pediatric Oncologist/
Survivorship Clinic director

Professional consultative service – BCM/TCH

Drs. Mark Miller and Vickie Leonard from the WSPEHU met with seven volunteers for the proposed BCM/TCH consultative service led by Dr. Michael Scheurer (pediatric cancer epidemiologist) and Dr. Shakeel. The group included the oncologist, a nurse practitioner, a social worker, and several research coordinators. They had a wide ranging discussion about what a consultative service might look like and what resources and advice would be available.

Follow-up has been ongoing to continue the progress towards realizing an active consultative service. BCM/TCH has applied for a Texas governmental grant for four years funding to establish the clinic as well as an evaluation process. We will continue to support the project as needed. Future large institutional trainings will include representation from BCM/TCH consultative service leaders to highlight insights obtained from their program development.

Pediatric Academic Societies - Toronto, CAN

Drs. Miller, Metayer and Wiemels presented a state-of-the-art plenary on childhood cancer and the environment at the 2024 annual Pediatric Academic Societies meeting in Toronto. The session reviewed current epidemiologic literature on environmental and immune-related risk factors of childhood cancer and explored resources for incorporating environmental health knowledge and practice into routine care and public health practice. We discussed the concerns of practitioners about how to answer parental and patient questions and the role of prevention in the context of both sub-specialty and general pediatric care as well as government-sponsored educational initiatives.

New York Presentations

Regional PEHSU leaders of POCES presented a series of talks and lectures by Drs. Miller and Nikki Wood (pediatric oncologist and POCES faculty) in New York organized by Perry Sheffield (**Region 2 PEHSU** Champion). They presented Occupational Environmental Medicine and Climate Science Grand Rounds at Icahn School of Medicine at Mt. Sinai Medical Center and conducted a separate presentation/discussion with members of the Mount Sinai Pediatric Hematology/Oncology group. They also gave presentations and had productive discussions at Memorial Sloan Kettering Hospital with their Pediatric Hematology/Oncology group. Finally, they gave a talk to the Pediatric Hematology Oncology fellows and others at Westchester Medical Center/Maria Fareri Children's Hospital. The events were hosted by participants in our trainings conducted in Wisconsin last year highlighting the importance of investment in developing a network of providers interested in these issues. They reached over 60 in these events. This effort has assisted the **Region 2 PEHSU** in making connections aimed at developing collaborations with these various programs.



"19 years ago as a resident at my first PAS, I attended the hot topics talk on environment and cancer. It was nice to revisit that topic now and hear so much more is known and associated with cancer from the environment."

"This was superb and very helpful to clinical practice. We should have more like this."

– PAS attendees

Other professional presentations

POCES champions conducted numerous other presentations both in person and virtually.

Region 3 POCES champion Champion Dr. Laura Anderko presented a webinar on *Childhood Cancer & the Environment* attended by 40 participants, a mix of nurses and public health professionals. She addressed the science as well as prevention strategies when counseling families about environmental childhood cancer hazards. Participants especially appreciated the exposure reduction and prevention strategies and resources including the [WSPEHSU web page](#) of resources and the [Dirty Dozen](#) list to reduce pesticide exposure.

Dr. Wood presented at an in-person and virtual *Cancer Environmental and Survivorship Research Symposium* in Omaha, Nebraska, a platform for researchers, clinicians, and stakeholders to collaborate and exchange insights on the impact of environmental exposures on pediatric cancer incidence and survivorship.

Dr. Woolf, **Region 1**, presented *Pediatric Environmental Health Grand Rounds* at Boston Children's Hospital, promoted widely on distribution lists and social media, and attended by 50 including medical toxicology fellowship program trainees. He also presented a Rhode Island cancer cluster case and to the 40+ professional audience attending the 2023 National PEHSU Program Meeting in Atlanta, Georgia.

Region 5 Champion Dr. Moody has been forming connections with the local pediatric trainees and practitioners to offer educational talks and materials, including pediatric oncologists and pediatric oncology epidemiologists. Beyond clinical oncologists and their teams, she plans to offer education to primary care providers and pediatrics trainees. This spring she hosted a presentation by POCES faculty pediatric oncologist Dr. Nikki Wood.

slides from the presentation

A focus on environmental exposures:

Outdoor air pollution



Pesticides



Indoor air pollution, including tobacco smoke



Solvents/volatile organic compounds (VOCs)



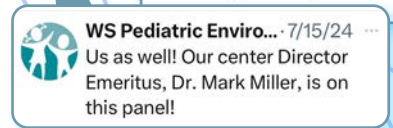
Clinicians/Public

Further ripples – Professional/Public presentations

In addition to presentations to clinicians, our work has rippled out to the general public, parents and families of children with cancer. For example, Dr. Miller presented at both the **Childhood Cancer Prevention Symposium** and the **Cancer Moonshot** webinar, both open to all.

Dr. Miller joined with other scientific experts, clinicians, researchers, agency officials, childhood cancer advocacy organizations, families, and business leaders in Washington, DC for the Inaugural **Childhood Cancer Prevention Symposium**. Presentations and panel discussions involved: Resources for Prevention Research and the Environment; Environmental Exposures and Childhood Cancer Risks (by Dr. Miller); Genetics and Early Detection; Preventing Adverse Outcomes and Late Effects; and Community/Advocacy Session.


The **Cancer Moonshot** program was established by the Biden Administration with a goal to mobilize a national effort to end cancer as we know it. Dr. Miller spoke on a webinar **Understanding of Environmental Exposures in Cancer by Strengthening Clinical, Government, and Community Partnerships** sponsored by the Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR). He described the results to date of the project and participated in a Q&A session.



Communities

Further afield - Community Outreach – Materials and Presentations

Flipbook: Una herramienta para los promotores de salud



- Este es el libro animado que creamos para *El cáncer infantil y el medio ambiente*.
- El lado que mira hacia usted tendrá su “guión” con la información necesaria.
- El lado que mira hacia su audiencia/miembros de la comunidad tendrá las imágenes simplificadas y las viñetas relacionadas con la información que cubrirá.

“Get the facts about reducing risk of childhood cancer.” Presentation slide showing learner and educator views of the training tool.

“The flip books have been a resounding success, with participants eagerly requesting multiple copies.”

– Erica Guerrero, MS, MPAS, PA-C,
Region 6

Innovative Materials: Flipbooks and PowerPoints in English and Spanish

We developed a series of illustrated materials including “flipbooks” and accompanying PowerPoints to help community health workers CHWs/promotores de salud educate parents and caregivers about environmental influences on childhood cancers. The 35-page flipbooks stand up on a table and feature Educator and Learner pages that are used in the train-the-trainer sessions and are designed for use in community education. They are available in English and Spanish. The audience uses the flipbooks and the trainer can use either the flipbook itself or the slides to present to the audience. The engaging content, featuring numerous colorful graphics, covers the basics on childhood cancer, children’s vulnerabilities to environmental pollutants and then goes into risk factors and prevention strategies on topics including pesticides, air pollution, solvents and nutrition.



“Get the facts about childhood cancer” illustrated factsheet for doctors and patients, translated in Spanish.

Other resources

We also translated into Spanish our fact sheet on childhood cancer and the environment, and developed handouts for activities at the trainings.

Trainings

CHWs/promotores de salud are dedicated to improving their communities and serve as trusted bridges between health professionals and community members. They can help improve health outcomes and promote health equity, particularly in underserved communities. We believe it is vital that we reach out to communities with information on environmental influences on childhood cancer so that families can understand how to avoid risk factors and protect their children.

Participants in workshops and trainings have expressed an eagerness for more information, reflected in evaluation comments from both trainers and CHWs/promotores de salud.

Our materials have already been well-received at trainings in Regions 6 and 10 (Texas and Washington state), and are scheduled in Region 7 for the near future.

In Region 6, the Southwest Center for Pediatric Environmental Health hosted trainings for CHWs in El Paso and Laredo Texas with attendees from Texas and New Mexico. Most had not been educated on the potential contribution of environmental exposure to childhood cancer in the past.



“Promotores are always a lively group to train, with rooms bustling with laughter and ‘charla’ (lively talk). Training this group is a profound and fun experience beyond the simple transfer of knowledge. It is a catalyst for growth, learning, and development, creating ripples of positive change in the communities they serve.”

– Erica Guerrero, MS, MPAS, PA-C, Region 6



According to Erica Guerrero, MS, MPAS, PA-C of Region 6, “We have successfully trained a total of 152 individuals in our region. The trainings in El Paso have sparked a significant demand for more education, highlighting the importance of the project and interest in the topic. We have scheduled a virtual training in Spanish, and we are pending an in-person training in New Mexico.”

A half-day virtual training on “Childhood Cancer as it Relates to Our Environment and Keeping Farmworkers and their Families Protected from Pesticides” was also conducted by Region 6 leaders for community health workers, promotores, early childhood educators and public health professionals working directly with the community.

All respondents to two virtual trainings in Region 10, Washington, were also very positive about the sessions, and either agreed or strongly agreed that after the training they better understand potential contributions of environmental exposures on childhood cancer, that children are more vulnerable to environmental toxicants, and that minimizing environmental exposures may reduce the risk for childhood cancer. The webinar trainings were conducted to a mix of CHWs, CHW program managers and public health specialist.

According to Champion Dr. MaryKate Cardon, “One attendee said that they could think of several CHW style organizations in areas with many farmworker families that would be interested in receiving this training, particularly because pesticide exposure is of great concern in these communities.”

Scene from a training for CHWs in Texas

“Ahora se más de este tema gracias a ustedes. (Now I know more about this topic thanks to you).”

– Promotore participant in El Paso training

“This was a very well organized, informed, and engaging presentation. I can’t wait to share with others.”

– Washington virtual training CHW

General Public

Media outreach – more rippling out the general public

We have reached out to wider and diverse audiences with several in-depth radio/podcast interviews and an extensive blog piece by well-established and esteemed interviewers. We have also developed a series of [web pages](#) with numerous resources and materials, including facts sheets, videos and more, free to download. Highlights include:

Mass Media

[Poisoning our Children](#) blog hosted by Jean-Marie Kauth, with guest Mark Miller, MD, MPH, “Stalwart Defender of Children’s Environmental Health.”

This interview with Dr. Miller goes in-depth into his personal journey into becoming an environmental health expert and pediatrician and his many influences along the way.

[Well Beyond Medicine – The Nemours Children’s Health Podcast](#) hosted by Carol Vassar. Environmental Factors and Childhood Cancer, guests include Mark Miller, MD, MPH; Catherine Metayer, MD, PhD, MPH; and Joseph Wiemels, PhD.

This episode focuses on the growing body of literature that has implicated the role of several environmental hazards in childhood cancer, such as exposure to pesticides, vehicle exhaust, gasoline, and tobacco smoke, all of which can increase the risk of a childhood cancer diagnosis. Speakers discuss a new training program developed by the WSPEHSU which aims to support and educate physicians so they, in turn, can offer practical guidance to parents and caregivers on how to prevent exposure to toxic chemicals associated with childhood cancer risk.

blog post graphics



Social media graphics



Social Media

We have conducted outreach throughout the year via the WSPEHSU social media accounts and have been supported in outreach by our collaborator and valuable ally this year the Children’s Environment and Health Network (CEHN). CEHN’s director Nsedu Obot Witherspoon has spoken compellingly on environmental justice and related topics at several of our events and continues to promote our work.

Miranda Kahn, a Los Angeles-based paper artist and stop motion animator, has developed several very short videos on ways to reduce the risk of childhood cancer in our children before conception and early in pregnancy. These videos are intended for use on social media and in presentations to communities.

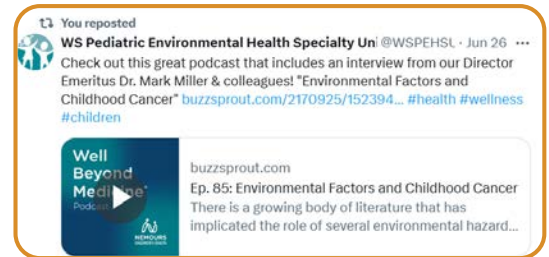
The first video is based on her 10-minute shadow puppet video Love in the Time of Toxicants. It’s a 2-minute extract video – in English and Spanish

Kahn also created an original stop motion animation educational/social media video highlighting the benefits of proper nutrition and risks of pesticides, and solvents/VOCs. The videos are made with original hand-cut paper and are available as a single two-minute video and broken down into one-minute sections. They include the following, all in English and Spanish:

▶ *Nutrition and Risks of Pesticides and Solvents/VOCs – 2 minutes*

Individual excerpted topics, one-minute each:

- *The importance of proper nutrition in preventing disease.*
- *Avoiding exposure to pesticides.*
- *Avoiding exposure to solvents/VOCs.*



Social media videos



Newsletters

In order to follow-up with clinicians who attended our 2023 workshops in Wisconsin, as well as others interested in environmental influences on childhood cancer and PEHSU Champions, we developed two [newsletters](#) in conjunction with the Children's Environment and Health Network (CEHN). The general newsletter has over 150 subscribers and the Champions 25. They have been very favorably received with extremely high open rates averaging over 75%. They cover topics including Key Concepts on childhood cancer, "Insights from the Field" authored by PEHSU leaders who share information and advice on presentations they have given, and additional resources and recent research papers.

Promotores newsletter

The Region 9 bilingual [Children's Environmental Health](#) Newsletter for CHWs/promotores de salud July issue is on environmental causes of childhood cancer. The September newsletter discusses practical steps parents and caregivers can take to reduce exposures to chemicals associated with childhood cancer risk and other adverse health outcomes.



The Next Wave

Moving Forward

We plan to build on the success of the past two years with expanded activities in our third year including additional community outreach, expanding our POCES faculty, speaking at key clinical conferences, continue building the online library, publishing commentaries and reviews in peer reviewed literature, and continuing to build a network of medical centers with whom we may support the development of consultative services on environmental influences on childhood cancer. ■

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