



WellSpring

Sharing physical
activity knowledge

CENTRE FOR ACTIVE LIVING • APRIL 2019 • VOLUME 30 • NUMBER 04

Exercise helps kids with cancer

Exercise guidelines, research, and practice in pediatric oncology

Amanda Wurz, PhD, Post-Doctoral Fellow; **Conné Lategan**, Undergraduate Honours Student; **Lotta Hamari**, PhD, Post-Doctoral Fellow; **Kate Wilson**, Research Coordinator; and **S. Nicole Culos-Reed**, PhD, Professor and Associate Dean Graduate, Faculty of Kinesiology, University of Calgary

Role of exercise in pediatric oncology

Exercise for children diagnosed with cancer is beneficial for many reasons. Not only is it safe, but exercise can also positively impact many of the negative physical effects of the disease and its treatments.¹⁻³ For example, during treatment, many children gain weight, report problems with their motor performance and development, and have a range of concerns related to the health of organs — such as the heart. Research has shown that exercise during and after treatment can assist with weight management, improve motor performance, and enhance cardiovascular functioning.⁴⁻⁷

In addition to impacting the physical effects of cancer and its treatments, exercise can also promote mental health and wellbeing during and after treatment, by helping children feel empowered and strong, experience a sense of normalcy, and connect with similar clients, their friends, and/or their family.⁸ Ultimately, these benefits suggest exercise can promote psychological health and social functioning during and after treatment.

Knowledge translation

In light of the benefits exercise can offer, we are actively looking for ways to ensure all children with cancer have access to exercise opportunities. This is called “knowledge translation”, and simply put, it means taking what we learn in our research studies and moving it into practice.

In Calgary, this knowledge translation includes ensuring families have access to evidence-based exercise resources, education, and programs. This includes, the Pediatric cancer survivors Engaging in Exercise for Recovery (PEER) program, Yoga Thrive for Youth (YTY), and the Pediatric Oncology Exercise Manual (POEM).

S U M M A R Y

Exercise among cancer patients has many physiological, mental, and social wellbeing effects during and after treatments.

This WellSpring highlights the various programs that support free physical activity opportunities developed for children and youth that have been diagnosed with cancer, survivors of pediatric cancer, and their siblings, as a means to support and empower them to be physically active and experience a sense of normalcy.

Pediatric cancer survivors Engaging in Exercise for Recovery (PEER)

PEER is a free physical activity program developed for children and youth (2-17 years of age) who have been diagnosed with any type or stage of cancer, survivors of pediatric cancer, and their siblings. This program was launched in May 2012 by a multidisciplinary team, including a pediatric oncologist, psychologist, physiotherapist, exercise physiologist, and a cancer and exercise expert in the Thrive Centre at the University of Calgary.

There are currently three age groups in the program: preschool (2-5 years), school (6-10 years), and teen (11-18 years). Each session is overseen by an exercise physiologist, pediatric nurse, and volunteers to ensure safety and program goal development.

The main goals of this program are to decrease physiological deconditioning, enhance physical literacy and quality of life, and empower children and youth to become physically active and eventually re-integrate into community-based sport and recreation. To ensure program sustainability, the program is in partnership with the Kids Cancer Care Foundation of Alberta.



Veronica, 6 years old.

Exercise can positively impact many of the negative physical effects of cancer and its treatments.

Yoga Thrive for Youth (YTY)

YTY is a fun, beneficial, and safe community-based yoga program for pediatric cancer patients, survivors, and their siblings. YTY is delivered in a 12-week group program that provides participants with individualized attention in a small group setting.

Classes aim to improve participants' quality of life by increasing physical fitness, cultivating greater self-esteem, and promoting creativity and relaxation. YTY classes also provide participants with a nurturing space for healing and a vibrant environment for building new friendships.

All YTY classes are taught by certified yoga instructors who follow an evidence-based protocol developed by the Health and Wellness Lab. The research undertaken to develop the YTY program explored the health benefits of a modified therapeutic yoga program for this population.

Pediatric Oncology Exercise Manual (POEM)

POEM was created as an **educational resource**, with versions for both families and healthcare providers (www.ucalgary.ca/poem). POEM also has infographics developed to summarize the chapters in an "easy to understand" format. Interest in POEM has resulted in numerous translations of documents, for implementation in both clinical and community-based settings. POEM is downloadable as a PDF, and the translational work can be found at: www.ucalgary.ca/poem/resources.

Even more...

Can we get children with cancer moving all over the world?

Several factors must be taken into account when developing strategies to improve the physical activity participation rates of childhood cancer patients and survivors. The current state of the research suggests there is a pressing need to provide **evidence-based guidelines** for those working with this population to promote physical activity participation and **evidence-based recommendations** for children with cancer.

As a result, we have created and are leading the International Pediatric Oncology Exercise Group (iPOEG) to develop evidence-based guidelines and recommendations for exercise in childhood cancer patients and survivors. These guidelines will not only serve as a tool for enhancing awareness around the benefits of physical activity during the pediatric cancer journey, but will also establish a common criterion for exercise prescription in pediatric cancer populations.



Kenzie, 8 years old.

In order to generate these guidelines, we first identified the exercise programs that are being offered worldwide,⁹ finding 46 programs being offered in 10 countries, including our own PEER and YTY. Second, we have started learning about the process of knowledge translation from those who successfully translated knowledge. Finally, we have assembled a core team of nine researchers in pediatric oncology and exercise, and a larger team of over 100 key stakeholders, including researchers, healthcare providers, and program developers from all over the world to help us prepare exercise guidelines and recommendations.

Using the Delphi process,^{10,11} we are currently building consensus for the guidelines and recommendations content. This process will culminate with an in-person meeting in Banff, Alberta in September 2019, with the core team, patient/family representatives, and additional healthcare providers, to provide input for the finalization of the iPOEG guidelines and recommendations.

Take home message

The current state of evidence supports the role of exercise in pediatric oncology for providing physical, functional, and psychosocial benefits. However, concerted knowledge translation efforts are required to ultimately enhance quality of life. These efforts can include programs, educational resources, guidelines, and recommendations.

In Calgary, we are committed to ensuring the accumulating evidence makes its way into practice. Our current programs (PEER and YTY) and resources (POEM), and future work developing exercise guidelines and recommendations specifically for children with cancer, is a critical part of this knowledge translation.

Developing international consensus (iPOEG guidelines and recommendations) will also continue to facilitate research networks so that we can extend our reach to ensure more children with cancer have access to safe and beneficial exercise opportunities.

Exercise can help children feel empowered and strong, experience a sense of normalcy, and connect with similar clients, their friends, and/or their family.

Visit the Health and Wellness Lab's website for further information on

- PEER (www.ucalgary.ca/healthandwellnesslab/programs/peer),
- YTY (www.ucalgary.ca/healthandwellnesslab/programs/yoga-thrive-youth),
- POEM (www.ucalgary.ca/poem),
- or contact Dr. Carolina Chamorro-Vinã at cchamorro@kidscancercare.ab.ca.

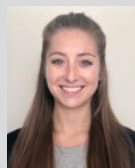
Acknowledgements: Funding support to the first author (AW) was provided from a CIHR Post-Doctoral Fellowship.

ABOUT THE AUTHORS

Amanda Wurz, PhD, is a Post-Doctoral Fellow with the Faculty of Kinesiology at the University of Calgary. She is a physical activity promotion researcher, with a focus on children, adolescents, and young adults diagnosed with cancer.



Conné Lategan is an undergraduate honours student with the Faculty of Kinesiology at the University of Calgary. Her honours project focused on the development of the Pediatric Oncology and Exercise Guidelines with Drs. Culos-Reed, Wurz and Chamorro-Vinã. She is also a student volunteer with the PEER program.



Lotta Hamari, PhD, is a Post-Doctoral Fellow with the Faculty of Kinesiology at the University of Calgary and with the Department of Nursing Science at the University of Turku in Finland. She is a physical activity and rehabilitation researcher, with a focus on health technology and childhood cancer.



Kate Wilson is the Research Coordinator with the Health and Wellness Lab in the Faculty of Kinesiology at the University of Calgary.



S. Nicole Culos-Reed, PhD, is a Professor and Associate Dean Graduate with the Faculty of Kinesiology at the University of Calgary. She is a health behaviour change researcher, with a focus on cancer and exercise.



References

1. Gawade PL, Hudson MM, Kaste SC, et al. A systematic review of selected musculoskeletal late effects in survivors of childhood cancer. *Curr Pediatr Rev*. 2014;10(4):249-262.
2. de Fine Licht SD, Rugbjerg K, Gudmundsdottir T, et al. Long-term inpatient disease burden in the adult life after childhood cancer in Scandinavia (ALiCCS) study: a cohort study of 21,297 childhood cancer survivors. *Plos Medicine*. 2017;14(5).
3. Huang IC, Hudson MM, Robison LL, Krull KR. Differential impact of symptom prevalence and chronic conditions on quality of life in cancer survivors and non-cancer individuals: a population study. *Cancer Epidemiol Biomarkers Prev*. 2017;26(7):1124-1132. doi: 10.1158/1055-9965.EPI-16-1007.
4. Buffart LM, Kalter J, Sweegers MG, et al. Effects and moderators of exercise on quality of life and physical function in patients with cancer: An individual patient data meta-analysis of 34 RCTs. *Cancer Treat Rev*. 2017;52:91-104. doi: 10.1016/j.ctrv.2016.11.010.

References (con't.)

5. Mizrahi D, Wakefield CE, Fardell JE, et al. Distance-delivered physical activity interventions for childhood cancer survivors: A systematic review and meta-analysis. *Crit Rev Oncol Hematol*. 2017;118:27-41. doi: 10.1016/j.critrevonc.2017.08.008.
6. Bourdon A, Grandy SA, Keats MR. Aerobic exercise and cardiopulmonary fitness in childhood cancer survivors treated with a cardiotoxic agent: a meta-analysis. *Support Care Cancer*. 2018;26(7):2113-2123. doi: 10.1007/s00520-018-4208-z.
7. Zucchetti G, Rossi F, Chamorro Vina C, Bertorello N, Fagioli F. Exercise program for children and adolescents with leukemia and lymphoma during treatment: A comprehensive review. *Pediatr Blood Cancer*. 2018;65(5):e26924. doi: 10.1002/pbc.26924.
8. Rustler V, Hagerty M, Daeggelmann J, Marjerrison S, Bloch W, Baumann FT. Exercise interventions for patients with pediatric cancer during inpatient acute care: A systematic review of literature. *Pediatr Blood Cancer*. 2017;64(11). doi: 10.1002/pbc.26567.
9. Wurz A, Daeggelmann J, Albinati N, Kronlund L, Chamorro-Vina C, Culos-Reed SN. Physical activity programs for children diagnosed with cancer: an international environmental scan. *Support Care Cancer*. 2019;27(4):1153-1162. doi: 10.1007/s00520-019-04669-5.
10. RAND Corporation. Delphi method. RAND Corporation. <https://www.rand.org/topics/delphi-method.html>. Published November 2013. Updated March 2019. Accessed March 15, 2019.
11. Maher TM, Whyte MK, Hoyles RK, et al. Development of a consensus statement for the definition, diagnosis, and treatment of acute exacerbations of idiopathic pulmonary fibrosis using the delphi technique. *Adv Ther*. 2015;32(10):929-943. doi: 10.1007/s12325-015-0249-6.

