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STUDY SCAN



Childhood Cancer Survivorship Magazine



Late Effects by High-Dose Methotrexate

Risk of Subsequent Gliomas and Meningiomas

The St. Jude Children's Research Hospital After Completion of Therapy Clinic

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STUDY SCAN UNDER THE SCOPE

EDITORIAL >

HELLO!

It is time for a new issue of Study Scan and here we go!

If you are interested in latest publications about childhood cancer survivorship then you should read our magazine.

Study Scan has a new online home. From now on you can find it for download on the LESS' website. We needed to do this because of some changes in administration but we would like to take the opportunity saying thank you to cancerpointe for helping us spread the word and hosting Study Scan from the beginning.

Thanks to everyone for being our readers of Study Scan. 2024 is the fourth year for our magazine.

Christian Müller



Prof. Dr. med. Thorsten Langer

ARTICLES >

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RESEARCH >

SUBSEQUENT RISK FOR GLIOMAS

Childhood cancer survivors are at risk of subsequent gliomas and meningiomas, but the risks beyond age 40 years are uncertain. These risks were now quantified in the largest ever cohort.

Clinicians following up survivors should be aware that the substantial risks of meningioma and glioma following CRT are sustained beyond age 40 and be vigilant for symptoms.

Find out more on page 45 or scan the following qr-code.





You are not alone with issues from treatment.

CHILDHOOD CANCER SURVIVOR (ANONYMOUS)



WHAT MATTERS TO YOU? ENGAGING WITH CHILDREN IN THE JAMES LIND ALLIANCE CHILDREN'S CANCER PRIORITY SETTING PARTNERSHIP

Susie Aldiss, Penelope Hart-Spencer, Loveday Langton, Sonia Malik, Keeley McEvoy, Jessica E Morgan, Rosa Reed-Berendt, Rachel Hollis, Bob Phillips, Faith Gibson, James Lind Alliance Children's Cancer Priority Setting Partnership Steering Group

Res Involv Engagem; doi: [10.1186/s40900-023-00518-2](https://doi.org/10.1186/s40900-023-00518-2)



BACKGROUND

Previous priority setting exercises have sought to involve children, but in the final reporting, it is evident that few children had been engaged through the process. A primary aim in the Children's Cancer Priority Setting Partnership was to find out from children what they want research to focus on. We report on our experience to inform methods of engagement with children in future James Lind Alliance Priority Setting Partnerships and similar exercises.

METHODS

We followed the James Lind Alliance process, collecting and shortlisting questions via online surveys with adult survivors of childhood cancer, carers, and professionals, and holding a final workshop. Alongside this, a parallel process to collect and prioritise questions from children was undertaken. We created animations for parents/carers to explain the project and surveys to children, gathered questions via online surveys and held a workshop with children to identify their priorities.

RESULTS

Sixty-one children and young people with cancer and 10 siblings, aged 3-21 years, submitted 252 potential questions/topics via the surveys. Submissions were refined into 24 summary questions. These questions were discussed at a workshop with eight children; they also added more questions on topics of importance to them. Workshop participants prioritised the Top 5 questions; top priority was, 'How can we make being in hospital a better experience for children and young people? (like having better food, internet, toys, and open visiting so other family members can be more involved in the child's care)'. The Top 5 also included cancer prevention, treatments closer to home, early diagnosis, and emotional support. These questions were taken to the final workshop at which the Top 10 priorities were decided, all five children's priorities were reflected in the final Top 10.

CONCLUSIONS

We have demonstrated that it is possible to successfully involve children directly in setting priorities for future research. Future priority setting exercises on topics relevant to children, should seek to include their views. The Children's Cancer Top 10 priorities reflect the voices of children and should inform the funding of future research.

POST-TRAUMATIC GROWTH IN PARENTS OF LONG-TERM CHILDHOOD CANCER SURVIVORS COMPARED TO THE GENERAL POPULATION: A REPORT FROM THE SWISS CHILDHOOD CANCER SURVIVOR STUDY-PARENTS

Julia Baenziger, Katharina Roser, Luzius Mader, Anica Ilic, Ursula M Sansom-Daly, André O von Bueren, Eva Maria Tinner, Gisela Michel

Psychooncology; doi: [10.1002/pon.6246](https://doi.org/10.1002/pon.6246)

OBJECTIVE

Post-traumatic growth (PTG) describes perceived positive changes following a traumatic event. We describe (i) PTG in parents of long-term childhood cancer survivors (CCS-parents) compared to parents of similar-aged children of the general population (comparison-parents), (ii) normative data for the Swiss population, and (iii) psychological, socio-economic, and event-related characteristics associated with PTG.

METHODS

CCS-parents (aged ≤ 16 years at diagnosis, ≥ 20 years old at study, registered in the Childhood Cancer Registry Switzerland (ChCR), and the Swiss population responded to a paper-based survey, including the PTG-Inventory (total score 0-105). We carried out (i) t-tests, (ii) descriptive statistics, and (iii) multilevel regression models with survivor/household as the cluster variable.

RESULTS

In total, 746 CCS-parents (41.7% fathers, response-rate = 42.3%) of 494 survivors (median time since diagnosis 24 (7-40) years), 411 comparison-parents (42.8% fathers, 312 households), and 1069 individuals of the Swiss population (40.7% male, response-rate = 20.1%) participated. Mean [M] total PTG was in CCS-parents $M = 52.3$ versus comparison-parents $M = 50.4$, $p = 0.078$; and in the Swiss population $M = 44.5$. CCS-parents showed higher 'relating-to-others' (18.4 vs. 17.3, $p = 0.010$), 'spiritual-change' (3.3 vs. 3.0, $p = 0.038$) and 'appreciation-of-life' (9.3 vs. 8.4, $p = 0.027$) than comparison-parents, but not in 'new-possibilities' and 'personal-strength'. Female gender, older age, higher post-traumatic stress, and higher resilience were positively associated with PTG. Individuals reporting events not typically classified as traumatic also reported growth.

CONCLUSIONS

Our findings highlight that mothers and fathers can experience heightened growth many years after their child's illness. Being able to sensitively foreshadow the potential for new-possibilities and personal development may help support parents in developing a sense of hope.

THE ASSOCIATION OF ENVIRONMENTAL FACTORS WITH NEUROCOGNITIVE OUTCOMES IN SURVIVORS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

Julia Baenziger, Katharina Roser, Luzius Mader, Anica Ilic, Ursula M Sansom-Daly, André O von Bueren, Eva Maria Tinner, Gisela Michel

Support Care Cancer; doi: [10.1002/pon.6246](https://doi.org/10.1002/pon.6246)

PURPOSE

To investigate the association of environmental factors, rehabilitation services during therapy and socioeconomic status (SES - insurance type), with neurocognitive outcomes at the end of therapy for survivors of childhood acute lymphoblastic leukemia (ALL).

METHODS

Survivors (n = 236) treated on the St. Jude Total Therapy Study 16 completed end of therapy testing with performance measures (IQ, attention, processing speed, fine motor skills, academics) and caregiver ratings (attention, executive function, adaptive skills). Environmental factors were abstracted from the medical record.

RESULTS

Distribution of sex (47.3% female, p = 0.399), treatment arm (45.5% low risk, 54.5% standard/high risk p = 0.929), insurance type (47.7% private, 52.3% public/none, p = 0.117), and mean age at diagnosis (7.7 vs. 6.8 years, p = 0.143) were similar for groups with (n = 110; 46.6%) and without (n = 126; 53.6%) rehabilitation services during therapy.

Compared to those without rehabilitation, the rehabilitation group (n = 110; 46.4%) had more caregiver reported problems with attention (Z = -0.28 vs. 0.43, p = 0.022), executive function (Z = -0.50 vs. -0.08, p = 0.003), and adaptive skills (Z = -0.41 vs. -0.13, p = 0.031). Among the rehabilitation group, there was no difference in outcomes by insurance status. Among those without rehabilitation, those with public insurance had worse neurocognitive outcomes than those with private insurance in IQ (Z = -0.04 vs. -0.45, p = 0.0115), processing speed (Z = -0.10 vs. -0.75, p = 0.0030), reading (Z = 0.18 vs. -0.59, p < 0.0001), and math (Z = -0.04 vs. -0.50, p = 0.0021).

CONCLUSION

Participation in rehabilitation services during early intensive therapy is associated with end of therapy caregiver-reported neurocognitive outcomes in daily life.

EUROPEAN RECOMMENDATIONS FOR SHORT-TERM SURVEILLANCE OF HEALTH PROBLEMS IN CHILDHOOD, ADOLESCENT AND YOUNG ADULT CANCER SURVIVORS FROM THE END OF TREATMENT TO 5 YEARS AFTER DIAGNOSIS: A PANCARE GUIDELINE

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J Cancer Surviv; doi: [10.1007/s11764-023-01493-z](https://doi.org/10.1007/s11764-023-01493-z)



PURPOSE

Childhood, adolescent and young adult (CAYA) cancer survivors require ongoing surveillance for health problems from the end of cancer treatment throughout their lives. There is a lack of evidence-based guidelines on optimal surveillance strategies for the period from the end of treatment to 5 years after diagnosis. We aimed to address this gap by developing recommendations for short-term surveillance of health problems based on existing long-term follow-up (LTFU) care guidelines.

RESULTS

The working group developed 44 recommendations for short-term surveillance of health problems, which were divided into four categories based on the level of surveillance required: awareness only (n = 11), awareness, history and/or physical examination without surveillance test (n = 15), awareness, history and/or physical examination with potential surveillance test (n = 1) and awareness, history and/or physical examination with surveillance test (n = 17).

CONCLUSION

The development of a guideline for short-term surveillance of health problems fills a critical gap in survivorship care for CAYA cancer survivors, providing much-needed support immediately after treatment up to 5 years after diagnosis.

IMPLICATIONS FOR CANCER SURVIVORS

This guideline will support healthcare professionals to provide appropriate follow-up care and improve the quality of life of CAYA cancer survivors.

ASSOCIATION OF HEARING LOSS WITH PATIENT-REPORTED FUNCTIONAL OUTCOMES IN ADULT SURVIVORS OF CHILDHOOD CANCER

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J Natl Cancer Inst; doi: [10.1093/jnci/djad250](https://doi.org/10.1093/jnci/djad250)

BACKGROUND

Hearing loss (HL) is prevalent following ototoxic therapy for childhood cancer. Associations between HL, self-perceived hearing handicap, and functional outcomes have not been examined in survivors.

METHODS

Adult survivors treated with platinum or head/neck radiotherapy with HL were recruited. Two hundred thirty-seven survivors (median[range] age at survey 37.0[30.0–45.0] years, 29.1[22.4–35.0] years since diagnosis, 4.0[2.9–7.7] years from last audiogram to survey) completed the Hearing Handicap Inventory for Adults and questionnaires on social and emotional functioning and hearing aid (HA) use. Hearing loss severity was defined according to Chang criteria. Multivariable logistic regression models estimated odds ratios (OR) and 95% confidence intervals (CI) for associations between HL, hearing handicap, functional outcomes, and HA use with adjustment for sex, race, age at HL diagnosis, and age at survey.

RESULTS

Two-thirds of survivors had severe HL, which was associated with increased likelihood of hearing handicap (mild-moderate handicap: OR = 2.72, CI 1.35–5.47; severe handicap: OR = 5.99, CI 2.72–13.18). Survivors with severe hearing handicap had increased likelihood of social isolation (OR = 8.76, CI 3.62–21.20), depression (OR = 9.11, CI 3.46–24.02), anxiety (OR = 17.57, CI 3.77–81.84), reduced personal income (OR = 2.82, CI 1.46–5.43), and less than full-time employment (OR = 2.47, CI 1.30–4.70). Survivors who did not use a recommended HA were twice as likely to have less than full-time employment (OR = 2.26, CI 1.10–4.61) and reduced personal income (OR = 2.24, CI 1.08–4.63) compared to survivors who wore a HA.

CONCLUSION

Self-perceived hearing handicap beyond measured HL is associated with reduced functional outcomes. Assessment of hearing handicap may facilitate targeted interventions in adult survivors with HL.

GENETIC FACTORS AND LONG-TERM TREATMENT-RELATED NEUROCOGNITIVE DEFICITS, ANXIETY, AND DEPRESSION IN CHILDHOOD LEUKEMIA SURVIVORS: AN EXOME-WIDE ASSOCIATION STUDY

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Cancer Epidemiol Biomarkers Prev; doi: [10.1158/1055-9965.EPI-23-0634](https://doi.org/10.1158/1055-9965.EPI-23-0634)

BACKGROUND

An increased risk of neurocognitive deficits, anxiety, and depression has been reported in childhood cancer survivors.

METHODS

We analyzed associations of neurocognitive deficits, as well as anxiety and depression, with common and rare genetic variants derived from whole-exome sequencing data of acute lymphoblastic leukemia (ALL) survivors from the PETALE cohort. In addition, significant associations were assessed using stratified and multivariable analyses. Next, top-ranking common associations were analyzed in an independent SJLIFE replication cohort of ALL survivors.

RESULTS

Significant associations were identified in the entire discovery cohort (N=229) between the AK8 gene and changes in neurocognitive function, whereas PTPRZ1, MUC16, TNRC6C-AS1 were associated with anxiety. Following stratification according to sex, the ZNF382 gene was linked to a neurocognitive deficit in males, whereas APOL2 and C6orf165 were associated with anxiety and EXO5 with depression. Following stratification according to prognostic risk groups, the modulatory effect of rare variants on depression was additionally found in the CYP2W1 and PCMTD1 genes. In the replication SJLIFE cohort (N=688), the male-specific association in the ZNF382 gene was not significant, however, a p-value<0.05 was observed when the entire SJLIFE cohort was analyzed. ZNF382 was significant in males in the combined cohorts as shown by meta-analyses as well as the depression-associated gene EXO5.

CONCLUSIONS

Further research is needed to confirm whether the current findings, along with other known risk factors, may be valuable in identifying patients at increased risk of these long-term complications.

A QUALITATIVE STUDY OF CHILDHOOD CANCER FAMILIES' POST-TREATMENT NEEDS AND THE IMPACT OF A COMMUNITY-BASED ORGANIZATION IN A RURAL, SOCIOECONOMICALLY DISADVANTAGED, MAJORITY HISPANIC/LATINO REGION

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Pediatr Blood Cancer; doi: [10.1002/pbc.30798](https://doi.org/10.1002/pbc.30798)

BACKGROUND

Individual- and population-level socioeconomic disadvantages contribute to unequal outcomes among childhood cancer survivors. Reducing health disparities requires understanding experiences of survivors from historically marginalized communities, including those with non-English language preference.

PROCEDURE

We partnered with a community-based organization (CBO) serving families of children with cancer in a rural region in California with low socioeconomic status and majority Hispanic/Latino (H/L) residents. We interviewed English- and Spanish-speaking adolescent/young adult (AYA) childhood cancer survivors (≥ 15 years old, ≥ 5 years from diagnosis), parents, and CBO staff to evaluate post-treatment needs and impact of CBO support. Data were analyzed qualitatively using applied thematic analysis. Themes were refined through team discussions with our community partners.

RESULTS

Twelve AYAs (11 H/L, 11 bilingual), 11 parents (eight H/L, seven non-English preferred), and seven CBO staff (five H/L, five bilingual) participated. AYAs (five female, seven male) were of median (min-max) age 20 (16-32) and 9 (5-19) years post diagnosis; parents (nine female, two male) were age 48 (40-60) and 14 (6-23) years post child's diagnosis. Themes included challenges navigating healthcare, communication barriers among the parent-AYA-clinician triad, and lasting effects of childhood cancer on family dynamics and mental health. Subthemes illustrated that language and rurality may contribute to health disparities. CBO support impacted families by serving as a safety-net, fostering community, and facilitating H/L families' communication.

CONCLUSIONS

Childhood cancer has long-lasting effects on families, and those with non-English language preference face additional burdens. Community-based support buffers some of the negative effects of childhood cancer and may reduce disparities.

JOB LOCK AMONG SURVIVORS OF CHILDHOOD CANCER AND THEIR SPOUSES POST AFFORDABLE CARE ACT IMPLEMENTATION: A CHILDHOOD CANCER SURVIVOR STUDY BRIEF REPORT

Austin R Waters, Qi Liu, Xu Ji, Yutaka Yasui, K Robin Yabroff, Rena M Conti, Tara Henderson, I-Chan Huang, Wendy Leisenring, Gregory T Armstrong, Paul C Nathan, Elyse Park, Anne C Kirchhoff

Pediatr Blood Cancer; doi: [10.1002/pbc.30790](https://doi.org/10.1002/pbc.30790)

ABSTRACT

It is unknown how common job lock (i.e., staying at job to maintain health insurance) remains among childhood cancer survivors after Affordable Care Act (ACA) implementation in 2010. We examined prevalence of and factors associated with job lock using a cross-sectional survey from the Childhood Cancer Survivor Study (3503 survivors; 942 siblings).

Survivor, spousal, and any survivor/spouse job lock were more frequently reported by survivors than siblings. Survivor job lock/any job lock was associated with older age, low income, severe chronic conditions, and debt/inability to pay debt. Job lock remains more common among survivors than siblings after ACA implementation.

REPRODUCTIVE OUTCOMES AND REPRODUCTIVE HEALTH CARE UTILIZATION AMONG MALE SURVIVORS OF CHILDHOOD CANCER: A DCCSS-LATER STUDY

Joyce J M Claessens, Adriaan Penson, Ewald M Bronkhorst, Leontien C M Kremer, Eline van Dulmen-den Broeder, Margriet van der Heiden-van der Loo, Wim J E Tissing, Helena J H van der Pal, Nicole M A Blijlevens, Marry M van den Heuvel-Eibrink, A Birgitta Versluys, Dorine Bresters, Cécile M Ronckers, Iris Walraven, Catharina C M Beerendonk, Jacqueline J Loonen; Dutch LATER study group

Cancer; doi: [10.1002/cncr.35119](https://doi.org/10.1002/cncr.35119)



BACKGROUND

Treatment-related gonadal dysfunction leading to fertility problems is a frequently encountered late effect in childhood cancer survivors (CCSs). This study evaluated reproductive outcomes and reproductive health care utilization among male CCSs compared with male siblings.

METHODS

A nationwide cohort study was conducted as part of the Dutch Childhood Cancer Survivor LATER study part 1, a questionnaire and linkage study. A questionnaire addressing reproductive outcomes and reproductive health care was completed by 1317 male CCSs and 407 male siblings. A total of 491 CCSs and 185 siblings had a previous or current desire for children and were included in this study.

RESULTS

Fewer CCSs had biological children compared with siblings (65% vs. 88%; $p < .001$). The type of conception by men who fathered a child was comparable between CCSs and siblings (spontaneous conception of 90% of both groups; $p = .86$). The percentage of men who had consulted a reproductive specialist because of not siring a pregnancy was higher in CCSs compared with siblings (34% vs. 12%; $p < .001$). Following consultation, fewer CCSs underwent assisted reproductive techniques (ART) compared with siblings (41% vs. 77%; $p = .001$). After ART, fewer CCSs fathered a child compared with siblings (49% vs. 94%; $p = .001$).

CONCLUSIONS

More male survivors consult a reproductive specialist, but fewer survivors undergo ART and father a child after ART compared with siblings. This insight is important for understanding potential problems faced by survivors regarding family planning and emphasizes the importance of collaboration between oncologists and reproductive specialists.

CHILDREN WITH CANCER AND THEIR CARDIORESPIRATORY FITNESS AND PHYSICAL FUNCTION-THE LONG-TERM EFFECTS OF A PHYSICAL ACTIVITY PROGRAM DURING TREATMENT: A MULTICENTER NON-RANDOMIZED CONTROLLED TRIAL

Martin Kaj Fridh, Peter Schmidt-Andersen, Liv Andrés-Jensen, Troels Thorsteinsson, Peder Skov Wehner, Henrik Hasle, Kjeld Schmiegelow, Hanne Bækgaard Larsen

J Cancer Surviv; doi: [10.1007/s11764-023-01499-7](https://doi.org/10.1007/s11764-023-01499-7)



PURPOSE

We aimed to determine the effects of a classmate-supported, supervised, in-hospital physical activity program during treatment primarily on cardiorespiratory fitness and secondarily on physical function.

METHODS

A multicenter non-randomized controlled intervention study including children diagnosed with cancer, 6-18 years at diagnosis treated with chemo-/radiotherapy. The intervention comprised (i) an educational session on cancer in the child's school class; (ii) selection of two "ambassadors"-classmates who were co-admitted, supporting the child's everyday hospital life; and (iii) supervised in-hospital physical activity from diagnosis and throughout intensive treatment. One-year post-treatment, physical testing included cardiorespiratory fitness (primary outcome), Sit-to-Stand test, Timed-Up-and-Go, and Handgrip Strength.

RESULTS

The intervention group included 75 of 120 children (61% boys, 13.4 ± 3.1 years); the control groups included 33 of 58 children with cancer (58% boys, 13.5 ± 2.5 years), and 94 age- and sex-matched children without a cancer history. One-year post-treatment, cardiorespiratory fitness tended to be higher in the intervention group (37.0 ± 6.0 mL/kg/min) than in the patient control group with cancer (32.3 ± 9.7 mL/kg/min) (mean difference 4.7 [0.4 to 9.1], $p = 0.034$). The intervention group performed better in the secondary outcomes. Compared with community controls, both patient groups had lower cardiorespiratory fitness. The patient control group had lower Sit-to-Stand, Timed Up and Go, and Handgrip Strength, while the intervention group had strength comparable to that of the community controls.

CONCLUSIONS

Peer-supported, supervised, in-hospital physical activity during treatment may improve cardiorespiratory fitness and muscle strength 1-year post-treatment in children with cancer; however, survivors continue to have lower cardiorespiratory fitness than community controls.

RISK FACTORS FOR TREATMENT-RELATED AMENORRHEA IN FEMALE SURVIVORS OF CHILDHOOD AND ADOLESCENT CANCER: 10-YEAR EXPERIENCES AT ONCOFERTILITY CLINIC IN KOREAN TERTIARY CENTER

Soo Jin Park, Jung Yoon Choi, Hyoung Jin Kang, Yun Jeong Lee, Young Ah Lee, Ji Yeon Han, Sung Woo Kim, Hoon Kim, Seung-Yup Ku

J Adolesc Young Adult Oncol; doi: [10.1089/jayao.2023.0132](https://doi.org/10.1089/jayao.2023.0132)

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RISKS OF SPINAL ABNORMALITIES AND GROWTH IMPAIRMENT AFTER RADIATION TO THE SPINE IN CHILDHOOD CANCER SURVIVORS: A PENTEC COMPREHENSIVE REVIEW

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Int J Radiat Oncol Biol Phys; doi: [10.1016/j.ijrobp.2023.10.039](https://doi.org/10.1016/j.ijrobp.2023.10.039)

PURPOSE

A PENTEC (Pediatric Normal Tissue Effects in the Clinic) review was performed to estimate the dose-volume effects of radiation therapy on spine deformities and growth impairment for patients who underwent radiation therapy as children.

METHODS AND MATERIALS

A systematic literature search was performed to identify published data for spine deformities and growth stunting. Data were extracted from 12 reports of children irradiated to the spine (N = 603 patients). The extracted data were analyzed to find associations between complication risks and the radiation dose (conventional fractionation throughout) as impacted by exposed volumes and age using the mixed-effects logistic regression model. When appropriate, corrections were made for radiation modality, namely orthovoltage beams.

RESULTS

In the regression analysis, the association between vertebral dose and scoliosis rate was highly significant ($P < .001$). Additionally, young age at time of radiation was highly predictive of adverse outcomes.

Clinically significant scoliosis can occur with doses ≥ 15 Gy to vertebrae during infancy (< 2 years of age). For children irradiated at 2 to 6 years of age, overall scoliosis rates of any grade were $> 30\%$ with doses > 20 Gy; grade 2 or higher scoliosis was correlated with doses ≥ 30 Gy. Children > 6 years of age remain at risk for scoliosis with doses > 30 Gy; however, most cases will be mild. There are limited data regarding the effect of dose gradients across the spine on degree of scoliosis. The risk of clinically meaningful height loss was minimal when irradiating small volumes of the spine up to 20 Gy (eg, flank irradiation), except in infants who are more vulnerable to lower doses. Growth stunting was more frequent when larger segments of the spine (eg, the entire spine or craniospinal irradiation) were irradiated before puberty to doses > 20 Gy. The effect was modest when patients were irradiated after puberty to doses > 20 Gy.

CONCLUSIONS

To reduce the risk of kyphoscoliosis and growth impairment, the dose to the spine should be kept to < 20 Gy for children < 6 years of age and to < 10 to 15 Gy in infants. The number of vertebral bodies irradiated and dose gradients across the spine should also be limited when possible.

UTILIZATION OF CARDIAC TESTS IN ANTHRACYCLINE-TREATED CANCER SURVIVORS DIFFERS BETWEEN YOUNG ADULTS AND CHILDREN: A CLAIMS-BASED ANALYSIS

Xu Ji, Xin Hu, Joseph Lipscomb, Eric J Chow, Ann C Mertens, Sharon M Castellino

Cancer Med; doi: [10.1002/cam4.6801](https://doi.org/10.1002/cam4.6801)



BACKGROUND

The Children's Oncology Group Guidelines recommend a cardiacechocardiogram, or comparable functional imaging, following therapy completion in survivors of childhood/adolescent cancers exposed to anthracyclines.

METHODS

Using the 2009-2019 Merative™ MarketScan® Commercial Database, we examined real-world utilization of cardiac testing among 1609 anthracycline-treated survivors of childhood/adolescent cancers.

RESULTS

The cumulative incidence of receiving an initial cardiac test by 5.25 years from the index date (six months after end-of-therapy) was 62.3% (95% CI = 57.5%-66.7%), with median time to initial test being 2.7 years (95% CI = 2.5%-3.1%). Young adults (18-28 years) were less likely than children (≤ 17 years) to receive cardiac testing (hazard ratio [HR] = 0.42, 95% CI = 0.3%-0.49%). More likely to receive cardiac testing were survivors receiving hematopoietic stem cell transplantation versus chemotherapy only (HR = 2.23, 95% CI = 1.63%-3.03%), and survivors with bone or soft tissue versus hematologic cancer (HR = 1.64, 95% CI = 1.30%-2.07%).

CONCLUSIONS

Nearly 40% of anthracycline-treated survivors of childhood/adolescent cancers had not received cardiac testing within 5.25 years post-index date, with young adults least likely to receive a test.

AND WHAT ABOUT TODAY? BURDEN AND SUPPORT NEEDS OF ADOLESCENT CHILDHOOD CANCER SURVIVORS IN LONG-TERM FOLLOW-UP CARE-A QUALITATIVE CONTENT ANALYSIS

Jana Winzig, Laura Inhestern, Désirée Sigmund, Verena Paul, Lesley-Ann Hail, Stefan Rutkowski, Gabriele Escherich, Corinna Bergelt

Child Care Health Dev; doi: [10.1111/cch.13207](https://doi.org/10.1111/cch.13207)



PURPOSE

Childhood cancer affects approximately 2000 children annually in Germany, and there is an increasing number of long-term childhood cancer survivors. Due to developmental tasks, adolescent survivors in long-term follow-up (LTFU) care may face specific challenges and perceive different burden due to their disease. The current study explored (a) the impact of cancer and burden regarding survivorship and (b) supportive needs of adolescent childhood cancer survivors in LTFU care.

METHODS

Semistructured qualitative interviews were conducted with 18 adolescent childhood cancer survivors in LTFU care aged 14-18 years (average age 16.4 years). Interviews were transcribed verbatim and analysed using content analysis.

RESULTS

Based on the exploratory research questions, two key categories were generated: (1) The impact and burden on survivors' lives during LTFU care and (2) support needs of adolescent childhood cancer survivors in LTFU care.

The four subcategories that emerged regarding the impact and burden on survivors' lives during LTFU care were (1) physical consequences, (2) cognitive impairments, (3) difficulties in social interactions, and (4) psychosocial burden. Additionally, two subcategories, (1) practical and (2) emotional support needs of adolescent childhood cancer survivors were identified.

CONCLUSIONS

Our results indicate that childhood cancer influences adolescent survivors' life in a negative way even many years after the end of treatment. Furthermore, parents seem to play a crucial role in the survivorship experience of childhood cancer survivors, as they remain keep responsible for most cancer-related concerns even during LTFU care, causing adolescents to persist in the child role. A family systemic approach to care is suggested to facilitate development-specific tasks and to enable adolescents to become autonomous adults. Still, the question remains as to who in the health care system could take over the family systemic tasks.

ASSOCIATION ANALYSIS OF SELF-REPORTED OUTCOMES WITH A VALIDATED SUBSET

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Stat Med; doi: [10.1002/sim.9976](https://doi.org/10.1002/sim.9976)

ABSTRACT

In health-science research, outcomes ascertained through surveys and interviews are subject to potential bias with respect to the true outcome status, which is only ascertainable with clinical and laboratory assessment. This measurement error may lead to biased inference when evaluating associations between exposures and outcomes of interest. Here, we consider a cohort study in which the outcome of interest is ascertained via questionnaire, subject to imperfect ascertainment, but where a subset of participants also have a clinically assessed, validated outcome available. This presents a methodological opportunity to address potential bias. Specifically, we constructed the likelihood in two parts, one using the validated subset and the other using a subset without validation.

This work expands on that proposed by Pepe and enables inference with standard statistical software. Weighted generalized linear model estimates for our method and maximum likelihood estimates (MLE) for Pepe's method were computed, and the statistical inference was based on the standard large-sample likelihood theory. We compare the finite sample performance of two approaches through Monte Carlo simulations. This methodological work was motivated by a large cohort study of long-term childhood cancer survivors, allowing us to provide a relevant application example where we examined the association between clinical factors and chronic health conditions.

MULTIFACETED SUPPORT FOR QUALITY OF LIFE IN CHILDHOOD CANCER SURVIVORS: QUESTIONNAIRE SURVEY

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Pediatr Int; doi: [10.1111/ped.15706](https://doi.org/10.1111/ped.15706)

BACKGROUND

Along with improvements in curative treatment for childhood cancer, childhood cancer survivors (CCSs) often face numerous problems such as late complications of cancer treatment, social issues at school, struggles in employment, and financial difficulties. These children have received a wide range of support from the medical, educational, and administrative sectors. However, it was unclear how this multifaceted support contributed to quality of life (QOL) of CCSs in Japan.

METHODS

The subjects were 46 CCSs of 16 years of age or older at the time of the survey, who had been diagnosed and treated for pediatric cancer. A self-administered questionnaire survey was conducted to investigate the in-hospital status during treatment, adjustment when returning to school, and administrative social support. The QOL of CCSs was also evaluated by the Medical Outcome Study 36-Item Short-Form Health Survey.

RESULTS

Twenty-four CCSs answered the questions. The respondents who had experienced school-life problems tended to have lower role/social QOL scores ($p = 0.046$), whereas the CCSs who had experienced administrative counseling tended to have lower physical QOL scores ($p = 0.036$). The mental QOL scores tended to be higher in respondents who were informed of the exact diagnosis of cancer during hospitalization. The role/social QOL scores tended to be lower in respondents who advanced to their preferred career path.

CONCLUSIONS

It is essential for three stakeholders-health-care providers, education offices, and public administrative agencies-to collaborate to share long-term psychosocial issues or concerns related to employment or daily living that CCSs may encounter, and to establish a coordinated approach to support CCSs.

PRIMARY CARE UTILIZATION AND CARDIOVASCULAR SCREENING IN ADULT SURVIVORS OF CHILDHOOD CANCER

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JAMA Netw Open; doi: [10.1001/jamanetworkopen.2023.47449](https://doi.org/10.1001/jamanetworkopen.2023.47449)



IMPORTANCE

Cardiovascular disease is the leading noncancer cause of premature death among survivors of childhood cancer. Adult survivors of childhood cancer are largely managed by primary care practitioners (PCPs), and health care utilization patterns related to cardiovascular screening are not well described.

MAIN OUTCOMES AND MEASURES

Outcomes of interest were numbers of PCP and specialist visits, cardiovascular risk factors (hypertension, dyslipidemia, and diabetes), risk factor screening, and cardiac testing. Multivariable logistic regression assessed characteristics associated with up-to-date cardiac testing at enrollment.

RESULTS

Of 347 enrolled participants, 293 (84.4%) had evaluable medical records (median [range] age, 39.9 [21.5–65.0] years; 149 [50.9%] male) and were included in analyses. At baseline, 238 participants (81.2%) had a documented PCP encounter; 241 participants (82.3%) had undergone blood pressure screening, 179 participants (61.1%) had undergone lipid testing, and 193 participants (65.9%) had undergone diabetes screening. A total of 63 participants (21.5%) had echocardiography completed or planned.

Only 198 participants (67.6%) had records referencing a cancer history. PCP documentation of prior cardiotoxic exposures was low compared with known exposures, including radiation therapy (103 participants [35.2%] vs 203 participants [69.3%]; $P < .001$) and anthracycline chemotherapy (27 participants [9.2%] vs 222 participants [75.8%]; $P = .008$). Few records referenced a need for cancer-related late effects surveillance (95 records [32.4%]). Independent factors associated with cardiac screening included documentation of increased cardiovascular disease risk (odds ratio [OR], 11.94; 95% CI, 3.37–42.31), a late-effects surveillance plan (OR, 3.92; 95% CI, 1.69–9.11), and existing cardiovascular risk factors (OR per each additional factor, 2.09; 95% CI, 1.32–3.31).

CONCLUSIONS AND RELEVANCE

This cross-sectional study of adult survivors of childhood cancer at increased risk of cardiovascular disease found low adherence to recommended cardiac testing and documentation of risk for these individuals. Improving accuracy of reporting of survivors' exposures and risks within the medical record may improve screening.

PREDIABETES AND ASSOCIATED RISK OF CARDIOVASCULAR EVENTS AND CHRONIC KIDNEY DISEASE AMONG ADULT SURVIVORS OF CHILDHOOD CANCER IN THE ST JUDE LIFETIME COHORT

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J Clin Oncol; doi: [10.1200/JCO.23.01005](https://doi.org/10.1200/JCO.23.01005)

PURPOSE

Little is known about the prevalence of prediabetes and associated risk of cardiovascular events and chronic kidney disease (CKD) with this reversible condition in survivors.

METHODS

Prevalence of prediabetes (fasting plasma glucose 100–125 mg/dL or hemoglobin A1c 5.7%–6.4%) and diabetes was clinically assessed in 3,529 adults ≥ 5 years from childhood cancer diagnosis and 448 controls stratified by age. Cox proportional hazards regression estimated progression from prediabetes to diabetes, and risk of future cardiac events, stroke, CKD, and death.

RESULTS

Among survivors, median age 30 years (IQR, 18–65), and the prevalence of prediabetes was 29.2% (95% CI, 27.7 to 30.7) versus 18.1% (14.5 to 21.6) in controls and of diabetes was 6.5% (5.7 to 7.3) versus 4.7% (2.7 to 6.6). By age 40–49 years, more than half of the survivors had prediabetes (45.5%) or diabetes (14.0%). Among 695 survivors with prediabetes and longitudinal follow-up, 68 (10%; median follow-up, 5.1 years) progressed to diabetes.

After adjustment for demographic factors and body composition, risk of progression was associated with radiation exposure to the pancreatic tail ≥ 10 Gy (hazard ratio [HR], 2.7 [95% CI, 1.1 to 6.8]) and total-body irradiation (4.4 [1.5 to 13.1]). Compared with survivors with normal glucose control, adjusting for relevant treatment exposures, those with prediabetes were at increased risk of future myocardial infarction (HR, 2.4 [95% CI, 1.2 to 4.8]) and CKD (2.9 [1.04 to 8.15]), while those with diabetes were also at increased risk of future cardiomyopathy (3.8 [1.4 to 10.5]) or stroke (3.4 [1.3 to 8.9]).

CONCLUSION

Prediabetes is highly prevalent in adult survivors of childhood cancer and independently associated with an increased risk of future cardiovascular and kidney complications. Prediabetes, a modifiable risk factor among childhood cancer survivors, represents a new target for intervention that may prevent subsequent morbidity and mortality.

BEST PRACTICE & RESEARCH CLINICAL HAEMATOLOGY: SCREENING FOR BREAST CANCER IN HODGKIN LYMPHOMA SURVIVORS

Stephanie M Wong

Best Pract Res Clin Haematol; doi: [10.1016/j.beha.2023.101525](https://doi.org/10.1016/j.beha.2023.101525)

ABSTRACT

Childhood and young adult survivors of Hodgkin lymphoma are at an elevated risk of developing breast cancer. Breast cancer risk is felt to originate from chest wall radiation exposure prior to the third decade of life, with incidence beginning to rise approximately eight to ten years following Hodgkin lymphoma treatment. Although incidence varies according to age at radiation exposure, dosage, and treatment fields, cohort studies have documented a cumulative incidence of breast cancer of 10–20% by 40 years of age. Women with a history of chest radiation for Hodgkin lymphoma are counselled to begin screening with bilateral breast MRI at 25 years of age, or eight years after radiation, whichever occurs later.

Outside of high-risk surveillance, the optimal management approach for women with prior radiation exposure continues to evolve. When diagnosed with breast malignancy, evidence supports consideration of unilateral therapeutic and contralateral prophylactic mastectomy, although breast conserving surgery may be considered following multidisciplinary assessment. This review will address the epidemiology, characteristics, screening and management guidelines, and breast-cancer prevention efforts for Hodgkin lymphoma survivors treated with radiation therapy in adolescence and young adulthood.

STEROIDOGENESIS AND ANDROGEN/ESTROGEN SIGNALING PATHWAYS ARE ALTERED IN IN VITRO MATURED TESTICULAR TISSUES OF PREPUBERTAL MICE

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Elife; doi: [10.7554/eLife.85562](https://doi.org/10.7554/eLife.85562)



ABSTRACT

Children undergoing cancer treatments are at risk for impaired fertility. Cryopreserved prepubertal testicular biopsies could theoretically be later matured in vitro to produce spermatozoa for assisted reproductive technology. A complete in vitro spermatogenesis has been obtained from mouse prepubertal testicular tissue, although with low efficiency. Steroid hormones are essential for the progression of spermatogenesis, the aim of this study was to investigate steroidogenesis and steroid signaling in organotypic cultures. Histological, RT-qPCR, western blot analyses, and steroid hormone measurements were performed on in vitro cultured mouse prepubertal testicular tissues and age-matched in vivo controls.

Despite a conserved density of Leydig cells after 30 days of culture (D30), transcript levels of adult Leydig cells and steroidogenic markers were decreased. Increased amounts of progesterone and estradiol and reduced androstenedione levels were observed at D30, together with decreased transcript levels of steroid metabolizing genes and steroid target genes. hCG was insufficient to facilitate Leydig cell differentiation, restore steroidogenesis, and improve sperm yield. In conclusion, this study reports the failure of adult Leydig cell development and altered steroid production and signaling in tissue cultures. The organotypic culture system will need to be further improved before it can be translated into clinics for childhood cancer survivors.

FINANCIAL HARDSHIP AMONG SIBLINGS OF LONG-TERM SURVIVORS OF CHILDHOOD CANCER: A CHILDHOOD CANCER SURVIVOR STUDY REPORT

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Cancer; doi: [10.1002/cncr.35150](https://doi.org/10.1002/cncr.35150)

BACKGROUND

Siblings of children with cancer may experience adverse household economic consequences, but their financial outcomes in adulthood are unknown.

METHODS

A total of 880 siblings (aged 18-64 years) of adult-aged childhood cancer survivors were surveyed to estimate the prevalence of financial hardship by three established domains (behavioral, material, and psychological). For individual financial hardship items matching the contemporaneous National Health Interview Survey or Behavioral Risk Factor Surveillance System, siblings were compared with the general population by calculating adjusted prevalence odds ratios (ORs) to sample-weighted responses. Multivariable logistic regression models examined associations between sibling characteristics and each hardship domain and between sibling hardship and survivors' cancer/treatment characteristics.

RESULTS

Behavioral, material, and psychological hardship was reported by 24%, 35%, and 28%, respectively. Compared with national survey respondents, siblings were more likely to report worries about medical bills (OR, 1.14; 95% confidence interval [CI], 1.06-1.22), difficulty affording nutritious foods (OR, 1.79; 95% CI, 1.54-2.07), and forgoing needed medical care (OR, 1.38; 95% CI, 1.10-1.73), prescription medications (OR, 2.52; 95% CI, 1.99-3.20), and dental care (OR, 1.34; 95% CI, 1.15-1.57) because of cost. Sibling characteristics associated with reporting financial hardship in one or more domains included female sex, older age, chronic health conditions, lower income, not having health insurance, high out-of-pocket medical expenditures, and nonmedical/nonhome debt. No survivor cancer/treatment characteristics were associated with sibling financial hardship.

CONCLUSIONS

Adult siblings of childhood cancer survivors were more likely to experience financial hardship compared with the general population. Childhood cancer may adversely affect entire households, with potentially lasting implications.

THE CUMULATIVE BURDEN OF SELF-REPORTED, CLINICALLY RELEVANT OUTCOMES IN LONG-TERM CHILDHOOD CANCER SURVIVORS AND IMPLICATIONS FOR SURVIVORSHIP CARE: A DCCSS LATER STUDY

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Cancer; doi: [10.1002/cncr.35148](https://doi.org/10.1002/cncr.35148)

BACKGROUND

The aim of this study is to evaluate how cumulative burden of clinically relevant, self-reported outcomes in childhood cancer survivors (CCSs) compares to a sibling control group and to explore how the burden corresponds to levels of care proposed by existing risk stratifications.

METHODS

The authors invited 5925 5-year survivors from the Dutch Childhood Cancer Survivor Study (DCCSS LATER) cohort and their 1066 siblings to complete a questionnaire on health outcomes. Health outcomes were validated by self-reported medication use or medical record review. Missing data on clinically relevant outcomes in CCSs for whom no questionnaire data were available were imputed with predictive mean matching. We calculated the mean cumulative count (MCC) for clinically relevant outcomes. Furthermore, we calculated 30-year MCC for groups of CCSs based on primary cancer diagnosis and treatment, ranked 30-year MCC, and compared the ranking to levels of care according to existing risk stratifications.

RESULTS

At median 18.5 years after 5-year survival, 46% of CCSs had at least one clinically relevant outcome. CCSs experienced 2.8 times more health conditions than siblings (30-year MCC = 0.79; 95% confidence interval [CI], 0.74-0.85 vs. 30-year MCC = 0.29; 95% CI, 0.25-0.34). CCSs' burden of clinically relevant outcomes consisted mainly of endocrine and vascular conditions and varied by primary cancer type. The ranking of the 30-year MCC often did not correspond with levels of care in existing risk stratifications.

CONCLUSIONS

CCSs experience a high cumulative burden of clinically relevant outcomes that was not completely reflected by current risk stratifications. Choices for survivorship care should extend beyond primary tumor and treatment parameters, and should consider also including CCSs' current morbidity.

POST-TREATMENT SPERM CRYOPRESERVATION PRACTICES IN CHILDHOOD AND YOUNG ADULT CANCER SURVIVORS

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Reprod Biomed Online; doi: [10.1016/j.rbmo.2023.103573](https://doi.org/10.1016/j.rbmo.2023.103573)

RESEARCH QUESTION

What are current practices of post-treatment fertility preservation in male childhood cancer survivors (CCS) who have not benefitted from pre-therapeutic fertility preservation in France and other European countries?

DESIGN

A survey was conducted of all fertility preservation centres in France (n = 30) and European fertility specialists (n = 9) in five European countries. Eight clinical cases and 40 questions were included to assess the effect of age at diagnosis, type of treatment (alkylating-agents, orchidectomy, testicular radiotherapy) and sperm parameters on the probability of a post-treatment fertility preservation proposal. Demographic characteristics of the responding practitioner were also collected.

RESULTS

Post-treatment sperm cryopreservation was proposed by 100% of fertility specialists in cases of severe oligoasthenoteratozoospermia, 77-88% in cases of moderate oligoasthenoteratozoospermia and in 65-77% in cases of sperm motility and vitality impairment. In cases of normal sperm parameters, 27-54% of fertility specialists would propose post-treatment sperm cryopreservation. These results did not differ significantly according to the type of treatment received or to responder-related factors. Practices of European specialists were also guided by sperm parameter results; 44-67% of specialists responding that they would propose sperm cryopreservation in cases of moderate to severe sperm parameter alterations.

CONCLUSION

Post-treatment semen analysis could be widely proposed to CCS who have not benefitted from pre-therapeutic fertility preservation. Post-treatment fertility preservation could be proposed in cases of persistent moderate to severe sperm parameter alterations. Guidelines would be important to homogenize practices and to encourage oncologists to refer CCS for fertility assessments.

PHYSICAL LATE EFFECTS OF TREATMENT AMONG SURVIVORS OF CHILDHOOD CANCER IN LOW- AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW

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J Cancer Surviv; doi: [10.1007/s11764-023-01517-8](https://doi.org/10.1007/s11764-023-01517-8)

PURPOSE

Physical late effects of treatment are well-documented among childhood cancer survivors in high-income countries, but whether prevalence and risk factors are comparable in low- and middle-income countries (LMICs) is unclear. We conducted a systematic review to assess physical late effect outcomes among childhood cancer survivors in LMICs.

METHODS

Five health sciences databases were searched from inception to November 2022 in all languages. We included observational studies conducted in LMICs that evaluated physical late effects of treatment in childhood cancer survivors. Mean or median cohort follow-up must have been ≥ 5 years from original cancer diagnosis.

RESULTS

Sixteen full articles and five conference abstracts were included. Studies were conducted in lower-middle ($n = 12$, 57%) or upper-middle income ($n = 9$, 43%) countries; nearly half ($n = 9$, 43%) were conducted in India. Five cohorts (24%) were comprised entirely of 5-year survivors. Subsequent malignant neoplasms were reported in 0-11% of survivors ($n = 10$ studies). Hypothyroidism and metabolic syndrome prevalence ranged from 2-49% ($n = 4$ studies) and 4-17% ($n = 5$ studies), respectively. Gonadal dysfunction ranged from 3-47% ($n = 4$ studies). Cardiac dysfunction ranged from 1-16% ($n = 3$ studies). Late effects of the musculoskeletal and urinary systems were least investigated.

CONCLUSIONS

Substantial knowledge gaps exist in LMIC childhood cancer survivorship. No low-income country data were found. In middle-income countries, late effects were defined and assessed variably and limited by selection bias and small sample sizes.

HISTORY AND CURRENT STATUS OF THE SURVIVORSHIP CARE PROGRAM AT THE UNIVERSITY OF CALIFORNIA, LOS ANGELES JONSSON COMPREHENSIVE CANCER CENTER (UCLA JCCC)

Stephanie M Wong

J Cancer Surviv; doi: [10.1007/s11764-023-01522-x](https://doi.org/10.1007/s11764-023-01522-x)

ABSTRACT

As one of the first comprehensive cancer centers to receive a designation from the National Cancer Institute, the Jonsson Comprehensive Cancer Center at UCLA Health has served as a leader in survivorship research for three decades. A clinical survivorship program for childhood cancer survivors was established in the early 2000s as this became a standard of care in pediatric oncology. However, it was not until receipt of external funding and the establishment of a Survivorship Center of Excellence in 2006 that clinical services were expanded to include adult cancer survivors, as well as survivorship care delivery research in the community and at affiliated clinical sites.

When this funding ended, there was limited institutional support for expansion of the program, and so the clinical programs did not develop further. Recently, there has been renewed interest in obtaining Commission on Cancer accreditation, and this has prompted an institutional assessment of survivorship care to inform future activities for system-wide program development. As oncology care expands throughout a large regional health system network, the future survivorship program will need to serve as a common resource for the entire health system by providing a repository of specialized services and resources as well as standard processes and pathways for a cohesive approach to care.

CHEMOTHERAPY AND RADIOTHERAPY LONG-TERM ADVERSE EFFECTS ON ORAL HEALTH OF CHILDHOOD CANCER SURVIVORS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Cancers (Basel); doi: [10.3390/cancers16010110](https://doi.org/10.3390/cancers16010110)



ABSTRACT

The survival rate for pediatric cancer has increased over the past few decades, short- and long-term complications have been detected and studied, and oral complications have emerged as an important topic of research. Here, we aimed to highlight the importance of oral manifestations that may only become apparent years or even decades after cancer treatment. This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis. We searched articles using PubMed via the MEDLINE, Web of Science, and LILACS databases until October 2023.

Overall, 35 observational studies were included, and the results estimated a pooled prevalence of the following dental anomalies: discoloration, 53%; crown-root malformations and agenesis, 36%; enamel hypoplasia, 32%; root development alterations, 29%; unerupted teeth, 24%; microdontia, 16%; hypodontia, 13%; and macrodontia, 7%. Most childhood cancer survivors have at least one dental sequela. Childhood cancer survivors presented a higher risk of having dental alterations than control counterparts. Additional analyses reveal possible sex-based differences that should be explored in future studies. These results collectively highlight the importance of oral healthcare and the prevention of disease in childhood cancer survivors.

EDUCATIONAL OUTCOMES IN SIBLINGS OF CHILDHOOD LEUKEMIA SURVIVORS: FACTORS ASSOCIATED WITH SCHOOL DIFFICULTIES AND COMPARISON WITH GENERAL POPULATION

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Cancer Med; doi: [10.1002/cam4.6821](https://doi.org/10.1002/cam4.6821)



BACKGROUND

To investigate the educational outcomes of siblings of childhood leukemia survivors, explore determinants of school difficulties, and compare the rates of repeating grades between siblings and the general population.

METHODS

A cross-sectional study of childhood leukemia survivors' siblings recruited through the Leucémies de l'Enfant et de l'Adolescent cohort, a French long-term follow-up program, was conducted, and education-related data were obtained via self-report questionnaires. Adjusted logistic regression models were used to identify variables associated with school difficulties and time since diagnosis. Rates of repeating a grade in middle school were compared between siblings and the general population of the same generation.

RESULTS

A total of 564 siblings with a mean time from diagnosis of 14.1 ± 6.4 years were included, among whom 139 (24.6%) repeated a grade, at an average of 6.4 ± 4.5 years after diagnosis. In multivariate analysis, the risk factors for repeating a grade were older siblings (odds ratio [OR] 2.3, $p = 0.006$), family financial difficulties (OR 2.8, $p = 0.008$), and history of repetition in survivors (OR, 2.5, $p = 0.001$). Sibling hematopoietic stem cell donors were at greater risk of repeating a grade long-term after diagnosis ($p = 0.018$). Overall, siblings did not have a higher risk of educational delays at the end of middle school than the general population.

CONCLUSION

Although the results are reassuring, socioeconomic and cancer-related factors may have an impact on siblings' schooling long after diagnosis. Paying attention to siblings contributes to identifying the most vulnerable families, allowing more attention and appropriate resources to avoid long-term repercussions. Additionally, supportive and targeted interventions can be developed to improve the organization of education and the health care system.

ANTHRACYCLINE-INDUCED CARDIOTOXICITY ON REGIONAL MYOCARDIAL WORK AND LEFT VENTRICULAR MECHANICAL DISPERSION IN ADOLESCENTS AND YOUNG ADULTS IN POST-LYMPHOMA REMISSION

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Cancer Med; doi: [10.1002/cam4.6857](https://doi.org/10.1002/cam4.6857)



BACKGROUND

Myocardial work (MW) is a new echocardiographic tool with a high sensitivity to detect early and subtle alterations of myocardial function. We aimed to evaluate the late effects of anthracyclines by assessing the global and segmental MW and intraventricular mechanical dispersion from speckle tracking echocardiography in childhood lymphoma survivors (CLS).

METHODS

Thirty-one young adults including CLS and age-matched healthy controls were enrolled. All underwent echocardiography including an evaluation of left ventricular (LV) morphology and regional function. We assessed LV longitudinal (differentiating sub-endocardial and sub-epicardial layers), circumferential strains and twist, global and regional MW index (MWI). LV mechanical dispersion was assessed from the time dispersion of LV longitudinal strain, from myocardial wasted work (MWW) and myocardial work efficiency (MWE).

RESULTS

The longitudinal strains both at the level of the sub-endocardium and sub-epicardium were reduced in CLS compared to controls. The global MWI was also decreased (1668 ± 266 vs $1870 \pm 264\%$.mmHg in CLS patients and controls, respectively, $p < 0.05$), especially on the apical segments. An increase of LV intraventricular mechanical dispersion was observed in CLS. MWW and MWE remained unchanged compared to controls.

CONCLUSION

Our results strongly support that cardiac remodeling is observed in CLS, characterized by a decrease in MW and an increase in LV mechanical dispersion. The apex is specifically altered, but its clinical significance remains uncertain. MW as a complement to strain seems interesting in cancer survivors to detect myocardial dysfunction at early stage and adapt their follow-up.

INCREASED CARDIAC RISK AFTER A SECOND MALIGNANT NEOPLASM AMONG CHILDHOOD CANCER SURVIVORS: A FCCSS STUDY

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JACC CardioOncol; doi: [10.1016/j.jaccao.2023.07.008](https://doi.org/10.1016/j.jaccao.2023.07.008)



BACKGROUND

Childhood cancer survivors (CCS) are at an elevated risk of developing both a second malignant neoplasm (SMN) and cardiac disease.

OBJECTIVES

This study sought to assess the excess of occurrence of cardiac disease after a SMN among CCS.

METHODS

Analyses included 7,670 CCS from the French Childhood Cancer Survivors Study cohort diagnosed between 1945 and 2000. To account for the time dependence of the occurrence of a SMN, we employed a landmark approach, considering an additive regression model for the cumulative incidence of cardiac disease. We estimated the effect of a SMN on the instantaneous risk of cardiac disease using a proportional cause-specific hazard model, considering a SMN as a time-dependent exposure. In both models, we adjusted for demographic and treatment information and considered death as a competing event.

RESULTS

In 7,670 CCS over a median follow-up of 30 years (IQR: 22–38 years), there were 378 cases of cardiac disease identified, of which 49 patients experienced a SMN. Patients who survived 25 years after their childhood cancer diagnosis and had a SMN in that time frame had a significantly increased cumulative incidence of cardiac disease, which was 3.8% (95% CI: 0.5% to 7.1%) higher compared with those without a SMN during this period. No SMN-induced excess of cardiac disease was observed at subsequent landmark times. SMNs were associated with a 2-fold increase (cause-specific HR: 2.0; 95% CI: 1.4–2.8) of cardiac disease.

CONCLUSIONS

The occurrence of a SMN among CCS is associated with an increased risk of cardiac disease occurrence and risk at younger ages.

GENE-LEVEL ANALYSIS OF ANTHRACYCLINE-INDUCED CARDIOMYOPATHY IN CANCER SURVIVORS: A REPORT FROM COG-ALTE₀₃N₁, BMTSS, AND CCSS

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BACKGROUND

Anthracyclines are highly effective in treating cancer, albeit with increased cardiomyopathy risk. Although risk is attributed to associations with single nucleotide polymorphisms (SNPs), multiple SNPs on a gene and their interactions remain unexamined.

OBJECTIVES

This study examined gene-level associations with cardiomyopathy among cancer survivors using whole-exome sequencing data.

METHODS

For discovery, 278 childhood cancer survivors (129 cases; 149 matched control subjects) from the COG (Children's Oncology Group) study ALTE₀₃N₁ were included. Logistic regression (machine learning) was used to identify gene-level SNP combinations for 7,212 genes and ordinal logistic regression to estimate gene-level associations with cardiomyopathy. Models were adjusted for primary cancer, age at cancer diagnosis, sex, race/ethnicity, cumulative anthracycline dose, chest radiation, cardiovascular risk factors, and 3 principal components.

Statistical significance threshold of 6.93×10^{-6} accounted for multiple testing. Three independent cancer survivor populations (COG study, BMTSS [Blood or Marrow Transplant Survivor Study] and CCSS [Childhood Cancer Survivor Study]) were used to replicate gene-level associations and examine SNP-level associations from discovery genes using ordinal logistic, conditional logistic, and Cox regression models, respectively.

RESULTS

Median age at cancer diagnosis for discovery cases and control subjects was 6 years and 8 years, respectively. Gene-level association for P2RX7 (OR: 0.10; 95% CI: 0.04-0.27; $P = 2.19 \times 10^{-6}$) was successfully replicated (HR: 0.65; 95% CI: 0.47-0.90; $P = 0.009$) in the CCSS cohort. Additional signals were identified on TNK1, LRRK2, MEFV, NOBOX, and FBN3. Individual SNPs across all discovery genes, except FBN3, were replicated.

CONCLUSIONS

In our study, SNP sets having 1 or no copies of P2RX7 variant alleles were associated with reduced risk of cardiomyopathy, presenting a potential therapeutic target to mitigate cardiac outcomes in cancer survivors.

IMPROVED CARDIOMYOPATHY RISK PREDICTION USING GLOBAL LONGITUDINAL STRAIN AND N-TERMINAL-PRO-B-TYPE NATRIURETIC PEPTIDE IN SURVIVORS OF CHILDHOOD CANCER EXPOSED TO CARDIOTOXIC THERAPY

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PURPOSE

To leverage baseline global longitudinal strain (GLS) and N-terminal-pro-B-type natriuretic peptide (NT-proBNP) to identify childhood cancer survivors with a normal left ventricular ejection fraction (LVEF) at highest risk of future treatment-related cardiomyopathy.

METHODS

St Jude Lifetime Cohort participants ≥ 5 years from diagnosis, at increased risk for cardiomyopathy per the International Guideline Harmonization Group (IGHG), with an LVEF $\geq 50\%$ on baseline echocardiography ($n = 1,483$) underwent measurement of GLS ($n = 1,483$) and NT-proBNP ($n = 1,052$; 71%). Multivariable Cox regression models estimated hazard ratios (HRs) and 95% CIs for postbaseline cardiomyopathy (modified Common Terminology Criteria for Adverse Events \geq grade 2) incidence in association with echocardiogram-based GLS (≥ -18) and/or NT-proBNP ($>$ age-sex-specific 97.5th percentiles). Prediction performance was assessed using AUC in models with and without GLS and NT-proBNP and compared using DeLong's test for IGHG moderate- and high-risk individuals treated with anthracyclines.

RESULTS

Among survivors (median age, 37.6; range, 10.2-70.4 years), 162 (11.1%) developed \geq grade 2 cardiomyopathy 5.1 (0.7-10.0) years from baseline assessment. The 5-year cumulative incidence of cardiomyopathy for survivors with and without abnormal GLS was, respectively, 7.3% (95% CI, 4.7 to 9.9) versus 4.4% (95% CI, 3.0 to 5.7) and abnormal NT-proBNP was 9.9% (95% CI, 5.8 to 14.1) versus 4.7% (95% CI, 3.2 to 6.2). Among survivors with a normal LVEF, abnormal baseline GLS and NT-proBNP identified anthracycline-exposed, IGHG-defined moderate-/high-risk survivors at a four-fold increased hazard of postbaseline cardiomyopathy (HR, 4.39 [95% CI, 2.46 to 7.83]; $P < .001$), increasing to a HR of 14.16 (95% CI, 6.45 to 31.08; $P < .001$) among survivors who received ≥ 250 mg/m² of anthracyclines. Six years after baseline, AUCs for individual risk prediction were 0.70 for models with and 0.63 for models without GLS and NT-proBNP ($P = .022$).

CONCLUSION

GLS and NT-proBNP should be considered for improved identification of survivors at high risk for future cardiomyopathy.

EFFECT OF CARVEDILOL VERSUS PLACEBO ON CARDIAC FUNCTION IN ANTHRACYCLINE-EXPOSED SURVIVORS OF CHILDHOOD CANCER (PREVENT-HF): A RANDOMISED, CONTROLLED, PHASE 2B TRIAL

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Lancet Oncol; doi: [10.1016/S1470-2045\(23\)00637-X](https://doi.org/10.1016/S1470-2045(23)00637-X)

BACKGROUND

Carvedilol improves cardiac function in patients with heart failure but remains untested as cardioprotective therapy in long-term childhood cancer survivors (ie, those who have completed treatment for childhood cancer and are in remission) at risk for heart failure due to high-dose anthracycline exposure. We aimed to evaluate the activity and safety of low-dose carvedilol for heart failure risk reduction in childhood cancer survivors at highest risk for heart failure.

METHODS

PREVENT-HF was a randomised, double-blind, phase 2b trial done at 30 hospitals in the USA and Canada. Patients were eligible if they had any cancer diagnosis that resulted in at least 250 mg/m² cumulative exposure to anthracycline by age 21 years; completed their cancer treatment at least 2 years previously; an ejection fraction of at least 50% or fractional shortening of at least 25%, or both; and bodyweight of at least 40 kg. Patients were randomly assigned (1:1) with automated computer-generated permuted block randomisation (block size of 4), stratified by age at diagnosis, time since diagnosis, and history of chest-directed radiotherapy, to carvedilol (up-titrated from 3.125 g per day to 12.5 mg per day) or placebo orally for 2 years.

FINDINGS

Between July 3, 2012, and June 22, 2020, 196 participants were enrolled, of whom 182 (93%) were eligible and randomly assigned to either carvedilol (n=89) or placebo (n=93; ITT population). Median age was 24.7 years (IQR 19.6–36.6), 91 (50%) participants were female, 91 (50%) were male, and 119 (65%) were non-Hispanic White. As of data cutoff (June 10, 2022), median follow-up was 725 days (IQR 378–730). 151 (n=75 in the carvedilol group and n=76 in the placebo group) of 182 participants were included in the mITT population, among whom LVWT/Dz was similar between the two groups (–0.14 [95% CI –0.43 to 0.16] in the carvedilol group vs –0.45 [–0.77 to –0.13] in the placebo group; difference 0.31 [95% CI –0.10 to 0.73]; p=0.14). Two (2%) of 89 patients in the carvedilol group two adverse events of grade 2 or higher (n=1 shortness of breath and n=1 arthralgia) and none in the placebo group. There were no adverse events of grade 3 or higher and no deaths.

INTERPRETATION

Low-dose carvedilol appears to be safe in long-term childhood cancer survivors at risk for heart failure, but did not result in significant improvement of LVWT/Dz compared with placebo. These results do not support the use of carvedilol for secondary heart failure prevention in anthracycline-exposed childhood cancer survivors.

SERUM ADIPOKINES AS BIOMARKERS FOR SURVEILLANCE OF METABOLIC SYNDROME IN CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA SURVIVORS IN LOW MIDDLE-INCOME COUNTRIES

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Nutr Cancer; doi: [10.1080/01635581.2023.2301139](https://doi.org/10.1080/01635581.2023.2301139)

BACKGROUND

Serum adipokines (leptin and adiponectin) are dysregulated before the onset of metabolic syndrome and hence may be useful biomarkers for screening of cardiometabolic late effects in childhood Acute Lymphoblastic Leukemia (cALL) survivors.

METHODS

We compared serum adipokine levels between 40 cALL survivors (aged 10-18 years, >2 years from treatment completion) with similar controls. A multivariable logistic regression analysis was then done to assess the association of metabolic syndrome in cALL survivors with variables including adipokines and other metabolic parameters, demographic and treatment details, and Dual-energy X-ray absorptiometry scan-derived variables.

RESULTS

Compared to controls, cALL survivors had a higher prevalence of metabolic syndrome (8/40 vs. 2/40, $P = .044$) and central obesity (11/40 vs. 4/40, $P = 0.042$). Median Serum Leptin (7.39 vs. 4.23 ng/ml, $P = 0.207$) levels and derived Leptin-Adiponectin Ratio (1.44 vs. 0.80, $P = 0.598$), were higher but not statistically different in our survivors compared to controls; Adiponectin levels were similar (6.07 vs. 5.01 $\mu\text{g/ml}$, $P = 0.283$). In the cALL survivors, overweight/obesity (odds ratio [OR] 21.9, $P = 0.020$) or higher Leptin levels (OR 1.11, $P = 0.047$), were independently associated with metabolic syndrome.

CONCLUSION

Serum Leptin, independently predictive of metabolic syndrome in our cALL survivors, may be tested in larger studies to assess its utility in surveillance and initiation of early preventive measures.

HOW I TREAT: LONG-TERM SURVIVORS OF CHILDHOOD ACUTE LEUKEMIA

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Blood; doi: [10.1182/blood.2023019804](https://doi.org/10.1182/blood.2023019804)

ABSTRACT

The population of childhood leukemia survivors who reach adulthood is growing due to improved therapy. However, survivors are at risk of long-term complications. Comprehensive follow-up programs play a key role in childhood leukemia survivor care. The major determinant of long-term complications is the therapeutic burden accumulated over time. Relapse chemotherapy, central nervous system irradiation, hematopoietic stem cell transplantation and total body irradiation are associated with greater risk of long-term complications. Other parameters include clinical characteristics such as age and sex as well as environmental, genetic and socio-economic factors, which can help to stratify the risk of long-term complications and organize the follow-up program.

Early diagnosis improves the management of several late complications such as anthracycline-related cardiomyopathy, secondary cancers, metabolic syndrome, development defects and infertility. Total body irradiation is the treatment associated with the worse long-term toxicity profile with a wide range of complications. Patients treated with chemotherapy alone are at a lower risk of long-term complications, although the optimal long-term follow-up remains unclear. Novel immunotherapies and targeted therapy are generally associated with a better short-term safety profile but still require careful long-term toxicity monitoring. Advances in understanding genetic susceptibility to long-term complications could enable tailored therapeutic strategies for leukemia treatment and optimized follow-up programs.

ANTHROPOMETRIC PARAMETERS AS A TOOL FOR THE PREDICTION OF METABOLIC AND CARDIOVASCULAR RISK IN CHILDHOOD BRAIN TUMOR SURVIVORS

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Diabetol Metab Syndr; doi: [10.1186/s13098-024-01262-7](https://doi.org/10.1186/s13098-024-01262-7)



PURPOSE

To assess the prevalence of alterations in anthropometric parameters predictive of metabolic syndrome and cardiovascular risk among childhood brain tumor survivors.

METHODS

Anthropometric parameters predictive of metabolic syndrome and cardiovascular risk were analyzed [height, weight, BMI, waist circumference, hip circumference, waist-height ratio (WHtR), waist-hip ratio (WHR, blood pressure] of 25 patients who survived childhood brain tumors.

RESULTS

21 patients (84%) showed alteration of at least one predictive anthropometric parameter. 11 patients (44%) showed a BMI > 75th percentile and 19 patients (76%) showed a pathological WHR value. A pathological WHtR (> 0.5), was identified in 17 patients (68%); the average WHtR observed was 0.53. 9 patients (36%) showed an alteration of all three anthropometric parameters considered. Comparing this subpopulation with the subpopulation with less than three altered parameters, a greater prevalence of the combined alteration was observed in the female sex compared to the male sex (67% vs. 26%). No significant differences were observed regarding the age of diagnosis and end of treatment nor the treatments carried out (chemotherapy, radiotherapy, steroid therapy) between the two groups.

CONCLUSION

These results suggest that this population is at high risk of presenting pathological values of BMI, WHR and WHtR with consequent high risk of developing metabolic syndrome and cardiovascular diseases.

WE ARE DONE! NOW WHAT? EXPLORING END OF TREATMENT NEEDS OF CHILDHOOD CANCER SURVIVORS AND THEIR PARENTS

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J Pediatr Hematol Oncol Nurs; doi: [10.1177/27527530231194598](https://doi.org/10.1177/27527530231194598)

BACKGROUND

Increased childhood cancer survival rates have spurred a new body of research pertaining to the cancer-survivorship continuum. Literature suggests a lack of research and guidelines for care at the end of treatment (EOT). To improve the transition to survivorship and determine any posttreatment challenges, this study explored the experiences of childhood cancer survivors (CCSs), parents/caregivers, and pediatric oncology health care professionals (HCPs) at EOT.

METHOD

This study employed a mixed methods design. EOT Questionnaires were completed by CCSs and parents/caregivers within 6 months of completing treatment, and by pediatric oncology HCPs.

RESULTS

A total of 75 CCSs and parents/caregivers and 21 HCPs completed the study. The majority of parents/caregivers (78%) and older CCSs (94%) recalled having an EOT "meeting." Most were satisfied with the meeting, but described unexpected worries/problems following EOT. Family members stating they were "very satisfied" with the EOT meeting increased significantly relative to the number of EOT topics addressed. In contrast, the omission of certain psychosocial discussion topics negatively correlated with satisfaction. Oncologists provided the majority of EOT services, with infrequent provision by other HCPs. Less than 20% of HCPs characterized families as "very satisfied" with EOT services and suggested improvements to meet families' needs.

DISCUSSION

This study found unmet psychosocial and anticipatory guidance needs, indicating a lack of preparedness. The results suggest that end of cancer treatment requires a more standardized, comprehensive, and multidisciplinary approach. Enhanced education and support services are needed to promote the successful navigation of all families through this period of transition.

CONTRIBUTING FACTORS TO WELL-BEING IN A SAMPLE OF LONG-TERM SURVIVORS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA: THE ROLE OF SOCIAL SUPPORT IN EMOTIONAL REGULATION

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Health Psychol Behav Med; doi: [10.1080/21642850.2023.2301550](https://doi.org/10.1080/21642850.2023.2301550)



OBJECTIVES

To understand why some long-term childhood cancer survivors experience positive adjustment in the long run,[Q1] this study aimed to (1) explore associations between well-being, health status, social support, and emotion regulation (ER) strategies in a cohort of long-term childhood lymphoblastic leukemia (cALL) survivors, (2) identify the individual contribution of each ER strategy to well-being (3) and their interaction with social support.

METHODS

We used data from 92 participants from the PETALE cohort (51% female, aged 24 ± 7 years). Measures included well-being (WHO-5), health status (15D), social support (SSQ-6), cognitive reappraisal and expressive suppression (ERQ), and emotional processing and expression (EAC). We modeled the odds of high well-being adjusting for health status in logistic regressions and explored the moderating role of social support with bootstrap techniques. Independent of clinical history, high well-being was associated with better health status, higher social support, more frequent use of cognitive reappraisal and emotional processing.

RESULTS

We found a main contribution of emotional processing to well-being ($OR = 2.12$, 95% $CI = 1.09-5.37$). The interaction between low suppression and high social support was significant ($OR = .40$, 95% $CI = .13-.79$). Probabilities for high well-being were 96% when expressive suppression was low and social support was high. Results suggest approaching one's own emotions may contribute to well-being in long-term childhood cancer survivors.

CLINICAL IMPLICATIONS

Combining curbing emotional suppression with promoting supportive social environment could be a promising target for future supportive care interventions in survivors.

NEUROCOGNITIVE AND PSYCHOSOCIAL OUTCOMES IN SURVIVORS OF CHILDHOOD LEUKEMIA WITH DOWN SYNDROME

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Cancer Med; doi: [10.1002/cam4.6842](https://doi.org/10.1002/cam4.6842)



OBJECTIVES

The primary aim of this study was to assess the feasibility of a developmentally tailored neurocognitive assessment in survivors of childhood acute leukemia with Down syndrome (DS-leukemia). A secondary aim was to compare outcomes in the DS-leukemia group to a historical comparison group of individuals with DS and no history of childhood cancer.

METHODS

Survivors of DS-leukemia ($n = 43$; 56% male, mean [SD] age at diagnosis = 4.3 [4.5] years; age at evaluation = 15 [7.9] years) completed a neurocognitive assessment battery that included direct measures of attention, executive function, and processing speed, and proxy ratings of attention problems and executive dysfunction. Direct assessment outcomes were compared to a historical comparison cohort of individuals with DS and no history of childhood cancer (DS-control; $n = 117$; 56% male, mean [SD] age at evaluation = 12.7 [3.4] years).

RESULTS

Rates of valid task completion ranged from 54% to 95%, suggesting feasibility for most direct assessment measures. Compared to the DS-control group, the DS-leukemia group had significantly lower completion rates on measures of executive function ($p = 0.008$) and processing speed ($p = 0.018$) compared to the DS-control group. There were no other significant group differences in completion rates. Compared to the DS-control group, the DS-leukemia group had significantly more accurate performance on two measures of executive function ($p = 0.032$; $p = 0.005$). Compared to the DS-control group, the DS-leukemia group had significantly more problems with executive function as identified on proxy ratings (6.5% vs. 32.6%, $p = <0.001$).

CONCLUSIONS

Children with Down syndrome (DS) are at increased risk for developing acute leukemia compared to the general population but are systematically excluded from neurocognitive outcome studies among leukemia survivors. This study demonstrated the feasibility of evaluating neurocognitive late effects in leukemia survivors with DS using novel measures appropriate for populations with intellectual developmental disorder.

LATE CARDIAC TOXIC EFFECTS ASSOCIATED WITH TREATMENT PROTOCOLS FOR HODGKIN LYMPHOMA IN CHILDREN

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IMPORTANCE

Contemporary North American trials for children with Hodgkin lymphoma (HL) have decreased radiation therapy (RT) use and increased pharmacologic cardioprotection but also increased the cumulative doxorubicin dose, making overall treatment consequences for late cardiac toxic effects uncertain.

OBJECTIVE

To estimate the risk of cardiac toxic effects associated with treatments used in modern pediatric HL clinical trials.

STUDY DESIGN

For this cohort study, Fine and Gray models were fitted using survivors in the Childhood Cancer Survivor Study who were diagnosed with HL between January 1, 1970, and December 31, 1999, and were followed for a median of 23.5 (range, 5.0–46.3) years. These models were applied to the exposures in the study population to estimate the 30-year cumulative incidence of cardiac disease. The study population comprised patients with intermediate-risk or high-risk HL treated in 4 consecutive Children's Oncology Group clinical trials from September 2002 to October 2022: AHOD0031, AHOD0831, AHOD1331, and S1826. Data analysis was performed from April 2020 to February 2023.

EXPOSURES

All patients received chemotherapy including doxorubicin, and some patients received mediastinal RT, dexrazoxane, or mediastinal RT and dexrazoxane.

RESULTS

The study cohort comprised 2563 patients, with a median age at diagnosis of 15 (range, 1–22) years. More than half of the patients were male (1357 [52.9%]). All 2563 patients received doxorubicin, 1362 patients (53.1%) received mediastinal RT, and 307 patients (12.0%) received dexrazoxane. Radiation therapy use and the median mean heart dose among patients receiving RT decreased, whereas the planned cumulative dose of doxorubicin and use of dexrazoxane cardioprotection increased. For patients treated at age 15 years, the estimated 30-year cumulative incidence of severe or fatal cardiac disease was 9.6% (95% CI, 4.2%–16.4%) in the AHOD0031 standard treatment group (enrolled 2002–2009), 8.6% (95% CI, 3.8%–14.9%) in the AHOD0831 trial (enrolled 2009–2012), 8.2% (95% CI, 3.6%–14.3%) in the AHOD1331 trial (enrolled 2015–2019), and 6.2% (95% CI, 2.7%–10.9%) in the S1826 trial (enrolled 2019–2022), whereas the expected rate in an untreated population was 5.0% (95% CI, 2.1%–9.3%). Despite the estimated reduction in late cardiac morbidity, the frequency of recommended echocardiographic screening among survivors will increase based on current guidelines.

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CONCLUSIONS AND RELEVANCE

In this cohort study of sequential HL trials, reductions in the proportion of children receiving mediastinal RT and increases in dexrazoxane use were estimated to offset the increased doxorubicin dose and produce a net reduction in late cardiac disease. Further studies on dexrazoxane are warranted to confirm whether its role in reducing cardiac toxic effects is maintained long term. These findings suggest that survivorship follow-up guidelines should be refined to align with the risks associated with treatment.

RISK OF SUBSEQUENT GLIOMAS AND MENINGIOMAS AMONG 69,460 5-YEAR SURVIVORS OF CHILDHOOD AND ADOLESCENT CANCER IN EUROPE: THE PANCARESURFUP STUDY

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BACKGROUND

Childhood cancer survivors are at risk of subsequent gliomas and meningiomas, but the risks beyond age 40 years are uncertain. We quantified these risks in the largest ever cohort.

METHODS

Using data from 69,460 5-year childhood cancer survivors (diagnosed 1940–2008), across Europe, standardized incidence ratios (SIRs) and cumulative incidence were calculated.

RESULTS

In total, 279 glioma and 761 meningioma were identified. CNS tumour (SIR: 16.2, 95% CI: 13.7, 19.2) and leukaemia (SIR: 11.2, 95% CI: 8.8, 14.2) survivors were at greatest risk of glioma. The SIR for CNS tumour survivors was still 4.3-fold after age 50 (95% CI: 1.9, 9.6), and for leukaemia survivors still 10.2-fold after age 40 (95% CI: 4.9, 21.4).

Following cranial radiotherapy (CRT), the cumulative incidence of a glioma in CNS tumour survivors was 2.7%, 3.7% and 5.0% by ages 40, 50 and 60, respectively, whilst for leukaemia this was 1.2% and 1.7% by ages 40 and 50. The cumulative incidence of a meningioma after CRT in CNS tumour survivors doubled from 5.9% to 12.5% between ages 40 and 60, and in leukaemia survivors increased from 5.8% to 10.2% between ages 40 and 50.

DISCUSSION

Clinicians following up survivors should be aware that the substantial risks of meningioma and glioma following CRT are sustained beyond age 40 and be vigilant for symptoms.

FEATURES OF STUDIES ON TRANSITION INTERVENTIONS FOR CHILDHOOD CANCER SURVIVORS: A SCOPING REVIEW

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Cancers (Basel); doi: [10.3390/cancers16020272](https://doi.org/10.3390/cancers16020272)



PURPOSE

In this scoping review, previously reported data were described and synthesized to document transition interventions in CCSs, and the features of intervention components of the current transition studies for CCSs were summarized.

METHODS

A literature search was conducted in PubMed, Web of Science, EMBASE, PsycINFO, CINAHL, Ovid, and the Cochrane Library following the PRISMA-ScR statement. All original studies (n = 9) investigating transition interventions in CCSs were included.

RESULTS

The current studies identified essential elements for transition programs, such as delivering knowledge, developing skills for coordination of care, and addressing psychosocial needs. However, the current transition interventions were generally in their infancy, and major deficits were found, including poorly reported intervention components and procedures, a limited number of relevant validated outcomes, and a failure to incorporate conceptual frameworks and international consensus statements.

CONCLUSIONS

This scoping review mapped current evidence of transition interventions for CCSs and highlighted the paucity of data in this area. More high-quality and well-reported randomized controlled trials are needed for the enrichment and standardization of future transition interventions.

EVALUATION OF METABOLIC AND CARDIOVASCULAR RISK MEASURED BY LABORATORY BIOMARKERS AND CARDIOPULMONARY EXERCISE TEST IN CHILDREN AND ADOLESCENTS RECOVERED FROM BRAIN TUMORS: THE CARMEP STUDY

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Cancers (Basel); doi: [10.3390/cancers16020324](https://doi.org/10.3390/cancers16020324)



ABSTRACT

In recent decades, the improvement of treatments and the adoption of therapeutic protocols of international cooperation has led to an improvement in the survival of children affected by brain tumors. However, in parallel with the increase in survival, long-term side effects related to treatments have been observed over time, including the activation of chronic inflammatory processes and metabolic alterations, which can facilitate the onset of metabolic syndrome and increased cardiovascular risk. The aim of this study was to find possible statistically significant differences in the serum concentrations of early biomarkers of metabolic syndrome and in the results of cardiopulmonary exercise testing between survivors of childhood brain tumors and healthy controls.

This is a prospective and observational study conducted on a group of 14 male patients who survived childhood brain tumors compared with the same number of healthy controls. The concentrations of early metabolic syndrome biomarkers [adiponectin, leptin, TNF- α , IL-1, IL-6, IL-10, endothelin-1, apolipoprotein B, and lipoprotein (a)] were measured and a cardiopulmonary exercise test (CPET) was performed. Results: Childhood brain tumor survivors performed worse on average than controls on the CPET. Furthermore, they showed higher endothelin-1 values than controls ($p = 0.025$). The CPET results showed an inverse correlation with leptin. The differences found highlight the greater cardiovascular risk of brain tumor survivors, and radiotherapy could be implicated in the genesis of this greater cardiovascular risk.

A SOFTWARE TOOL TO SUPPORT FOLLOW-UP CARE IN A FRENCH CHILDHOOD CANCER COHORT: CONSTRUCTION AND FEASIBILITY

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BACKGROUND

Treatment summaries and a personalized survivorship care plans based on internationally approved, organ-specific follow-up care recommendations are essential in preserving the health and quality of life for cancer survivors. Cohorts made up of survivors of childhood cancer have made significant contributions to the understanding of early mortality, somatic late complications, and psychosocial outcomes among former patients. New treatment protocols are needed to enhance survival and reduce the potential risk and severity of late effects, and working with treatment databases is crucial in doing so.

METHODS

In the GOCE (Grand Ouest Cancer de l'Enfant [Western Region Childhood Cancer]) network, in a participative approach, we developed the LOG-after medical tool, on which health data are registered and can be extracted for analysis. Its name emphasizes the tool's goal, referring to 'logiciel' (the French word for software) that focuses on the period "after" the acute phase. This tool is hosted on a certified health data server. Several interfaces have been developed that can be used depending on the user's profile. Here we present this innovative co-constructed tool that takes national aspects into account, including the results of the feasibility/satisfaction study and its perspective.

RESULTS

The database contains data relating to 2558 patients, with samples from 1702 of these (66.54%) being held in a tumor bank. The average year in which treatment started was 2015 (ranging from December 1967 to November 2022). Former patients' opinions were collected by their doctor by e-mail, telephone, or during a consultation in an open-ended question and a non-directive interview. All patients were satisfied with the tool, with interest in testing it in the long term. Some former patients found that the tool provided them with some ease of mind; one, for instance, commented: "I feel lighter. I allow myself to forget. I know I will get a notification when the time comes."

CONCLUSIONS

Freely available to all users, LOG-after: (1) provides help with determining personalized survivorship care plans for follow-up; (2) builds links with general practitioners; (3) empowers the patient; and (4) enables health data to be exported for analysis. Database URL for presentation: <https://youtu.be/2Ga64iausJE>.

LATE EFFECTS OF HIGH-DOSE METHOTREXATE IN CHILDHOOD CANCER SURVIVORS: A SWISS SINGLE CENTRE OBSERVATIONAL STUDY

Kevin Brunold, Maria Otth, Katrin Scheinemann

Discov Oncol; doi: [10.1007/s12672-024-00861-0](https://doi.org/10.1007/s12672-024-00861-0)



IMPORTANCE

Childhood cancer survivors (CCS) are at risk for late effects of different organ systems. The currently available screening recommendations for those treated with high-dose methotrexate (HD-MTX) are not uniform and the available literature is limited.

OBJECTIVE

We aim to assess the prevalence and severity of late effects in CCS treated with HD-MTX at a single centre in Switzerland. We focus on organ systems defined at risk by the long-term follow-up care guidelines of the children's oncology group (COG), because this guideline has a holistic approach, is evidence based, and up to date.

METHODS

We used the modified Common Terminology Criteria for Adverse Events (CTCAE) to assess late effects in 15 different organ systems. Eligible were CCS diagnosed with cancer younger than 18 years and treated with HD-MTX, defined as at least 1 g per body surface area ($\geq 1 \text{ g/m}^2$).

RESULTS

We analysed 32 CCS with a median follow-up of 12.1 years. The endocrine system was most frequently affected by adverse events (69%), followed by the musculoskeletal (57%) and neuropsychological (38%) systems. The hepatobiliary (9%) and immunological (6%) systems were the least affected ones. Within the endocrine system, overweight/obesity was the most frequent and severe diagnosis.

CONCLUSION

Late effects in CCS treated with HD-MTX are frequent. Our findings could add to the COG guidelines, where only screening for the musculoskeletal, neuropsychological, and hepatobiliary systems are recommended. More patient data need to be collected and analysed using the suggested standardised approach, to increase the quality of evidence for future screening recommendations.

LATE MORTALITY AMONG 5-YEAR SURVIVORS OF CHILDHOOD CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Cancer; doi: [10.1002/cncr.35213](https://doi.org/10.1002/cncr.35213)



BACKGROUND

Childhood cancer survivors are at increased risk of late mortality (death ≥ 5 years after diagnosis) from cancer recurrence and treatment-related late effects. The authors conducted a systematic review and meta-analysis to provide comprehensive estimates of late mortality risk among survivors internationally and to investigate differences in risk across world regions.

METHODS

Health sciences databases were searched for cohort studies comprised of 5-year childhood cancer survivors in which the risk of mortality was evaluated across multiple cancer types. Eligible studies assessed all-cause mortality risk in survivors relative to the general population using the standardized mortality ratio (SMR). The absolute excess risk (AER) was assessed as a secondary measure to examine excess deaths. Cause-specific mortality risk was also assessed, if reported. SMRs from nonoverlapping cohorts were combined in subgroup meta-analysis, and the effect of world region was tested in univariate meta-regression.

RESULTS

Nineteen studies were included, and cohort sizes ranged from 314 to 77,423 survivors. Throughout survivorship, SMRs for all-cause mortality generally declined, whereas AERs increased after 15–20 years from diagnosis in several cohorts. All-cause SMRs were significantly lower overall in North American studies than in European studies (relative SMR, 0.63; 95% confidence interval, 0.49–0.80). SMRs for subsequent malignant neoplasms and for cardiovascular, respiratory, and external causes did not vary significantly between world regions.

CONCLUSIONS

The current findings suggest that late mortality risk may differ significantly between world regions, but these conclusions are based on a limited number of studies with considerable heterogeneity. Reasons for regional differences remain unclear but may be better elucidated through future analyses of individual-level data.

LATE COMPLICATIONS IN LONG-TERM CHILDHOOD CANCER SURVIVORS: WHAT THE ORAL HEALTH PROFESSIONAL NEEDS TO KNOW

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Dent J (Basel); doi: [10.3390/dj12010017](https://doi.org/10.3390/dj12010017)



ABSTRACT

With diagnostic and therapeutic advances, over 80% of children diagnosed with cancer become long-term survivors. As the number of childhood cancer survivors (CCS) continues to increase, dental practitioners become more likely to have CCS among their patients. CCS may develop late complications from damage caused by their cancer treatment to endocrine, cardiovascular, musculoskeletal, and other organ systems. These complications may surface decades after the completion of treatment. Adverse outcomes of childhood cancer treatment frequently involve oral and craniofacial structures including the dentition.

Tooth development, salivary gland function, craniofacial growth, and temporomandibular joint function may be disturbed, increasing oral health risks in these individuals. Moreover, CCS are at risk of developing subsequent malignancies, which may manifest in or near the oral cavity. It is important that dental practitioners are aware of the childhood cancer history of their patients and have knowledge of potential late complications. Therefore, this narrative review aims to inform dental practitioners of late oral complications of cancer treatment modalities commonly used in pediatric oncology. Furthermore, selected common non-oral late sequelae of cancer therapy that could have an impact on oral health and on delivering dental care will be discussed.

DIETARY PATTERNS AND THEIR ASSOCIATIONS WITH SOCIODEMOGRAPHIC AND LIFESTYLE FACTORS IN ADULT SURVIVORS OF CHILDHOOD CANCER: A CROSS-SECTIONAL STUDY

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Am J Clin Nutr; doi: [10.1016/j.ajcnut.2024.01.012](https://doi.org/10.1016/j.ajcnut.2024.01.012)

BACKGROUND

Little is known about the specific dietary patterns in adult survivors of childhood cancer.

OBJECTIVES

We aimed to identify dietary patterns specific to childhood cancer survivors and examine their associations with sociodemographic and lifestyle factors.

METHODS

Adult survivors of childhood cancer (mean:31±8 years, n=3,022) and non-cancer controls, n=497) in the St. Jude Lifetime Cohort self-reported diet over the past 12 months using a validated Food Frequency Questionnaire. Factor analysis with 48 predefined food groups was performed to identify foods consumed together. Subsequently, cluster analysis with energy-adjusted factor scores was used to categorize survivors into a mutually exclusive dietary pattern. Dietary patterns were the primary outcomes. Multivariable multinomial logistic regressions were used to cross-sectionally examine associations between sociodemographic and lifestyle factors and dietary patterns in cancer survivors.

RESULTS

Among the four dietary patterns identified, the fast-food pattern (36 %) was the most common, followed by the Western contemporary (30 %), the plant-based (20 %), and the animal-based (14 %) patterns in childhood cancer survivors. In contrast, the plant-based (38 %) and fast-food patterns (29 %) were prevalent in controls. In survivors, male sex, younger age, lower educational attainment, and physical inactivity were associated with the fast-food, Western contemporary, or animal-based pattern. Compared with non-Hispanic White survivors consuming the plant-based diet, non-Hispanic Black survivors were 2-5 times more likely to consume the fast-food (Odds ratio [OR]=2.76; 95 % confidence interval [CI]: 1.82, 4.18) or the animal-based diet (OR=5.61; 95 % CI: 3.58, 8.78). Also, survivors residing in the most deprived area were 2-3 times more likely to consume the fast-food, Western contemporary, or animal-based diet.

CONCLUSIONS

Unhealthy dietary patterns are prevalent in adult survivors of childhood cancer, especially those with lower socioeconomic status and racial minorities. Interventions to improve diet and health in childhood cancer survivors need to concurrently address disparities that contribute to adherence to healthy dietary practices.

PARENTHOOD FOR CHILDHOOD CANCER SURVIVORS: UNFOUNDED FEAR OF CANCER DEVELOPMENT IN OFFSPRING AND RELATED HEALTH BEHAVIORS

Nina Dalkner, Eva Fleischmann, Anja Borgmann-Staudt, Christine Fürschuß, Stephanie Klco-Brosius, Katerina Kepakova, Jarmila Kruseova, Herwig Lackner, Gisela Michel, Andrea Mohapp, Eva Nagele, Anna Panasiuk, Melanie Tamesberger, Eva Z Reininghaus, Karin Wiegele, Magdalena Balcerek

Front Psychol; doi: [10.3389/fpsyg.2023.1269216](https://doi.org/10.3389/fpsyg.2023.1269216)



ABSTRACT

Current literature reveals no increased risk for adverse non-hereditary health outcomes in the offspring of childhood cancer survivors (CCS), yet survivors reported concerns regarding their offspring's health. To investigate how the fear of cancer development in offspring influences parental behavior related to health and prevention, survey reports from 256 European adult CCS and 256 age- and sex-matched siblings who participated in a multicenter study on offspring health were analyzed in the present study. Analyses of covariance and chi-square tests were conducted to test for differences between CCS and siblings in outcome variables (all related to healthy parenting behavior).

CCS reported higher fear levels ($p = 0.044$, Partial $\eta^2 = 0.01$) and less alcohol consumption ($p = 0.011$, $\Phi = 0.12$) and smoking ($p = 0.022$, $\Phi = 0.11$) during pregnancy than siblings. In survivor families, children were breastfed less often ($p < 0.001$, $\Phi = 0.18$). Partial correlation analyses showed that CCS' fear levels decreased with increasing age ($r = -0.16$, $p = 0.014$), time since oncological therapy ($r = -0.19$, $p = 0.003$), and number of children ($r = -0.21$, $p = 0.001$). Overall, due to their own experiences with cancer, many CCS harbor misperceptions regarding the health outcomes of their offspring. Although the fear decreases with increasing distance from the active disease, any fear should be taken seriously, even if unfounded, and combated through targeted educational measures.

LONG-TERM NEUROTOXICITY AMONG CHILDHOOD ACUTE LYMPHOBLASTIC LEUKAEMIA SURVIVORS ENROLLED BETWEEN 1971 AND 1998 IN EORTC CHILDREN LEUKEMIA GROUP STUDIES

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Discov Oncol; doi: [10.1007/s12672-024-00869-6](https://doi.org/10.1007/s12672-024-00869-6)



ABSTRACT

Survival after childhood acute lymphoblastic leukemia (ALL) has increased over the last 40 years with an overall survival above 90%. Survivors may experience neurological late effects secondary to chemotherapy and radiotherapy. This observational retrospective study evaluated the cumulative incidence of neurological late effects among 890 childhood ALL survivors treated in EORTC CLG trials (58741, 58831/2 and 58881) between 1971 and 1998. Median follow-up was 19 years and interquartile range of the follow-up was 15-22 years. At 20 years from the end of treatment, approximately 66% of patients from the 58741 trial (accrual time: 1971-1978) and approximately 15% from the more recent trials had cognitive disturbance grade 1 or higher.

Cumulative incidences at 20 years from treatment end of seizures, stroke and leukoencephalopathy were respectively 45%, 16% and 62% in study 58741, 13%, 2% and 5% in study 58831/2, and 8%, 2% and 3% in study 58881. Patients who were 10-17 years of age at diagnosis had a higher incidence of stroke and leukoencephalopathy as compared to those less than 6 years of age. Noteworthy, all neurological late effects continued to occur beyond 5 years after end of treatment. This retrospective study highlights the frequency of neurological late effects in survivors of childhood ALL. With the increase of the overall survival of ALL patients, the role and potential benefit of longitudinal neurological screening should be evaluated in further studies as these neurological late effects become an important public health challenge. This study is part of the larger EORTC CLG 58 Late Adverse Effects (LAE) study

THE ST. JUDE CHILDREN'S RESEARCH HOSPITAL AFTER COMPLETION OF THERAPY CLINIC

Melissa M Hudson

J Cancer Surviv; doi: [10.1007/s11764-023-01519-6](https://doi.org/10.1007/s11764-023-01519-6)



ABSTRACT

The St. Jude's After Completion of Therapy (ACT) Clinic was established in 1984 to address the needs of long-term survivors treated at St. Jude Children's Research Hospital. Survivors eligible for transfer to ACT Clinic include those treated at St. Jude who are cancer-free, 5 years from diagnosis (5 years after completion of relapse therapy), and 2 years after completion of therapy. Services provided to clinic attendees include transportation, housing, and medical care costs not covered by insurance. The clinic's mission is to improve the quality of life of survivors by facilitating their access to resources that optimize physical and emotional health, social functioning, and educational and vocational achievement. ACT evaluations are undertaken by a multidisciplinary team comprised of nurses, advanced practice providers, physicians, social workers, psychologists, and other medical subspecialists as needed.

ACT interventions include the organization of a survivorship care plan/treatment summary, risk-based health screening, counseling about health risks/risk mitigation, comprehensive psychosocial assessment, assistance with care transitions, and case management for identification of local resources. The ACT Clinic offers educational opportunities to graduate medical trainees and precepts national and international visitors seeking guidance in the development of survivorship programs. The ACT Clinic also provides a robust infrastructure for research investigations that have aimed to characterize health outcomes in long-term survivors and test interventions to prevent/remediate adverse effects of childhood cancer and its therapy. Findings from research facilitated by the ACT Clinic have informed health surveillance recommendations for long-term survivors and guided interventions to promote healthy aging among this growing population.

CANCER SURVIVORSHIP PROGRAMS AT THE DANA-FARBER CANCER INSTITUTE

Ann H Partridge, Alicia Morgans, Lauren P Knelson, Christopher Recklitis, Larissa Nekhlyudov, Susan N Chi, Lisa B Kenney, Lisa Diller, Lynda M Vrooman

J Cancer Surviv; doi: [10.1007/s11764-023-01525-8](https://doi.org/10.1007/s11764-023-01525-8)

PURPOSE

We sought to present the current status of survivorship programs at Dana-Farber Cancer Institute which include the David B. Perini, Jr. Quality of Life Clinic for survivors of childhood cancer, Stop and Shop Neuro-Oncology Outcomes Clinic for pediatric brain tumor survivors, and Adult Survivorship Program for adult cancer survivors including those diagnosed as adults (age 18 years and older) and adult survivors of childhood cancer, in an effort to share best practices as well as challenges.

METHODS

Description of programs and discussion.

RESULTS

Our institutional programs are detailed regarding their history and the multidisciplinary approach and both consultative and long-term care delivery models for pediatric and adult cancer survivors, with the goal of meeting the spectrum of survivorship care needs, from diagnosis and management of long-term effects of cancer-directed therapy and surveillance for subsequent cancer, to healthy lifestyle promotion and psychosocial support. Program investigators conduct research to understand the risks and unmet needs of cancer survivors, and to develop and test interventions to improve care delivery and medical and psychosocial outcomes. There are also educational initiatives detailed.

CONCLUSIONS

Survivorship programs at Dana-Farber are designed to optimize care and outcomes for cancer survivors including conducting quality improvement initiatives and research to further understand and meet the clinical needs of the large, heterogenous, and growing population cancer survivors into the future.

LABORATORY AND CLINICAL FEATURES OF TUMOR LYSIS SYNDROME IN CHILDREN WITH NON-HODGKIN LYMPHOMA AND EVALUATION OF LONG-TERM RENAL FUNCTIONS IN SURVIVORS

Selcen Bozkurt, Dildar Bahar Genc, Sema Vural

BMC Pediatr; doi: [10.1186/s12887-024-04549-w](https://doi.org/10.1186/s12887-024-04549-w)



OBJECTIVE

The purpose of our study is to investigate the laboratory and clinical features of tumor lysis syndrome (TLS) and acute kidney injury (AKI) in childhood non-Hodgkin lymphomas (NHL) and to reveal their impact on long term kidney function in survivors.

METHODS

Our single-center retrospective study included 107 patients (0-18 years old) with NHL who were admitted and treated at our hospital between 1998 and 2020. The relationship between TLS and age, gender, histopathological subgroup, tumor stage, lactate dehydrogenase (LDH) level at presentation, bone marrow and kidney involvement were assessed. The long-term renal functions of the patients were investigated.

RESULTS

80.3% of the patients were male with a median age of 9.8 years. The most common detected histopathological subgroup was Burkitt lymphoma. Hyperhydration with or without alkalisation, and allopurinol were used in first-line treatment and prophylaxis of TLS. Laboratory TLS and clinical TLS was observed in 30.8% and 12.1% of patients, respectively. A significant correlation was found between young age, advanced stage, high LDH level at presentation, and TLS. AKI was observed in 12.1% of the patients. When the glomerular filtration rate values of the patients at the first and last admissions were compared after an average of 6.9 years, a mean decrease of 10 mL/min/1.73 m² was found. It was not, however, found to be statistically significant.

CONCLUSION

Lower age, advanced stage, and high LDH level at presentation were found to be risk factors for TLS in our study. Long-term renal function loss was not observed in the survivors who received early and careful prophylaxis/treatment for TLS. The survivors are still being followed up.

CIRCULATING LEPTIN IS ASSOCIATED WITH ADVERSE VASCULAR CHANGES IN YOUNG ADULT SURVIVORS OF CHILDHOOD CANCER

Olof Broberg, Tobias Feldreich, Constance G Weismann, Ingrid Øra, Thomas Wiebe, Johan Ärnlöv, Petru Liuba

Cardiol Young; doi: [10.1017/S1047951124000076](https://doi.org/10.1017/S1047951124000076)



INTRODUCTION

Proteomics may help discover novel biomarkers and underlying mechanisms for cardiovascular disease. This could be useful for childhood cancer survivors as they show an increased risk of cardiovascular disease. The aim of this study was to investigate circulating cardiovascular proteins in young adult survivors of childhood cancer and their relationship to previously reported subclinical cardiovascular disease.

METHODS

Ninety-two cardiovascular proteins were measured in 57 childhood cancer survivors and in 52 controls. For proteins that were significantly different between childhood cancer survivors and controls, we performed correlations between protein levels and measures of peripheral arterial stiffness (carotid distensibility and stiffness index, and augmentation index) and endothelial dysfunction (reactive hyperemia index).

RESULTS

Leptin was significantly higher in childhood cancer survivors compared to controls (normalized protein expression units: childhood cancer survivors 6.4 (1.5) versus 5.1 (1.7), $p < 0.0000001$) after taking multiple tests into account. Kidney injury molecule-1, MER proto-oncogene tyrosine kinase, selectin P ligand, decorin, alpha-1-microglobulin/bikunin precursor protein, and pentraxin 3 showed a trend towards group differences ($p < 0.05$). Among childhood cancer survivors, leptin was associated with anthracycline treatment after adjustment for age, sex, and body mass index ($p < 0.0001$). Higher leptin correlated with lower carotid distensibility after adjustment for age, sex, body mass index, and treatments with radiotherapy and anthracyclines ($p = 0.005$).

CONCLUSION

This proteomics approach identified that leptin is higher in young asymptomatic adult survivors of childhood cancer than in healthy controls and is associated with adverse vascular changes. This could indicate a role for leptin in driving the cardiovascular disease burden in this population.

CIRCULATING LEPTIN IS ASSOCIATED WITH ADVERSE VASCULAR CHANGES IN YOUNG ADULT SURVIVORS OF CHILDHOOD CANCER

Olof Broberg, Tobias Feldreich, Constance G Weismann, Ingrid Øra, Thomas Wiebe, Johan Ärnlöv, Petru Liuba

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CONCLUSION

This proteomics approach identified that leptin is higher in young asymptomatic adult survivors of childhood cancer than in healthy controls and is associated with adverse vascular changes. This could indicate a role for leptin in driving the cardiovascular disease burden in this population.

MOVEMENT EFFICIENCY IN SURVIVORS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA: A REPORT FROM THE ST. JUDE LIFETIME COHORT STUDY

Aron Onerup, Sedigheh Mirzaei S, Matthew D Wogksch, Chelsea G Goodenough, Genevieve Lambert, Yadav Sapkota, Daniel A Mulrooney, Melissa M Hudson, Lisa M Jacola, Kirsten K Ness

J Cancer Surviv; doi: [10.1007/s11764-024-01550-1](https://doi.org/10.1007/s11764-024-01550-1)



PURPOSE

Movement efficiency, a measure of neuromuscular biomechanics, may be modified by physical activity. We aimed to assess the risk of and risk factors for low movement efficiency in survivors of childhood acute lymphoblastic leukemia (ALL).

METHODS

Participants underwent an assessment of activity energy expenditure (AEE) with actigraphy, and the gold standard doubly labeled water, where the differences between elimination rates of oxygen and hydrogen from body water are evaluated over a week. Movement efficiency was assessed using the raw residuals of a linear regression between AEEs from accelerometers and doubly labeled water. Elastic-net logistic regressions were used to identify demographic, treatment, and functional variables associated with movement efficiency.

RESULTS

The study cohort included 256 non-cancer controls and 302 ALL survivors (48% female), categorized as efficient (N = 24), normal (N = 245), or inefficient (N = 33) based on their movement efficiency. There was no difference in the odds for poor movement efficiency between survivors (n = 33, 10.9%) compared to controls (n = 23, 9.0%, odds ratio [OR]: 1.19, 95% confidence interval [CI]: 0.67, 2.10; p = 0.55). In survivors, neuropathy was associated with a higher risk of being inefficient compared to efficient (OR 4.30, 95% CI 1.03-17.96), while obesity (≥ 30 kg/m²) had a protective association (OR 0.18, 95% CI 0.04-0.87).

CONCLUSIONS

Neuropathy was associated with a higher risk of poor movement efficiency in survivors of childhood ALL.

IDENTIFYING SOCIAL OUTCOMES OF IMPORTANCE FOR CHILDHOOD CANCER SURVIVORS: AN E-DELPHI STUDY

Aron Onerup, Sedigheh Mirzaei S, Matthew D Wogksch, Chelsea G Goodenough, Genevieve Lambert, Yadav Sapkota, Daniel A Mulrooney, Melissa M Hudson, Lisa M Jacola, Kirsten K Ness

J Patient Rep Outcomes; doi: [10.1186/s41687-023-00676-7](https://doi.org/10.1186/s41687-023-00676-7)



PURPOSE

Childhood cancer survivors (CCS) are at risk of deficits in their social outcomes, a key aspect of overall health and quality of life. Social outcomes of import are ill-defined leading to potential gaps in research and service provision. In this study, we undertook a preliminary consensus seeking exercise to support the development of a framework of the important social outcomes for CCS.

METHODS

A modified e-Delphi study was conducted with four groups: CCS, health professionals, social workers and teachers. Round 1, developed from a literature review, included 34 questions rated for importance on a 7-point Likert scale. Rounds 2 and 3 presented items not achieving consensus, additionally proposed items and in round 3, a ranking question.

RESULTS

Survey 1 was completed by 38 participants, 31 (82%) completed survey 2 and 28 (76%) completed survey 3. A total of 36 items were prioritised across 6 domains (education, independence, work, relationships, community, lifestyle), together forming the final list of social outcomes. Of these, 22 items met consensus for importance. Items rated most important were "having autonomy" and "avoiding social isolation". Quantitative and qualitative results reflected that social outcomes for survivors and general public should be the same.

CONCLUSION

We have generated initial consensus on important social outcomes for CCS, highlighting the need for these to be matched to those of the general population. It suggests strategies are required to ensure autonomy and appropriate support for independence and relationships are provided through long-term aftercare and beyond. Further work is needed to validate and develop these findings into a framework to support appropriate social aftercare for CCS.

EFFECT OF A 1-YEAR PHYSICAL ACTIVITY INTERVENTION ON QUALITY OF LIFE, FATIGUE, AND DISTRESS IN ADULT CHILDHOOD CANCER SURVIVORS-A RANDOMIZED CONTROLLED TRIAL (SURFIT)

Wei H Deng, Simeon J Zürcher, Christina Schindera, Ruedi Jung, Helge Hebestreit, Iris Bánteli, Katja Bologna, Nicolas X von der Weid, Susi Kriemler, Corina S Rueegg

Cancer; doi: [10.1002/cncr.35207](https://doi.org/10.1002/cncr.35207)



INTRODUCTION

Childhood cancer survivors (CCS) are at risk of experiencing lower quality-of-life, fatigue, and depression. Few randomized controlled trials have studied the effect of physical activity (PA) on these in adult long-term CCS. This study investigated the effect of a 1-year individualized PA intervention on health-related quality-of-life (HRQOL), fatigue, and distress symptoms in adult CCS.

METHODS

The SURfit trial randomized 151 CCS ≥ 16 years old, < 16 at diagnosis and ≥ 5 years since diagnosis, identified through the Swiss Childhood Cancer Registry. Intervention participants received personalized PA counselling to increase intense PA by ≥ 2.5 h/week for 1 year. Controls maintained usual PA levels. The authors assessed physical- and mental-HRQOL, fatigue, and distress symptoms at baseline, 3, 6, and 12 months.

T-scores were calculated using representative normative populations (mean = 50, standard deviation = 10). Generalized linear mixed-effects models with intention-to-treat (ITT, primary), and three per-protocol allocations were used.

RESULTS

At 12 months, ITT (-3.56 larger decrease, 95% confidence interval -5.69 to -1.43 , $p = .001$) and two per-protocol analyses found significantly lower fatigue. Physical-HRQOL improved significantly in two per-protocol analyses at 12 months. No other effects were found.

CONCLUSION

SURfit showed that increased intense PA over 1 year improved fatigue in adult CCS. Survivors should be recommended PA to reduce the burden of late-effects.

HEALTH-RELATED RISK BEHAVIORS AMONG U.S. CHILDHOOD CANCER SURVIVORS: A NATIONWIDE ESTIMATE

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BMC Cancer; doi: [10.1186/s12885-024-11894-7](https://doi.org/10.1186/s12885-024-11894-7)



BACKGROUND

Childhood cancer survivors (CCS) are subject to a substantial burden of treatment-related morbidity. Engaging in health protective behaviors and eliminating risk behaviors are critical to preventing chronic diseases and premature deaths. This study is aimed to provide updated information on currently smoking, physical inactivity, binge drinking patterns and associated factors among CCS using a nationwide dataset.

METHODS

We constructed a sample of CCS (cancer diagnosis at ages < 21y) and healthy controls (matched on age, sex, residency, race/ethnicity) using 2020 Behavioral Risk Factor Surveillance System. We used Chi-square tests and Wilcoxon rank-sum test to examine differences in sociodemographics and clinical characteristics between two groups. Logistic, ordinal regression and multivariable models (conditional models for matching) were used to determine factors associated with risk behaviors.

RESULTS

The final sample (18-80y) included 372 CCS and 1107 controls. Compared to controls, CCS had a similar proportion of binge drinking (~ 18%) but higher prevalence of currently smoking (26.6% vs. 14.4%, $p < 0.001$), physical inactivity (23.7% vs. 17.7%, $p = 0.012$), and of having 2-or-3 risk behaviors (17.2% vs. 8.1%, $p < 0.001$). Younger age, lower educational attainment, and having multiple chronic health conditions were associated with engaging in more risk behaviors among CCS. Females, compared to male counterparts, had lower odds of binge drinking (adjusted odds ratio (aOR) = 0.30, 95% confidence interval (CI): 0.16-0.57) among CCS but not in all sample. Having multiple chronic health conditions increased odds of both currently smoking (aOR = 3.52 95%CI: 1.76-7.02) and binge drinking (aOR = 2.13 95%CI: 1.11-4.08) among CCS while it only increased odds of currently smoking in all sample.

DISCUSSION

Our study provided risk behavior information for wide age-range CCS, which is currently lacking. Every one in four CCS was currently smoking. Interventions targeting risk behavior reduction should focus on CCS with multiple chronic health conditions.

LAPAROSCOPIC OVARIAN TISSUE COLLECTION FOR FERTILITY PRESERVATION IN CHILDREN WITH MALIGNANCIES: A MULTICENTRIC EXPERIENCE

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Front Surg; doi: [10.3389/fsurg.2024.1352698](https://doi.org/10.3389/fsurg.2024.1352698)



INTRODUCTION

Long survivors after childhood cancer are increasing thanks to oncological improvements. Their quality of life and fertility-sparing should be considered in the early phases of each oncological pathway. Cryopreservation of ovarian tissue removed before starting gonadotoxic therapies is the only fertility sparing procedure available for prepubertal children affected by cancer and it does not affect the timing of the start of the treatment.

MATERIALS AND METHODS

The present study shows the surgical and clinical outcomes following laparoscopic ovarian tissue collection (LOTC) for a total of 311 patients aged between 0 and 17 years old from four different European Centers.

RESULTS

Only two major complications were reported according to the Clavien Dindo classification (0.6%).

DISCUSSION

LOTC can be considered a safe procedure.

VERSKIK QUALITATIVE STUDY DESIGN: ACTUAL FOLLOW-UP NEEDS OF PAEDIATRIC CANCER SURVIVORS, THEIR INFORMAL CAREGIVERS AND FOLLOW-UP STAKEHOLDER PERCEPTIONS IN GERMANY

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BMJ Open; doi: [10.1136/bmjopen-2023-072860](https://doi.org/10.1136/bmjopen-2023-072860)



INTRODUCTION

This article presents the study design of the qualitative part of the VersKiK study (Long-term care, care needs and wellbeing of individuals after cancer in childhood or adolescence: study protocol of a large scale multi-methods non-interventional study) aiming to explore actual follow-up needs of childhood and adolescence cancer survivors and their informal caregivers, gaps in current follow-up care provision and trajectories of cancer survivors' transition from paediatric to adult healthcare.

MATERIALS AND ANALYSIS

We will conduct up to 30 interviews with survivors of childhood and adolescence cancer and their informal caregivers with up to 20 participant observations of follow-up appointments. The results of these will be discussed in up to four focus groups with healthcare professionals and representatives of self-help groups. The study design aims to evaluate follow-up care after childhood cancer considering perspectives from survivors, their informal caregivers as well as healthcare providers. The combination of different data sources will allow us to get an in-depth understanding of the current state of follow-up care after paediatric cancer in Germany and to suggest recommendations for care improvement.

ETHICS AND DISSEMINATION

The VersKiK study was approved by the Ethics Committee Otto von Guericke University on 2 July 2021 (103/21), by the Ethics Committee of Johannes Gutenberg University Mainz on 16 June 2021 (2021-16035), by the Ethics Committee University of Lübeck on 10 November 2021 (21-451), by the Ethics Committee University of Hospital Bonn on 28 February 2022 (05/22). For each part of the qualitative study, a separate written informed consent is prepared and approved accordingly by the ethics committees named above.

UTILITY OF APICAL FOUR-CHAMBER LONGITUDINAL STRAIN IN THE ASSESSMENT OF CHILDHOOD CANCER SURVIVORS: A MULTICENTER STUDY

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Echocardiography; doi: [10.1111/echo.15766](https://doi.org/10.1111/echo.15766)

INTRODUCTION

A previous multicenter study showed that longitudinal changes in standard cardiac functional parameters were associated with the development of cardiomyopathy in childhood cancer survivors (CCS). Evaluation of the relationship between global longitudinal strain (GLS) changes and cardiomyopathy risk was limited, largely due to lack of quality apical 2- and 3-chamber views in addition to 4-chamber view. We sought to determine whether apical 4-chamber longitudinal strain (A4LS) alone can serve as a suitable surrogate for GLS in this population.

METHODS

A4LS and GLS were measured in echocardiograms with acceptable apical 2-, 3-, and 4-chamber views. Correlation was evaluated using Pearson and Spearman coefficients, and agreement was evaluated with Bland-Altman plots. The ability of A4LS to identify normal and abnormal values compared to GLS as the reference was evaluated.

RESULTS

Among a total of 632 reviewed echocardiograms, we identified 130 echocardiograms from 56 patients with adequate views (38% female; mean age at cancer diagnosis 8.3 years; mean follow-up 9.4 years). Correlation coefficients between A4LS and GLS were .89 (Pearson) and .85 (Spearman), with Bland-Altman plot of GLS-A4LS showing a mean difference of $-.71 \pm 1.8$. Compared with GLS as the gold standard, A4LS had a sensitivity of 86% (95% CI 79%-93%) and specificity of 82% (69%-95%) when using normal range cutoffs and 90% (82%-97%) and 70% (58%-81%) when using ± 2 standard deviations.

CONCLUSION

A4LS performs well when compared with GLS in this population. Given the more recent adoption of apical 2- and 3-chamber views in most pediatric echocardiography laboratories, A4LS is a reasonable stand-alone measurement in retrospective analyses of older study cohorts and echocardiogram biorepositories.

NUTRITIONAL ASSESSMENT AND DIETARY INTERVENTION AMONG SURVIVORS OF CHILDHOOD CANCER: CURRENT LANDSCAPE AND A LOOK TO THE FUTURE

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Front Nutr; doi: [10.3389/fnut.2023.1343104](https://doi.org/10.3389/fnut.2023.1343104)



ABSTRACT

Over 85% of childhood cancer patients become long-term survivors. Still, cancer and its therapies are associated with a myriad of long-term complications such that childhood cancer survivors (CCS) endure excess disease burden, morbidity, and mortality throughout their lifetimes. Existing literature suggests that CCS maintain poor dietary intake and nutritional status. Thus, as childhood cancer cure rates continue to improve, the role of diet and nutrition in mitigating many of the most common adverse long-term health outcomes among CCS has gained significant interest. Herein we present an in-depth review of existing scientific literature evaluating dietary intake and nutrition status among CCS and its

impact on treatment-related health complications; as well as contemporary intervention strategies aimed at overcoming distinctive barriers and improving deleterious lifestyle behaviors in this heterogeneous, at-risk population. Patient-specific, clinical, and systemic factors act as barriers to the timely conduct of comprehensive dietary/nutritional assessments and provision of tailored, risk-based recommendations. This Mini Review discusses the current state of the science, persisting research gaps, and opportunities for advancement of assessment and intervention strategies to address the unique needs of CCS.

MECHANISMS OF SLEEP DISTURBANCES IN LONG-TERM CANCER SURVIVORS: A CHILDHOOD CANCER SURVIVOR STUDY REPORT

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JNCI Cancer Spectr; doi: [10.1093/jncics/pkae010](https://doi.org/10.1093/jncics/pkae010)



INTRODUCTION

Sleep problems following childhood cancer treatment may persist into adulthood, exacerbating cancer-related late effects and putting survivors at risk for poor physical and psychosocial functioning. This study examines sleep in long-term survivors and their siblings to identify risk factors and disease correlates.

METHODS

Childhood cancer survivors (≥ 5 years from diagnosis; $n = 12,340$; 51.5% female; mean[SD] age = 39.4[9.6] years) and siblings ($n = 2395$; 57.1% female; age = 44.6[10.5] years) participating in the Childhood Cancer Survivor Study completed the Pittsburgh Sleep Quality Index (PSQI). Multivariable Poisson-error generalized estimating equation compared prevalence of binary sleep outcomes between survivors and siblings and evaluated cancer history and chronic health conditions (CHC) for associations with sleep outcomes, adjusting for age (at diagnosis and current), sex, race/ethnicity, and BMI.

RESULTS

Survivors were more likely to report clinically-elevated composite PSQI scores (>5 ; 45.1% vs 40.0%, adjusted prevalence ratio [PR] 1.20, 95%CI 1.13-1.27), symptoms of insomnia (38.8% vs 32.0%, PR = 1.26, 95%CI 1.18-1.35), snoring (18.0% vs 17.4%, PR = 1.11, 95%CI 1.01-1.23), and sleep medication use (13.2% vs 11.5%, PR = 1.28, 95%CI 1.12-1.45) compared to siblings. Within cancer survivors, PSQI scores were similar across diagnoses. Anthracycline exposure (PR = 1.13, 95%CI 1.03-1.25), abdominal radiation (PR = 1.16 95%CI 1.04-1.29) and increasing CHC burden were associated with elevated PSQI scores (PRs 1.21-1.48).

CONCLUSIONS

Among survivors, sleep problems were more closely related to CHC than diagnosis or treatment history, though longitudinal research is needed to determine the direction of this association. Frequent sleep-promoting medication use suggests interest in managing sleep problems; behavioral sleep intervention is advised for long-term management.

INSIGHTS FROM AN ADVISORY BOARD: FACILITATING TRANSITION OF CARE INTO ADULTHOOD IN BRAIN CANCER SURVIVORS WITH ACQUIRED PEDIATRIC GROWTH HORMONE DEFICIENCY

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Growth Horm IGF Res; doi: [10.1016/j.ghir.2024.101573](https://doi.org/10.1016/j.ghir.2024.101573)



OBJECTIVE

Children with growth hormone deficiency (GHD) face multiple challenges that can negatively impact the transition from pediatric to adult endocrinology care. For children with GHD resulting from brain cancer or its treatment, the involvement of oncology care providers and possible disease-related comorbidities add further complexity to this transition.

DESIGN

An advisory board of pediatric and adult endocrinologists was convened to help better understand the unique challenges faced by childhood cancer survivors with GHD, and discuss recommendations to optimize continuity of care as these patients proceed to adulthood. Topics included the benefits and risks of growth hormone (GH) therapy in cancer survivors, the importance of initiating GH replacement therapy early in the patient's journey and continuing into adulthood, and the obstacles that can limit an effective transition to adult care for these patients.

RESULTS/CONCLUSIONS

Some identified obstacles included the need to prioritize cancer treatment over treatment for GHD, a lack of patient and oncologist knowledge about the full range of benefits provided by long-term GH administration, concerns about tumor recurrence risk in cancer survivors receiving GH treatment, and suboptimal communication and coordination (e.g., referrals) between care providers, all of which could potentially result in treatment gaps or even complete loss of follow-up during the care transition. Advisors provided recommendations for increasing education for patients and care providers and improving coordination between treatment team members, both of which are intended to help improve continuity of care to maximize the health benefits of GH administration during the critical period when childhood cancer survivors transition into adulthood.

RISK FACTORS FOR NEUROCOGNITIVE IMPAIRMENT, EMOTIONAL DISTRESS, AND POOR QUALITY OF LIFE IN SURVIVORS OF PEDIATRIC RHABDOMYOSARCOMA: A REPORT FROM THE CHILDHOOD CANCER SURVIVOR STUDY

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Cancer; doi: [10.1002/cncr.35236](https://doi.org/10.1002/cncr.35236)

BACKGROUND

Prevalence and risk of poor psychological outcomes following rhabdomyosarcoma (RMS) are not well-established.

METHODS

Participants in this cross-sectional, case-control study (n = 713 survivors, 42.5% female; mean [SD] age, 30.5 [6.6] years; n = 706 siblings, 57.2% female; mean age, 32.8, [7.9] years) completed measures of neurocognition, emotional distress, and health-related quality of life (HRQOL). Multivariable logistic regression models identified treatments, health behaviors, and chronic conditions associated with impairment.

RESULTS

Relative to siblings, more survivors reported neurocognitive impairment (task efficiency: 21.1% vs. 13.7%, emotional regulation: 16.7% vs. 11.0%, memory: 19.3% vs. 15.1%), elevated emotional distress (somatic distress: 12.9% vs. 4.7%, anxiety: 11.7% vs. 5.9%, depression: 22.8% vs. 16.9%) and poorer HRQOL (physical functioning: 11.1% vs. 2.8%, role functioning due to physical problems: 16.8% vs. 8.2%, pain: 17.5% vs. 10.0%, vitality: 22.3% vs. 13.8%, social functioning: 14.4% vs. 6.8%, emotional functioning: 17.1% vs. 10.6%).

Cranial radiation increased risk for impaired task efficiency (odds ratio [OR], 2.30; 95% confidence interval [CI], 1.14-4.63), whereas chest and pelvic radiation predicted increased risk of physical functioning (OR, 2.68; 95% CI, 1.16-6.21 and OR, 3.44; 95% CI, 1.70-6.95, respectively). Smoking was associated with impaired task efficiency (OR, 2.06; 95% CI, 1.14-3.70), memory (OR, 2.23; 95% CI, 1.26-3.95), anxiety (OR, 2.71; 95% CI, 1.36-5.41) and depression (OR, 1.77; 95% CI, 1.01-3.11). Neurologic conditions increased risk of anxiety (OR, 2.30; 95% CI, 1.04-5.10), and hearing conditions increased risk of depression (OR, 1.79; 95% CI, 1.05-3.03). Neurologic and hearing conditions, respectively, were associated with impaired memory (OR, 2.44; 95% CI, 1.20-4.95 and OR, 1.87; 95% CI, 1.05-3.35) and poor health perception (OR, 2.62; 95% CI, 1.62-4.28 and OR, 2.33; 95% CI, 1.34-4.06).

CONCLUSIONS

RMS survivors are at significant risk for poor psychological outcomes. Advancing therapies for local control, smoking cessation, and managing chronic medical conditions may mitigate poor outcomes following RMS.

LATE MORBIDITY AND MORTALITY AFTER AUTOLOGOUS BLOOD OR MARROW TRANSPLANTATION FOR LYMPHOMA IN CHILDREN, ADOLESCENTS AND YOUNG ADULTS-A BMTSS REPORT

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Leukemia; doi: [10.1038/s41375-024-02144-7](https://doi.org/10.1038/s41375-024-02144-7)



ABSTRACT

We determined the risk of late morbidity and mortality after autologous blood or marrow transplantation (BMT) for lymphoma performed before age 40. The cohort included autologous BMT recipients who had survived ≥ 2 years after transplantation (N = 583 [HL = 59.9%; NHL = 40.1%]) and a comparison cohort (N = 1070). Participants self-reported sociodemographics and chronic health conditions. A severity score (grade 3 [severe], 4 [life threatening] or 5 [fatal]) was assigned to the conditions using CTCAE v5.0. Logistic regression estimated the odds of grade 3-4 conditions in survivors vs. comparison subjects. Proportional subdistribution hazards models identified predictors of grade 3-5 conditions among BMT recipients. Median age at BMT was 30.0 years (range: 2.0-40.0) and median follow-up was 9.8 years (2.0-32.1).

Survivors were at a 3-fold higher adjusted odds for grade 3-4 conditions (95% CI = 2.3-4.1) vs. comparison subjects. Factors associated with grade 3-5 conditions among BMT recipients included age at BMT (>30 years: adjusted hazard ratio [aHR] = 2.31; 95% CI = 1.27-4.19; reference: ≤ 21 years), pre-BMT radiation (aHR = 1.52; 95% CI = 1.13-2.03; reference: non-irradiated), and year of BMT (≥ 2000 : aHR = 0.54; 95% CI = 0.34-0.85; reference: <1990). The 25 years cumulative incidence of relapse-related and non-relapse-related mortality was 18.2% and 25.9%, respectively. The high risk for late morbidity and mortality after autologous BMT for lymphoma performed at age <40 calls for long-term anticipatory risk-based follow-up.

SYSTEMIC BIOLOGICAL MECHANISMS OF NEUROCOGNITIVE DYSFUNCTION IN LONG-TERM SURVIVORS OF CHILDHOOD HODGKIN LYMPHOMA

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Clin Cancer Res; doi: [10.1158/1078-0432.CCR-23-3709](https://doi.org/10.1158/1078-0432.CCR-23-3709)

BACKGROUND

Hodgkin lymphoma (HL) survivors experience neurocognitive impairment despite receiving no central nervous system-directed therapy, though little is known about underlying mechanisms.

METHODS

HL survivors (n=197) and age-, sex- and race/ethnicity-frequency-matched community controls (n=199) underwent standardized neurocognitive testing, and serum collection. Luminex multiplex or ELISA assays measured markers of inflammation and oxidative stress. Linear regression models compared biomarker concentrations between survivors and controls and with neurocognitive outcomes, adjusting for age, sex, race, body mass index, anti-inflammatory medication, and recent infections.

RESULTS

HL survivors (mean[SD] current age 36[8] years, 22[8] years post-diagnosis) demonstrated higher concentrations of interleukin-6 (IL-6), high-sensitivity c-reactive protein (hs-CRP), oxidized low-density lipoprotein, and glutathione peroxidase (GPx), compared to controls (p's<0.001).

Among survivors, higher concentrations of IL-6 were associated with worse visuomotor processing speed (p=0.046). hs-CRP ≥ 3 mg/L was associated with worse attention, processing speed, memory, and executive function (p's<0.05). Higher concentrations of malondialdehyde were associated with worse focused attention and visual processing speed (p's<0.05). Homocysteine was associated with worse short-term recall (p=0.008). None of these associations were statistically significant among controls. Among survivors, hs-CRP partially mediated associations between cardiovascular or endocrine conditions and visual processing speed, while IL-6 partially mediated associations between pulmonary conditions and visuomotor processing speed.

CONCLUSIONS

Neurocognitive function in long-term survivors of HL appears to be associated with inflammation and oxidative stress, both representing potential targets for future intervention trials.

QTC INTERVALS AT REST AND DURING EXERCISE ASSESSED BY GROUP CORRECTION FORMULAS IN SURVIVORS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA

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J Electrocardiol; doi: [10.1016/j.jelectrocard.2024.01.010](https://doi.org/10.1016/j.jelectrocard.2024.01.010)



INTRODUCTION

Early signs of subclinical cardiac damage must be identified before they turn into clinical manifestations. Tailoring a formula is relevant for precise QTc evaluation in childhood acute lymphoblastic leukemia (ALL) survivors considering they are at risk of long-term cardiac problems. Therefore, we aim to develop group heart rate correction formulas for QT intervals in childhood ALL survivors at rest and during exercise, and to assess the applicability of these methods across a variety of risk groups exposed to diverse chemotherapy dosages.

METHODS

Two hundred and fifty childhood ALL survivors in the PETALE study were classified into 3 groups depending on their prognostic risk group. ECG measurements (QT and RR intervals) were made at rest and during a cardiopulmonary exercise test. QT correction for heart rate was applied using 5 different formulas, which included 2 previously published formulas and 3 group-specific formulas for each sex.

RESULTS

The QT/RR relation showed 2 different curves between rest and during exercise, which was worse for females. Group-specific QTc formulas allowed adequate heart rate-corrected QT interval, independently of the cumulative dose of doxorubicin received during treatment. Group-specific formulas showed significantly shorter QTc intervals than QTc from Bazett's formula. QTc (Bazett's formula) values surpassed the established clinical norm in 22 males (11%) and 22 females (11%), with a majority occurring during exercise, affecting 15 males (7.5%) and 10 females (5%).

CONCLUSION

This study shows the applicability of personalized group correction of QT/RR data in childhood ALL survivors. Our comprehensive assessments (spanning rest, exercise, and recovery) is an effective approach for risk stratification of cardiac complications in childhood ALL survivors.

MORTALITY AFTER MAJOR CARDIOVASCULAR EVENTS IN SURVIVORS OF CHILDHOOD CANCER

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J Am Coll Cardiol; doi: [10.1016/j.jacc.2023.12.022](https://doi.org/10.1016/j.jacc.2023.12.022)

BACKGROUND

Adult survivors of childhood cancer are at risk for cardiovascular events.

OBJECTIVES

In this study, we sought to determine the risk for mortality after a major cardiovascular event among childhood cancer survivors compared with noncancer populations.

METHODS

All-cause and cardiovascular cause-specific mortality risks after heart failure (HF), coronary artery disease (CAD), or stroke were compared among survivors and siblings in the Childhood Cancer Survivor Study (CCSS) and participants in the Coronary Artery Risk Development in Young Adults (CARDIA) study. Cox proportional hazard regression models were used to estimate HRs and 95% CIs between groups, adjusted for demographic and clinical factors.

RESULTS

Among 25,658 childhood cancer survivors (median age at diagnosis 7 years, median age at follow-up or death 38 years) and 5,051 siblings, 1,780 survivors and 91 siblings had a cardiovascular event. After HF, CAD, and stroke, 10-year all-cause mortalities were 30% (95% CI: 26%-33%), 36% (95% CI: 31%-40%), and 29% (95% CI: 24%-33%), respectively, among survivors vs 14% (95% CI: 0%-25%), 14% (95% CI: 2%-25%), and 4% (95% CI: 0%-11%) among siblings. All-cause mortality risks among childhood cancer survivors were increased after HF (HR: 7.32; 95% CI: 2.56-20.89), CAD (HR: 5.54; 95% CI: 2.37-12.93), and stroke (HR: 3.57; 95% CI: 1.12-11.37). CAD-specific mortality risk was increased (HR: 3.70; 95% CI: 1.05-13.02). Among 5,114 CARDIA participants, 345 had a major event. Although CARDIA participants were on average decades older at events (median age 57 years vs 31 years), mortality risks were similar, except that all-cause mortality after CAD was significantly increased among childhood cancer survivors (HR: 1.85; 95% CI: 1.16-2.95).

CONCLUSIONS

Survivors of childhood cancer represent a population at high risk for mortality after major cardiovascular events.

REPRODUCTIVE LATE EFFECTS AND TESTOSTERONE REPLACEMENT THERAPY IN MALE CHILDHOOD CANCER SURVIVORS: A POPULATION-BASED STUDY (THE FEX-CAN STUDY)

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Int J Cancer; doi: [10.1002/ijc.34890](https://doi.org/10.1002/ijc.34890)



ABSTRACT

Childhood cancer survivors are at risk of various endocrine late effects affecting their quality of life. The aim of this study was to assess the prevalence and predictors of endocrine and reproductive outcomes in young adult survivors. A secondary aim was to assess possible associations between testosterone replacement therapy (TRT) and other endocrine, cardiovascular and psychosocial late effects. This nationwide study comprised 1212 male childhood cancer survivors aged 19–40 years, identified through the National Quality Registry for Childhood Cancer in Sweden. Median age at diagnosis during 1981–2017 was 7 (range 0–17) and at study 29 (19–40) years. The study combined self-report survey data with cancer treatment data from the national registry. Hormone-induced puberty was self-reported by 3.8% of the survivors and ongoing TRT by 6.0%.

In separate logistic regression analyses, these treatments were associated with hematopoietic stem cell transplantation and cranial radiotherapy. Hormone-induced puberty was additionally associated with younger age at diagnosis. Men with TRT had a higher prevalence of other endocrine deficiencies, cholesterol medication, depressive symptoms and fatigue as well as a lower probability of living with a partner, having a biological child or current occupation. In the total male cohort, 28.2% reported having a biological child. Reassuring reproductive outcomes after less intensive therapies and low frequency of TRT were observed in young adult male childhood cancer survivors treated in the most recent treatment era. However, men with TRT suffered from several other endocrine, cardiovascular and psychosocial late effects, indicating a need for long-term monitoring of this high-risk group.

COGNITIVE AND BEHAVIOURAL REHABILITATION INTERVENTIONS FOR SURVIVORS OF CHILDHOOD CANCER WITH NEUROCOGNITIVE SEQUELAE: A SYSTEMATIC REVIEW

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Neuropsychol Rehabil; doi: [10.1080/09602011.2024.2314880](https://doi.org/10.1080/09602011.2024.2314880)



ABSTRACT

There is considerable interest in cognitive and behavioural interventions to manage and improve neurocognitive (dys)functions in childhood cancer survivors and the literature is rapidly growing. This systematic review aimed to examine the literature of such interventions and their impact on executive functions (EFs) and attention. A search of relevant manuscripts was performed in PubMed, PsycINFO, and Web of Science in March 2023 in accordance with the PRISMA statement. After screening 3737 records, 17 unique studies published between 2002 and 2022 were charted and summarized. Participants (N = 718) were mostly children (M = 12.2 years), who were long-term survivors (M = 5.0 years post treatment) of brain or CNS tumours (48%).

Identified interventions included computerized cognitive training, physical activity, and cognitive interventions with compensatory strategy training. The highest quality RCT studies included computerized training (i.e., Cogmed), neurofeedback, and exergaming. Evidence suggests that Cogmed may improve the performance of certain working memory tasks (near transfer) and possibly improve visual attention tasks for individuals with working memory impairments. However, the evidence did not support far transfer of effects to real life. No significant effects (near or far-transfer) were found following neurofeedback and exergaming interventions. Finally, a knowledge gap was identified for interventions directed at long-term survivors in adulthood.

THE LIVED EXPERIENCE OF PEOPLE AFFECTED BY CANCER: A GLOBAL CROSS-SECTIONAL SURVEY PROTOCOL

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PLoS One; doi: [10.1371/journal.pone.0294492](https://doi.org/10.1371/journal.pone.0294492)



ABSTRACT

A diagnosis of cancer impacts the person's physical and mental health and the psychosocial and financial health of their caregivers. While data on the experience of living with cancer is available, there is a dearth of data from persons in low- and middle-income countries (LMICs). The perspectives of other impacted individuals also remain understudied (e.g., bereaved family members), as well as the impact on survivors and their families over time. The objective of this study is to describe the psychosocial and financial impact of cancer on people diagnosed with cancer as a child, adolescent or adult, their families/caregivers, and the family members of those who have died from cancer, in high-income countries (HICs) and LMICs. This study is an observational, descriptive, quantitative study. Data will be collected anonymously via a digital online cross-sectional survey distributed globally by the World Health Organization (WHO) via the LimeSurvey software.

Participants will include (a) adults aged 18+ who have been diagnosed with cancer at any age, who are currently undergoing cancer treatment or who have completed cancer treatment; (b) adult family members of individuals of any age with a cancer diagnosis, who are currently undergoing cancer treatment or who have completed cancer treatment; and (c) bereaved family members. Participants will be anonymously recruited via convenience and snowball sampling through networks of organisations related to cancer. Survey results will be analysed quantitatively per respondent group, per time from diagnosis, per disease and country. Results will be disseminated in peer-reviewed journals and at scientific conferences; a summary of results will be available on the WHO website. This study will suggest public health interventions and policy responses to support people affected by cancer and may also lead to subsequent research focusing on the needs of people affected by cancer.

PROTOCOL FOR THE ONLOOP TRIAL: PRAGMATIC RANDOMIZED TRIAL EVALUATING A PROVINCE-WIDE SYSTEM OF PERSONALIZED REMINDERS FOR EVIDENCE- BASED SURVEILLANCE TESTS IN ADULT SURVIVORS OF CHILDHOOD CANCER IN ONTARIO

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Implement Sci; doi: [10.1186/s13012-024-01347-x](https://doi.org/10.1186/s13012-024-01347-x)



BACKGROUND

Childhood cancer treatment while often curative, leads to elevated risks of morbidity and mortality. Survivors require lifelong periodic surveillance for late effects of treatment, yet adherence to guideline-recommended tests is suboptimal. We created ONLOOP to provide adult survivors of childhood cancer with detailed health information, including summaries of their childhood cancer treatment and recommended surveillance tests for early detection of cardiomyopathy, breast cancer, and/or colorectal cancer, with personalized reminders over time.

METHODS

This is an individually randomized, registry-based pragmatic trial with an embedded process and economic evaluation to understand ONLOOP's impact and whether it can be readily implemented at scale. All adult survivors of childhood cancer in Ontario overdue for guideline-recommended tests will be randomly assigned to one of two arms: (1) intervention or (2) delayed intervention. A letter of information and invitation will detail the ONLOOP program.

RESULTS

Those who sign up will receive a personalized toolkit and a screening reminder 6 months later. With the participants' consent, ONLOOP will also send their primary care clinician a letter detailing the recommended tests and a reminder 6 months later. The primary outcome will be the proportion of survivors who complete one or more of the guideline-recommended cardiac, breast, or colon surveillance tests during the 12 months after randomization. Data will be obtained from administrative databases. The intent-to-treat principle will be followed. Based on our analyses of administrative data, we anticipate allocating at least 862 individuals to each trial arm, providing 90% power to detect an absolute increase of 6% in targeted surveillance tests completed. We will interview childhood cancer survivors and family physicians in an embedded process evaluation to examine why and how ONLOOP achieved success or failed. A cost-effectiveness evaluation will be performed.

CONCLUSION

The results of this study will determine if ONLOOP is effective at helping adult survivors of childhood cancer complete their recommended surveillance tests. This study will also inform ongoing provincial programs for this high-risk population.

ROLE OF NUTRACEUTICALS IN COUNTERACTING INFLAMMATION IN IN VITRO MACROPHAGES OBTAINED FROM CHILDHOOD CANCER SURVIVORS

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Cancers (Basel); doi: [10.3390/cancers16040714](https://doi.org/10.3390/cancers16040714)



ABSTRACT

The advancement of anti-cancer therapies has markedly improved the survival rate of children with cancer, making them long-term childhood cancer survivors (CCS). Nevertheless, these treatments cause a low-grade inflammatory state, determining inflamm-aging and, thus, favoring the early onset of chronic diseases normally associated with old age. Identification of novel and safer therapeutic strategies is needed to counteract and prevent inflamm-aging. Macrophages are cells involved in immune and inflammatory responses, with a pivotal role in iron metabolism, which is related to inflammation. We obtained macrophages from CCS patients and evaluated their phenotype markers, inflammatory states, and iron metabolism by Western blotting, ELISA, and iron assays. We observed a strong increase in classically activated phenotype markers (M1) and iron metabolism alteration in CCS, with an increase in intracellular iron concentration and inflammatory markers..

These results suggest that the prevalence of M1 macrophages and alteration of iron metabolism could be involved in the worsening of inflammation in CCS. Therefore, we propose macrophages and iron metabolism as novel therapeutic targets to counteract inflamm-aging. To avoid toxic regimens, we tested some nutraceuticals (resveratrol, curcumin, and oil-enriched lycopene), which are already known to exert anti-inflammatory properties. After their administration, we observed a macrophage switch towards the anti-inflammatory phenotype M2, as well as reductions in pro-inflammatory cytokines and the intracellular iron concentration. Therefore, we suggest for the first time—that nutraceuticals reduce inflammation in CCS macrophages through a novel anti-inflammatory mechanism of action, modulating iron metabolism

HUMAN PAPILLOMAVIRUS VACCINATION IN PEDIATRIC, ADOLESCENT, AND YOUNG ADULT CANCER SURVIVORS-OPPORTUNITY TO ADDRESS GAPS IN CANCER PREVENTION AND SURVIVORSHIP

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Vaccines (Basel); doi: [10.3390/vaccines12020114](https://doi.org/10.3390/vaccines12020114)



ABSTRACT

The risks of secondary cancers associated with human papillomavirus (HPV) infection are as much as three times higher for survivors of pediatric, adolescent, and young adult cancer (PYAC) compared to the general population. Despite this, HPV vaccination rates among PYAC survivors remain low. Whereas pediatric oncology providers endorse HPV vaccination of PYAC survivors, many lack the resources or opportunities to intervene. The responsibility of HPV vaccination, therefore, falls to primary care providers and practices. This article provides an overview of the challenges with HPV vaccination that are distinct to PYAC survivors and discusses potential strategies to increase HPV vaccine coverage in this population.

THE EXPERIENCES OF CHILDREN AND ADOLESCENTS WITH CANCER RETURNING TO SCHOOL: A QUALITATIVE META-SYNTHESIS

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J Pediatr Nurs; doi: [10.1016/j.pedn.2024.02.014](https://doi.org/10.1016/j.pedn.2024.02.014)

BACKGROUND

Returning to school can be challenging for children and adolescents with cancer who have been absent for a long time. As there is little known about the return to school experience of children and adolescents with cancer, this meta-synthesis aimed to describe the experiences of children and adolescent cancer patients as they return to school.

METHODS

Seven English databases and three Chinese databases were searched from inception to March 14, 2023. The Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) was used to appraise study quality. Data were synthesized using the Thomas and Harden thematic and content analysis method.

RESULTS

Twelve qualitative studies met the inclusion criteria and were analyzed into meta-synthesis. Data synthesis led to constructing four analytical themes and twelve sub-themes. The four major themes constructed were: benefits to school re-entry, barriers to school re-entry, motivators to school re-entry and the adaptation process after returning to school.

CONCLUSION

Children and adolescents with cancer were willing to return to education and can adapt to school life over time. But they were faced with challenges, including physical, psychological, and social barriers. Appropriate measures need to be taken to reduce those barriers.

PSYCHIATRIC DISORDERS IN CHILDHOOD CANCER SURVIVORS: A RETROSPECTIVE MATCHED COHORT STUDY OF INPATIENT HOSPITALISATIONS AND COMMUNITY-BASED MENTAL HEALTH SERVICES UTILISATION IN WESTERN AUSTRALIA

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Aust N Z J Psychiatry; doi: [10.1177/00048674241233871](https://doi.org/10.1177/00048674241233871)

OBJECTIVE

We examined the impact of long-term mental health outcomes on healthcare services utilisation among childhood cancer survivors in Western Australia using linked hospitalisations and community-based mental healthcare records from 1987 to 2019.

METHOD

The study cohort included 2977 childhood cancer survivors diagnosed with cancer at age < 18 years in Western Australia from 1982 to 2014 and a matched non-cancer control group of 24,994 individuals. Adjusted hazard ratios of recurrent events were estimated using the Andersen-Gill model. The cumulative burden of events over time was assessed using the method of mean cumulative count. The annual percentage change in events was estimated using the negative binomial regression model.

RESULTS

The results showed higher community-based service contacts (rate/100 person-years: 30.2, 95% confidence interval = [29.7-30.7] vs 22.8, 95% confidence interval = [22.6-22.9]) and hospitalisations (rate/1000 person-years: 14.8, 95% confidence interval = [13.6-16.0] vs 12.7, 95% confidence interval = [12.3-13.1]) in childhood cancer survivors compared to the control group.

Childhood cancer survivors had a significantly higher risk of any event (adjusted hazard ratio = 1.5, 95% confidence interval = [1.1-2.0]). The cumulative burden of events increased with time since diagnosis and across age groups. The annual percentage change for hospitalisations and service contacts significantly increased over time ($p < 0.05$). Substance abuse was the leading cause of hospitalisations, while mood/affective and anxiety disorders were common causes of service contacts. Risk factors associated with increased service events included cancer diagnosis at age < 5 years, leukaemia diagnosis, high socioeconomic deprivation, and an attained age of < 18 years.

CONCLUSIONS

The elevated utilisation of healthcare services observed among childhood cancer survivors emphasises the need for periodic assessment of psychiatric disorders, particularly in high-risk survivors, to facilitate early management and optimise healthcare resources.

QUALITATIVE ANALYSIS OF SCHOOL RE-ENTRY EXPERIENCES OF TURKISH SURVIVORS OF CHILDHOOD AND ADOLESCENT CANCER: PARENTAL PERSPECTIVE

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Semin Oncol Nurs; doi: [10.1016/j.soncn.2024.151613](https://doi.org/10.1016/j.soncn.2024.151613)

OBJECTIVE

This study aimed to explore the school re-entry experiences of Turkish survivors of childhood and adolescent cancer.

DATA SOURCES

In this qualitative study, semistructured in-depth interviews were undertaken with parents of childhood cancer survivors who had completed treatment for at least 2 years (n = 20). Interviews were conducted via telephone or video conferencing. The study was conducted and reported according to the COREQ (Consolidated Criteria for Reporting Qualitative Research) guidelines. The components of qualitative rigor were considered to ensure confidence in the methods and data.

CONCLUSIONS

The average age of parents was 43.20 ± 4.66 years (range 37-55) (n = 20). The mean age of survivors was 8.45 ± 2.03 years at diagnosis and 15.05 ± 2.08 years during the study. The diagnosis of most of the survivors was lymphoma (35%). Four main themes were developed: worry; challenging situations; negative effects of the disease process; and facilitating situations. Parents stated that both children and parents need support during the school re-entry process.

IMPACT FOR NURSING PRACTICE

This study revealed that survivors may experience problems that make school re-entry difficult. With cooperation between the health team and the school, arrangements should be made to ensure survivors have a positive experience on school re-entry. Pediatric oncology nurses should know survivors' requirements and take action to deliver school re-entry adjustment programs.

THE ENGAGE STUDY: A 3-ARM RANDOMIZED HYBRID TYPE 1 EFFECTIVENESS AND IMPLEMENTATION STUDY OF AN IN-HOME, COLLABORATIVE PCP MODEL OF REMOTE TELEGENETIC SERVICES TO INCREASE UPTAKE OF CANCER GENETIC SERVICES IN CHILDHOOD CANCER SURVIVORS

Tara O Henderson, Mary Ashley Allen, Rajia Mim, Brian Egleston, Linda Fleisher, Elena Elkin, Kevin Oeffinger, Kevin Krull, Demetrios Ofidis, Briana Mcleod, Hannah Griffin, Elizabeth Wood, Cara Cacioppo, Michelle Weinberg, Sarah Brown, Sarah Howe, Aaron McDonald, Chris Vukadinovich, Shani Alston, Dayton Rinehart, Gregory T Armstrong, Angela R Bradbury

BMC Health Serv Res; doi: [10.1186/s12913-024-10586-z](https://doi.org/10.1186/s12913-024-10586-z)



BACKGROUND

Germline cancer genetic testing has become a standard evidence-based practice, with established risk reduction and screening guidelines for genetic carriers. Access to genetic services is limited in many places, which leaves many genetic carriers unidentified and at risk for late diagnosis of cancers and poor outcomes. This poses a problem for childhood cancer survivors, as this is a population with an increased risk for subsequent malignant neoplasms (SMN) due to cancer therapy or inherited cancer predisposition. The ENGaging and Activating cancer survivors in Genetic services (ENGAGE) study evaluates the effectiveness of an in-home, collaborative PCP model of remote telegenetic services to increase uptake of cancer genetic testing in childhood cancer survivors compared to usual care options for genetic testing.

METHODS

The ENGAGE study is a 3-arm randomized hybrid type 1 effectiveness and implementation study within the Childhood Cancer Survivor Study population which tests a clinical intervention while gathering information on its delivery during the effectiveness trial and its potential for future implementation among 360 participants. Participants are randomized into three arms. Those randomized to Arm A receive genetic services via videoconferencing, those in Arm B receive these services by phone, and those randomized to Arm C will receive usual care services.

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DISCUSSION

With many barriers to accessing genetic services, innovative delivery models are needed to address this gap and increase uptake of genetic services. The ENGAGE study evaluates the effectiveness of an adapted model of remote delivery of genetic services to increase the uptake of recommended genetic testing in childhood cancer survivors. This study assesses the uptake in remote genetic services and identify barriers to uptake to inform future recommendations and a theoretically-informed process evaluation which can inform modifications to enhance dissemination beyond this study population and to realize the benefits of precision medicine.

COGNITIVE EFFECTS OF CRANIAL IRRADIATION IN LEUKAEMIA: A SURVEY AND META-ANALYSIS



P Cousens, B Waters, J Said, M Stevens

J Child Psychol Psychiatry 1988; [10.1111/j.1469-7610.1988.tb00757.x](https://doi.org/10.1111/j.1469-7610.1988.tb00757.x)

ABSTRACT

Central nervous system (CNS) prophylaxis involving cranial irradiation has frequently been found to result in cognitive deficits in survivors of childhood acute lymphoblastic leukaemia. The existence of this effect is still controversial, however, as is the question of factors that might affect its severity.

The literature is surveyed and a meta-analysis undertaken on 30 IQ comparisons, which shows a substantial average decrement in irradiated subjects. The effect is larger when radiation is administered at a younger age and appears to be progressive. The effect may comprise two elements, one common to young cancer patients and one specific to CNS prophylaxis.

THE FEASIBILITY AND ACCEPTABILITY OF A DATA CAPTURE METHODOLOGY IN PEDIATRIC CANCER PATIENTS TREATED WITH TARGETED AGENTS AND IMMUNOTHERAPIES

Karim Thomas Sadak, Taiwo Opeyemi Aremu, Seah Buttar, Daniel Van Ly, Brenda Weigel, Joseph P Neglia

Curr Oncol; doi: [10.3390/curroncol31020051](https://doi.org/10.3390/curroncol31020051)



ABSTRACT

As childhood cancer treatments have improved to include new and innovative agents, the need for more advanced monitoring of their long-term effects and related research has increased. This has resulted in a need for evidence-based research methodologies for the longitudinal care of childhood cancer patients treated with targeted agents and immunotherapies. The rationale for this pilot study was to determine the feasibility and acceptability of a data capture methodology for pediatric, adolescent, and young adult cancer patients treated with targeted agents and immunotherapy as there is little research to inform this delivery of care. Data were collected from thirty-two patients and two providers for descriptive statistics and thematic analyses.

Feasibility was characterized by expected participant attrition. Key drivers of acceptability were (1) providers' language and clarity of communication and (2) convenient participation requirements. Long-term follow-up research practices developed with input from key stakeholders, including patients, caregivers, and providers, can lead to acceptable and feasible research protocols that optimize successful participant recruitment. These evidence-based research practices can result in high participant satisfaction and can be implemented as program development initiatives across centers caring for childhood cancer survivors.

IMPRINT

STUDY SCAN is a free, quarterly online magazine for everyone who is involved in care of childhood cancer survivors or who is interested in childhood cancer survivorship. It is published by the German childhood cancer late effects study group LESS – Late Effects Surveillance System (Arbeitsgruppe Spätfolgen)

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