Re-Engage: A Novel Nurse-Led Program for Survivors of Childhood Cancer Who Are Disengaged From Cancer-Related Care

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ABSTRACT

Background: Survivors of childhood cancer often experience treatment-related chronic health conditions. Survivorship care improves survivors' physical and mental health, yet many are disengaged from care. Innovative models of care are necessary to overcome patient-reported barriers to accessing survivorship care and to maximize survivors' health. **Methods:** We piloted a novel survivorship program, called "Re-engage," a distance-delivered, nurse-led intervention aiming to engage, educate, and empower survivors not receiving any cancer-related care. Re-engage involves a nurse-led consultation delivered via telephone/online to establish survivors' medical history and needs. Participants completed questionnaires at baseline, 1 month post-intervention, and 6-month follow-up. **Results:** A total of 27 survivors who had not accessed survivorship care in the last 2 years participated (median age, 31 years; interquartile range [IQR], 27–39 years); of which, 82% were at high-risk for treatment-related complications. Participation in Re-engage was high (75%) and there was no attrition once survivors enrolled. At 1 month postintervention, 92% of survivors reported that Re-engage was "beneficial," which all survivors reported at 6-month follow-up. Survivors' overall satisfaction with their care increased from 52% before Re-engage to 84% at 1 month postintervention. Survivors' mean self-efficacy scores remained similar from baseline to 1 month postintervention ($b = -0.33$, 95% CI, -1.31 to 0.65), but increased significantly from baseline to 6-month follow-up ($b = 1.64$, 95% CI, 0.28 – 3.00). At 6-month follow-up, 73% of survivors showed an increase in health-related self-efficacy compared with baseline. **Conclusions:** Re-engage is a highly acceptable and feasible intervention and promotes health-related self-efficacy, which is integral to survivors being advocates for their own health. Further empirical work is needed to evaluate the long-term efficacy of Re-engage. Trial registration: ACTRN12618000194268

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Background

Most survivors of childhood cancer experience long-term health complications due to their cancer treatment, warranting lifelong care.¹ Survivorship care provides opportunities for late effects prevention, screening, and proactive management.² Ideally, survivorship care should be personalized and risk-based^{3,4}; however, the optimal delivery of childhood cancer survivorship care is greatly debated.⁵

Current models of survivorship care are inadequate. In many hospitals, the increasing number of survivors outweigh current service capacity, which relies primarily on oncologists.^{5,6} Many pediatric cancer centers are limited to major cities and do not offer lifelong survivorship care, necessitating transition to nonspecialized and adult services, a critical point at which many survivors disengage from care.⁶ These factors necessitate new models of care that empower survivors as guardians of their healthcare, ideally with healthcare coordination support. Nurses are increasingly recognized as key health professionals in survivorship care delivery, with preliminary evidence suggesting that nurse-led care is safe, acceptable, and feasible.⁷ Specialized nurse practitioners have the potential to optimize patient outcomes by equipping patients and families with the skills to manage their health needs, while maximizing the efficiency of healthcare delivery.^{8,9}

As few as 42% of survivors of childhood cancer receive survivorship care in their adult years.¹⁰ Disengaged survivors miss out on opportunities for health education that can impact their health behaviors and healthcare use positively. They are also less likely to receive care from a health professional who is aware of their long-term cancer-related risks,¹¹ leading to poorer physical and emotional outcomes compared with survivors who are engaged in specialized survivorship care.¹²

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It can be challenging for survivors to manage their healthcare needs, given fluctuating health and frequent breaks in communication with health professionals. Managing the complexities of this changing state may be best suited to technology-enabled support that encourages self-management of care.¹³ Educating survivors about their long-term risks is critical to promote engagement in survivorship care. Ideally, education should be an ongoing process into adulthood in order to accommodate survivors' information needs and preferences as they age.^{11,14}

Although re-engaging survivors into active survivorship care is a priority, few studies have focused on this. To promote cancer-focused and risk-appropriate care, our team developed a new distance-delivered intervention, "Re-engage," for survivors lost to follow-up. This nurse-led program aims to empower survivors to advocate for themselves in the healthcare system. Re-engage is purpose-designed to overcome survivor-, health professional-, and system-related barriers documented in the literature.¹¹ Our pilot study aimed to assess the feasibility and acceptability of Re-engage and collect preliminary evidence of its impact on survivors' health-related self-efficacy, health behaviors, information needs, satisfaction with care, and emotional well-being.

Methods

The South Eastern Sydney Local Health District Human Research Ethics Committee approved this study (Ref:16/366). A detailed study protocol was published previously (eAppendix 2, available with this article at JNCCN.org).¹⁵

Study Design

We used a single group, pretest, and posttest design to assess the acceptability, feasibility, and potential efficacy of Re-engage.

Participants

We recruited survivors who: (1) were aged >16 years; (2) were diagnosed with cancer <18 years of age; (3) had completed cancer treatment at Sydney Children's Hospital; (4) were at least 5 years postdiagnosis; and (5) had not received cancer-related survivorship care in the prior 2 years.

Recruitment

We identified survivors through electronic hospital records. The clinic nurse and oncologist also identified survivors. We mailed eligible participants an information package comprising a personalized invitation letter, information sheet, consent form, and opt-in/opt-out card. We classified survivors as uncontactable after 2 unsuccessful attempts to reach them via telephone or email 2 weeks after nonreceipt of opt-in/out cards. Participants who opted-in were provided information on how to

borrow equipment for the study if needed (eg, telephone, computer/tablet, internet connection).

Re-engage Intervention

Re-engage is a distance-delivered live intervention requiring synchronous participation by survivors and the nurse via secure videoconferencing software or telephone, according to participants' preference. The Re-engage intervention is described in Figure 1.

Outcomes and Measures

We collected data at baseline, 1 month postintervention, and 6-month follow-up via online/paper surveys according to participant preference (supplemental eTable 1).

We assessed acceptability in the 1 month post-intervention survey, with questions evaluating satisfaction with program consultations length (1 = too long, 2 = just right, 3 = too short), program satisfaction based on the Youth Satisfaction Survey (eg, services needed/received: 1 = strongly disagree; 5 = strongly agree),¹⁶ satisfaction with care (1 = poor; 5 = excellent), and perceived benefit and burden of the study (1 = not at all; 5 = very much, plus open-ended questions). We determined a priori that Re-engage would be acceptable if >80% of participants were satisfied with the program and feasible if we achieved at least 75% participation, 75% program compliance, and <20% attrition.¹⁵

We assessed health-related self-efficacy using an 8-item measure based on a previously validated 3-item measure (eg, confidence asking doctor about concerns) combined with an additional 5 purpose-designed questions related to cancer survivorship (eg, confidence recognizing the signs of recurrence).¹⁷ Response options ranged from 1 = not confident to 3 = very confident. The summed score of each item formed a continuous composite score (range, 8–24), with higher scores representing better self-efficacy. The new 8-item measure showed reasonable reliability (Cronbach α =0.79), and preliminary evidence of convergent construct validity with the original 3-item measure (baseline: $r = 0.877$, $P<.01$; 1 month postintervention: $r = 0.695$, $P<.01$; and 6-month follow-up: $r = 0.878$, $P<.01$).

The secondary outcomes were survivors' health behaviors/beliefs, healthcare use, unmet information needs, satisfaction with care, and physical and mental well-being. We assessed survivor-reported reasons for not accessing survivorship care using an open-ended question.

Risk and Needs Assessments

We stratified participants using the Intensity of Treatment Rating scale 3.0 (ITR-3), which assigns survivors to 4 risk levels based on their cancer diagnosis, stage/risk, and

Figure 1. Recruitment flowchart.

Abbreviations: CNC, clinical nurse consultant; GP, general practitioner; MDT, multidisciplinary review.

^aHigh-risk = specialist/MDT care; low/medium-risk = primary services with specialist input where needed.

treatments received.¹⁸ A higher level (3 or 4) indicates higher treatment intensity and therefore higher risk of treatment-related conditions. The MDT also conducted an assessment of survivors' current medical and psychosocial needs using information collected with the triage tool.

Data Analysis

We analyzed quantitative data using SPSS Statistics, version 29 (IBM Corp), including descriptive statistics to summarize sample characteristics, analyze feasibility/acceptability, and summarize secondary outcomes. We compared self-efficacy scores preintervention and postintervention using multilevel models (MIXED function).

Results

Of 36 eligible and contactable survivors approached, 27 opted in to Re-engage (75% response rate; Figure 1). All consenting survivors completed the full program (ie,

there was no postenrollment attrition). Survey completion was high at 1 month postintervention (n=25, 93%) and at 6-month follow-up (n=21, 78%).

Among the participants, 59% were male (Table 1) and median age at study enrollment was 31 years (interquartile range [IQR], 27–39 years). Using the ITR-3, 82% of survivors were classified as high risk (level 3 and 4). No survivors were low risk (level 1). Based on MDT assessments using information collected in the triage tool, 48% of survivors had medical or psychosocial needs prompting return to the survivorship clinic or specialist referral.

Reasons for Disengagement

All but 1 survivor reported reasons for not engaging in survivorship care (supplemental eFigure 1), with 35% reporting >1 reason, most commonly distance to clinic (30%) and a low perceived need for survivorship care due to lack of health problems (30%).

Table 1. Participant Characteristics (N=27)

Characteristic	Survivors n (%) ^a
Male survivors	16 (59)
Self-identified ethnicity	
Australian	19 (70)
Not Australian	7 (30)
Area of residence ^b	
Major city	18 (72)
Regional/Remote	7 (28)
Education	
High school only	10 (37)
Postschool (eg, university)	17 (63)
Employed	22 (82)
Income, AUD	
<\$60,000	13 (50)
≥\$60,000	13 (50)
Primary diagnosis	
Leukemia	10 (40)
Lymphoma	4 (16)
Brain cancer	6 (24)
Other ^c	5 (20)
Treatment received	
Surgery	15 (60)
Chemotherapy	26 (96)
Radiation	18 (69)
Bone marrow transplant	5 (28)
Relapsed	3 (11)
Second cancer	3 (11)
ITR-3 risk level ^d	
Level 1 (low risk)	0
Level 2 (medium risk)	5 (18)
Level 3 (high risk)	15 (56)
Level 4 (high risk)	7 (26)
MDT needs assessment	
Low	6 (22)
Medium	8 (30)
High	27 (48)

(continued)

Table 1. Participant Characteristics (N=27) (cont.)

Characteristic	Survivors n (%) ^a
Age, median	31.0
Interquartile range	27–39
Age at diagnosis, mean (SD)	9.0 (3.8)
Range	0–16
Years since treatment completion, mean (SD)	22.8 (9.6)
Range	7–39

Abbreviations: ITR-3, Intensity of Treatment Rating scale 3.0; MDT, multidisciplinary team.

^aNumbers and percentages may not add up due to missing values and rounding errors.

^bAccording to Area of Remoteness Index Australia (ARIA) classifications.

^cOther diagnoses included osteosarcoma, rhabdomyosarcoma, and severe aplastic anemia.

^dA higher rating indicates a higher treatment intensity based on diagnosis, stage, and treatment data.

invitation, and therefore did not require any follow-up calls. Among the remainder, the mean number of follow-up calls was 1.2 per survivor (range, 1–2). No participants required us to supply equipment for participation (eg, telephone, computer/tablet, internet connection). Two participants opted to have their consultations using videoconferencing and 25 selected the telephone. All consultations were completed with the patient alone, except in one case in which the survivor had cognitive impairments and was accompanied by his siblings.

Median length of the first consultation was 68 minutes (IQR, 45–90 minutes [SD, 29]), rated by 92% of survivors as “just right” (n=23/25). Median length of the second consultation was 11 minutes (range, 7–15 minutes [SD, 5]), which all survivors rated as “just right.” We did not observe any evidence of a difference in consultation length over the course of the study ($P=.420$) or by diagnosis ($P=.185$). However, consultation length was significantly longer in older participants ($P=.020$).

Acceptability

Postintervention, 92% of survivors reported that the study was “beneficial” to them (n=23/25). Four participants, 2 of whom did not go on to complete the 6-month follow-up survey, rated the study as “a little bit” burdensome, which they attributed to the length of the surveys rather than the program itself. At 6-month follow-up, 100% of participants reported that the study was “beneficial” (n=21) and 4 reported that it was “a little bit” burdensome, again attributed to the surveys.

Based on survey results at 1 month postintervention, Re-engage was shown to be highly acceptable, with 96% reporting satisfaction with the amount and quality of information delivered (n=24/25) and indicating that they liked the help received (n=24/25); 1 survivor reported needing additional help (Figure 2). Preintervention,

Feasibility

The opt-in rate for clinician-identified survivors (82%) was higher than for survivors recruited via post (75%). A total of 13 survivors invited via post were deemed uncontactable (eg, package was returned to sender), and out-of-date details on medical records limited the success of this recruitment approach. A total of 44% of participating survivors opted in on receipt of a study

52% of survivors were satisfied with their cancer-related care ($n=14/27$) compared with 84% postintervention ($n=21/25$).

Qualitatively, participants were highly supportive of the program. Six survivors reported benefiting from the information they received about their cancer history, healthcare needs, and recommended lifestyle changes. Five survivors reported that Re-engage provided them with access to specialist care, including a male neuroblastoma survivor aged 40 years, who stated that, “without things like [Re-engage], there is very little out there for long-term survivors.” Two survivors indicated that Re-engage made them feel more “proactive” about their health, because it created an opportunity to seek care for unaddressed and sometimes suppressed concerns. They praised the remote delivery and ability to coordinate their future care more easily ($n=2$).

Preliminary Efficacy Evidence

Survivors' mean health-related self-efficacy score before participating in the program was 17.16. Compared with baseline, 44% of participants had an increase in self-efficacy scores by 1 month postintervention and 72% of participants had an increase in scores by 6-month follow-up. There was strong evidence of a change in average self-efficacy over time [$F(2,21)$, 8.40; $P=.002$]. Survivors' mean scores decreased from baseline to 1 month postintervention ($b = -0.33$; 95% CI, -1.31 to 0.65), yet significantly increased from baseline to 6-month follow-up ($b = 1.64$; 95% CI, 0.28 – 3.00) (Figure 3).

Survivors' engagement in risky behaviors (eg, smoking) and health behaviors (eg, exercise) remained similar pre-intervention, postintervention, and at follow-up (Table 2). Other health-related outcomes also remained stable, including quality of life and information needs. Survivors

did appear more likely to report having a regular GP at 6-month follow-up (81%) compared with baseline or 1 month postintervention (both 67%), and reported brushing their teeth more regularly at 6-month follow-up (95%) compared with baseline (73%) and 1 month postintervention (79%).

Discussion

Re-engage is a novel nurse-led e-health intervention developed to re-engage survivors into active follow-up and improve their health-related self-efficacy. Our data suggest that Re-engage is feasible to deliver and highly acceptable to survivors. Preliminary efficacy data seem promising for increasing survivors' self-efficacy and thus confidence in managing their own survivorship care into adulthood. Re-engage shows the potential to empower survivors in coordinating their complex care, and in the future may influence survivors' lifestyle, health beliefs, and overall physical and mental well-being to help maximize quality of life after surviving childhood cancer.

Survivors reported various reasons for not accessing cancer-related care, many of which align with internationally cited barriers.¹¹ Distance is a prominent issue for survivors in Australia, where clinics are limited to major cities.⁶ Coupled with survivors' low perceived need for survivorship care¹⁹ and poor understanding of their personal risks and resulting surveillance needs,²⁰ it is understandable that survivors cease to seek survivorship care. It is therefore encouraging that we experienced high uptake for Re-engage and no attrition, despite targeting the challenging population of disengaged survivors. Nevertheless, we encountered some challenges tracing some survivors such a long time after treatment completion, which is unsurprising given the highly mobile nature of this age group.²¹

Figure 2. Participant ratings of acceptability of Re-engage at 1 month postintervention ($n=25$).

Survivors' openness to novel models of care is supported by the high acceptability ratings of Re-engage. Participants praised the nurse-led approach, despite survivors' well-established preference for oncologist-led models of care,²² supporting the potential for future nurse-led models in pediatric oncology. Nurse-led models have been used in adult cancer²³ and other illnesses,²⁴ but to date have been more acceptable among survivors of childhood cancer for supportive care rather than medical care.²⁵ Offering specialist nurse-led care may be particularly important in the pediatric oncology context, in which survivors commonly report an attachment to their oncology team, leading to a reluctance to transition to adult healthcare, which may ultimately lead to disengagement.²⁶

Preliminary evidence of the efficacy of Re-engage suggests that the program has the potential to improve survivors' health-related self-efficacy, empowering them to access the right care at the right time. It is not surprising that self-efficacy significantly increased at 6-month follow-up but not at 1 month postintervention. Given the complexity of survivors' needs, the longer period may have been necessary to enable action to address these needs, such as arranging an appointment at clinic or with the recommended specialists for further follow-up, or receiving treatment (eg, psychologic care) to resolve outstanding issues. Further longitudinal evaluation is needed to establish the long-term efficacy of Re-engage and drivers of self-efficacy, including clinical/demographic factors and potentially modifiable drivers (eg, survivors' information needs).

A primary goal of survivorship care is to encourage healthy lifestyles in survivors in order to further reduce

their risk of late effects. Self-efficacy is also an important driver for behaviors such as information-seeking, care-seeking, and risk-taking. For example, perceived control has been shown to be associated with survivorship care attendance,²⁷ and positively associated with health behaviors such as physical activity.²⁸ The opportunity for prevention and early detection reinforces the importance of (re)engaging, educating, and empowering survivors to receive appropriate lifelong care and minimize these adverse outcomes.

Re-engage did place a time burden on our staff. Our results have informed modifications to the execution of the next iteration of Re-engage that we are evaluating in an implementation trial. Manual completion of the triage tool during the first consultation was particularly time-consuming. We are currently digitizing the tool, including drop-down options for common responses to speed completion. We will create a version that patients can complete before consultations, and will partially automate letters to survivors' GPs. We anticipate that these changes will reduce the overall nurse time/cost of delivering Re-engage. Streamlining the MDT meeting will further reduce intervention costs, such as including psychologist involvement for only high-risk cases. Cost is also a major barrier for survivors attending face-to-face appointments, and perpetuates nonattendance.¹¹ Importantly, Re-engage incurs no direct costs for survivors, resulting in a significant cost-saving for them. Internationally, Re-engage may be partially reimbursable through the healthcare system (eg, Medicare Services in Australia and Canada, or some insurance companies in America). For the healthcare system, early detection of late effects in survivors participating in Re-engage has the potential to allow more cost-effective management of their care.

For 18% of Re-engage participants, review of their diagnosis/treatment alone suggested that they were at lower risk for serious/chronic health conditions (ie, ITR level 1 or 2). However, in 48% of cases, MDT assessment found physical and psychosocial issues that remained unaddressed despite receiving care in the community, highlighting the added value of the MDT assessments in recognizing risk factors that affect survivors' quality of life. For example, some survivors reported comorbidities that might exacerbate their risk of treatment-related late effects, such as obesity, which further increases their risk of cardiovascular disease and second cancers.²⁹

Strengths and Limitations

Re-engage is one of the first attempts to address the barriers faced by many survivors who are disengaged from care, using an innovative nurse-led program and low-burden distance-delivered design. Our pilot suggests that Re-engage is effective in improving survivors' health-related self-efficacy in the medium term (up to 6 months). Our pilot did not include a control group, and it is possible

Figure 3. Mean self-efficacy scores at baseline, 1 month post-intervention, and 6-month follow-up. The orange line is the mean score.

^aPossible scores: 8 to 24.

Table 2. Health-Related Outcomes

Outcome	Baseline (mean, SD)	1 Month Postintervention (mean, SD)	6-Month Follow-Up (mean, SD)
Psychosocial factors			
Total met information needs (0–8, ↑ = better)	4.5 (2.83)	4.7 (2.82)	5.1 (2.98)
Quality of life index (0–1, ↑ = better)	0.9 (0.10)	0.9 (0.12)	0.9 (0.08)
Self-rated overall health (0–100, ↑ = better)	77.8 (14.22)	77.4 (13.68)	76.4 (21.63)
Anxiety score (0–10, ↓ = better)	3.6 (2.53)	3.2 (3.08)	3.5 (2.21)
Depression score (0–10, ↓ = better)	2.3 (2.49)	1.8 (2.70)	2.5 (2.74)
Distress score (0–10, ↓ = better)	2.2 (2.17)	1.9 (2.61)	2.4 (2.37)
Lifestyle factors			
Hours of exercise (in the past week)	2.8 (3.52)	4.6 (10.49)	5.6 (10.44)
Weight, kg	72.5 (16.79)	72.9 (17.38)	68.8 (14.94)
Alcohol consumption (standard drinks in the past wk)	9.2 (5.68)	7.3 (4.77)	8.1 (7.32)
Total, n	27	25	21
Healthcare use and satisfaction, %			
Satisfied with cancer-related care	52	84	81
Has a regular general practitioner	67	67	81
Regular medication adherence	93	92	84
Health behaviors, %			
Current smoker	—	4	4
Brushes teeth twice daily, regularly	73	79	95
Practices skin protection in the sun	93	92	95
Consumes fruit daily	41	46	26
Consumes vegetables daily	52	42	37

that self-efficacy may naturally improve over time. Few survivors opted for the videoconferencing option, instead choosing to complete their consultations via telephone. Further research to explore survivors' preferences for models delivered via e-health would be of value.

Our pilot sample size was small ($n < 30$) and may overrepresent disengaged survivors who were already interested in re-engaging into survivorship care, particularly if they had previously received care from the nurse consultant, potentially biasing the results. We were not able to collect data about nonrespondents, including their reasons for nonparticipation. In addition, participants had varied primary cancer diagnoses, which may have impacted the results. Most of our participants were recruited opportunistically by clinicians who reviewed lists of patients who had not been to clinic in a long time or if survivors made contact first, potentially introducing some bias compared with systematically approaching all eligible survivors via hospital records. Compared with the Australian survivor population,³⁰ our pilot sample had a similar proportion of men and women, and survivors diagnosed with leukemias, lymphomas, and brain cancer. However, our sample captured a larger proportion of survivors who were living rurally or remotely.

Given that most participants were Australian-born and all were English-speaking, the intervention should be trialed in non-English-speaking and culturally diverse populations, because they may face additional barriers to accessing care. Our study did, however, capture survivors with limited access to care, for example those living remotely and those who had moved interstate since being treated at Sydney Children's Hospital (28%). Given the similarities in globally reported barriers to accessing survivorship care,^{11,31} Re-engage may be implemented in other international settings, with some modifications to suit local resources and practices. Further research investigating the effect of engagement in the healthcare system (eg, with their oncologist or GP) on survivors' satisfaction with care would be valuable.

Conclusions

This study shows that our novel distance-delivered, nurse-led Re-engage program is acceptable and feasible and illustrates early efficacy. Re-engage has the potential to empower survivors in coordinating their complex care, improving their long-term engagement, and increasing their satisfaction with care. Ultimately, Re-engage may also minimize the long-term burden associated with treatment of childhood cancer.

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References

- Sadak KT, Neglia JP, Freyer DR, et al. Identifying metrics of success for transitional care practices in childhood cancer survivorship: a qualitative study of survivorship providers. *Pediatr Blood Cancer* 2017;64:e26587.
- Shapiro CL. Cancer survivorship. *N Engl J Med* 2018;379:2438-2450.
- Dixon SB, Bjornard KL, Alberts NM, et al. Factors influencing risk-based care of the childhood cancer survivor in the 21st century. *CA Cancer J Clin* 2018;68:133-152.
- Mayer DK, Alfano CM. Personalized risk-stratified cancer follow-up care: its potential for healthier survivors, happier clinicians, and lower costs. *J Natl Cancer Inst* 2019;111:442-448.
- Tonorez ES, Barnea D, Cohn RJ, et al. Models of care for survivors of childhood cancer from across the globe: advancing survivorship care in the next decade. *J Clin Oncol* 2018;36:2223-2230.
- Signorelli C, Wakefield CE, McLoone JK, et al. Models of childhood cancer survivorship care in Australia and New Zealand: strengths and challenges. *Asia Pac J Clin Oncol* 2017;13:407-415.
- Gates P, Krishnasamy M. Nurse-led survivorship care. *Cancer Forum* 2009;33:175-178.
- Gardenier D, Ullrich T, Davis EL. Can primary care nurse practitioners provide survivorship care to cancer patients? *J Nurse Pract* 2018;14:228-229.
- Garcia-Vivar C, Elizondo N, Ambrosio L. Primary care nursing is essential to fully implement survivorship care plans for long-term cancer survivors and their families. *Cancer Nurs* 2019;42:177-178.
- Signorelli C, Wakefield CE, Fardell JE, et al. Perceptions of future health and cancer risk in adult survivors of childhood cancer: Implications for engagement in follow-up care. *Cancer* 2019;125:1008-1009.
- Oeffinger KC, Wallace WHB. Barriers to follow-up care of survivors in the United States and the United Kingdom. *Pediatr Blood Cancer* 2006;46:135-142.
- Signorelli C, Wakefield CE, Fardell JE, et al. The impact of long-term follow-up care for childhood cancer survivors: a systematic review. *Crit Rev Oncol Hematol* 2017;114:131-138.
- Peden C, Saxon L. Digital technology to engage patients: ensuring access for all. *NEJM Catalyst*. Accessed June 17, 2020. Available at: <http://catalyst.nejm.org/digital-health-technology-access/>
- Vetsch J, Fardell JE, Wakefield CE, et al. "Forewarned and forearmed": long-term childhood cancer survivors' and parents' information needs and implications for survivorship models of care. *Patient Educ Couns* 2017;100:355-363.
- Signorelli C, Wakefield CE, Johnston KA, et al. 'Re-engage' pilot study protocol: a nurse-led eHealth intervention to re-engage, educate and empower childhood cancer survivors. *BMJ Open* 2018;8:e022269.
- Stüntner-Gibson D, Koren PE, DeChillo N. The youth satisfaction questionnaire: what kids think of services. *Fam Soc* 1995;76:616-624.
- Miller KA, Wojcik KY, Ramirez CN, et al. Supporting long-term follow-up of young adult survivors of childhood cancer: correlates of healthcare self-efficacy. *Pediatr Blood Cancer* 2017;64:358-363.
- Kazak AE, Hocking MC, Ittenbach RF, et al. A revision of the intensity of treatment rating scale: classifying the intensity of pediatric cancer treatment. *Pediatr Blood Cancer* 2012;59:96-99.
- Lee JL, Gutierrez-Colina A, Williamson Lewis R, et al. Knowledge of late effects risks and healthcare responsibility in adolescents and young adults treated for childhood cancer. *J Pediatr Psychol* 2019;44:557-566.
- Lindell RB, Koh SJ, Alvarez JM, et al. Knowledge of diagnosis, treatment history, and risk of late effects among childhood cancer survivors and parents: the impact of a survivorship clinic. *Pediatr Blood Cancer* 2015;62:1444-1451.
- Australian Bureau of Statistics. 4130.0.55.002 - Housing Mobility and Conditions, 2007-08. Accessed June 17, 2020. Available at: <https://www.abs.gov.au/ausstats/abs@.nsf/mf/4130.0.55.002>
- Signorelli C, Wakefield CE, Fardell JE, et al. The role of primary care physicians in childhood cancer survivorship care: multiperspective interviews. *Oncologist* 2019;24:710-719.
- Moore S, Corner J, Haviland J, et al. Nurse led follow up and conventional medical follow up in management of patients with lung cancer: randomised trial. *BMJ* 2002;325:1145.
- Watts SA, Gee J, O'Day ME, et al. Nurse practitioner-led multidisciplinary teams to improve chronic illness care: the unique strengths of nurse practitioners applied to shared medical appointments/group visits. *J Am Acad Nurse Pract* 2009;21:167-172.
- Goodenough B, Cohn RJ. Parent attitudes to audio/visual telecommunications in childhood cancer: an Australian study. *Telemed J E Health* 2004;10(Suppl 2):S15-25.
- Nandakumar BS, Fardell JE, Wakefield CE, et al. Attitudes and experiences of childhood cancer survivors transitioning from pediatric care to adult care. *Support Care Cancer* 2018;26:2743-2750.
- Baenziger J, Roser K, Mader L, et al. Can the theory of planned behavior help explain attendance to follow-up care of childhood cancer survivors? *Psychooncology* 2018;27:1501-1508.
- Keats MR, Culos-Reed SN, Courneya KS, et al. Understanding physical activity in adolescent cancer survivors: an application of the theory of planned behavior. *Psychooncology* 2007;16:448-457.
- Moke DJ, Hamilton AS, Chehab L, et al. Obesity and risk for second malignant neoplasms in childhood cancer survivors: a case-control study utilizing the California Cancer Registry. *Cancer Epidemiol Biomarkers Prev* 2019;28:1612-1620.
- Youlten DR, Baade PD, Green AC, et al. The incidence of childhood cancer in Australia, 1983-2015, and projections to 2035. *Med J Aust Med J Aust Med* 2020;212:113-120.
- Signorelli C, Wakefield C, McLoone JK, et al. Childhood cancer survivorship: barriers and preferences [published online November 11, 2019]. *BMJ Support Palliat Care*. doi: 10.1136/bmjspcare-2019-002001

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