

## REVIEW

# The chance of transition: strategies for multidisciplinary collaboration

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## Abstract

Many long-term childhood cancer survivors suffer from treatment-related late effects, which may occur in any organ and include a wide spectrum of conditions. Long-term follow-up (LTFU) is recommended to facilitate early diagnosis and to ensure better health outcomes. Due to the heterogeneity of these sequelae, different specialists work together in the diagnosis and treatment of these conditions. Experts from both pediatric and internal medicine are involved in age-appropriate care by providing a transition process. Hence, LTFU of childhood cancer survivors is a prototypic example of multidisciplinary care for patients with complex needs treated in a specialized setting. International collaborations of healthcare professionals and scientists involved in LTFU of childhood cancer survivors, such as the International Guideline Harmonization Group, compile surveillance recommendations that can be clinically adopted all over the world. These global networks of clinicians and researchers make a joint effort to address gaps in knowledge, increase visibility and awareness of cancer survivorship and provide an excellent example of how progress in clinical care and scientific research may be achieved by international and multidisciplinary collaboration.

## Key Words

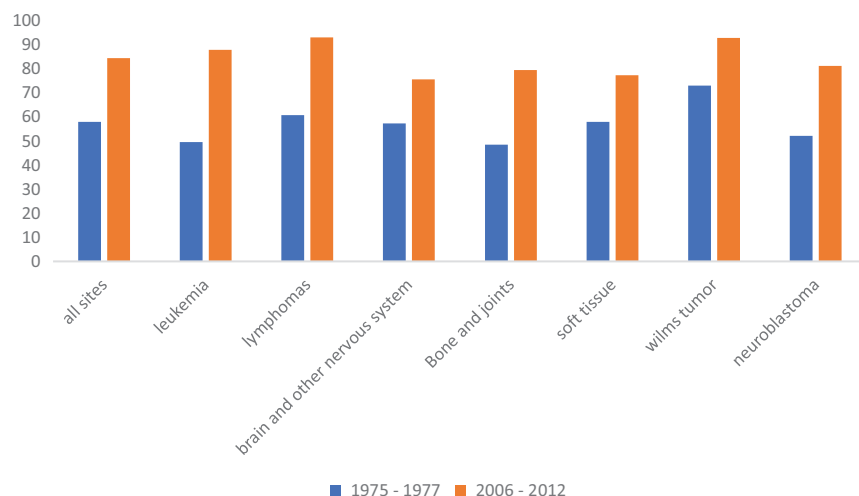
- ▶ late effects
- ▶ transition
- ▶ international collaboration
- ▶ childhood cancer survivors

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The number of patients surviving childhood cancer has continuously increased over the last five decades, mainly due to advances in cancer biology, treatment and supportive care (see Fig. 1 (1)). This has led to a growing number of childhood cancer survivors currently estimated at around 300,000–500,000 in Europe (<https://siope.eu/>) and 450,000 in the United States (<https://curesearch.org/>). Although the estimated number of 300,000 new cases of

childhood cancer globally every year is small compared to the total number of 17 million new cancer cases (<https://canceratlas.cancer.org>), childhood cancer survivors have the potential for long lives ahead of them. Therefore, the quality of childhood cancer survivorship is crucial.

Despite the advances in cancer treatment, many long-term survivors suffer from treatment-related late effects, which may occur years to decades after the completion of

**Figure 1**

Changes in 5-year relative survival (in %, y-axis) for childhood cancer patients (age: 0–14 years) with different cancer entities (x-axis) between 1975 and 2012 (data from (1)).

therapy (2). Increasing knowledge and recognition of these sequelae resulted in, whenever possible, a reduction or even elimination of radiotherapy exposure or high cumulative chemotherapy doses in newer treatment approaches, which are anticipated to be associated with improved life expectancy as a consequence of fewer, life-threatening late effects. However, despite these important adaptations, even more recently diagnosed childhood cancer survivors still face a projected reduction in life expectancy of 14% compared to individuals without a history of cancer, due to late relapses as well as to severe chronic health conditions (3). Thus, early diagnosis, or better still prevention, of these late effects and their sequelae is essential to ensure better health outcomes (4). Therefore, long-term follow-up (LTFU) is recommended for survivors to address their unique cancer-/treatment-related health risks (5). It is generally offered every 1–5 years, depending on the survivor's risk profile, and can be adjusted individually if new chronic health conditions arise. Organ- as well as treatment exposure-based LTFU recommendations have been developed in order to facilitate the development of a personalized care plan and to improve the quality of LTFU care.

Childhood cancer care is typically provided in a pediatric cancer center where follow-up continues until the risk of recurrence is perceived to be low. The focus of LTFU care typically starts 2 or more years after completion of therapy when concerns about surveillance for primary cancer recurrence decline and focus on education, late effects surveillance, risk reduction, etc. increases.

Late effects after childhood cancer may occur in any organ or lead to systemic consequences and include a wide spectrum of conditions that can negatively affect physical, functional and psychosocial functioning, for example,

cardiac or endocrine diseases, cognitive impairment and subsequent malignancies. Hence, for optimal survivorship care, it is necessary that different specialists are involved in the diagnosis and treatment of these conditions. Ideally, when the patient enters LTFU, a team of physicians coordinates the transition between oncology and primary care, and consultations with subspecialty providers as needed. Regular consultations involving LTFU specialists from both pediatric and internal medicine as well as (initial) joint meetings with the patient may support the transition process and optimize LTFU care. In addition, the holistic approach in LTFU care also benefits from the participation of a multidisciplinary team including specialist nurses, dietitians, psychologists and social workers, among others, as well as time and resources to address health risk mitigation by the provision of advice on implementing lifestyle changes such as smoking cessation, undertaking physical activity and adopting a healthy diet, in order to optimize future long-term health.

When the patient reaches adulthood, specialists in family or internal medicine and necessary sub-disciplines are needed for adequate care. During the transition process, the LTFU core team expands as clinicians with experience in late effects surveillance and management may gradually assume responsibility of the organization of LTFU from the pediatrician. Against this context, LTFU of childhood cancer survivors is a prototypic example of multidisciplinary care for patients with complex needs, providing collaborative and age-appropriate care by transition with the support of experts from pediatric and internal medicine as well as additional different medical, nursing and other healthcare specialists. It is inspired by multiple longstanding collaborative efforts between specialists from both pediatric and internal medicine

working with chronically ill patients. LTFU care for childhood cancer survivors and its focus on international collaboration in the establishment of guideline-based care and standardized transition processes may now in turn motivate these existing structures to develop further the long-term care of chronically ill patients.

Our initial knowledge about late effects resulted from LTFU of patients surviving cancer in the 1970s and 1980s. With increasing evidence of cancer treatment-related sequelae, research was extended and structured during the last few decades revealing a broad spectrum of possible physical and psychological consequences mainly depending on the type of cancer and specific treatment modalities received. Based on these findings, evidence-based guidelines and recommendations for LTFU have been published in several countries that aim to reduce long-term morbidity and mortality by early detection and treatment of late effects. Although some of these guidelines differ in terms of recommendations for certain examinations or intervals between examinations, they all advocate for a regular and risk-adapted LTFU that, with the exception of low-risk patients, may take place in specialized centers.

In order to harmonize these guidelines and to create LTFU recommendations based on as high a level of evidence as possible, the International Late Effects of Childhood Cancer Guideline Harmonization Group (IGHG) was founded in 2010, aiming to implement a common strategy for the surveillance of chronic late effects in childhood cancer survivors by uniting experts from all over the world to share and combine their knowledge (<http://www.ighg.org/>). This global collaboration consisting of physicians, other healthcare professionals and researchers from various specialties and survivor advocates aims to avoid duplication of efforts in guideline creation by providing organ/disease-specific surveillance recommendations based on a systematic literature review and evaluation of the evidence according to methods developed by the Cochrane Childhood Cancer Group of the Cochrane Collaboration. Some of these guidelines were assembled in collaboration with PanCare, a multidisciplinary pan-European network of professionals, survivors and their families that aims to coordinate and improve LTFU care for childhood cancer survivors throughout Europe (<https://www.pancare.eu/>) and by the contribution of other cooperative groups, especially the North American Children's Oncology Group, the Dutch Childhood Oncology Group (DCOG/SKION) as well as the United Kingdom Children's Cancer and Leukaemia Group and SIGN (Scottish Intercollegiate Guidelines Network). PanCare has also developed evidence-based guidelines concerning the delivery of LTFU care,

including publications on transition and models of care (6). These guidelines have been published in high profile peer-reviewed medical journals, and many other guidelines are still under development. They also serve as the basis for the Survivorship Passport (SurPass) as an example of an electronic LTFU tool, which is currently used in clinical testing and will be available for childhood cancer survivors in multiple countries. It provides a summary of each survivor's clinical history together with personalized follow-up and screening recommendations activated by built-in algorithms linking the individual treatment history with risk factors identified by IGHG and/or PanCare guidelines. The final SurPass will be validated and approved by the late effects specialist after shared decision making with the survivor and/or his/her caregivers to empower them in planning and organizing their own healthcare (7).

The international and multidisciplinary collaboration of healthcare professionals and scientists involved in LTFU of childhood cancer survivors is an essential effort to create a global network of dedicated clinicians and researchers providing specialized care as well as pursuing high-quality research. This approach may identify and jointly address gaps in knowledge and hence increase visibility and awareness of childhood cancer survivorship among other healthcare providers as well as in the general population. During the SARS-CoV-2 pandemic, these structures allowed the immediate initiation of global cooperation to collect and evaluate evidence on COVID-19 in childhood cancer survivors starting as early as March 2020. While other expert groups created country- or disease-specific recommendations, this collaboration resulted in one joint COVID-19 statement for childhood cancer survivors all over the world that was released on 7 April 2020 (translation into 16 different languages is available at <https://www.ighg.org/>) (8).

LTFU of childhood cancer survivors may thus serve as a model for multidisciplinary care of patients with complex needs, combining prevention, early detection and treatment of various chronic health conditions in a specialized setting. The rarity of childhood cancer as well as the highly collaborative and multidisciplinary nature of pediatric oncology care allow the development and implementation of recommendations for standardized content of LTFU that, once clinically adopted, may serve as a model for adult oncology care dealing with a much larger number of cancer survivors. Moreover, this international collaboration has not only enhanced LTFU care for childhood cancer survivors, but has also provided an excellent example of how progress in clinical care and scientific research may be achieved.

### Declaration of interest

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of this review.

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