In many pursuits, the ‘finishing line’ is not always where you think it is. For many years the ‘finishing line’ for children and adolescents with cancer was being told that they were cured – usually after four to five years of disease-free survival. It is now apparent that the consequences of having had a malignancy, especially in childhood, can impact many years later. In the greater scheme of things, curing significant numbers of childhood cancers has been a relatively recent phenomenon, namely over the last 35-40 years. This period has seen a phenomenal change in outcomes for childhood malignancies. When Farber first used methotrexate to treat children with leukaemia in 1948, short remissions resulted, but ultimately all patients succumbed to the disease. His initial report in the *New England Journal of Medicine* in 1948 was met with derision, as the prevailing view was that leukaemias were incurable and that the children should be allowed to ‘die in peace’. Indeed, in the 1960s parents were often told to take their children home and to love them, as there were no sustained remissions.

The use of multi-agent chemotherapy in the late 1960s led to the first reported durable remissions for children with acute leukaemias and lymphomas. The 1970s saw a dramatic rise in cure rates for many malignancies. It is humbling to realise that many of these children are now in their 40s and 50s - in many respects still relatively young.

Until this watershed, the only long-term survivors of childhood malignancy resulted from curative surgery or curative radiation. The numbers were small, but even then there was a recognised cost seen in these long-term survivors with growth effects, neuro-cognitive and neuro-endocrine complications and the suggestion of increased second malignancies. In his seminal paper on the role of radiotherapy in medulloblastoma, Bloom noted that children under two years of age often required ongoing institutional care after receiving craniospinal radiotherapy. Prior to this, Lampe expressed concern regarding brain damage that could result from high doses of radiation to brains of younger patients.

It was hoped that chemotherapy would eliminate the need for radiation and be free of long-term consequences, but unfortunately this was not to be. Until the 1990s, once a patient was deemed cured they were usually discharged from the primary treating institution and told to live a normal life with reasonable expectation that they would. There has been an increasing recognition over the last 20 years of the many complications that may result from anti-cancer treatments. As a profession, we have an obligation to screen for and deal with these problems. This paper reviews the challenges facing childhood cancer survivors considering the physical, psychological, social and financial implications.

**Epidemiology of cancer in children**

According to the Surveillance, Epidemiology and End Results data, the incidence of cancers in young people less than 20 in the US, has remained static between 12.9 and 16.7 per 100,000 during the last 30 years. During
this time, the mortality incidence has decreased from 5.2 to 2.6. The most common malignancies are leukaemias (45/100,000), central nervous system malignancies (28/100,000), lymphomas (24/100,000), soft tissue sarcomas (12/100,000), germcell/trophoblastic tumours/neoplasms of the gonads (11.6/100,000), malignant bone tumours (9/100,000), neuroblastomas (8/100,000) and renal tumours eg. Wilms (6/100,000).5

As a result of this improvement in treatment, it is now expected that 80% of childhood cancer patients will become long-term survivors.6 One in 640 young adults 20-39 are cancer survivors and this means that the average general practice would be expected to have at least two of these patients per physician.

Treatments for childhood and adolescent cancers are diverse. The most common malignancy in this group is leukaemia (as above) and the chemotherapy for this condition can often continue over 18 months, possibly requiring total body irradiation and bone marrow transplantation. Lymphomas are treated predominantly with chemotherapy, with radiation used in a number of cooperative group protocols, albeit at much lower doses than adult patients receive. Brain tumours are usually treated with up-front surgery followed by up to 59 Gy of radiation. Sarcomas are usually treated with surgery and subsequent chemotherapy, often with the role of radiotherapy dependant on the histology and surgical clearance pathologically. The doses of radiotherapy for this group are variable, ranging from a modest 36 Gy to a radical 50.4 (Rhabdomyosarcoma) or 55.8 Gy (Ewings). At the other end of the spectrum, Wilm’s tumour in the early stages is treated with a short course of chemotherapy and radiotherapy usually of very small doses (10.8-21.6 Gy).

The gist of the European cooperative group studies has been to avoid radiation unless the local control with surgery comes with unacceptable toxicities. The North American cooperative groups in contrast have aimed to reduce the doses of radiotherapy, but the result is that more children are receiving it. Not surprisingly, over the last decade many treatment protocols for diseases such as Wilm’s tumour are converging on the role and dose of radiotherapy, allowing cross group studies to be entertained.

**Physical effects from the cancer itself**

The tumour itself can cause significant long-lasting problems prior to any therapeutic intervention. In brain tumours, there is good evidence that having a tumour itself can cause disturbance of the hypothalamic pituitary axis prior to surgery or radiotherapy.7 Likewise, the development of hydrocephalus is recognised to be an independent cause of significant neurocognitive decline in patients with brain tumours, previously attributed solely to radiation therapy.8 Damage to neurones may not be repairable and so often timely intervention is crucial in the setting of cord compression (eg. osteosarcoma or Ewing’s), or the optic chiasm (craniopharyngiomas and optic pathway gliomas).

**Surgery**

Clearly, the need for cancer resections of bony structures may have significant cosmetic effects and impacts on growth, especially if the growth plates are involved. The issue of rehabilitation involved after amputations is significant. Those patients who have undergone splenectomy, as performed at staging laparotomy for Hodgkin’s disease in the 1970s and 80s, are at risk of pneumococcal and meningococcal infections and as such require life-long surveillance and vaccinations.9 Long-term neurocognitive insult and neuronal injury are a possible complication of major brain tumour resections. Nephrectomy patients develop compensatory hypertrophy of the remaining kidney and run the risk of earlier onset hypertension, with its related health issues and proteinuria.10-12

**Late effects from radiotherapy and chemotherapy**

The most famous first victim of radiation late effects was probably Marie Curie, who discovered radium along with her husband Pierre. She also went on to develop the first mobile X-ray station in France in World War I. Marie died of aplastic anaemia, most likely as a result of her long-term radiation exposure. Her daughter Irene, also a Nobel Prize winning radiation physicist, developed and died from acute leukaemia. Pierre Curie however, was spared a similar fate – he was run over by a horse drawn cart on the streets of Paris in April of 1906.

The most studied modality producing late effects is radiation. The first patients were treated in the late 1890s and until the advent of chemotherapy, it was the only effective non-surgical treatment for cancer available. However, from relatively early on the effects of radiotherapy were appreciated.

> “The dangers from the use of X-rays may be grouped as immediate and remote. During the actual exposure, the possibility of making contact with a high-tension lead carrying a very high voltage has to be guarded against. An accident of this kind may easily be fatal...constitutional disorders, anaemia and sterility not infrequently arise in operators who are constantly exposed to X-rays.”13

In 1935, the concept of immediate and long-term or late effects was very simple. It is now thought that late effects refer to complications that arise many months to many years after the completion of therapy.

Indeed, much of the significant early data regarding adverse effects from radiotherapy is not from therapeutic radiation exposure - rather from the Hiroshima and Nagasaki atomic bomb data, industrial accidents and use in benign conditions. For example, in the 1940s and 50s, superficial irradiation was a commonly used treatment for tinea capitis, with doses of 0.04-0.45 Gy used.14 Early reports from the 1960s suggested an increase in leukemias, other malignancies and interestingly ‘mental disorders’. The incidence of thyroid, brain and other head and neck cancers was also found to be increased in the large cohort of Israeli immigrants treated for tinea in the 1940s and 50s.15

Much of the current data regarding late effects of cancer treatments has been developed for the retrospective cohort of ~ 10,000 patients with matched sibling controls in the Childhood Cancer Survivors Study group.6,16-19
Much of this data and other published literature has been brought together in the formation of the long-term follow-up guidelines of the Children's Oncology Group (www.survivorshipguidelines.org/). These guidelines are used as the basis for many long-term follow-up programs both in the US and internationally.

It is beyond the scope of this paper to exhaustively detail the physical effects of chemotherapy and radiotherapy, however, a brief overview follows.

**Head and neck region**

Alopecia is physically perhaps the most insignificant side-effect of cancer treatment, but psychologically, one of the more distressing, particularly for teenage girls. Cranial radiation often leads to temporary hair loss in field and the degree of permanent effect relates to total dose. It is apparent that combined chemoradiation (such as in medulloblastoma) can lead to more pronounced permanent thinning of the hair, or indeed complete alopecia. The lens of the eye is very sensitive to the effects of radiation and to steroid administration, which both lead to cataractogenesis. In conditions such as medulloblastoma and leukaemia requiring prophylactic cranial irradiation, it is difficult to adequately cover the cribriform plate without giving some dose to the lens. In itself, cataract removal is a fairly straightforward procedure, but the dose to the anterior chamber of the eye also increases the later risk of developing glaucoma.

The hypothalamic-pituitary axis is often compromised if it is involved in the surgical resection of tumours (particularly craniopharyngioma). Both surgery and radiotherapy to the hypothalamus can lead to hypothalamic obesity or metabolic syndrome, which is thought to be due to an abnormality in the normal satiety response to food. Radiotherapy effects to this axis present with a median time of three years post therapy. The thyroid axis is usually affected first, followed by growth hormone, the sex hormones (sometimes presenting as precocious puberty) and less commonly Adrenocorticotropic hormone, leading to Addisonian syndromes. The thyroid gland itself may suffer primary failure if it is in the primary radiation field. In conditions requiring cranio-spinal irradiation, it may prove difficult to distinguish between central failure and peripheral (glandular) failure. Central infertility may also result from radiation, however, this may be negated by the use of gonadotrophic releasing hormone agonists to induce gonadal stimulation.

Often the most devastating long-term effects is the functional neurological compromise suffered by patients who have had brain tumours or cranial irradiation. As mentioned previously, there is evidence that hydrocephalus itself can aggravate neurocognitive compromise. Merchant et al have demonstrated that IQ decline is proportional to the volume of brain treated, especially the temporal lobes and leukaemia requiring prophylactic cranial irradiation. This is particularly relevant in patients with mediastinal lymphoma, and needs to be considered in some with a history of neuroblastoma. Bleomycin chemotherapy is a potent inducer of interstitial fibrosis and pneumonitis. These problems are aggravated by tobacco and marijuana smoking, so smoking cessation is essential for people with these prior exposures.

**Cardiac effects**

Both radiotherapy and chemotherapy have significant impacts on cardiac function. High-dose anthracyclines (eg. > 350 mg/m² equivalent doxorubicin), can induce cardiac failure during treatment. There is also a recognised decrement in cardiac function which may present years later. In female patients, cardiac failure may be unmasked during pregnancy. It is advisable for pregnant women with a history of cardiac irradiation or anthracycline chemotherapy to undergo cardiac function assessment during pregnancy and monitoring during labour and delivery. Radiotherapy to the chest increases the risk of ischaemic heart disease by 2-5%. These patients also have an increased rate of valvular abnormalities, usually presenting with stenotic rather than incompetent valvular heart disease. Renal irradiation may cause cortical scarring or fibrosis, increasing the risk of Angiotensin converting enzyme driven hypertension, aggravating both the cerebral and cardiac risk profile.

Intriguingly, there is data that implicates higher doses of cisplatin used in the treatment of testicular cancers in the development of the metabolic syndrome. This clearly has ongoing implications for the cardiovascular health of these patients.

**Pulmonary effects**

Radiation doses above about 20 Gy induce variable degrees of pulmonary fibrosis in the radiation field, which if marked, may lead to a restrictive pattern on lung function testing and a decrease in overall diffusing capacity. This is particularly relevant in patients with mediastinal lymphoma, and needs to be considered in some with a history of neuroblastoma. Bleomycin chemotherapy is a potent inducer of interstitial fibrosis and pneumonitis. These problems are aggravated by tobacco and marijuana smoking, so smoking cessation is essential for people with these prior exposures.

**Gastrointestinal effects**

High dose radiation to the gastrointestinal tract can lead to localised strictures, gastrointestinal tract blood loss from telangiectastic blood vessel formation in the walls and/or chronic loose motions or diarrhoea. There are reports of radiation induced bowel cancers in people treated for Wilms’ tumour or rhabdomyosarcoma.

**Genitourinary effects**

High dose cyclophosphamide may induce haemorrhagic cystitis despite routine intravenous hydration prior to chemotherapy. Cyclophosphamide in childhood increases
High dose irradiation may induce scarring in the bladder, causing reduced bladder volume, which may result in urinary frequency and urge incontinence. Many chemotherapies, particularly potent alkylating agents (especially nitrogen mustards), can induce infertility in later life. Chemotherapy (especially cyclophosphamide) may be associated with premature menopause. This is related to chemotherapy dose and age at treatment. Radiation has been found to reduce uterine blood flow, and in doses above 16-20 Gy may induce hypoplasia and fibrosis, resulting in miscarriage or inability to carry a pregnancy to term. Radiotherapy doses of 2-4 Gy to the testes and 4-6 Gy to the ovaries may induce sterility, and at higher levels (~20 Gy) may result in loss of hormonal function.

**Musculoskeletal hypoplasia**

As depicted in figure 1, the threshold dose for hypoplasia induced by radiation appears to be about 16 Gy, with the plateauing of effect seen at about 25 Gy. If there is inhomogeneity across growth plates (as in vertebral bodies), asymmetric growth may lead to impaired cosmetic outcomes, such as kyphoscoliosis, facial asymmetry and pelvic tilt. Associated with this could be effects on neuronal, glandular and mechanical functions as described above. Clearly another mechanism of impaired growth is from the effects on growth hormone production from hypothalamic/pituitary irradiation. Chemotherapy itself may cause overall growth failure, with twin studies showing that bone marrow transplanted patients are reliably shorter than their siblings. Radiation can lead to late osteoporosis in field and in some cases radionecrosis in high dose areas. Likewise, high total dose corticosteroids may induce osteoporosis and more worryingly avascular necrosis of the head of the femurs.

**Second malignancies**

One of the most concerning complications of cancer treatment, both for the patient and the treating clinicians, is second malignant neoplasms. Some primary tumours in themselves are associated with an increased risk of other malignancies, such as retinoblastoma, or lymphoma. Intensive chemotherapy, particularly etoposide-like drugs, carry a risk of induced leukemias and myelodysplastic syndromes. The second malignancy risk from radiotherapy has a dose response, with the exception of thyroid cancers, which seem to plateau at a dose of approximately 15 Gy. Concurrent chemotherapy, particularly doxorubicin, increases the risk of developing a radiation induced second malignancy.

It has been appreciated for many years that treatment for Hodgkin’s lymphoma using mediastinal radiation increases the risk of breast cancer. More recently, the induction of menigiomas and more rarely gliomas in the central nervous system with antimetabolite maintenance chemotherapy in acute lymphoblastic leukemia is apparent. Retinoblastoma patients who have had irradiation have a significant risk of a second malignant neoplasm, especially osteosarcomas in the treatment field. The prognosis from

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**Figure 1 – Schematic representation of the late effects of radiotherapy**

Legend: The shape of these curves indicate an initial gentle rise in incidence with increasing radiotherapy doses. The steeper sections represent the critical regions of dose where there is a rapid increase in the incidence of growth retardation/glandular function/fibrosis and vascular complications; at higher dose levels the incidence tends to plateau. In planning radiotherapy for children it is preferable to dose critical structures below that where the curves steepen. There is a near linear development of second malignancy to dose.

(Incidence – reflects the incidence or severity of the complication; Dose – in Gray; d/e – disease; Sex – male or female gender; * function- surrogate for function; Malignancy – radiation/treatment induced second malignancy (excluding disease recurrence)).
these tumours is grim. Development of skin cancers within a previous radiation field is common. Infield lung cancers have been reported with an observed to expected ratio of 7.0, and in this study, all were smokers. Eighty per cent of secondary malignancies are either in the field of radiotherapy or at the margins, strongly implicating the role of radiation in the pathogenesis of these conditions.

**Psychological and social effects**

It has become increasingly apparent that having had a cancer can have a profound impact on psychosocial development. Survivors of cancer in childhood or adolescence are much less likely than their peers to marry, hold a job, reach the same socioeconomic status, have insurance or complete tertiary education. The most obvious impacts relate to failure to socialise due to brain injury, whether it be surgical insult (such as posterior fossa syndrome or hemiplegias), or failure to concentrate and follow game commands due to prior radiation. Damaged frontal lobe function often impacts on group play, and children may be ostracised as a result. More subtle impacts are seen when children lose touch with their peers during long absences caused by treatment. Social awkwardness engendered by lack of hair or just the fact of having their peers feeling awkward about their diagnosis of cancer can impede normal interactions. They are also often caught between wanting to be ‘normal’, yet having a life-changing event acknowledged in some way (see Carl’s story).

**Carl’s story**

Carl was found to have a medulloblastoma in his second last year of high school. He found that once the diagnosis was known, especially once his hair began to fall out, he felt cocooned from his friends, that they didn’t see him in the same way and often would tiptoe around him with their jokes and stories in case they offended him.

He found however, that their conversations were more inane and juvenile: “I’d faced a life threatening illness and they were concerned about who said what to who; it just didn’t seem important anymore.” He repeated his second last year of school to catch up on the work he had missed out on while undergoing treatment. When he was in his final year he found it hard to be motivated as all his friends were at university and having a great time, while he was still stuck with the ‘kids’.

While wanting to get on with a normal life he became increasingly concerned about minor symptoms in case they represented disease recurrence. The periods between his scans and obtaining the results were also extraordinarily stressful for him. A referral to a psychology and counselling service in concert with regular medial check-ups has helped this latter problem.

He is now in tertiary studies and pursuing a music career. His illness has given him a very different perspective on life and he remains anxious as to the possible late effects of treatment.

This can become particularly poignant once the treatment is completed and they look physically normal. Indeed, often adolescents and children find the academic dislocation hard to overcome, resulting in poor grades and worsening social isolation should they need to repeat a year of school. As they transition into the period of adolescence and young adulthood, social awkwardness, along with the physical impact from cancer and its treatments, can provide additional stress on relationships. Having a healthy body image and self-esteem relies on accepting physical appearances, which in the maelstrom of surgery, chemotherapy and radiotherapy is hard for young people to achieve, especially with the change in the way people respond to them. Permanent physical treatment side-effects such as hair loss, amputation, scarring and fatigue, can result in reactive depression, anxiety and in some situations post-traumatic stress disorder. Increased prevalence of somatic symptoms, depression and/or anxiety, attention deficit and anti-social behaviour among young cancer survivors, has been documented in those diagnosed with leukaemia. Central nervous system tumours and neuroblastoma are also deemed to be at particular risk. Brain tumour patients in particular may have profound and often debilitating fatigue, which inhibits ability to work and particularly socialise after work if they are employed. In some patients, exogenous growth hormone or stimulants such as dexamphetamine may be useful adjuncts, and of course screening for hypothyroidism (either central or due to gland damage) is an important part of long-term surveillance.

Other causes of fatigue need to be considered and it is often an early sign of more significant issues, such as a reactive depression, post-traumatic stress disorder or general anxiety. Many long-term survivors have a marked anxiety about their health. The wait for test results can be particularly onerous, while returning to the same institution where their initial treatment was given can bring distressing flashbacks or even responsive nausea and vomiting. Minor symptoms can bring on marked agitation about the possible cause, and it is behoven upon the caring team to put the risks of long-term problems in perspective. In other cases, patients may want to completely ignore what they have been through and refuse further follow-up. The extreme of this is to engage in risk taking behaviour such as tobacco and alcohol excess or illicit drug use.

Childhood cancer survivors often find long-term consequences in later life that are not directly related to the direct physical effects of chemotherapy or radiotherapy. In many countries (such as Australia), there are enormous hurdles to cancer survivors joining the military and developing further trade opportunities that could carry on into civilian life. Short-term memory impairment and concentration span problems, which may result from cranial radiation and intrathecal chemotherapy, reduce patients’ ability to complete tertiary education or even vocational training assessments. More subtle issues such as altered cosmetic outcomes or personality affects, may deny survivors of childhood and adolescent cancers promotion prospects or other advancement in their fields.

Life insurance policies are often very difficult to obtain, which is frequently an issue when they start their own
families. For instance, many policies issued in this setting exclude any malignancy, even if it were to develop outside the treatment field and have no obvious link to the treatment given or the primary condition. Likewise, health insurance in many spheres may be difficult to obtain and in many regions assisted fertility (eg. IVF) is not necessarily covered in public health programs. In regions where there is no universal health coverage this can carry significant implications for these patients, both for future health issues as well as the need for routine surveillance for long-term treatment related effects.

The increasing use of molecular genetics in the diagnosis of the primary tumour raises the spectre of future employers requesting the results as part of the employment process, potentially allowing discrimination. This is of most concern in jurisdictions where part of the employment conditions involve employer funded health insurance.

In the brain tumour survivor cohort treated to high doses of radiation to large volumes, or who have suffered significant initial injury from the tumour or surgery, there is the heart-rending situation where significantly neurocognitively impaired patients are reliant on their new ageing parents for many of their activities of daily living. These parents often struggle with the issue of who will care for their children when they die or become too frail to do it themselves.

Finally, one of the more insidious and common problems faced by cancer survivors is the lack of knowledge about the issues by both themselves and their treating medical practitioners. Clearly there needs to be a balance in informing survivors of their long-term risk and causing unnecessary concern. Many patients feel that they are a “time bomb” waiting to develop a second cancer or other significant complication. The majority of patients will not develop a second cancer - their relative risks mandate an appropriate screening regimen, but an understanding of the risk is critical for their peace of mind. In a busy oncology clinic, the needs of acutely unwell and newly diagnosed patients generally take precedence over those who are apparently cured and healthy. In our practice, we find that a consult in our dedicated late effects clinic - with the same patient we saw last in an acute clinic, and often in the same clinic room - is profoundly different in the scope of issues covered. Indeed, we have a number of patients in whom there is a correspondence trail between their family doctor asking for advice about issues and the oncology team answering that it is not related to their cancer and thus not appropriate for them to address. How should these patients be cared for now?

At one end of the spectrum is the concept discussed above, whereby once a patient is deemed cured they are discharged into their family physician’s care. The other end is regular detailed follow-up in a multidisciplinary long-term follow-up clinic. The problem with the first option is that it places a lot of reliance on the family doctor to keep up-to-date with a wide range of potential issues for what may be only a couple of patients in their practice. Compounding this is the mobile nature of the young adult population and patients’ lack of knowledge about what treatment they received, let alone the likely toxicities. The second does create its own issues. A dedicated paediatric late effects clinic can reach a steady state whereby the patients that are discharged when they reach adulthood (18 years old), are replaced by patients entering the long-term follow-up period - a revolving door concept. However, an adult clinic is more like a bucket. Patients enter the clinic either directly from their oncology team or from the paediatric long-term follow-up unit and, due to the high cure rates and low mortality from late effects, and with no ongoing plan will stay there. The clinic initially ran second monthly, but over the last 10 years is now bursting at the seams with a fully booked clinic every week.

Shared care

Clearly a shared care model is appropriate. The model that we are developing in our centre is based on a stratified shared care system. On entry to the clinic patients will be assessed as low, intermediate or high risk. Low risk patients would include such groups as a stage I Wilms tumour treated with surgery and simple chemotherapy. These patients would be able to be discharged into their family physician’s care with important provisos. The first is that the patients are given a survivorship care plan which outlines the treatment they have received, the risks identified as a result of the treatment and the recommended screening investigations and lifestyle modifications. This would enable the patient to change doctors without compromising their ongoing care, and would also give the family doctors guidance. The second proviso is the need to have a feedback loop, so that the long-term follow up clinic knows who the local doctor is, what tests have been ordered and what the results are. This is necessary to ensure that the appropriate care is being delivered and to allow contact with both the patient and the family doctor should new information about potential late effects become apparent. In a survey of GPs from the Netherlands, 97% of GPs were willing to participate in the long-term care of survivors and 64% felt that it was their responsibility.

The intermediate risk group would be patients who need regular surveillance and imaging, but not on an annual basis. This would include any patients who had had radiotherapy, high dose anthracyclines or endocrinopathies. Again a passport and management plan is essential, as is the feedback loop to a robust database. For instance, structural imaging for second malignancy surveillance or echocardiograms for delayed cardiotoxicity may be done every two to three years. Subsequent review in a multidisciplinary setting could alternate with yearly bloods, blood pressure checks and lifestyle modification counselling by the GPs.

The high risk group would be those who need annual multidisciplinary review in a tertiary centre. Again the passport and database would be essential to inform the GPs for the care between visits to the long-term follow-up clinic. Patients in this group would include brain tumour/cranial irradiation patients and bone marrow transplant recipients.

In the Netherlands survey, GPs felt that to participate in a shared care program they needed availability of guidelines (64%), sufficient information about the patient’s...
medical history (37%) and short communication lines (45%). The main barriers to participation were felt to be workload (16%), lack of knowledge (15%) and lack of communication from the parent institution.69

The challenges facing long-term follow-up programs mirror those of oncologists caring for adults, especially in diseases that have significant cure rates. Hopefully, a working model for childhood and adolescent cancer survivors will extrapolate easily to the appropriate care of cured adults.

As a profession, we have only been curing childhood cancers reliably for 30-40 years. This is the span of many of our senior colleagues’ and mentors’ working lives. We need to provide robust and thorough follow-up, both for our current patients’ sakes, and through surveillance and research, patients that are yet to come through our doors. It may well be that in 200 years, our professional descendents look upon the gross surgeries performed without anaesthesia 200 years ago. The question for our profession is how we will be viewed with regard to the care we have provided for our patients.

References


