Trajectories of Obesity and Overweight Rates Among Survivors of Childhood Acute Lymphoblastic Leukemia

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Acute lymphoblastic leukemia (ALL) is the most common and survivable form of childhood cancer (Howlader et al., 2014). To date, ALL survivorship rates are greater than 90% for pediatric patients (Howlader et al., 2014), leading to a growing concern about the numerous long-term effects of childhood cancer treatment. For instance, adult survivors of childhood cancer are 8.2 times more likely to have a severe or life-threatening condition than cancer-free siblings (Oeffinger et al., 2006), and 75% of five-year childhood cancer survivors report at least one adverse health outcome (Geenen et al., 2007). Most alarming is the disproportionate impact that these adverse outcomes have by age, as a younger age at ALL diagnosis (aged 6 years or younger) is associated with worse post-treatment cardiac outcomes (Lipshultz et al., 1995; Mulrooney et al., 2009), academic achievement (Harila-Saari et al., 2007), performance/global/verbal IQ (von der Weid et al., 2003), likelihood of earning a college degree (Haupt et al., 1994; Holmqvist et al., 2010), and income as an adult (Holmqvist et al., 2010). In an effort to improve the lives and not merely the longevity of childhood ALL survivors, a need exists to identify the modifiable negative health outcomes of childhood cancer therapy and how these vary by age.

One of the most common and potentially modifiable outcomes of ALL treatment is obesity/overweight status (Asner, Ammann, Ozsahin, Beck-Popovic, & von der Weid, 2008; Oeffinger et al., 2003; Reilly et al., 2000). Numerous samples of childhood ALL survivors demonstrate obesity rates two times greater than the general population or other comparable cohorts (i.e., siblings) (Asner et al., 2008; Garmey et al., 2008; Oeffinger et al., 2003). This elevated prevalence increases the vulnerability of ALL survivors to a wide range of harmful outcomes, including hypertension, type 2 diabetes, asthma, nonalcoholic fatty liver disease, gastrointestinal problems, endothelial dysfunction, and other medical and psychological comorbidities (Pulgaron, 2013). In addition, the accumulation of obesity and its comorbidities results in a lifetime of increased medical costs and diminished quality of life (Finkelstein, Graham, & Malhotra, 2014; Kanellopoulos, Hamre, Dahl, Fossa, & Ruud, 2013). Given that obese children and