Authors: Valerie Arsenault MD1, Weiyu Qiu MSc2, Qi Liu MSc3, Jennifer Yeh PhD4, Wendy Leisenring ScD5, Kirsten K. Ness PT PhD6, Gregory T. Armstrong MD MSCE7, Tara O. Henderson MD MPH8, Alexandra Walsh MD9, K. Robin Yabroff PhD10, Kevin Oeffinger MD11, Melissa M. Hudson MD12, Yutaka Yasui PhD13, Paul C. Nathan MD MSc14

Institutions:

1. AfterCare Program, Division of Hematology/Oncology, The Hospital for Sick Children, University of Toronto, 555 University Ave, Toronto, Ontario, Canada, M5G 1X8, valerie.arsenault@sickkids.ca
2. School of Public Health, University of Alberta, 4-051B Edmonton Clinic Health Academy (ECHA), 11405 87 Avenue NW, Edmonton, Alberta, Canada, T6G 1C9, weiyu@ualberta.ca
3. Department of Public Health Sciences, University of Alberta, 2348 133 St, Surrey, BC, V4A 9T7, ql3@ualberta.ca
4. Division of General Pediatrics, Boston Children's Hospital, Harvard Medical School, 300 Longwood Avenue, Boston, MA, 02115, USA. jennifer.yeh@childrens.harvard.edu
5. Fred Hutchinson Cancer Research Center, 1100 Fairview Ave. N., P.O. Box 19024, Seattle, WA 98109-1024, wleisenr@fredhutch.org
6. Epidemiology and Cancer Control, MS 735, Room S6013, St. Jude Children’s Research Hospital, 262 Danny Thomas Place, Memphis, TN 38105-3678, kiri.ness@stjude.org
7. Epidemiology and Cancer Control, MS 735, St. Jude Children's Research Hospital, 262 Danny Thomas Place, Memphis, TN 38105-3678, greg.armstrong@stjude.org
8. University of Chicago, Department of Pediatrics, Section of Hematology, Oncology and Stem Cell Transplantation, 5841 S. Maryland Avenue MC 4060 Chicago, IL 60637, thenderson@peds.bsd.uchicago.edu
9. Division of Hematology/Oncology, Phoenix Children’s, 1919 E. Thomas Rd., Phoenix, Arizona 85016, awalsh@phoenixchildrens.com
10. American Cancer Society, Inc., 250 Williams Street, Atlanta, GA 30303, robin.yabroff@cancer.org
11. Duke Cancer Institute, 2424 Erwin Dr, Suite 601, Durham, NC, 27705, kevinoeffinger@duke.edu
12. Survivorship Division, Department of Oncology, St. Jude Children’s Research Hospital, 262 Danny Thomas Place, Mailstop 735, Memphis, TN 38105, melissa.hudson@stjude.org
13. St. Jude Children’s Research Hospital, 262 Danny Thomas Place, Mail Stop 735, Memphis, TN, USA, 38105, yutaka.yasui@stjude.org
14. AfterCare Program, Division of Hematology/Oncology, The Hospital for Sick Children, University of Toronto, 555 University Ave, Toronto, Ontario, Canada, M5G 1X8, paul.nathan@sickkids.ca
**Background:** Chronic health conditions are frequent among childhood cancer survivors and lead to increased health care resource utilization. We compared rates of ED visits and hospitalizations between survivors and siblings.

**Methods:** Analyses included 10,762 ≥5-year survivors and 2,069 siblings who completed a questionnaire from 2014-2016. We calculated ED visits and non-obstetric hospitalizations in the last 12 months per 1,000 person-years (PY) and evaluated cause-specific hospitalization rates using ICD-10 categories. Multivariable Poisson regression models evaluated predictors of survivor visits.

**Results:** Median age in survivors and siblings was 35.3 years (IQR 29.0-43.1) and 42.9 years (IQR 35.6-50.2), respectively; time from cancer diagnosis was 27.8 years (IQR 21.7-34.1). 24.2% of survivors and 16.2% of siblings had ≥1 ED visit (p<0.001); rates were 521/1,000 PY for survivors and 246/1,000 PY for siblings (age/sex-adjusted relative rate [RR] 2.0; 95% confidence interval [CI] 1.7 - 2.3). Factors associated with increased survivor ED visits were black race (RR 1.6, CI 1.2-2.0), being obese (RR 1.4, CI 1.2-1.7) or underweight (RR 1.9, CI 1.2-3.0), female sex (RR 1.3, CI 1.1-1.5), younger age (p=0.02) or abdomen/pelvis (RR 1.2, CI 1.1-1.4) or brain irradiation (RR 1.2, CI 1.0-1.4). 13.3% of survivors and 8.3% of siblings had ≥1 hospitalization (p<0.001); rates were 219/1,000 PY for survivors and 130/1,000 PY for siblings (RR 1.9; CI 1.3 - 2.9). Factors associated with increased survivor hospitalizations were female sex (RR 1.3, 1.1-1.5), younger age (p<0.0001), being obese (RR 1.3, CI 1.0-1.6) or underweight (RR 1.5, 95% CI 1.1-2.2) or platinum chemotherapy exposure (RR 1.6, CI 1.3-2.0). The most common indications for hospitalization were diseases of the digestive (21.9/1,000 PY; CI 18.7 - 25.7) and circulatory (20.9/1,000 PY; CI 17.8 – 24.4) systems. Leukemia survivors had the highest ED visit and hospitalization rates.

**Conclusions:** Childhood cancer survivors had a 2-fold increased likelihood of an ED visit or hospitalization compared with their siblings. This increases the economic burden on survivors and the health care system.