

CHILDHOOD CANCER SURVIVOR STUDY- Analysis Concept Proposal

1. TITLE: Financial Hardship Among Adult Survivors of Childhood Cancer that have Undergone Hematopoietic Cell Transplant (HCT)

2. WORKING GROUP INVESTIGATORS: This proposed study will be within the Cancer Control Working Group.

David Buchbinder	dbuchbinder@choc.org
Paul Nathan	paul.nathan@sickkids.ca
Greg Armstrong	Greg.Armstrong@stjude.org
Nandita Khera	khera.Nandita@mayo.edu
Neel Bhatt	nbhatt@fredhutch.org
Yutaka Yasui	Yutaka.yasui@stjude.org
I-Chan Huang	i-chan.huang@stjude.org
Anne Kirchhoff	anne.Kirchhoff@hci.utah.edu
K. Robin Yabroff	robin.yabroff@cancer.org
Wendy Leisenring	wleisenr@fredhutch.org
Eric Chow	ericchow@uw.edu
Saro Armenian	SArmenian@coh.org
Smita Bhatia	sbatia@uab.edu

3. BACKGROUND AND RATIONALE:

Advances in our understanding of hematopoietic cell transplant (HCT) techniques and supportive care have ensured an expanding population of HCT survivors.¹ Over 80% of HCT recipients that are 2-year survivors will be alive at 10 years post-HCT.² In the United States, it is estimated that there will be greater than a half-million long-term HCT survivors by the year 2030.³ HCT survivors experience illness-specific physical and emotional challenges such as chronic health conditions as well as psychosocial challenges which often impact employment status, health insurance status and income, and financial hardship.⁴⁻¹⁰ The National Marrow Donor Program (NMDP) / Be the Match recently employed a patient-centered outcomes research platform to engage patients, caregivers, researchers and key stakeholders in a variety of symposia, working groups, and webinars to identify vital areas of focus for HCT survivors.¹¹ One of the major areas identified was *financial hardship*.

In prior studies, financial hardship has been categorized into three domains: material, psychological, and behavioral.¹² *Material* aspects include high out of pocket medical expenses, being sent to debt collection, filing for bankruptcy, problems paying off medical bills, paying medical bills off over time, and an inability to afford necessary medical care. *Psychological* aspects include worry about being able to afford medical costs associated with illness or accidental injury. *Behavioral* aspects include delaying or foregoing needed medical care such as outpatient care, prescription medication, mental health care, dental care, eyeglasses, specialist, or survivorship visits because of cost. Importantly, financial hardship has been associated with detrimental health behaviors such as non-adherence to treatment and foregoing medical care as a result of cost burden as well as impairments in health-related quality of life, increased stress, and treatment non-adherence) among cancer survivors in general.¹³⁻¹⁶ A recent set of analyses focused on the characterization of financial hardship within the Childhood Cancer Survivor Study using data generated in the Follow-up 6 survey (Nathan et al., ASCO 2021). Factor analysis of responses to the financial hardship questions included in that survey demonstrated that the specific items from the questionnaire loaded onto 3 factors which we have labelled *material*

hardship/financial sacrifices, behavioral hardship, and psychological hardship. There were two additional items (sent to debt collection and bankruptcy) which did not load onto a factor and were treated as individual items.

Recent studies have begun to characterize the burden of financial hardship and the unique risk factors for financial hardship among HCT survivors, but few have evaluated the impact among long-term pediatric HCT survivors in adulthood.⁶⁻¹⁰ Bona and colleagues evaluated survivors of pediatric allogeneic HCT among which approximately 20% of families reported income loss and nearly one-third reported insecurity with respect to food and housing post-transplant.¹⁰ Risk factors evaluated among adult HCT survivors have included sociodemographic as well as cancer- and treatment-related variables. Khera and colleagues evaluated specific sociodemographic factors and found that younger current age and lower educational attainment were associated with greater financial hardship among HCT survivors.⁷ A longer elapsed period since HCT was also associated with greater financial hardship. The specific cancer diagnosis and treatment type or intensity may also be associated with greater financial hardship. Having survived cancer and currently having chronic health conditions or experiencing poor mental and/or physical health may serve as risk factors for financial hardship among HCT survivors.⁸

Previous studies focused on financial hardship among HCT survivors are few and have largely employed small sample sizes from single centers and a lack of focus on long-term survivors of HCT during adulthood, limiting the ability to understand the impact of financial hardship.⁶⁻¹⁰ Further information, drawn from large, diagnostically diverse samples, utilizing comparison populations are needed to best identify risk factors as well as protective factors for financial hardship. Adult survivors of childhood cancer who underwent HCT are a unique subset of patients with medical and psychosocial challenges inherent to transition of care from pediatric type to adult type. The aim of this study is to use the Childhood Cancer Survivor Study (CCSS) cohort to describe the burden of financial hardship among adult survivors of childhood cancer that have undergone HCT and identify sociodemographic as well as HCT-related factors that may shape the risk of developing financial hardship. We will also compare the financial hardship in HCT survivors with age-, sex-, and disease-matched conventionally treated (any treatment except not having an HCT) survivors as well as siblings of survivors from the CCSS cohort. These preliminary data are an essential step toward understanding the incremental effect of HCT on employment and financial issues beyond that of those treated with conventional therapy in order to help develop targeted interventions to mitigate financial hardship.

4. SPECIFIC AIMS:

Aim 1: Using follow-up 6 (FU6) data, we will describe the prevalence of financial hardship using the domains of financial sacrifices, behavioral hardship, and psychological hardship as well as the two additional items (sent to debt collection and bankruptcy) as depicted (see Page 4) among adult survivors of childhood cancer that have undergone HCT. We will also describe the insurance concerns, and employment concerns as well as assets and debts among adult survivors of childhood cancer that have undergone HCT. Comparison will be made to age-, sex-, and disease-matched conventionally treated survivors and all siblings of survivors.

Hypothesis: *We hypothesize that medical financial hardship among adult survivors of childhood cancer that have undergone HCT will be greater than the medical financial hardship reported by conventionally treated survivors of the same cancers and siblings of survivors even after adjusting for sociodemographic and clinical characteristics.*

Aim 2: When evaluating medical financial hardship as experienced by adult survivors of childhood cancer that have undergone HCT when compared to conventionally treated survivors, we will examine social determinants of health and HCT-related exposures, as well as late effects including chronic health conditions and late relapse which may serve as mediators of a difference in medical financial hardship among the HCT cohort (that is above and beyond the financial hardship among conventionally treated survivors).

Hypothesis: *We hypothesize that survivors' social determinants of health including minority race/ethnicity, low household income, public or no health insurance, unemployment, being unmarried/single/divorced, and low educational attainment will be associated with increased medical financial hardship among adult survivors of childhood cancer that have undergone HCT above and beyond the medical financial hardship among conventionally treated survivors .*

We hypothesize that HCT-related exposures including total body irradiation (TBI) and busulfan will be associated with increased medical financial hardship among adult survivors of childhood cancer that have undergone HCT above and beyond the medical financial hardship among conventionally treated survivors.

We hypothesize that late effects including chronic health conditions post-HCT and late relapse / second malignant neoplasm (SMN) will be associated with increased medical financial hardship among adult survivors of childhood cancer that have undergone HCT above and beyond the medical financial hardship among conventionally treated survivors.

5. ANALYSIS FRAMEWORK:

5.1 Sample:

The proposed analyses will utilize data collected in the full cohort from adult survivors (≥ 18 years of age at questionnaire) that underwent HCT prior to 21 years of age for cancer diagnosed between 1970 through 1999 in the United States and Canada. Financial toxicity was assessed in the FU6 survey. Notably, among CCSS participants eligible for FU6, one third were selected at random to complete the financial toxicity section resulting in 3349 CCSS participants completing the financial toxicity portion of the survey. Among them, there are 138 HCT survivors who completed the version of the FU6 questionnaire that addressed financial hardship (see Table below). The majority of these HCT survivors were diagnosed with leukemia (63%) and neuroblastoma (20%). The average age at the time of diagnosis was 9 years (yrs) (range 0 – 21 yrs). The average age at the time of completion of FU6 is 34 yrs (range 20-61 yrs). For comparison, we will use data from age (current)-, sex-, and disease-matched conventionally treated survivors. Matching will be at a ratio of 1: 3 (one HCT survivor to three matched conventionally treated survivors) in order to ensure adequate statistical power for the proposed analyses. The full sibling cohort that answered the survey (unmatched) will also serve as a comparison group. Aims 1 and 2 will include all subjects who responded to the version of the FU6 survey that assessed financial hardship.

Table: Characteristics of the 138 survivors who underwent HCT within 5 years of diagnosis

		Frequency	Percent
Sex	Male	66	48
	Female	72	52
Cancer diagnoses	Leukemia	87	63
	CNS	9	7
	HL	6	4
	NHL	7	5
	Neuroblastoma	27	20
	Bone cancer	2	1

CNS- central nervous system, HL- Hodgkin lymphoma, NHL- non-Hodgkin lymphoma

5.2 Outcomes of Interest and Predictor Variables:

Aim 1: Using follow-up 6 (FU6) data, we will describe the 3 domains (material hardship /financial sacrifices, behavioral hardship, and psychological hardship) as well as the two additional items (sent to debt collection and bankruptcy) among adult survivors of childhood cancer that have undergone HCT. We will also describe health insurance costs and concerns including type of coverage, annual deductible, and concerns related to being able maintain health insurance coverage. We will also describe employment costs and concerns including employment status, taking time off, changing jobs, changing to a more flexible schedule, avoiding promotion, worry about forced retirement, and job lock (staying to avoid loss of health insurance). Lastly, we will describe current annual household income, as well as assets including home value and debts including mortgages or loans on home and associated balance. Other debts will also be described including credit cards, car loans, medical provider debt, life insurance policy loans, or loans from relatives. Comparisons will be made to age (current), sex, and disease matched conventionally treated survivors. The full sibling cohort that answered the survey (unmatched) will also serve as a comparison group.

Financial Hardship

Three domains were defined (material hardship/financial sacrifices, behavioral hardship, and psychological hardship). Each item was scored (0 or 1) and scores summed to generate a score for each domain which will be converted to Z-scores. Two additional items did not load onto a single factor, they are individual items (sent to debt collection and bankruptcy) which are binary (yes/no).

Material Hardship/Financial Sacrifices (8 items – in the past year)

- A. Reduced spending on vacation or leisure (C9)
- B. Reduced spending on large purchases (C9)
- C. Delayed or reduced spending on home improvement (C9)
- D. Used savings set aside for other purposes (C9)
- E. Reduced spending on basics (C9)
- F. Paying off medical bills over time (C7)
- G. Made a change to living situation (C9)
- H. Problems paying medical bills (C5,C6)

Behavioral Hardship (8 items – in the past year)

- I. Forgone any needed medical care (C8)
- J. Forgone yearly visit to your primary care doctor (C8)
- K. Forgone specialist (C8)
- L. Forgone follow-up care (C8)
- M. Forgone prescription medicine (C8)
- N. Forgone eyeglasses (C8)
- O. Forgone mental health counseling (C8)
- P. Forgone dental care (C8)

Psychological Hardship (3 items – in the past year)

- Q. Worry or stress about having enough money to pay rent or mortgage (C17)
- R. Worry or stress about having enough money to buy nutritious meals (C18)
- S. Worry or stress about having enough money to pay household utilities, such as water, gas, and electricity (C19)

Other Hardship (2 items)

- T. History of being sent to debt collection (C29)
- U. History of filing for bankruptcy (C30)

Determinants

Health Insurance – Costs and Concerns

- V. Current health insurance coverage (C1, C2)
- W. Current deductible (C3)
- X. Concerns about losing insurance (C4)

Employment – Costs and Concerns

- Y. Current employment status (C13)
- Z. Taking time off work (C14)
- AA. Change jobs (C14)
- BB. Change to flexible schedule (C14)
- CC. Avoid promotion (C14)
- DD. Worry about forced retirement (C14)
- EE. Stay to avoid loss of health insurance (C14)
- FF. Spouse / significant other stay to avoid loss of health insurance (C15)

Assets and Debts

- GG. Current Annual Household Income (C21)
- HH. Home ownership (C22, C23)
- II. Home value (C24)
- JJ. Mortgage (C25)
- KK. Mortgage balance (C26)
- LL. Other debt (credit card balances, car loans, medical debt, life insurance policy loans, loans from relative, etc.) (C27)
- MM. Amount of other debt (C28)
- NN. Out of pocket expenses (C10)

Predictor Variables:

- A. None – descriptive by survivor and sibling status

Aim 2: When evaluating medical financial hardship as experienced by adult survivors of childhood cancer that have undergone HCT when compared to conventionally treated survivors, we will examine social determinants of health and HCT-related exposures, as well as late effects including chronic health conditions and late relapse which may serve as mediators of a difference in medical financial hardship among the HCT cohort (that is above and beyond the financial hardship among conventionally treated survivors).

Financial Hardship (as per Aim 1)

Material hardship/Financial Sacrifices Domain (8 items)

Behavioral Hardship Domain (8 items)

Psychological Hardship Domain (3 items)

Individual Hardship Items (2 items)

Potential Mediating Variables:

- A. Survivor (HCT & Conventionally Treated) Social Determinants of Health (Baseline/ Most Recent FU prior to FU6/FU6)
 - a. Educational attainment (FU5 A4)
 - b. Household Income (FU6 C21)
 - c. Employment (FU6 C13)
 - d. Health Insurance (FU6 C1, C2)
 - e. Marital status (FU5 M2)
- B. Survivor (HCT & Conventionally Treated) HCT-related exposures
 - a. TBI (yes/no)
 - b. Busulfan (yes/no)
- C. Survivor (HCT & Conventionally Treated) Chronic Health Conditions (from Baseline / Most Recent FU prior to FU6/FU6)
 - a. Chronic health conditions - grade <3 vs. grade 3 or greater and number of chronic health conditions- ≥ 2 or <2 (FU5 D1-K15)
 - b. Late Relapse / SMN (yes/no)

Potential Confounding Variables:

- A. Survivor (HCT & Conventionally Treated) Demographics Characteristics (from Baseline / Most Recent FU prior to FU6/FU6)
 - a. Race/ ethnicity (Baseline A5)
- B. Survivor (HCT & Conventionally Treated) Disease/ treatment related Characteristics (from Baseline / Most Recent FU prior to FU6/FU6)
 - a. Time from diagnosis (Baseline and FU6 Today's date)

5.3 Statistical analysis plan:

Table 1 will provide descriptive statistics of the HCT survivor, conventionally treated survivor and sibling populations including socio-demographic characteristics, such as, age at FU6 completion, sex, race/ethnicity, household income, and educational attainment as well as disease/treatment characteristics such as diagnosis, time from diagnosis and time from HCT, TBI or Bu exposure, and late effects including chronic health conditions as well as late relapse or SMN. This information will be retrieved from FU6, baseline forms or the most recent FU survey as available. In Table 2, we will provide necessary comparisons of the HCT population to the overall population in CCSS without HCT.

Aim 1:

For the purposes of Aim 1, responses to the questions regarding financial hardship will be described for HCT survivors/non-survivors as well as conventionally treated survivors and siblings using frequencies and percents. Table 3 will report descriptive statistics including frequency counts and proportions describing financial hardship question responses and determinants of financial hardship among survivors of childhood HCT, age (current), sex, and disease matched conventionally treated survivors, and siblings (using the full sibling cohort that answered the FU6 survey – unmatched). Table 4 will report descriptive statistics including frequency counts and proportions describing health insurance costs and concerns (type of coverage, annual deductible, and concerns related to being able maintain health insurance coverage). Employment costs and concerns (employment status, taking time off, changing jobs, changing to a more flexible schedule, avoiding promotion, worry about forced retirement, and job lock or staying to avoid loss of health insurance) will also be reported. Lastly, current annual household income and assets (home value) as well as debts (mortgages or loans on home and associated balance, credit cards, car loans, medical provider debt, life insurance policy loans, or loans from relatives) will be reported. Comparisons will be made among survivors of childhood HCT matched conventionally treated survivors, and siblings (using the full sibling cohort that answered the FU6 survey – unmatched). Table 5 will also describe the Z-scores (mean and standard deviation) focusing on domain-specific financial hardship scores among HCT survivors, conventionally treated survivors, and siblings. Of note, a recent set of analyses focused on the characterization of financial hardship within the Childhood Cancer Survivor Study using data generated in the Follow-up 6 survey (Nathan et al., ASCO 2021). Factor analysis was completed which allowed for incorporating relative weights of individual hardship items (i.e., factor loadings) into the calculation of a hardship score. Principal factor analysis was performed, and the items loaded onto 3 factors (material hardship/financial sacrifices, behavioral hardship, and psychological hardship). Two additional items did not load onto a single factor, they are individual items (sent to debt collection and bankruptcy). Each item was scored a 0 or 1 and the scores summed to generate a score for each domain and converted to Z-scores: we will use these scores. Table 6 will provide domain specific scores focusing on comparisons among HCT survivors, conventionally treated survivors, and siblings. Crude estimates will be provided as well as estimates adjusted by sociodemographic characteristics such as, age of the sample, sex, and race/ethnicity.

Aim 2:

For the purposes of Aim 2, evaluating medical financial hardship as experienced by adult survivors of childhood cancer that have undergone HCT when compared to conventionally treated survivors, Table 1 will depict the HCT and conventionally treated survivors difference in social determinants of health (educational attainment, household income, employment, health

insurance, and marital status), HCT-related exposures, and late effects including chronic health conditions as well as late relapse and SMN. Table 8 will then depict survivor social determinants of health, HCT-related exposures, and late effects including chronic health conditions as well as late relapse and SMN association with medical financial hardship. Table 7A-B will also depict changes in the HCT-vs.-conventionally-treated-survivor variable's association with medical financial hardship with and without adjustment for survivor social determinants of health and HCT-related exposures as well as late effects including chronic health conditions as well as late relapse or SMN. These analyses will jointly establish survivor social determinants of health, HCT-related exposures, and late effects including chronic health conditions and late relapse as well as SMN as potential mediators of the medical financial hardship experience by HCT which is above and beyond that experienced by conventionally treated survivors. Moreover, we will assess if survivor social determinants of health, HCT-related exposures, or late effects including chronic health conditions and late relapse or SMN is a stronger mediator.

Beta coefficients, relative risks, and odds ratios accompanied by 95% confidence intervals will be reported where applicable. Analysis will be carried out using the SAS statistical software (SAS Institute, Cary, NC).

APPENDIX A

TABLE 1: Characteristics of the Adult Survivors of Childhood Cancer Treated with Hematopoietic Cell Transplant (HCT), Conventional Therapy, and Siblings

Variable	HCT Survivors N = (%)	Conventionally treated survivors N= (%)	Siblings N = (%)	P value
Current Age 18-20 20-29 30-39 40+				
Gender Male Female				
Race/ethnicity Non-Hispanic White Non-white				
Household Income <\$40,000 \$40,000-59,999 Over \$60,000				
Education High school (HS) or below HS Some college College graduate and above				
Employment status Employed – Full Time Employed – Part Time Unemployed/not in labor force				
Health Insurance <ul style="list-style-type: none"> • Private(Individual/ Employer sponsored) • Public (Medicare/ Medicaid/ Indian health/ VA or Tricare/other state sponsored/ govt program) • None 				
Marital Status Married Divorced/separated Never married Widowed				

Disease Diagnosis Leukemia Lymphoma Solid tumors				
Time from diagnosis				
TBI exposure Yes No				
Busulfan Exposure Yes No				
Any Chronic Health Condition Grade <3 Grade 3 or 4				
Number Chronic Health Conditions ≥2 <2				
Late Relapse / SMN Yes No				

TABLE 2: Characteristics of the Adult Survivors of Childhood Cancer Treated with Hematopoietic Cell Transplant (HCT), and the Overall CCSS Population

Variable	HCT Survivors N = (%)	CCSS Survivors N= (%)	P value
Current Age 18-20 20-29 30-39 40+			
Gender Male Female			
Race/ethnicity Non-Hispanic White Non-white			
Household Income <\$40,000 \$40,000-59,999 Over \$60,000			
Education High school (HS) or below HS Some college College graduate and above			
Employment status Employed – Full Time Employed – Part Time Unemployed/not in labor force			
Health Insurance <ul style="list-style-type: none"> • Private(Individual/ Employer sponsored) • Public (Medicare/ Medicaid/ Indian health/ VA or Tricare/other state sponsored/ govt program) • None 			
Marital Status Married Divorced/separated Never married Widowed			
Disease Diagnosis Leukemia Lymphoma Solid tumors			

Time from diagnosis			
TBI exposure Yes No			
Busulfan exposure Yes No			
Any Chronic Health Condition Grade<3 Grade 3 or 4			
Number Chronic Health Conditions ≥ 2 < 2			
Late Relapse / SMN Yes No			

TABLE 3: Financial Hardship by Domain for Survivors and Siblings

Financial Hardship Domain	HCT Survivors N (%)	Conventionally Treated Survivors N (%)	Siblings N (%)	P value
<p>Material Hardship/Financial Sacrifices (8 items)</p> <p>Reduced spending on vacation or leisure (C9)</p> <p>Reduced spending on large purchases (C9)</p> <p>Delayed or reduced spending on home improvement (C9)</p> <p>Used savings set aside for other purposes (C9)</p> <p>Reduced spending on basics (C9)</p> <p>Paying off medical bills over time (C7)</p> <p>Made a change to living situation (C9)</p> <p>Problems paying medical bills (C5,C6)</p>				
<p>Behavioral Hardship (8 items)</p> <p>Forgone any needed medical care (C8)</p> <p>Forgone yearly visit to your primary care doctor (C8)</p> <p>Forgone specialist (C8)</p> <p>Forgone follow-up care (C8)</p> <p>Forgone prescription medicine (C8)</p> <p>Forgone eyeglasses (C8)</p> <p>Forgone mental health counseling (C8)</p> <p>Forgone dental care (C8)</p>				
<p>Psychological Hardship (3 items)</p> <p>Worry or stress about having enough money to pay rent or mortgage (C17)</p>				

Worry or stress about having enough money to buy nutritious meals (C18)				
Worry or stress about having enough money to pay household utilities, such as water, gas, and electricity (C19)				
Other Hardship (2 items)				
History of being sent to debt collection (C29)				
History of filing for bankruptcy (C30)				

TABLE 4: Financial Hardship Determinants for Survivors and Siblings

Financial Hardship Determinant	HCT Survivors N (%)	Conventionally treated survivors N (%)	Siblings N (%)	P value
<p>Health Insurance – Costs and Concerns</p> <p>Health insurance coverage (C2)</p> <ul style="list-style-type: none"> ○ None ○ Private(Individual/ Employer sponsored) ○ Public (Medicare/ Medicaid/ Indian health/ VA or Tricare/other state sponsored/ govt program) <p>Health insurance annual deductible (C3)</p> <ul style="list-style-type: none"> ● <1300 ● 1301-2600 ● >2600 ● Missing <p>Moderate to great concern about being able to maintain insurance coverage (C4)</p>				
<p>Employment – Costs and Concerns</p> <p>Employed (C13)</p> <p>Taking time off, change jobs, change to flexible schedule, avoid promotion, worry about forced retirement, job lock or staying to avoid loss of health insurance (C14)</p> <p>Spouse stays in job to avoid loss of health insurance (C15)</p>				
<p>Current Annual Household Income (C21)</p> <ul style="list-style-type: none"> ● <20K ● 20K-99,999 ● >100K ● Missing 				
<p>Assets and Debts</p> <p>Home and value (C22, C23, C24) Patient owning home</p>				

<p>Mortgages or loans on home and outstanding balance (C25, C26)</p> <ul style="list-style-type: none"> • None • <50K • 50K-250K • >250K <p>Other debt such as credit cards, car loans, debt to medical providers, life insurance policy loans, relatives, etc. and outstanding balance (C27, C28)</p> <ul style="list-style-type: none"> • None • <50K • 50K-250K • >250K 				
<p>Out of pocket payment in last year (C10)</p>				

TABLE 5: Financial Hardship Domain Specific Scores for Survivors and Siblings

Financial Hardship Domain	HCT Survivors	Conventionally treated survivors	Siblings	P value
	Z-score Mean SD	Z-score Mean SD	Z-score Mean SD	
Financial Hardship				
Financial Sacrifices Domain				
Behavioral Hardship Domain				
Psychological Hardship Domain				
Sent to debt collection*				
Filing for bankruptcy*				

*Percent values will be reported and chi-square analysis will be used for the two items (sent to debt collection and filing for bankruptcy as they are binary (yes/no)).

TABLE 6: Financial Hardship Domain Specific Scores – Comparisons for Survivors and Their Siblings

Financial Hardship Scores	Crude Diff HCT and Conventional Z-score Mean SD	Adjust Diff# Z-score Mean SD	Crude Diff HCT and Siblings Z-score Mean SD	Adjust Diff# Z-score Mean SD
Financial Hardship Financial Sacrifices Domain Behavioral Hardship Domain Psychological Hardship Domain Sent to debt collection* Filing for bankruptcy*				

#Adjusted for by age current, sex, race/ ethnicity.

**Percent values will be reported and chi-square analysis will be used for the two items (sent to debt collection and filing for bankruptcy as they are binary).

TABLE 7A: Multivariable Models* of Social Determinants of Health and Chronic Health Conditions and Medical Financial Hardship Among HCT Survivors and Conventionally Treated Controls.

Variable	Financial Sacrifices Domain		Behavioral Hardship Domain		Psychological Hardship Domain	
	Model with adjustment	Model without Adjustment	Model with adjustment	Model without Adjustment	Model with adjustment	Model without Adjustment
	β	95%CI	β	95%CI	β	95%CI
HCT Survivors						
Conventionally Treated Survivors						
Social Determinants of Health						
Current Household Income						
<ul style="list-style-type: none"> • <20K • 20K-99,999 • >100K • Missing 						
Educational attainment						
High school (HS) or below HS						
Some college						
College graduate and above						
Current Employment status						
Employed						
Unemployed						
Current Health Insurance						
<ul style="list-style-type: none"> ○ None ○ Private(Individual/ Employer sponsored) ○ Public (Medicare/ Medicaid/ Indian health/ VA or Tricare/other state sponsored/ govt program) 						
Current Marital Status						
Married						
Divorced/separated						
Never married						
Widowed						
HCT Exposures						
TBI						
Yes						
No						
Busulfan						
Yes						
No						

Late Effects			
Any Chronic Health Condition Grade<3 Grade 3 or 4			
Number Chronic Health Condition ≤2 >2			
Late Relapse / SMN Yes No			

*Models also adjusted for race/ethnicity, and time since diagnosis

TABLE 7B: Multivariable Models* of Social Determinants of Health and Chronic Health Conditions and Medical Financial Hardship Among HCT Survivors and Conventionally Treated Controls.

Variable	Sent to Debt Collection		Filed for Bankruptcy	
	Model with adjustment	Model without Adjustment	Model with adjustment	Model without Adjustment
	OR	95%CI	OR	95%CI
HCT Survivors Conventionally Treated Survivors				
Social Determinants of Health				
Current Household Income • <20K • 20K-99,999 • >100K • Missing				
Educational attainment High school (HS) or below HS Some college College graduate and above				
Current Employment status Employed Unemployed				
Current Health Insurance ○ None ○ Private(Individual/ Employer sponsored) ○ Public (Medicare/ Medicaid/ Indian health/ VA or Tricare/other state sponsored/ govt program)				
Current Marital Status Married Divorced/separated Never married Widowed				
HCT Exposures				
TBI Yes No				
Busulfan Yes No				

Late Effects		
Any Chronic Health Condition Grade<3 Grade 3 or 4		
Number Chronic Health Condition ≤2 >2		
Late Relapse / SMN Yes No		

*Models also adjusted for race/ethnicity, and time since diagnosis

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