

# CHILDHOOD CANCER SURVIVOR STUDY

## Analysis Concept Proposal

- 1. **TITLE:** Health status, medical care, and preventive health practices of African American (AA) adult survivors of childhood cancer
- 2. **WORKING GROUP AND INVESTIGATORS:** This proposed study will be within the Cancer Control Working Group. Proposed investigators will include:

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### 3. BACKGROUND AND RATIONALE:

Health status, medical follow-up, and preventive health practices are domains identified for attention in order to optimize the long-term health of all childhood survivors. These areas are of special importance to certain racial and ethnic minority groups whose health status and access to health care is often compromised even prior to the co-morbidity of childhood cancer and its potential late effects [1,2].

The racial distribution of pediatric cancers varies dramatically for differing pediatric malignancies [3-5]. Racial and ethnic differences in survival after both childhood and adult cancer have been well documented. Specifically, many reports reveal poorer outcomes for African American children [5] and adults [2] with cancer and other illnesses. There are few studies which indicate no race related difference in childhood cancer survival in the newer era (since 1984) of more aggressive risk directed treatment however [4,6]. In the initial CCSS analyses, ethnic minorities as a group did not appear to have a higher risk for adverse health status, inadequate medical follow-up or inadequate cancer screening practices (Oeffinger, Hudson, Mertens, Yeazel, et al.). This finding differs widely from the current literature specifically characterizing African American adults and children with chronic medical conditions. Due to the small proportion of minorities in the cohort, the initial CCSS analysis did not separate African Americans from Latinos or Asian ethnic minorities. Bhatia et al. [5] have recently defined that there are differences among disease outcomes for each of these minority populations, and therefore a separate analysis and characterization is warranted for each of these groups.

Reasons for differences in health outcomes among African Americans as a racial group have not been clear. Hypotheses for the differing outcomes include:

- Poor and delayed access to care resulting in advanced stage at disease presentation
- Poor patient compliance rate with prescribed therapy confounded by diminished socioeconomic status
- Decreased enrollment on national therapeutic protocols resulting from physician bias and/or patient/parent perception
- Genetic and ethnic diversity in disease biology within a given malignancy [7,8]
- Difference in therapeutic response due to genetic heterogeneity in drug metabolism [9]

The CCSS cohort provides a unique opportunity to assess some of these confounding differences, since protocols mandate uniform therapy and follow-up guidelines across all racial groups. This cohort provides a long follow-up time for assessment of health status and cancer-related health problems in African American children treated for cancer between 1970-1986. The uniform diagnostic and treatment approach theoretically ensures minority patients equal access to screening for late effects and cancer-related morbidities that should produce similar outcomes for African American survivors and all childhood cancer survivors. However, once these patients are dismissed from follow-up by the pediatric cancer center their access to medical care and the uniformity of medical follow-up changes (LTCT 2002 Abstract 23: Oeffinger et al). The impact of race on these changes in health monitoring can therefore be assessed and related to the overall long-term morbidity and mortality of African American childhood cancer survivors.

Depressed socioeconomic issues of the African American population have been proposed as a major barrier to their preventive health care [1,10,11]. In adult settings, African Americans more frequently report loss of insurance coverage after a cancer diagnosis than their Caucasian counterparts. In the study by Pui et al the difference in the proportion of African Americans covered by Medicaid versus private insurers was significant [4]. This study has the potential to evaluate the influence of race on healthcare access of childhood cancer survivors, who historically encounter socioeconomic barriers due to cancer-related chronic diseases.

Many adult-onset diseases may have an earlier presentation and accelerated natural history in young adults who are survivors of a childhood cancer [12]. African American adult patients have a higher prevalence of co-morbid chronic health problems, which have been significantly associated with poorer outcomes in medical oncology settings [2]. Therefore, health care providers should anticipate screening for specific conditions with an established higher prevalence in the African American population like, diabetes mellitus, heart disease, tobacco-related illnesses, obesity-related illnesses, and depression. Furthermore an increased incidence of poor health behaviors (tobacco use, poor dietary practices, high risk sexual behaviors) related to lower socio-economic status and education levels might increase the risk of cancer-related morbidity.

Finally, although there is a lower incidence of most pediatric cancers in African Americans, the risk for adult malignancies is higher among this minority population than in the general population [2]. Race has not been observed as a predisposing factor for the development of subsequent malignancies after childhood cancer in numerous cohort investigations, although the ability to study race as a prognostic factor has been limited due to the small numbers of African

American childhood cancer patients. For example, African Americans represented only 4% of the CCSS study cohort (Table 1), yet comprised 3% of study participants reporting the development of a second malignancy [13]. Due to a small relative number of AA survivors (n=597) we cannot make any premature conclusions about the relative risk of second malignancies. However, second malignancies may occur with an increased frequency and with an accelerated tempo in this group.

**Table 1. Demographics of African American Survivors of Childhood Cancer represented in the CCSS cohort. Count and (Percentage of cohort). (51 respondents did not specify a race)**

Demographic Characteristics	Black N=697		Black, not Hispanic N=618	
	N	(%)	N	(%)
Gender				
Male	367	(4.9)	333	(4.4)
Female	330	(5.1)	285	(4.4)
Age at diagnosis				
0-9	466	(5.3)	409	(5.3)
10-14	148	(5.2)	133	(4.7)
15-20	83	(3.4)	76	(3.1)
Age at survey response				
5-14	117	(5.7)	96	(4.7)
15-19	190	(6.3)	165	(5.5)
20-29	255	(4.4)	232	(4.0)
30+	135	(4.2)	125	(3.9)
Cancer diagnosis				
Leukemia	200	(4.3)	172	(3.6)
CNS	72	(4.0)	65	(3.6)
Hodgkins	73	(3.8)	66	(3.5)
NHL	50	(4.8)	43	(4.1)
Kidney	111	(9.2)	97	(8.1)
Neuroblastoma	53	(5.7)	46	(5.0)
Soft tissue sarcoma	75	(6.2)	68	(5.6)
Bone cancer	63	(9.0)	61	(5.2)

**4. SPECIFIC AIMS/OBJECTIVES/RESEARCH HYPOTHESES:**

- a. Describe the health status, medical care, and cancer screening practices of adult survivors of African American ethnicity who were diagnosed with cancer in childhood in comparison with white, non-Hispanic survivors and with sibling controls.
- b. Determine factors associated with adverse health status, lack of medical care, or absence of cancer screening practices in this special population
- c. Define non cancer co-morbidities which may impact the overall health status of African American survivors

## 5. ANALYSIS FRAMEWORK:

- a. Subject population: African American adult ( $\geq 18$  years of age at time of responding to baseline questionnaire) survivors
- b. Comparison groups: White, non-Hispanic survivors, and African American sibling control group
- c. Outcomes of interest:

### Health Status

**Hypothesis 1:** In general African American survivors in the CCSS cohort will have poorer health and more physical impairment in comparison with sibling controls, and to non-Hispanic survivors. Six domains of health status will be assessed: general health, mental health, physical impairment, limitations of activity, pain as a result of cancer, and anxiety/fears as a result of cancer (For further detail about the outcome variables, see the attached appendix I).

### Health Care

**Hypothesis 2:** African American survivors will have a higher prevalence of ER visits than non-Hispanic white survivors and they will have a lower prevalence of outpatient visits.

**Hypothesis 3:** A larger proportion of AA survivors will be uninsured and have a higher level of difficulty obtaining insurance or have Medicaid coverage compared to the non-Hispanic Caucasian survivors in the cohort.

### Cancer Screening Practices

**Hypothesis 4:** African American survivors have a lower prevalence of cancer screening practices (pap smear, breast self-examination, clinical breast examination, and testicular self-examination) in comparison with non-Hispanic white survivors (stratified by gender). Also, AA female survivors who were 25 years or older at time of interview and who were treated with chest/mantle radiation will be less likely to report ever having a mammogram.

- d. Independent (exploratory) variables
  1. Sociodemographics variables will include: age at interview; gender; race/ethnic background; household income; health insurance; education; marital status; employment status
  2. Cancer-related variables will include: diagnosis; age at diagnosis; interval from diagnosis to age at interview; Primary Tumor type; Stage of tumor for solid tumors and "risk" groups for leukemia; treatment-related variables.

e. Analytic approach

The analytic approach developed for the health status, medical care, and cancer screening practices analyses will be employed for this study. Briefly, descriptive univariate analyses will be performed to assess the associations among demographic and cancer-related variables with the outcome measures. To determine the strength of association between the outcome variables and the demographic and cancer-related factors hypothesized to be significant *a priori*, multivariate models will be constructed using logistic regression to estimate odds ratios (OR) with 95% confidence intervals (95% CI) for adverse health status, lack of medical care, or inadequate cancer screening practices. Some characterizations will have to be descriptive given the small number in the African American cohort.

Two comparison groups will be used in this analysis: white, non-Hispanic adult survivors and the black sibling control group. Tables will be similar to those generated for the health status, medical care, and cancer screening practices analyses.

**6. SPECIAL CONSIDERATION**

Resources are available through this working group to handle the dataset and data analysis. The analysis will be done by Kevin Oeffinger/UT Southwestern with assistance from John Whitton and Yutaka Yasui

## **Appendix I**

### **Outcome variables with CCSS question numbers:**

1. Health Status variables:
  - a. Perceived general health (N15)
  - b. Mental health (BSI-18: J questions; global score and three subdomains - depression, anxiety, somatization)
  - c. Physical impairment (developed from N10-12)
  - d. Activity limitations (developed from N14)
  - e. Pain as a result of the previous cancer (J36)
  - f. Anxiety as a result of the previous cancer (J37)
  
2. Health Care variables:
  - a. General medical contact (B1)
  - b. General physical examination (N16)
  - c. Cancer-related visit (variable created from B1 and B4)
  - d. Cancer center visit (variable created from B1 and B2)
  - e. Emergency room visits
  - f. Health Insurance Q1-3
  
3. Cancer screening practices (gender-specific)
  - a. Pap smear (N20)
  - b. BSE (N19)
  - c. Clinical breast exam (N21)
  - d. Mammogram (N22)
  - e. TSE (N18)

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