

CCSS

Psychology Working Group

Kevin R. Krull, PhD

Psychology Advisory Group

- Pim Brouwers, Neuropsychology, NIMH
- Kim Edelstein, Neuropsychology, Princess Margaret Hospital
- Jordan Gilleland, Psychology, Aflac Cancer Center, Emory University
- Kristy Hardy: Psychology, Children's National Medical Center
- Bob Hayashi, Oncology, St. Louis Children's, Washington University
- Nina Kadan-Lottick: Oncology; Yale University
- Allison King; Neuro-Oncology, St. Louis Children's, Washington University
- Jin-shei Lai: Psychometrics; Lurie Cancer Center, Northwestern
- M. Fatih Okcu: Neuro-Oncology; Texas Children's Cancer Center, Baylor
- Christopher Recklitis: Psychology; Dana Farber Cancer Center
- Elizabeth Wells; Neurology, Children's National Medical Center

Objectives

- Review recent research findings
- Summarize ongoing projects
- Discuss future high priority area

Completed Manuscripts (Published/In Press/Under Review)

Klosky et al (St. Jude). Relations between Posttraumatic Stress and Posttraumatic Growth in Long-Term Survivors of Childhood Cancer: A Report from the Childhood Cancer Survivor Study. *Health Psychol*, 2014; 33(8): 878-82.

Brinkman et al (St. Jude). Suicide ideation and associated mortality in adult survivors of childhood cancer. *Cancer*, 2014; 120(2): 271-7.

Nolan et al (U Memphis). Predictors of Future Health-Related Quality of Life in Survivors of Adolescent Cancer. *Pediatr Blood Cancer*, 2014; 61(10): 1891-4.

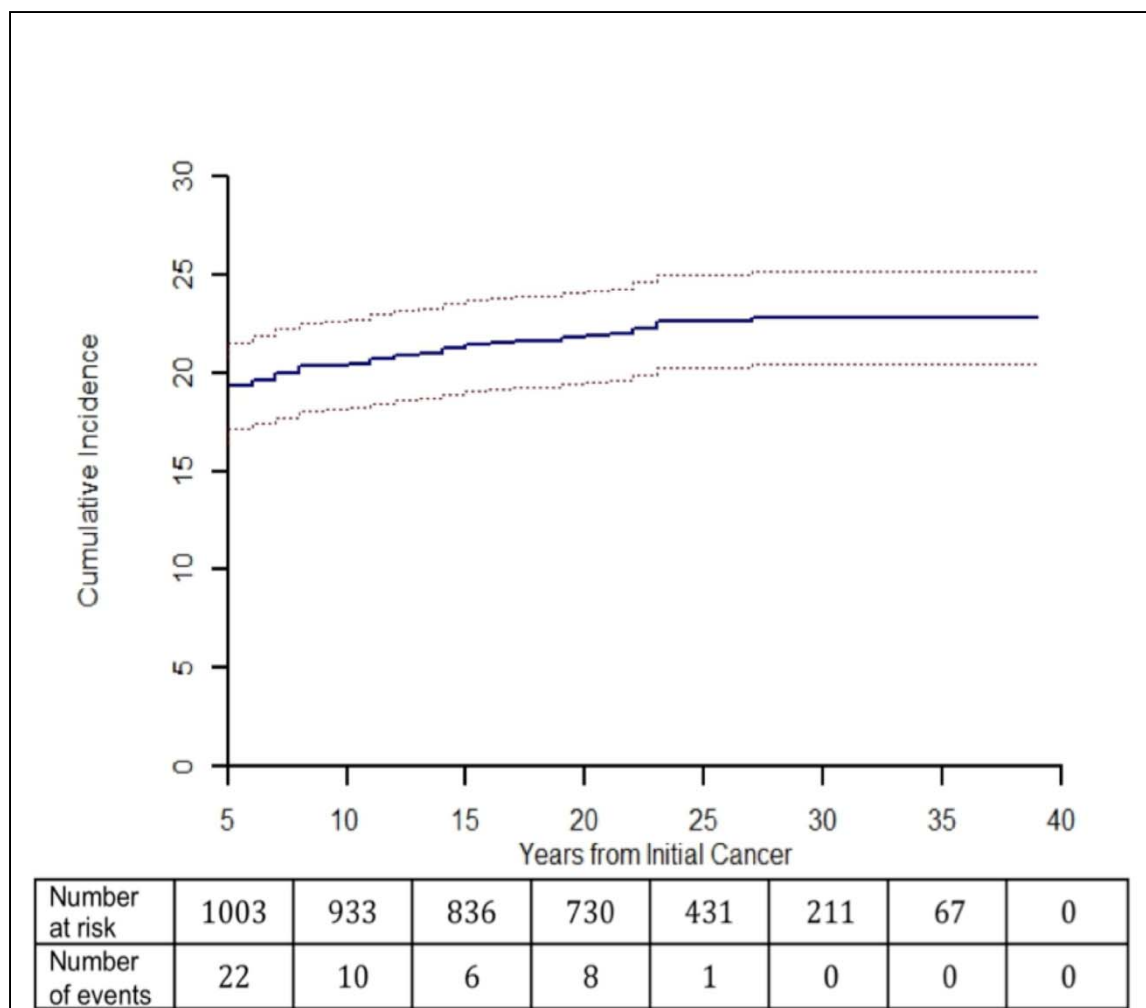
Kenzik et al (U Florida). The Childhood Cancer Survivor Study-Neurocognitive Questionnaire (CCSS-NCQ) Revised: Item Response Analysis and Concurrent Validity. *Neuropsychology*, 2015; 29(1): 31-44.

Prasad et al (LSU-HSC). Psychosocial and Neurocognitive Outcomes in Adult Survivors of Adolescent and Early Young Adult Cancer: A Report from the Childhood Cancer Survivor Study. *J Clin Oncol*, 2015 (In Press).

Fullerton et al (UCSF). Recurrent Stroke in Childhood Cancer Survivors. *Neurology*, 2015 (In Press).

de Blank et al (Case Western). The Impact of Vision Loss Among Survivors of Childhood Central Nervous System Astroglial Tumors. *Cancer*, 2015 (In Press).

Cumulative Incidence of Vision Loss



(de Blank, 2015)

Multivariable Models of Social Outcomes

	Not married	Live dependently	Not employed	Personal Income ≤\$20,000/year	Education < College
Vision Status					
No vision loss	Reference	Reference	Reference	Reference	Reference
Some vision loss	1.19(0.68,2.10)	1.15(0.70,1.90)	1.29(0.79,2.09)	1.17(0.67,2.02)	0.93(0.56,1.55)
Bilateral blindness	4.74(1.49,15.00)	3.12(1.30,7.48)	2.17(1.06,4.46)	1.58(0.61,4.08)	2.05(0.99,4.23)
Cranial Radiation					
None	Reference	Reference	Reference	Reference	Reference
≤30Gy	0.90(0.27,3.04)	0.98(0.31,3.06)	2.41(0.78,7.46)	1.17(0.35,3.88)	0.53(0.14,1.98)
>30Gy	2.19(1.39,3.45)	1.83(1.23,2.73)	1.74(1.17,2.59)	1.87(1.23,2.85)	2.05(1.37,3.06)
Medical Comorbidity (Grade 3-5)					
No	Reference	Reference	Reference	Reference	Reference
Yes	1.85(1.17,2.95)	1.83(1.22,2.73)	2.83(1.92,4.15)	2.67(1.71,4.17)	1.84(1.25,2.72)

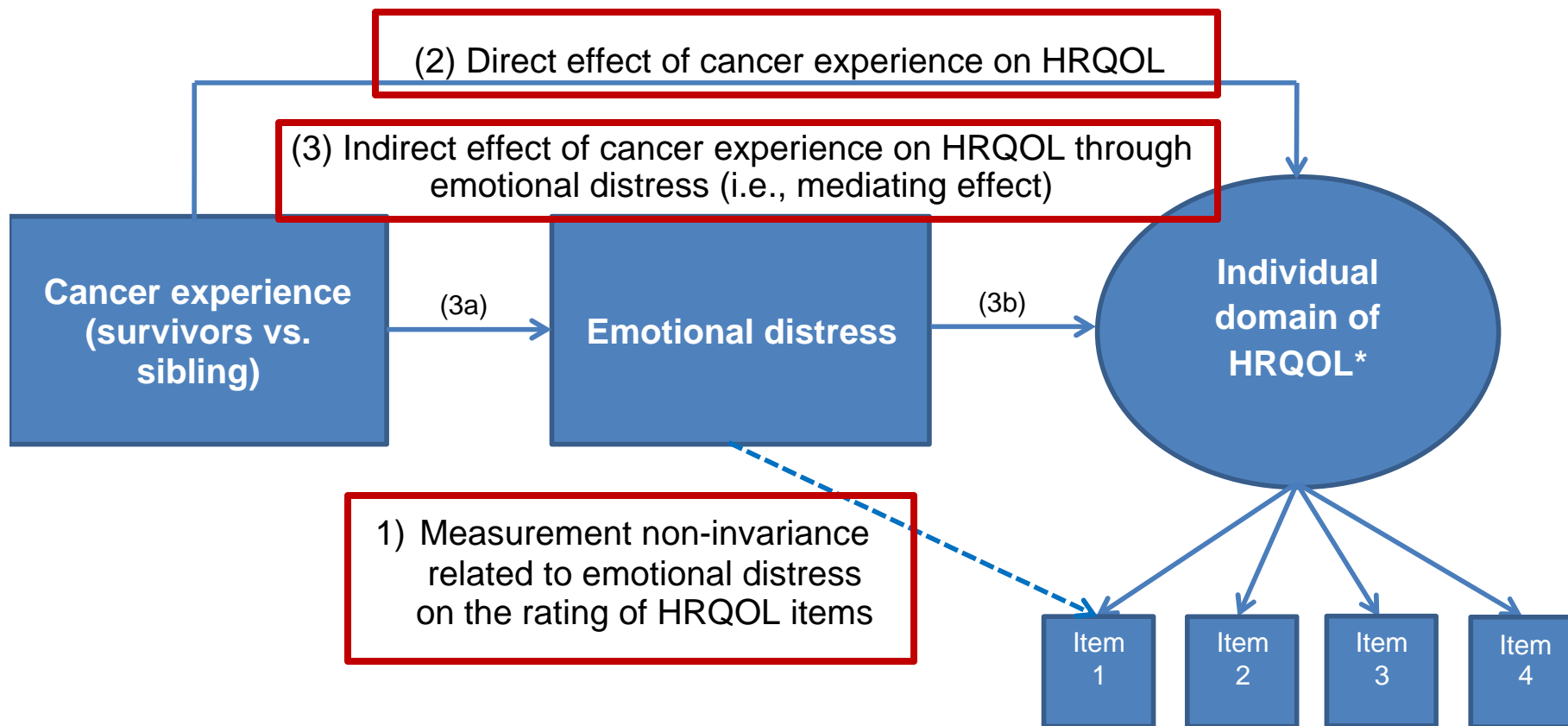
Note: Adjusted for age at diagnosis, age and gender

(de Blank, 2015)

Devine et al (Rutgers). Psychological Functioning and Physical Activity Among Adolescent-Aged Survivors of Early Childhood Cancer: A Report from the Childhood Cancer Survivor Study. *Under review.*

Huang et al (St. Jude). The Mediating Role of Emotional Distress Symptoms in Comparing Quality of Life between Adult Survivors of Childhood Cancer and Siblings: A Report from the Childhood Cancer Survivor Study. *Under review.*

Non-invariance and Mediation Model



* HRQOL is treated as a latent variable

(Huang, 2015)

Emotional Distress Mediation of HRQOL

	Anxiety	Depression	Somatization
Physical functioning (PF)			
Role limitations due to physical health problems (RP)			
Direct effect: cancer to RP	-0.019	-0.024	0.013
Indirect effect: cancer to RP through emotional distress	-0.026*	-0.022*	-0.058***
Cancer to emotional distress	0.062*	0.048*	0.091***
Emotional distress to RP	-0.418***	-0.464***	-0.633***
Total effect: direct plus indirect effects	-0.045**	-0.046***	-0.045**
RMSEA/CFI	0.032/0.998	0.024/0.999	0.032/0.998
Social functioning (SF)			
Direct effect: cancer to SF	-0.007	-0.012	0.012
Indirect effect: cancer to SF through emotional distress	-0.043*	-0.038*	-0.061***
Cancer to emotional distress	0.062*	0.049*	0.092***
Emotional distress to SF	-0.691***	-0.776***	-0.667***
Total effect: direct plus indirect effects	-0.050**	-0.050**	-0.050**
RMSEA/CFI [†]	0.028/0.999	0.028/0.999	0.028/0.999

(Huang, 2015)

Recently Completed Analyses

Recently Completed

Hardie (Drexel). Longitudinal patterns of late effects in adult survivors of childhood brain tumors.

Brinkman (St. Jude). Chronic alcohol consumption and neurocognitive function in adult survivors of childhood cancer.

Rach (U Memphis). Psychosocial and physical factors influencing fatigue in survivors of childhood Hodgkin lymphoma.

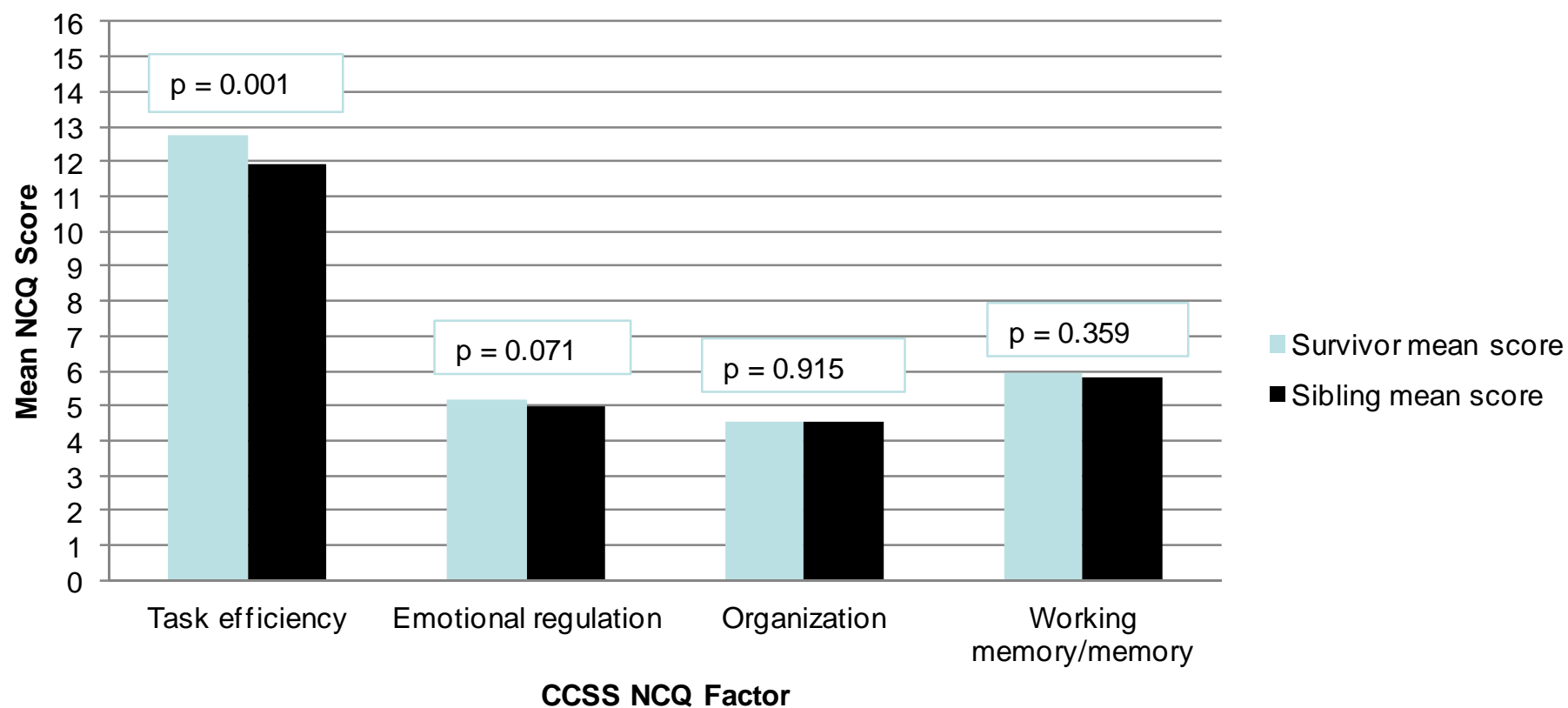
Kimberg (St. Jude). Association between health locus of control and health-related behavior in adult survivors of childhood cancer.

Russell (Virginia Commonwealth U). Identifying longitudinal predictors of quality of life in adolescent survivors of pediatric cancer.

Krull (St. Jude). Impact of chronic disease on neurocognitive and psychosocial functions

Schapiro (WashU). Neurocognitive and psychosocial difficulties in survivors of Rhabdomyosarcoma

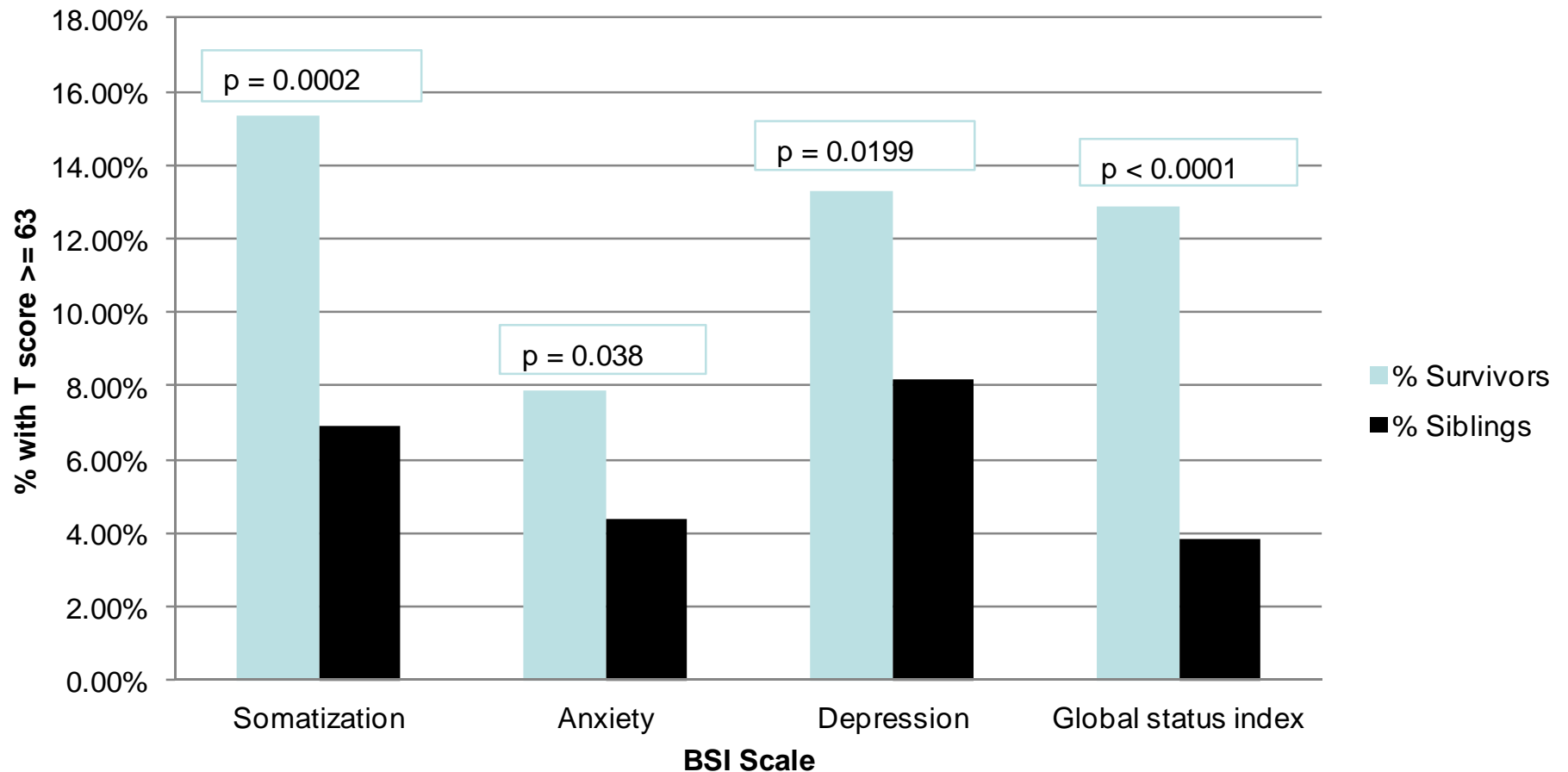
Neurocognitive Questionnaire



(Shapiro, 2015)

Survivors of Rhabdomyosarcoma

Emotional Distress



(Shapiro, 2015)

Concepts/AOIs in Progress

Approved Concept Proposals

Perez (Mass Gen) Mental health care service availability and utilization among childhood cancer survivors.

Ris (Baylor) Adult Neurobehavioral Late Effects of Pediatric Low Grade Brain Tumors.

Huang (St. Jude) Mode effects of patient-reported outcomes data collection in childhood cancer survivors.

Weinstein (Georgia State) Predictors and outcomes of personal strengths in young adult survivors.

Approved AOI's

Lai (Northwestern) Fatigue reported by childhood cancer survivors and its relationship to health outcomes.

Zhang (Tufts) Eating Disorder Behaviors in Adolescent Survivors of Childhood Cancer.

Buchbinder (UC-Irvine) Psychosocial Concerns Among Siblings of Childhood Cancer Survivors.

Kadan-Lottick (Yale) Neurocognitive Functioning in Survivors of Osteosarcoma.

High Priority Proposals for Expansion Cohort

High Priority Concept Proposal

Jacola – Cognitive, behavioral and learning problems in survivors of ALL.

Brinkman – Social and behavioral phenotypes of adolescent survivors of childhood cancer.

D'Agostino – Latent symptom clusters on BSI-18 in survivors of childhood cancer.

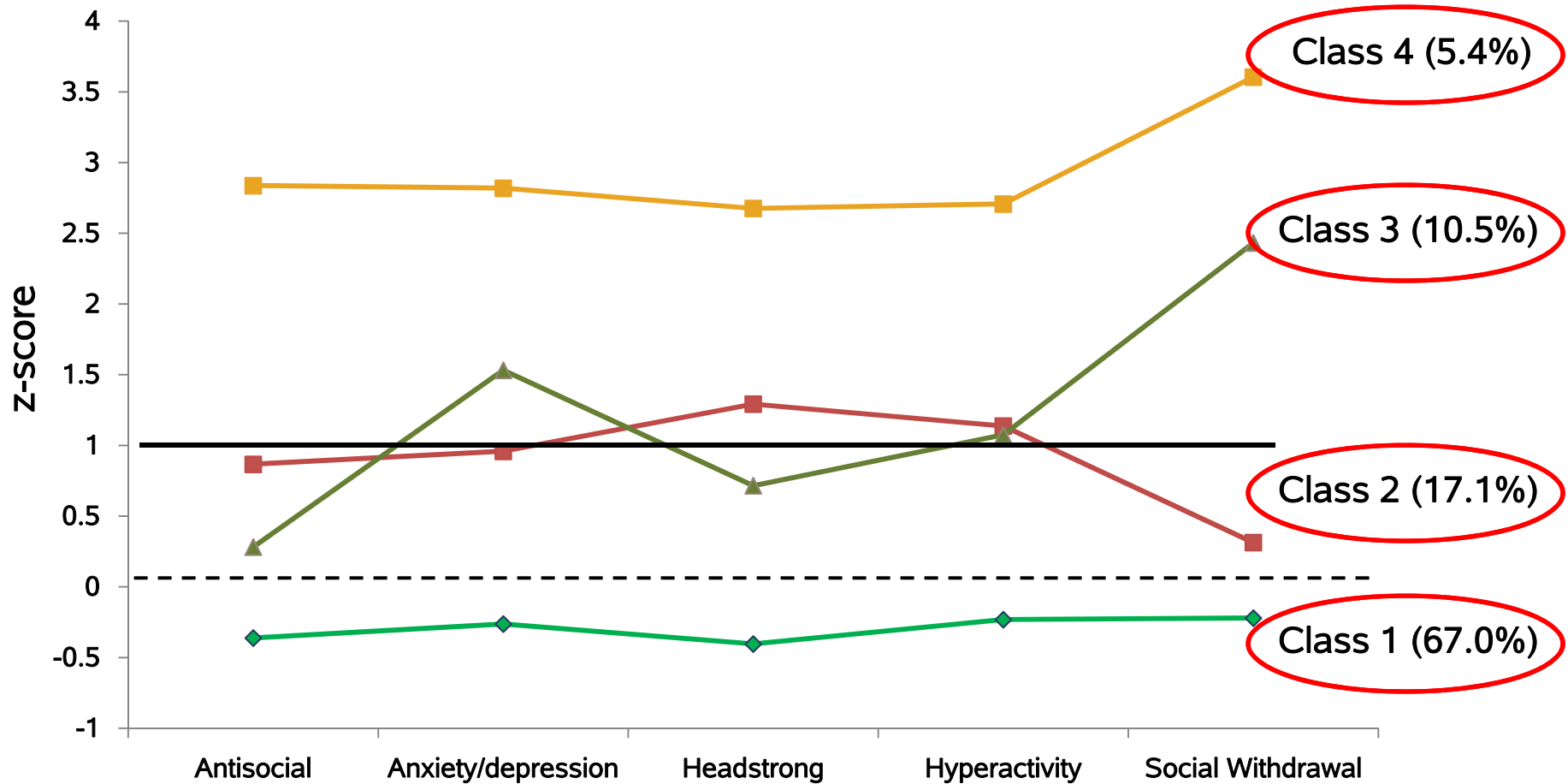
Study Sample

(n=4,225)	Mean (SD)
Age at diagnosis, years	2.9 (1.9)
Time since diagnosis, years	12.4 (2.1)
Current age, years	14.9 (1.6)
	n (%)
Male sex	2248 (53.2)
Diagnosis	
CNS tumors	663 (15.7)
Leukemia	1646 (39.0)
Lymphoma	227 (5.4)
Non-CNS solid tumors	1689 (40.0)

(Brinkman, 2015)

- Behavior problem index (BPI)
 - Parent-reported symptoms of:
 - Antisocial behavior
 - Anxiety/depression
 - Headstrong behavior
 - Hyperactivity
 - Social withdrawal
 - Scores transformed to z-scores using CCSS sibling data; higher scores impaired

Latent Classes of Comorbidity



(Brinkman, 2015)

High Priority Concept Proposal

Jacola – Cognitive, behavioral and learning problems in survivors of ALL.

Brinkman – Social and behavioral phenotypes of adolescent survivors of childhood cancer.

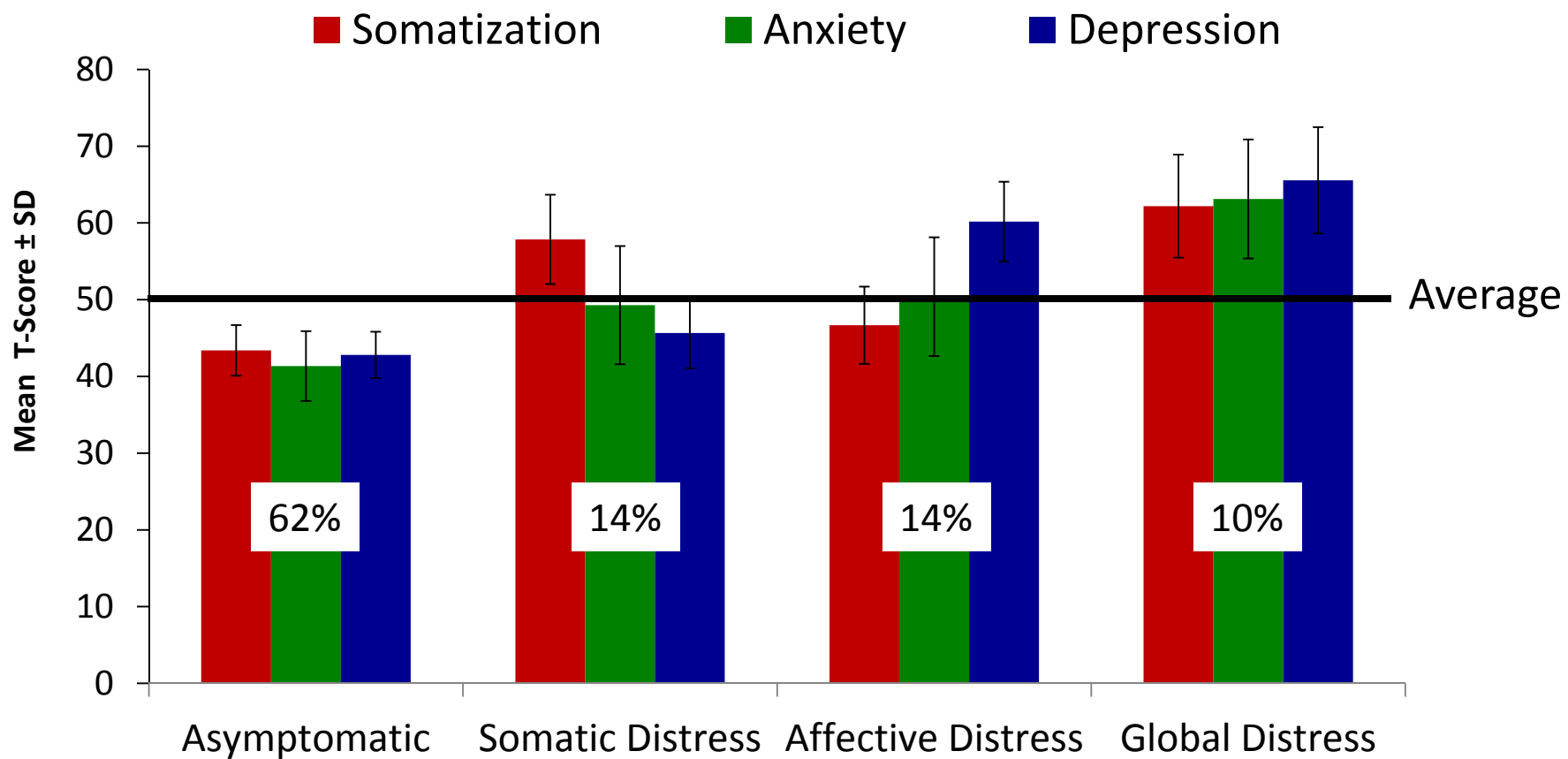
D'Agostino – Latent symptom clusters on BSI-18 in survivors of childhood cancer.

Emotional Distress

		Survivors N=16079	
		N	%
Sex	Male	8323	51.76
Race	White	14070	87.51
	Black	976	6.07
	Other	923	5.74
Ethnicity	Non-Hispanic	14816	92.15
Age at Baseline	18-24	6169	38.37
	25-29	4582	28.5
	30-34	3298	20.51
	>=35	2030	12.63
Education	< High school	1212	7.54
	High school	3110	19.34
	Some college	5688	35.38
	≥ College graduate	5495	34.18

(D'Agostino, 2015)

Emotional Distress



(D'Agostino, 2015)

Mueller/Krull Stroke in survivors of CNS tumors

- Aim 1: Determine whether increased stroke risk in pediatric brain tumor survivors is associated with vasculopathies, and if that risk is increased by modifiable, atherosclerotic risk factors.
 - Case-cohort study with MRI/MRA in 200 cases and a random subcohort of 200 brain tumor survivors.
- Aim 2: Determine the effect of stroke and cerebral microbleeds on neurocognitive function in pediatric brain tumor survivors.
 - Detailed neurocognitive testing with MRIs to determine the number and location of small vessel vasculopathies.

Priorities: Concept Proposals

Exploitation of the expansion data

- Three decades of data on:
 - Cognitive, behavioral, emotional comorbidities during adolescence
 - Emotional distress in adult survivors
 - Suicide ideation in adult survivors
- Reduction in thoracic radiation and increase in anthracyclines
- Reduction in cranial RT and increase in methotrexate in ALL
- Increased sample of CNS tumors
- Outcomes in solid tumor and sarcoma survivors

Priorities: Ancillary Studies

- Potential Interventions (mHealth)
 - Behavioral strategies for insomnia
 - Cognitive-behavioral intervention for distress/suicide ideation
 - Adaptation to memory and attention problems
 - Social skills training / social network support
- Response to Intervention and Expansion of Psychological Outcomes
 - Remote cognitive assessment
 - Patient Reported Outcomes Measurement Information System (PROMIS)
 - Computerized Adaptive Testing (CAT)