Executive Summary

Symptom Management Quality of Life Steering Committee
Clinical Trials Planning Meeting on Cancer-Related Cognitive Impairment (CRCI)
National Cancer Institute, Rockville, MD
March 4-5, 2021 (Virtual)
Co-Chairs: Susan Dorsey, Ph.D., RN, FAAN, Michelle Janelsins, Ph.D., MPH,with Jean Lynn, MPH, RN, and Diane St. Germain, RN, MS

Meeting Description

The National Cancer Institute (NCI) Symptom Management and Health-related Quality of Life Steering Committee (SxQoL SC) convened a virtual Clinical Trial Planning Meeting on Cancer-Related Cognitive Impairment. The primary goal of the meeting was to review the state of the science and current trials to develop recommendations for one or more clinical trial(s) that would represent the needed next step in CRCI research.

Additional research is needed to further evaluate CRCI in populations where gaps in evidence exist. The Clinical and Translational Research Operations Committee (CTROC) approved the conduct of a meeting sponsored by the Symptom Management Quality of Life Steering Committee to address research gaps and develop NCORP concepts focused on CRCI.

Meeting Background

The cognitive effects from both the cancer and its' treatment are frustrating for patients and can interfere with many aspects of overall quality of life including daily functioning, the ability to perform at work, achieve educational goals, and interact socially.

Approximately 20 longitudinal studies of adult patients with non-CNS cancer have shown that cancer-related cognitive impairment (CRCI), which can include changes in memory, executive function, attention, and processing speed, occurs in up to 30% of patients prior to any treatment and in up to 75% of patients during treatment. It is estimated that approximately half of patients experience CRCI up to 6 months post-treatment and long-term persistence of CRCI (~1 year) is estimated to occur in approximately 30-40% of survivors. Research is still ongoing to determine the long-term prevalence of CRCI 5 years post-treatment. Growing evidence from preliminary studies suggests that CRCI broadly affects a heterogenous group of cancer patients including those with hematologic malignancies, breast cancer, colorectal cancer, testicular cancer, multiple myeloma, and ovarian cancer. The majority of research has been conducted in breast cancer and limited research in other cancers that could be at high risk of CRCI including lung cancer, and those cancers that predominately affect older adults (e.g., chronic myelogenous leukemia).

Meeting Objectives

- Identify and prioritize cancers, cancer therapies and at-risk groups for CRCI.
- Identify specific areas needed in pharmacologic and behavioral interventions and natural history studies.

- Identify optimal cognitive measurement assessments to incorporate into research.
- Evaluate existing and potential CRCI biomarkers using integral and integrative endpoints.
- Identify gaps in the literature based on disease groups and treatment phenotypes that can be moved forward into an NCORP concept for a prospective, observational study.

Meeting Deliverables

- Two to three concepts focusing on behavioral interventions, pharmacologic interventions, and a longitudinal concept that will be developed within working groups over the next year.
- Meeting summary in a peer reviewed journal on the outcomes of this meeting and identified gaps for future research.

Meeting Summary

Review of the National Community Oncology Research Program (NCORP): Diane St. Germain from the Division of Cancer Prevention provided an overview of NCORP, a program with a focus on studies in cancer prevention, screening, cancer control, symptom management, and cancer care delivery. Cancer disparities research is integrated throughout these domains. There are seven Research Bases, including two university-based programs: University of Rochester and Wake-Forest University that develop the science and protocols to be conducted within the network. Thirty-four Community Sites and 12 Minority Underserved Sites accrue patients to NCORP studies as well as treatment and imaging trials funded by the National Clinical Trials Network (NCTN). The NCORP network represents over 4000 investigators. More information can be found at https://ncorp.cancer.gov/

Keynote Address: Focus on multidisciplinary teams: Dr. Janelsins provided a keynote address to set the stage of the meeting. The focus of the meeting was on building consensus regarding alleviating cancer related cognitive impairment that manifests itself with mild to moderate difficulties in the areas of memory, attention, processing, and executive functions. Obtaining a pre-treatment baseline assessment is critical to detect changes over time whose impact can be quite profound to the patient and affects their quality of life, livelihood, and social functioning. The etiology of CRCI can be multifactorial, including socio-demographic, genetics, type of chemotherapy and endocrine therapy, levels of inflammation (measured by specific biomarkers) in the body as well as lifestyle. As the treatment landscape changes, the focus will need to be on large intervention studies that target both biologic and cognitive processes developed by multidisciplinary teams to move the field forward.

Lessons Learned - Pediatric Oncology: Cognitive impairment is quite different in children and the evidence is best documented in patients who received treatment that directly impacts the central nervous system such as children with brain tumors and acute lymphocytic leukemia. Less is known about the cognitive impact during therapy that may impact the central nervous system, especially developmental skills that affect neurodevelopmental changes in the frontal and temporal lobes. The challenge with

studying pediatric patients is to develop better models of assessment that would reduce the burden on patients, families and providers while providing data of high utility that could predict outcomes over time and be sensitive to changes in treatment and easy to implement in the context of clinical care.

Lessons Learned - Geriatric Oncology: Older populations are more vulnerable to cognitive changes, and this impacts an older adult's ability to live independently, participate in social situations and maintain good quality of life. Age associated cognitive disorders have shared risk factors and potential common biologic mechanisms. Incorporation of clinical (e.g., geriatric assessment) and biological (e.g., cytokine) measures of aging in cognitive studies may help identify vulnerable parts at high-risk for poor cognitive outcomes. Furthermore, the geriatric syndrome of aging ranges across the health continuum. For frail populations including some patients with cancer, this is associated with diminished functional reserve and ability to recover from stress and thus accelerates the aging process which in turn, makes patients more vulnerable to poorer outcomes.

Considerations for Studying Cognitive Impairment Related to Specific Treatment Modalities

Hormonal

- **Androgen Deprivation Therapy (ADT) in the Treatment of Prostate Cancer:** There is some data to suggest that memory and executive function are impacted by ADT that may be due to inflammation. The use of anti-depressants may be an alternative treatment to prevent cognitive issues which may inform a pharmacologic intervention. Vortioxetine was discussed as a possible therapeutic in this setting.
- **Endocrine Therapy:** Estrogen receptors in the brain in both cancer and non-cancer populations are affected by endocrine therapy and can be a mechanism for cognitive decline. Further research has demonstrated a high level of association with inflammation, fatigue, and cognitive impairment.

Cognitive effects of Tyrosine Kinase Inhibitors (TKIs): There are currently over 55 TKIs approved by the FDA for the treatment of cancer. Data from a pilot study was presented showing cognitive changes in the setting of TKI therapy.

CAR-T Cell Therapy: The focus is on impairment in multiple domains of health including comorbidities, lack of sleep, disability, and fatigue. CAR-T cell therapy began in 2018. There are no data on long-term effects for patients who experience acute neurotoxicity. ICANS and PRO assessments are being used on the patients receiving CAR-T therapy investigating both cognitive function and quality of life. Investigation of the cytokine release storm (CRS) that occurs in most patients receiving CAR-T therapy is critical for understanding the acute neurotoxicity phase. Imaging studies investigating changes in brain metabolism may also point to a contributing factor of CAR-T therapy.

Mechanistic Understanding of CRCI

Mechanisms of Chemo Brain Repair by Cell Therapy: The focus of this discussion was on understanding cognitive deficits in response to treatment with cisplatin, including

mitochondrial dysfunction as a key factor, and exploring the potential to treat chemobrain with cell therapy,

Novel Neuroimaging Techniques: Neuroimaging studies have demonstrated treatment-related:

- Reductions in gray matter volume/density and white matter integrity;
- Alterations in task-related and resting-state brain activity;
- Alterations in structural and functional connectivity in men with breast cancer utilizing functional and structural MRI

Mechanistic Underpinnings of CRCI: Genomics/Epigenomics have a role in interventions to mitigate CRCI. Genes involved in the tumor were significantly associated in every domain of cognitive assessments and change in DNA methylation is associated with cognitive decline. The challenge is that most studies to date have been small and not reproducible. There is the opportunity to develop omics studies to investigate biologic mechanisms linking cancer, cancer treatments, and CRCI. It is critical that diverse populations are included in these studies.

Remote Neuropsychological Assessments: In the field of CRCI, these became a necessity due to the pandemic. Technologies utilized are landline (audio only), Smart Phones (audio and visual), and/or computer. Smart Phones was the prevalent technology. The availability of technology, occurring in a variety of forms e.g., teleconferencing and telehealth, may lead to SES or age-related biases that may influence remote assessment. Performance also depends on the technological abilities of the participant and internet connectivity. Psychometric considerations of validity and reliability need to be explored further to include well-controlled longitudinal studies, as well as comparisons to traditional neuropsychology assessment methods, neuroscience methods, and patient reported outcomes.

Discussion on Measurement-Neuropsychology, Neuroscience Methods, **PROs:** The group recommended the usage of the Trail Making Test, Controlled Oral Word Association Test, and Hopkins Verbal Learning Test-Revised across studies within the NCORP network as these are standardized and validated measures that have been implemented by multiple groups (e.g., NRG, URCC). Utilization in computerized measures that feature automated scoring and the ability to measure threshold effects is also important for inclusion in studies assessing cognitive change in individuals with cancer. Importantly, the implementation of cognitive assessments in NCORP has included training of study staff at sites (e.g., coordinators, study nurses) that do not require clinical neuropsychology training. Final scoring should be completed and reviewed by the study team including expertise in neuropsychology, clinical psychology, cognitive science, and other relevant fields. The FACT-Cog and PROMIS-Cognitive Function instruments were recommended for patient report.

Neurocognitive Outcomes in Neuro-Oncology Trials within the NCTN/NCORP: Next Steps to Reduce CRCI in Neuro Oncology: Research in neurocognitive outcomes has largely revolved around the use of radiation therapy because of its' pivotal role in the management of most primary and metastatic brain tumors. Radiation therapy combined with systemic chemotherapy causes DNA damage and is relatively agnostic to any drivers or driver mutations that exist within most primary metastatic brain tumors in children and

adults. The use of new modalities of radiation e.g., stereotactic, intensely modulated radiation therapy, and hippocampal avoidance can lead to a significant reduction in the risk of cognitive impairment as well as improvement in patient reported outcomes.

Additionally, the use of proton therapy can significantly lower the dose of radiation delivered affecting long-term IQ and improve processing speed. The use of Memantine with radiation has been shown to have a modest effect when combined with whole brain radiation. Research is currently being conducted exploring radio-genomic biomarkers that may predict for toxicity.

Pharmacologic Interventions for CRCI

Wake Forest Pilot Study 1801: An NCORP pilot study of Ramipril for Preventing Cognitive Decline after Brain Radiation in patients with glioblastoma. Administration of the ACE inhibitor during radiation has been shown to prevent cognitive decline.

Donepezil in the Treatment of CRCI- Two studies were discussed including investigation of donepezil in patients with brain tumors and the other in patients with breast cancer. The reason donepezil was chosen is that it is a reversible acetylcholinesterase inhibitor that has exhibited activity in patients with moderate to severe Alzheimer's disease. The phase III study demonstrated that if the patient had higher cognitive impairment, they responded better to donepezil than patients with less cognitive impairment. Donepezil was also used in breast cancer patients 1-5 years post treatment and showed a positive effect on memory and higher baseline cognitive impairment predicted a better response to donepezil. Exercise Interventions for CRCI-Lessons Learned and Future Considerations

Exercise Interventions for CRCI – Lessons Learned and Future Considerations

Exercise and CRCI Impairment: Dose, Type and Maintenance: A key question to consider is what amount and type of exercise is needed to improve cognition and include this in guidelines and recommendations. In a small pilot study of breast cancer survivors, the group that was assigned to higher aerobic activity had significant improvements in measuring processing speed and self-report measures – but it is not known how long this is maintained after the intervention stops. The caveat is that most cancer patients in treatment are not achieving high aerobic activity and perhaps a target for intervention would be patients with sedentary behavior. Another intervention was the use of a Fitbit tracker that provides accountability to the patient on their activity, but the information was also used by a health coach to identify which patients may need more counseling and intervention.

Physical Activity and CRCI: Samples and Mechanisms: In a small study that is still ongoing, post-menopausal breast cancer patients were randomized into small groups for 1:1 intervention by a health coach. All participants were assessed at baseline for cognitive function, cardio-respiratory assessment, fitness symptoms and inflammatory markers. The study is currently ongoing with results forthcoming. An area of needed research is to understand the mechanism(s) of physical activity that influences CRCI in aging adults including blood-based biomarkers associated with aging, neuroimaging, and DNA methylome.

Cognitive Rehabilitation Approaches for CRCI

Memory and Attention Adaptation Training (MAAT) Memory and attention adaptation training is a cognitive behavioral therapy (CBT) approach designed to treat cancer survivors with CRCI. The traditional rehabilitative approach of daily, repetitive practice in cognitive exercises or computerized gaming platforms are effective for improving verbal memory performance as well as processing speed. The CBT focus is on functional improvement such as daily tasks for which memory is used. CBT has a rich condition of a theory-based treatment development and is also used in randomized controlled trials and other methods to developempirical support for the approach. The testing is standardized so it can be replicated at multiple institutions especially at NCORP sites if trained psychologists are available.

MATT- Geriatric: Older age is particularly relevant as many patients 65 and older are not enrolled in clinical trials especially in trials with behavioral interventions. A CCMSC Model (Contextual, Cohort based, Maturity, Specific Challenges Model) was used to adapt the MAAT intervention to be applied to older adults. MATT-G sessions extended from 8-10 with this cohort via videoconferencing by a clinical psychologist through a HIPPA compliant video conferencing platform. Smaller amounts of new information was introduced in each session to reduce the complexity of interpreting the information. Formal Phase II RCT testing is ongoing.

During the second half of the meeting, CTPM Leaders engaged with the 3 breakout groups.Breakout Groups at the meeting.

Longitudinal – *Facilitators: Lynne Wagner, Ph.D., Alexis Bakos, Ph.D., MPH and Susan Dorsey, Ph.D., RN, FAAN* – The group focuses on questions related to measurement including the minimum set of measures to include in a longitudinal study and what legacy measures should be considered with respect to the heterogeneity of cancer types and their treatment. Most importantly, what biospecimens would be collected for multi-omics.

Behavioral – *Facilitators: Patricia Ganz, M.D., Marge Good, MPH, RN and Karen Mustian, Ph.D.* The focus will be on which interventions do we have the best evidence for treating CRCI that can be conducted as a phase II/III NCORP trial.

Pharmacologic – *Facilitators: Deb Barton, Ph.D., RN, FAAN, Glenn Lesser, M.D., and Diane St. Germain, RN, MS.* The focus will be on which agent(s) or novel therapeutic target(s) do we have the best evidence for a Phase II/III that can be conducted in the NCORP network.

Current Status of Recommendations

The breakout groups met for the first time at the meeting. They have continued to meet virtually over the past 12 months and each group developed concept ideas to be implemented in the NCORP network. Once the concepts have been developed, they will be reviewed by the Symptom Management Quality of Life Steering Committee.

This Executive Summary presents the consensus arising from the CTPM. These recommendations are not meant to address all clinical contexts, but rather represent priorities for publicly funded clinical research.

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Co-Chairs: Susan Dorsey, Ph.D., RN, FAAN, Michelle Janelsins, Ph.D., MPH,with Jean Lynn, MPH, RN, and Diane St. Germain, RN, MS

Name of Attendees and Affiliation

Jared Acoba, MD	University of Hawaii Cancer Center
Tim Ahles, PhD	Memorial Sloan Kettering Cancer Center
Jack Aiello, MS, EE	National Cancer Institute
Terri Armstrong, PhD	CCR, NCI, NIH
Alexis Bakos, PhD	NIH/NCI
Erin Bantum, PhD	University of Hawaii Cancer Center
Debra Barton, RN PhD	University of Michigan School of Nursing
Catherine Bender, PhD	University of Pittsburgh
David Cella, PhD	Northwestern University, Feinberg School of Medicine
Alexandre Chan, PharmD, MPH, FCCP, FISOPP, BCPS, BCOP, Aph	University of California, Irvine
Peter Cole, MD	Rutgers Cancer Institute
Yvette Conley, PHD, FAAN	University of Pittsburgh
Christina Cramer, MD	Wake Forest School of Medicine
Saurabh Dahiya, MD, FACP	University of Maryland School of Medicine
Susan G. Dorsey, PhD	University of Maryland Baltimore
Leanne Embry, PhD	University of Texas Health Science Center - San Antonio
Robert Ferguson, PhD	University of Pittsburgh School of Medicine, UPMC Hillman Cancer Center
Marvella Ford, PhD	Medical University of South Carolina Hollings Cancer Center
Patricia Ganz, MD	UCLA Jonsson Comprehensive Cancer Center
Vinai Gondi, MD	Northwestern Medicine Cancer Center Warrenville and Proton Center
Brian Gonzalez, PhD	Moffitt Cancer Center
Marge Good, RN, MPH	National Cancer Institute
Sara Hardy, MD	University of Rochester
Kristina Hardy, PhD	Children's National Hospital
Sheri Hartman, PhD	University of San Diego, California
Cobi Heijnen, PhD	The University of Texas MD Anderson Cancer Center
Lynn Henry, MD, PhD	University of Michigan
Judith Hopkins, MD	SCOR NCORP/Novant Health Cancer Institute (NHCIK)
Todd Horowitz, Ph.D.	National Cancer Institute
Paul Jacobsen, PhD	National Cancer Institute
Deborah Jaffe, PhD	National Cancer Institute

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Name of Attendees and Affiliation

Michelle Janelsins, PhD, MPH	University of Rochester
Victor Kipnis, PhD	National Cancer Institute
Sheetal Kircher, MD	Northwestern University, Feinberg School of Medicine
Thuy Koll, MD	University of Nebraska Medical Center
Kevin Krull, PhD	St. Jude Children's Research Hospital
Cecilia Lee, DrPH, RN	National Cancer Institute
Glenn Lesser, MD	Wake Forest Baptist Medical Center
Ashlee Loughan, PhD	Virginia Commonwealth University
Maryam Lustberg, MD MPH	The Ohio State University
Jean Lynn, MPH, RN	National Cancer Institute
Debra Lyon, PhD	University of Florida
Allison Magnuson, DO	University of Rochester Wilmot Cancer Institute
Jeanne Mandelblatt, MD, MPH	Georgetown-Lombardi Comprehensive Cancer Center
Worta McCaskill-Stevens, MD	National Cancer Institute
Brenna McDonald, PsyD	Indiana University School of Medicine
Michelle Monje, MD PhD	Stanford University
Ida Moore, PhD	University of Arizona
Alicia Morgans, MD, MPH	Northwestern University, Feinberg School of Medicine
David Morilak, PhD	University of Texas Health Science Center - San Antonio
Karen Mustian, PhD	University of Rochester
Mark O'Rourke, MD	Prisma Health
Yvette Ortiz, MS	The Emmes Company, LLC
Jennifer Pak, RN, BSN	National Cancer Institute
Stephanie Pugh, PhD	NRG Oncology
Stephen Rapp, PhD	Wake Forest University School of Medicine
James Root, PhD	Memorial Sloan Kettering Cancer Center
Sandra Russo, MD, PhD, MPH	National Cancer Institute
Andrew Saykin, PsyD	Indiana University School of Medicine
Elena Schwartz, PhD	National Cancer Institute
Diane St. Germain, RN, MS, CRNP	National Cancer Institute
Carla Strom, MLA	Wake Forest Comprehensive Cancer Center
Marita Titler, PhD RN	University of Michigan
Joseph Unger, PhD	Fred Hutchinson Cancer Research Center
Kathleen Van Dyk, PhD	University of California, Los Angeles
Diane Von Ah, PhD	Indiana University

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Lynne Wagner, PhD	Wake Forest School of Medicine
Jeffrey Wefel, PHD	University of Texas MD Anderson Cancer Center

Clinical Trials Planning Meeting on Cancer-Related Cognitive Impairment (CRCI) Planning Committee

Co-Chairs:

Susan Dorsey, PhD, RN, FAAN
Michelle Janelsins, PhD, MPH

Members:

Alexis Bakos, PhD, MPH, RN
Debra Barton, PhD, RN, AOCN, FAAN (Chair Emeritus – SxQoL SC)
Catherine Bender, PhD, RN, FAAN
Christina Cramer, MD
Leanne Embry, PhD
Sheri Hartman, PhD
Glenn Lesser, MD (Co-Chair SxQoL SC)
Jean M. Lynn, MPH, RN
Allison Magnuson, DO
James Root, PhD
Andrew Saykin, PsyD
Diane St. Germain, RN, MS, CRNP

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Clinical Trials Planning Meeting on Cancer Related Cognitive Impairment
March 4-5, 2021
12 noon – 5 PM

AGENDA

DAY ONE – THURSDAY, MARCH 4, 2021

12:00 PM	Welcome	Jean Lynn, MPH, RN & Diane St. Germain, RN, MS
12:00-12:05 PM	Introduction and Overview of Meeting Objectives	Susan Dorsey, PhD University of Maryland
12:05-12:35 PM	NCORP Program Overview and Perspective on Meeting Objectives: CRCI Portfolio	Diane St. Germain, RN, MS,DCP/NCI
12:35-1:05 PM	CRCI: A Look Back and a Look Ahead	Michelle Janelsins, PhD, URCC
1:05-1:45 PM	Lessons Learned from Study Cognition in Pediatricand Geriatric Oncology	
	Lessons Learned and Tools from Pediatric Oncology	Kristina Hardy, PhD, Children's National Hospital, Washington, DC
	Lessons Learned and Tools from Geriatric Oncology	Thuy Koll, M.D., University of Nebraska Medical Center
	Discussion re: Pediatric and Geriatric oncology Tools/Lessons Learned with Speakers/Participants	*Moderator:* Leanne Embry, PhD University of Texas Health ScienceCenter at San Antonio
1:45-2:15 PM	Special Considerations for Specific Treatments PanelDiscussion with Speakers/Participants	*Moderator:* Debra Barton, PhD, RN, AOCN, FAAN, University of Michigan
	Mechanisms of Cognitive Impairment Induced by Androgen Deprivation Therapy and Potential Treatment with Vortioxetine	David Morilak, PhD, University of Texas Health Science Center at SanAntonio
	Reproductive Hormones and Cognition: Impact of Cancer Treatment	Patricia Ganz, MD, University ofCalifornia, Los Angeles
	Cognitive Impairment in Tyrosine Kinase Inhibitors-(TKI) Recipients	Brian Gonzalez, PhD, Moffitt Cancer Center
	CAR-T Cell Therapy & Cognition	Saurabh Dahiya, MBBS,University of Marylan
2:15-2:45 PM	**B - R - E - A - K**	

2:45-3:15 PM	Mechanistic Understanding of CRCI-Panel Discussion with Speakers/Participants	*Moderator:* Susan Dorsey, PhD,RN, FAAN, University of Maryland
	Mechanisms of Chemo Brain- Repair byCell Therapy	Cobi Heijin, PhD, MD, UT MD AndersonCancer Center
	Mechanistic Underpinnings of CRCI: Novel Neuroimaging Techniques	Brenna McDonald, PhD, IndianaUniversity
	Mechanistic Underpinnings of CRCI: Genomics/Epigenomics	Yvette Conley, PhD, University ofPittsburgh
3:15-3:30 PM	Remote Neuropsychological Assessment inResearch Settings	James Root, PhD, Memorial SloanKettering Cancer Center
3:30-4:00 PM	Discussion on Measurement - Neuropsychology,Neuroscience Methods, PROs	*Moderators:* Andy Saykin, PhD,Indiana University and Judy Hopkins, MD, Novant Health
4:00-4:40 PM	Neurocognitive Outcomes in Neuro-OncologyTrials	
	Next Steps to Reduce CRCI in Neuro-Oncology	Vinai Gondi, MD, Northwestern University
	Neurocognitive Testing in Cooperative Group Clinical Trials	Jeff Wefel, PhD, UT MD Anderson Cancer Center
	Discussion: Neuro-Oncology TrialsDay 1	*Moderator:* Alexis Bakos, PhD,MPH, RN
4:40-5:00 PM	Consensus Review/Wrap -Up	Michelle Janelsins, PhD, URCC, Susan Dorsey, PhD, RN, FAAN, University of Maryland, Diane St.Germain, RN, MS, CRNP, DCP/NCI

DAY 2 – FRIDAY, MARCH 5, 2021

12:00-12:05 PM	Introduction to Day 2	Susan Dorsey, PhD University of Maryland
12:05-12:50 PM	Pharmacologic Interventions for CRCI: LessonsLearned and Future Considerations	
	WF-8801 NCORP Pilot Study of Ramipril for Preventing Cognitive Decline after Brain Irradiation in GBM	Christina Cramer, MD Wake ForestUniversity
	Donepezil in the Treatment of Cancer Related Cognitive Impairment	Steve Rapp, PhD, Wake Forest University

	Discussion with Speakers/Participants	*Moderator:* Glenn Lesser, MD,Wake Forest University
12:50-1:35 PM	Exercise Interventions for CRCI: Lessons Learned andFuture Considerations	
	Exercise and Cancer Related Cognitive Impairment: Dose, Type and Maintenance	Sheri Hartman, PhD, UC SanDiego
	Physical Activity and Cancer Related Cognitive Impairment: Samples and Mechanisms	Cathy Bender, PhD, RN, FAAN,University of Pittsburgh
	Discussion with Speakers/Participants	*Moderator:* Karen Mustian,PhD, URCC
1:35-2:20 PM	Cognitive Rehabilitation Approaches for CRCI	
	Memory and Attention Adaptation Training (MAAT)	Robert Ferguson, PhD, Universityof Pittsburgh
	Memory and Attention Adaptation Training-Geriatric (MAAT-G)	Alison Magnuson, MD, URCC
	Discussion with Speakers/Participants	*Moderator*: Lynne Wagner, PhD,Wake Forest University
2:20-2:35 PM	**B - R - E - A - K**	
2:35-3:50 PM	Concurrent Breakouts	
	Longitudinal Study	*Facilitators:* Lynne Wagner, PhD, Alexis Bakos, PhD, MPH, MichelleJanelsins, PhD, Susan Dorsey, PhD,RN, FAAN
	Behavioral Trial	*Facilitators:* Patricia Ganz, MD, Marge Good, MPH, RN, Karen Mustian, PhD
	Pharmacologic Trial	*Facilitators:* Deb Barton, PhD,RN, FAAN, Glenn Lesser, MD,Diane St. Germain, RN, MS, CRNP
3:50-4:35 PM	Report Out by Each Group *(15 mins each)*	
4:35-5:00 PM	Group Discussion – Next Steps for PlanningStudies and Meeting Wrap-Up	Susan Dorsey, PhD, RN, Michelle Janelsins, PhD, Diane St. Germain,RN, MS, CRNP
	ADJOURNMENT	