



Cognitive Deficits Associated with Cancer Treatment: Implications for Patient Care

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Overview

- "Chemobrain"
 - Definition, Characteristics and Prevalence
- Effects of cognitive deficits on daily functioning
- Potential etiologies of cognitive deficits
- Treatment possibilities



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What is "Chemobrain?"

"I don't go anywhere without my calculator or my lists.
I'd be helpless-hopeless without them!
Was chemo brain in the brochure?"



"There are times
when I'm just blank."



"AT LEAST WE HAVE AN EXCUSE
AND IT'S NOT JUST OUR AGE."

"It flares especially when I'm tired.
I stutter and have word retrieval issues."

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What is "Chemobrain?"



CHEMO BRAIN!® an original
play by Linda Phelan
Schroeder –
Directed by Francine Gertz
and performed by Cancer
Survivors
www.chemobrain.net

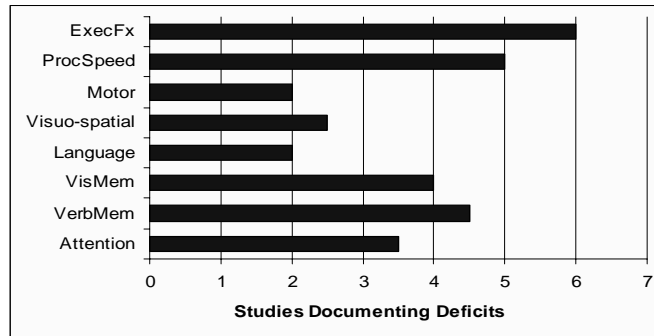
www.chemobraininfo.org

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Understanding Cognitive Deficits

Cognitive changes during and after cancer treatment.



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Understanding Cognitive Deficits

- Incidence
 - 17% to 35% of breast cancer survivors
- Duration of deficits
 - Subjective complaints vs. measurable deficits
 - Improvements over time
- Statistical vs. clinical significance
 - How do cognitive deficits affect daily life?

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Cognitive Deficits and Daily Functioning

- MU Cancer and Cognition Study
 - NIH/NCI funded R03 pilot study
 - 44 Women
 - Stages I-III breast cancer
 - Adjuvant Chemotherapy
 - 3 time points, all post-chemotherapy
 - Cognitive, QOL, psychological factors

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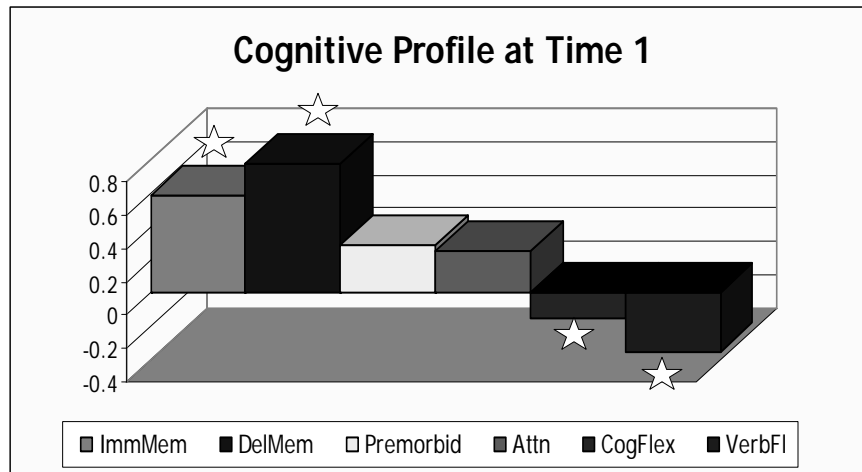
MU Cancer and Cognition Study

- Areas of Cognitive Functioning Assessed
 - Executive Functioning – Cognitive Flexibility
 - Executive Functioning – Verbal Fluency
 - Attention
 - Immediate Memory
 - Delayed Memory

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MU Cancer and Cognition Study



MU Cancer and Cognition Study Time 1 Findings

- Depression
 - Hesitation
- Quality of Life
 - Hesitation
 - Fatigue
 - # of chemotherapy treatments



MU Cancer and Cognition Study Time 1 Findings

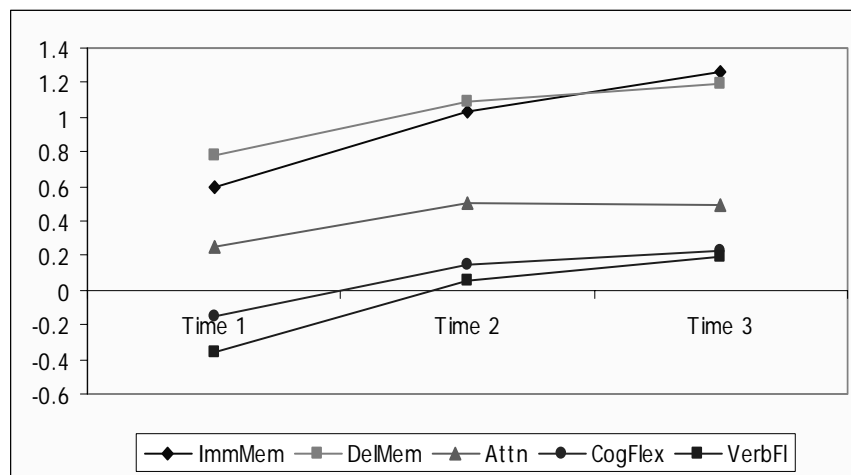
- Social Role Functioning and Community Involvement
 - Executive functioning
 - Cognitive flexibility
 - Hesitation
 - Fatigue



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MU Cancer and Cognition Study



MU Cancer and Cognition Study Time 3 Findings

- Depression
 - Hesitation
- Quality of Life
 - Executive functioning – Verbal fluency
 - Hesitation
 - Fatigue
- Social Role Functioning
 - Hesitation

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MU Cancer and Cognition Study Summary of Findings

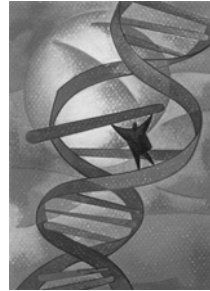
- Executive dysfunction affects social role functioning and community involvement in the early stages of recovery.
- Executive dysfunction affects quality of life at 1-year after treatment completion.

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Potential Etiologies

- Depression
- Stress
 - Physiological changes
- Genetics
 - APOE E4 allele
- Hormone changes
 - Estrogen effects
 - Tamoxifen



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Potential Etiologies

- Direct neurologic effects
 - Dose effects
 - Neurotoxic effects
 - Interfering with DNA/RNA synthesis and function
 - Immunosuppressive effects
 - Cerebrovascular changes
 - Damage to blood vessels

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Structural Neuroimaging



- Chemotherapy
 - General effects
 - Regional effects
- Tamoxifen
 - Hippocampal volume

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Functional Neuroimaging

- Baseline resting metabolism
 - Frontal lobe hypoactivation
 - Chemotherapy and Tamoxifen
- Task-related metabolism
 - Different pattern of activation in frontal lobes



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Treatment Implications

- Preventative steps
 - Advances in chemotherapy
 - Dose effects
 - Identifying and treating at risk populations
 - Genetic risk?
 - Role of stress?
 - Medication
 - Epoietin-alpha

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Treatment Implications

- Cognitive deficit interventions
 - Medications
 - Methylphenidate
 - Evidence from pediatric populations
 - Cognitive remediation
 - Guidelines for TBI rehabilitation as model
 - Memory and Attention Adaptation Model (Ferguson, 2007)

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Treatment Implications

- Addressing contributors to deficits
 - Fatigue
 - Treatment of contributing factors
 - Behavioral interventions
 - Depression
 - Traditional psychotherapeutic interventions
 - Support group
 - Psychoeducation
 - Cognitive Behavioral Therapy

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Treatment Implications

- CAM interventions
 - Mindfulness-based stress reduction
 - Tai Chi
 - Yoga



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Collaborators

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- Jane Armer, Ph.D., MU School of Nursing
- Albert Yee, Ph.D.



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