

# Introduction to the Special Issue: A Tribute to the Life of Raymond K. Mulhern

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Raymond Kenneth Mulhern, PhD, was known throughout the field of pediatric psychology as a pioneer in the science that now links psychology and neuropsychology with childhood cancer. As an academician, a clinical psychologist, and a clinical investigator, Ray set the standards and goals as the study of the psychological and cognitive changes in children and adolescents treated for cancer were first recognized in the late 1970s.

Ray was amongst the first psychologists in the United States recruited to an academic position within a pediatric oncology division, when he joined the Medical College of Wisconsin in 1979. He began a career-long study of the neuropsychological effects of cancer and its treatment in children and adolescents with acute lymphocytic leukemia (ALL) and brain tumors. In relocating to St Jude Children's Research Hospital in 1985, Ray developed a division that has been able to definitively document the correlations amongst disease, therapy, and functional outcome. He and his faculty developed strategies to assess the factors that impact upon learning, memory, and neurocognitive development in large cohorts of survivors of childhood leukemia and other types of childhood cancer. Present at the creation of St Jude's multidisciplinary brain tumor program, he began a series of prospective studies that set the pace for understanding the impact of brain tumors and therapy upon functional capabilities. Concurrent with his early work at St Jude, Ray took the lead in introducing neuropsychological studies at the formation of the Pediatric Oncology Group (POG) Brain Tumor Committee. Through this forum, Ray was able to introduce a generation of new investigators to opportunities at the interface of pediatric oncology, psychology, and clinical neuroscience.

Ray was exacting in his studies and detailed in analyses that often broke new ground in defining children's functional problems as they survived the serious effects of childhood cancer. He contributed over

140 papers to the medical literature in addition to numerous chapters and a textbook, while taking the lectern to deliver his work around the world. After years of describing functional consequences of childhood cancer, Ray began a pioneering program in pharmacologic interventions to improve learning and, with it, the overall life opportunities for surviving children. The National Cancer Institute (NCI) funded trials in pharmacologic and cognitive interventions are a legacy which has set the pace for research at St Jude and elsewhere.

Throughout his career, Ray was a committed teacher and mentor for a host of graduate students, post-doctoral fellows, and junior faculty in his own program, St Jude, and, through the Pediatric Oncology Group, throughout the nation. He was always eager to nurture talent, stimulate minds, and advance the careers of his junior colleagues—and he took pride, appropriately, in the independent directions and accomplishments of his many faculty and trainees.

Known to his academic family as *Ray*, he was a dedicated family man whose wife, children, and relatives knew him only as *Ken*. Ray (or Ken) took enormous pride in his family's accomplishments—and cherished his time with his wife Donna and their children, Marissa and Patrick.

Ray's untimely illness far too quickly removed a guiding light in an area of study and practice that has become central to pediatric psychology, psychosocial oncology, and neuro-oncology. For his colleagues as for his many true friends and loving family, Ray always has provided the leadership—and the challenge—that drove him toward a position of highest regard. It is in this spirit that we have chosen to celebrate Ray's life and contributions to the field of psychosocial oncology by compiling this special series of articles by his colleagues, coworkers, and friends, many of whom owe enormous gratitude for Ray's mentorship and collegiality over the years. We have

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presented this special issue in accordance with the series of research endeavors in which Ray's contributions to the psychosocial oncology literature have been organized: functional outcomes associated with pediatric cancer, clinical trials examining promising intervention for cancer late effects, and, finally, quality of life for cancer survivors.

### Functional Outcomes

In the first article in this series, Ris (2007) provides a commentary on the progress of programmatic research related to neurobehavioral outcomes of children treated for intracranial tumors. Ris observes that research on late effects in pediatric brain tumors continues to increase both in quality and in quantity. The result has been a large body of increasingly sophisticated evidence pertaining to the outcomes of those receiving the most toxic treatments. Ris has recommended that additional research be conducted with regard to the neuropsychological effects associated with "benign" tumors in childhood. Butler (2007) has provided an interesting commentary to Ris.

On further examining the functional impairments associated with brain tumors, Palmer, Reddick, and Gajjar (2007) review the extant literature related to deficits in intellectual functioning, academic achievement, memory, and attention for children treated for medulloblastoma. They also review neuroimaging studies demonstrating changes in brain tissue following chemotherapy and radiation treatment. Findings from their review suggest that impairments in attention, memory and processing speed may explain declining intelligence test scores and the academic struggles for these children.

Borrowing from the psychopathology literature, Reeves et al. (in press) assess the notion of behavioral symptoms associated with a sluggish cognitive tempo among pediatric survivors of leukemia relative to a comparison group of sibling controls. Findings reveal that survivors exhibit more symptoms associated with a sluggish cognitive tempo than do the sibling comparison control group. Moreover, a sluggish cognitive tempo is associated with lower intelligence test scores and poorer achievement scores. Reeves et al. (in press) conclude that a sluggish cognitive tempo may represent a specific behavioral component of cognitive late effects.

Emphasizing the issue of resilience among children with cancer, Phipps (2007) has described an adaptive paradigm as a model for understanding the positive psychosocial adjustment among children with cancer. Phipps concludes that studies have consistently found children

with cancer to report low symptom levels of psychological distress with child adaptive style being a stronger predictor of psychosocial outcomes than health history. Based on the findings of their review, Phipps suggests that children with cancer represent a flourishing population.

Underscoring issues of secondary prevention or more specifically, the prevention of secondary malignancies, Tyc (in press) has summarized information pertaining to rates of smoking among youngsters who have been treated for cancer. An examination also is made of those risk factors associated with smoking onset among these youth. Based on Tyc's findings, it is suggested that issues associated with the timing, intensity, and duration of smoking intervention need to be carefully examined among children with cancer.

Further, Hinds et al. (2007) have focused on end of life issues, a topic that has recently been dormant, particularly with so many children and adolescents now surviving cancer. Hinds et al. examine 26 studies related to end of life and conclude that the majority of these investigations include only parent and staff informants, while very studies include self-reported outcomes. Cross-informant few data with regard to end of life issues would seem to be an important next direction in this literature.

Finally, Ray was always interested in uncharted territory or provocative issues related to pediatric psychosocial oncology. In their Commentary, Noll and Kupst (2007) suggest that the rather strong response from both caregivers and the community when a child is diagnosed with cancer may actually serve as a protective factor or a buffer from the stressors associated with the cancer experience. They insist that a sizeable literature suggests prevalence of overt dysfunction to be no higher among cancer survivors than in the general population. It is hoped that this provocative piece will serve to stimulate additional research and model development over the next several years.

### Interventions and Clinical Trials

Kazak et al. (2007) describes the translation of psychological research into clinical services within pediatric oncology based at The Children's Hospital of Philadelphia. Kazak et al. summarize two models and suggest that the integration of these two models offers a "blueprint" for the development and evaluation of services to children with cancer and their families; it is suggested that similar studies may be appropriate for other chronic pediatric illnesses.

Related to the clinical management of late effects including learning problems for children and adolescents with cancer, Daly and Brown (2007) examine the extant literature on stimulant drug therapy for survivors of childhood cancer during the late-effects period. In their review of literature, they find only four studies that have examined the effects of stimulant medication on the cognitive toxicities of childhood survivors of cancer. Daly and Brown conclude that although there is preliminary support for the efficacy and safety of the stimulants for survivors of leukemia and brain tumors, much more research is needed concerning the long-term effects of the stimulants among cancer survivors. In the spirit of the recommendations provided by Daly and Brown, Conklin et al. (2007) provide the results of a controlled clinical trial that Ray began several years ago in which the acute efficacy and adverse side effects of methylphenidate, a widely used stimulant, has been examined for survivors of childhood cancer with learning impairments. Findings of this important investigation reveal that a significant stimulant drug effect was evident in the area of attention. Further, male gender, older age at treatment and higher intellectual function were all predictive of better medication response. Conklin et al. conclude that methylphenidate shows some neurocognitive benefit and is well tolerated by the majority of children in their study.

### Quality of Life

Eiser (2007) has reviewed research related to the physical and psychological late effects experienced by survivors of childhood cancer and the possible impact of these late effects on health-related quality of life. She has underscored that a systematic assessment of quality of life should be an integral part of the follow-up of the physical and psychological late effects for children having survived cancer. In addressing assessment issues related to quality of life, Varni, Limbers and Burwinkle (2007) have examined the general literature on pediatric health-related quality of life measurement. Their data suggest that children as young as 5 years may reliably and validity self-report health related quality of life, although Varni et al. recommend parent-proxy report when children are too young, ill, or cognitively impaired to complete a quality of life assessment.

We express our sincere appreciation to those who contributed to this special issue as a meaningful tribute to Raymond Mulhern. In many ways, Ray's original pioneering research over a quarter of a century ago exploring then uncharted waters was the spark that has helped, either directly or indirectly, shape the fruition of these articles.

To Ray, we are indebted for his foresight and thinking in this very important area within pediatric psychology.

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