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5 min. break

4:55 - 5:00pm Friday, 3rd February, 2023

Plenary F: Timing of Influences on Brain and Cognition: a Lifespan Perspective

Presenter: Kristine Beate Walhovd

5:00 - 6:00pm
Friday, 3rd February, 2023
Pacific Ballroom A

Abstract & Learning Objectives:
Brain and cognition vary and change markedly across the lifespan. I use magnetic resonance imaging and cognitive data to show that while general age trends can be identified in brain and cognition, there are great individual differences through life, and these are influenced by several factors, including at early life stages. Hence, in some respects, aging starts in the womb. Recognizing and understanding the impact of early relative to later stage factors on neurocognitive lifespan differences, changes and aging is a major challenge. Adequately meeting this challenge is crucial both to understand the mechanisms at work early in life, and to identify what and how residual variance may be affected by later life factors. Thus, knowledge of the timing of influences on brain and cognition along the lifespan is needed to develop realistic plans for prevention and intervention to optimize brain and cognition at different ages. I discuss how example factors such as prenatal drug exposure, birth weight, genetics, education, income, and "baseline" general cognitive ability, as well as cognitive training interventions relate to differences and/or changes in the human brain along the lifespan. Example findings are drawn from the studies of the Center for Lifespan Changes in Brain and Cognition (LCBC), where we follow individuals ranging in age from 0 to 100 years. Our studies are in part linked to Norwegian registry data, including the Mother, Father and Child Cohort study (Moba), the Norwegian Twin Registry and the Medical Birth Registry. Linkage to registry data on normal variation of pre-and perinatal characteristics, as well as studies of groups with known early biomedical risk, such a prenatal drug exposure, enable investigation of the possible impact of neurodevelopmental factors on brain and cognitive function through the entire life course. I also discuss how genetically informed studies of brain and cognition sampling broader age spans may contribute to our understanding of the timing of influences. Selectivity of samples constitute a challenge to generalizability in all human research. I discuss how research across international databases can, beyond boosting power and detect consistency of effects, help us appreciate there are diverse associations of possible factors of influence on different groups. This is crucial, as we need to understand to what extent various factors´ association with brain and cognition are universal or cohort-specific, prior to mechanistic understanding. Thus, in this presentation, I will discuss how transdisciplinary, longitudinal, multi-method, and multi-cohort research can illuminate factors that may influence brain and cognition, and their potential timing, in a lifespan perspective.
Upon conclusion of this course, learners will be able to:
1. Recognize that differences in brain and cognition even at advanced age may reflect early life factors, rather than, or in addition to, differences in brain and cognitive change with age
2. Describe consistency as well as diversity of factors´ (such as SES) associations with brain and cognition across cohorts of different age and origin.
3. Evaluate differences in factors present early in life, including at birth ("different offset") before attributing variance in brain and cognitive function to changes with age ("different slope")

CE Workshop 11: The Cognitive Contraindications, Complications and Costs of Epilepsy Surgery

Presenter: Sallie Baxendale

7:20 - 8:50am
Saturday, 4th February, 2023
Town & Country Ballroom B

Abstract & Learning Objectives:
The role of the neuropsychologist in epilepsy surgery programs has evolved considerably over the past decade. In addition to gatekeeping against catastrophic outcomes, the preoperative neuropsychological assessment is also used to predict the nature and extent of likely postoperative cognitive change and to guide the preparation of prospective candidates accordingly. This workshop will introduce the concepts of contraindication, complication and cost with respect to cognitive outcomes following traditional and newer, less invasive forms of epilepsy surgery. We will explore how neuropsychological data can be integrated with the findings from the wider presurgical evaluation to assess the cognitive risk in each of these categories, with a particular focus on functional and structural imaging techniques. Finally we will look at ways in which information about risks to cognitive function can be shared with both fellow clinicians and patients at each stage along the surgical pathway.
Upon conclusion of this course, learners will be able to:
1. Recognize the distinction between cognitive contraindications, complications and costs in cognitive outcomes following epilepsy surgery
2. Summarize the latest developments in non invasive epilepsy surgery investigations and techniques and their implications for neuropsychological function
3. Apply neuropsychological data to predict postoperative cognitive outcomes and use these predictions to prepare surgical candidates for any anticipated changes.

CE Workshop 12: Magnetic Resonance Spectroscopy for in vivo Assessment of Neurochemistry in Neuropsychology Research

Presenter: Jamie Near

7:20 - 8:50am

Saturday, 4th February, 2023
Pacific Ballroom A

Abstract & Learning Objectives:
Magnetic resonance spectroscopy (MRS) is an imaging technique closely related to magnetic resonance imaging (MRI) that allows non-invasive measurement of tissue chemistry and metabolism in vivo. One important application of MRS is in the human brain, where few alternative methods for neurochemical/metabolic measurement are available. MRS has demonstrated clinical value in several brain conditions, including the diagnosis and staging of cancers, neurodegenerative diseases, and creatine deficiency disorder. But beyond its clinical value, MRS has tremendous potential as a research tool. In the context of neuropsychological research, MRS provides an important tool to help understand how neurochemistry and metabolism are associated with everyday cognitive functions including sensory and motor function, perception, memory, decision making, and mood.
In this educational workshop, I will focus on magnetic resonance spectroscopy and its use in neuropsychology research. I will begin by introducing the basics of how MRS data are collected, processed, and analyzed I will discuss the advantages of MRS as well as its limitations. Finally, I will provide a selected summary of current literature involving the use of MRS in neuropsychological research.
Upon conclusion of this course, learners will be able to:
1. Describe how magnetic resonance spectroscopy experiments are conducted, including methods of data acquisition, processing, analysis and interpretation.
2. List examples from recent literature of how MRS has been used in neuropsychological research.
3. Apply and devise new experiments involving the use of MRS for neuropsychological research.

Invited Symposium 4: Innovations in Infant, Toddler, and Young Child Neuropsychological Models of Care

Chair: Natasha N. Ludwig