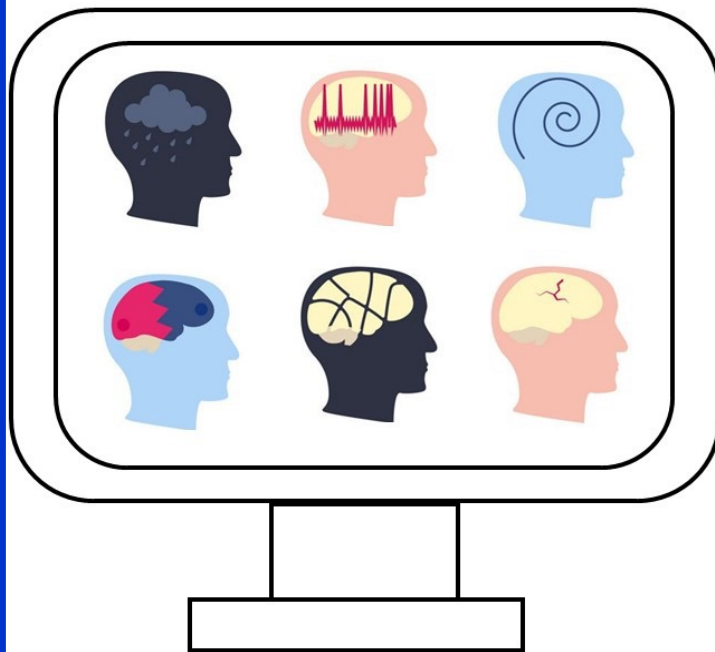# ACADEMIC PSYCHIATRY SYMPOSIUM

**Department of Psychiatry and Behavioral Sciences
Vanderbilt University Medical Center**

June 18, 2021

https://www.vumc.org/psychiatry/grand-rounds/AcademicPsychiatry2021

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The Department of Psychiatry and Behavioral Sciences
welcomes you to Academic Psychiatry Symposium 2021

Several events are planned for the APS, from a plenary talk on innovation to a game that tests your expertise as practitioners and researchers.

This year's APS will be conducted remotely. We will use Zoom to both watch and participate in the events.

Registration for the meeting is now open. You may register at any time until 3:00 pm on June 18.   Register at:

https://zoom.us/meeting/register/tJ0ldeGsqDojHNwRV9bL4Pp7RMK9tNpLN5JS

After registering, you will receive a confirmation email containing information about joining the meeting.

To join the **Zoom** meeting, which starts at 11:00 am (CST) on **Friday, June 18, 2021**, go to

https://www.vumc.org/psychiatry/grand-rounds/AcademicPsychiatry2021

Welcome to the 2021 Academic Psychiatry Day.
We look forward to seeing you!

ORGANIZING COMMITTEE

Ariel Y. Deutch

Alan S. Lewis

Maureen K. McHugo

Sepi Shokouhi

M. E. Wood

Jennye Woolf

We are indebted to the members of the 2021 APS. Without their effort, skills, and creativity the APS would not be possible.

SCHEDULE

11:00 - 11:05	Introduction
11:05 - 12:05	Oral Session:
Graduating	
	Resident Presentations
12:15 - 1:15	Plenary Session
1:30 - 2:30	Poster Session I
2:35 - 3:05	Trivia Event
3:15 - 4:15	Poster Session II
4:15 - 4:30	Trivia Results
4:30 - 4:35	Closing Comments

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4	Manesh Gopaldas	Longitudinal trajectories of anxiety and depression in alcohol abstinence
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6	Seth Christman	The effects of accelerated brain aging on the antidepressant response in late-life depression
7	Alexander Conley	EEG as a functional biomarker of nicotine activity: Evidence from a pilot study of adults with late-life depression
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11	Nathan Winters	Targeting diacylglycerol lipase to reduce alcohol consumption
12	Brandee Feola	BNST and amygdala responses to unpredictable threat in children
13	Kristan Armstrong	Systematic review of the relationship of premorbid functioning and psychosocial outcomes in longitudinal studies of early psychosis
14	Suzanne Avery	Hippocampal network dysfunction in early psychosis: A 2-year longitudinal study
15	Anna Huang	Characterizing effects of age, sex, and psychosis symptoms on thalamocortical functional connectivity in youth
16	Alexandra Moussa-Tooks	Cerebellar structure across early and chronic stages of Illness in schizophrenia spectrum disorders and psychotic bipolar disorder

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18	Eric Strobl	Synthesized difference in differences
19	Elise Scott	Ethics education for psychiatry residents: Development of a discussion-based pilot curriculum
20	Lee Dockery	Implementation of hospital misuse protocol: A pilot study
21	Alex Bettis	Emotion regulation processes in adolescents following psychiatric hospitalization
22	Aaron Pachol	Relationship between perceived stress, reported anxiety, and elevated evening cortisol in youth with autism spectrum disorder
23	Jo Ellen Wilson	Pseudodelirium: Psychiatric conditions to consider on the differential for delirium

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25	Jennifer Vega	Neuroplasticity-based cognitive remediation for chemotherapy-related cognitive impairment
26	Paul Newhouse	Menopause-related cognitive symptoms: Impact on brain structure
27	Jo Ellen Wilson	Delirium, depression, and long-term cognitive impairment
28	Veronika Kondev	Endocannabinoid regulation of innate fear responding
29	Luis Rosas-Vidal	The basomedial amygdala to bed nucleus of stria terminalis projection reduces defensive behaviors
30	James Bauer	Hyperactivity of ventral hippocampal mossy cells degrades dorsal hippocampal mnemonic function via longitudinal projections
31	Maxwell Roeske	The impact of incomplete hippocampal inversion on hippocampal shape in schizophrenia
32	Kendall Beals	Contributions of empathy and emotion identification to subclinical paranoia

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39	Alisa Zoltowski	Insular connectivity in autistic versus neurotypical development
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44	Maureen McHugo	Amplitude of hippocampal low frequency fluctuations in early psychosis: a two-year follow-up study

Graduating Resident Presentations

Oral Communications

The oral session will feature four members
of the graduating class of residents.

These oral presentations represent work that was
initiated and conducted by the graduating residents, as
does the work of two residents who have elected to
communicate their work by poster. (The two abstracts
for the poster presentations can be found in Poster
Session 1).

Patrick McGuire, M Gopaldas, J Raffoul, A Saxena

Health system science and residency education

Department of Psychiatry and Behavioral Sciences, VUMC

Competency in health systems is an urgently needed and often overlooked aspect of traditional undergraduate and graduate medical education. During the 2020-21 academic year, we sought to bolster psychiatry resident's experience with health system science through a series of interactive didactics. Topics addressed included healthcare delivery systems, value-based care, health care economics, and structural competency. The series was well-received within the residency. We believe that education in health systems is necessary to prepare physicians to advocate for their patients and to protect against burnout.

Devin Greene

Kintsugi: How a Japanese art form brought us together

Department of Psychiatry and Behavioral Sciences, VUMC

Psychiatrists and mental health providers are often looked to for answers regarding complex social questions. These are often difficult to discuss, as they can be controversial, timely to explain, and intersect with political and legal issues. More so, trainees are not always aware how the many national psychiatric organizations stand on certain issues (APA, AACAP, for example). At present, there is a deficiency in the education of psychiatry trainees to adequately equip them with the appropriate knowledge or background to discuss these topics with peers and patients. Active learning via engagement in debate has been studied as an effective tool in enhancing critical thinking, comfort level with topics, as well as improving tolerance of differing viewpoints. We introduced a "didactic by debate" series that includes participation from experts in the field and department members. Specifics topics included The Goldwater Rule, cannabis, gun control, and physician assisted death. We then used surveys with both qualitative and quantitative measures to assess the benefit, interest, and degree of learning among attendees.

Stephanie Fall

Improving first episode psychosis resident education: A pilot 4th year psychosis concentration

Department of Psychiatry and Behavioral Sciences, VUMC

Caring for patients with first episode psychosis requires a unique skillset beyond which can be acquired on a general psychosis rotation. For most psychiatry residents, exposure to patients with first episode psychosis is limited, both in the number of patients seen over the course of training and in the amount of time spent caring for an individual patient. It is proposed that the 4th post-graduate year in psychiatry residency allows for an in-depth exposure to early psychosis work with an opportunity to serve patients longitudinally for up to 12 months. A pilot 4th year psychosis concentration was designed for residents interested in a future career dedicated to serving this patient population. A successful completion of the pilot has laid the groundwork for the future development of a first episode psychosis residency training curriculum. Future efforts should be made to incorporate a first episode psychosis curriculum in earlier stages of training to expose more residents to this important line of work.

Manesh Gopaldas[1], E. Flook[1], N. Hayes[2], J Blackford[3]

Longitudinal trajectories of anxiety and depression in alcohol abstinence

[1] Department of Psychiatry and Behavioral Sciences, VUMC
[2] Cumberland Heights Foundation, Nashville, TN
[3] University of Nebraska

Background: High relapse rates remain a substantial barrier for addiction treatment. Rodent studies suggest heightened negative affect is key in triggering relapse; however, much remains unknown about the role of negative affect during abstinence in humans. In this study, we investigated the course of anxiety and depression in individuals in early recovery from alcohol use disorder (AUD). Methods: This study used longitudinal data collected from residents (n=860) of a private, inpatient rehabilitation center. Anxiety and depression were measured at baseline and regular intervals for six weeks with the GAD-7 and PHQ-9, respectively. Linear growth curve analyses were used to identify trajectory groups. Results: For anxiety, four distinct trajectory groups emerged: low (71%), high (5%), rapid decline (6%), and gradual decline (18%). For depression, there were three trajectory groups: low (72%), high (6%), and gradual decline (22%). Group membership differed significantly by sex; men were more likely to be in the low class for anxiety and depression, while women were more likely to be in the higher anxiety (p=0.003) and depression (p=0.0001) classes. Conclusions: We discovered multiple, unique patterns of anxiety and depression over the course of early abstinence, including critical information about which individuals were at highest risk for relapse.

Plenary Session

Reed A. Omary, MD, MS
Carol D. and Henry P. Professor and Chair,
Department of Radiology at VUMC

"How to Spark Innovation in Health Care"

With more than 20 years of experience as an interventional radiologist, scientist, and educator, Dr. Omary has authored more than 200 peer-reviewed publications and is the recipient of more than $7 million in grants, including funding for research on image-guided therapies for hepatocellular carcinoma.

From 2011 to 2017, Dr. Omary was a member (and the only interventional radiologist) on the NIH Medical Imaging Study Section. Since 2017, he has chaired the NIH Special Emphasis Panels on Bioengineering Research Partnerships in Imaging.

Dr. Omary currently serves on the board of directors of the Society of Chairs of Academic Radiology Departments, and is Treasurer of the Association of University Radiologists. He also is an Associate Editor of the Journal of the American College of Radiology.

Dr. Omary is deeply committed to the training and mentorship of medical students, residents, and fellows. He has trained more than 100 clinical interventional radiology fellows, with his research trainees having received more than 60 awards.

In addition to his leadership of the VUMC Department of Radiology, Dr. Omary co-leads the Medical Center's strategic planning efforts. He is also the founder and director of School of Medicine's Medical Innovators Development Program. An avid advocate for innovation in health care, Dr. Omary has developed and promoted the internationally recognized podcast "Innovation Activists: Designing Health Care's Future".

POSTER SESSION I
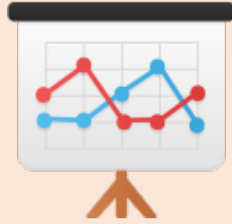
There are two poster sessions, each lasting for one hour. Both sessions feature innovative and creative work. Because of time constraints, it is unlikely that you will be able to hear or see all of the communications you wish to attend. One advantage of a departmental academic symposium is that the presenters of the poster and oral communications are your colleagues. If time constraints leave you without time for questions or comments, take advantage of the proximity of your colleagues to arrange to meet to discuss the work.

R. Ahmed[1], D. Elsen[1], B. Boyd[1], H. Kang[1], K. Albert[1], S. Szymkowicz[1], B. Landman[2], W. Taylor[1]

Connectivity affecting the antidepressant response in late life depression (the CAARE study)

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Department of Electrical Engineer and Computer Sciences, VU

Late-life depression (LLD) is characterized by differences in connectivity within and across intrinsic functional networks. How functional connectivity patterns at baseline may influence response to antidepressant treatment has not been robustly studied in a placebo-controlled trial in LLD. Ninety-five depressed elders completed baseline assessments and resting-state functional MRI prior to randomization to either escitalopram up to 20mg daily or identical placebo (2:1 allocation) for 8 weeks. Using a brain atlas parcellated by functional connectivity networks, we selected regions of interests as seeds for seed-to-seed connectivity analyses. Primary analyses tested whether interactive effects between functional connectivity patterns, treatment allocation, and time were associated with subsequent change in depression severity (measured by MADRS). Significant interactions associating connectivity to MADRS severity over time were present in the anterior Default Mode Network, specifically between the right-mPFC and left-rostral ACC and between the right-mPFC and right-rostral ACC. We also observed significant statistical interactions involving connectivity of the hippocampus, specifically between the PCC and right-hippocampus, the PCC and left-hippocampus, and between the left-hippocampus and subgenual ACC. Response to antidepressants in LLD is related to functional connectivity patterns in the anterior and posterior DMN hubs, limbic network, and hippocampus. Clinical translation of these findings is needed.

Seth Christman[1], R. Ahmed[1], C. Bermudez, D. Elsen[1], C. Ryan[1], B. Landman[2], S. Szymkowicz[1], W. Taylor[1]

The effects of accelerated brain aging on the antidepressant response in late-life depression

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Departments of Electrical Engineer and Computer Science, VU

Late-life depression is associated with markers of accelerated brain aging, but the clinical value of this finding is unclear. We examined whether a brain-based measure of accelerated aging predicted antidepressant response in a randomized controlled trial of depressed elders. We applied a machine-learning approach that estimated brain age from structural MRI data in 95 older adults with current major depression (MADRS) and intact cognition (MMSE.) Adults. The machine-learning model estimated brain age from MRI data, which was compared to chronological age to determine the brain-age gap (BAG; estimated age-chronological age). Participants were randomized 2:1 to flexibly-dose escitalopram vs. placebo, with MADRS repeated at two-week intervals. The primary outcome of interest was the interaction of BAG by time on MADRS. BAG was not associated with response to treatment at any time point. Unexpectedly, in one secondary outcome, larger BAG was associated with remission in patients receiving escitalopram rather than placebo. BAG does not appear to predict antidepressant response in older adults, and older-appearing brains in the setting of intact cognition are not clearly less responsive to antidepressant treatment.

A. Conley[1], A. Key[2], W. Taylor[1], K. Albert[1], B. Boyd[1], J. Vega[1], P. Newhouse[1]

EEG as a functional biomarker of nicotine activity: Evidence from a pilot study of adults with late-life depression

Departments of [1]Psychiatry and Behavioral Sciences
and [2]Hearing and Speech Sciences, VUMC

Late-life depression (LLD) is a debilitating condition that is associated with poor response to antidepressant medications and deficits in cognitive performance. Nicotine has emerged as a potential candidate to improve cognitive performance in patients with LLD. We report results from a pilot study of transdermal nicotine in LLD examining whether nicotine treatment would improve cognitive performance and mood. The study additionally used electroencephalography (EEG) recordings as a tool to test for potential mechanisms underlying the effect of nicotine. Eight non-smoking participants with LLD completed EEG recordings at baseline and after 12 weeks of transdermal nicotine treatment (NCT02816138). Nicotine augmentation treatment was associated with improved performance on an auditory oddball task. Analysis of event-related oscillations showed that nicotine treatment was associated with reduced beta desynchronization at week 12 for both standard and target trials. The change in beta power on standard trials was also correlated with improvement in mood symptoms. This pilot study provides preliminary evidence for the impact of nicotine in modulating cortical activity and improving mood in depressed older adults

T. Castellano[1], S. Shokouhi[1], A. Rosenberg[2], M. Dervishi[1], B. Boyd[1], T. Peterson[2], N. Morton[1], P. Newhouse[1]

[18F]FEOBV PET imaging of the cholinergic neurotransmission system: An early biomarker of Alzheimer's risk

Departments of [1]Psychiatry and Behavioral Sciences and [2]Radiology, VUMC

In collaboration with the VUMC Radiochemistry core, we have developed a complete path to the production of a novel PET radiotracer, known as [18F]FEOBV, which exhibits high binding affinity and specificity for presynaptic vesicular acetylcholine transporters. [18F]FEOBV enables the in-vivo assessment of the brain cholinergic integrity. As part of a pilot study, we conducted [18F]FEOBV scans on 6 postmenopausal women (age: 58 ± 6) who had completed baseline Alzheimer's disease (AD) biomarker assessments, including $A\beta$ PET (with [18F]florbetapir). The global [18F]FEOBV uptake declined with aging, and was also lower in two participants who were $A\beta+$. We found a significant association between [18F]FEOBV uptake and the volume of the nucleus basalis of Meynert on subjects' structural MRI ($\beta=2.37$, p-value = 0.042*). Throughout the progression of AD, the most consistent neuronal losses are seen in cholinergic neurons, where these losses negatively affect attention, learning, and memory formation. In the past, a lack of direct/specific biomarker of cholinergic integrity has posed a barrier to the in-vivo assessment of this key brain process. [18F]FEOBV may be used an early in-vivo biomarker of Alzheimer's risk and identify individuals who may benefit the most from standard and novel pro-cholinergic treatments.

J. Connell[1] , K. Ahra[2], N. Brummel[3], M. Patel[1], S. Vandekar[2], P. Pandharpande[1], R. Dittus[4], S. Heckers[5], E.W. Ely[1], J.E. Wilson[1]

Advanced age Is associated with catatonia in critical illness: Results from the delirium and catatonia prospective cohort investigation

[1]Critical Illness, Brain Dysfunction, and Survivorship Center, VUMC
[2]Department of Biostatistics, VUMC
[3]Division of Pulmonary, Critical Care, and Sleep Medicine, Ohio State University Medical Center
[4]Geriatric Research, Education, and Clinical Center Service, Veterans Affairs (VA) Tennessee Valley Healthcare System
[5]Department of Psychiatry and Behavioral Sciences, VUMC

Introduction: Catatonia, characterized by motor, behavioral and affective abnormalities, frequently co-occurs with delirium during critical illness. Advanced age is a known risk factor for development of delirium. However, the association between age and catatonia has not been described. We aim to describe the occurrence of catatonia, delirium, and coma by age group in a critically ill, adult population. Design: Convenience cohort, nested within 2 clinical trials and 2 observational cohort studies at a single academic medical center describing 378 critically ill adult patients on mechanical ventilation and/or vasopressors. Results: Patients were assessed for catatonia, delirium, and coma by independent and blinded personnel. The most common causes of admission were trauma in the youngest age group (47%) and sepsis/septic shock in all other groups (30%, 26%, and 24% by increasing age quartiles). Of 378 patients, 23% met diagnostic criteria for catatonia, 66% experienced delirium, and 52% experienced coma during the period of observation. The prevalence of catatonia, co-occurring catatonia and delirium, and co-occurring catatonia and coma increased significantly with advancing age group (p values <0.05). Conclusion: Given the significant relationship between age and catatonia, these data demonstrate catatonia's association with advanced age in critical illness. Future studies should explore if cognitive morbidities associated

L. Valiulis[1], J.E. Wilson[1,2], S. Williams Roberson[1,3,4]

Conventional and quantitative electroencephalogram (EEG) features in hospitalized patients assessed for catatonia

[1]Critical Illness, Brain Dysfunction and Survivorship (CIBS) Center and the Departments of , [2]Psychiatry and Behavioral Sciences and [3]Neurology, VUMC, and [4]Department of Biomedical Engineering, Vanderbilt University

Background: Catatonia involves psychomotor irregularities. EEG may help characterize the pathologic processes underlying catatonia. The most common EEG abnormality in catatonia is generalized slowing. To our knowledge, no quantitative EEG (qEEG) analyses have been performed in catatonic patients. We aimed to describe the conventional and quantitative EEG characteristics of hospitalized patients with and without catatonia. Methods: We identified patients who underwent EEG recording within 24 hours of a catatonia evaluation. We collected demographic data, psychiatric evaluations, and conventional EEG descriptions. Catatonia was diagnosed using DSM-5 criteria. We computed 27 qEEG features characterizing band power, spectral variability, coherence and complexity. We compared patients with and without catatonia using the Wilcoxon Rank Sum Test and the Fisher's Exact Test. Results: We identified 82 patients for inclusion. Median (IQR) age was 41 (6-91) years and 46% were male. One catatonic patient had seizures on EEG. We found an increased prevalence of generalized slowing in catatonia (46% versus 17%, p=0.0085). EEG theta variability was lower in catatonia (p=0.0056). Conclusion: Hospitalized patients with catatonia may be more likely to demonstrate signs of cerebral dysfunction on EEG than those without catatonia. Although conventional EEG findings are nonspecific, qEEG may give insights to the neurophysiology of catatonia.

N. Winters, G. Bedse, A. Astafyev, T. Patrick, V. Mahajan, J. Uddin, S. Centanni, D. Samuels, L. Marnett, D. Winder, S. Patel

Targeting diacylglycerol lipase to reduce alcohol consumption

Department of Psychiatry and Behavioral Sciences, VUMC

Alcohol use disorder (AUD) is associated with substantial morbidity, mortality, and societal cost, and pharmacological treatment options for AUD are limited. The endogenous cannabinoid (eCB) signaling system is critically involved in reward processing and alcohol intake is positively correlated with release of the eCB ligand 2-Arachidonoylglycerol (2- AG) within reward neurocircuitry. Here we show that genetic and pharmacological inhibition of diacylglycerol lipase (DAGL), the rate limiting enzyme in the synthesis of 2- AG, reduces alcohol consumption in a variety of preclinical models ranging from a voluntary free-access model to aversion resistant-drinking, and dependence-like drinking induced via chronic intermittent ethanol vapor exposure in mice. DAGL inhibition also prevented ethanol-induced suppression of GABAergic transmission onto midbrain dopamine neurons, providing mechanistic insight into how DAGL inhibition could affect alcohol reward. Lastly, DAGL inhibition during either chronic alcohol consumption or protracted withdrawal was devoid of anxiogenic and depressive-like behavioral effects. These data suggest reducing 2-AG signaling via inhibition of DAGL could represent a novel approach to reduce alcohol consumption across the spectrum of AUD severity.

B. Feola[1,2], S. N. Melancon[3], J. Clauss[4], M. Noall[5], A. Mgboh[1], E. Flook[1], M. Benningfield[1], J. Blackford[1,5]

BNST and amygdala responses to unpredictable threat in children

[1] Department of Psychiatry and Behavioral Sciences, VUMC
[2] Department of Psychology and Human Development, VU
[3] Department of Psychiatry, UCLA
[4] McLean Hospital, Harvard Medical School
[5] University of Nebraska Medical Center

Background: Anxiety disorders are chronic disorders that arise early in development. Translational evidence demonstrates that the bed nucleus of the stria terminalis (BNST) is critical for anxiety. In adults, the BNST drives the anticipation of unpredictable threat and is elevated in individuals with anxiety disorders. However, it remains unknown whether the BNST is involved in unpredictable threat anticipation in children. Methods: Forty-two 8 - 10-year-old children participated in an unpredictable threat fMRI task in which they were trained to associate cues with images. BNST and amygdala activation was examined in response to cues and images. Significant findings were followed by task-based functional connectivity analyses. Results: In response to unpredictable cues, children showed a significant amygdala response but no response in the BNST. During image viewing, the amygdala, but not the BNST, showed a significantly greater response to fear face relative to neutral images. Conclusion: Unpredictable threat activated the amygdala, but not the BNST, in children, a pattern opposite of that observed previously in adults. Thus, the BNST's role in threat processing may emerge later in development.

K. Armstrong

Systematic review of the relationship of premorbid functioning and psychosocial outcomes in longitudinal studies of early psychosis

Department of Psychiatry and Behavioral Sciences, VUMC

Premorbid functioning, developmental performance before the onset of psychosis, is a well-known prognostic indicator, but is understudied in relationship to psychosocial outcomes. We set out to investigate these relationships. A systematic review was completed and included studies from 2007 to 2019 that examined premorbid functioning and psychosocial outcomes in early psychosis. Inclusion criteria were: non-affective psychotic disorders verified by a diagnostic system within three years of psychosis. Objective measures of psychosocial functioning and use the Premorbid Adjustment Scale (PAS) to measure pre-illness functioning were required for standardization across studies. Results were grouped by use of the PAS: domain of functioning or developmental approach. Eight studies found significant relationships between premorbid functional domains and longitudinal psychosocial functioning. Social premorbid functioning was a predictor of global and social functional outcomes while academic premorbid functioning was a consistent predictor of occupational outcome. Late adolescence functioning was a significant predictor of occupational outcomes. These results signify the prognostic power of premorbid functioning to psychosocial outcomes in psychosis. Support for the detailed use of the PAS in predicting longitudinal outcomes is provided. These results may inform intervention strategies by individually tailoring psychosocial rehabilitations from premorbid patterns using patient's strengths to support recovery.

S. Avery, B. Rogers, M. McHugo, K. Armstrong, S. Heckers

Hippocampal network dysfunction in early psychosis: A 2-year longitudinal study

Department of Psychiatry and Behavioral Sciences, VUMC

Background: Hippocampal networks are disrupted in schizophrenia. Specifically, modularity—a measure of network cohesion—is abnormally low, indicating signaling deficits exist between the hippocampus and its cortical targets. However, little is known about the progression of hippocampal-cortical network dysfunction over the course of illness. Methods: We examined resting-state connectivity in 159 participants (86 early psychosis, 73 healthy control), with 85 participants examined longitudinally over 2 years. Modularity was calculated for two networks: 1) a core hippocampal-medial temporal lobe cortex (MTLC) network; and 2) an extended hippocampal-cortical network. Group and time effects were tested in a linear mixed effects model; secondary analyses tested anterior and posterior network divisions. Results: Hippocampal-MTLC modularity was higher in the early psychosis group compared to controls and decreased over time in both groups (no group-by-time interaction). Group effects were driven by the posterior hippocampal-MTLC network, while time effects were driven by the anterior hippocampal-MTLC network. Modularity in the extended hippocampal-cortical network did not differ between groups. Conclusions: These results show abnormally elevated modularity in a core hippocampal-MTLC network in early psychosis, suggesting selectively increased hippocampal signaling within a localized, but not widespread, cortical circuit in the early stage of illness.

A. Huang[1], B. Rogers[2], J. Sheffield[1], S. Vandekar[3], A. Anticevic[4], N. Woodward[1]

Characterizing effects of age, sex, and psychosis symptoms on thalamocortical functional connectivity in youth

Departments of [1]Psychiatry and Behavioral Sciences, [2]Institute of Imaging Sciences, and [3]Department of Biostatistics, VUMC
[4] Department of Psychiatry, Yale University School of Medicine

The thalamus is composed of multiple nuclei densely connected with the cortex in an organized manner. Thalamocortical dysconnectivity is present in multiple neurodevelopmental disorders including schizophrenia and autism. To understand how these networks are abnormal in neurodevelopmental disorders, it is important to understand typical development. The present study characterized age effects, sex effects and effects of clinical symptomatology in anatomically constrained thalamocortical networks in a large community sample of youth from the Philadelphia Neurodevelopmental Cohort (PNC). In 1100 youth aged 8-21, we characterized age and sex effects in six thalamocortical networks using complementary region-of-interest (ROI) and voxel-wise analyses. To characterize effects of clinical symptomatology, we separated youth into three groups based on their clinical symptoms (typically developing youth, n = 298; psychosis spectrum youth, n = 320; youth with other psychopathologies, n = 482). Sensory/motor thalamocortical networks showed a negative effect of age. Unexpectedly, frontal thalamocortical networks showed no effect of age. Females had greater connectivity with the visual cortex, while males showed greater connectivity with the orbitofrontal cortex. Typically developing youth showing subtle signs of greater connectivity compared to psychosis spectrum youth. Characterizing typical development of thalamocortical networks provides an anchor for conceptualizing these networks in neurodevelopmental disorders.

A. Moussa-Tooks[1], B. Rogers[2], J. Sheffield[1], J. Blackford[1], S. Heckers[1], N. Woodward[1]

Cerebellar structure across early and chronic stages of illness in schizophrenia spectrum disorders and psychotic bipolar disorder

[1]Department of Psychiatry and Behavioral Sciences and
[2]Vanderbilt University Institute of Imaging Sciences, VUMC

Prominent neural models hypothesize that the cerebellum contributes to psychosis pathophysiology, especially schizophrenia, and may be developmental in nature. While a recent mega-analysis found reduced posterior ('cognitive'-related) cerebellar grey matter in individuals with schizophrenia, it remains unclear whether abnormalities are transdiagnostic and present in early-stage psychosis.   Using a large, cross-sectional dataset, the current study evaluated cerebellar structure in 357 patients (249 schizophrenia-spectrum [SZ; 122 early-stage, 127 chronic], 108 bipolar with psychotic features [BP-P; 46 early-stage, 62 chronic]), and 217 non-psychiatric controls. The SUIT toolbox was used to optimize cerebellar analysis. One-way ANOVAs were computed for each region of interest (covariates=total intracranial volume, age, sex).   Whole cerebellar grey matter volume did not differ between diagnostic or illness stage groups (full-sample Cohen's d=0.052). More granular models investigated lobular-specific grey matter volume and voxel-based morphometry across diagnostic groups or stages of illness, with negligible effect sizes. In contrast, cerebral regions exhibited small to medium effect sizes, consistent with the literature.   The current findings suggest that cerebellar anatomical abnormalities in psychosis are relatively modest or highly heterogenous across samples. This highlights the need for additional large-scale studies to determine whether cerebellar anatomical abnormalities are associated with illness severity, including cognitive impairment, and connectivity differences.

R. Cassidy[1], Y. Xu[2], Y. Lu[2], L. Mangieri[2], B. Arenkiel[3], Q. Tong[2]

Brain states and the hypothalamus: Generalized manifestations of hunger and anxiety produced by activation of lateral & paraventricular hypothalamic projections to the basal forebrain

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]The University of Texas Health Science Center at Houston
[3]Baylor College of Medicine

"Behavior", narrowly defined, is the multi-muscle motor output produced by activating a neural circuit - the most famous example being that of the gill-siphon retraction reflex in Aplysia californica. Such circuits may have their activation threshold altered to adapt to the environment. In this case, intracellular protein modifications occur after repeated activation to raise the threshold. Vertebrate brains abstract this principle; activation of certain diffusely projecting neurocircuits raise or lower the threshold of most other neurocircuits, collectively producing a "brain state". For example, "asleep" and "awake" are generated by the antagonistic action of orexin- and melanin-concentrating hormone-expressing hypothalamic neurons. My PhD research, presented in brief, explores this principle in mice. Our laboratory discovered two hypothalamic neurocircuits which produce "hunger" and "anxiety" brain states via their action on the attention circuits of the basal forebrain. The circuits are the lateral hypothalamus (GABA) --> medial septum/diagonal band of Broca (GABA) & the paraventricular hypothalamus (glutamate) --> lateral septum (GABA). This contrasts well with research demonstrating that specific basal forebrain projections only alter context-specific eating. Understanding the origins of hunger and anxiety brain states will improve the care of disordered eating, both obesogenic and leptogenic.

E. Strobl[1], T. Lasko[2]

Synthesized difference in differences

Departments of [1]Psychiatry and Behavioral Sciences and
[2]Biomedical Informatics, VUMC

Randomized clinical trials (RCTs) eliminate confounding but impose strict exclusion criteria that prevent sampling of the entire clinical population. Observational (OBS) datasets are more inclusive but suffer from confounding. Difference in Differences (DD) eliminates confounding from OBS data by comparing outcomes before and after treatment administration. The algorithm however requires a parallel slope assumption that may not apply in practice when confounding shifts across time. In this paper, we propose Synthesized Difference in Differences (SDD) that infers the correct (possibly non-parallel) slope by linearly adjusting DD using additional RCT data. The algorithm achieves state of the art performance across multiple synthetic and real datasets even when the RCT excludes the majority of patients.

E. Scott

Ethics education for psychiatry residents: Development of a discussion-based pilot curriculum

Department of Psychiatry and Behavioral Sciences, VUMC

Background: Ethical challenges regularly arise within the field of psychiatry. While there is broad agreement regarding the importance of ethics education for psychiatry trainees, there is limited literature regarding how to structure this education.   Methods: The authors developed and implemented a novel discussion-based ethics curriculum for adult psychiatry residents at Vanderbilt University Medical Center. Residents participated in four peer-led ethics sessions with short knowledge-based presentations followed by small group discussion and return for large-group debriefing. Topics included pharmacological cognitive enhancement (session 1), decision-making capacity (session 2), and involuntary commitment (sessions 3 and 4). Attitude and confidence surveys were completed before and after each session.   Results: Residents reported that ethics sessions were highly valuable and worth their time across all study time points. Confidence articulating and sharing personal beliefs on the ethically dense topics discussed increased following each session, with effect sizes of 1.12 for pharmacological cognitive enhancement, 0.46 for decision-making capacity, and 0.58 for involuntary commitment. Sessions were highly attended with strong trainee participation. Conclusions: A peer-led discussion-based ethics curriculum shows promise for improving resident confidence in selected ethical topics in psychiatry. Further research is required to determine the impact of this curriculum on resident knowledge and attitudes over time.
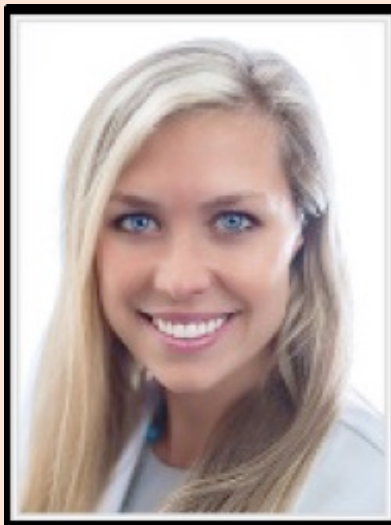
L. Dockery, K. Kast, M. Philips, A. Lake, M. Gopaldas, M. Smith, D. Marcovitz

Implementation of hospital misuse protocol: A pilot study

Department of Psychiatry and Behavioral Sciences, VUMC

Introduction: Misuse of prescribed and illicit substances poses a challenge for patient outcomes and provider attitudes in general hospital settings. Little is known regarding the effects of hospital interventions to reduce risk. Providers at VUMC created a Hospital Misuse Protocol to optimize outcomes for patients and providers. Objective: We sought to evaluate the effect of hospital misuse protocol implementation on relevant patient outcomes including AMA discharges, rehospitalization, medications-for-opioid use disorder (MOUD) initiation, as well as its impact on provider attitudes. Methods: A manual retrospective chart review was completed for misuse protocol patients. Survey data regarding provider attitudes surrounding initiation of the misuse protocol pilot was also collected and analyzed. Results: Preliminary analysis of 41 patients enrolled in the protocol found that 65% stayed through planned discharge compared to 89% of all patients with an addiction psychiatry consult. Additional early findings indicate decreased rates of MOUD follow up and naloxone prescription in patients leaving AMA. Provider attitude surveys demonstrate an increase in feelings of support and perceived access to resources. Conclusions: With data collection ongoing, we present preliminary findings suggesting feasibility of implementation of a general hospital misuse protocol as well as acceptability by a multidisciplinary group of hospital providers.

A. Bettis[1], T. Burke[2], J. Nesi[3], R. Liu[2]

Emotion regulation processes in adolescents following psychiatric hospitalization

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Massachusetts General Hospital, Harvard Medical School
[3]Rhode Island Hospital, Brown Medical School

Objective: Teens are at elevated risk for suicide in the period following discharge from intensive hospital services. The ability to flexibly regulate emotional responses to stress is potentially an important protective factor during periods of risk, yet no studies have directly examined the role of flexible emotion regulation (ER) during clinical transition periods. Methods: N=31 teens (Mage=15.54, SD=1.43) admitted to a psychiatric inpatient unit completed baseline surveys assessing ER flexibility, emotion reactivity, and current suicidal ideation and suicide attempt history. Following discharge, teens completed a 14-day ecological momentary assessment protocol assessing stress, ER strategy use, affect, and SI. Preliminary results: Teens reported elevated SI at admission (M=32.87; SD=19.42). At baseline, SI was positively correlated with reduced context sensitivity (r=.33), but not with ER repertoire or ability to modify skill use. ER repertoire (r=-.55) and context sensitivity (r=-.38) were correlated with reduced emotional reactivity. EMA results to be conducted: We will calculate within and between subject variability in ER strategy use following hospitalization to characterize teen ER flexibility. Discussion: This study represents the first test of the role of flexible ER in teen suicide risk during a clinical transition. Data will inform clinical intervention during the transition out of intensive services.

A. Pachol, B. Corbett

Relationship between perceived stress, reported anxiety, and elevated evening cortisol in youth with autism spectrum disorder

Department of Psychiatry and Behavioral Sciences, VUMC

Recent studies have reported elevated evening cortisol levels in children with autism spectrum disorder (ASD) compared to typically developing (TD) children, and stress associated with changes or problems throughout the day has been identified as a potential contributor. Our goal was to determine if relationships exist between perceived stress or reported anxiety with elevated evening cortisol in children with ASD. The study examined 234 youth between 10 to 13 years of age. We hypothesized that elevations in evening cortisol would be associated with increased perceived stress and trait anxiety. Self-report measures were used to determine levels of perceived stress and reported anxiety. Spearman correlations examined associations between self-reports and evening cortisol. Resulting t-tests confirmed a statistically significant difference between diagnostic groups on evening cortisol levels, perceived stress, and anxiety, as well as positive correlations between all variables (all $p < 0.05$). However, when examining associations within diagnostic groups, correlations were not statistically significant. It appears that observed elevation in evening cortisol levels in children with ASD is not primarily resulting from elevation in perceived stress or reported anxiety. Further investigation is needed to identify other factors which may be contributing to elevated evening cortisol in ASD.

J. E. Wilson[1], P. Andrews[1], A. Ainsworth[2], K. Roy[3], E.W. Ely[1], M.Oldham[4]

Pseudodelirium: Psychiatric conditions to consider on the differential for delirium

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]University of Rochester Medical Center
[3]Oregon Health and Science University
[4]University of Rochester

Objective: Several psychiatric conditions may resemble delirium: described as pseudodelirium. However, because the clinical management of these conditions differs markedly from that of delirium, prompt differentiation is essential. We aim to provide an educational review to aid in identifying and managing psychiatric conditions that may resemble delirium. Method: Based on clinical experience, we identified four conditions as being among the most difficult to differentiate from delirium-disorganized psychosis, Ganser syndrome, delirious mania, and catatonia. We provide an overview of each condition, describe its clinical features, differentiate its phenotype from delirium, and review clinical management. Results: The thought and behavioral disorganization in disorganized psychosis can be mistaken for the clouded sensorium and behavioral dysregulation encountered in delirium. The fluctuating alertness and apparent confusion in Ganser syndrome resemble delirium's altered arousal and cognitive features. As its name suggests, delirious mania presents as a mixture of hyperactive delirium and mania; additional features may include psychosis, autonomic activation, and catatonia. Both delirium and catatonia have hypokinetic and hyperkinetic variants, and the two syndromes can also co-occur. Conclusions: The clinical presentations of several psychiatric conditions can blend with the phenotype of delirium, at times even co-occurring with it. Detailed evaluation is often required to differentiate such instances of pseudodelirium.

Trivia Contest

Try to win a special quiz that tests your clinical and research skills.

The first prize winner will receive a one-year membership for two to the Belcourt Theater. If you are already a member, the prize can be used for a renewal of your membership. In addition, the first prize winner receives a $50.00 certificate for tickets and concessions.

The top two runners-up will win a special treat bag.

POSTER SESSION II
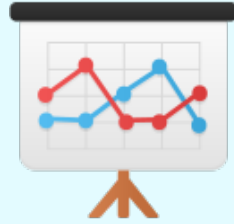
There are two poster sessions, each lasting for one hour. Both feature innovative work. It is likely that you will be unable to attend all the communications you wish to.

One advantage of a departmental event is that the presenters of the poster and oral communications are your colleagues. If time constraints leave you without time for questions or comments, take advantage of the proximity of your colleagues to arrange to meet, in person, by phone, or via Zoom, to discuss the work.

S. Szymkowicz, D. Elson, K. Albert, W. Taylor

Greater baseline subjective attentional complaints predict poorer 8-week antidepressant response in late-life depression

Department of Psychiatry and Behavioral Sciences, VUMC

Introduction: Late-life depression (LLD) is characterized by subjective dysexecutive complaints, which are associated with poor antidepressant response. The relationship between other subjective cognitive complaints and antidepressant response is less clear. This may be particularly relevant for subjective attentional complaints, which are a diagnostic criterion for Major Depressive Disorder and may underlie some executive processes. Methods: Eighty-eight adults with LLD were recruited and underwent an 8-week antidepressant trial. Subjective cognitive complaints were assessed via attention (Attentional Control Scale (ACS), WHODAS 2.0, domain 1) and broad-based cognitive (PROMIS) measures. Antidepressant response was determined via change in MADRS from baseline to week 8. Separate linear regressions examined these relationships, controlling for age, sex, baseline MADRS, and treatment arm. Results: Greater baseline attentional (ACS and WHODAS), but not general cognition, complaints were significantly associated with less improvement in MADRS scores. Follow-up ACS analyses found that change in MADRS was significantly related to attentional shifting, but not focusing, complaints. Conclusion: It is important to assess for subjective attentional complaints in LLD, as their presence at baseline may predict poor treatment response. Further research is needed to better understand the relationship between subjective and objective attention in LLD, their relationship with various outcomes, and underlying mechanisms.

J. Vega[1], X. Gong[1], A. Conley[1], W. Taylor[1], P. Newhouse[1], S. Morimoto[2]

Neuroplasticity-based cognitive remediation for chemotherapy-related cognitive impairment

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]University of Utah

Advances in breast cancer treatment are resulting in a growing number of cancer survivors. This has broadened the scope of care from treating the disease alone to managing long-term effects of cancer survivorship. Chemotherapy-related cognitive impairment (CRCI) is a common long-term complication reported by breast cancer patients and survivors. The most common cognitive difficulties reported among breast cancer survivors involve executive functions. A novel cognitive enhancement strategy called neuroplasticity-based computerized cognitive remediation (nCCR) could be used to target the executive function cognitive deficits experienced by breast cancer survivors. We are completing a single-arm feasibility study aimed at demonstrating feasibility and acceptability of nCCR in cancer survivors with CRCI. Participants that completed the study thus far (n=16) completed an average of 7.45 hours of nCCR training per week and an average of 44.69 hours total. Preliminary analyses in an early subset of completed participants (n=7) show significant improvement on tasks of processing speed, cognitive flexibility, verbal memory, and attention following 6-weeks of nCCR. Participants also exhibit improvement in self-reported perceived cognitive impairment and perceived cognitive abilities. Preliminary results not only demonstrate feasibility, but also that nCCR confers cognitive benefits to both self-report and objective performance in cancer survivors with CRCI.

P. Newhouse[1,2], A. Conley[1,2], K. Albert[1,2], B. McDonald[2], A. Saykin[2], B. Boyd[1,2], S-G Kim[3], J. Dumas[4]

Menopause-related cognitive symptoms: impact on brain structure

[1]Center for Cognitive Medicine and [2]Department of Psychiatry and Behavioral Sciences, VUMC
[2]University of Indiana
[3]Soonchunhyang University, Korea
[4]University of Vermont

Menopause is associated with increasing cognitive complaints and older women are at increased risk of developing Alzheimer's disease compared to men. One proposed reason for this reduced cognitive performance is the loss of estrogen following the menopause transition. However, there is difficulty in delineating effects of age and estrogen loss in samples of aging women. To account for this difficulty, the present study looked at the impact of subjective cognitive complaints on the cortical structure in a sample of younger postmenopausal women. We chose to focus on subjective cognitive complaints, as they are more sensitive at younger ages compared to objective measures. Forty-four postmenopausal women aged between 50 and 60 years, completed a series of subjective measures of cognitive complaints and postmenopausal symptoms, as well as objective cognitive tests of verbal episodic and working memory, and also had a structural MRI scan. The results of the study showed that increasing levels of cognitive complaints were associated with lower gray-matter volume in the right medial temporal lobe. The findings of the present study indicate that endorsed cognitive complaints may represent cortical dysfunction and may indicate increased risk for cognitive decline.

J.E. Wilson[1,2], P. Andrews[1], J. Thompson[3], R. Raman[2,3,4], C. Rick[5], A. Kiehl[2], P. Pandharipande[2,6,7], J.C. Jackson[2,5,8], E.W. Ely[2,5,6,8], W.D. Taylor[1,4,8]

Delirium, depression, and long-term cognitive impairment

[1]Department of Psychiatry and Behavioral Sciences, [2]Critical Illness, Brain Dysfunction, and Survivorship Center, [3]Department of Biostatistics, [4]Center for Cognitive Medicine, [5]Department of Medicine, [6]Center for Health Services Research, [7]Department of Anesthesiology, VUMC and [8]Veteran's Affairs TN Valley, Geriatrics Research, Education and Clinical Center

This study examined whether history of depression is associated with less delirium or coma free days, or worse one-year post-discharge depression severity and cognitive impairment. Secondary data analysis of the BRAIN-ICU longitudinal cohort study. A total of 821 subjects were included in analyses, with 261 (33%) pre-admission history of depression. After adjusting for covariates, pre-admission history of depression was not associated with days of delirium or coma in the ICU (OR 0.78, 95% CI, 0.59 - 1.03 p= 0.077). A prior history of depression was associated with higher BDI-II scores at 3 and 12 months (3 months OR 2.15, 95% CI, 1.42 - 3.24 p= <0.001; 12 months OR 1.89, 95% CI, 1.24 - 2.87 p=0.003). We did not observe an association between pre-admission history of depression and cognitive performance at either 3 or 12 months (3 months beta coefficient -0.04, 95% CI, -2.70 - 2.62 p=0.97; 12 months 1.5, 95% CI, -1.26 - 4.26 p= 0.28). Patients with a depression history prior to ICU stay exhibit a greater severity of depressive symptoms in the year after hospitalization. Premorbid depression was not related to post-discharge cognitive performance.

V. Kondev, A. Morgan, M. Najeed, S. Patel

Endocannabinoid regulation of innate fear responding

Departments of Psychiatry and Behavioral Sciences and
Molecular Physiology & Biophysics, VUMC

Anxiety disorders, including generalized anxiety disorder (GAD) and post-traumatic stress disorder (PTSD), are the most common mental illness in the United States. Symptoms characteristic of these diseases have been suggested to rely on maladaptive fear learning processes. For example, an oversensitivity to unpredictable aversive events, persistence of fear memory, and excessive fear in the absence of true danger all present as symptoms in anxiety disorders, and also relate to dysfunctional fear expression, consolidation, and extinction. The endocannabinoid (eCB) system includes crucial components of the processes involving fear learning and has recently been identified as an emerging therapeutic target to treat stress-related disorders. Here, we assess the neural mechanism through which eCBs may modulate fear learning by focusing on an understudied input from the ventral hippocampus (vHIPP) to the nucleus accumbens (NAc). Using slice electrophysiology and fiber photometry, we assess how eCBs modulate vHIPP-NAc activity ex vivo and in vivo. Furthermore, using a viral-mediated INTERSECT approach, we selectively delete components of the eCB system in the vHIPP-NAc circuit to assess how eCB signaling at these synapses mediates contextual fear expression and fear generalization. These data ultimately provide insight into the specific neural mechanisms by which eCB signaling modulates fear learning.

L. Rosas-Vidal, M. Altemus, S. Patel

The basomedial amygdala to bed nucleus of stria terminalis projection reduces defensive behaviors

Department of Psychiatry and Behavioral Sciences, VUMC

The bed nucleus of stria terminalis (BNST) has been implicated in the regulation of anxiety, fear, and reward-related behaviors. Lesions of BNST reduce anxiety-like behaviors and fear generalization. Furthermore, BNST mediates sustained fear and apprehension. This sustained state of fear and apprehension is present in PTSD. Activation of the anterodorsal BNST (adBNST) reduces different features of anxiety through distinct projections to the lateral hypothalamus and ventral tegmental area. The adBNST receives projections from the basomedial amygdala (BMA). Neuronal activity in the BMA has been shown to encode safety and its activation has been shown to reduce freezing and anxiety-like behavior. However, the downstream neural circuits responsible for these effects have not yet been identified. One possible connection that could be mediating these effects is the BMA-adBNST pathway. Our data shows that activation of BMA-adBNST projection reduces open-arm avoidance in the elevated plus maze and reduces both conditioned and innate freezing in mice. Furthermore, activation of BMA to BNST neurons increases the number of neurons expressing the activity marker cFOS in adBNST. Thus, the BMA to BNST projection could be an important pathway that engages to reduce defensive behaviors by increasing adBNST activity.

J. Bauer[1], S. Rader[1], M. Joffe[2,3], W. Kwon[1], J. Quay[4], C. Zhou[5], J. Conn[2,3,6,7], A. Lewis[1,5,6,7]

Hyperactivity of ventral hippocampal mossy cells degrades dorsal hippocampal mnemonic function via longitudinal projections

Department of [1]Psychiatry and Behavioral Sciences, [2]Warren Center for Neuroscience Drug Discovery,[3]Department of Pharmacology, [4]Quantitative and Chemical Biology Program, [5]Department of Neurology, and [6]Vanderbilt Kennedy Center, VUMC

The anterior hippocampus of individuals with early psychosis or schizophrenia is hyperactive, as is the ventral hippocampus in many schizophrenia-related rodent models. Mossy cells (MCs) of the ventral dentate gyrus (vDG) target both dorsal DG (dDG) granule cells and inhibitory interneurons along the hippocampal long axis. Furthermore, MCs respond to stimulation throughout hippocampal subfields, and consequently may be suited to detect hyperactivity at its origin. Here we hypothesized that vMC hyperactivation activates dDG granule cells to influence dorsal hippocampal function. In CD-1 mice, we targeted dDG-projecting vMCs using an intersectional viral strategy. vMCs were recorded during exploratory behaviors using in vivo fiber photometry. We used excitatory chemogenetic constructs to investigate how vMC hyperactivation affects long-term spatial memory during an object location memory (OLM) task. Photometry revealed vMC activation during exploratory rearing. Furthermore, vMCs innervated dDG granule cells, and vMC chemogenetic activation modestly increased dDG granule cell activity and associated c-Fos. Finally, vMC chemogenetic activation during the OLM training phase impaired performance 1-day later, without affecting locomotion or object exploration. These data suggest that vMC activation can directly excite dorsal granule cells and interfere with dDG function, supporting future study of this circuitry in schizophrenia-related animal models featuring ventral hyperactivity.

M. Roeske[1], M. McHugo[1], I. Lyu[2], J. Blackford[3], S. Heckers[1]

The impact of incomplete hippocampal inversion on hippocampal shape in schizophrenia

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Department of Computer Science and Engineering, Ulsan National Institute of Science and Technology, Ulsan, Korea
[3]Munroe-Meyer Institute Department of Research, University of Nebraska Medical Center

Incomplete hippocampal inversion (IHI) is an anatomical variant of the human brain that is more prevalent and severe in patients with schizophrenia. We hypothesized that IHI contributes to hippocampal shape differences observed in patients with schizophrenia. We studied 199 schizophrenia patients and 161 healthy control participants with 3-Tesla MRI and measured the prevalence and severity of IHI in each hippocampus bilaterally using established, quantitative criteria. Hippocampal surface reconstructions were completed using the SPHARM-PDM toolkit. We employed linear models in SurfStat to assess the relationship of IHI with hippocampal shape. IHI is associated with deflations of the lateral and medial surfaces and inflations of the superior and inferior surfaces of the hippocampus. Linear models not including IHI as a variable replicate well-known hippocampal shape differences in schizophrenia patients localized primarily to the CA1 region of the hippocampal head (left hemisphere cluster = 550 vertices, $p = 1.24E-06$; right hemisphere cluster = 413 vertices; $p = 1.27E-06$) and tail. Including an IHI by Group interaction in the model removes the significant shape differences in the CA1 region. These findings suggest that IHI contributes to hippocampal morphological differences observed in schizophrenia and may be associated with alterations in specific subfields of the hippocampus.

K. Beals, S. Sperry, J. Sheffield

Contributions of empathy and emotion identification to subclinical paranoia

Department of Psychiatry and Behavioral Sciences, VUMC

Paranoia has been associated with a multitude of social cognitive deficits in both clinical and non-clinical populations. In schizophrenia, empathy is significantly and broadly impaired, but its relationship with paranoia is unknown. Furthermore, deficits in emotion identification (EI) are present in both clinical and non-clinical paranoia and may underlie relationships between paranoia and empathic processing. The current investigation aimed to examine associations between paranoia, empathy and emotion identification in the general population. Structural equation modeling (SEM; N=226) revealed a direct effect of the empathy fantasy subscale on paranoia, such that higher fantasy was associated with more severe paranoia (p=.002). No other empathy subscales were associated with paranoia. The empathic concern subscale was negatively associated with EI, with higher empathic concern related to worse EI (p=.004). Paranoia and EI were not significantly associated and all indirect paths through EI were non-significant. These results add to previous literature demonstrating relationships between the fantasy subscale and delusion severity in both schizophrenia and psychosis-risk populations, by showing that this perspective-tasking aspect of empathy may contribute to delusional thinking in the general population. Relationships with empathy were limited by self-report, and performance-based measures are recommended for future research.

J. Sheffield[1], A. Brinen[1], D. Freeman[2]

Paranoia and grandiosity in the general population: differential associations with putative causal factors

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Oxford University

Worry, negative self-beliefs, and sleep disturbance have been identified as contributory factors to the onset, maintenance, and severity of paranoia. We tested the specificity of these contributory factors to paranoia compared to grandiosity, a different type of delusional ideation. Data were used from 814 adults from the Nathan Kline Institute-Rockland (NKI-Rockland) study, a general population dataset. Paranoid and grandiose delusional ideation was assessed using the Peters Delusions Inventory (PDI-21) and correlated with self-reported worry, negative self-beliefs, and sleep quality. Correlations were compared using Fisher's r-to-z transform to examine whether the magnitude of relationships differed by delusion type. Paranoia was significantly associated with worry, negative self-belief, and sleep quality. Grandiosity demonstrated significantly weaker relationships with worry and negative self-beliefs. Relationships with sleep quality were similar. We replicate previous reports that worry, negative self-beliefs and sleep quality are associated with paranoid ideation in the general population. We extend these findings by demonstrating that these contributory factors, particularly worry and negative self-beliefs, are associated with paranoid ideation to a greater extent than grandiosity. This suggests a degree of specificity of contributory factors to different types of delusional thinking, supporting the pursuit of specific psychological models and treatments for each delusion type.

R. Finlayson, A. Kim, S. Vandekar, P. Martin

Unprofessional physician behavior

Department of Psychiatry and Behavioral Sciences, VUMC

We reviewed evaluations of 727 physicians, from almost every US state that were conducted at the Vanderbilt Comprehensive Assessment Program. VCAP evaluations are conducted over 2-4 days by a multidisciplinary team that adheres to the American Psychiatric Association guidelines for conducting fitness for duty evaluations of physicians.   After 2009, when The Joint Commission Sentinel Event Alert 40 (Behaviors that undermine a culture of safety) was implemented, referred physicians were older (median age, 52 vs 48 years, adjusted $p=0.02$). More were seen for disruptive behavior and fewer for sexual boundary violations (adjusted $p<.0001$). Diagnoses of cognitive disorders were more prevalent (9% vs 2%, adjusted $p<.01$) but sexual disorders and personality disorders occurred less frequently (both adjusted $p<.001$).   Disruptive referrals, compared to those referred for other reasons, had more personality trait difficulties rather than severe personality diagnoses (adjusted $p<.0001$) but fewer diagnoses of anxiety (adjusted $p=0.016$), mood (adjusted $p=0.008$), or substance use disorders (adjusted $p<.0001$). The disruptive referrals were more likely found to be fit to practice.   Less easily explained is the significant decline in referrals for sexual boundary violations, which may suggest additional culture changes within Healthcare Organizations, perhaps associated with growth in the proportion of women practicing medicine.

R. Calvosa, B. Corbett

Gender differences in social communication during the CASS protocol

Department of Psychiatry and Behavioral Sciences, VUMC

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder diagnosed in males approximately four times as often as females (Maenner et.al, 2020). It has been hypothesized that females engage in more camouflaging of symptoms to include better social communication during simple social exchange. This project was conducted to determine if there are significant behavioral differences between males and females diagnosed with ASD during a friendly social interaction. The Contextual Assessment of Social Skills (CASS) protocol was used to test hypothesized behavioral differences, and the Interested condition was used to simulate a friendly social encounter. The sample included 91 participants with confirmed diagnosis of ASD (60 males, 31 females). Independent sample t-tests were used to examine Vocal Expression, Gestures, and Positive Affect with the hypothesis that females would have overall higher scores. The results confirmed females with ASD show better Positive Affect $t(89) = -2.373$, $p = 0.02$, and Vocal Expression $t(88) = -2.105$, $p = 0.038$; however, Gestures $t(89) = -0.639$, $p = 0.526$ was not significantly different between groups. The findings show that females demonstrate more prosocial behaviors in simple social interactions. Results corroborate previous research demonstrating that females more frequently use camouflaging in social situations (Corbett et al., 2020).

A. Gorniak, T. Kuhn, J. Ebert

Promoting trauma-informed care though consultation as intervention: Reviewing a model

Department of Psychiatry and Behavioral Sciences, VUMC

More than 420,000 children are in foster care in the United States (Children's Bureau, 2019); children enter the system after experiencing trauma, often multiple traumas (Kramer et al., 2013), usually perpetuated by a caregiver (Greeson et al., 2011). Childhood traumatic experiences impact functioning across domains throughout the lifespan (Mersky & Topitzes, 2010). These children require effective mental health care, yet the mental health system can itself be traumatizing (Onken et al., 2002). Trauma informed care is a model of systems-level change in child-welfare associated systems promoting effective collaboration, prevention, and intervention to benefit those they serve (Beyerlein & Bloch, 2014; Bunting et al., 2019). To this end, the Vanderbilt Center of Excellence implemented a client-centered case consultation model bringing together key members of teams serving children and families involved with child welfare in Tennessee. This intervention aims to facilitate collaboration, empower stakeholders, and strengthen resilience in team-members in ways that generalize benefits from the client to other children, families, and the systems themselves. The current project will explicate the consultation model, situating it within existing consultation and trauma-informed care literature, report on the status of the satisfaction-related data, and provide next steps to promote continued quality improvement in service provision.

J. Schwartzman[1], Z.J. Williams[2], B.A. Corbett[1]

Exploring the roles of diagnosis and sex in the severity and type of depression symptoms in early adolescents with and without autism spectrum disorder

[1]Department of Psychiatry and Behavioral Sciences and [2]Medical Scientist Training Program, VUMC

Prevalence rates of depression are higher in youth with Autism Spectrum Disorder (ASD) than typically-developing (TD) youth, yet the effects of ASD diagnosis and sex on depressive symptom severity remain incompletely understood, particularly in specific age groups. Using the Children's Depression Inventory, Second Edition (CDI-2), the present study explored diagnostic- and sex-based differences in depressive symptom severity in a sample of 212 early adolescents (10:0-13:5 years) with and without ASD. Significant group differences were found according to ASD diagnosis (d=0.587, 95% CI [0.308,0.867]) and sex (d=0.365 [0.089,0.641]), with more depressive symptoms endorsed in the ASD and female groups. However, the interaction of diagnosis and sex was not significant, suggesting an additive risk of ASD status and female sex. Item-level analyses showed diagnostic differences on nearly half of the CDI-2 items with higher severity in the ASD group (Probability of Superiority range = 0.42-0.65), differences within sexes, and differences by diagnosis persisted when limiting analyses to children with high levels of depressive symptoms. A more nuanced understanding of symptom endorsement and the roles of diagnosis and sex may uncover salient intervention targets for depression in the unique context of ASD.

R. Muscatello[1], A. Kim[2], S. Vandekar[2], B. A. Corbett[1]

Diagnostic, developmental, and health effects on parasympathetic regulation and reactivity in youth with autism spectrum disorder

Departments of [1]Psychiatry and Behavioral Sciences and [2]Biostatistics, VUMC

Increasing evidence suggests individuals with autism spectrum disorder (ASD) demonstrate atypical autonomic regulation; however, research remains inconsistent. The current study examined parasympathetic regulation and response (respiratory sinus arrhythmia; RSA) to the Trier Social Stress Test (TSST), a social evaluative threat paradigm, in a large, well-characterized sample of youth, ages 10-13 years, with ASD (n=138) or typical development (TD; n=103). Linear mixed effects models examined the effects of baseline RSA, time, age, sex, pubertal stage, BMI, and diagnosis. Diagnosis, age, pubertal development, and body mass index (BMI) were hypothesized to be associated with ANS function. A base model with no covariates demonstrated youth with ASD had significantly lower RSA on average relative to those with TD. When including covariates, elevated BMI was associated with decreased parasympathetic regulation and the strength of the diagnosis effect was reduced. As lower parasympathetic regulation may increase susceptibility for a number of conditions, such as anxiety or depression, it will be important to further elucidate the link between BMI and the ANS, especially in ASD. Findings further emphasize the need to account for relevant covariates when examining autonomic response in ASD, as these related variables may be contributing to noted inconsistencies in the literature.

A. Zoltowski[1], M. Failla[2], A. Weitlauf[3], L. Mash[4], S. Davis[1], B. Heflin[5], B. Rogers[1], C. Cascio[1]

Insular connectivity in autistic versus neurotypical development

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]The Ohio State University
[3]Vanderbilt Kennedy Center
[4]San Diego State University and UCSD
[5]Florida International University

There is increasing evidence for altered interoceptive processing in individuals diagnosed with autism (AUT), compared to neurotypical individuals (NT). At a neural level, there is some preliminary evidence of altered functional and structural connectivity patterns of interoceptive cortices in autism, though developmental patterns of these differences are unclear. To better examine the role of age in interoceptive connectivity patterns in autism, we used a cross-sectional approach to examine interoceptive connectivity across a wide age range. N=28 individuals with autism (ages 8-54) and N=45 neurotypical individuals (ages 8-41) completed a resting-state fMRI scan. From these resting state scans, we analyzed seed-based functional connectivity of primary interoceptive cortex in the posterior insula between group. Age by diagnostic group interactions in seed-based connectivity patterns are reported.

J. Thome[1], R. Raman[2], R. Jarrett[2], K. Gracey[1], T. Kuhn[1]

Building a risk-adjusted model for monitoring psychopharmaceutical prescriptions for children in the child welfare system

Departments of [1]Psychiatry and Behavioral Sciences and [2]Biostatistics, VUMC

Children in the child welfare system are more likely to receive psychotropic medication prescriptions than children in the general population. This session will detail the use of administrative- and prescription-level child data and Administration on Children, Youth and Families guidelines to quantify variability in prescribing practices among prescribers for child welfare. These data were used to build a risk adjusted model that accounts for case complexity and estimates the adjusted probability of potentially inappropriate psychotropic prescriptions (i.e., red-flagged prescriptions). It is vital to monitor psychotropic prescriptions for children in the child welfare system. Quantifying variability in prescribing practices among prescribers for these children can be used to guide oversight and identify areas of needed support and intervention. The goal of this model is to promote safe and effective prescribing in this vulnerable population.

I. Reddy[1], D. Ruderfer[2], L. Davis[2]

Analysis of copy number variation in conduct disorder

Departments of [1]Psychiatry and Behavioral Sciences
and [2]Genetic Medicine, VUMC

Objective: Conduct disorder (CD) is a disorder of childhood that is characterized by aggression, rule-breaking, and disregard for the wellbeing of others. Copy number variation (CNV) is an important risk factor for several neurodevelopmental disorders; however, the role of this form of genetic variation in CD is poorly understood. Methods: CNVs were defined from genotyped individuals within the Vanderbilt BioVU biobank using PennCNV. We identified individuals of European ancestry meeting criteria for CD based on higher-order phenotypic annotation of linked electronic health records (known as "phecodes"). Controls were defined based on the absence of CD and closely related phecodes. Results: CD cases demonstrated a higher overall CNV burden (both number of CNVs and total length), an effect which was more pronounced in females than in males. Genome wide association identified four regions meeting significance criteria following correction for multiple comparisons, including regions implicated in brain development and dysfunction. Phenome wide association within the case-control cohort revealed significant associations between CD and substance use disorders in adults. Conclusions: These preliminary results identify novel genetic associations with CD. Such vulnerabilities could inform early therapeutic intervention and improve predictive models related to the progression of externalizing pathology and development of substance use disorders.

E. Williamson[1], E. Shoemaker[2], A. Kim[3], S. Vandekar[3], S. Joshi[4], A.L. Lewis[5], I. Zalpuri[4], A. Kerlec[6]

Perspectives on the recruitment of Child & Adolescent Psychiatry residents into training programs

Departments of [1]Psychiatry and Behavioral Sciences and [2]Biostatistics, VUMC
[3]University of Southern California
[4]Stanford University
[5]Medical University of South Carolina
[6]The Ohio State University

Objective. Recruitment of the next generation of child and adolescent psychiatrists is an important mission of the American Association of Directors of Psychiatric Residency Training (AADPRT) and the American Academy of Child & Adolescent Psychiatry (AACAP). A review of the National Resident Matching Program (NRMP) CAP Match data will inform current and future practices. Methods. The NRMP, American College of Graduate Medical Education (ACGME), and Association of American Medical College (AAMC) databases were queried from 1996-2021. A key word literature search of Medline via PubMed and Google Scholar of psychiatric and medical education was reviewed for the same time period. Results. The NRMP data show that the number of programs in the Match has increased and the percentage of programs that fill all of their positions in the Match is increasing. However, the numbers indicate a surplus of positions for the number of applicants, and the surplus appears to be increasing. Conclusions: One concerning trend is the surplus of positions compared to applicants while there is a great need for child psychiatrists. More research is needed on the incentives and disincentives for programs and applicants to participate in the Match and how to increase interest in Child & Adolescent psychiatry.

S. Avery[1], A. Huang[1], J. Sheffield[1], B. Rogers[1], S. Vandekar[1], A. Anticevic[2], N. Woodward[1]

Development of thalamocortical structural connectivity in typically developing and psychosis spectrum youth

[1]Department of Psychiatry and Behavioral Sciences, VUMC
[2]Department of Psychiatry, Yale University School of Medicine

Background: Structural connections between the thalamus and cortex are disrupted in schizophrenia. Attenuated psychotic symptoms often begin in adolescence, during a critical phase of neural and cognitive development. However, little is known about the development of thalamocortical structural connectivity and its impact on cognition. Methods: We examined diffusion data from 1144 participants (aged 8-21) collected as part of the Philadelphia Neurodevelopmental Cohort, which included 316 typically-developing youth, 330 psychosis-spectrum youth, and 498 youth with other psychopathology. Probabilistic tractography was calculated between the thalamus (seed) and six bilateral cortical regions (targets). White matter integrity (FA) measures were tested for effects of age, sex, and group, and associations with cognition were examined. Results: Thalamocortical white matter tract integrity broadly increased with age, was higher in males, and was lower in psychosis-spectrum youth. Better cognition, including measures of complex cognition, executive function, and social cognition, was selectively associated with higher FA in thalamic-PFC and thalamic-posterior parietal tracts. Conclusions: These findings suggest that white matter integrity continues to mature rapidly throughout middle-to-late development, is reduced in youth with psychosis symptoms, and is associated with cognitive ability.

M. McHugo, B. Rogers, S. Avery, K. Armstrong, S. Heckers

Amplitude of hippocampal low frequency fluctuations in early psychosis: a two-year follow-up study

Department of Psychiatry and Behavioral Sciences, VUMC

Background: Hippocampal hyperactivity due to an underlying excitation/inhibition imbalance has been proposed as a biomarker and treatment target for schizophrenia. The resting state fMRI signal amplitude is correlated with glucose metabolism as well as oscillatory activity and thus may serve as a proxy measure for hippocampal hyperactivity. Previous work has shown that individuals with schizophrenia have increased fMRI amplitude in the hippocampus, but it is unclear whether this varies by hippocampal subregion and whether it changes with illness progression. Methods: We measured resting state hippocampal fMRI activity with the amplitude of low frequency fluctuations (ALFF) in 153 individuals (81 early psychosis, 72 healthy control), with 123 individuals followed for 2 years. ALFF was extracted from the anterior, posterior, and total hippocampus and analyzed using linear mixed models. Results: We found increased hippocampal ALFF in the early psychosis group compared to healthy controls at baseline, but this effect was not present after 2 years. There were no group differences by anterior/posterior hippocampal subregion. Conclusions: Our results support a model in which intrinsic activity within the hippocampus is increased already in the early stage of psychosis but varies with illness state.

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