NATIONAL NETWORK *of*
DEPRESSION CENTERS

Clinical Innovation, Collaboration, and Computational Psychiatry: Leveraging Networks

10th Annual Conference

October 17-19, 2018
Baltimore, MD

nndc.org

The Johns Hopkins
Mood Disorders Center

Hosted in collaboration with the Johns Hopkins University Mood Disorders Center

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Table of Contents

For your convenience, we have included blank pages for notes at the back of this booklet and a list of local resources on the back cover.

Acknowledgments

We would like to thank all of our speakers and facilitators for their contributions both to this conference and to their areas of study. We are proud to work with such highly respected and knowledgable clinicians, researchers, and advocates and hope to continue developing these and other relationships with some of the world's brightest minds.

In addition, we thank the NNDC Conference Program and Planning Committees for putting together another engaging and innovative Annual Conference Program.

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Meet the NNDC Team

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Welcome!

Sagar Parikh, MD
Conference Co-Chair

Ray DePaulo, MD
Conference Co-Chair

Welcome to the 2018 NNDC Annual Conference!

This is our 10th Annual Conference – can you believe it? The NNDC has grown so much since its inception, expanding from 16 founding members to 26 Member Centers and 3 International Affiliations today. Our 10th year has been a year of many exciting milestones. The Mood Outcomes Program, our flagship initiative combining measurement-based care with a comprehensive research registry is well on its way to achieving and surpassing our 2018 goal of 10,000 patients enrolled --an important milestone along the path to supporting large-scale, longitudinal, multi-site studies needed to identify predictors of risk and resilience!

In addition to supporting the growth of the Mood Outcomes Program, the Network renewed its commitment to supporting collaborative research in our Task Groups. For the second year in a row, we have offered pilot funding to our Task Groups. Funding through these Task Group Momentum Grants support initiatives that help our Task Groups develop pilot programs and research projects that can be used as a basis for larger grant proposals in the future. Congratulations to the ECT, Women & Mood Disorders, and Child & Adolescent Mood Disorders Task Groups – all recipients of 2018 Task Group Momentum Grants! We look forward to seeing what innovative work comes out of these groups in the coming years.

Crafting the program for the Annual Conference is always an exciting opportunity to showcase not only the latest developments in mood disorders research, but also the ways in which the NNDC, as a collaborative Network, is poised to foster great changes in how we understand, diagnose, and treat depressions and bipolar illnesses. To that end, we are thrilled to welcome Dr. Joshua Gordon, Director of the National Institute of Mental Health, whose keynote address will explore the current state of depression research and avenues for large-scale, multi-site research only possible with a Network like ours. The Program Committee has also structured this year's conference around a number of symposia, each focused on one of our Task Groups, to highlight recent successes, feature key collaborators past, present, and future, and invite conference attendees to discuss near- and far-term research objectives for each group.

The Annual Conference is the perfect time to start thinking about how you can get more involved with the NNDC. If you're not part of a Task Group, we invite you to consider joining one (or two or three)! Or perhaps you have a project idea you've been developing – we'd love to discuss how it might fit into the work our Task Groups are doing.

Thank you for joining us, as always.

From the Executive Director's Desk

The National Network of Depression Centers is pleased to welcome you to Baltimore for our 10th Annual Conference! This year's theme – "Clinical Innovation, Collaboration, and Computational Psychiatry: Leveraging Networks" – was designed to highlight ways the NNDC is uniquely positioned to advance large-scale, multi-site studies and programs, bringing together NNDC Members, International Affiliates, and other partnerships that are being formed along the way.

Pat Rinvelt, MBA
Executive Director

Thank you for joining us – we hope to see you again next year!

Featured Speakers

We are honored to have as our featured speakers two eminent psychiatrists who are recognized worldwide as thought leaders changing how we understand and treat mood disorders.

Joshua A. Gordon, MD, PhD • Keynote Speaker

National Institute of Mental Health

Joshua A. Gordon, MD, PhD, is the Director of the National Institute of Mental Health. Dr. Gordon's research focuses on the analysis of neural activity in mice carrying mutations of relevance to psychiatric disease. His lab studies genetic models of these diseases from an integrative neuroscience perspective, focused on understanding how a given disease mutation leads to a behavioral phenotype across multiple levels of analysis. Dr. Gordon's work has been recognized by several prestigious awards, including the The Brain and Behavior Research Foundation – NARSAD Young Investigator Award, the Rising Star Award from the International Mental Health Research Organization, the A.E. Bennett Research Award from the Society of Biological Psychiatry, and the Daniel H. Efron Research Award from the American College of Neuropsychopharmacology. Dr. Gordon received his MD/PhD degree at the University of California, San Francisco and completed his Psychiatry residency and research fellowship at Columbia University.

David Mrazek Memorial Lecturer • Mark A . Frye, MD

Mayo Clinic

Mark A. Frye, MD, is chair of the Department of Psychiatry and Psychology at Mayo Clinic. Dr. Frye also serves as director of the Mayo Clinic Depression Center. His current research centers on genomics, brain imaging, and neuroendocrinology of mood disorders and alcoholism, complementing his clinical interests in bipolar disorder, depression, and alcoholism. Dr. Frye serves on the editorial boards of *International Journal of Bipolar Disorders* and *World Journal of Psychiatry* and as scientific reviewer for the Interventions Committee for Adult Disorders at the National Institute of Mental Health. Dr. Frye has received multiple honors and awards both as an educator and researcher, including the Mogens Schou Award for Education from the International Society for Bipolar Disorder, two Mayo Clinic Rome Mentorship Awards, and the Gerald Klerman Senior Investigator Award from the Depression and Bipolar Support Alliance. Dr. Frye received his medical degree from the University of Minnesota School of Medicine and completed his psychiatric training at the UCLA Neuropsychiatric Institute. He subsequently completed a research fellowship in the Biological Psychiatry Branch at the National Institute of Mental Health in Bethesda, Maryland.

Education Statement

Satisfactory Completion

Learners must complete an evaluation form to receive a certificate of completion. Your chosen sessions must be attended in their entirety. Partial credit of individual sessions is not available. If you are seeking continuing education credit for a specialty not listed below, it is your responsibility to contact your licensing/certification board to determine course eligibility for your licensing/certification requirement.

Joint Providership

Physicians

In support of improving patient care, this activity has been planned and implemented by Amedco LLC and National Network of Depression Centers. Amedco LLC is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

Credit Designation Statement – Amedco LLC designates this live activity for a maximum of **12.5 *AMA PRA Category 1 Credits™***. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Psychologists

This course is co-sponsored by Amedco and National Network of Depression Centers. Amedco is approved by the American Psychological Association to sponsor continuing education for psychologists. Amedco maintains responsibility for this program and its content. **12.5 hours**

The following boards accept courses from APA providers for Counselors: AK, AR, AZ, CA, CO, CT, DC, DE, FL, GA, IA, ID, IL, IN, KY, KS, ME, MO, NC, ND, NH, NE, NJ, NM, NV, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, WI, WY

AL / Counselors: Activities not providing NBCC approval may be approved by the Board for individual licensees upon receipt of acceptable documentation prior to the activity. Please send course details to your licensing board for approval BEFORE the event. No approvals afterward by the board.

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The following state boards accept courses from APA providers for Addictions Professionals: AK, AR, CO, CT, DE, GA, IA, IN, KS, LA, MO, MT, NE, NM, NC, ND, NJ, NV, NY (outstate held), OK, OR, SC, UT, WA, WI, WY

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Social Workers

Amedco, #1346, is approved as a provider for social work continuing education by the Association of Social Work Boards (ASWB) www.aswb.org, through the Approved Continuing Education (ACE) program. Amedco maintains responsibility for the program. ASWB Approval Period: 6/24/2016 to 6/24/2019. Social workers should contact their regulatory board to determine course approval for continuing education credits.
Social workers participating in this course may receive up to **12.5 clinical continuing education clock hours**.

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AL / Counselors: Activities not providing NBCC approval may be approved by the Board for individual licensees upon receipt of acceptable documentation prior to the activity. Please send course details to your licensing board for approval BEFORE the event. No approvals afterward by the board.

The following board accept courses from ASWB providers for MFTs: AK, AR, AZ, CA, CO, FL, IA, ID, IN, KS, ME, MO, NC, NE, NH, NM, NV, OK, PA, RI, TN, TX, UT, VA, WI, WY

MA / MFTs: Participants can self-submit courses not approved by the MAMFT board for review.

The following state board accept courses from ASWB providers for Addictions Professionals: AK, CA, CO, CT, GA, IA, IN, KS, LA, MO, MT, ND, NM, NV, OK, OR, SC, WA, WI, WV, WY

Schedule-at-a-Glance

WEDNESDAY, OCTOBER 17, 2018 • NNDC Board and Staff Only

3:30p - 4:30p | Executive Committee Meeting
Raven Room

5:00p - 7:30p | Board Meeting
Raven Room

THURSDAY, OCTOBER 18, 2018 • All Attendees

7:30a - 8:30a | Breakfast
Grand Ballroom

8:30a - 9:00a | Welcome & Opening Remarks
Grand Ballroom
James Potash, MD, MPH - Johns Hopkins University
Ray DePaulo, MD - Johns Hopkins University
Sagar Parikh, MD, FRCPC - University of Michigan

9:00a - 10:30a | Mini Symposium • Suicide Prevention
Grand Ballroom
Richard McKeon, MD, MPH - Substance Abuse and Mental Health Services Administration
Holly Wilcox, PhD - Johns Hopkins University
William Coryell, MD - University of Iowa
Suicide Prevention Task Group

10:30a - 10:45a | Break

10:45a - 12:15p | Mini Symposium • Substance Abuse & Mood Disorders
Grand Ballroom
Constance Guille, MD - Medical University of South Carolina
Wilson Compton, MD, MPE - National Institute on Drug Abuse

12:15p - 1:00p | Lunch
Grand Ballroom

1:00p - 2:00p | Judged Poster Session
Grand Foyer
Poster Award Winners will be announced at dinner.

2:00p - 4:00p | Symposium • Women & Mood Disorders
Grand Ballroom
Samantha Meltzer-Brody, MD, MPH - University of North Carolina
Pauline Maki, PhD - University of Illinois at Chicago
Sandra Weiss, PhD, RN, FAAN - University of California San Francisco
Heather Flynn, PhD - Florida State University
Women & Mood Disorders Task Group

4:00p - 4:15p | Break

4:15p - 5:15p | Mini Symposium • Mood Outcomes Update
Grand Ballroom
David Katzelnick, MD - Mayo Clinic
Peter Zandi, PhD - Johns Hopkins University

5:15p - 6:15p | Keynote Lecture
Grand Ballroom
Joshua Gordon, MD, PhD - National Institute of Mental Health

6:15p - 7:00p | Break

7:00p - 7:45p | Dinner & Poster Awards
Grand Ballroom

7:45p - 9:00p | Special Presentation • Moods & Music - Robert Lowell: Poet & Patient
Grand Ballroom
Kay Redfield Jamison, PhD - Johns Hopkins University
Meg Hutchinson - Singer-songwriter

FRIDAY, OCTOBER 19, 2018 • All Attendees

7:30a - 8:30a | Breakfast
Grand Ballroom

8:30a - 10:30a | Symposium • Pharmacogenomics & Treatment Resistant Depression
Grand Ballroom
Mark Frye, MD - Mayo Clinic • David Mrazek Memorial Lecturer
Rima Kaddurah-Daouk, PhD - Duke University
Patricio Riva Posse, MD - Emory University
Cheryl McCullumsmith, MD, PhD - University of Toledo
TRD Task Group

10:30a - 10:45a | Break

10:45a - 12:45p | Symposium • Child & Adolescent Mood Disorders
Grand Ballroom
Stephen Strakowski, MD - University of Texas at Austin
Karen Swartz, MD - Johns Hopkins University
Mary Fristad, PhD - The Ohio State University
Leslie Miller, MD - Johns Hopkins University
Child & Adolescent Mood Disorders Task Group

12:45p - 1:00p | Closing Remarks

Session Details

THURSDAY, OCTOBER 18, 2018

9:00a

MINI SYMPOSIUM • **SUICIDE PREVENTION**

Suicide Prevention in the United States: Challenges, Opportunities, and Innovations

Presented By

Richard McKeon, PhD, MPH
Chief, Suicide Prevention Branch
Substance Abuse and Mental Health Services Administration

Objectives

1. Describe the relationship between suicide and depression
2. Describe the current status of evidence based assessment and treatment

Learn More

www.samhsa.gov

Latent Infection, Inflammatory Markers, and Repeated Suicide Attempts

Presented By

William Coryell, MD
George Winokur Professor of Psychiatry
University of Iowa Carver College of Medicine

Objectives

1. Learn of new findings regarding latent infection and cytokine levels as risk factors for recurrent suicidal behavior
2. Learn of potential interactions between trait impulsivity and biological risk factors for suicidal behaviors

10:45a

MINI SYMPOSIUM • **SUBSTANCE ABUSE & MOOD DISORDERS**

Sex, Drugs and Depression: Sex and Gender Differences in Mood and Opioid Use Disorders

Presented By

Constance Guille, MD
Associate Professor
Director, Women's Reproductive Behavioral Health Program
Medical University of South Carolina

Objectives

1. Recognize the commonly occurring presentation of mood and opioid use disorders
2. Understand the role of sex differences in mood and opioid use disorders
3. Understand the rational for gender specific treatments for mood and opioid use disorders

Science as a Solution to the Opioid Crisis: Implications for Overlapping Mood and Opioid Use Disorders

Presented By

Wilson M Compton, MD, MPE
Deputy Director
National Institute on Drug Abuse

Objectives

1. Attendees will understand the risks of and modify their prescribing practices of opioids
2. Attendees will understand the chronic, relapsing nature of addiction and how that perspective influences long-term treatment decisions

1:00p

Judged Poster Session

Visit poster presentations from Task Groups, NNDC Experts, and Emerging Scholars from across the Network. Poster abstracts can be found starting on page 16. Winners of the Best Poster Awards will be announced at dinner.

2:00p

SYMPOSIUM • **WOMEN & MOOD DISORDERS**

Applying Precision Medicine in Perinatal Depression to Develop Novel Treatment Approaches

Presented By

Samantha Meltzer-Brody, MD, MPH
Ray M. Hayworth Distinguished Professor of Mood and Anxiety Disorders
Director, UNC Perinatal Psychiatry Program
University of North Carolina at Chapel Hill

Objectives

1. Increased understanding of biomarker hypotheses of perinatal mood disorders
2. Increased knowledge of genetic vulnerability to perinatal mood disorders
3. Understanding of novel treatment approaches in development that could improve patient outcomes

Learn More

www.womensmooddisorders.org
@UNCWomensMood

New NNDC Guidelines for the Identification and Treatment of Perimenopausal Depression

Presented By

Pauline M Maki, PhD
Professor of Psychiatry and Psychology
Director of Women's Mental Health Research Program
Senior Director of Research, Center for Research on Women and Gender
University of Illinois at Chicago

Objectives

1. Increased understanding of biomarker hypotheses of perinatal mood disorders
2. Increased knowledge of genetic vulnerability to perinatal mood disorders
3. Understanding of novel treatment approaches in development that could improve patient outcomes

Learn More

/womensmentalhealthresearchuic

Opportunities for NNDC Impact on State and National Perinatal Mental Health

Presented By

Heather A Flynn, PhD
Professor and Vice Chair
Department of Behavioral Sciences and Social Medicine
Florida State University College of Medicine

Objectives

1. To understand opportunities for the NNDC to partner with states to impact policy, training and clinical programming to improve perinatal mental health outcomes
2. To recognize models of strategic research partnerships with decision-making entities
3. Understand major gaps in perinatal mental health care and research

Learn More

www.flmomsmatter.org

4:15p

NNDC UPDATE

Mood Outcomes Program: Progress and Future Directions

Presented By

David Katzelnick, MD
Professor of Psychiatry
Chair, Division of Integrated Behavioral Health
Mayo Clinic

Peter P Zandi, PhD
Professor and Vice Chair of Research,
Department of Mental Health
Johns Hopkins Bloomberg School of Public Health

Objectives

1. Understand the value of enrolling patients into the Mood Outcomes Program
2. Describe the average rate of improvement for patients with bipolar disorder and unipolar depression in the mood outcomes program

5:15p

KEYNOTE ADDRESS

Depression: A View from the NIMH

Presented By

Joshua A Gordon, MD, PhD
Director
National Institute of Mental Health

Objectives

1. Understand the current state of research in the neurobiology of depression
2. Appreciate gaps in knowledge with regard to novel treatments for depression, such as ketamine and brain stimulation
3. Articulate future directions in depression research

Learn More

www.nimh.nih.gov/about/director/messages
@NIMHDirector

7:45p

SPECIAL PRESENTATION • MOODS & MUSIC

Robert Lowell: Poet & Patient

Presented By

Kay Redfield Jamison, PhD
Dalio Professor in Mood Disorders
Professor of Psychiatry
Johns Hopkins University

Meg Hutchinson
Singer-songwriter and poet

Robert Lowell, one of America's greatest writers, suffered throughout his life from severe bipolar illness. He was hospitalized twenty times yet he lived his life with courage and used his work to describe, vividly and without equal, the terror of psychosis and the pain of depression. He also wrote, all the more convincingly, about the beauty of life and the power of love. Join us as singer-songwriter Meg Hutchinson performs her arrangements of Lowell's poems, with special presentation by Dr. Kay Redfield Jamison.

FRIDAY, OCTOBER 19, 2018

8:30a

SYMPOSIUM • **PHARMACOGENOMICS & TRD**

Using Biomarkers to Inform Clinical Practice and Drug Development in Mood Disorders

6th Annual NNDC David A Mrazek Memorial Lecture

Presented By

Mark Frye, MD
Chair, Department of Psychiatry and Psychology
Mayo Clinic

Objectives

1. Identify potential biomarkers that may inform future clinical practice in mood disorders

Metabolomic Genetic Integrated Approach for Optimizing Treatment Outcomes in Depression

Presented By

Rima Kaddurah-Daouk, MD
Professor, Department of Psychiatry and Behavioral Sciences
Professor, Department of Medicine
Duke Institute for Brain Sciences
Director, Pharmacometabolomics Research Center
Duke University

Objectives

1. Learn about metabolomics tools for the study of antidepressants mechanism of action and molecular basis for variation in response
2. Understand the use of metabolomics data for sub-classification of neuropsychiatric diseases
3. Understand the use of combined omics data towards a precision medicine approach in the study of depression and treatment outcomes

NNDC Treatment Resistant Depression Task Group: Setting the Standards

Presented By

Cheryl McCullumsmith, MD, PhD
Professor and Chair
Department of Psychiatry
University of Toledo

Objectives

1. Define treatment resistant depression
2. Outline evidence for efficacy of treatment strategies

10:45a

SYMPOSIUM • **CHILD & ADOLESCENT MOOD DISORDERS**

Brain Changes at the Onset of Bipolar I Disorder: A Neurodevelopmental Illness of Adolescence

Presented By

Stephen M Strakowski, MD
Associate Vice President, Regional Mental Health
Chair, Department of Psychiatry
University of Texas at Austin Dell Medical School

Objectives

1. Understand the role of neurodevelopment on the onset of bipolar disorder
2. Describe neural systems impacted in emerging bipolar disorder

Learn More

Check out Dr. Strakowski's video blog series on medscape.com - "Strakowski on Psychiatry"

Universal Depression Education in High Schools: Results from the Adolescent Depression Awareness Program

Presented By

Karen L Swartz, MD
Director of Clinical and Educational Programs
Director, Adolescent Depression Awareness Program
The Johns Hopkins Mood Disorders Center

Objectives

1. To discuss the rationale of depression education as a method for suicide prevention
2. To review the Adolescent Depression Awareness Program (ADAP) depression education curricula for high school students, teachers and parents
3. To discuss the results of ADAP's effectiveness in changing knowledge and attitudes about depression among high school students

Update on the Child & Adolescent Mood Disorders Interest Group (CAMDIG)

Presented By

Mary A Fristad, PhD, ABPP
Professor and Vice Chair
The Ohio State University Wexner Medical Center
Nationwide Children's Hospital

Leslie Miller, MD
Assistant Professor
Johns Hopkins University School of Medicine

Objectives

1. Be aware of differences in mood assessment for adolescents versus adults
2. Know the size/scope of the NNDC adolescent network

Travel Award Recipients

Congratulations to the 2018 Emerging Scholar Travel Award Recipients! Check out their posters during the Annual Conference Poster Session at 1:00pm on Thursday, October 18.

Ahmed Ahmed, MD • **Mayo Clinic**

Poster #1 Metabolomic Signature of Exposure and Response to Citalopram/Escitalopram in Clinical Subtypes of Major Depression – Metabolomics Informs about Disease Heterogeneity
Abstract on p16

Isabelle Bauer, PhD • **University of Texas Health Science Center at Houston**

Poster #4 A double-blind randomized placebo-controlled study of aspirin and N-acetyl cysteine as adjunctive treatments for bipolar depression
Abstract on p17

Rachel Bergmans, PhD, MPH • **University of Michigan**

Poster #5 Depression, food insecurity and diabetic morbidity: Evidence from the Health and Retirement Study
Abstract on p17

Liisa Hantsoo, PhD • **University of Pennsylvania**

Poster #14 GABAergic neuroactive steroids across the menstrual cycle and in response to stress in Premenstrual Dysphoric Disorder (PMDD)
Abstract on p21

Matthew Hughes, MD • **University of Michigan**

Poster #15 Cultivating Wellness in Physician Trainees: The Intern ProSkills Project
Abstract on p22

Jessica Lipschitz, PhD • **Brigham & Women's Hospital**

Poster #18 Adoption of Mobile Apps for Depression and Anxiety: Results from a Survey on Patient Interest and Barriers to Engagement
Abstract on p23

Mark Long, DO • **The Ohio State University**

Poster #19 Reducing Medical Transfers of Patients within 48 Hours of Psychiatric Admission
Abstract on p24

Grace Masters • **University of Massachusetts**

Poster #20 Rates of positive screens for bipolar disorder in pregnant and postpartum women and associated risk factors
Abstract on p24

Haitham Salem, MD, PhD • **University of Texas Health Science Center at Houston**

Poster #28 Is the self-reported Borderline Personality Questionnaire any useful? A Retrospective analysis among bipolar inpatient population compared to previously reported US sample data
Abstract on p28

Samantha Schmitz • **University of Iowa**

Poster #31 University of Iowa Mood Disorders Center Program Evaluation
Abstract on p30

Jill Sutton, PhD • **University of Florida**

Poster #37 Exploration of Depressive Symptoms During Substance Use Disorder Treatment
Abstract on p32

Cuneyt Tegin, MD • **University of Louisville**

Poster #38 Association Between Hand Digit Ratio (2D:4D) and Bipolar Disorder
Abstract on p33

Poster Abstracts

1. Metabolomic Signature of Exposure and Response to Citalopram/Escitalopram in Clinical Subtypes of Major Depression – Metabolomics Informs about Disease Heterogeneity

Ahmed T. Ahmed MBBCh, Sudeepa Bhattacharyya PhD,Duan Liu, PhD,Drew Neavin, Yongxian Zhuang, PhD, Ming-Fen Ho, PhD, Joanna M. Biernacka, PhD, Daniel K. Hall-Flavin, MD, William V. Bobo, MD, Michelle K. Skime, Gregory D. Jenkins, Krishna R. Kalari, PhD, Wayne R. Matson, PhD, Michiaki Kubo PhD, Elisabeth Binder, MD, PhD, Liewei Wang, MD, PhD, Boadie W. Dunlop MD, Richard M. Weinshilboum, MD, A John Rush MD, Mark A. Frye, MD, Rima Kaddurah-Daouk, PhD

Background: Major depressive disorder (MDD) is considered to be heterogeneous and multidimensional disease. Hence, it is essential to identify subtypes of MDD for improving treatment outcomes and for prediction. Existing clinical trial datasets could be potentially mapped onto Research-Domain-Criteria (RDoC) constructs allowing investigators to both explore more narrowly defined clinical subtypes and the relationship of these subtypes to biological markers and clinical outcomes approximating RDoC criteria. In this study we use such an approach with the power of metabolomics to define metabolic signatures that inform about the clinical subtypes in MDD.

Methods: *Clinical study:* We used samples from the Mayo Clinic NIH-Pharmacogenomics Research Network-Antidepressant Pharmacogenomics Medication Study (PGRN-AMPS). PGRN-AMPS enrolled 800 MDD patients treated with citalopram/escitalopram. MDD symptoms were assessed with HRSD-17 at baseline, 4-week and 8-week of treatment. *Mapping clinical subtypes:* Using expert review and consensus, we defined three clinical subtypes based on the presence of symptoms severity using 17-item Hamilton Depression Rating Scale scores (HRSD17) as follow: core depression (CD) [items 1(depressed mood) and 7(anhedonia)], anxiety (A) [items 9 (agitation), 10 (anxiety psychological), 11 (anxiety somatic) and 15 (hypochondriasis)] and neurovegetative symptom of melancholia (NVSM) [items 6(late insomnia) and 12(somatic gastrointestinal)]. *Metabolomic Profiling:* A targeted, liquid chromatography-electrochemical coulometric array (LCECA) metabolomics platform was used to measure 31 metabolites within key neurotransmitter pathways tryptophan tyrosine and related purine pathway. *Informatics methods:* Baseline differences as well as differences related to effect of drug on key pathways was investigated. Analyses were conducted separately for 4 and 8 weeks. Linear mixed effects models were also used to determine association between the changes in metabolites and three clinical subtypes.

Results: We evaluated metabolic profiles of 290 subjects in PGRN-AMPS at baseline and metabolic changes during drug treatment in each of the identified clinical subtypes correlating metabolic signatures with clinical outcomes. We will present biochemical findings and metabolic signatures that are common and unique for these clinical subtypes. Common changes include rapid and marked decrease in levels of serotonin in tryptophan pathway, a decrease in MHPG end product of tyrosine/catecholamine pathway and decrease in xanthine/hypoxanthine end products in the purine metabolic pathway. For the depressed clinical subtype we observed unique altered tryptophan metabolism resulting in increased production of indoles including indole 3 acetic acid (I3AA) and indole 3 propionic acid (I3PA). These metabolites are co regulated through human and gut co-metabolism suggesting a possible change in the gut of patients who express this depressed clinical sub type. Expanded biochemical coverage through the use of additional metabolomics platforms is being implemented to define more globally metabolic signatures for the clinical subtypes.

Conclusion: Using expert review and consensus to define clinical subtypes in MDD combined with biochemical data provides insights about disease heterogeneity and enabling steps towards disease subclassification.

2. Real-time Assessment of Mood and Cognition with BiAffect

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Background: Cognitive dysfunction in bipolar disorder has been shown to be present even in the euthymic state. Cognitive dysfunction in bipolar disorder has been associated with poor treatment response and increased risk of relapse. There has been recent attention on digital phenotyping and passive sensing through smart, connected devices to probe cognition in real-world settings. Our passive sensing tool, BiAffect, is a custom-built smartphone keyboard that captures keystroke metadata ('how you type, not what you type'). In previous studies, our group has demonstrated that BiAffect-derived keystroke metadata is associated with mood symptom severity and can be used prospectively to predict changes in mood in patients with bipolar disorder. For the present study, we hypothesized that typing metadata would be significantly associated with cognitive domains measured with traditional neuropsychological testing.

Methods: 18 participants with bipolar disorder and 12 healthy comparison subjects from the Prechter Longitudinal Study of Bipolar Disorder at the University of Michigan were provided a mobile phone with a customized keyboard that passively collected keystroke metadata. Participants also completed a neuropsychological battery including the Tower of London task and the Trail Making Test. Select BiAffect-derived time-based metrics (interkey delay, typing speed) were associated with processing speed and set-shifting on the Trail Making Test. A measure of disorder in typing and time to make a move on the Tower of London were compared using Shannon entropy.

Results: Processing speed, as measured by Trail Making Test (part A), was significantly correlated with average interkey delay (i.e., time since last key, $r = .5$, $p < .001$) and keys/second ($r = -.54$, $p < .001$). Set shifting, as measured by Trail Making Test-Part B, was highly associated with average time since last key ($r = .68$, $p < .00001$) and keys/second ($r = -.62$, $p < .00001$). Participants with bipolar disorder had significant increases in entropy in interkey delay times ($p = .048$, $d = -.83$) and entropy of Tower of London move times ($p = .029$, $d = -.84$). Furthermore, Entropy in interkey delay was significantly associated with entropy in Tower of London moves in participants with bipolar disorder only ($r=.78$, $p=.001$), with a trend level group x association interaction ($p = .05$).

Conclusion: This pilot study demonstrates that passive, unobstrusive smartphone keystroke metadata can be used to probe cognitive function and dysfunction in bipolar disorder, revealing multi-scalar behavioral features accessible through digital assays.

3. Increased Symptoms of Psychosis and Decreased Core Symptoms of Mania and Lifetime Lithium Use in US Bipolar I Patients of African vs European Ancestry

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Introduction: Misdiagnosis is common in bipolar disorder and disproportionally affects racial/ethnic minorities. There is interest in better understanding the contribution of differential illness presentation and/or racial bias to misdiagnosis.

Methods: Utilizing the Genetic Association Information Network (GAIN) public database, this study compared clinical phenomenology between bipolar patients of African vs European ancestry (AA = 415 vs EA = 1,001). The Diagnostic Interview for Genetic Studies (DIGS) was utilized to evaluate individual symptom endorsement anchored to the most severe episodes contributing to diagnostic confirmation of bipolar I disorder (BPI) in AA and EA patients. Lifetime and current medication use was compared between groups.

Results: The symptom of elevated or euphoric mood was significantly less endorsed in AA bipolar patients than in EA patients (94.6% AA vs 97.5% EA, p=0.027). During the most severe episode of mania, AA BPI participants, in comparison to EA BPI participants, had a significantly lower sum of manic symptoms, but a significantly higher sum of psychotic symptoms (Mania: AA – Mean of 7.4 endorsed questions vs EA – mean of 7.7 endorsed questions, p = 0.006; Psychosis: AA – Mean of 1.3 endorsed questions, EA – mean of 1.0 endorsed questions, p = 0.002). AA BPI participants, in comparison to EA participants, had significant lower percentage of lifetime lithium (AA – 52.5% vs EA- 74.2%, p < 0.0001) and mood stabilizing anticonvulsant use (AA – 69.4% vs EA- 79.8%, p = 0.0003).

Conclusion: The differential rate of core manic symptoms and psychotic symptom endorsement from a structured diagnostic interview may represent differential illness presentation that could possibly contribute to misdiagnosis. The symptom endorsement aligns with the medication use pattern of reduced lithium drug therapy utilization. This study is limited by interviewer interpretation of symptom endorsement and therefore potential racial bias cannot be excluded. Incorporation of study methods to eliminate potential racial bias and overall greater participation of bipolar patients of African ancestry in research is a critical future direction to further delineate differential illness characteristics that may have diagnostic and treatment implications.

4. A double-blind randomized placebo-controlled study of aspirin and N-acetyl cysteine as adjunctive treatments for bipolar depression

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Objectives: Neuroinflammation has been implicated in the pathophysiology of bipolar disorder (BD). Some evidence shows that non-steroidal anti-inflammatory treatments (NSAID) have promising antidepressant effects. The antioxidant N-acetylcysteine (NAC) may enhance the effects of NSAID. No study has, however, tested the adjunctive therapeutic benefits of NSAID and NAC in BD.

Methods: The sample included 24 medicated patients diagnosed with DSM-IV BD, aged 18-65 years and with a Montgomery-Åsberg Depression Rating Scale (MADRS) score >20. Participants were randomly assigned to receive either aspirin (1000 mg), NAC (1000 mg), combined aspirin and NAC, or placebo. Data was collected between 2013 and 2017. The primary outcome was a ≥50% reduction in MADRS scores. Participants completed mood and global functioning questionnaires. They also underwent blood tests prior to and following 8 and 16 weeks of treatment. A Bayesian analytical method was adopted and posterior probability distributions were calculated to determine the probability of treatment response.

Results: Following the first 8-week treatment phase, individuals on placebo and NAC+aspirin had similar probability for successful treatment response (~70%). Following a 16-week treatment period, NAC+aspirin was associated with higher probability of treatment response (67%) compared to placebo (57%), NAC (55%), and aspirin (33%). There was no treatment effect on IL-6 and CRP levels at either 8 or 16 weeks.

Conclusion: The co-administration of NAC and aspirin over a period of 16 weeks was associated with a reduction in depressive symptoms. The adverse effects were minimal. These preliminary findings may serve as a starting point for future studies assessing the efficacy, tolerability, and safety of anti-inflammatory and anti-oxidant agents in the treatment of bipolar depression.

Trial Registration: This study is registered with ClinicalTrials.gov, number NCT01797575.

5. Depression, food insecurity and diabetic morbidity: Evidence from the Health and Retirement Study

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Objectives: There is growing appreciation of the role of food insecurity in disparities in diabetes outcomes, but less known about how this experience relates to other psychosocial factors that are important in diabetes management, such as depression. This study examines the pathways linking food insecurity and depression among older adults with diabetes.

Methods: Data come from respondents in the 2010–2014 waves of the Health and Retirement Study with a history of diabetes (n=2,951). Weighted logistic regression models evaluate cross-sectional associations between food insecurity and diabetic morbidity (2012). Logistic regression was also used to assess relationships of food insecurity and diabetic morbidity with depressive symptoms, both cross-sectionally

and longitudinally (2012 to 2014). Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D). Path analysis, a type of structural equation modeling, was used to determine whether diabetic morbidity mediates the relationship of food insecurity with depression.

Results: Severe food insecurity was associated with 2.18 (95% CI=1.28-3.73) higher odds of not having diabetes under control and a 1.92 (95% CI=1.14-3.23) times higher odds of kidney trouble associated with diabetes. Severe food insecurity was associated with a 2.60 (95% CI=2.09-3.22) higher odds of depression cross-sectionally and a 1.71 (95% CI=1.34-2.18) higher odds longitudinally. Diabetic morbidity explained 9% (95% CI=2-16%) of the association of food insecurity with depressive symptoms in 2012 and 15% (3-27%) of the association with new depressive symptoms in 2014.

Conclusion: Food insecurity is associated with risk of depressive symptoms among older adults with diabetes. Interventions that reduce food insecurity among older adults with diabetes may improve disease management and reduce depression severity.

6. Is breastfeeding protective against postpartum depression?

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Objectives: Postpartum depression (PPD) is a devastating illness that affects the health and relationships of 1 in 7 women and their children. Many studies have demonstrated that postpartum depression is associated with a decrease in breastfeeding and earlier cessation of breastfeeding. This is detrimental, as breastfeeding provides numerous benefits for mothers and babies. However, the reverse correlation has been less extensively studied. If a reciprocal relationship existed and breastfeeding is protective against PPD, then a plausible intervention to prevent PPD would be to help women continue breastfeeding. Our objective was to review the literature on the relationship between breastfeeding cessation and postpartum depression.

Methods: A PubMed literature search was conducted using a combination of the search terms “postpartum depression,” “breastfeeding,” “cessation,” and “lactation.” All 9 studies included were found through this literature search or the reference section of these articles.

Results: The majority of studies found that current breastfeeding and breastfeeding frequency correlated with fewer symptoms of postpartum depression, and that current formula feeding was a risk factor for the development of postpartum depression. One study showed that breastfeeding cessation was predictive of increased development of postpartum depression.

Conclusion: Breastfeeding may be protective against the development of postpartum depression, and breastfeeding cessation may be a risk factor for developing postpartum depression. More extensive research is needed in this area, but the current evidence base should encourage physicians to provide breastfeeding support for their patients who are new mothers.

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7. A mixed-methods assessment of patient and clinician attitudes towards the Mood Outcomes Program

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Objectives: The Mood Outcomes Program (MOP), a measurement-based care system established by the National Network of Depression Centers (NNDC), is utilized in the Adult Mood Disorders Clinic at the Johns Hopkins Bayview Medical Center. Patients complete four brief self-rated assessments (PHQ-9, GAD-7, ASRM, C-SSRS) before each visit on an electronic tablet in the waiting room. The questionnaire results are immediately available in graph form, which enables the clinician and patient to visually review the patient’s progress over the past twenty visits. The primary aim of the study was to assess the benefits, drawbacks, and logistical challenges of the MOP. The secondary aim was to work with patients and clinicians to identify potential solutions to the drawbacks and logistical challenges.

Methods: Seven clinicians (M age=42, 57% female) and 33 patients (M age=43, 70% female) from the Adult Mood Disorders Clinic at Bayview participated. Seven clinicians and five patients completed both a written survey and an individual in-depth interview, and 28 patients completed a written survey. Surveys and interviews assessed sociodemographic information, frequency of MOP use, and attitudes towards the MOP. Quantitative data was summarized descriptively, and qualitative interview transcripts were coded using a codebook developed through multiple iterations utilizing both a bottom-up and top-down approach.

Results: Patients and clinicians tended to agree that using the MOP and discussing the results has been useful, has improved healthcare, has been comfortable, and is something that they would like to continue. Participants reported that the benefits of the MOP include the capability to concretely and jointly track progress, create goals, assess symptoms, analyze treatment outcomes, and improve communication and collaboration. Suggested solutions to the drawbacks and logistical challenges include addressing problems with tablets, allowing patients to complete measures and access graphs at home, expanding the options of measures delivered, and adding clinical cut-offs and a space for notes on the graphs.

Conclusion: Overall, both clinicians and patients viewed the MOP as a useful, meaningful, and feasible component of outpatient mental health treatment in a community psychiatry setting. Future efforts should focus on improving the breadth of measures delivered, as well as enhancing both the accessibility and the clinical utility of the results.

8. Bipolar Illness in Pregnancy: Obstetric Outcomes and Rates of Comorbid Diseases Highlight the Need for Collaborative Care

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Introduction: The risk of recurrence of depression or mania for pregnant women with bipolar disorder can be as high as 70% with more than 2/3 of these women discontinuing their mood stabilizers. The remaining 1/3 continued psychotropic medications yet still had recurrences. Although the risks are small, prospective mothers remain concerned for birth defects, poor pregnancy and neonatal outcomes with continuing their lithium and other psychotropic medications. However, untreated bipolar disorder also bears great perinatal risk for mother and child. We conducted a preliminary study of women enrolled in the Prechter Bipolar Longitudinal Research Study to examine aspects of their psychiatric conditions, medical conditions, and pregnancy outcomes.

Methods: Participants in the initial phase of this data analysis included 280 women with bipolar disorder who enrolled in a longitudinal study and reported history of pregnancy at their baseline assessment. These women identified as white (82%), black or African American (9%), and more than one race (7%). Reports of marital status included 44% married, 27% divorced, 5% separated, 2% widowed, and 22% never married. Mean age at time of enrollment was 43.7 years (SD 11.2). Comorbid anxiety conditions included social phobia (20%), panic disorder (20%), and PTSD (18%). Comorbid alcohol dependence was reported by 30% and other substance dependence by 25% of participants. Comorbid medical conditions included anemia (38%), asthma (26%), goiter/thyroid disease (29%), overweight (62%), migraine (48%), and head injury (27%). A second phase of this research project included a questionnaire developed by the multi-disciplinary team which assessed recurrence of depression, mania and mixed episodes during pregnancy, pregnancy outcomes and use of complementary or alternative treatments.

Results: In the original sample of 280 women with bipolar disorder the mean age at onset of bipolar illness was 17.5 years (SD 8.3). Mean number of mania episodes prior to study enrollment was 8.2 (SD 24.4). Mean number of depressive episodes was 25.9 (SD 44.1). Mean number of hypomania episodes was 30.7 (SD 67.6). Self-report of obstetric outcomes was obtained for 245 (87.5%) of the sample. These women reported 646 pregnancies, 365 live births, 167 pregnancies losses [93 abortions, 70 miscarriages, and 4 stillbirths or deaths of infant in first week of life]. In the second phase of this research project, additional women were identified and 359 surveys were emailed to potential participants with 91 completed surveys (39% response rate). Among those who responded, 47 (55%) reported no recurrence during pregnancy, 20 (24%) reported recurrence of depression during pregnancy, 8 (9%) reported recurrence of mania during pregnancy, and 20 (24%) reported mixed episodes during pregnancy. Of these, 27 (32%) reported trying complementary or alternative treatments with 9 (33%) reporting engagement in yoga, 21 (77%) reporting exercise, 15 (57%) reporting mindfulness, and 5 (19%) reporting other.

Discussion: For many women with bipolar disorder, the risks of birth defects due to medications are balanced against the risks of a recurrence of mania or depression if no medications are taken during pregnancy. Most physicians support use of traditional treatment with mood stabilizing medications such as lithium and low-dose antipsychotic medications. Complementary and alternative treatment strategies should be considered. Pregnant women with bipolar disorder face extremely difficult decisions related to their psychiatric care as well as significant concerns about obstetric and fetal safety. These data also highlight the importance of integrated care among obstetricians, psychiatrists, and primary care providers.

9. Suicides and Accidents: Comparing Opioid Related Deaths in Maryland

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Background: As rates of both suicide and opioid use continue to increase in the United States, they should not be mistaken for independent epidemics; it is important to evaluate the synergistic burden that each issue exerts on the other. Opioid use increases risk for depression and suicide, lowers inhibition, and is potentially lethal. Suicide rates are often underestimated, and evidence suggests a large proportion of deaths classified as accidents are likely suicides. This study contributes to the identification of intentionality in opioid deaths by comparing the characteristics of cases determined to be suicides and accidents in the state of Maryland — a state with a high rate of opioid related deaths, and a thorough state-wide Medical Examiner (ME) system where only definitive cases are labeled suicides or accidents, leaving most of opioid deaths 'undetermined.'

Background: To identify characteristics of carefully determined suicides as distinguished from accidents among opioid related deaths.

Methods: Descriptive data on all 3,048 opioid related Maryland deaths (2006-2017) were attained from the ME. Decedents were divided into ME-determined suicides and accidents. Opioid involvement was determined by toxicology. Logistic regression was run adjusting for demographics, toxicology results, and cause of death to generate relative odds ratios.

Results: Among opioid-positive decedents, death by poisoning comprised 63% of accidents and 38% of suicides. Controlling for other factors, suicide decedents were more often Caucasian (OR 2.4, 95% CI 1.9-3.0, p<0.001), over age 60 (OR 1.5, 95% CI 1.2-1.9, p<0.001), and taking antidepressants (OR 1.5, 95% CI 1.2-1.8, p<0.001). They were less likely to have taken multiple drugs and to have died by poisoning. There was no difference in sex or alcohol intoxication.

Conclusion: Designing appropriate interventions requires an etiologic understanding of opioid-related deaths. While characteristics of opioid-related suicides and accidents are similar, but such deaths are more likely to be suicide when the decedent is Caucasian, over 60, on antidepressants, and not taking other drugs.

10. Inflammation as a moderator or outcome with combined interventions for bipolar II depression

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Background: There has been limited prospective study, most focusing on bipolar I disorder, to discern potential state-related differences in inflammation in bipolar disorder. Almost nothing is known about these factors in bipolar II disorder. Data suggests that pro-inflammatory cytokines may be elevated with abnormal mood states. If abnormal mood states are related to elevations in cytokines in bipolar disorder, then treatment of these mood states has the potential to normalize peripheral markers of inflammation.

Methods: Using data from a randomized clinical trial of Interpersonal and Social Rhythm Therapy (IPSRT) + quetiapine vs. IPSRT + placebo for bipolar II depression, we examined whether treatments for bipolar II depression impact inflammatory cytokines and to what degree this mirrors changes in depressive symptomatology as measured by the Hamilton Rating Scale for Depression (HRSD-17).

Results: Cytokine values were available for 33 participants who completed baseline and 20 week follow-up. After excluding those with CRP values >= 10 mg/L, there were 27 patients available for analysis (IPSRT+quetiapine N=10, IPSRT+placebo N=17). Baseline measure of inflammation did not appear to moderate response, nor was change in HRSD-17 score correlated with changes in cytokines. Those who received IPSRT+quetiapine saw significantly greater increases in IL-6 (p=0.02) and TNF-α (p=0.04), even after adjusting for body mass index. Descriptively, the pattern of cytokine changes appeared to differ between the two groups with the quetiapine group showing increases in pro-inflammatory and decreases in anti-inflammatory cytokines and the psychotherapy group showing reduced pro-inflammatory cytokines.

Discussion: This small study suggests a worsening cytokine profile over time with quetiapine plus psychotherapy compared to psychotherapy alone. Larger experimental studies are needed to discern potential differential effects of treatment strategies for bipolar II depression on cytokines. The elevated risk of cardiovascular morbidity and mortality among those with bipolar II disorder underscores the clinical relevance of this work.

Trial Registration: ClinicalTrials.gov Identifier: NCT00411463

Funding: NIH R01MH08431 (Holly A. Swartz)

11. Clinical, Cognitive, and Brain-Based Markers of Late Life Mood Disorders: A Multi-Site Registry Project

Geriatric Mood Disorders Task Group (National Network of Depression Centers)

Background: Most studies of late-life depression and bipolar disorder suffer from small, demographically homogenous sample sizes, reducing the ability to generalize findings to the broad population of older adults experiencing mood disorders. Multi-site studies can overcome some of the limitations inherent in single-site designs by including larger sample sizes and increased participant diversity.

Methods: The Geriatric Mood Disorders Task Group has been developing a multi-site data registry that capitalizes on existing data collected by members of the Task Group at different institutions. This project combines clinical, neuropsychological, and resting state fMRI data collected among older adults with depression, bipolar disorder, and no history of mental illness.

Results: Our analysis plan includes examination of between-group differences and identification of clinical predictors of neuropsychological and brain network functioning. We will also examine heterogeneous data sources (clinical, neuropsychological, neuroimaging) across geriatric mood disorders for transdiagnostic characterization of the population to capture "biotypes" consistent with the RDoC framework.

Conclusion: We describe some of the challenges in creating a multi-site registry and how such a project can lead to NIH funding.

12. Feasibility and Acceptability of a Mobile Application (MHi-GO) for Medication Adherence and Mood Tracking in Mood Disorders: A Pilot Study

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Background: Mood disorders, including depression and bipolar disorder, are important public health concerns with significant costs to society. There are a number of treatments for these disorders, but they are not always effective and even when they are patients often do not adhere to prescribed regimens. There has been growing interest in using mobile technology to address the challenges of treatment in psychiatry. The aim of this study was to evaluate the feasibility and acceptability of using MHi-GO (Mental Health Integrated Care and Research On-the-Go), a mobile application for medication adherence and mood tracking for patients with mood disorders, in a busy, urban outpatient psychiatry clinic.

Methods: MHi-GO is a cross-platform modular app designed using the Ionic framework. The initial build includes a medication module, follow up (appointment) module, survey module, and progress module. In this pilot study, ten participants 18 years or older with a mood disorder and currently taking an antidepressant received treatment-as-usual augmented with the app. They were asked to use the app to complete a daily single item survey on mood and document medication adherence.

Results: Participants were in the study for an average of 60 days and demonstrated app activity for approximately half of the study duration. The medication and follow-up appointment modules were accessed most often. The average survey response rate was 59.87%, while the average medication response rate was 37.36%. Rates were higher among patients who reported better mood status. Participants reported satisfaction in app friendliness and ease of use.

Discussion: This is a small pilot study in which participants found a mobile app easy to use and enjoyed the medication and appointment reminders. We envision this as a first step in developing MHi-GO to be a platform that can be used with the Mood Outcomes Program to enhance the power and capabilities of the measurement-based program in collaboration with our partners in the National Network of Depression Centers.

13. Is there a relationship between impulsivity and aggression on suicidal behavior in psychiatric adult inpatient cohort?

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Clinicians face a daunting challenge of determining the factors that may increase an individual's risk for suicide. In a general population sample, individuals that had attempted suicide scored higher on measures of aggression and impulsivity. This relationship appears to hold true in the psychiatric inpatient population. Inpatients who had a history of aggression were more likely to have made a suicide attempt and among inpatients diagnosed with major depressive disorder, previous suicide attempters scored higher on impulsivity. However, other investigators found that a history of aggression in inpatients did not differentiate those who attempted or committed suicide from those who did not attempt or commit suicide. In order to clarify this relationship, we examined aggression, impulsivity, and suicidal behavior in a sample of adult psychiatric inpatients. Adult psychiatric inpatients (n = 199) participated in a psychometric evaluation study. Past month suicidal behavior (preparatory actions, suicide attempt, interrupted attempt, aborted attempt) was reported on the Columbia-Suicide Severity Rating Scale (C-SSRS). Past month aggression (yes/no) and impulsivity (yes/no) were reported on an investigator-designed risk assessment measure (RAM). We performed a series of logistic regression analyses to examine whether aggression and impulsivity were significant predictors of suicidal behavior. Aggression was not a significant predictor of preparatory acts ($p = 0.92$), interrupted attempt ($p = 0.40$), or actual attempt ($p = 0.31$). However, inpatients who reported aggression were 3.06 times more likely to have aborted an attempt in the past month (Wald = 6.29, $p = 0.01$). Impulsivity was not a significant predictor of preparatory acts ($p = 0.95$) or interrupted attempt ($p = 0.11$). Inpatients who reported impulsivity were 3.13 times more likely to have aborted an attempt (Wald = 4.04, $p = 0.04$) and 3.60 times more likely to have made an actual attempt (Wald = 12.38, $p < 0.01$). Since both aggression and impulsivity were significant predictors of aborted attempt, we ran a logistic regression including both traits as predictors. Aggression remained a significant predictor of aborted attempt (Wald = 3.79, odds ratio = 2.47, $p = 0.05$) but impulsivity was no longer a significant predictor (Wald = 2.02, odds ratio = 2.32, $p = 0.16$). In our sample of adult psychiatric inpatients, recent history of aggression and impulsivity were associated with an increased risk of recent suicidal behavior. Previous studies examined aggression and impulsivity as risk factors for suicide attempt. Our use of a standardized suicide assessment enabled us to examine these traits as risk factors for a range of suicidal behaviors. Future studies should confirm these results by utilizing standardized instruments to assess suicidal behavior, aggression, and impulsivity.

14. GABAergic neuroactive steroids across the menstrual cycle and in response to stress in Premenstrual Dysphoric Disorder (PMDD)

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Background: Allopregnanolone (ALLO), a progesterone metabolite, is a potent gamma-aminobutyric acid (GABA) agonist. It is responsive to acute stress, and evidence suggests dysregulated ALLO function in premenstrual dysphoric disorder (PMDD). We investigated ALLO response to a laboratory stressor in the follicular (F) and luteal (L) phases of the menstrual cycle (MC) in women with PMDD and female controls. We hypothesized that ALLO response to stress would differ between the PMDD and control groups, and across MC.

Methods: Female participants (controls, PMDD) underwent a threat of shock laboratory stressor during the F and L phases in a within-subject design. Blood was drawn 15 minutes pre- stressor and 30 minutes post-stressor; ALLO was assessed via gas chromatography mass spectrometry (GC/MS). PMDD diagnosis was confirmed with prospective symptom tracking across two MCs. ALLO measures were log transformed for normality. Linear mixed models assessed differences by group, MC phase, and pre/post stressor.

Results: Averaged across the MC, the PMDD group (n = 9) had higher ALLO levels ($p=0.0134$), such that women with PMDD had significantly elevated ALLO levels in the F phase compared with controls (n = 14) ($p = 0.0027$), but this group difference decreased in the luteal phase ($p = 0.0517$). There were no differences in ALLO response to stress between groups ($p= 0.642$).

Conclusion: Women with PMDD differ in peripheral ALLO levels from healthy controls, particularly in the F phase. However, ALLO response to acute stress did not differ in the PMDD group compared with controls. Future work should assess whether ALLO levels are associated with PMDD symptom severity or physiologic response to stress.

15. Cultivating Wellness In Physician Trainees: The Intern ProSkills Project

Matthew J. Hughes MD, Heather E. Schultz MD MPH, Kathryn Baker MD

Background: Resident physicians are particularly vulnerable to burnout, with alarming depression rates (28.8%) that are higher than age-matched controls, though rates of treatment seeking are lower.

Purpose: To develop a preventative model to teach residents coping skills and build resilience to burnout and depression.

Methods: The design of ProSkills is a combination of process group ("Pro") and cognitive skills training ("Skills"). During their months on psychiatry rotations (50% of the year), interns met twice monthly with a consistent faculty psychiatrist and chief resident for a 60-minute process group. Emphasis was placed on creating a "safe" space in which interns could express emotions and concerns without repercussion. The last 30 minutes were used to teach mindfulness and cognitive skills. To track effectiveness, a Qualtrics survey was created consisting of numerous mental health scales including PHQ9, GAD7, MBI, SF self-compassion scale, MAAS, and brief resiliency scale. This survey was sent to all psychiatry residency classes before ProSkills began and then quarterly for the academic year.

Results: In the intern class, mean PHQ-9 scores increased after the beginning of intern year. Mean burnout level tested by MBI was in the low to moderate range and did not vary significantly over the course of intern year. Self-compassion scores, mindfulness, and resilience remained stable.

Discussion: Further data is yet to be collected given that this is a pilot study with a small initial sample size.

Conclusion: While interns did not report a significant increase in resilience, mindfulness, or self-compassion scores, levels of burnout remained stable, which may reflect a benefit of the program.

16. Nitrated meat products are associated with mania in humans and altered behavior and brain gene expression in rats

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Background: Mania, the defining mood state of bipolar disorder (BPD), is a serious neuropsychiatric condition associated with significant morbidity and mortality. While genome-wide association studies (GWAS) have identified several genetic risk factors for BPD, the large gap in estimated heritability between GWAS and family studies suggests a significant role for the environment in mediating and propagating illness.

Methods: To better understand potential relationships between environmental exposures and neuropsychiatric illness, we conducted an exposure survey for specific food products in a cohort of 1101 individuals with and without psychiatric diagnoses. Finding that individuals hospitalized with mania had a markedly increased dietary history for cured meat, we modeled this association in rats. In a series of three experiments, adult male Sprague-Dawley rats were provided commercially-available processed beef jerky, preservative-free beef jerky, or a purified beef-based diet with or without nitrates. Rats were evaluated for mania-like behavior through 22-hour locomotor activity monitoring and novel environment exposure. Hippocampal tissue, intestinal fecal matter, and blood plasma were collected for microarray, microbiome analysis, and immunoassay-based cytokine analysis respectively.

Results: Individuals hospitalized for mania were significantly more likely to have a have a history of cured meat consumption compared to control individuals without psychiatric illness (adjusted odds ratio 3.49, 95% confidence interval 2.24-5.45, $p < 9 \times 10\text{-}8$). Rats exposed to commercially-available cured meat exhibited overall locomotor hyperactivity and hyperactivity within a novel environment compared to rats on a control diet, whereas rats consuming a meat product prepared without preservatives behaved similarly to controls. Given these results and evidence suggesting dysregulation of nitric oxide levels, which can vary with levels of dietary nitrate intake, in patients with BPD, we evaluated the effects of consumption of a purified beef-based diet with or without added nitrate in rats. We found that rats consuming the added nitrate diet also exhibited overall and novelty-induced hyperactivity compared to rats consuming the non-nitrate diet. Microarray analysis of hippocampal tissue revealed dysregulation in several pathways including those relating to serotonin receptor signaling, nuclear factor κB signaling, bacterial pattern recognition – all of which have been implicated in human BPD – and sphingosine-1-phosphate signaling in rats consuming nitrate-prepared meat. Microbiome analysis of intestinal fecal matter also showed increased levels of two bacterial taxa, *Lachnospiriceae* and *Erysipelotrichales*, in these animals. Finally, cytokine analysis of blood plasma indicated significant changes in several pro- and anti-inflammatory cytokines in nitrate-exposed rats, suggesting an overall phenotype of immunosuppression.

Conclusion: Taken together, the human and rodent results suggest that consumption of nitrated meat products may be one environmental factor contributing to mania. Rodent studies further revealed that the association between nitrated meat consumption and mania may be mediated by changes to the gut microbiome and peripheral immune profile. Further investigation of this association and potential contributing mechanisms is needed prior to altering clinical recommendations for patients at risk for mania.

17. Kynurenine Pathway Activity in Placenta and Blood Predicts Peripartum Depression

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Background and Aim: Depression is common during and after pregnancy (peripartum depression, PPD); affecting up to 20% of pregnant women. Women with PPD are proposed to constitute a group where immunological mechanisms are likely involved in the generation of depressive symptoms, due to the profound changes of the maternal immune response during pregnancy. Placental tissue express all the enzymes of the kynurenine pathway, with indoleamine 2,3-dioxygenase (IDO) being highly expressed and involved in maternal-fetal tolerance mechanisms. The prominent expression and activity of the kynurenine enzymes in human placenta may elevate the secretion of metabolites into the blood stream. Kynurenine and its metabolites might enter the brain, generating neuroinflammation and altering glutamate neurotransmission. Here, we studied whether PPD is a specific form of inflammation-induced depression, mediated by a dysregulated kynurenine pathway in placenta.

Methods: 118 women were enrolled in the first trimester at Spectrum Health, Grand Rapids, Michigan. They were assessed at four time-points during and after pregnancy (1st, 2nd, 3rd trimester and the post-partum) with blood samples and psychiatric evaluation. Placentas were collected at delivery. A score on the Edinburgh Peripartum Depression Scale (EPDS) of 13 and above was used as a cut-off to indicate patients with significant current depressive symptoms. Plasma was analyzed for tryptophan (TRP), kynurenine (KYN), quinolinic- (QUIN), picolinic- and kynurenic- (KYNA) acids using liquid chromatography–mass spectrometry and gas-chromatography-mass spectrometry. Interleukin 6 was measured using high-sensitivity electrochemiluminescence. Placentas were analyzed for expression of IDO, ACMSD and QPRT using qPCR.

Results: 22 of 118 women had significant/severe depressive symptoms at visit A, 12 at visit B, 14 at visit C and 12 at visit D. The expression of the kynurenine enzymes in placental tissue, in particular IDO, at delivery was associated with both the degree of inflammation and kynurenine metabolites in the blood of the pregnant women. The mean plasma levels of QUIN increased over time in pregnancy, and the increase was greater in the women that developed depression. In the third trimester, mean plasma QUIN was 893.4±111.3 (±SEM) pg/ml in women with depression vs 619.2±22.5 (±SEM) pg/ml in healthy pregnancy control women (ß=0.32, $p<0.005$, linear regression, QUIN predicting depression). After delivery, the QUIN levels decreased back to those of non-depressed women. We also found that a biomarker index consisting of IL-6, the KYN/TRP ratio (pathway induction), and QUIN/KYNA ratio ("neurotoxic" index) at visit A and B predicts the development of depression at later timepoints (3rd trimester and post-partum). Predictions were based on blood samples as early as the first trimester (ROC analysis, AUC 85% for prediction of depression in the third trimester based on a blood sample from the second trimester).

Conclusion: We found that kynurenine metabolites in plasma predicted the development of depressive symptoms during pregnancy. The expression of IDO in placental tissue was associated with inflammation and metabolite levels in the blood, suggesting a significant role of the placenta in generating biological changes triggering depression during pregnancy.

18. Adoption of Mobile Apps for Depression and Anxiety: Results from a Survey on Patient Interest and Barriers to Engagement

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Background: Effective treatments for depression and anxiety exist, but most people in need do not receive them owing to logistical barriers (e.g., cost, transportation, daytime availability for weekly in-clinic appointments) and an insufficient supply of clinicians trained to provide evidence-based psychotherapy, which is a first line treatment in most cases of depression. Scalable treatment options are essential if we are to address the massive public health burden of depression and digitally-delivered interventions offer one such option. Despite promising efficacy research and ease of access, adoption of mHealth (mobile device-based) depression interventions has been limited. More insight into patients' perspectives is required to create effective implementation strategies.

Methods: This was a cross-sectional survey study of Veterans who had attended an appointment at a single Veterans Health Administration (VHA) facility in early 2016 that was associated with one of the following mental health concerns: unipolar depression, any anxiety disorder, or post-traumatic stress disorder (PTSD). We used the VA Corporate Data Warehouse (CDW) to extract a set of eligible participants and selected 400 of these participants at random to mail a paper survey with items addressing the following: demographics, overall health, mental health, technology ownership/use, interest in mobile app interventions for mental illness, reasons for use/nonuse, interest in specific features of mobile apps for mental illness.

Results: Of the 400 potential participants,149 (37.3%) completed and returned a survey. 79.9% reported that they owned a smart device and 73.1% reported that they were interested in using an mHealth intervention, but only 10.7% had done so. Paired-samples t-tests indicated that ratings of interest in using an app recommended by a clinician were significantly greater than general interest ratings and even greater when the recommending clinician was a specialty mental health provider. Additionally, greater severity of depression (measured by the PHQ-8) and greater severity of anxiety (measured by the GAD-7) were both associated with higher interest ratings. The most frequent concerns related to using an app for mental illness were lacking proof of efficacy (71.8%), privacy concerns (59.1%) and not knowing where to get one (51.0%).

Conclusion: Most respondents had access to devices to use mobile apps for mental illness and were interested, but were not using these apps. Those with higher symptom severity reported greater interest. Key factors that may improve adoption include provider endorsement, greater publicity of efficacious apps, and clear messaging around efficacy and privacy of information.

19. Reducing Medical Transfers of Patients within 48 Hours of Psychiatric Admission

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Background: Adults with mental illness are accounting for a growing percentage of patients presenting to emergency settings, often with medical concerns in addition to psychiatric crises.1 There is debate within the medical community about what constitutes adequacy of medical clearance for this population, although best practices are emerging.2 In addition, many patients, while hospitalized for psychiatric care, may ultimately incur significant medical comorbidity necessitating transfer for further stabilization.3 While a fundamental goal is appropriate triage of patients and prevention of clinical deterioration for those psychiatrically hospitalized, early recognition and intervention within the inpatient setting is crucial.4 To address these concerns and attempt to reduce the number of patient transfers within 48 hours of arrival from psychiatric to medical settings, a quality improvement initiative was undertaken.

Methods: An interprofessional team identified organizational concerns and challenges of patients having significant medical issues compromising optimal psychiatric care of inpatients. Strategies were developed to intervene early in the admission process to ascertain if quality of care and appropriateness of placement for adults could be improved. Among other actions, these strategies included developing a unit-level medical review and pre-admission screening process having both physician and nursing input; providing feedback to colleagues in consultative, emergency, and medical settings to promote co-management; improving collaboration with internal medicine consult services; and conducting quality reviews that provide additional interdisciplinary education on the identification and management of medical issues.

Results: Retrospective review indicates that there has been a 35% reduction in patient transfers from the psychiatric to medical setting within 48 hours of admission. During this same period, there was actually a downward trend in percentage of patients receiving general and subspecialty internal medicine consultations, from 15% to 11% of the psychiatrically hospitalized population.

Conclusion: Utilization of several strategies including an interprofessional team-based protocol to screen for pre-admission medical concerns in adults slated for psychiatric admission from emergency and consultation settings in a tertiary academic medical center has yielded a significant reduction in the percentage of patients necessitating subsequent transfer to medical settings.

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20. Rates of positive screens for bipolar disorder in pregnant and postpartum women and associated risk factors

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Background: Bipolar disorder affects 2-8% of pregnant and postpartum women. Women are at increased risk for new-onset and relapse of bipolar disorder during the perinatal period, and untreated illness is associated with poor maternal and infant outcomes. The objectives of this study were to describe: (1) rates of women who screen positive for bipolar disorder in the obstetric setting; (2) their associated risk factors; and, (3) their participation in treatment.

Methods: Pregnant and postpartum women were recruited from 14 obstetric practices in Massachusetts. Primary data were collected regarding obstetric and psychiatric care. Depression screenings were done with the Edinburgh Postnatal Depression Scale (EPDS), bipolar disorder screenings with the Mood Disorder Questionnaire (MDQ), and substance use screenings with the Parents, Partners, Past, and Pregnancy screen (the 4Ps).

Results: The analysis included 575 participants. Almost one-fifth of the total sample (18.8%) screened positive for bipolar disorder. The likelihood of a positive bipolar screen was significantly increased amongst those who: (1) received prior pharmacotherapy (adjusted odds ratio (aOR): 3.3, 95% CI: 1.8-5.8); (2) self-reported need but were not receiving psychiatric treatment in the prior 3 months (aOR: 3.4, 95% CI: 1.7-6.5); and, (3) screened positive for substance abuse (aOR: 13.4, 95% CI: 2.3-78.9). One-fifth who screened positive for bipolar disorder reported receiving psychiatric pharmacotherapy currently (20.0%) and less than one-third reported current psychotherapy participation (31.0%).

Conclusion: In comparison to previously published literature, positive bipolar disorder screening rates were higher than anticipated in our sample of pregnant women. Less than half of the sample that screened positive were receiving evidence-based treatment, despite the fact that they were more than three times as likely to report feeling they needed psychiatric help. Our data suggest that there is a gap in care that needs to be addressed in order to connect perinatal women who screen positive for bipolar disorder to care. Given that frequent medical care is provided to pregnant and postpartum women in the obstetric setting, it is an ideal place to help do this.

21. Education, Research, & Care: Building a Mood Disorders Center at the University of Iowa

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Background: In 2016, we formalized and officially founded the University of Iowa Mood Disorders Center, specifically designed to bring together the University of Iowa team of 100+ researchers, physicians, residents, psychotherapists, social workers, nurses, occupational therapists, music therapists, medical assistants, students, and dedicated volunteers that are working daily in research labs, outpatient clinics, inpatient units, support groups, and classrooms to improve the lives of people with bipolar disorder and major depression.

Methods: With our focus on changing the lives of those with depression and bipolar disorder, we have spent the past two years creating new clinical programming including three new support groups: an inpatient mood disorders group, a group for medical students experiencing mental illness, and an outpatient depression and bipolar disorder support group. In 2017, we launched the Treatment Resistant Mood Disorders Consultation clinic, and a monthly Case Conference, and. In 2018, we added a psychologist led ACT Group Therapy course. In 2019, we aim to hire an additional psychiatrist and continue expanding our new clinical services. To improve research, the MDC has fostered over a dozen collaborations with faculty across 6 departments on the UI campus to facilitate recruitment through our research registry, provide assistance in protocol writing and IRB approvals for new investigators, and increase awareness of research opportunities at UI through marketing and education seminars. Education initiatives aimed at patients, families, students, staff, faculty, residents, and administration include presentations at Grand Rounds, community talks, psychoeducation for patients, and psychopharmacology lectures.

Results: The MDC is creating a culture of collaboration across departments, disciplines, and patient/clinician relationships so that we work together to create solutions that are informed by a wide lens and focused on in-the-moment outcomes for patients. The MDC Research Registry now has 471 participants and has been utilized over a dozen times for grant writing and recruitment for clinical trials.

Conclusion: The University of Iowa Mood Disorders Center has seen progress in clinical services provided to patients with mood disorders, educational efforts for health care providers, and research collaboration across campus. Despite the progress made, the MDC and the patients served need better access to psychiatrists, psychotherapists, and effective treatments. The MDC seeks opportunities for development of educational programming for clinicians and researchers-in-training, community outreach, and delivery of services.

22. Safe Administration of Electroconvulsive Therapy in Patient with Pericardial Effusion

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Background: Electroconvulsive therapy can be a fast and effective treatment for patients with acute mania that have not responded to other treatments. Although there are no absolute contraindications to ECT, certain medical conditions relating to the cardiovascular system may increase the mortality risk associated with ECT. Therefore, it is important to adequately weigh the risks and benefits of ECT in a patient with significant cardiac history.

Case: A 69 year-old male with a history of pericardial effusion, chronic osteoarthritis, anemia, hypertension, bipolar 1 disorder presents under involuntary admission for aggression, disorganized behaviors in the context of medication noncompliance noted by his caregiver. On initial evaluation, patient was noted to be euphoric, illogical and expansive. Patient mentioned that he had not been able to sleep for an unspecified amount of time. He reported that he had a lot of energy and that he had been exercising a lot. He stated that he can read minds and "bend men into steal." He did not feel that he needed treatment because his mood was great. One year prior, patient was hospitalized for about 2.5 months for a similar presentation of mania. After failing on multiple antipsychotics including Perphenazine, Olanzapine, Fluphenazine, Loxapine, Risperidone, Haloperidol and multiple mood stabilizers including Depakote and Lithium, ECT was pursued for his treatment-resistant mania. However, his chest x-ray on admission showed cardiomegaly and a follow-up echo showed a moderate pericardial effusion. Cardiology was consulted but did not indicate need for pericardiocentesis because he was hemodynamically stable. Nine ECT treatments were administered and patient showed much improvements and was discharged on Haloperidol and Trazodone. During this admission, he was restarted on Haloperidol for mood stabilization and was eventually given Haldol Decanoate IM one week after hospitalization. Multiple sleep aids were initiated without success including Trazodone, Benadryl, Ambien, Ativan and Clonazepam. Patient's symptoms continued even with the addition of a second antipsychotic, Olanzapine, so ECT was reconsidered. His most recent TTE before admission showed a stable, moderate pericardial effusion and a repeat TTE showed an effusion similar in size. Given limited available literature on pericardial effusion and ECT, Cardiology and Anesthesia were asked to further evaluate the patient for ECT. It was determined that he had no clinical evidence of hemodynamic compromise given that his blood pressure was on the hypertensive side and he was not tachycardic. Regarding any planned sedation or anesthesia with his effusion, adequate hydration was advised to avoid hypotension. Patient subsequently received 6 ECT treatments. He showed marked improvements and was discharge on Haloperidol Decanoate every 30 days given his history of medication noncompliance.

Background: Cardiovascular complications during ECT remain a cause of morbidity and mortality. At this point there is no literature addressing the safety of ECT in patients with pericardial effusion. This case illustrates that with appropriate cardiac management and close monitoring for the development of hemodynamic instability, ECT can be given to patients with treatment-resistant mania and comorbid pericardial effusion.

23. Assessing the Utility of the Healthy Start Screen in Predicting Postpartum Depression via an Elevated Edinburgh Postnatal Depression Scale Score

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Background: Postpartum depression occurs in approximately 15% of all pregnancies. Pre-existing depression and perinatal depression are known risk factors for the development of postpartum depression. The American College of Obstetrics and Gynecology recommends screening for depression at least once in the perinatal period (1). The Healthy Start Screen, a mandated screening tool of all pregnant women seen for initial prenatal care in the state of Florida, assesses women at risk for adverse pregnancy related outcomes (2). Questions 6, 7, and 8 are specifically related to mental health (3).

Objectives: To determine whether elevated Healthy Start Screen Scores (HSS) on specific screening questions correlate with an elevated Edinburgh Postnatal Depression Scale (EPDS) score, thus identifying women at risk for developing postpartum depression.

Methods: A retrospective chart review of 2816 pregnant women seen by the Department of OBGYN, Obstetrics Clinic between January 1, 2016 to March 1, 2018 was completed. Patients who had both a HSS and a postpartum EPDS were included in the study. There were a total of 1738 study participants. Questions 1-10 on the HSS score were evaluated as "yes" or "no". A positive HSS was a score of 6 or greater. A positive EPDS score was 12 or greater.

Results: This retrospective chart review of 1738 women found that question 6 ($p<0.001$): "feeling down, depressed or hopeless in the last month", question 7 ($p<0.05$): "feeling alone when faced with problems in the last month", question 8 ($p<0.001$): "ever receiving mental health services or counseling", and question 10 ($p<0.05$): "having any trouble paying bills" are positively predictive for postpartum depression using a multivariate model. Interestingly, question 10 ($p<0.05$): "are you married now" was protective and associated with a decreased risk of postpartum depression.

Conclusions and relevance: The Healthy Start Screen, a mandated screen of all pregnant women in Florida, may be a useful tool in identifying women at elevated risk of developing postpartum depression. Utilizing this data may be helpful for obstetricians in identifying at-risk women in a more timely fashion.

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24. The Michigan Peer-to-Peer Depression Awareness Campaign: School-Based Prevention to Reduce the Impact of Depression Among Adolescents

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Background: Adolescent mental health (10 to 19 years as defined by the World Health Organization) has emerged as a priority over the last decade. In response, the University of Michigan Depression Center and the Ann Arbor Public Schools in Washtenaw County, Michigan, launched the Peer-to-Peer Depression Awareness Program (P2P) in 2009. The P2P program is a peer-based initiative that emphasizes early detection and prevention of mood disorders and anxiety through schoolwide intervention. Specifically, the program seeks to raise awareness of mental health conditions, fight stigma, and encourage help-seeking behavior.

Methods: In 2016-2017, 84 Peer Mentors across seven high schools were trained to develop and implement awareness campaigns. The intervention began with a kickoff conference to teach key mental health information and coping skills, as well as social marketing strategies. Each P2P team then developed and implemented a depression awareness campaign featuring activities tailored to fit their school. Both Peer Mentors and a sample of non-P2P students completed baseline and post-test questionnaires.

Results: Campaign activities included school assemblies, displays around school, and giveaways. A total of 708 students completed questionnaires. Following campaign rollouts, students demonstrated improved attitudes toward depression, increased confidence in identifying and referring peers, improved help-seeking intentions, and reduced stigma.

Conclusions and Future Directions: The intervention increases depression literacy through the use of youth-designed and youth-implemented depression awareness and outreach activities, which may result in earlier detection of depression and in fewer depression sequelae. In 2017-2018, 270 Peer Mentors across 11 high schools and nine middle schools participated in the P2P program. Survey results are currently being analyzed. Eighteen high schools and 15 middle schools in two counties have already committed to participating in the P2P program during the 2018-2019 academic year.

25. Deploying the NNDC-Epic Consortium Build for the Mood Outcomes Program

Patel, Paresh et al. (final author list TBD)

One of the principal objectives of the National Network of Depression Centers is to promote measurement-based care (MBC) in psychiatry. This is significant cultural change accompanied by substantial impacts to clinical workflows. A central challenge in clinical decision support is delivery of the right information, to the right person, in the right format, through the right channel, at the right time in the workflow. The

challenge is compounded by patient reported outcomes (PROs), with the same 'rights' applying to patient engagement. Electronic Health Records (EHRs), properly designed, have the potential to facilitate MBC. Here, we describe the development of an NNDC-Epic consortium build for the NNDC core measure set and deployment of the build at the University of Michigan. The Department of Psychiatry at Michigan Medicine previously had a homegrown electronic PRO system that suffered a number of vulnerabilities, key of which was lack of complete integration with the enterprise EHR (Epic Systems). Moreover, Michigan Medicine already had a number of clinics utilizing distinct PRO sets, so successful integration of the NNDC PRO set required careful consideration of department-wide processes. A major advantage of this approach is that the workflow is naturally extensible as other mental health clinicians embrace MBC. Key elements for success from the experience at Michigan Medicine are 1) a clinical champion (typically a physician champion), preferably with a fair knowledge of EHR capability and department-wide clinical workflows, and 2) close collaboration with an institutional application coordinator dedicated to the project. The workflow leverages Epic's Episode of Care functionality to coordinate case management. It is anticipated that experience at Michigan Medicine will serve to streamline a path for similar deployments at other Epic institutions.

26. Impact of On-site Perinatal Mood Disorders Clinic in the Diagnosis and Management of Perinatal Mood Disorders in Obstetrics/Gynecology – A Pilot Study

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Background: Perinatal mood disorders are expected in approximately 15% of all postpartum women[1]. Systematic recognition with resultant diagnosis and treatment remain inadequate[2]. Untreated depression has long-term effects not only for the mother, but the infant as well, including issues with maternal/infant bonding resulting in behavioral, psychosocial, and cognitive developmental delays in offspring[3]. Barriers to evaluation and treatment include lack of trained providers, lack of referral sources, lack of access, and lack of transportation. In March 2017, the University of Florida Department of Obstetrics and Gynecology began an internal Perinatal Mood Disorder Clinic (PMDC) staffed by an on-site physician double boarded in obstetrics/gynecology and psychiatry with the aim of improving access to timely evaluation and treatment of women with perinatal mood disorders. This pilot study aims to assess the health outcomes of postpartum women seen in the PMDC.

Methods: We conducted a retrospective chart review of 120 patients seen at the PMDC between March 1, 2017 and June 1, 2018. For this study, inclusion criteria included having at least 1 visit at the PMDC and being in the postpartum period (defined as up to 1 year after delivery) at the initial PMDC visit. Measurements of interest included participant Edinburgh Postnatal Depression Scale (EPDS) scores and Florida Obsessive Compulsive Index (FOCI) scores at their initial and final PMDC visit as an indicator of the severity of a patient's mood disorder(s). Two-tailed t-tests were used to compare initial and final EPDS and FOCI scores for patients with >1 recorded score. Analyses were conducted in Excel.

Results: 76 postpartum patients met inclusion criteria for this study. For patients with >1 recorded EPDS score the mean initial score was 16.19 (standard deviation of 4.03) and the mean final score was 10.63 (standard deviation of 6.63). There was a statistically significant difference between initial and final EPDS score ($p<0.001$). For postpartum patients with >1 recorded FOCI score the mean initial score was 8.23 (standard deviation of 6.00) and the mean final score was 5.08 (standard deviation of 5.23). There was also a statistically significant difference between initial and final FOCI score ($p<0.05$).

Conclusion: Women in the postpartum period with one or more visits to the PMDC showed improved clinical outcomes related to mental health as measured by EPDS and FOCI scores. Therefore, the PMDC may be filling an existing gap in access to quality and timely care for postpartum women. Given the impact of perinatal mood disorders on the health of both mother and child, it is likely that this pilot study will prompt further support for the clinic, such as increased referrals from primary providers and attempts to decrease the attrition rate. This study is limited by the retrospective chart review design, and a clinical trail would be required to confirm that improvement in EPDS and FOCI scores is not due to the passing of time alone.

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27. Universal Suicide Screening within an Urban Pediatric Emergency Department

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Background: Suicide is a significant public health problem; ranking as the second leading cause of death for youth ages 10 to 14 and 15 to 24 years old[1]. The increasing rate of suicide precipitated the Joint Commission to release a Sentinel Alert in 2016[2]. In the Sentinel Alert the Joint Commission made various, strategic recommendations for reducing the burden of suicide in our nation. Among these recommendations was systematic suicide screening in health care facilities. Healthcare providers often do not detect suicide risk among those who die by suicide, even though most suicide decedents have received healthcare services, usually unrelated to suicide or mental

health, in the year prior to their death[3,4]. Despite the recommendation for universal suicide screening in health care facilities it is still rare to find systems that are actually implementing universal suicide screening. While a limited number of healthcare systems nationwide have implemented universal suicide screening in adult populations[5], few to none employ universal suicide screening in pediatric populations.

Methods: This study aimed to explore the feasibility and sustainability of universal suicide screening implemented as routine care in an urban pediatric Emergency Department setting; and explore the population uniquely identified for suicide risk using a brief suicide screening tool. The ASQ (Ask Suicide-Screening Questions) 6 was administered to all eligible pediatric patients ages 10 and older starting in January 2017 through July 31, 2017 at the Johns Hopkins Hospital. Demographics and ASQ responses were extracted from the medical records.

Results: Preliminary statistical analysis found that 4% of medical and surgical patients screened positive for suicide risk and 43% of those ages 8 and older with behavioral or psychiatric chief complaints.

Conclusion: Universal suicide screening within a pediatric hospital setting is feasible, not burdensome, and appears to double detection of those at risk for suicide. We are currently examining post-disposition outcomes of screening such as future suicide attempts and death by suicide.

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28. Is the self-reported Borderline Personality Questionnaire any useful? A Retrospective analysis among bipolar inpatient population compared to previously reported US sample data

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Background: To date, the role of patient-rated Borderline Personality Questionnaire (BPQ) as a useful tool in clinical populations has been controversy [1-3]. A total BPQ score > 56 correlated with an overall diagnostic accuracy of 85% for BPD in previous literary reports. The current study used the BPQ to examine the potential role of co-existing Borderline Personality traits on severity, Length of stay (LOS) and outcomes in bipolar disorder (BD) inpatients.

Methods: A retrospective study design was used to analyze the electronic medical records of 714 patients with a primary diagnosis of BD by DSM-IV-TR criteria admitted to an academic hospital between July 2013 and July 2014. Patients completed the BPQ within 24hours of admission and directly before discharge. A univariate, bivariate (t-test, chi-square test), and multivariate analyses were then conducted to examine the potential relationship between BD severity, LOS and the BPQ. Demographic co-variables were investigated including age, gender, race, in addition to urine drug screen results and number of admissions.

Results: Upon admission, 13.88% of the inpatients (n=714) scored ≥56 on the BPQ consistent with a diagnosis of borderline personality disorder (BPD) with a mean total score of 30.63 ± 18.7 (US national mean is 21.06 ± 12.28). Our sample's mean Impulsivity Score (I) was 2.8 ± 2.22 (reported US sample mean Impulsivity Score = 3.16 ± 2.57), our sample's mean Affective Instability Score (AI) was 5.02 ± 3.4 (reported US sample Affective Instability Score = 2.32 ± 2.05), our sample's mean Abandonment (Ab) score was 3.82 ± 3.0 (reported US sample Abandonment Score = 0.91 ± 1.10), our sample's mean Relationship (R) score was 4.09 ± 2.18 (reported US sample Relationship Score = 3.25 ± 2.75), our sample's mean Self-Image (SI) score was 2.54 ± 2.35 (reported US sample Self-Image Score = 3.30 ± 2.46), our sample's mean Suicide/self-mutilation (SSM) score was 2.68 ± 2.197 (reported US sample Suicide/Self-Mutilation Score = 1.28 ± 1.63), our sample's mean Emptiness (E) score was 3.52 ± 3.02 (reported US sample Emptiness Score = 1.77 ± 1.77), our sample's mean Intense Anger (IA) score was 3.77 ± 3.01 (reported US sample Intense Anger Score = 3.43 ± 3.20), our sample's mean Quasi-Psychotic (QP) score was 1.94 ± 1.73 (reported US sample Quasi-Psychotic States Score = 2.13 ± 2.25). The difference between the BPQ scores upon admission and discharge (BPQ discharge: 22.3±15.36) was highly significant (p=0.0001) indicating that even shot term hospitalization can help improve BPQ severity scores. The Regression analysis revealed that the presence of BPD predicted shorter LOS in our inpatient sample. Our preliminary results also showed that the severity of bipolar symptoms positively correlated with borderline personality diagnosis (results not shown).

Conclusion: Our preliminary data suggests that the presence of co-existing BPD in acutely hospitalized bipolar disorder patients could be used as a predictor of severity, shorter LOS, and better outcome. Further studies are warranted to replicate the findings and investigate the other potential benefits of BPQ in early detection and possibly prevention programs.

Limitations: Our study population is limited to only an inpatient sample which limits generalization of the results. Relying on the debatable self-report nature of BPQ, despite being widely used is also a limiting factor.

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29. Comparing Structured Diagnostic Interviewing to Chart Diagnosis and Patient-Reported Assessment in the Penn State Clinical Assessment and Rating Evaluation System Registry (PCARES-R)

Erika FH Saunders, Dahlia Mukherjee, Daniel Waschbusch, Duanping Liao, Amanda Pearl, Errol Aksu, Robert Gonzalez, Luke Piper, Sujatha Koduvayur Parthasarathy, Edward Bixler

Background: Misdiagnosis is a common cause of poor treatment response for patients with psychiatric illness. We analyzed data collected from the first cohort of the Penn State Clinical Assessment and Rating Evaluation System Registry (PCARES-R) which includes all encounters from 2/17/2015 to 4/18/2018 in an ambulatory psychiatry clinic in central Pennsylvania. The PCARES-R data included systematic patient-reported assessment, structured interview, and the electronic medical record (EMR). We expected to find a higher proportion of patients diagnosed with conditions on the structured interview than in the EMR, and a higher rate of severity in patient-reported assessment measures in patients diagnosed in the EMR than those patients who are not diagnosed in the EMR with a particular condition.

Methods: The first cohort of PCARES-R patients (N=1400) were given DSM-5 Level 1 and Level 2 patient-reported outcome measures at initial visit to an ambulatory psychiatry clinic. A subset of patients were also given a structured interview (MINI International Neuropsychiatric Interview, MINI; N=503), and a subset of patients (N=148) received this interview after the clinical visit rather than before. We calculated the OR between MINI diagnosis and EMR diagnosis and calculated the OR of a 1- SD increase in score on patient-reported outcome measures and the chance of an EMR diagnosis.

Results: The sample had a mean age of 41.8 +/- 15.2 y, was 34% male, 84% Caucasian, 95% non-Hispanic, 40% married and 42% single. The highest concordance between MINI and EMR diagnoses were for depression, bipolar II, anxiety, addiction, alcohol use, psychosis and PTSD. When the structured interview was administered prior to the clinical interaction, the odds of diagnostic concordance were significantly greater than if the structured interview was administered after the clinical interaction. The MINI identified more positive diagnoses than EMR for most diagnostic categories except current depression, current BPII and bipolar NOS. We found a significantly increased odds of a MINI diagnosis of current depression and bipolar I disorder with the elevation of the depression Level 2 score, with the MINI diagnosis of bipolar I being also significantly associated with ASRM level 2 score. In addition, we found a significantly increased odds of MINI diagnoses of anxiety disorder and PTSD with the elevation of the anxiety level 2 score in our patients.

Conclusion: Using structured patient assessment has been recommended as best practice. We demonstrated that structured assessment may improve the detection of psychiatric illness by clinicians. Patient-reported outcomes were significantly correlated with corresponding structured interview categories, indicating that a high score on the patient-reported outcome can be used as a screener to alert clinicians to an area of concern.

30. Systematic Assessment and Measurement-Based Care in the Clinic: Provider Views on Establishing the Penn State Psychiatry Clinical Assessment and Rating Evaluation System (PCARES) Registry

Erika FH Saunders, Dahlia Mukherjee, Daniel Waschbusch, Duanping Liao, Amanda Pearl, Errol Aksu, Robert Gonzalez, Luke Piper, Sujatha Koduvayur Parthasarathy, Edward Bixler

Background: To measure the acceptability among providers of implementation of use of a standardized system to 1) provide clinicians and patients with data to enhance the diagnostic accuracy during the initial clinical encounter and 2) track course of illness and progress longitudinally during treatment.

Methods: We implemented a standardized battery of assessments including screening for a broad set of symptom areas (eg. mood, anxiety, psychosis), transdiagnostic symptoms (eg. anger, aggression, sleep, memory problems), behaviors affecting mental health (eg. disordered eating patterns, substance use) and general functioning. A 24-question survey of adult providers engaged in the PCARES Program was administered via e-mail using SurveyMonkey on 3/28/2017 and repeated on 3/16/2018.

Results: Between 2017 and 2018, the proportion of providers who rated the PCARES information “pretty useful” or “very useful” clinical useful increased from 33% to 58.8%. The proportion of providers who used clinical outcomes information during a visit with a patient increased from 46.2% to 58.8%. Current practice was to ask the patient to complete PCARES outcome measures during the provider visit, and this was being done at all phases of the visit. The majority of clinicians surveyed, 65%, preferred measures to be given in the waiting room than during the visit.

Conclusion: Challenges in implementing a patient-centered MBC system included deciding on the measures to use, incorporating the measurements into clinical workflow, integrating data into the notes entered in to the Electronic Medical Record (EMR), gaining provider buy-in, and educating both the patients and the providers about the purpose and the process. Provider buy-in grew over time. Implementing a systematic assessment and patient-rated outcomes program described is fraught with challenges and takes time, effort and re-engineering of the clinical work flow. Clinicians looking to implement MBC will need to weigh several factors in deciding how to design a program: 1) breadth of symptoms screened and measured, 2) depth of information on each symptom area, 3) time for the assessments, and 4) local operational factors needed to create a system that allows for patients to complete assessments and for those data to be returned to the clinician. Based on our experience, we advocate for putting validated tools into use in the clinic as a way to improve patient care and present transparent evidence of the initial stages of implementing such a change in clinical practice.

31. University of Iowa Mood Disorders Center Program Evaluation

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Background: The University of Iowa Mood Disorders Center was founded with a mission to improve the outcomes for individuals affected by bipolar disorder or depression by integrating relevant clinical services, research, and education initiatives focused on mood disorders at the University of Iowa Hospitals and Clinics.

Objective: We sought to evaluate mood disorder programming across the Mood Disorders Center, to identify gaps in services and areas in need of improvement. These results will inform a strategic plan to address opportunities for growth and development.

Methods: Patient satisfaction and opportunities for improvement were collected using an online survey from pre-existing patient satisfaction surveys. Patient demographic information was also collected using questions from the National Institute of Health and Census Records. Patients were approached across several services including transcranial magnetic stimulation, mood disorders partial hospitalization program, treatment resistant depression clinics, mood disorders support group, psychotherapy groups, mood disorders outpatient clinic, and women's wellness and counseling center. The inpatient mood disorders service and electroconvulsive therapy service were not included.

Results: The survey has currently been completed by 30 patients. Of these patients, 57% provided feedback on outpatient clinic services, 7% on the partial hospitalization program, 23% on the TMS clinic, 13% on psychotherapy group; 3% on the treatment resistant specialty clinic and 20% on the support group. The center overall has a net promoter score of 57, meaning that 70% of patients were likely to recommend the mood disorder centers services to friends and family and 14% were not likely to recommend the services. Average satisfaction with services encompassed by the Mood Disorder Center overall, and across the different variables of satisfaction, was between somewhat satisfied and extremely satisfied. Responses to measures of satisfaction with "explanation of treatment options", staff ability to "answer questions" show the most room for improvement with 26 % and 17%, respectively, of respondents indicating they are less than satisfied. Updated survey results will be presented at the 2019 NNDC Conference.

Conclusion: While more survey responses will be required to identify opportunities for improvement in each service area, the small study suggests an opportunity for improvement of patient care by increasing staff training on communication with patients about treatment options and soliciting questions about their care. This information along with feedback from peer institutions obtained at the 2019 NNDC meeting will guide our strategic planning.

32. Stress Management and Resiliency Training (SMART) in Depressed Patients - A feasibility study

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Background: Stress is associated with both onset and recurrence of depression. Resilience is the process of adapting well in the face of adversity, trauma and tragedy. This study hypothesized that increasing resiliency can be an effective component of a depression treatment plan. The aim of this study was therefore to investigate the feasibility of an eight-week group program of SMART for enhancing resiliency in patients with of mild –moderately severe major depression.

Methods: In an open label study, 23 depressed participants with a mild to moderately severe major depressive episode were recruited to take part in a 8 week group therapy program of SMART encompassing principles of attention training and intentional practice of gratitude, compassion, higher meaning, acceptance and forgiveness. All participants continued usual clinical care for their depression. Resilience, measured by the Connor Davidson Resilience Scale (CD-RISC) was the primary outcome; perceived stress, measured by Cohen's Perceived Stress Scale and depression, measured by Hamilton Rating Scale for Depression (HAMD-17) and Patient Health Questionnaire, nine items (PHQ-9) and were secondary outcomes.

Results: 17 participants (74%) were rated as study completers (based on attending ≥ 6 sessions). At study end, Intention to treat analysis at 8 weeks, there was a significant improvement in resilience ($p = 0.03$), Cohen's d=0.52, reduction in perceived stress ($p = .002$), Cohen's d=0.68 and improvement in depression ($p < .001$), Cohen's d=1.19 with 10 (43%) participants achieving remission based on PHQ-9 ≤ 5 and HAMD ≤ 7. There was a negative correlation between resilience and perceived stress, $r=-0.668$, $p < 0.017$ and between resilience and depression, $r=-0.507$, $p < 0.017$ (using Bonferroni correction). Participants who dropped out of the study were younger (35.83±4.87), compared to study completers (50.18±12.86), $p<0.05$.

Strengths and Limitations: This was a novel intervention examining an intervention to enhance resiliency in depressed patients. Limitations include the non-randomized design and the small sample size.

Conclusion: A resilience training program focused on stress management is feasible for patients in the midst of a major depressive episode. Our findings suggest that increasing resilience may mediate the relationship between stress and major depression. A larger randomized controlled trial is needed to stablish efficacy of this intervention.

33. Stress Management and Resiliency Training (SMART) in Depressed Patients - A feasibility study

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Background: Prior studies have shown the short-term antidepressive effectiveness of partial wake therapy (PWT) when used alone or with luminotherapy and as an adjunct to pharmacotherapy. We aimed to demonstrate the feasibility of administering adjunctive PWT, with or without luminotherapy, to patients with depression on a specialty mood disorders unit.

Methods: Eligible subjects were adults (aged 18-65 years) admitted to the Mood Disorders Unit at Mayo Clinic and had a clinical diagnosis of a depressive disorder (unipolar or bipolar depression). All subjects completed a Morningness-Eveningness Questionnaire (MEQ), a Personal Inventory for Depression-SAD, and a six-item Hamilton Depression Rating Scale (HAM-D6) at baseline, and were kept awake from 2:00 am onward during each day of treatment. Subjects received three PWT treatments every other day, for a total of 6 days. Luminotherapy was administered for 30 minutes each morning, the timing of which was determined on the basis of MEQ responses. The primary outcome was improvement in depressive symptoms assessed by HAM-D6. Secondary outcome measures included remission (HAM-6 score ≤7), response (≥50% reduction in baseline HAMD-6 score), and change in individual HAM-D6 item scores.

Results: Twenty-four patients (unipolar depression=18, bipolar depression=6) were enrolled (mean age 40.79 ±12.48 years, 66% female). The mean (SE) change in HAMD-6 score was 7.74 ± 1.26, ($p<0.0001$), a significant reduction (improvement) from baseline (16.08 ± 0.45) at day 6. The most commonly reported side effects were headache (n=5), irritability (n=4), itchy eyes (n=4), aching eyes (n=3), tiredness (n=2), and nausea (n=2). Ten (41.67%) patients achieved response and 11 (45.83%) achieved remission at day 6. Individual HAM-D6 item analysis showed higher score for psychomotor retardation at baseline was associated with remission (OR = 3.4; 95% CI, 1.03 -11.22), even after adjusting for age and sex. Results did not differ between patients with unipolar and bipolar depression. None of the patients experienced treatment-emergent hypomanic symptoms.

Limitations: Small sample size and single-arm, open-label study design.

Conclusion: Partial wake therapy is feasible and well tolerated as an adjunct to usual care in hospitalized patients with depression. Higher baseline psychomotor retardation may be positively associated with remission. These findings need to be replicated in larger samples of hospitalized depressed patients.

34. Implementation of a Novel Johns Hopkins Perioperative Pain Program: An Integrated Care Model for Patients with Mood Disorders and Opioid Dependence

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Background: Increased use of prescription opioids for chronic pain has led to alarming rates of addiction and opioid related deaths in the United States. Opioid prescriptions in the post-operative period contribute to this epidemic. The Perioperative Pain Program (PPP) utilizes multimodal pain approaches within an integrated healthcare model to improve patient-centered pain outcomes and decrease opioid utilization along a continuum of three defined stages: 1. preoperative, 2. postoperative hospitalization and 3. post-discharge. PPP clinic consists of psychiatrists and addiction medicine specialists, anesthesiologists who specialize in acute and chronic pain, with referrals to physical medicine and rehabilitation, integrative medicine specialists and intensive outpatient substance use programs, if needed. This pilot study aims to investigate the feasibility of implementing PPP within a quaternary academic center.

Methods: PPP evaluates perioperative patients who are chronic opioid users, on opioid maintenance therapy, or are at high risk of developing opioid dependence postoperatively and have comorbid mood. Primary outcomes include morphine equivalent doses (MED), pain severity, physical and mental health functioning, and symptoms of insomnia; using the Brief Pain Inventory (BPI), Short Form Health Survey (SF-12), and Insomnia Severity Index (ISI), respectively.

Results: From November 2017 through February 2018, PPP has collected patient-reported outcomes on N = 65 new patients. Specialists in orthopedics, general surgery, colorectal surgery, plastic surgery, otolaryngology, oncology, in addition to primary care and anesthesia have made referrals. The majority of patients are referred post-operatively, however one-third (N = 21) had an initial PPP consult preoperatively. The majority of initial consults (88%) used opioids in the month prior to initial visit and slight majority are female (56%). Twenty-six percent of initial consults are current smokers and 10% are on opioid maintenance therapy (e.g., methadone or buprenorphine). At initial visit, PPP patients report using MED of 190.5mg + 456mg. They also report moderate-to-severe pain severity (6.5 + 2.4) and pain interference (6.4 + 2.3), poor physical health (29.2 + 8.1) and mental health (44.7 + 12.7) and clinically meaningful symptoms of insomnia (14.0 + 7.4). All patients who continue in PPP sign an opioid agreement and receive random urine toxicology screens. Approximately 25% of initial consults are referred to the psychiatrist located in the PPP clinic.

Conclusion: PPP manages patients at risk for difficult pain management or opioid dependence, coordinates care with outpatient providers, and utilizes multimodal pain approaches. We have successfully implemented a novel integrated care model of perioperative pain management at two Johns Hopkins sites. Future studies are required to determine the effectiveness of the PPP, compared with current healthcare delivery models, in improving patient-centered outcomes and reducing opioid utilization postoperatively.

35. Medical Students' Attitudes Towards People Living with Major Mental Illnesses: Anti-Stigma Early Intervention Project

Bruce R Stevens PhD, Kyle Dalton MD, Travus White MD, Veronica Novosad MD, Beverly Vidaurreta PhD, Lou Ann Cooper PhD

Background: Depressive disorders and other major mental illnesses significantly impact overall lifestyle disability and economic burden. Mental and physical disorders are often comorbidly related. Transforming the existing healthcare system requires improvements in medical education of the impact of mental illness stigma. Stigma influences provider humanitarian care and contributes to iatrogenic medical errors.

Objectives: The purpose of this project was to provide an interventional exercise among medical students to address the stigmatization of depressive disorders and the other mental illnesses, in order to enhance professional effectiveness in the next generation of healthcare providers.

Specific Aims: 1) measure mental illness stigmatization attitudes of medical students; 2) provide an anti-stigma intervention to mitigate injustices/iatrogenic complications of medical treatments; and 3) quantify the effect of an anti-stigma intervention.

Methods: A pre/post quasi-experimental design examined the effectiveness of a novel intervention on medical students' attitudes about depression and other mental illnesses. A medical student team wore t-shirts printed with the word "Depression" or other mental illness, plus an internet resource barcode. Students were directed to attend to the interactions/reactions of other people throughout the day, as well as their own reactions. A week later an interactive seminar with audience-response handheld clickers included medical school students, faculty, and the subjects. Group discussion responses were computed in realtime and projected to the audience. A modified Mental Illness:Clinicians Attitudes Scale instrument (MICA; Kassam et al. 2010. Acta Psychiatr Scand 122:153-161) was administered 2 weeks before and 1 week after the intervention (N=103). ANCOVA modelling of post-intervention MICA scores included covariates of pre-intervention scores, with responses changes analyzed by Wilcoxon nonparametric tests.

Results: The ANCOVA model accounted for 52% of the variance in post-intervention MICA scores ($F=36.0$, $p<0.0001$). Students with more positive (less stigmatizing) attitudes at pretest also tended to have more positive attitudes at post-test ($t=9.98$, $p<0001$). Personal experience with a serious mental illness yielded more positive attitudes at post-test ($t=2.07$, $p=0.04$). Positive attitude changes arose on 5 of 24 scale items ($p<0.05$): stigmatizing vocabulary; self-disclosure of mental illness; comfort conversing with a person with a mental illness vs. physical illness; concern about children exposed to mental illness.

Conclusion: The results indicated that a single intervention is not sufficient to modify all stigmatizing attitudes among medical students. Additional efforts aimed at reducing the stigma of people living with major mental illnesses must be included widely and experientially throughout the medical school curriculum.

36. Human Gut Microbiome Dysbiosis in Depression and Anxiety Correlated with Blood Biomarkers

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Background: Development of effective lab biomarkers for psychiatric diagnostic, preventative, and therapeutic purposes depends on understanding the integrative whole-body pathophysiology axis linking the gut microbiome-brain-immune system. Experimental intravenous bolus administration of lipopolysaccharide endotoxin (LPS) into healthy human volunteers evokes acute anxiety and depression symptoms in a dose-dependent manner. Preclinical studies demonstrated that behaviors in animal models of depression and anxiety were altered by gut dysbiosis.

Hypothesis: We hypothesized that depressive and anxiety disorders are linked to human gut dysbiosis with microbiota species that possess genes and metabolic pathways secreting LPS, which, in conjunction with compromised gut permeability barrier integrity, invokes systemic manifestations; this includes brain and altered intestinal epithelium paracellular integrity molecules discharged into blood, namely zonulin and intestinal isoform of fatty acid binding protein-2 (FABP2).

Methods: Blood and stool samples were collected from antibiotic-free human volunteers meeting DSM-5 criteria for a depressive disorder or anxiety disorder, and from healthy human reference subjects without a diagnosed mental illness. Stool microbiome data were obtained by initial 16S rRNA gene amplicon sequence analysis followed up by extensive whole genome metagenomic shotgun sequencing analyses. Plasma LPS, zonulin, and FABP2 were quantified by immunoassays. The project was approved by the University of Florida Institutional Review Board.

Results: Multivariate ordination methods, KEGG ortholog metabolic pathway and gene analyses, linear discriminant analysis effect size assessments, and distance analyses collectively revealed significantly different ($P<0.05$) microbiome patterns which differentiated depression or anxiety vs. healthy reference status. For these mental states there were significant ($P<0.05$) direct correlations of gut dysbiosis with blood levels of each LPS, zonulin, and FABP2.

Conclusion: Human gut microbiome dysbiosis is directly correlated with blood biomarkers of increased gut permeability in individuals with depressive or anxiety disorders, in contrast to mentally healthy reference subjects. Intestinal epithelium pathophysiology and the attending specific serum biomarkers of neuropathology-associated molecules reflect systemic manifestations, thus implicating the gut as a novel target for diagnosing and/or managing mental disorders.

37. Exploration of depressive symptoms during substance use disorder treatment

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Background: Depressive symptoms are commonly associated with substance use disorders[1]. Although this association has been established consistently across studies and epidemiologic surveys[2,3], several issues remain unclear, including the effects of treatment on depressive symptoms and the relationship between depressive symptoms and other important determinants of recovery (e.g., abstinence self-efficacy and emotion regulation). In this study, we assessed the presence of depressive symptoms; the relation between depressive symptoms and anxiety, abstinence self-efficacy, and emotion regulation; and the effects of substance use disorder (SUD) treatment on depressive symptoms.

Methods: We utilized data collected from 97 patients who sought SUD treatment in a partial-hospitalization program. Informed consent was obtained from all participants. Data were collected from a baseline standard of care assessment and again at a 28-day follow-up. Depressive symptoms were assessed with the Patient Health Questionnaire – 9 (PHQ-9), anxiety symptoms with the Generalized Anxiety Disorder – 7 scale (GAD-7), alcohol and drug self-efficacy with the Alcohol Abstinence Efficiency Scale (AASE) and Drug Abstinence Efficiency Scale (SASE), and emotion regulation with the Difficulties in Emotion Regulation Scale – 18 (DERS-18). Pearson correlations

examined the relation between depressive symptoms, anxiety, alcohol/drug abstinence self-efficacy, and emotion regulation. Paired samples t-tests were utilized to examine changes in symptoms across 1 month of treatment.

Results: On average, patients presented with PHQ-9 scores in the moderately depressed range (M = 11.90, SD = 6.63). There was a significant decrease in depressive symptoms after 28 days of treatment (t =11.06, p < .001), with patients scoring, on average, in the minimal to mildly depressed range (M = 4.59, SD = 4.55). There were significant correlations between depressive symptoms and measures of anxiety, alcohol and drug abstinence self-efficacy, and emotion regulation both at baseline and at 28-day follow-up (all p < .001). The change in PHQ-9 scores from baseline to follow-up was also significantly correlated with the change in GAD-7 scores (r = .69, p < .01) and negatively correlated with scores on the Impulse subscale of the DERS-18 at 28-day follow-up (r = -.24, p < .05).

Conclusion: Depressive symptoms are common among individuals presenting to SUD treatment and are associated with lower abstinence self-efficacy and emotion regulation skills, as well as higher levels of anxiety symptoms. Significant decreases in depression symptoms occur after 28 days of SUD treatment, along with decreases in anxiety, and improved drug and alcohol abstinence self-efficacy and emotion regulation. Greater improvements in depression are associated with decreased impulsivity. These results highlight the importance of attending to depressive symptoms among individuals with SUDs and provide insight into potential mechanisms of treatment efficacy. More research is needed into the effects of treatment on depressive symptoms, as well as the diagnostic complication of properly assessing for independent mood and anxiety disorders among individuals with SUDs.

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38. Association Between Hand Digit Ratio (2D:4D) and Bipolar Disorder

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Background: The 2th- to 4th-finger ratio (2D:4D) has been proposed as a potential indicator of greater androgen exposure during fetal development[1]. While smaller digit ratios, suggestive of stronger perinatal androgen action, have been associated with male-linked disorders (e.g., autism), problematic video gaming behavior[2], larger digit ratios, suggestive of weaker perinatal androgen action, have been associated with depression, schizophrenia, and eating disorders[3,4,5].

Objective: We investigated association between hand digit ratio (2D:4D) and Bipolar Disorder.

Methods: 53 bipolar subjects were invited among Bipolar clinic patients. 52 non-bipolar subjects were invited. Data was collected between February 2017- February 2018. A structured interview (M.I.N.I.) was performed on both bipolar group and control group to assess bipolar sign and symptoms, substance use, personality traits. Impulsivity was assessed with Barratt impulsivity Scale. Both hands of subjects were scanned by photocopier and measured with following Digit Ratio Measurement Guide.

Results: Bipolar group has higher impulsivity scores in all impulsivity sub-types compared to control group. Right hand 2D:4D ratio is significantly higher in Bipolar group. There is no difference on left 2D:4D ratio between Bipolar group and Control group.

Conclusion: Our findings indicate that right hand 2th- to 4th-finger ratio is significantly higher in Bipolar group.

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39. Collaborating with Employers for Evidence-Based Workplace Mental Health Programs

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Background: Workplace wellness programs are becoming increasingly prevalent; rigorous efficacy evaluations are needed.[1] Different workplace mental health strategies are beginning to show improvements in clinical outcomes among employees.[2] Potential exists for partnerships between depression and bipolar centers of excellence and employers to collaboratively develop comprehensive, multi-faceted workplace mental health programs.

Methods: This work outlines the processes used to lay a foundation for enhancing workplace mental health programs with organizations. A current partner company, a Fortune 500 major manufacturer, expressed concern about employee mental wellness and sought clinical expertise from the University of Michigan Depression Center to aid development of new, evidence-based programs and services for their employees. Through interdisciplinary, structured discussions and use of approaches from business management models, our team identified key strategies to demonstrate the value and efficacy of a range of mental health program offerings.

Results: We document the process, barriers, and strategies to overcome them used in establishing the partnership with a large company and note key insights from each step. Further, through collaboration with our partner company, we identified the following topics which required literature review to support program development: needs assessments; physiological impacts of work environment; treatment protocols; stigma in the workplace; mental illness and other medical comorbidities; the importance of training and involving supervisors and managers; organizational change, case studies outlining other effective workplace mental health programs, and evaluation of workplace mental health programs.

Conclusion: Each partnership with an employer should have its own unique process and tailored priorities, but several lessons can be learned by reviewing the steps taken to establish a collaboration between a depression center and employer. Specifically, understanding potential roadblocks can help depression center and company leaders create more efficient, effective plans for establishing partnerships and promoting sustainability. Understanding a roadmap for program development may expedite such processes.

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40. The Association Between Participation in CenteringPregnancy and Postpartum Depression

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Background: Postpartum depression (PPD) affects 10-20% of all women.1 Several risk factors are associated with PPD including: age, race, socioeconomic status, limited social support, history of depression, and family history of depression.2 CenteringPregnancy is a prenatal care model in which women of similar gestational ages receive their prenatal care within a group setting. CP is thought to enhance care via: enriching social support through peer support and increased time with the medical provider, improving knowledge related to self-care and pregnancy/health related topics. The purpose of this study was to determine whether women enrolled in CenteringPregnancy care were less likely to have a diagnosis of PPD compared to women enrolled in traditional prenatal care.

Methods: A retrospective chart review was conducted for a random sample of 220 patients seen at UF Health in traditional care and all participants in CenteringPregnancy who completed 3 or more sessions (n=124) from March 2015-March 2017. PPD was assessed at first postpartum visit via the Edinburgh Postnatal Depression Scale (EPSD), where a score of ≥12 was categorized as positive for PPD. Logistic regression models estimated the relationship between care delivery method and PPD, controlling for patient characteristics.

Results: Fewer in CenteringPregnancy had PPD by EPDS score (8.87%) than in traditional care (13.18%; p=0.231). In multivariate analysis, participation in traditional care versus CenteringPregnancy was not associated with an increased risk of PPD (aOR: 1.68; 95% CI: 0.69-4.10). Patients with a history of depression were 3.87 times more likely to have PPD (95% CI: 1.72-8.73), as were patients taking any psychiatric medications during pregnancy (aOR: 3.69; 95% CI: 1.27-10.70).

Conclusion: Our findings suggest that women in CenteringPregnancy may be less likely to develop PPD than patients in traditional care models. Prenatal and postpartum depression has been linked to several adverse outcomes for mothers and infants,3 so further research is needed to quantify the impact of group prenatal care on PPD.

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