A personalised approach to mental health

To begin, could you explain what drew you to the study of mental health?

GA: As a psychology graduate student, I developed a strong interest in the integration of concepts of normal and abnormal child development into children’s mental health interventions. I later completed a postdoctoral fellowship in child psychiatry research at the University of Iowa, which launched my career in children’s mental health. In my first position as a professor in an academic health centre, I directed a diagnostic and treatment service for children with autism and developmental disorders. This afforded me a personal view of the anguish and frustration of parents raising a disabled child. I developed a deep compassion for these youngsters and their families and recognised that I could make a significant contribution to their lives as a clinician, research scientist and advocate. A key turning point in my career was the adoption of a preventative orientation within a community mental health context. I have devoted the past 25 years to designing and implementing preventive interventions in community systems of care.

AG: As a hotel manager in Tel Aviv, I experienced the Gulf War first hand. What struck me most was the terror of the parents while their children were at home. I became motivated to learn more about families, parenting and children’s exposure to violence. During my graduate studies in Clinical Psychology at Columbia University, and later at the Yale Child Study Center, I worked with inner city children exposed to violence. I realised that findings from the science of prevention and intervention were rarely being used in the community. Moving to Minnesota enabled me to pursue my interests in prevention research and developmental psychopathology.

How did you come to be co-investigators and colleagues? What mutual benefits has your partnership afforded?

GA: We met about 10 years ago. Abi asked me to serve as her mentor in intervention science. I was immediately impressed by her enthusiasm and depth of knowledge and eagerly agreed. We soon discovered that we shared an interest in embedding preventive mental health interventions in community systems of care serving at-risk children and their families. I believe Abi and I have made significant contributions to this area and I have benefited greatly from Abi’s enthusiasm, knowledge and experience.

AG: I don’t think I would be pursuing what I do today without Gerry’s support! I had been embedded in community agencies serving highly-stressed families, but had little research experience. Gerry offered me the opportunity to partner on a National Institute of Mental Health (NIMH) grant application to extend his Early Risers conduct problems prevention programme to the homeless shelters I had been working with.

Can you discuss your Center for Personalization Research in Children’s Mental Health (CPPR)?

GA&AG: Conventional evidence-based mental health interventions (EBPs) conform to a fixed-type ‘one-size-fits-all model’, in which all clients receive uniform composition and dosage. Although many people receive some benefit from EBPs, the effects are often not strong and weaken over time. In addition, EBPs can be costly to implement and burdensome to the client. To address these concerns, CPPR’s research programme calls for the personalisation of mental health interventions. Such interventions are designed to respond to the needs and preferences of children and their families. The CPPR research agenda seeks to translate new discoveries in genetics, neuroscience, and developmental science into the development of innovative interventions that incorporate the needs and preferences of children and their families.

Why is the personalisation of mental health interventions so important?

GA&AG: There are an increasing number of evidence-based treatment and preventive interventions in mental health. Unfortunately, their effects have had minimal public health impact. Given the high prevalence of mental health disorders and their high burden and cost to person and society, it behooves us as mental health professionals to expect more accessible and cost-effective treatments. Personalised medicine has produced notable successes in oncology and cardiology. Personalised mental healthcare, in the form of adaptive approaches, may result in similar benefits.

What do you hope to be the implications of your work?

GA&AG: We hope that our work will lead to the discovery of transformative ideas and technologies for personalising the design of prevention and treatment programmes within the realm of children’s mental health. The goal is to optimise treatment benefits while reducing burden, cost and stigma associated with conventional forms of mental healthcare.
A new era of personalised healthcare

Research from the University of Minnesota, USA, presents an innovative approach to mental health interventions. Its personalised framework seeks to improve outcomes for patients suffering from mental illness, as well as for individuals at future risk for developing disorders and associated health-compromising behaviours.

THE VERY NATURE of mental health renders a one-size-fits-all approach to treatment both inflexible and ineffective. There is considerable heterogeneity in the causes that place individuals at risk for mental disorder and it is this heterogeneity that is believed to account for variability in how people respond to conventional prevention and treatment. A new generation of research is exploring novel approaches to the longstanding question of what interventions work best, for whom, why, and under what circumstances. Personalised medicine shows how genomics-based knowledge can be used to select targeted drug treatments, thereby radically changing the paradigm for how treatments are prescribed and delivered. Equally compelling are emerging approaches in preference-based care where individuals collaborate with providers in selecting their personalised treatment options. Advances in this area are leading to new technology-assisted treatments such as computer-based eHealth (electronic) and mHealth (mobile) interventions. As other areas of medicine move toward personalised healthcare, the obvious question is: why not mental health?

Dr Gerald August and his colleagues are working to test the utility of a personalised approach to children's mental health. The focus is on psychosocial-based preventive interventions in children and youth who are at risk for mental and chemical health problems. Growing corroboration suggests that evidence-based prevention programmes (EBPs) can be beneficial for children with, or at risk of, mental illness and substance use disorders. Although the availability of EBPs has increased in recent years, their public mental health benefit is yet to be fully manifest. One explanation for their disappointing performance may be their design and structure. These programmes are typically fixed-prescription models in which all participants receive a standard version with the same (often multiple) components and dosage, regardless of their individual profile of needs and preferences. For many individuals, however, such programmes are too diffuse to have measureable impact and are not accessible or acceptable to healthcare consumers. As a consequence, EBPs are often perceived by clients as irrelevant, burdensome and expensive, and as a result, compliance is low and outcomes poor. In order for EBPs to fulfil their potential, personalised options are required.

To meet this need, August and his close collaborator, Dr Abigail Gewirtz have formed the Center for Personalized Prevention Research (CPPR) at the University of Minnesota, with support from a National Institute of Mental Health (NIMH) grant. The Center endeavours to remodel EBPs to optimise outcomes, through pioneering personalised intervention designs and technologies.

CPPR

The investigational framework of CPPR includes two major divisions. The first adheres to a needs-based approach in which basic science discoveries are translated into the development and testing of interventions that address an individual's biobehavioral vulnerabilities and contextual risk factors. CPPR investigators have begun drilling down to the various brain systems that underlie personal vulnerabilities to uncover genetic markers, neuroanatomic structures, neurophysiological circuits and neurocognitive processes that may provide clues to the causes of any one person's illness. Specific therapeutic change strategies may map onto these substrates, thereby allowing for customised treatment. "The ultimate goal is to get the right intervention to the right client at the right time," August explains.

The second major division of CPPR recognises the potential benefit of encouraging clients to participate with their providers in clinical care decisions, known as shared decision-making. Research examines how client choice affects intervention outcomes and what factors influence how clients make their choices (eg, personality traits, family contextual factors, motivational cognitions). Once identified, these factors can be incorporated into the design of decision-aids, mini-interventions presenting medical evidence in consumer-friendly ways. The intent is to help clients make deliberate, effective choices about healthcare options. "Decision aids use a variety of formats including pamphlets, DVDs, web- and social media messages with information about options, probable outcomes, untoward effects and use of client stories/testimonials," Gewirtz reveals.

AN EVOLVING PERSONALISATION RESEARCH PORTFOLIO

One example of the type of personalisation research CPPR is currently conducting is the development of adaptive treatment strategies (ATS) for the prevention of serious conduct problems in youth referred for pre-court diversion programming. ATS are individualised decision rules specifying how intervention components or dosages of an intervention should be adjusted at critical decision points over time based on the individual's early response. To construct these ATS, August is using an emerging technology called the Sequential Multiple Assignment Randomisation Trial (SMART). Participants are randomised in stages to different intervention options to address questions about treatment sequence and dosage that cannot be answered by traditional randomised control trials (RCTs). This method will provide answers to key questions...
Early prevention efforts strive to promote resilience through skill-building efforts that pave the way for positive mental health.

such as: ‘which second-stage intervention option works best for youth who do not show adequate response to a first-stage option?’ and, ‘which sequence of interventions yields the greatest long-term effects?’ In addition, the study is examining pre-intervention youth and family characteristics that moderate treatment outcomes and thus might serve as secondary tailoring variables. These data will address the question of what works best for whom. “This type of intervention framework could not only result in better outcomes for high-risk youth, but provide a more efficient and cost-effective service for community providers,” August states.

CPPR investigators are also using personalised approaches to examine the impact of client preferences on intervention outcomes. In one study implemented in children’s mental health clinics throughout the state of Michigan, Gewirtz and her team are randomising parents of disruptive youngsters to preference or no preference treatment arms – both include four different delivery options of the Oregon Parent Management Training Program. “It will be interesting to see whether offering parents choices about the type and format of programme (i.e. individual or group, home- or clinic-based, child- or parent-focused treatment) will result in greater compliance and satisfaction with improved outcomes,” Gewirtz notes. Of heuristic value will be the identification of personal factors associated with various intervention options and factors that predict level of parent engagement and child outcomes.

A NEW ERA IN MENTAL HEALTH

Through their work with the CPPR, August, Gewirtz and their colleagues are ushering in a paradigm shift in mental health. By incorporating the needs and preferences of individuals, they seek to improve outcomes both for children and their families while reducing the burden and rising cost of healthcare.

More needs to be learned regarding how findings from genomics and neuroscience can inform the design of adaptive interventions. Can the discovery of specific genes associated with response to treatment unlock the actual pathophysiological mechanisms underpinning risk and resiliency? Can imaging studies that reveal altered brain circuits provide the roadmap to develop rehabilitative behavioural strategies? A new era of neuroscience research will yield tailoring variables, based on how genetic and neurobiological variables interact with environmental factors. As a result, improved intervention models could match treatment to individuals based on genetic profile, biomarkers, environmental exposure, and preferences.

CPPR RESEARCH GOALS

- To understand the role of genetic, neurobiological and neurocognitive mechanisms that underlie the processes that are dysregulated in emotional and behavioral disorders, and employ them as preventive intervention targets
- To adapt preventive intervention models that are informed by individual characteristics and have the greatest promise to distinguish responders and non-responders in preventive intervention trials
- To identify or develop theory-informed measures that assess how parents make decisions about the type of mental healthcare they prefer for their children
- To develop decision-aid interventions that help parents and youth make informed choices about the type of mental care that will provide the greatest benefits

OBJECTIVES

To support a personalised approach to children’s mental health by developing new and innovative interventions that incorporate the individual needs and preferences of children and their families.

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DR GERALD AUGUST specialises in developmental psychopathology and prevention science. His research focuses on the prevention of aggressive and antisocial behaviour and drug abuse in high-risk children and youth. He has developed and validated an early-age conduct problems prevention programme that has been recognised as an exemplary drug abuse prevention programme by the Center for Substance Abuse Prevention’s National Registry of Effective Prevention Programs, a model programme by the Office of Juvenile Justice and Delinquency Model Program’s Guide Database, and a research-based programme by the National Institute on Drug Abuse (NIDA). August has served as Principal Investigator on a number of prevention projects, supported by NIDA, NIH and Substance Abuse and Mental Health Services Administration (SAMHSA) addressing issues pertaining to the efficacy and effectiveness of preventive interventions for high-risk children and youth to community systems of care. More recently, he was awarded an NIMH Developing Center grant to study the personalisation of preventive interventions to fit the needs and preferences of children at risk for serious conduct problems. He is also co-Director of the Institute for Translational Research in Children’s Mental Health at the University of Minnesota.