How can we know when a defendant is lying? Or if the memory of an eyewitness is accurate? Or when someone with cognitive impairment is vulnerable to financial predators? Or when a young person with poor impulse control at risk for committing an act of violence? These issues of truth and deception, mental capacity, eyewitness testimony, guilt and innocence and criminal responsibility are fundamental concerns of our legal and criminal justice systems.

The burgeoning field of forensic neuroscience – the study of brain and behavior in legal contexts – is shedding light on these issues. In research laboratories at Massachusetts General Hospital and elsewhere, scientists are working to map the locations of human thought and emotion using ever more sophisticated imaging technologies like Magnetic Resonance Imaging (MRI) and Positron Emission Technology (PET). There is hope that this young but rapidly advancing field holds promise for providing certainty beyond a doubt in the courtroom.

CAUTION ON SCIENTIFIC ‘EVIDENCE’

MGH psychiatrist and attorney Judith Edersheim, JD, MD, believes that the introduction of neuroscience into the courtroom has made many positive contributions to legal outcomes. But according to Dr. Edersheim, there are egregious examples in which shoddy use of neuroscientific findings has undermined the pursuit of justice. “This is a complex and busy intersection, where neuroscience is meeting up with an overburdened and unprepared justice system,” notes Dr. Edersheim.

To ensure that the best available knowledge from neuroscience is brought to bear on legal decision-making, she co-founded the MGH Center for Law, Brain and Behavior (CLBB) with fellow MGH physician Bruce H. Price, MD. Dr. Price is a cognitive and behavioral neurologist and an authority on memory and executive functions.

“Bruce and I saw that brain science was being imported prematurely into the courtroom, and that the cause-and-effect conclusions being reached were not supported by the current evidence. We found this very disturbing,” Dr. Edersheim says. “Junk science only furthers public confusion, despair and injustice.” CLBB’s principal goal is to address this problem by offering evidence-based and relevant translations of neuroscience in the legal arena.

“This is a complex and busy intersection, where neuroscience is meeting up with an overburdened and unprepared justice system.”

Judith Edersheim, JD, MD

Unlike the “irrefutable” forensic evidence pieced together during any episode of TV’s popular “CSI: Crime Scene Investigation,” much of the data generated by imaging techniques such as MRI and PET scans defy simple conclusions, leaving ample room for arbitrary or inaccurate interpretation in real-life courtrooms, according to Drs. Edersheim and Price. “With the technology we have today, you can’t do an MRI of someone’s brain to determine whether they have decision-making capacity,” says Dr. Edersheim, who also serves as assistant clinical professor of Psychiatry at Harvard Medical School.

(Continued on page 6)
Message from the Chief

Thanks in large measure to support from hospital leadership, and increasingly to charitable support, MGH Psychiatry nurtures exceptional talent. In the summer issue of Mindscapes, you will read about Steve Willis and Elissa Freud’s support for the research of Dr. Rakesh Karmacharya, who is doing extraordinary work with stem cells in a quest to identify “disease signatures” for bipolar disorder and schizophrenia. Through their new Center for Law, Brain and Behavior, Drs. Judith Ekersheim and Bruce Price are bringing the best available knowledge from neuroscience to bear on legal decision-making in the courtroom. And Dr. Anthony Weiner is expanding psychiatric care for the fastest growing age group in America – older adults.

Philanthropy makes these and other exciting initiatives possible and, in so doing, helps our team of psychiatrists and psychologists set the standard of care for psychiatric illness. Projects and services that now thrive would never have been possible without anchor funding from charitable donors. Programs that were nascent or small are now large and impactful.

On behalf of our MGH Psychiatry faculty, thank you to our growing community of friends and supporters. Your confidence and trust inspire and enable our work. I hope that your summer is a time of health, renewal, family and friends.

Jerrold F. Rosenbaum, MD
Psychiatrist-in-Chief
Massachusetts General Hospital
Stanley Cobb Professor of Psychiatry
Harvard Medical School

Expanding Outpatient Care for Older Adults

Longer life spans and aging baby boomers will contribute to a doubling of the population of older Americans. By 2030, the number of adults age 65 and older is expected to grow to 71 million, comprising 20 percent of the population.

A passionate advocate for improved psychiatric care for older adults, Anthony P. Weiner, MD, has taken on the charge of expanding the Department of Psychiatry's outpatient services for adults age 65 and older.

MENTAL HEALTH CHALLENGES IN LATER LIFE

“As we age, there are a number of challenges to mental health,” says Dr. Weiner, a leading geriatric psychiatry clinician with nearly two decades of experience. “In addition to medical problems such as heart disease or diabetes, older adults also may face cognitive disorders such as Alzheimer’s, or emotional difficulties that may be triggered by grieving, loss of function or social isolation.”

About 5 percent of adults age 65 and older will develop depression. The prevalence is more than double that for older individuals who are hospitalized and those who require home health care. Tragically, suicide is often closely tied to depression. The rate of suicide is higher among individuals age 65 and older than any other age group, with non-Hispanic white men age 85 and older having the highest rate.

MEETING A DEMOGRAPHIC IMPERATIVE

To address this demographic imperative, Dr. Weiner is expanding outpatient psychiatry services for older adults, collaborating with and building on the work of colleagues William E. Falk, MD, and M. Cornelia Cremens, MD. Using teams of multidisciplinary geriatric specialists, the Older Adult Outpatient Psychiatry Program will support the complex care needs of patients and their families, while closely coordinating with patients’ other medical specialists and community-based partners. By 2017, Dr. Weiner’s goal is to quintuple the program’s capacity for new patient visits.

Dr. Weiner was recruited to Mass General in 2011, after 20 years of caring for older adult patients and their families, including at Lahey Clinic and Hallmark Health/Lawrence Memorial Hospital. “We recruited Tony for his extensive experience providing medical-psychiatric care to older patients in a variety of settings,” says MGH Psychiatrist-in-Chief Jerrold F. Rosenbaum, MD. “The Older Adult Outpatient Psychiatry Program will help us meet the extraordinary demand for psychiatric services for older adult patients and their families through the next decade and beyond.”

Adapted from an article published in MGH Hotline

Anthony P. Weiner, MD
Faculty News

Anne E. Becker, MD, PhD, ScM, founding director of the MGH Eating Disorders Clinical and Research Program, received the Price Family Foundation Award for Research Excellence from the National Eating Disorders Association (NEDA). The award will be presented at the NEDA Conference in Washington, D.C., in October 2013.

Noah C. Berman, PhD, clinical fellow in Psychology in the Obsessive-Compulsive and Related Disorders Program, received a grant from the International OCD Foundation to study cognitive biases in OCD and mechanisms of generational transmission.

Eugene V. Beresin, MD, MPH, director of the Clay Center for Young Healthy Minds, was made a fellow of the British Institute of Mental Health. Dr. Beresin also received the Greenblatt Memorial Award for Teaching, given by the University of California, Los Angeles.

Nancy Keuthen, PhD, director of the Trichotillomania Clinic and Research Unit, was awarded a grant from the Trichotillomania Learning Center for collections to a trichotillomania DNA repository.

Andrew A. Nierenberg, MD, director of the Bipolar Clinic and Research Program and associate director of the Depression Clinical and Research Program, was awarded a grant from the American Foundation for Suicide Prevention for a neuroimaging study in bipolar disorder to explore whether suicide can be reconceptualized as impaired decision making. Dr. Nierenberg was recently appointed vice president of Research for the International Society for Bipolar Disorders.

Jerrold F. Rosenbaum, MD, MGH psychiatrist-in-chief, will assume the presidency of the American Foundation for Suicide Prevention in December 2013.

Ronald Schouten, MD, JD, director of the Law & Psychiatry Service, was awarded the Benjamin Franklin gold medal for his book *Almost a Psychopath: Do I (Or Does Someone I Know) Have a Problem With Manipulation and Lack of Empathy?* The book was named the best book in psychology in 2013 by the Independent Book Publisher’s Association.

Luke E. Stoeckel, PhD, clinical neuropsychologist in the Center for Addiction Medicine, received a Charles A. King Trust Fellowship for his research in self-regulation of brain activation in addiction.

Louisa Sylvia, PhD, assistant director of Psychology in the Bipolar Clinic and Research Program, was awarded a grant from the American Foundation for Suicide Prevention to test a form of cognitive-behavioral therapy to improve sleep disturbance in individuals with bipolar disorder and suicidal ideation.

Mai Uchida, MD, a staff psychiatrist in the Clinical and Research Program in Pediatric Psychopharmacology and Adult ADHD, received a grant from the American Academy of Child and Adolescent Psychiatry to conduct pilot research on attention-deficit and hyperactivity disorder.

Anthony P Weiner, MD, director of the Older Adult Outpatient Psychiatry Program, received a grant from the Ralph E. Ogden Foundation to expand clinical psychiatry services for older adults.
Elissa Freud and Steve Willis Help Advance Research in Bipolar Disorder and Schizophrenia

Science Inspires Art

Elissa Freud and Steve Willis are long-standing benefactors of the Department of Psychiatry, who are committed to ensuring that no stone is left unturned in the quest to advance scientific understanding of psychiatric illness and improve the lives of those who suffer.

“Mental illness is a public health crisis,” says Steve, founder of Wellfleet Communications and Argon Networks. “Psychiatric research has lagged behind other areas of medical research and we want to help change that trajectory.”

EARLY SUPPORT
Steve and Elissa’s philanthropic partnership with the department began 13 years ago, after an extended family member was hospitalized for bipolar disorder. Elissa, a social worker by training, noticed that there were few resources to help patients and family members navigate a mental health crisis. (This was in 2000, before the Internet made information and stories about other people’s health universally available.)

That same year, Elissa and Steve decided to make a gift to the Department of Psychiatry to launch a program to educate and support individuals and families affected by psychiatric illness. The program, the Mood and Anxiety Disorders Institute (MADI) Resource Center, became a focal point for the couple’s passionate commitment to helping affected individuals and families navigate the mental health journey.

“Mental illness is a public health crisis. Psychiatric research has lagged behind other areas of medical research, and we want to help change that trajectory.”

– Steve Willis

While sustaining their personal and financial commitment to MADI throughout the 2000s, Steve and Elissa also supported clinical research in the MGH Bipolar Clinic and Research Program aimed at developing best practices for the care of patients with bipolar disorder.

INVESTING IN A YOUNG SCIENTIST
A decade after establishing MADI, Steve and Elissa felt the urge once again to expand their support for Mass General, this time by investing in basic science. In 2011, MGH Psychiatrist-in-Chief, Jerrold F. Rosenbaum, MD, introduced them to Rakesh Karmacharya, MD, PhD, who was then being recruited to direct Stem Cell Research at the MGH Psychiatry Center for Experimental Drugs and Diagnostics.

The couple felt an immediate connection to him. “Dr. Karmacharya is a rare combination of clinical psychiatrist and basic scientist,” says Steve. “In his clinical practice, he sees the daily impact of these illnesses, fueling his commitment to research.”

Scientists in the early stages of their research careers, like Dr. Karmacharya, 41, are tackling difficult questions in psychiatry using nontraditional, novel approaches. “Our young scientists have the creativity and drive to push beyond the boundaries of traditional research,” says Dr. Rosenbaum. “Their work will transform our understanding of mental illness and, ultimately, give patients and families hope for a life that is not compromised by illness and the sometimes debilitating side effects of treatment.”
**USING STEM CELL TECHNOLOGY**

Dr. Karmacharya’s research builds on the groundbreaking discovery by Shinya Yamanaka, MD, PhD, in Japan that skin cells could be “reprogrammed” into stem cells by introducing a set of four genes into the skin cells. Dr. Yamanaka was awarded the Nobel Prize in 2012 for this scientific breakthrough.

In his laboratory, Dr. Karmacharya has succeeded in transforming skin cells from patients with psychiatric disorders into stem cells from which he is able to create functioning neurons – brain cells – in a Petri dish. This remarkable feat allows Dr. Karmacharya to look for disease-specific differences in the structures and functions of the patient-derived neuronal cells when compared to neuronal cells from healthy individuals. “If neurons can reveal the biological underpinnings of a person’s psychiatric diagnosis,” says Dr. Karmacharya, “this discovery could lead to a more rational approach to treating and managing psychiatric illnesses.”

Dr. Karmacharya is at the forefront of unraveling the neurobiology of bipolar disorder and schizophrenia. His ultimate goal is to identify “disease signatures” for these illnesses based on biological differences at the cellular level. These disease signatures will guide the search for drugs that can modulate the disease signatures and ameliorate cellular dysfunction.

By screening hundreds of thousands of chemicals, Dr. Karmacharya intends eventually to develop new treatments that are more effective and have fewer harmful or troubling side effects than current medications. “My patients and their families go through a lifetime of suffering,” Dr. Karmacharya explains. “There is an urgent need to find treatments that work well.” Dr. Karmacharya spends four days each week in his lab, and sees patients one day per week.

**RECOGNITION OF ENTREPRENEURIAL SPIRIT**

As a successful entrepreneur, Steve Willis recognizes the value of Dr. Karmacharya’s research. He equates Elissa’s and his decision to fund this endeavor with evaluating the benefits and risks of supporting any new venture.

“Starting a new venture is about recognizing an opportunity and solving a problem,” says Steve. “You base your ‘investment’ on the endeavor’s reach, risk and the return. Dr. Karmacharya’s work has a bold reach and the potential return is immense: by directly studying non-invasive neuronal activity of specific patients, new and innovative treatments can be developed.”

**SCIENCE INSPIRES ART**

When Steve and Elissa first toured Dr. Karmacharya’s lab, he showed them a photograph depicting a result of his work. “In the image, we saw the neurons and astrocytes that Dr. Karmacharya and his team had generated, starting from skin cells,” says Elissa, an accomplished ceramic artist. “The picture was compelling. We spent time looking at the image while Dr. Karmacharya explained its different elements. They were intellectually fascinating as well as visually beautiful.”

For Elissa, the impact of what she saw went beyond the vibrant colors and shapes of the green neurons, red astrocytes and blue nuclei. She also saw hope. “The pictures moved me on so many levels,” she says. “I was fascinated by their complexity, beauty and potential. These neurons may hold the key to understanding mental illness.”

Inspired by his research, Elissa has translated this image (left) into a three-dimensional ceramic sculpture composed of 12 tiles based on the neurons grown in Dr. Karmacharya’s lab (below).

**ABOUT THE SCIENTIST:**

Rakesh Karmacharya, MD, PhD, was born and raised in the city of Patan in the Kathmandu Valley in Nepal. At 17, guided by what he refers to as youthful enthusiasm (and with encouragement from his high school teachers), he skipped his senior year of high school and boarded an airplane for the first time to attend MIT and Harvard University on full scholarship. “I told my mother that I would be away for four years,” Dr. Karmacharya says. “Things didn’t exactly work out that way, and she still reminds me of that.” Twenty-five years later and more than 7,000 miles away from home, Dr. Karmacharya is a compassionate psychiatrist treating patients with bipolar disorder and schizophrenia. “I want to see my patients recover and reclaim their lives,” says Karmacharya about his work in the laboratory.
LIMITATIONS OF SCANNING TECHNOLOGY

“A brain scan may not detect gross physical impairment,” she adds. “And even if it did, the physical impairment may not be reflected in a functional disability. So scans are not always the answer.” Prior to becoming a psychiatrist, Dr. Edersheim graduated from Harvard Law School and spent four years as counsel with a major Boston law firm.

“To ensure responsible, ethical and scientifically sound translation of neuroscience concepts into the legal arena, we first need to determine what is clinically relevant, and then help judges, jurors and lawyers who are not scientifically trained to understand the science,” explains Dr. Price, who is chief of the McLean Hospital Department of Neurology, associate in Neurology at Mass General and associate professor of Neurology at Harvard Medical School.

“We’re looking to impact legal and public policy. It’s not an easy task, but it’s worthy,” Dr. Price says. “Eventually, everyone will be touched by these issues.” Five years in the making, launched three years ago and fully operational within the past two years, CLBB already has emerged as a vocal proponent of a more disciplined translation of neuroscience in the courtroom.

MULTIDISCIPLINARY LEADERSHIP

Directed by a core team committed to bringing together experts from the legal and scientific communities, CLBB coordinates interdisciplinary research and training programs, drawing heavily on the established research and clinical expertise at Mass General. Other core team members include Justin T. Baker, MD, PhD, CLBB’s director of scientific programming and a research fellow at the Harvard University Center for Brain Science; and Rebecca W. Brendel, MD, JD, CLBB’s director of law and ethics, clinical director of the Red Sox Foundation and Massachusetts General Hospital Home Base Program, and assistant professor of Psychiatry at Harvard Medical School. In addition, a 14-member advisory council comprised of thought leaders in government, finance, biotechnology and media advises the center regarding critical issues in the translation of brain science into social science.

The CLBB team is advancing the frontiers of forensic neuroscience through an expanding research agenda, symposia that bring together the scientific and legal communities, news commentary for leading mass media outlets such as the The Wall Street Journal and Huffington Post and a website, www.clbb.org, with videotaped lectures and articles.

“...what is clinically relevant, and then help judges, jurors and lawyers who are not scientifically trained to understand the science.”

Bruce H. Price, MD

CURRENT PROJECTS

Among CLBB’s current projects is a study of impulse control and aggression. “Humans are constantly faced with the opportunity to pursue immediate rewards at the cost of larger long-term rewards,” notes CLBB faculty member and principal investigator Joshua W. Buckholtz, PhD, who is also an assistant professor of Psychology at Harvard University. “By contrast, highly impulsive people are unable to delay gratification, leading them to make poor decisions that can have serious negative consequences.” This research study seeks to identify the neural circuits which tip the balance in favor of impulsive decisions, and to develop ways to intervene in that circuitry. Advances in this area would have immediate implications for understanding and deterring spontaneous violence.

A second CLBB project focuses on older adults with cognitive impairment who are at heightened vulnerability to coercion by opportunists hoping to control their decisions, particularly concerning financial matters. The goal of the study is to devise and test a psychometric instrument to measure susceptibility to undue influence that can be used in proceedings about guardianship, testamentary capacity and informed consent. “The development of this tool will make an immediate contribution to the protection of adults with mild to severe intellectual impairments,” says Dr. Price. “Ultimately, our success will hinge on answering the question, ‘Can science help address some of the huge legal issues of the day and add value to the behavioral questions in the courtroom?’” states Dr. Price. “We believe strongly that it can.”

The MGH Center for Law, Brain and Behavior is funded solely by charitable gifts and grants.
DINNER FOR THE ALAN AND LORRAINE BRESSLER PROGRAM FOR AUTISM SPECTRUM DISORDERS, MGH, JUNE 11

Standing, from left: Joseph Biederman, MD, director, Pediatric Psychopharmacology and Adult ADHD Program; Helen Charlupski, member, Pediatric Psychopharmacology Council; Thomas J. Spencer, MD, associate chief, Pediatric Psychopharmacology and Adult ADHD Program; Lorraine Bressler; Scott Epstein; Gagan Joshi, MD, medical director of the Alan and Lorraine Bressler Program for Autism Spectrum Disorders; Stephanie Furtak, clinical research coordinator. Seated, from left: Janet Wozniak, MD, director, Pediatric Bipolar Disorder Program; Karen Bressler; Arielle Bressler Lopez; Nancy Bressler.

JACK CONNORS, JR. AWARD FOR FUNDRAISING EXCELLENCE, PALM BEACH, FLA, FEB. 28

From left: James E. Thompson, MGH vice president for Development; Carroll Carpenter, co-founder, Leadership Council for Psychiatry and award recipient; Michele Kessler, co-founder, Leadership Council for Psychiatry and award recipient; Betsy Nabel, MD, president, Brigham and Women’s Hospital; Jim Asp, senior vice president and chief development officer, Brigham and Women’s Hospital.

THINK:KIDS ADVISORY BOARD DINNER, THE PAUL S. RUSSELL, MD MUSEUM, MGH, JAN. 31

LEFT PHOTO: From left: Thomas G. Stemberg and David S. Barlow, Think:Kids Advisory Board members; with Edward P. Lawrence, chair, Partners HealthCare Board of Directors.

RIGHT PHOTO: From left: J. Stuart Ablon, PhD, director, Think:Kids; Martina B. Albright, PhD, director of clinical training, Think:Kids; and Dr. Albright’s husband, Jon Bernstein.

LECTURE BY TIMOTHY E. WILENS, MD, LAKE WALES CHARTER HIGH SCHOOL, LAKE WALES, FLA, MARCH 1

Center right, Timothy E. Wilens, MD, director, Clinical Programs, MGH Center for Addiction Medicine; second from right, Donna Dunson, principal, Lake Wales Charter High School; right, Serita Winthrop, member of MGH Leadership Council for Psychiatry; and three students. Dr. Wilens spoke to 1,300 students about drug and alcohol abuse.

MGH EATING DISORDERS CLINICAL AND RESEARCH PROGRAM SEMINAR, BOSTON, APRIL 26

LEFT PHOTO: From left: Rebecca Strong, keynote speaker; Jennifer Thomas, PhD, co-director, MGH Eating Disorders Program; Anne E. Becker, MD, PhD, ScM, founding director, MGH Eating Disorders Program.

RIGHT PHOTO: From left: Jerrold F. Rosenbaum, MD, MGH psychiatrist-in-chief; Jennifer Thomas, PhD, co-director, MGH Eating Disorders Program; and Jeanie N. Calhoun, member, MGH Leadership Council for Psychiatry.
Faculty Books

ALMOST ANOREXIC: Is My (or My Loved One’s) Relationship with Food a Problem?

By Jennifer J. Thomas, PhD, and Jenni Schaefer
Published by Harvard Health Publications/Hazelden, 2013

Millions of men and women struggle with disordered eating. Some stand at the mirror wondering how they can face the day when they look so fat. Others binge, purge or exercise compulsively. Many skip meals, go on diet after diet or cut out entire food groups. Still, they think they are never thin enough.

While 1 in 200 adults have experienced full-blown anorexia, at least 1 in 20 (and 1 in 10 teen girls) have exhibited some key symptoms. Many suffer from the effects but never address the issue because they don’t fully meet the diagnostic criteria. If this is the case for you, then you may be “almost anorexic.” Drawing on case studies and the latest research, Almost Anorexic combines a psychologist’s clinical experience with a patient’s personal recovery story to help readers understand and overcome almost anorexia.

FAST MINDS: How to Thrive if You Have ADHD (Or Think You Might)

By Craig Surman, MD, and Tim Bilkey, MD, with Karen Weintraub
Published by Berkley Hardcover, 2013

FAST MINDS is an acronym for common symptoms that are often seen in Attention Deficit/ Hyperactivity Disorder (ADHD): Forgetful, Achieving below potential, Stuck in a rut, Time challenged, Motivationally challenged, Impulsive, Novelty seeking, Distractible, Scattered.

Millions of adults have ADHD or some of its traits, but they are under-recognized, under-treated and often under-supported. This book empowers people with ADHD, or some of its characteristics, to adapt and thrive. By working through the program in this book, readers will develop personalized strategies to take control of their lives.

With inspiring stories of real people who have adapted and thrived using the methods in this book, FAST MINDS will help readers create the kind of lives they want to live.

Book summaries are based on publisher descriptions found at www.amazon.com

THE MGH PSYCHIATRY ACADEMY
PATIENT AND FAMILY EDUCATION SEMINARS

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