MINDSCAPES

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Seeking Justice at the Intersection of Neuroscience and the Law:

New Center for Law, Brain and Behavior guides use of neuroscience in the courtroom

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? When is 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.

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Judith Edersheim, JD, MD, and Bruce H. Price, MD, Directors of the MGH Center for Law, Brain and Behavior

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.

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LIMITATIONS OF SCANNING TECHNOLOGY

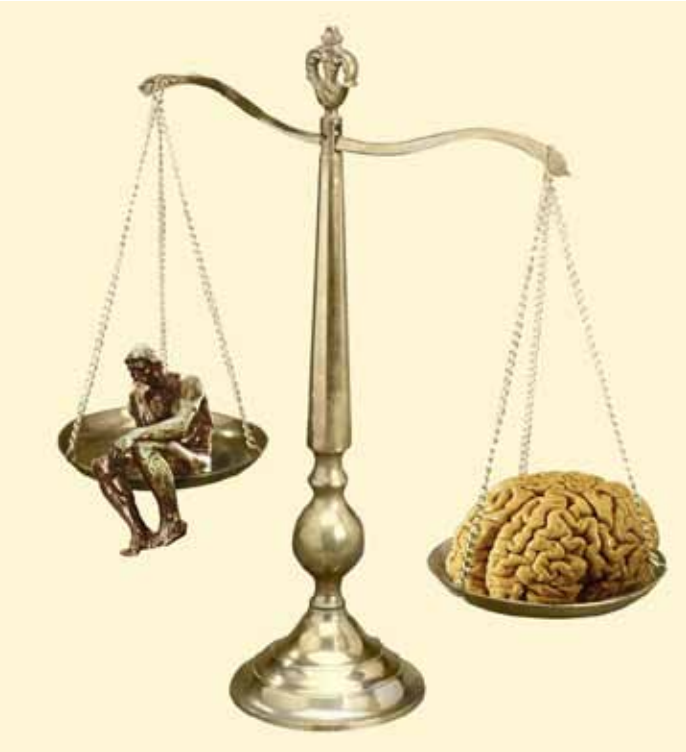
"A brain scan may not detect gross physical impairment," she adds. "And even if it did, the physical impairment may not be reflected in a functional disability. So scans are not always the answer." Prior to becoming a psychiatrist, Dr. Edersheim graduated from Harvard Law School and spent four years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

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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."

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