

## The Neurobiology of Suicide

FROM THE BENCH TO THE CLINIC  
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Why do people become suicidal? Why do some suicide attempts have a fatal outcome whereas others do not? Is there a brain abnormality that drives certain individuals to think suicidal thoughts? Why do some patients attempt to kill themselves and others only commit repeated acts of self-injurious behavior? Why do males generally choose violent means of committing suicide whereas females generally overdose? Is there a specific brain chemical aberration that accounts for these phenomena? What about a genetic predisposition to suicide? Can suicide be predicted and/or prevented? Are there any biological markers or other predictors of suicidal individuals? Is there a reliable treatment intervention? These and other pivotal questions are addressed in *The Neurobiology of Suicide: From the Bench to the Clinic*, a highly informative text edited by Stoff and Mann. The editors have done a superb job of identifying pertinent topics and selecting a cadre of researchers and clinicians to contribute to the volume. The publication fills a major void in the literature on the neurobiology of suicide, as the only similar volume appeared a decade ago. A broad readership of practitioners, clinical researchers and basic scientists should find the volume highly informative, easy to read and understand, with stimulating and challenging suggestions for future research.

The book is subdivided into three sections. The first section provides an excellent overview of pre-clinical studies in animal models of suicidal behavior, and how these have been used in attempts to determine 'bio-behavioral' relationships and the effects of genetic and environ-

mental manipulations on behavior. Because animals are not known to commit suicide as we know it in the human paradigm, impulsiveness and externally directed aggression have been used as a proxy for suicidal behavior. A chapter describing the information obtained from a knockout mice lacking a specific serotonin receptor presents fascinating 'cutting-edge' molecular findings using a creative new model for a specific aspect of human psychopathology.

The second section is devoted to clinical neuropathological studies aimed at elucidating the neuroanatomical and neurochemical factors involved in suicidal tendencies. In four chapters, researchers cogently summarize the findings from postmortem analyses of suicide victims. This section provides a wealth of information regarding the possible role of the serotonergic and noradrenergic systems in depression and suicide. A chapter written by Ghanshyam N. Pandey describes how human platelets containing a specific subtype of a serotonin receptor may prove to be a useful marker for identification of suicidal patients. This chapter is a nice addition to an earlier chapter discussing the relationship between lowered cholesterol levels and inadequate CNS serotonergic activity, as studies predict that low serum cholesterol may have a potential link to impulsivity, aggression, and suicidal behavior.

The third section addresses clinical issues surrounding the management of the suicidal patient, including a discussion of psychotherapeutic and pharmacotherapeutic characteristics that are unique to these cases. Of particular value to the clinician is the chapter 'A Four-pathway Clinical-Biochemical Model' for suicide, which is succinctly written and summarizes potential physiological and psychological suicide risk factors. For example, a discussion is included on the increased suicide risk associated with brief, recurring depressive episodes, especially those superimposed upon major depression, usually referred to as 'combined' or 'double depression'. This section of the book is also highly informative and challenging in that it raises some important issues confronting the clinician who is called

upon to deal with suicidal patients, such as the extent to which antidepressants control the emergence of suicidal thoughts, whether drug treatments may aggravate or even precipitate a suicide attempt, whether psychotherapy may intensify suicidal tendencies, and the safety of benzodiazepine treatment with actively suicidal patients. The utility of lithium in exerting anti-suicide action is also cogently reviewed by Leonardo Tondo *et al.* In a careful but brief review of the relevant literature, the authors

conclude that lithium maintenance consistently produces reduced rates of life-threatening or fatal suicidal acts in patients with severe recurrent mood disorders, not limited to bipolar illness. The authors suggest that the beneficial anti-aggression effects of lithium may be related to enhancement of central serotonergic function.

A surprising omission from the book was a discussion of the potential roles of dopamine and endorphins in suicide. Dopamine has been commonly linked to pleasure/reward mechanisms, and dysfunction of the dopaminergic system may be partially responsible for persistent anhedonia, or total loss of the ability to experience pleasure, among chronically suicidal patients.

The editors are to be commended for having composed an excellent introduction to the theme of suicide, and a lucid summary section in which they provide a synthesis and final review of the issues presented in the three components of the book.

The subtitle of the volume, 'From the Bench to the Clinic', is apt, given the content of the book; the many topics covered by the book should interest a broad readership of clinicians and researchers. The text includes both basic and clinical research findings, and investigates many hypotheses and promising new systems that should aid in unraveling the puzzle of suicidal behavior and its multifaceted manifestations. The breadth of topics and contributors selected illustrates the editors' expert knowledge of the field. The publication of such a volume is timely and the information it contains is up-to-date. I recommend it highly.

