Suicide Diagnosis, Assessment and Prevention

WWW.RN.ORG®
Reviewed November 2022, Expires November 2024
Provider Information and Specifics available on our Website

By Melissa Slate, RN, CNN

Objectives

On completion of this continuing medical education offering, participants will be able to:

1. Gain deeper understanding concerning the history, diagnosis and assessment and prevention of suicide.
2. Delineate the scientific findings and theories concerning suicide.
3. Review current interventions used in psychiatry for preventing suicide.

Introduction

From the perspective of a mental health professional, suicidal acts are not rare. Suicide accounts for about 10% of deaths among psychiatric patients, and life-threatening attempts are much more common than fatalities. Suicide is a major public health challenge. It is the third leading cause of death among juveniles and young adults, and ranks eighth for all ages. In addition to its impact on survivors, suicide is not only distressing to clinicians caring for persons at risk but it is also a significant liability risk. Despite progress in defining risk rates and predictive factors, knowledge on which to base sound clinical and public policies regarding suicide prevention and treatment remains remarkably limited. This overview summarizes the current knowledge of suicide. Part I covers the historical background of views of suicide and contemporary clinical-descriptive and epidemiological information about suicide. Part II deals with psychosocial and biological

theories of causation, clinical assessment, risk factors, and clinical management of suicidal persons.

Some suicides occur unexpectedly; many others are predicted but seem to be virtually unpreventable. Most are a final outcome of a psychiatric illness, particularly a mood or psychotic disorder or alcoholism.[1] Only a minority of suicides arise from stressful life events in an otherwise emotionally healthy person. In all cases, peak risks of suicidal behavior probably are time-limited, and thus are potentially preventable. Nevertheless, evidence that prevention can be achieved predictably and consistently is lacking. Moreover, despite advances in the mental health sciences, most contemporary societies treat suicide as a matter of shame, representing a failure of personal responsibility, family cohesion, or social systems. This nonclinical view of suicide severely complicates intervention and research on the subject, and even limits reliability of epidemiological statistics due to under- or misreporting of suicides.

Historical Background

Ancient Cultures

Western cultures have always considered suicide with wariness and varying levels of acceptance or sanction. In ancient Greece, suicide was an offense against the state and suicides were denied burial in community sites, and sometimes mutilated.[2,3] Some early humanistic philosophical movements accepted suicide; others deplored it as an offense against social order or the gods.[2] Plato (circa 427-347 BC) considered suicide an offense against society, but recognized possible exceptions based on civil law or response to severe adverse events. Aristotle (384-322 BC) unambiguously condemned suicide as a cowardly act**,** and Plutarch (circa AD 46-120) continued the generally antisuicide tradition represented by Aristotle.[2,3]

In imperial Rome, suicide was not uncommon, and was sometimes considered honorable among civic leaders and intellectuals (Tondo 2019).[2] Cicero (106-43 BC) generally condemned suicide, but accepted it as an act of heroism, self-sacrifice, or defense of honor. Many cultures dominated by the Imperial Roman army resorted to suicide to escape humiliation or abuse, sometimes hoping for a favorable afterlife. Under Emperor Constantine I (circa AD 290-337) rules against suicide became stricter, with

confiscation of goods after suicide aimed at avoiding criminal justice or to compensate the state for loss of a citizen.[2]

Middle Ages

Mixed views on the issue of suicide continued during the Middle Ages in Europe.[2,3] It may have been respected by some if committed as a heroic act or means of avoiding rape, but the dominant view was that suicide was a selfish or criminal act. Corpses of suicides were dishonored by mutilation, denial of cemetery burial, or placement under public streets.[2,3] Property of suicides routinely was confiscated by the state unless the suicide was recognized as insane or mentally incompetent -- a rare outcome, given widespread sharing of confiscated property between the crown and the courts.[4]

The Renaissance brought a re-evaluation of suicide.[2] Dante Alighieri (1265-1321) followed a double standard: "noble souls" (including poets, philosophers, and some politicians) went to Limbo, but unpopular politician-suicides were condemned to the depths of Hell.[2] As education improved and humanitarian interests increased, many famous suicides of the past were reinterpreted as expressions of philosophical convictions. Condemnation still was expected, but intellectuals could discuss the issue more freely.[2] Erasmus (1466-1536) viewed suicide as a way of ridding oneself of the "weariness of life," yet still considered it an insane act.[5]

17th-19th Centuries

Before 1800 in England, suicides were more often recorded among peasants than aristocrats, possibly because dueling served as a surrogate act for suicide and aristocrats viewed suicide as a shameful act.[4] Even among the clergy, suicide was almost invariably hidden, or occasionally attributed to insanity, and among monks, suicide may have occurred as a result of religiously motivated self-starvation. In 17th century English literature, suicide was a common theme, usually presented as a response to guilt or love. Shakespeare (1564-1616) included suicides in several dramas. Poet-priest John Donne (1572-1631) justified suicide as a response to unnatural conditions of civilization, and as lacking biblical prohibition.[6] During the mid-17th century the term "suicide" became increasingly used in England and throughout Europe.[3]

Most philosophers of the 17th-18th centuries condemned suicide, but some

writers recognized a connection between suicide and melancholy or other severe mental disturbances.[3] Robert Burton (1577-1640) in *Anatomy of Melancholy* [7] provided the first "modern" interpretation of suicide, suggesting specifically that suicide can represent an expression of severe depression (melancholy). Moreover, penalties for suicide were less often enforced as judges realized that sentencing a corpse was irrational, and that the same person, technically, could not be considered both murderer and victim.

Through the 18th century, most suicides were attributed to mental illness. Despite opposition from the clergy and military, social pressure for decriminalization followed the French Revolution in 1789, and this view spread throughout Europe in the 19th century.[8] In England, suicide was illegal until 1961, although punishments were abolished in the 1870s. Ireland decriminalized suicide only in 1993. The late 19th century brought efforts to study suicide as a sociological or medical problem, including early epidemiological statistical analyses. Prominent contributors to this new movement were Enrico Morselli (1852-1929) in his *Il Suicidio: Saggio di Statistica Morale Comparata*[9] and Émile Durkheim (1858-1917) in *Le Suicide: Un Étude Sociologique*.[10]

Religious Views

Suicide is considered a sin against God among monotheistic religions, including Judaism, Christianity, and Islam.[2,11] The Ten Commandments to Moses do not explicitly mention suicide, but forbid "killing." Apparent rarity of suicide in the Old Testament and throughout Jewish history may reflect a view of life as sacred. Judaism did not permit religious burial of suicides, based on 2nd century Talmudic writings (Mishnah) paralleling contemporary Roman and Christian laws and practices. Although they did not explicitly condemn suicide, some Talmudic scholars proposed that suicide could preclude eternal happiness. Punishment was intended only if suicides were "intentional," as indicated by communication of intent, a criterion that may underlie the rarity of suicides reported in ancient Hebrew texts. Nevertheless, mass suicides occurred during the centuries of persecution of the Jews.[2,11]

Early Christianity became concerned with "voluntary martyrdom" at the hands of the Roman military, which was provoked by groups of the faithful, presumably to assure a favorable afterlife, but at some risk of depleting

numbers of early converts. Self-sacrifice was accepted as altruistic, but taking one's own life was considered egotistical, and therefore sinful. Saint Augustine (AD 354-430) condemned suicide as an act against God, by extension of the Sixth Commandment to Moses ("Thou shalt not kill.").[12] The second Roman Catholic Council of Orleans (AD 533) expressed the first official disapproval of suicide, considering it (ambiguously) as either the Devil's work or an expression of mental insanity, and the Council of Barga (AD 563) forbade burial to all suicides.[13,14] Suicide was condemned not only as a sin against life and the will of God, but also as an "ideological" defect in the control of free will. Thomas Aquinas (1225-1274) considered suicide a sin against God and the state, and particularly dangerous for making repentance impossible. Suicide emerging from morbid guilt or despair was particularly abhorrent to the early Church, but despair was to be dealt with by benevolence as well as by reason and penance. It was only by the 20th century that Christianity softened its teachings on suicide by accepting a lack of effective conscience implicit in suicide, but condemnation for suicide was not abandoned until 1983. As recently as 1995, Pope John Paul II restated Church opposition to suicide, euthanasia, and abortion as crimes against life not unlike homicide and genocide.[2,15]

Islam has generally condemned suicide based on belief that Allah's will determines destiny and the time of death, but tolerates suicide as a form of self-sacrifice, particularly in holy wars. Hinduism is more tolerant of suicide through its belief in eventual detachment of the soul from the body and reincarnation. Hinduism accepts ritual suicide by a widow (*suttee*), as a way to cancel her husband's sins and to gain honor for their children, but this practice now is rare. Buddhism also claims detachment from the body, but condemns suicide as a violation of the requirement that men should live for the time destined and cannot hope to avoid sufferings to which they had been condemned from previous lives. Also, suicide implies insufficient detachment and indifference to life.[11]

Is Suicide Always an Outcome of Illness?

A widely held view is that being suicidal is itself a psychopathological condition or is a strong indication of mental illness. Psychological autopsies carried out by skilled diagnosticians have found evidence of various forms of psychopathology in as many as 90% of completed suicides.[16] Certainly, a

person contemplating suicide is in a depressed mood, sometimes in reaction to adverse circumstances, but this state of mind does not necessarily represent a psychiatric disorder. Usually, an operational distinction is drawn between suicide as a consequence of preexisting psychiatric illness, and suicide as a resolution of an existential dilemma or a response to a precipitating experience in the absence of a history of psychiatric disturbance.[2]

Psychiatric Illnesses

Major affective illnesses or mood disorders (major depressive and bipolar manic-depressive disorders) are associated with about half of all suicides. Suicide accounts for 9% to 15% of deaths among persons with major mood disorders, although these rates are as low as 4% among persons with milder illnesses that do not involve hospitalization.[17-20] Suicide risk is similar in bipolar and major depressive mood disorders.[19] Mania and hypomania are rarely associated with suicidal behavior. Instead, past and current depressive states are commonly associated with suicide among persons with major affective illnesses, sometimes in association with severe anxiety or agitation.[21] Mixed, excited-dysphoric-agitated mood states also present a much higher risk of suicide than pure mania.[22] Substance and alcohol use disorders, alone, or as comorbid problems, which are common in mood disorders, are found in about 25% of suicides, and the lifetime risk of suicide among substance abusers is similar to that in depressives.[18,19] Anxiety disorders, even when controlled for comorbid depression and substance abuse, are implicated in 15% to 20% of suicides; psychotic disorders including schizophrenia account for another 10% to 15% of suicides.[18] Finally, personality disorders, particularly borderline and antisocial personality, increase suicide risk by about 6-fold, and suicide is especially likely if a comorbid mood or substance use disorder is also present.[23] Overall, these relatively high suicide rates arise from prolonged times-at-risk and ubiquitous comorbidity, and are higher among presumably more severely ill patients who require hospitalization at some time.

The highest risk of suicide occurs in the presence of multiple comorbid conditions, particularly combinations of affective or psychotic disorders with abuse of alcohol or drugs.[17,18,24-28] Without comorbid substance abuse, suicide rates are lower. In broad samples that include persons with and without comorbidity, long-term suicide rates average about 6% for affective disorders, 7% for alcoholism, and 4% for schizophrenia.[29,30] Harris and

Barraclough[31] contributed to these conclusions by performing a meta-analysis of research on suicide risk in various psychiatric and neurological disorders (Table 1). Furthermore, another recent meta-analysis of case-fatality prevalence (percentage of a sample who die by suicide) in patients diagnosed with an affective disorder showed increasing risk in affective-disorder outpatients (2.0%), current inpatients (4.0%), and patients hospitalized at some time for suicidal behavior (6.0%).[20]

Table 1. Pooled Standard Mortality Ratios (SMR) for Suicide in Psychiatric and Neurological Illnesses

Condition	Studies (N)	SMR	[95% CI]
Prior Suicide Attempt	9	38.4	[34.0-43.1]
Eating Disorders	15	23.1	[15.3-33.4]
Major Depression	23	20.4	[18.3-22.6]
Sedative abuse	3	20.3	[14.2-28.2]
Mixed drug abuse	4	19.2	[16.1-22.8]
Bipolar disorder	15	15.0	[12.2-18.4]
Opioid abuse	10	14.0	[10.8-17.9]
Dysthymia	9	12.1	[11.5-12.8]
Obsessive-compulsive	3	11.5	[2.38-33.7]
Panic disorder	3	10.0	[4.57-19.0]
Schizophrenia	38	8.45	[7.98-8.95]
Personality disorders	5	7.08	[4.77-10.1]
AIDS	1	6.58	[5.77-7.63]
Alcohol abuse	35	5.86	[5.41-6.33]
Epilepsy	12	5.11	[3.90-6.58]
Pediatric psychiatric	11	4.73	[3.97-5.60]
Cannabis abuse	1	3.85	[1.84-7.07]
Spinal cord injury	1	3.82	[3.29-4.42]
Neuroses	8	3.72	[2.97-4.60]

Brain Injury	5	3.50	[1.14-8.18]
Huntington's chorea	4	2.90	[2.24-3.68]
Cancer	1	1.80	[1.71-1.89]
Mental retardation	5	0.88	[0.18-2.58]

Standardized mortality ratios (SMR) with 95% confidence intervals (CI) for diagnoses based on DSM-III and ICD-9 criteria in descending order of magnitude. Ratios >1 indicate increased risk. Data adapted from Harris and Barraclough (1997).[31]

Epidemiology

Intent and Lethality

Suicidality represents a spectrum of risk or likelihood, with an implicit progression in the seriousness of risk from thoughts to specific plans, gestures or minor self-injurious acts, to attempts with a range of potential lethality, and completed suicide.[58] Epidemiological data concerning suicide are notoriously suspect, because some deaths labeled accidental may hide suicides due to shame, to limit psychological burdens on survivors, or even to avoid loss of life-insurance payments. In such cases, intent is not clear for lack of information. Sometimes deaths occurring well after a suicide attempt are attributed to the final cause rather than considered a delayed outcome of a suicidal act. It is particularly difficult to evaluate suicidal intent (level of expectation of death) and lethality (nature of the method) for attempted suicides in the search for sound epidemiological statistics concerning suicidal behavior.[26,59-62]

High in the hierarchy of lethal methods are violent acts involving a firearm, hanging, carbon monoxide poisoning, drowning, suffocation, or jumping from a great height.[63] Drug overdoses and poison ingestions may be less violent, but vary in their toxicity and lethality. Risk of a fatal outcome of a suicidal act is least with weak intent and the use of a method of low lethality -- for example, an overdose involving a harmless medication, particularly when discovery can be expected or communication of intent has been made

to family members or friends. Risk is highest with firm intention of dying and use of a highly lethal method -- for example, use of a firearm, hanging, suffocation, or drowning after leaving a suicide note. Other acts of intermediate likelihood of fatality vary in both seriousness of intent and lethality of means. A suicide note usually indicates serious suicidal intent, but may indicate an effort to communicate to others or to provoke rescue.

Suicidal ideation in most cases is not accompanied by a suicide attempt, but almost all suicides had thought of suicide previously and usually communicated their intentions directly or indirectly. However, previous communication of suicidal ideation does not guarantee future safety. Persons showing impulsive or risk-taking behavior, antisocial behavior, and self-injury or surgery-seeking behavior, often in association with personality, anxiety or posttraumatic disorders, or with alcoholism or drug addiction, have sometimes been considered "partial" or chronic suicides.[64] Hypothetically, such partial suicidal acts may substitute for actual suicide, but this concept is prognostically unreliable, particularly when self-injurious behaviors arise with substance abuse or psychiatric illness.[19,65]

Suicides and Attempts

Worldwide, about 1 million persons die of suicide each year, including more than 30,000 in the United States and 120,000 in Europe.[66] Each suicide has an impact on an average of 6-7 survivors, so that more than 6 million persons lose someone close to them due to suicide each year (about 180,000 in the United States alone). The total number of suicide survivors in United States since 1973 probably exceeds 4 million.[67] In the United States in 1998, there was an average of 84 suicides/day (3-4/hour), accounting for 1.3% of all deaths and ranking eighth among causes of death.[67,68] Among young persons aged 15-24 years in Europe and North America, suicide recently became the third leading cause of death in males and ninth in females.[69] Even these striking estimates, based on World Health Organization (WHO) and government surveys, almost certainly underestimate suicide rates by at least one third and possibly by half, due to underreporting.[69,70]

National and regional suicide rates vary widely. They recently averaged 14.5/100,000 per year internationally, varying at least 10-fold between countries. Rates per 100,000 population ranged from 3.6 in Greece to 33 in Hungary, with intermediate rates of 10-20 in central and northern Europe

and the United States (Table 2).[67,70,71] In the United States, the annual rate per 100,000 has held steady at about 11 in recent decades, but with wide state and regional differences, ranging from 22.7 in Nevada to 7.2 in New Jersey and from 17.2 in the Mountain region to 11.3 in the Pacific region.[67] Annual suicide rates in Asian countries include 300,000 reported suicides in China (32.3/100,000), the only country with a greater risk among women than men.[72] In Japan, there are about 20,000 suicides/year (17/100,000).[73] Many possible environmental and social explanations for national and regional variations have been considered, including climate, latitude or annual light/dark cycles, ethnicity, religion, population density, unemployment rate, geographic isolation, substance abuse policies, alcohol consumption, and social or political systems. However, another factor of undoubted importance is variance in societal attitudes about suicide and efficiency of reporting suicide, although regional variations are also present in the United States despite presumably similar reporting procedures.

Suicide attempts, particularly life-threatening attempts, are sometimes referred to as "parasuicides," a term coined by Kreitman.[74] Data about parasuicides are even less reliable than for suicides, due to the lack of reliable national records and heterogeneity of classifications based on varying intent and lethality. International studies have reported prevalences for suicide attempts in the general population ranging from 0.04% to 4.6% for lifetime risk and about 0.8%/year overall, or 0.2% to 0.6%/year for apparently life-threatening acts.[26,67,75,76] The ratios of attempts/suicides in the general population has varied from 6:1 to 25:1, and averages about 18:1 worldwide, with a much lower ratio (possibly only 2:1 to 5:1) in persons with major affective disorders.[16,20,77] Parasuicide is important since 30% to 60% of suicides have been preceded by an attempt, and 10% to 14% of those who attempt suicide eventually kill themselves, at rates about 100 times higher than in the general population.[69,75,78,79] The annual international rate of suicidal ideation is much higher, but even more unreliable, with estimates ranging from 6% to 14% in the general population, and presumably even higher among individuals with psychiatric and substance use disorders.[76,80]

Methods Across Cultures

Methods of suicide commonly employed for centuries include hanging, drowning, stabbing, and jumping, with increased use of firearms in modern times, especially in the United States.[3,67] Although, the list of methods remains remarkably similar cross-culturally -- with local variations reflecting

availability and access, cultural variables, age, sex, ritualistic significance, and imitation -- both national and cultural differences in choices of methods are substantial.

In the United Kingdom, most men commit suicide by poisoning and most women hang themselves; in Denmark, hanging is more common in men and poisoning in women; in Sweden, poisoning and hanging are more common in men, whereas women choose drowning. In China and India, the most common method by far is pesticide poisoning. In the United States, suicide by firearms is much more common than by hanging or poisoning.[67,81] Overdosing with over-the-counter medicines is a very common way of *attempting* suicide.[67] In self-injurious acts with varying levels of suicidal intent, women generally prefer drug overdoses and wrist-cutting, however, recent data show an increasing use of firearms and a decreased incidence self-poisoning among American women.[67] Men tend to choose violent, more lethal means including gunshot, hanging, and jumping.[67]

In the United States, where more than 200 million firearms are in the hands of private citizens (more than twice the number of 30 years ago), suicide by gunshot has been among the most commonly employed methods for 50 years, currently accounting for about 60% of all suicides, 61% of suicides in adolescents, 71% in the elderly, 62% in men, and 38% in women.[67] The prevalence of this method has increased steadily since the 1950s, compared with more stable rates seen for most other methods.[11,67,81,82] More than 90% of suicides by gunshot had access to the weapon at home, where it was intended for personal defense or sporting use. Approximately 83% of fatal gunshot wounds are associated with suicides, compared with 7% for homicides committed by relatives, 3% associated with accidents, and only 2% of deaths involving strangers. Many suicides by gunshot involve access to a gun owned by a family member, and those who own a gun are 32 times more likely to commit suicide than those who do not own a gun.[67] Evidence that gun control may reduce overall suicide risk includes findings that states and countries with relatively strict regulation of firearms possession have lower suicide rates.[11,82] This finding also indicates that limiting access to 1 method of suicide does not always lead to a shift to alternative means.

Risk factors

Age. Youth suicide is a global emergency. In the United States, suicide

among those aged 15-24 years has become a national emergency since the annual rate of suicide among this group has increased more than 5-fold since 1950 (from 2.7 to 13.8/100,000.[83] In Denmark and Japan, suicide is the leading cause of death among adolescents, and all forms of violence combined represent the leading cause of death in this age group internationally; in part owing to the low probability of a fatal medical illness in youth.[84] Before adolescence, suicide is rare, probably reflecting difficulty in planning and carrying out a suicide plan, limited availability of lethal means and illegal substances, and greater dependence on adults.[85] Adolescence also has been associated with high rates of suicide in the past. In England during the 16th-18th centuries (when life-expectancy was much shorter), a third of suicides occurred before age 14 years, probably following abuse and neglect, and half occurred before age 24.[4]

In the United States, youths aged 15-24 years account for nearly 14% of all suicides, and suicide accounts for more than 13% of all deaths in that age group (at rates of 1 death every 2 hours).[67,68] Each suicide corresponds to 100-400 attempts of varying levels of lethality and intent, and attempts are 2-3 times more frequent in females than males.[86] Approximately 7% of youths attempt suicide at least once before age 25, and 41% make more than 1 attempt.[86] Youth suicide rates are higher in single-parent families, especially if the father is missing. Other risk factors include narcissistic and antisocial personality traits, unemployment, poverty, previous attempts, interpersonal problems, physical or sexual abuse, psychiatric and substance-use disorders, and various forms of limited problem-solving or coping skills.[27,83,87,88] Vulnerability to suicide in the young is also strongly associated with unrecognized depressive states, substance abuse, eating disorders, and personality disorders.[31,65,84]

Youth suicide stirs particular interest, but this age group accounts for only a minority of all suicides. Risk for suicide rises with advancing age, particularly after age 60, probably in relation to retirement, widowhood, social isolation, declining general vigor and health, and other losses. In the United States the recent annual suicide rate per 100,000 persons over age 65 was 16.9, compared with 11.3 overall, and rates climbed to 20.0 among those older than age 75.[67] One elderly person commits suicide in the United States approximately every 1.5 hours.[67] The ratio of attempts/suicides in the elderly is only 4:1, indicating a higher degree of intent and lethality with advancing age.[67] The suicide rate among elderly Americans has declined by about 16% since 1990, probably in response to better care and greater

access to treatment, or improved overall quality of life.[67] Moreover, because of an increased risk of fatal medical disorders, the proportion of deaths by suicide for the elderly in the United States (0.3%) is much lower than that for youths and young adults (13.5%).[67] Nevertheless, because the world population is aging, suicides among the elderly will continue to increase and become a growing public health challenge.

Sex. Since medieval times in Western societies, suicide has been mainly a male behavior, by a rather consistent sex ratio of about 4:1.[3,4,9] The male/female ratio of annual suicide rates per 100,000 in the United States was recently reported as 18.7/4.4, or 4.25.[67,68] For attempts, the male/female ratio is inverted, at 1:3 [67] and, somewhat paradoxically, a higher number of suicide attempts tends to lower risk of fatal outcomes among women. This difference between attempts and suicides in women may reflect a lesser degree of intent, but also a tendency in women to not use violent and highly lethal means. In Eastern countries where self-poisoning with pesticides is a common nonviolent but lethal method, women commit suicide at least as frequently as men.[66] Worldwide suicide rates have increased over the past 3 decades -- mainly among men and young women -- but have remained stable among women overall.[2] Simultaneously in the United States (from 1970 to 1998), annual suicide rates per 100,000 rose from 16.2 to 18.7 in men, but decreased from 6.8 to 4.5 in women.[67,68] These differences between men and women may also reflect a tendency for women to seek and accept help from friends or professionals, whereas men often view help-seeking as a sign of weakness.[89]

Temporal factors. The occurrence of suicide has been more common during the spring since at least the Middle Ages,[3] accounting for 53% of suicides from April to July in England during the 16th-18th centuries.[4] The month of May is associated with maximum suicide risk in many countries of the Northern Hemisphere.[90] In the United States, suicide is least common in December, despite the high prevalence of winter depression and the potential stress of the holiday season.[11] Similarly, in Finland, suicides are most frequent in men from April to July, with 2 peaks for women in May and October, and an autumn peak among the elderly.[91] It has not been determined whether seasonal differences in suicide rates are attributable to sunlight, temperature, or fluctuation in the prevalence of acute affective illness. In Europe, suicides decrease before and during Christmas and New Year's Day, but increase by 40% *after* these holidays.[92] Suicides were

more prevalent on Monday than Saturday in 1 study,[93] but the relationship of risk to days of the week has been inconsistent in other reports.[90,94]

Costs. Suicide is a human tragedy and a heavy emotional burden for its survivors. In addition, suicide and parasuicide result in major economic losses. Direct costs reflect treatment and hospitalization following suicide attempts, and indirect costs represent lost potential lifetime income due to suicide-related disability and premature death. Notably, every youth suicide implies a loss of productivity of 50 years or more. The resulting economic burden from suicides and serious attempts may exceed $16 billion annually in the United States,[95,96] with similar costs in Europe.[97]

Causes and Clinical Management

Causative Factors

Suicidal acts are complex human behaviors involving many aspects of an individual's personality, state of health, and life circumstances. Since antiquity, the decision of putting an early end to one's own life has intrigued many philosophers and clinicians. Today, explanations of suicidal behavior have largely shifted from moral philosophy to medical biology, psychology, and sociology. All of these approaches can contribute to understanding both individual decisions to suicide and to addressing the clinical and public health challenge that suicide represents. Although factors associated with biology, psychology, and sociology are presented here as contributors to "causes" of suicide, it is important to emphasize that most have been identified essentially as additional risk factors found to be associated with suicide by clinical or epidemiological analysis.

Biological

There is increased risk of suicide in some families.[66] For example, the American Amish population experienced 26 suicides in the past century, 75% of which occurred in only 4 families, whereas many other families experienced depression but not suicide.[98] In families with an index case of a suicide attempt, especially one involving violence, suicidal behavior is significantly more prevalent than in other families with depressions.[99]

Although an early twin study found no evidence of increased concordance

for suicide in monozygotic twins,[100] several other twin studies on suicide have found a significantly greater risk of double suicides among identical vs fraternal twin pairs.[99,101] Concordance for suicide in twins may indicate imitative behavior in the surviving twin, although it is also plausible that suicide in a twin may discourage suicide in the surviving twin. Absence of complete concordance for suicide in identical twins leaves room for environmental contributions. In a rare study of adoptees aimed at differentiating inherited and environmental causes, among 57 of 5483 adoptees (1.04%) who committed suicide, suicide was much more common in the first-degree biological relatives than in the relatives of the adoptive families, even though depression was less clearly familial in this sample.[102]

Postmortem studies strongly suggest that cerebral concentrations of serotonin are reduced in suicides and, specifically, that deficient serotonergic functioning in the ventral prefrontal cerebral cortex may contribute to disinhibition of impulsive-aggressive behavior.[103-106] Clinical studies also suggest that overt aggression is more common in subjects with previous suicide attempts.[103,104] However, cerebral serotonin may react to environmental factors including stress, loss, abuse of psychoactive substances, or low cholesterol levels, as well as depressive illness -- all of which have been associated with suicide.[107,108]

Psychological

Psychodynamic proposals concerning suicide have emphasized contributions of conflicts, losses, and changes in relationships as contributors to suicidal risk, and have often viewed suicide as a depressive or psychotic act, sometimes associated with fantasies of escape, reward, reunion, or resurrection.[109] "Depression" in psychoanalytic theory need not be a diagnosable major affective disorder, but can involve self-punitive mechanisms arising from guilt or shame. Freud considered suicide to derive from confusion between the self and a lost other-object, leading to homicidal rage directed at the self.[110-112] Suicidal psychodynamics may arise from guilt for wishing the death of parents, identification with a parent's death, revenge for loss of gratification, or a request for help, and from the tension between instincts of life (Eros) and death (Thanatos).[113] Jung thought that suicide destroyed harmony between the conscious and the subconscious mind based on repressed aggressive impulses, in part directed toward components of the opposite sex within the self, and theoretically correctable by making the unconscious conflict conscious.[114] Adler saw suicide as the

result of an insurmountable condition of inferiority originating in childhood and as an expression of spite toward mother or another adult considered responsible for one's failure.[115]

Suicide can be conceptualized psychologically as an excessive reaction arising from intense preoccupation with humiliation and disappointment[114] that is driven by punitive and aggressive impulses of revenge, spite, or self-sacrifice, wishes to kill and be killed, or yearning for release into a better experience through death.[14,111,116-119] Suicide may also occasionally arise from a sense of omnipotence and hope of reaching a state of glory or an attempt to fuse with the external world.[120,121] Other common themes are intolerable aloneness and isolation, particularly in persons with a personality disorder.[122]

Behavioral psychologists have devoted little attention to suicide, but some have suggested that suicide derives from a learned depressive condition arising from a lack of positive reinforcement or prolonged exposure to seemingly insoluble negative situations leading to a sense of helplessness.[123] Cognitive approaches also attribute suicide to learned impotence and hopelessness as an automatic and pervasive pathological scheme for organizing and interpreting experience.[123-125] Suicidal persons may have impaired problem-solving capacity associated with a passive attitude toward the challenges of living.[126] The varied individual paths to suicide tend to have in common the concept that dying is an ultimate form of mastery over life.[2,66]

Defense mechanisms, introjection of lost objects, self-aggression, and psychiatric and medical illnesses, arising from a biological/genetic predisposition all may contribute to suicide, but none seems either necessary or sufficient to explain it. Tondo[2] suggests a common theme in the several psychological interpretations of suicide as representing an ultimate defense of identity and the self. Such a response may arise from profound threats to self-esteem and confidence, often through losses and disappointments over persons, social groups, or occupational activities in which much has been invested emotionally, sometimes excessively or overly rigidly -- in turn, leading to a sense of pervasive and irreparable damage to the self.

Sociological

Sociological investigations seek social-structure models of influences on suicide, including family, culture, religion, occupation, socioeconomic class, and groups or organizations, typically derived from applying ecological and epidemiological methods to investigate relationships of suicide rates to social-demographic factors and secular variations. Modern sociological studies started with Morselli[9] and Durkheim.[10] Following both the social economics of Malthus and the evolutionary determinism of Darwin, Morselli interpreted suicide as a consequence of a lack of vital resources for all, with inevitable loss of the weakest. Durkheim distinguished 3 types of suicide, based essentially on social roles -- egoistic, altruistic, and anomic (arising from angry frustration). Absent or negative social relationships also can be associated with suicide by involving loss of support or involvement in toxic relationships or cults.[127] Although social isolation and material or emotional deprivation seem to play a fundamental role in suicide, multifactorial biopsychosocial models usually are favored today, and they offer the most comprehensive available theoretical models.[128]

Global influences. Massive global changes in the 20th century had little overall effect on international suicide rates, although, paradoxically, shifts in suicide rates have been greater in countries relatively protected from wars and economic disasters, and increases have occurred selectively in countries that had relatively low rates in 1900. For example, in the United States, the annual suicide rate per 100,000 population of 10.2 in 1900 increased to 16.2 early in World War I, decreased in the 1920s, rose to 17.4 during the Depression, and then fell during World War II, to remain stable thereafter at 10-12.[11,67] During World War II, the reported suicide rate in Germany remained stable or even fell slightly, whereas some countries not directly involved in the war (eg, Ireland, Finland) experienced marked increases. For the most part, however, both world wars were associated with decreased suicide rates in winning, losing and neutral countries alike. A notable exception is an increase in suicides by women in association with the loss of family members in war. Generally, suicide rates decrease during natural crises or disasters, and then increase *after* the emergencies have ended.[129] During the Nazi period, suicide among European Jews was an epidemic that peaked in 1942. In concentration camps, suicide rates were low, but increased *after* liberation.[11]

Marital status and sexual orientation. There is a consistently lower frequency of suicides among married persons with dependent children, perhaps due to an increased sense of responsibility as well as selection

bias associated with relatively healthy and successful adaptation. In contrast, elderly widowed men carry the highest suicide risk.[130]

Early research on the relationship between sexual orientation and suicide risk usually involved selected research samples that were not necessarily representative of the general population. These studies found high rates of suicide attempts (20% to 39%) in young homosexuals and bisexuals that were 5-10 times above expected rates.[2] Some of these studies were not controlled for substance abuse. Nevertheless, better-designed studies tend to confirm the older findings and suggest that homosexuality can lead to social stress or identity conflicts with a consequent increase of suicidal behavior.[131-134]

Socioeconomic status. Suicide is more frequent at both extremes of the socioeconomic spectrum, and there is increased risk following sharp changes of status -- up or down. However, very high and low levels of education show a lower suicide risk. Relationships of suicidal behavior and employment status have been inconsistent and suggest that unemployment is less stigmatized during times of general economic recession.[135,136] Unemployment may contribute to suicidal risk indirectly through its impact on family tension arising from economic deprivation and loss of normal social role and self-esteem leading to indignity, isolation, hopelessness, alcohol abuse and violence.[136] Unexpectedly, a recent Finnish study found more suicides in both men and women during a period of economic growth and a decrease during a recession.[137] In that study, suicide was not associated with unemployment or divorce, but it was related to alcohol abuse. Several recent studies have found unemployment to be associated with suicide, particularly in young persons.[27,88,138-142] As with marriage and having children, employment status can involve selection bias for absence or presence of factors known to be strongly related to suicide risk, including mental illness and substance abuse.[135] High suicide rates found in specific professional groups (including physicians and dentists) are unexplained.[130]

Religion. Although most religions oppose suicide, suicide rates vary considerably among religions and between areas with a predominant religion. For example, Morselli[9] reported lower rates of suicide in European Catholics than in Protestants or Jews. Moreover, the current annual suicide rate for Catholic countries in Europe averages 12.5 per 100,000, compared with 17.6 in Protestant countries, but with no difference between the 2 Irelands.[23,67,71] Suicide risk may also be lower among persons who have

higher rates of participation in religious practices.[143] Some of these differences may arise from technical artifacts, including variance in reporting of suicide, with a tendency toward lower rates in countries with strong sanctions against suicide. For example, Catholic countries have had striking recent increases in suicide rates that are attributed to better data collection and greater acceptance of religious funerals for suicides.[144]

Urban vs rural living. Urban life has often been blamed for creating isolating anomic environments with high suicide rates. Morselli[9] found no difference between rural and urban suicide rates. However, in the United States, states containing the 10 most populated cities (accounting for 87% of the state populations) all were at or below the national average.[67] In Australia recently, there was a selective increase of suicide among young men in rural areas.[145] In China, suicide in rural areas is 3 times more prevalent than in urban centers.[72] Among factors contributing to suicide risk in rural areas, lack of access to assistance or treatment may be a more important factor than general social isolation.[2]

Race and ethnicity. In the United States, the suicide rate in white men (20.3/100,000) is nearly double that of black and other nonwhite men. The US suicide rate for white women (4.8/100,000) is twice that for black women, and triple that for other nonwhite women.[67,146] In Europe, the suicide rate for Finno-Ugric peoples is twice the European average; the rate in Anglo-Saxon countries is close to the average, whereas in Mediterranean countries the rate is one third below average.[2,58] Ethnic differences associated with suicide appear to be independent of current living environments. For example, German, French, and English immigrants had higher suicide rates than other white groups living in the same areas of New York State, whereas Italians there had a much lower rate, and all were close to the rates in the countries of origin.[11]

Suicide by imitation. Suicide, although an extremely personal decision, may be influenced by social forces including imitation. Romantic literature contains many examples of suicide for romantic reasons or imitation. A prominent example is from a novel by Goethe (1774)[147] in which the hero, Werther, killed himself after being rejected by a girl he loved. His fictional death was followed by imitation by many youths in real life, and hence the term "Werther effect" (ie, suicide by romantic imitation). Today, suicide by imitation appears to be influenced by diffusion of information through the mass media,[148-153] which at times has been minimized by avoiding

sensational reports of suicides that supply details about the methods involved.[154,155] Other authors dispute the importance of this effect, usually based on negative empirical findings.[156-159] Following the publication of *Final Exit* by Humphry,[160] the rate of suicides using 2 of the methods described in this book increased, but the total number of suicidal events decreased.[2] It is likely that identification with a victim by age, sex, and location are key factors in imitation, but they are modified by other influences such as economic status, attitudes toward suicide, and problem-solving strategies.[46,70,157]

Clinical Management

Assessment

An essential preliminary step in clinical management of persons who are potentially suicidal is to consider relevant risk or causal factors and potentially protective factors considered above.[130,161] Moreover, such risk factors may or may not be identical for suicides and those attempting suicide.[162,163] Notable risk factors (Table 3) include social isolation and threats to emotional security and self-esteem, including psychiatric or medical illness. Particularly important predisposing factors seem to be a depressive disorder, hopelessness, previous suicide attempts, and substance or alcohol abuse.[28] Alcohol abuse is a major factor that has been found in the history of at least one fourth of all suicides examined, and identified as an acute factor in at least half.[1] Risk tends to be very high in older men who live in rural or other socially isolated locations.[164] Additional factors specific to youth, include early marriage, unwanted pregnancy, and absence of parental support, a history of abuse, school problems, lack of social acceptance, and availability of firearms. Protective factors may include religious faith and the presence of young children.

Table 3. Risk and Protective Factors for Suicide

Risk Factors
Demographic or social factors • Young and elderly men • Native American or Caucasian

- Being single (widowed > divorced > separated > single)
- Social isolation, including new or worsening estrangement, and rural location
- Economic or occupational stress, losses, or humiliation
- New incarceration
- History of gambling
- Easy access to a firearm

Clinical factors

- Past and current major psychiatric illness (especially depressive)
- Personality disorder (borderline, narcissistic, antisocial)
- Impulsive or violent traits by history
- Current medical illness
- Family history of suicide
- Previous suicide attempts or other self-injurious or impulsive acts
- Current anger, agitation, or constricted preoccupation
- Current abuse of alcohol or drugs or heavy smoking
- Easy access to lethal toxins (including prescribed medicines)
- Formulated plan, preparations for death, or suicide note
- Low ambivalence about dying vs living

Factors specific to youth

- All of the above, less racial difference
- Recent marriage, unwanted pregnancy
- Lack of family support
- History of abuse
- School problems
- Social ostracism, humiliation
- Conduct disorder
- Homosexual orientation

Precipitants

- Recent stressors (especially losses of emotional, social, physical, or financial security)

Protective factors

- Intact social supports, marriage
- Active religious affiliation or faith
- Presence of dependent young children
- Ongoing supportive relationship with a caregiver
- Absence of depression or substance abuse
- Living close to medical and mental health resources
- Awareness that suicide is a product of illness
- Proven problem-solving and coping skills

Clinical assessments should note the presence, levels, or absence of such factors in the clinical record, with close follow-up, and changes also noted for both clinical and liability considerations.

Clinical Management

Assessment

An essential preliminary step in clinical management of persons who are potentially suicidal is to consider relevant risk or causal factors and potentially protective factors considered above.[130,161] Moreover, such risk factors may or may not be identical for suicides and those attempting suicide.[162,163] Notable risk factors (Table 3) include social isolation and threats to emotional security and self-esteem, including psychiatric or medical illness. Particularly important predisposing factors seem to be a depressive disorder, hopelessness, previous suicide attempts, and substance or alcohol abuse.[28] Alcohol abuse is a major factor that has been found in the history of at least one fourth of all suicides examined, and identified as an acute factor in at least half.[1] Risk tends to be very high in older men who live in rural or other socially isolated locations.[164] Additional factors specific to youth, include early marriage, unwanted pregnancy, and absence of parental support, a history of abuse, school problems, lack of social acceptance, and availability of firearms. Protective factors may include religious faith and the presence of young children.

Clinical factors strongly associated with suicidal risk include an ongoing depressive or dysphoric-agitated disorder, found in about 60% of suicides at postmortem assessment ("psychological autopsy"). Assessment of suicide

potential seeks to determine the extent of suicidal ideation and intent as well as the specificity and extent of planning an attempt. Interventions should consider these points and institute sustained clinical control during acute risk and continuous assistance in cases of sustained or long-term suicidality.

Factors strongly associated with suicide include being male, older than 60, widowed or divorced, living alone, having economic problems, presence of a recent stressful life event (especially if related to a loss), presence of anhedonia or depression as a symptom, a major mood disorder, previous suicide attempt, hopelessness, psychosis, alcoholism or substance abuse, panic attacks, severe anxiety or agitation. Risk factors associated with suicide *attempts* include being female, younger than 30, having relationship problems or living alone, as well as the factors just listed for suicide.[162,163]

Other characteristics of potentially suicidal persons also should be considered in risk assessment.[114] These include indications of suicidal intent that can be identified in about 80% of suicides. Many suicidal persons are indecisive and may even count on being rescued. Suicidal impulses or even planning are often transient, time-limited, and crisis-reactive. Many suicides occur during early weeks of emerging clinical improvement in a major psychiatric illness, and soon after hospital discharge. Suicide can occur at any age and in any socioeconomic class.

Jacobs and colleagues[164] proposed a protocol for evaluating suicidal risk. Their scheme includes:

1. Identifying predisposing and potential precipitating factors.
2. Assessing current and possibly changing suicidal intent over time..
3. Formulating interventions based on responsiveness to shifting levels of suicidality (acute or chronic), impulsivity, consciousness, therapeutic alliance, and ability to cooperate with ongoing or subsequent assessments.

Effective clinical intervention into potential suicide requires specific information that can help in estimating the intensity of suicidal ideation and intent. Many physicians and even mental health professionals are reluctant to inquire about suicide, perhaps for fear of provoking risk not otherwise present but, more likely, out of discomfort.[163] Suicidal ideas are not new to suicidal persons, and many potential victims will share some of their suicidal

thoughts, even if reluctantly. Evaluation should follow a hierarchical assessment, based on simple direct questions concerning thoughts about life at the moment, current level of life dissatisfaction, presence of thoughts about death, preoccupation with self-harm or escape, and the formulation of specific plans and access to a method of self-destruction.

If answers to the preceding inquiries suggest that suicide is likely, the patient must be reassured that help is available and that the clinician is interested in knowing more about his or her despair, takes these suicidal feelings seriously, and will remain available to assist in working out possible interventions. Well-intentioned comments pertaining to hurtful consequences of suicide to others should be avoided because they can increase already excessive guilt and desperation. Superficial minimizing of the potential seriousness of suicidal feelings intended as reassurance is also dangerous. It is also wise to withhold judgment about lethality and intent, since these factors are not readily assessed, can change quickly, and may not reliably predict future behavior. Persons in despair and contemplating suicide need help, and usually gain comfort by being listened to and taken seriously. Ambivalence between desires to live or die may increase tension, anxiety, and suicidality, but a degree of confusion and uncertainty can also contribute to a therapeutic alliance.

Effective assessment for suicide risk also includes attempts to assess levels of intent and lethality, based on evaluating the nature of and access to a proposed method, and the presence of other persons, particularly family members or friends who may be able to prevent a suicidal act or offer additional support.[59,60,165] The presence of a detailed suicidal plan, preparation of notes, or clearing up insurance or other business matters pertaining to survivors are especially ominous occurrences. Interventions are guided by the mental competence and cooperation of the potentially suicidal person, based on clinical assessment of his judgment, comprehension of the circumstances and recommendations; and the likelihood of cooperation and adherence to recommendations. Clinicians who do not feel they are competent to manage a suicidal person can seek consultation or referral to a mental health specialist or make use of specialized healthcare institutions.

Toxic stress (also called chronic stress) **occurs when the brain and body's fight or flight response is activated too often or for too long**. The fight or flight response activates in response to perceived threats, problems, or demands and results in the release of hormones like adrenaline and cortisol.

Secondary traumatic stress is the emotional duress that results when an individual hears about the firsthand trauma experiences of another. Each year more than 10 million children in the United States endure the trauma of abuse, violence, natural disasters, and other adverse events. Nurses experience secondary traumatic stress (STS), defined as negative behavior and emotion driven by fear and work-related trauma, in the course of caring for patients. STS occurs when nurses are traumatized by their work, and is usually associated with a particular event

Suicide Interventions and Treatment Effects

Empirical research support for commonly employed or proposed interventions aimed at preventing suicide and suicide attempts remains strikingly limited and largely inconclusive.[28,130,166] Nevertheless, some guidelines that arise from clinical experience and some research can be offered. In general, appropriate interventions are based on considering acute and long-term risk factors.[130,165,167,168] High acute risk calls for family involvement or hospitalization as the patient is given continuous reassurance and support and is treated as a collaborator in care planning. Hospitalization is more likely to be required if the patient is not already in treatment, is not seeking help for himself or herself, or is being coerced into psychiatric assessment. Treatment at home requires particularly close support and monitoring by family members, who can call for emergency help, including from the police, if required. Suicidal risk may paradoxically increase after antidepressant treatment is initiated.[163] Supportive engagement with a suicidal patient requires active work in seeking a less pessimistic perspective on problems and dividing them into lesser units with
greater chances of solution. For protracted suicidal risk, many mental health professionals use a "therapeutic contract for safety," essentially an agreement to seek help before acting on a suicidal impulse. However, the value of such an intervention is questionable, and its effectiveness probably parallels the ongoing alliance between clinician and patient.[169]

In most cases involving potential suicide, pharmacotherapy will probably be required. In general, agents, doses, and dispensed quantities of drugs should themselves carry low risks of lethality. Since suicide most often arises in acute depressive illness, either in a primary major mood disorder or as a symptomatic phase of another condition, use of a safe newer antidepressant is a very likely option. Remarkably, however, although depression is a key risk factor in suicide and clinically effective antidepressants have been used for more than 40 years, evidence that they reduce suicidal risk remains elusive and unconvincing.[28,39,170-174] For example, the overall suicide rate in the United States general population has changed little since the introduction of the first tricyclic antidepressants in the early 1960s,[67] despite some indications that depression has increased in prevalence or, at least, in recognition since the 1940s.[19,175]

Improved recognition and treatment of mood disorders since the 1950s may have led to a moderate decrease in the annual suicide rate per 100,000 in the elderly (from 25.0 to 16.9), and a slight decrease among women (from 4.9 to 4.5), even though corresponding rates increased in men (from 16.5 to 18.7) and in youths (from 5.0 to 11.1).[67] These trends may reflect treatment effects in women and the elderly, who tend to seek and accept psychiatric treatment more often than do men and young persons, and it is conceivable that stable suicide rates in the face of rising prevalence of depressive illness[19,175] may suggest some therapeutic impact on suicide.

There is some evidence that older antidepressants, though potentially lethal on overdose, may afford somewhat better protection against suicidal behavior than the safer newer agents.[176,177] At the same time, suggestions that some antidepressants may actually increase suicide risk owing to their direct lethality on overdose or to specific adverse behavioral effects, such as agitation, restlessness, or insomnia, are not well substantiated.[39,178-180] Nevertheless, prudent practice calls for extreme caution in prescribing or dispensing lethal quantities of drugs to potentially suicidal persons, as well as caution in assessing patients for adverse affective or behavioral reactions that might increase their internal distress and potentially contribute to suicidal risk. Since adequate dosing of antidepressants is effective in treating depression, it is plausible that such treatment should

have a greater impact on suicide risk.[36,181] Nevertheless, working against such an
expected benefit, the rate of recognition of depressive illness and clinical data on the use of antidepressants in adequate doses and duration of use remain remarkably inadequate, including in persons with known suicidal risk.[39,182,183]

Antianxiety and antipsychotic agents also have a place in the comprehensive care of suicidal patients, but their short- and long-term effects on suicide have rarely been studied.[28,39] Electroconvulsive therapy (ECT) seems to be the most effective acute treatment for emerging or ongoing suicidality,[184,185] and the National Institute of Mental Health considers it as the first-choice treatment in emergency situations of high suicidal risk.[186] However, effectiveness of ECT for suicide *prevention* has not been proved.[187]

Evidence of pharmacological prevention of suicide can be found in research on long-term treatment of bipolar and non-bipolar mood disorders with lithium, which is effective against recurrences of bipolar depression as well as mania.[188-191] Studies reporting on suicide and lithium have consistently found lower rates of suicide and attempts during lithium maintenance treatment than without lithium treatment.[21,77,192-194] Some limitations apply to these studies, including potential lack of control over randomization,
inclusion of some patients with high pretreatment suicide risk, and presence
of treatment-discontinuation effects that can contribute to recurrence of affective illness as well as suicidal risk.[195,196] Nevertheless, long-term lithium treatment has been associated with an approximate 7-fold lowering of crude average suicide rate, from 1.78% to 0.25% of patients with manic- depressive illness per year.[77,195,196] Based on more rigorous statistical analysis, this difference was nearly 9-fold.[194] Considering a reported mean suicide risk of 0.52% a year in patients with major affective disorder,[16] lithium treatment appears to reduce this risk by about 50%. This estimate does not take into account confounding factors that may increase the risk, such as previous suicide attempts, lack of compliance, and concomitant substance abuse.

Recent studies found evidence of a 6.5-fold reduction of suicide, risk of suicides, and life-threatening parasuicides during long-term lithium-

treatment of bipolar I and II patients.[21,77,192,193] Moreover, the risk increased by 20-fold within the first 12 months after discontinuing lithium maintenance treatment, but later fell to the same level seen before lithium treatment had started. The increase of suicide risk in the first year after lithium discontinuation parallels the increased risk of affective morbidity in the first year after lithium discontinuation, compared with that in the years before treatment, and risk of both depression and of suicidal acts is probably more elevated after rapid discontinuation.[195-197]

The action of lithium in possibly preventing suicide may involve its specific action against aggressive behavior, which is possibly related to decreased functioning of the serotonin system.[38,198,199] Mood stabilizers without serotonergic effect, such as carbamazepine, may be less effective in preventing suicide,[200,201] although treatments other than lithium have not been adequately evaluated. Inconsistent with the serotonin hypothesis is evidence that selective serotonin reuptake inhibitors (SSRIs) have shown little effect on suicidality[39,174] and the *antiserotonergic* agent clozapine probably reduces suicidality in schizophrenia.[202] It may well be that the effect of lithium on suicidal behavior reflects reduction of morbidity, especially due to depression, with decreased intensity of aggressive and hostile affect. In addition, benefit may arise from supportive long-term therapeutic relationships associated with the use of drugs, including lithium and clozapine, that require particularly close clinical monitoring for safe use.

Psychological theories about suicide have directed psychodynamic and cognitive-behavioral psychotherapeutic interventions to minimize suicidal
risk in at-risk persons. Usually, these efforts aim to decrease anxiety associated with thoughts of death, mobilize defenses against them, and improve problem-solving and coping strategies. An essential implied
element of such interventions is support through availability and consistency of the therapist.[203] Isolation should be avoided, daily activities maintained, and the patient reminded repeatedly when depression is the basis of the suicidal ideation that it can be treated.[123] Such therapeutic work typically provokes a conflict between the patient who wants to die and the therapist who seeks to protect life, with intense countertransference responses.[120] Dealing directly with thoughts of death may be disturbing for a therapist and provoke his or her own fears of death or failure, feelings of helpless despair, retaliatory anger, or

impulses to collaborate with a suicide, thus safe intervention requires considerable self-knowledge.[204]

Suicide should be interpreted as an effort to escape from unbearable suffering.[205,206] Placing an emphasis on living as a responsibility to others can be dangerous, and may contribute to suicidal guilt and despair. A more constructive approach seeks to make the patient more conscious of the problems that led him to consider suicide as the only possible solution.[207] Few studies have examined the specific effectiveness of psychotherapy in suicide treatment or prevention. Most involve case reports that do not allow for critical analysis or generalization. Rare studies with some elements of experimental or controlled design yield inconsistent and inconclusive findings. One study found that adding psychotherapy was associated with reduced likelihood of repeat suicide attempts compared with risk in patients receiving psychopharmacological treatment and nonspecific support.[208] A recent review concluded that the likelihood of self-destructive behaviors decreased during cognitive-behavioral treatment.[142]

Finally, when suicidal intent is high, all efforts to intervene may fail.[163] When suicide has occurred, reactions from survivors, including family and involved clinicians, vary from sadness and guilt to impotence and anger. It is humane and highly appropriate for clinicians to express condolences to surviving family members and usually important to be present at funeral or memorial services. Statements to survivors that may provoke guilt on their part, or suspicion of less-than-adequate treatment of the suicide should be avoided. Suicide is 1 of the most likely outcomes to provoke consideration
of psychiatric malpractice suits. Adding notes to the patient's record to clarify the circumstances of a suicide is important, but altering or destroying clinical records is unethical and illegal. Reflections on the actions taken are
important for all professional personnel involved in caring for a suicidal patient, and discussion of suicides with an expert colleague is often useful.[2] Suicides typically leave a number of survivors who can helpfully support each other by sharing their feelings of loss and trying to understand the underlying feelings of the suicidal person, and they may also benefit from
reviewing their reactions with a trusted clinician who knew the suicide victim. A number of self-help organizations for survivors of suicides have emerged

in the United States and Europe.

Most importantly there must be a confidential and standardized pathway to care for nurses that covers screening, assessing, safety, planning, and follow up for nurses at risk for suicide.

Conclusions

For centuries, suicide was not considered a psychopathological act, but typically was condemned by religions and states as a sin or a crime until very recent times. Nevertheless, an association of suicide with mental illness has been recognized for many centuries, or suicide itself taken as evidence of mental disturbance. Research shows that perhaps 90% of suicides arise in relation to a psychiatric or substance-abuse diagnosis, or both, and about 60% are associated with a mood disorder. Suicide risk is greater in men, with older age, after previous attempts, in a current depressive or dysphoric-agitated state, after onset of psychiatric illness in youth, and with a poor treatment-response. Only about 10% of suicides lack evidence of psychiatric illness, and suicide may even be considered a "rational" choice in some cases, such as in seeking relief for incurable painful terminal illness. Physician-assisted suicide remains uncommon and controversial, although easing of the end of life with liberal use of analgesics is evidently common. The strong association of suicide with psychiatric illness is not only quantitatively very important, but may also encourage potentially life-saving help-seeking and relieve potential victims and their families of guilt. Nevertheless, even now, a medical view of suicide remains far from universally accepted in our culture.

Only about 6% to 15% of persons suffering from mood disorders eventually commit suicide and a much higher percentage attempt suicide at a range of levels of lethality of intent and method. Attempts are more closely associated with fatalities (lower risk ratio) among persons with psychiatric illnesses than in the general population, and so can be considered potentially more lethal. Psychiatric illness is most often an ongoing risk factor, but the *timing* of suicidal acts tends to be associated with stressful life events, particularly those involving losses, separations, and other

changes or threats to self-esteem and confidence. Other risk factors include male sex (women have higher rates of attempts, and these tend to be less violent than in men); age (either over 65 or 15-24 years); access to a firearm; springtime; and threats to financial security or loss of reputation.

Suicide is a leading psychiatric and medical challenge that can be fairly characterized as epidemic and an international public health emergency. It ranks eighth among causes of death in the United States, and is the third leading cause for those aged 15-24. Deaths due to suicide exceed 1 million annually worldwide; this number would be much greater if corrected for underreporting, and far exceed the number of homicides. The annual international suicide rate averages 14.5/100,000 (and attempts occur at
260/100,000 or more),[77] but rates vary substantially by country and region for unknown environmental, ethnic, and cultural reasons, as well as
variance in case finding and reporting. The economic burden may exceed $20 billion annually in the United States and in Europe. The human costs to surviving families and friends are also extraordinary in that the lives of approximately 6-7 persons are significantly affected by each suicide. Methods of suicide are a matter of public as well as professional concern in
that more than 60% of men and about 40% of women use firearms to kill themselves. Suicide represents a major risk for malpractice liability in contemporary psychiatry.

Social factors contributing to suicide risk usually are found in family and other intimate relationships and friendships, work, social class, ethnic groups, religion, and living environments. Psychological factors include unresolved conflicts and emotional losses leading to a troubled and unstable existence and to a perceived loss of security or even of identity that pushes the individual toward self-annihilation. Biological factors are implied by evidence of genetic predisposition to suicide, possibly independent of specific psychopathology. However, relevant, specific
molecular or pathophysiological phenotypes remain elusive. Nevertheless, a tentative working conclusion is that the standard tripartite biopsychosocial risk-factor model is well suited to understanding and directing the care and safe management patients who are potentially or actively suicidal.

Assessment of suicide risk is an essential component to recognizing the problem and formulating appropriate interventions. Basic knowledge of the facts and risk factors is increasingly widely available to professionals and

the general public. With acute suicidality of high estimated lethal potential, emergency psychiatric intervention, including by civil commitment if necessary, may be life saving. Because depressive or dysphoric-agitated affective moods are by far the most likely conditions associated with suicide, urgent and aggressive treatment by appropriate medical (psychopharmacological or ECT) methods, close clinical supervision, and psychosocial interventions are essential. Despite the self-evident need to treat mood and anxiety disorders, personality dysfunctions, and

independent or comorbid substance use disorders in an effort to reduce suicidal risk in acute states of crisis, remarkably few psychopharmacological or psychosocial treatments have been evaluated or empirically proved to have a substantial long-term, preventive impact on suicide rates. Moreover, international suicide rates have changed little since the advent of effective antidepressant, mood-stabilizing, anxiolytic, and antipsychotic medicines from the 1950s. An exception is the long-term use of lithium salts in bipolar and unipolar forms of manic-depressive illness and possibly use of

clozapine in chronic psychotic disorders. Their proven effectiveness in preventing recurrences of mania and depression (or of psychosis), and

perhaps also the close clinical supervision required for the safe use of both

treatments, is paralleled by a reduction in the risk of suicidal behavior during treatment.

Assessment of treatment effects on suicidal behavior and on excess general mortality associated with major psychiatric illnesses is extremely challenging because the outcomes are, by definition, infrequent, and require prolonged observations in large numbers of subjects who are being managed in an ethical and clinically appropriate manner with similarly plausible

interventions and treatments. In conclusion, there is a timely and encouraging reawakening of interest in the challenges of recognizing and preventing suicide as an international pubic health and public policy crisis.[209] This review indicates clearly that much is known,

much more remains to be learned, particularly pertaining to effective, practicable, affordable, and socially acceptable preventive interventions.

References

1. Frances RJ, Franklin J, Flavin DK. Suicide and alcoholism. Am J Drug Alcohol Abuse. 1987;13:327-341.
2. Tondo L. *Prima del tempo. Capire e prevenire il suicidio.* Rome, Italy: Carocci; 2019.
3. Minois G. *History of Suicide, Voluntary Death, in Western Culture*. Baltimore, Md: Johns Hopkins University Press; 1999.
4. MacDonald M, Murphy TR. Sleepless souls. *Suicide in Early Modern England*. Oxford, England: Clarendon Press; 1990.
5. Erasmus D. Miller CH, trans. *The Praise of Folly*. New Haven, Conn: Yale University Press; 1979.
6. Donne J. *Biathanatos*. New York, NY: Garland Press; 1982.
7. Burton R. *Anatomy of Melancholy*. Faulkner TC, Nicolas K, Kiessling NK, Blair RL, eds. Oxford, England: Clarendon Press; 1989.
8. Juanatey-Dorado C. *Derecho, Suicidio y Eutanasia*. Madrid, Spain: Spanish Ministry of Justice and the Interior; 1994.
9. Morselli E. *Il Suicidio: Saggio di Statistica Morale Comparata*. Milan, Italy: Fratelli Dumolard; 1879.
10. Durkheim E. *Suicide: A Sociological Study*. Spaulding JA, Simpson G, trans. Glencoe, Ill: Free Press; 1951.
11. Dublin LI. *Suicide: A Sociological and Statistical Study*. New York, NY: Ronald Press; 1963.
12. Augustine. *The City of God.* New York, NY: The Modern Library; 2019
.
13. Sullivan EW. General introduction. In: Donne J. *Biathanatos*. Newark, Del: University of Delaware

Press;1982.
14. Zilboorg G. Differential diagnostic types of suicide. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:36-61.
15. John Paul II. Evangelium vitae. Origins. 1995;24:689-727.
16. Conwell Y, Henderson RE. Neuropsychiatry of suicide. In: Fogel BS, Schiffer RB, Rao SM, eds. *Neuropsychiatry*. Baltimore, Md: Williams & Wilkins; 1996:485-521.
17. Guze SB, Robins E. Suicide and primary affective disorders. Br J Psychiatry. 1970;117:437-438.
18. Roy A. Suicide. In Kaplan HI, Sadock BJ, eds. *Comprehensive Textbook of Psychiatry*. Vol 2. 5th ed. Baltimore, Md: Williams & Wilkins; 1989:1414-1427.
19. Clark DC, Goebel-Fabbri AE. Lifetime risk of suicide in major affective disorders. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey- Bass; 1998:270-286.
20. Bostwick JM, Pankratz VS. Affective disorders and suicide risk: a reexamination. Am J Psychiatry. 2019;157:1925-1932.
21. Tondo L, Baldessarini RJ, Hennen J, Floris G, Silvetti F, Tohen M. Lithium treatment and risk of suicidal behavior in bipolar disorder patients. J Clin Psychiatry. 1998;59:405-414.
22. Strakowski SM, McElroy SL, Keck PE. Suicidality among patients with mixed and manic bipolar disorder. Am J Psychiatry. 1996;153:674-676.
23. Foster T, Gillespie K, McClelland R, Patterson C. Risk factors for suicide independent of DSM-III-R Axis I disorder. Br J Psychiatry. 1999;175:175-179.
24. Angst J, Sellaro R, Angst F. Long-term outcome and mortality of treated vs untreated bipolar and depressed patients: a preliminary report. Int J Psychiatr Clin Pract. 1998;2:115-119.
25. Angst J, Angst F, Stassen HS. Suicide risk in patients with major depressive disorder. J Clin Psychiatry. 1999;60(suppl 2):57-62.
26. Mosciki EK. Epidemiology of suicide. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:40-51.
27. Appleby L, Cooper J, Amos T, Faragher B. Psychological autopsy study of suicides by people aged under 35. Br J Psychiatry. 1999;175:168-174.

28. Baldessarini RJ, Jamison KR, eds. Effects of medical interventions on suicidal behavior. J Clin Psychiatry. 1999;60(suppl 2):1-122.
29. Inskip HM, Harris EC, Barraclough B. Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. Br J Psychiatry. 1998;172:35-37.
30. Simpson SG, Jamison KR. The risk of suicide in patients with bipolar disorders. J Clin Psychiatry. 1998;60(suppl 2):53-56.
31. Harris EC, Barraclough B. Suicide as an outcome for mental disorders: a meta-analysis. Br J Psychiatry. 1997;170:205-208.
32. Kessler RC, McGonigle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the US: results from the national comorbidity study. Arch Gen Psychiatry. 1994;51:8-19.
33. Keller MB, Lavori PW, Klerman GL, et al. Low levels and lack of predictors of somatotherapy and psychotherapy received by depressed patients. Arch Gen Psychiatry. 1986;43:458-466.
34. McCombs JS, Nichol MB, Stimmel GL, Sclar DA, Beasley CM Jr, Gross LS. Cost of antidepressant drug therapy failure: a study of

antidepressant use patterns in a Medicaid population. J Clin Psychiatry. 1990;51(suppl):60-69.
35. Isacsson G, Boëthius G, Bergman U. Low level of antidepressant prescription for people who later commit suicide: 15 years of experience from a population-based drug database in Sweden. Acta Psychiatr Scand. 1992;85:444-448.
36. Isacsson G, Holmgren P, Wasserman D, Bergman U. Use of antidepressants among people committing suicide in Sweden. Br Med J. 1994;308:506-509.
37. Suominen KH, Isometsä E, Henriksson MM, Ostamo AI, Lonnqvist JK. Inadequate treatment for major depression both before and after attempted suicide. Am J Psychiatry. 1998;155:1778-1780.
38. Baldessarini RJ, Tondo L, Suppes T, Faedda GL, Tohen M. Pharmacological treatment of bipolar disorder throughout the life-cycle. In: Shulman KI, Tohen M, Kutcher S, eds. *Bipolar Disorder Through the Life-Cycle*. New York, NY: John Wiley and Sons; 1996:299-338.
39. Baldessarini RJ, Tarazi FI. Drugs and the treatment of psychiatric disorders: antimanic and antidepressant agents. In: Hardman JG, Limbird LE, Molinoff PB, Ruddon RW, Gilman AG, eds. *Goodman and Gilman's The Pharmacological Basis of Therapeutics*. 10th ed. New York, NY: McGraw-Hill Press; 2001. In press.
40. Holmes TH, Rahe RH. The social readjustment rating scale. J Psychosom Res. 1967;11:213-218.
41. Paykel ES, Prusoff BA, Myers JK. Suicide attempts and recent life events. A controlled comparison. Arch Gen Psychiatry. 1975;32:327-333.
42. Heikkinen ME, Lonnqvist JK. Recent life events in elderly suicide: a nationwide study in Finland. Int Psychogeriatr. 1995;7:287-300.
43. Gould MS, Fisher P, Parides M, Flory M, Shaffer D. Psychosocial risk factors of child and adolescent completed suicide. Arch Gen Psychiatry. 1996;53:1155-1162.
44. Battin MP. *Ethical Issues in Suicide*. Englewood Cliffs, NJ: Prentice-Hall; 1995.
45. Meisel A, Snyder L, Quill T. Seven legal barriers to end-of-life care: myths, realities, and grains of truth. JAMA. 2019;284:2495-2501.
46. Diekstra RFW. The significance of Nico Speijer's suicide: How and when should suicide be prevented? Suicide Life-Threat Behav. 1986;16:3-15.

47. Siegel K. Psychosocial aspects of rational suicide. Am J Psychotherapy. 1986;40:405-418.
48. Humphry D. The case for rational suicide. Suicide Life-Threat Behav. 1987;17:335-338.
49. Emanuel EJ, Fairclough DL, Emanuel LL. Attitudes and desires related to euthanasia and physician-assisted suicide among terminally ill patients and their caregivers. JAMA. 2019;284:2460-2468.
50. Werth JL Jr. *Rational suicide: Implications for Mental Health Professionals*. Washington, DC: Taylor and Francis; 1996.
51. Battin MP. Can suicide be rational? Yes, sometimes. In: Werth JL Jr, ed. *Contemporary Perspectives on Rational Suicide*. Philadelphia, Pa: Brunner/Mazel; 1999:13-21.
52. Brandt RB. The morality and rationality of suicide. In: Perlin S, ed. *A Handbook For The Study of Suicide*. New York, NY: Oxford University Press; 1975:61-76.
53. Callahan D. Reasons, rationality, and ways of life. In: Werth JL Jr, ed. *Contemporary Perspectives on Rational Suicide*. Brunner/Mazel, Philadelphia, 1999:22-28.
54. Breitbart W, Rosenfeld B, Pessin H, et al. Depression, hopelessness, and desire for hastened death in terminally ill patients with cancer. JAMA.2019;284:2907-2911.
55. Conwell Y, Caine ED, Olsen K. Suicide and cancer in later life. Hosp Commun Psychiatry. 1990;41:1334-1339.
56. Perry S. Suicidal ideation and HIV testing. JAMA. 1990;263:679-682.
57. Smith WJ. Rational suicide as the new Jim Crow. In: Werth JL Jr, ed. *Contemporary Perspectives on Rational Suicide*. Philadelphia, Pa: Brunner/Mazel; 1999:54-62.
58. O'Carroll PW, Berman AL, Maris RW, Moscicki EK, Tanneyt BL, Silverman MM. Beyong the tower of Babel: a nomenclature for suicidology. Suicide Life-Threat Behav. 1996;26:237-252.
59. Shneidman ES. Suicide, lethality, and the psychological autopsy. Int Psychiatry Clin. 1969;6:225-250.
60. Beck AT, Beck R, Kovacs M. Classification of suicidal behaviors: quantifying intent and medical lethality. Am J Psychiatry. 1975;132:285-287.
61. Pierce DW. Suicidal intent in self-injury. Br J Psychiatry. 1977;130:377-385.
62. Pierce DW. The predictive validation of a suicide intent scale: a five year follow-up. Br J Psychiatry. 1981;139:391-396.

63. Stone G. *Suicide and Attempted Suicide*. New York, NY: Carroll and Graf; 1999.
64. Menninger KA. *Man Against Himself*. New York, NY: Harcourt; 1938.
65. Tondo L, Baldessarini RJ, Hennen J, et al. Suicide attempts in major affective disorder patients with comorbid substance use disorders. J Clin Psychiatry. 1999;60(suppl 2):63-69.
66. Jamison KR. *Night Falls Fast*. New York, NY: Alfred Knopf; 1999.
67. American Association of Suicidology. U.S.A. Suicide: 1998 Official Final Data. Available at: http://www.suicidology.org/index.html. Accessed February 5, 2001.
68. Murphy SL. Deaths: final data for 1998. Natl Vital Stat Rep. 2019;48:1-100.
69. Diekstra RFW. Epidemiology of suicide and parasuicide. Acta Psychiatr Scand Suppl. 1993;371:9-20.
70. World Health Organization (WHO). Suicide: International Rates. Available at: http://www.who.int/mental_health/Topic_Suicide/suicide1.html. Accessed: January 22, 2001.
71. Mäkinen IH, Wasserman D. Suicide prevention and cultural resistance: stability in suicide ranking of European countries, 1970-88. Ital J Suicidology. 1997;7:73-85.
72. Phillips MR, Liu H, Zhang Y. Suicide and social change in China. Culture Med Psychiatry. 1999;23:25-50.
73. Yoshioka N. Epidemiological study of suicide in Japan: is it possible to reduce committing suicide? Nippon Hoigaku Zasshi. 1998;52:286-293.
74. Kreitman NS. *Parasuicide*. New York, NY: John Wiley and Sons; 1997.
75. Schmidtke A, Bille-Brahe U, DeLeo D, et al. Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989-1992. Results of the WHO/EURO Multicentre Study on Parasuicide. Acta Psychiatr Scand. 1996;93:327-338
76. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry. 1999;56:617-626.
77. Tondo L, Baldessarini RJ. Reduced suicide risk during lithium maintenance treatment. J Clin Psychiatry. 2019;61(suppl 9):S97-

S104.
78. Stengel E. *Suicide and Attempted Suicide*. London, England: Penguin; 1964.
79. Tejedor MC, Diaz A, Castillón JJ, Pericay JM. Attempted suicide: repetition and survival findings of a follow-up study. Acta Psychiatr Scand. 1999;100:205-211.
80. Crosby AE, Cheltenham MP, Sacks JJ. Incidence of suicidal ideation and behavior in the US, 1994. Suicide Life-Threat Behav. 1999;29:131-140.
81. Kellerman AL, Rivara FP, Somes G, Reay DT, Francisco J, Banton JG, Prodzinski J Fligner C, Hackman BB: Suicide in the home in relation to gun ownership. N Engl J Med. 1992;327:467-472.
82. Boyd JH. The increasing rate of suicide by firearms. N Engl J Med. 1983;308:872-874.
83. Goldman S, Beardslee WR. Suicide in children and adolescents. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:417-442.
84. Group for the Advancement of Psychiatry. Adolescent Suicide (GAP Report 140). Washington, DC: American Psychiatric Press; 1996.
85. Shaffer DA, Fisher P. The epidemiology of suicide in children and young adolescents. J Am Acad Child Adoles Psychiatry. 1981;20:545-565.
86. Andrews JA, Lewinsohn PM. Suicidal attempts among older adolescents: prevalence and co-occurrence with psychiatric disorders. J Am Acad Child Adolesc Psychiatry. 1992;31:655-662.
87. Lester D. Adolescent suicide risk today: a paradox. J Adolescence. 1998;21:499-503.
88. Gunnell D, Lopatatzidis A, Dorling D, Wehner H, Southall H, Frankel S. Suicide and unemployment in young people. Br J Psychiatry. 1999;175:263-270.
89. Murphy GE. Why women are less likely than men to commit suicide. Compr Psychiatry. 1998;39:165-175.
90. Altamura CA, van Gastel A, Pioli R, Mannu P, Maes M. Seasonal and circadian rhythms in suicide in Cagliari, Italy. J Affect Disord. 1999;53:77-85.
91. Hakko H, Rasanen P, Tiihonen J. Seasonal variation in suicide occurrence in Finland. Acta Psychiatr Scand. 1999;99:308-310.
92. Jensen G, Jensen BF, Arensman E, et al. Attempted suicide and

major public holidays in Europe: Findings from the WHO multicenter study on parasuicide. Acta Psychiatr Scand. 1999;99:412-418.
93. Massing W, Angermeyer MC. The monthly and weekly distribution of suicide. Soc Sci Med. 1985;21:433-441.
94. Noble RE. Temporal fluctuations in suicide calls to a crisis intervention service. Suicide Life-Threat Behav. 1996;26:415-423.
95. Palmer CS, Revicki DA, Hapern MT, Hatziandrieu EJ. The cost of suicide and suicide attempts in the United States. Clin Neuropharmacology. 1995;18(suppl 3):S525-S533.
96. Wyatt RJ, Henter I. An economic evaluation of manic-depressive illness. Soc Psychiatry Psychiatr Epidemiol. 1995;30:213-219.
97. Kind P, Sorensen J. The costs of depression. Intl Clin Psychopharmacol. 1993;7:191-195.Part II
98. Egeland J, Sussex J. Suicide and family loading for affective disorders. JAMA. 1985;254:915-918.
99. Roy A, Nielsen D, Rylander G, Sarchiapone M, Segal N. Genetics of suicide in depression. J Clin Psychiatry. 1999;60(suppl 2):12-17.
100. Kallmann FJ, Anastasio MM. Twin studies on the psychopathology of suicide. J Nerv Ment Dis. 1947;105:40-55.
101. Roy A, Nielsen D, Rylander G, Sarchiapone M. Genetics of suicide: family studies and molecular genetics. Ann NY Acad Sci. 1997;836:135-157.
102. Wender PH, Kety SS, Rosenthal D, Schulsinger F, Ortmann J, Lunde I. Psychiatric disorders in the biological and adoptive families of adopted individuals with affective disorders. Arch Gen Psychiatry. 1986;43:923-929.
103. Mann JJ. The neurobiology of suicide. Nature Med. 1998;4:25-30.
104. Mann JJ. Role of serotonergic system in the pathogenesis of major depression and suicidal behavior. Neuropsychopharmacology. 1999;21(suppl 2):99S-105S.
105. Mann JJ, Arango V. Abnormalities of brain structure and function in mood disorders. In: Charney DS, Nestler EJ, Bunney MS, eds. *Neurobiology of Mental Illness*. New York, NY: Oxford University Press;1999:385-393.
106. Mann JJ, Huang Y-Y, Underwood MD, et al. A serotonin transporter gene promoter polymorphism (5-HTTLPR) and prefontal cortical binding in major depression and suicide. Arch Gen Psychiatry. 2019;57:729-738.

107. Arranz B, Blennow K, Eriksson A, Mansson JE, Marcusson J. Serotonergic, noradrenergic, and dopaminergic measures in suicide brains. Biol Psychiatry. 1997;41:1000-1009.
108. Partonen T, Haukka J, Virtamo J, Taylor PR, Lonnqvist J. Association of low serum total cholesterol with major depression and suicide. Br J Psychiatry. 1999;175:259-262.
109. Hendin H. Psychodynamics of suicide, with particular reference to the young. Am J Psychiatry. 1991;148:1150-1158.
110. Litman RE. Sigmund Freud on suicide. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:200-220.
111. Maltsberger JT, Goldblatt MJ, eds. Essential Papers on Suicide. New York, NY: New York University Press. 1996.
112. Maltsberger JT. The psychodynamic understanding of suicide. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey Bass; 1998:72-82.
113. Friedman M, Glasser M, Laufer E, Laufer M, Wohl M. Attempted suicide and self-mutilation in adolescence: some observations from a psychoanalytic research project. In: Maltsberger JT, Goldblatt MJ, eds. E*ssential Papers on Suicide*. New York, NY: New York University Press; 1996:259-268.
114. Leenaars AA. *Suicide Notes: Predictive Clues and Patterns*. New York, NY: Human Sciences Press; 1998.
115. Adler A. *The Practice and Theory of Individual Psychology.* Radin P, trans. New York: Harcourt, Brace and Co; 1929.
116. Allen TE. Suicidal impulse in depression and paranoia. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:173-184.
117. Friedlander K. On the longing to die. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:93-103.
118. Gutheil EA. Dream and suicide. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:118-130.
119. Menninger KA. Psychoanalytic aspects of suicide. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:20-35.
120. Maltsberger JT, Buie DH Jr. The devices of suicide: revenge, riddance and rebirth. In: Maltsberger JT, Goldblatt MJ, eds. *Essential*

Papers on Suicide. New York, NY: New York University Press; 1996:397-416.
121. Maltsberger JT. Ecstatic suicide. Arch Suicide Res. 1997;3:283-301.
122. Adler G, Buie DH Jr. Aloneness and borderline psychopathology: possible relevance of child development issues. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:356-378.
123. Rosenberg NK. Psychotherapy of the suicidal patient. Acta Psychiatr Scand Suppl. 1993;371:54-56.
124. Beck AT. Thinking and depression. Arch Gen Psychiatry. 1963;9:324-333.
125. Beck AT, Kovacs M, Weissman A. Hopelessness and suicidal behavior. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicid*e. New York, NY: New York University Press; 1996:331-341.
126. Pollock LR, Williams JM. Problem solving and suicidal behavior. Suicide Life-Threat Behav. 1998;28:375-387.
127. Maris RW. Social and familial risk factors in suicidal behavior. Psychiatr Clin North Am. 1997;20:519-550.
128. Maris RW. *Pathways to Suicide*. Baltimore, Md: Johns Hopkins University Press; 1981.
129. Krug EG, Kresnow M, Peddicord JP, et al. Suicide after natural disasters. N Engl J Med. 1998;338:373-378.
130. Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998.
131. Fergusson DM, Horwod LJ, Beautrais AL. Is sexual orientation related to mental health problems and suicidality in young people? Arch Gen Psychiatry. 1999;56:876-880.
132. Goldberg J, True WR, Ramakrishnan V, Lyons M, Eisen S, Tsuang MT. Sexual orientation and suicidality. Arch Gen Psychiatry. 1999;56:867-874.
133. Herrell R, Goldberg J, True WR, et al. Sexual orientation and suicidality. Arch Gen Psychiatry. 1999;56:867-874.
134. Remafedi G. Sexual orientation and youth suicide. JAMA. 1999;282:1291-1292.
135. Platt S. Parasuicide and unemployment. Br J Psychiatry. 1986;149:401-405.
136. Platt S. The social transmission of parasuicide: is there a modeling effect? Crisis. 1993;14:23-31.
137. Hintikka J, Saarinen PI, Viinamaki H. Suicide mortality in Finland

during an economic cycle, 1985-95. Scand J Public Health. 1999;27: 85-88.
138. Diekstra RF. Suicide and suicide attempts in the European economic community: an analysis of trends, with special emphasis upon trends among the young. Suicide Life-Threat Behav. 1985;15:27-42.
139. Beautrais AL, Joyce PR, Mulder RT. Unemployment and serious suicide attempts. Psychol Med. 1998;28:209-218.
140. Claussen B. Suicidal ideation among the long-term unemployed: a five-year follow-up. Acta Psychiatr Scand. 1998;98:480-486.
141. Lewis G, Sloggett A. Suicide, deprivation, and unemployment: record linkage study. BMJ. 1998;17:1283-1286.
142. Hawton K, Houston K, Shepperd R. Suicide in young people. Study of 174 cases, aged under 25 years, based on coroners' and medical records. Br J Psychiatry. 1999;75:271-276.
143. Neeleman J. Regional suicide rates in The Netherlands: does religion still play a role? Int J Epidemiol. 1998;27:466-472.
144. Kelleher MJ, Chambers D, Corcoran P, Williamson E, Keeley HS. Religious sanctions and rates of suicide worldwide. Crisis. 1998;19:78-86.
145. Dudley MJ, Kelk NJ, Florio TM, Howard JP, Waters BG. Suicide among young Australians, 1964-1993: an interstate comparison of metropolitan and rural trends. Med J Austral. 1998;169:77-80.
146. Poussaint AF, Alexander A. *Lay my burden down*. Boston, Mass: Beacon Press; 2019.
147. Goethe JW von. *The Sorrows of Young Werther*. Mayer E, Bogan L, trans. New York, NY: Vintage Books; 1973.
148. Gould MS, Shaffer D. The impact of suicide in television movies: evidence of imitation. N Engl J Med. 1986;315:690-694.
149. Goldney RD. Suicide: role of the media. Austral NZ J Psychiatry. 1989;23:30-34.
150. Phillips DP, Carstensen LL. Clustering of teenage suicides after television news stories. N Engl J Med. 1986;315:685-689.
151. Schmidtke A, Hafner H. The Werther effect after television films: new evidence for an old hypothesis. Psychol Med. 1988;18:665-676.
152. Stack S. The effect of the media on suicide: evidence from Japan, 1955-1985. Suicide Life-Threat Behav. 1996;26:132-142.
153. Deisenhammer EA, Kemmler G, De Col C, Fleischhacker WW, Hinterhuber H. Railroad suicides and attempted suicides in Austria, 1990-94: extending the hypothesis of mass media transmission of

suicidal behavior. Nervenarzt. 1997;68:67-73.
154. Sonneck G, Etzersdorfer E, Nagel-Kuess S. Imitative suicide on the Viennese subway. Soc Sci Med. 1994;38:453-457.
155. Jobes DA, Berman AL, O'Carroll PW, Eastgard S, Knickmeyer S. The Kurt Cobain suicide crisis: perspectives from research, public health, and the news media. Suicide Life-Threat Behav. 1996;26:260-271.
156. Littmann SK. Suicide epidemics and newspaper reporting. Suicide Life-Threat Behav. 1985;15:43-50.
157. Berman AL. Fictional depiction of suicide in television films and imitation effects. Am J Psychiatry. 1988;145:982-986.
158. Kessler RC, Downey G, Milavsky JR, Stipp H. Clustering of teenage suicides after television news stories about suicides: a reconsideration. Am J Psychiatry. 1988;145:1379-1383.
159. Merskey H. Influences of the media: a powerful what? Lancet. 1996;347:416-418.
160. Humphry D. *Final Exit*. New York, NY: The Hemlock Society; 1991.
161. Blumenthal SJ. Suicide: A guide to risk factors, assessment, and treatment of suicidal patients. Med Clin North Am. 1988;72:937-971.
162. Linehan MM. Suicidal people: One population or two? Ann N Y Acad Sci. 1986;487:16-33.
163. Hirschfeld R, Russell JM. Assessment and treatment of suicidal patients. N Engl J Med. 1997;337:910-915.
164. Jacobs DG, Brewer M, Klein-Benheim M. Suicide assessment: an overview and recommended protocol. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:3-39.
165. Perlis RH, Stern TA. Suicide. In: Stern TA, Herman JB, eds. *Psychiatry Update and Board Preparation*. New York, NY: McGraw-Hill; 2019:409-413.
166. Silverman MM, Felner RD. Suicide prevention programs: issues of design, implementation, feasibility, and developmental appropriateness. Suicide Life-Threat Behav. 1995;25:93-105.
167. World Health Organization (WHO): Preventing Suicide: A Resource for General Physicians. Geneva: WHO Department of Mental Health, 2019. Available at: http://www.who.int/mental_health/Publication_Pages/Pubs_suicide.htm. Accessed March 5, 2001
168. Ellison JM: *Treatment of Suicidal Patients in Managed Care.*

Washington, DC: American Psychiatric Press; 2019.
169. Miller MC, Jacobs DG, Gutheil TG. Talisman or taboo: the controversy of the suicide-prevention contract. Harvard Rev Psychiatry. 1998;6:78-87.
170. Malone KM. Pharmacotherapy of affectively ill suicidal patients. Psychiatr Clin North Am. 1997;20:613-625.
171. Salzman C. Treatment of the suicidal patient with psychotropic drugs and ECT. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:372-382.
172. Müller-Oerlinghausen B, Berghofer A. Antidepressants and suicidal risk. J Clin Psychiatry. 1999;60(suppl 2):94-99.
173. Isacsson G. Suicide prevention -- a medical breakthrough? Acta Psychiatr Scand. 2019;102:113-117.
174. Kahn A, Warner HA, Brown WA. Symptom reduction and suicide risk in patients treated with placebo in antidepressant clinical trials: an analysis of the FDA database. Arch Gen Psychiatry. 2019;57:311-317.
175. Klerman GL, Weissman MM. Increasing rate of depression. JAMA. 1989;261:2229-2235.
176. Barbui C, Campomori A, D'avanzo B, Negri E, Garattini S. Antidepressant drug use in Italy since the introduction of SSRIs: national trends, regional differences and impact on suicide rates. Soc Psychiatry Psychiatr Epidemiol. 1999;34:152-156.
177. Leon AC, Keller MB, Warshaw MG, et al. Prospective study of fluoxetine treatment and antisuicidal behavior in affectively ill subjects. Am J Psychiatry. 1999;156:195-201.
178. Teicher MH, Glod C, Cole JO. Emergence of intense suicidal preoccupation during fluoxetine treatment. Am J Psychiatry. 1990;147:207-210.
179. Healy D. The fluoxetine and suicide controversy: A review of the evidence. CNS Drugs 1994;1:223-231.
180. Healy D. Emergence of antidepressant-induced suicidality. Primary Care Psychiatry. 2019;6:23-28.
181. Isacsson G, Holmgren P, Druid H, Bergman U. Psychotropics and suicide prevention: implications from toxicological screening of 5,281 suicides in Sweden. Br J Psychiatry. 1999;174:259-265.
182. Marzuk PM, Tardiff K, Leon AC, et al. Use of prescription psychotropic drugs among suicide victims in New York City. Am J Psychiatry. 1995;152:1720-1725.
183. Oquendo MA, Malone KM, Ellis SP, Sackeim HA, Mann JJ.

Inadequacy of antidepressant treatment for patients with major depression who are at risk for suicidal behavior. Am J Psychiatry. 1999;156:190-194.
184. Avery D, Winokur G. The efficacy of electroconvulsive therapy and antidepressants in depression. Biol Psychiatry. 1977;12:507-523.
185. Metzger ED. ECT and suicide. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:406-414.
186. Rose RM, Burt RA, Clayton PJ. Consensus development conference statement: Electroconvulsive therapy. JAMA. 1985;254:2103-2108.
187. Prudic J, Sackeim HA. Electroconvulsive therapy and suicide risk. J Clin Psychiatry. 1999;60(suppl 2):S104-S110.
188. Goodwin FK, Jamison KR. *Manic-Depressive Illness*. New York: NY: Oxford University Press; 1990.
189. Davis JM, Janicak PG, Hogan DM. Mood stabilizers in the prevention of recurrent affective disorders: a meta-analysis. Acta Psychiatr Scand. 1999;100:406-417.
190. Goodwin FK, Ghaemi SN. The impact of mood stabilizers on suicide in bipolar disorder: a comparative analysis. Primary Psychiatry. 1999;6:61-66.
191. Bauer M, Bschor T, Kunz D, Berghofer A, Strohle A, Müller-Oerlinghausen B. Double-blind, placebo-controlled trial of the use of lithium to augment antidepressant medication in continuation treatment of unipolar major depression. Am J Psychiatry. 2019;157:1429-1435.
192. Baldessarini RJ, Tondo L. Antisuicidal effect of lithium treatment in major mood disorders. In: Jacobs D, ed. *Harvard Medical School Guide to Assessment and Intervention in Suicide*. San Francisco, Calif: Jossey-Bass; 1998:355-371.
193. Baldessarini RJ, Tondo L, Hennen J. Antisuicidal effects of lithium in manic-depressive disorders. J Clin Psychiatry. 1999;60(suppl 2):S77-S84.
194. Tondo L, Hennen J, Baldessarini RJ. Reduced suicide risk with long-term lithium treatment in major affective illness: a meta-analysis. Acta Psychiatr Scand. 2001. In press.
195. Faedda GL, Tondo L, Baldessarini RJ, Suppes T, Tohen M. Outcome after rapid vs. gradual discontinuation of lithium treatment in bipolar mood disorders. Arch Gen Psychiatry. 1993;50:448-455.
196. Baldessarini RJ, Tondo L, Viguera AC. Effects of discontinuing

lithium maintenance treatment. Bipolar Disord. 1999;1:17-24.
197. Suppes T, Baldessarini RJ, Faedda GL, Tohen M. Risk of recurrence following discontinuation of lithium treatment in bipolar disorder. Arch Gen Psychiatry. 1991;48:1082-1088.
198. Wickham EA, Reed FV. Lithium for the control of aggressive and self-mutilating behavior. Int Clin Psychopharmacol. 1977;2:181-190.
199. Müller-Oerlinghausen B, Müser-Causemann B, Volk J. Suicides and parasuicides in a high-risk patient group on and off lithium long-term medication. J Affect Disord. 1992;25:261-270.
200. Thies-Flechtner K, Müller-Oerlinghausen B, Seibert W, Walther A, Greil W. Effect of prophylactic treatment on suicide risk in patients with major affective disorders. Pharmacopsychiatry. 1996;29:103-107.
201. Greil W, Ludwig-Mayerhofer W, Erazo N, et al. Lithium vs. carbamazepine in the maintenance treatment of bipolar disorders: a randomized study. J Affect Disord. 1997;43:151-161.
202. Meltzer HY, Anand R, Alphs L. Reducing suicide risk in schizophrenia: focus on the role of clozapine. CNS Drugs. 2019;14:355-365.
203. Himmelhoch JM. Lest treatment abet suicide. J Clin Psychiatry. 1987;48:44-54.
204. Hendin H, Lipschitz A, Maltsberger JT, Haas AP, Wynecoop S. Therapists' reactions to patients' suicides. Am J Psychiatry. 2019;158:2022-2027.
205. Shneidman ES. Aphorisms of suicide and some implications for psychotherapy. Am J Psychotherapy. 1984;38:319-329.
206. Shneidman ES. Psychotherapy with suicidal patients. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:417-426.
207. Hendin H. Psychotherapy and suicide. In: Maltsberger JT, Goldblatt MJ, eds. *Essential Papers on Suicide*. New York, NY: New York University Press; 1996:427-441.
208. Moller HJ. Attempted suicide: efficacy of different aftercare strategies. Int Clin Psychopharmacol. 1992;6(suppl 6):58-59.
209. Surgeon General of the United States: A National Suicide Prevention Strategy. Washington, DC: US Public Health Service, US Government Printing Office, 2001. In press. Accessed March 5, 2001.