Antisocial personality disorder (ASPD) is characterized by a pattern of socially irresponsible, exploitative, and guiltless behaviour. Rates of natural and unnatural death (suicide, homicide, and accidents) are excessive. ASPD is a predictor of poor treatment response. ASPD begins early in life, usually by age 8 years. Diagnosed as conduct disorder in childhood, the diagnosis converts to ASPD at age 18 if antisocial behaviours have persisted. While chronic and lifelong for most people with ASPD, the disorder tends to improve with advancing age. Earlier onset is associated with a poorer prognosis. Other moderating factors include marriage, employment, early incarceration (or adjudication during childhood), and degree of socialization.

Antisocial personality disorder is defined by a pattern of socially irresponsible, exploitative, and guiltless behaviour. Symptoms include failure to conform to law, failure to sustain consistent employment, manipulation of others for personal gain, deception of others, and failure to develop stable interpersonal relationships. Lifetime prevalence for ASPD is reported to range from 2% to 4% in men and from 0.5% to 1% in women. Prevalence peaks in people age 24 to 44 years and drops off in people 45 to 64 years. The male-to-female ratio is estimated at between 2:1 and 6:1, depending on assessment method and sample characteristics. The prevalence of ASPD varies with the setting but can reach 80% in correctional settings.

ASPD is associated with co-occurring mental health and addictive disorders, including major depressive disorder, bipolar disorder, anxiety disorders, somatic symptom disorders, substance use disorders, gambling disorder, and sexual disorders. People with ASPD are at risk for traumatic injuries, accidents, suicide attempts, hepatitis C infections, and the human immunodeficiency virus. People with ASPD use a disproportionate share of medical and mental health services. ASPD has been identified as a predictor of poor treatment response in certain populations.

People with ASPD have high mortality rates owing to accidents, suicide, and homicide. One study showed elevated death rates from diabetes mellitus, suggesting that some people with ASPD may neglect their medical problems or fail to comply with medical regimens.

Early Course
Antisocial behaviours typically have their onset before age 8 years. Nearly 80% of people with ASPD developed their first symptom by age 11 years. Boys develop symptoms earlier than girls, who may not develop symptoms until puberty. Robins has observed that a child who makes it to age 15 without exhibiting antisocial behaviours (that is, CD) will not develop ASPD. Other investigators have also
reported that the presence of CD in childhood is a robust predictor of ASPD in adulthood.\textsuperscript{20–22}

The DSM-\textsuperscript{5} definition of ASPD requires a history of childhood CD, the diagnosis used for persistent and serious childhood behaviour problems. Once the child passes age 18 years, if the behavioural problems have persisted the diagnosis changes to ASPD. An estimated 25\% of girls and 40\% of boys with CD will later meet criteria for ASPD.\textsuperscript{6} A subset of antisocial adults have no history of childhood CD, but appear to meet adult criteria for ASPD; these people tend to have milder syndromes.\textsuperscript{23,24}

### Early Studies: The Gluecks and Robins

Research conducted in the 1940s and 1950s by Robins\textsuperscript{19} at Washington University in St Louis, and by the Gluecks (see Glueck and Glueck\textsuperscript{25}) at Harvard, independently showed the continuity between adult and childhood behavioural problems. The work of these researchers later influenced the diagnostic criteria for ASPD in DSM-\textsuperscript{III}.\textsuperscript{26}

The Gluecks\textsuperscript{25} followed 500 boys between age 10 and 17 years judged officially delinquent by the Massachusetts correctional system. The boys were contacted for interviews at ages 25, 32, and 45 years. In the 1990s, Sampson and Laub\textsuperscript{27} reanalyzed the Gluecks’ data, originally published in \textit{Unraveling Juvenile Delinquency},\textsuperscript{25} and were able to confirm their findings. Severe antisocial behaviour in childhood (that is, problems serious enough to constitute delinquency in the eyes of the law) was strongly linked to adult criminality and deviant behaviour. Arrests between age 17 and 32 years were 3 to 4 times more likely to occur in men with a history of delinquent behaviour than in their nondelinquent peers. Childhood antisocial behaviour also predicted educational achievement, economic status, employment, and family life in adulthood. Sampson and Laub\textsuperscript{27} concluded that the varied outcomes correlated with childhood behaviour are all expressions of the same underlying trait.

More influential was the work of Robins,\textsuperscript{19} who studied 524 subjects seen in a child guidance clinic between 1922 and 1932 and followed up in the 1950s. She described the study in \textit{Deviant Children Grown Up}.\textsuperscript{19} The children were, on average, 13 years old when seen at the clinic; nearly three-quarters were boys, most of whom had been referred from juvenile court. Robins concluded that ASPD is a chronic, persistent disorder that seldom remits.

Among the 524 subjects, 94 qualified for an ASPD diagnosis in adulthood, 82 of whom were interviewed an average of 30 years later. Now in their 30s and 40s, Robins concluded that 12\% had remitted (that is, no evidence of antisocial behaviour), while another 27\% had improved but not remitted, and 61\% were unimproved or worse. The median age for improvement was 35 years, but Robins noted that there was “no age beyond which improvement seemed impossible.”\textsuperscript{19, p 222} That a subject had improved did not mean the disorder was no longer a problem. She writes the following:

The finding that more than one-third of the sociopathic group had given up much of the antisocial behavior . . . does not mean that at present they are strikingly well-adjusted and agreeable persons. Many of them report interpersonal difficulties, irritability, hostility toward wives, neighbors, and organized religion. They are in many cases no longer either a threat to the life and property of others nor a financial drain on society.\textsuperscript{19, p 236}

### The Iowa Antisocial Follow-Up

Black et al\textsuperscript{28} followed-up 71 men who had been psychiatrically hospitalized at the University of Iowa between 1945 and 1970 and met DSM-\textsuperscript{III} criteria for ASPD, which were applied retrospectively to the case notes. The researchers were able to trace over 90\% of the men and had sufficient information to rate outcome in 45 who had been hospitalized an average of 29 years earlier. The men were a mean age of 56 years at the follow-up. With ratings similar to those used by Robins,\textsuperscript{19} Black et al\textsuperscript{28} concluded that 27\% of the subjects had remitted, 31\% had improved but not remitted, and 42\% were unimproved or worse. Subjects most likely to have improved were the least symptomatic at baseline and had achieved an older age by the time of the follow-up. Black et al\textsuperscript{28} concluded that many of the antisocial behaviours present at index evaluation were still present at follow-up:

Although most of our subjects were no longer having frequent confrontations with the police, they continued to have enduring problems with \textit{poor}.

### Clinical Implications

- ASPD is important to diagnose because of its prognostic implications.
- ASPD shows the continuity between childhood and adult behavioural problems.
- ASPD is chronic and lifelong for most people, but tends to moderate with advancing age.

### Limitations

- Many prospective studies have involved nonrepresentative samples, such as those who have been hospitalized or adjudicated.
- The definition of ASPD has evolved, complicating the interpretation of findings in early studies.
- Many prospective studies have used a limited number of predictive variables.
occupational performance, social isolation, marital discord, poor family relations, and substance abuse, p 138

Black et al29 compared the course of the antisocial man to that of people with schizophrenia or depression, as well as to healthy control subjects, data previously published in the Iowa 500 study. All subjects had been hospitalized at the same facility. In this comparison, antisocial men fared less well than depressed subjects and healthy control subjects in their marital, occupational, and psychiatric adjustment. Antisocial men functioned better than people with schizophrenia in their marital status and housing, but not in their occupational status or aggregate psychiatric symptoms. In other words, they were more likely than people with schizophrenia to be married and to have their own housing, but they were as likely to perform poorly in the workplace and to have disabling psychiatric symptoms though the specific symptoms differed.

Both Black et al28,30 and Robins19 found that a sizable percentage of people with ASPD improve or remit with advancing age. This finding is consistent with crime statistics, which show that arrests peak among people in their late teens and then decline. Few arrests occur in older adults; when arrests occur they are due to conduct offences, such as public drunkenness, rather than with violent crime.31 While the aging antisocial person is less troublesome to the community, many remain troublesome to their families, neighbours, and coworkers. Many of these people will need to draw on public resources for survival; and many of those who improve are unable to regain lost opportunities in education, employment, and domestic life. For some people, improvement still means living on society’s margins.32

Youth Follow-up Studies
The Developmental Trends Study21,33,34 began in 1987 and involved 177 boys in Pennsylvania and Georgia, age 7 to 12 years, who were followed up at regular intervals into early adulthood. The purpose of the study was to document the course of disruptive behaviour over time and its interaction with co-occurring disorders. The boys were recruited from university clinics to which they had been referred because of disruptive behaviour disorders, such as attention-deficit hyperactivity disorder or CD. The investigators showed the following: boys with an early onset of symptoms had a faster progression to more serious problems than boys whose problems emerged at a later age; physical fighting predicted the onset of CD more than any other symptoms; oppositional defiant disorder appeared to be a developmental precursor to CD in some boys; and CD was predictive of the later diagnosis of ASPD.

The Pittsburgh Youth Study33,35 was a longitudinal study of inner-city boys that also began in 1987, and whose aim was to trace the development of antisocial and delinquent behaviour from childhood to early adulthood. Among boys in the first, fourth, and seventh years in the Pittsburgh public schools, 1517 were screened, and the 30% most antisocial were selected for follow-up, along with 30% of the remainder as a comparator. The boys ranged in age from 7 to 13 years at intake. In this study, the researchers were able to show that problem behaviours occurred along a developmental trajectory from childhood to adolescence. The onset of minor covert acts, such as lying and shoplifting, tended to occur before the onset of property damage, which, in turn, occurred before the onset of moderate-to-serious forms of delinquency.

The Jack Roller’s Story
The natural history of ASPD is illustrated in a more personal way by examining the true life of Stanley (the Jack Roller), as portrayed in the books The Jack Roller: A Delinquent Boy’s Own Story by Clifford Shaw36 and The Jack Roller at 70 by the Jack Roller and Jon Snodgrass.37 Stanley was a chronic runaway at age 6, truant by age 8, in custody 26 times before age 10, and 38 times by age 17, including 3 terms at a home for incorrigible boys, and 1 year each in 2 reformatories. Through a great deal of ingenuity, Snodgrass found and re-interviewed Stanley when he was 70 years old. No longer involved in any significant criminal activity, Stanley continued to have trouble keeping jobs, was constantly on guard against assault by others, and took little responsibility for his own problems. He clearly had all the earmarks of ASPD, despite his advanced age.

Shaw later edited Brothers in Crime, published in 1938.38 The book describes the 5 Martin boys and their progression from juvenile delinquents to adult criminals, who, together, spent a total of 55 years in prison. At the time of publication, the brothers ranged in age from 25 to 35 years, 4 of the 5 were considered improved and were engaged in self-supporting activities, although the oldest, John, was actively alcoholic, while the youngest, Carl, was incarcerated. The stories of their misbehaviour intertwine, but also display the familial nature of ASPD.

Different Trajectories
Moffitt and colleagues (see Moffitt19 and Odgers et al40) have suggested that ASPD is highly stable in a small percentage of men and women whose behavioural problems are extreme (categorized as life-course-persistent). As part of the Dunedin longitudinal study in New Zealand, Moffitt and colleagues traced the outcome of 1037 children from age 3 to 32 years. Conversely, most antisocial youth with behavioural problems were categorized as having an adolescence-limited form of antisocial behaviour, described as less severe and typically arising in the context of teenage peer group pressure. These teens typically have little or no history of earlier antisocial behaviour and will improve on their own, as most children diagnosed with CD do not develop adult ASPD. For both men and women, the life-course-persistent group showed an early onset of antisocial behaviour, developed more severe behavioural problems,
and had a greater variety of problems than the adolescent-limited group.

Outcome Predictors in ASPD
Robins\textsuperscript{19} found that most of the children improved as they grew older and did not become adults with ASPD. She concluded that variety and severity of childhood behaviour problems were the single best predictors of adult antisocial behaviour. Robins writes as follows:

No patient without moderately severe antisocial behavior, as measured by having six or more kinds of antisocial behavior, four or more episodes of antisocial behavior, or an episode of such behavior serious enough that it might have led to a court appearance, was diagnosed sociopathic personality as adult.\textsuperscript{19, p 157}

Among the few variables predictive of long-term adjustment, Robins\textsuperscript{19} observed that greater improvement occurred in people over 40 years at the time of follow-up. These findings are consistent with data reported by Black et al\textsuperscript{28,30} in which improvement in men with ASPD was positively associated with increasing age. Another variable is incarceration. Robins found that men incarcerated less than a year had a higher rate of remission than those who were never incarcerated, or those who were incarcerated for longer periods of time. This latter finding suggests that a brief incarceration could act as a deterrent to further antisocial behaviour.

Relationships
Marriage is another moderating variable. In Robins’ study,\textsuperscript{19} over one-half of married people with ASPD improved, but few unmarried people improved. Spouses, partners, and others close to the person with ASPD can play an important role in urging therapy, and improvement often comes when one has a source of personal support and motivation. People with ASPD who remitted had stronger family ties, were more involved in their communities, and were more likely to live with their spouses. These findings are largely consistent with the Gluecks’ findings that linked job stability and marital attachment with improvement.\textsuperscript{25} Each of these situations—from brief incarceration to relative success with marriage and family life—could easily be the result of improvement rather than its cause.

One might expect that people with ASPD who stay happily married, or who have not faced lengthy periods of incarceration, simply have milder cases of ASPD to begin with or are otherwise predisposed to getting better. There is some evidence for this, at least regarding marriage. In a study of male twins followed from 17 to 29 years, the researchers discovered that men with less severe forms of antisocial behaviour were more likely to marry than their more antisocial twin.\textsuperscript{31} Possibly, severe antisocial symptoms hinder marriage because they interfere with forming intimate relationships.

Another factor that may moderate eventual outcome is degree of childhood socialization, which is the child’s tendency to form relationships and internalize social norms. Jenkins and Glickman\textsuperscript{42} identified 2 types of children with CD: the socialized and the undersocialized. They observed that the ability to develop group loyalty is crucial and marks a fundamental division among children with CD. Socialized children, regardless of their behaviour, form strong ties to a familiar group of friends, whereas undersocialized children tend to be loners. In a 10-year, follow-up study, Henn et al\textsuperscript{43} found that socialized delinquents were less likely to have been convicted of crimes or imprisoned as adults than undersocialized delinquents.

Other Studies
Three additional studies are relevant to any review of the natural history of ASPD. These are the follow-up studies of Maddocks,\textsuperscript{44} Gibbens et al,\textsuperscript{45} and Tong,\textsuperscript{46} all conducted in the United Kingdom in the 1950s and 1960s. The subjects in each study were considered psychopaths, a rough equivalent of ASPD.

Maddocks\textsuperscript{44} reported a 5-year, follow-up study of patients seen in an outpatient department between 1961 and 1963. The men were considered psychopaths, and the inclusion criteria included impulsivity, trouble with the law, several spouses or sexual partners, trouble at school, and unreliability. Maddocks traced 52 of 59 men; 10 (19%) had settled down, 39 (75%) had not settled, and 3 (6%) had died by suicide. He defined settled down as having shown a reduction of impulsiveness enabling the patient to stay in the same job, stay with the same partner, and “generally a reduction in symptoms that placed him in the category in the first place.”\textsuperscript{44, p 511} While there was no clear distinction between men who had settled and those who had not, 15 (38%) of those who had not settled drank excessively or were frank alcoholics.

Gibbens et al\textsuperscript{45} reported on a 8-year, follow-up of 72 incarcerated criminal psychopaths whose courses were compared with those of 59 ordinary criminals. The psychopaths were considered as having severe cases, and were selected with the assistance of experienced prison medical officers. The psychopaths had a greater number of subsequent convictions than the control subjects, yet 24% had only 1 or no conviction. Of note, the psychopaths were more likely than the control subjects to have an abnormal electroencephalograph. Gibbens et al\textsuperscript{45} concluded that psychopathic personality “does not inevitably portend as hopeless a prognosis as is usually implied.”\textsuperscript{109} 109 Psychopaths considered aggressive had a worse prognosis, compared with the inadequate psychopaths. They had more reconvictions and were committed for aggressive offences, such as willful damage and drunken assault. Gibbens et al\textsuperscript{45} write as follows:

It seems probable that the aggressive psychopath is so crippled in all his social relations that he is only able to live by crime and his record therefore consists very largely of acquisitive offences.\textsuperscript{9,112}
Tong reported on the outcome of criminal psychopaths. They had been legally classified as psychopaths in the United Kingdom, and incarcerated between 1954 and 1961 at Rampton Hospital, a special close security psychiatric hospital that catered to offenders considered dangerous or to have violent propensities. Tong defined psychopathic behaviour as

> criminal behavior characterised by extreme callousness, brutality, disregard for others, on the one hand, and or criminal behavior which is not necessarily violent or serious, but is repeated over and over again.\(^{104}\)

The men were a mean age of 29 years at follow-up and had been incarcerated nearly 9 years. Among the 587 men, 171 (29%) relapsed, from which Tong concluded that the "prognosis is far from hopeless."\(^{105}\) Few admitted at later ages relapsed, and "Both age on discharge and length of stay in hospital correlated positively with success"\(^{105}\)—findings that are roughly similar to what Black et al reported in their follow-up study.

**Future Directions**

Several conclusions can be drawn from this review. The natural history of ASPD is better understood than other personality disorders because of the various case reports and longitudinal studies that have been conducted during the past 80 years. For most people, ASPD is a chronic disorder that begins in early childhood and continues throughout adulthood. ASPD is associated with co-occurring mental health and addictive disorders; mortality rates are high. While people with ASPD improve with advancing age, problems continue, though on a lesser scale, such as poor job performance and domestic problems. Improvement can occur at any age, but it most likely starts between the mid-30s and early 40s. Lastly, people with more severe syndromes at onset, appear to be the ones with the most severe ASPD at follow-up. We cannot predict outcome, but people with earlier onset tend to have a worse outcome, and moderating factors include marriage, family and community ties, early incarceration (or adjudication in childhood), and degree of socialization.

Researchers have much work to do. They need to determine the full extent of the disorder in various subpopulations and to determine the clinical picture in women, as well as their comparative course and outcome. A small percentage of people with ASPD appear not to have a history of CD, and researchers need to better characterize this subset. Outcome data are based on skewed samples. While it is clear that the disorder is chronic for most, we have little understanding of how or why some improve, while others do not. Nor do we know if any therapeutic interventions, or incarceration, change its course. Outcome predictors are important to study, including clinical and illness variables, and potential biomarkers. Lastly, we must focus attention on troubled children because of their great risk for developing ASPD.

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