Historical Overview
In the past most, if not all, emotional and behavioral disturbances in children and adolescents were considered to have events which affect psychological development or parenting problems or psychological conflicts as causes. The view that children come into the world as perfect beings who are then acted upon, influenced, and determined by interactions with their world has survived largely intact in many quarters since its origin as an attractive conjecture of 18th century philosophers. Recognition that physiological processes cause many emotional and behavioral problems in children has lagged behind parallel findings concerning adult mental illness. The biological model of child and adolescent emotional disorders is less well known or accepted by many with professional responsibility for the welfare of young people.

The concept of biological disorder causing or contributing to emotional and behavioral problems in youngsters seems to run counter to the ingrained teachings of our professional cultures and in some instances to threaten the conceptual frameworks and vested interests of non-medical professionals. But, just as widely accepted etiologic concepts long taught in other areas of medicine have given way over the years to new information, the burgeoning knowledge of neuroscience and the process of scientific inquiry have persuasively demonstrated that many emotional disorders have their roots in neurobiological problems, and that treatment with medication may be of substantial benefit in these instances.

The Mind Does Not Exist Apart From The Brain
Any assessment of a child or adolescent with a severe emotional disturbance cannot be complete without assessment for the known biological problems which may be at the core of the disruptions, whatever coexistent social, family, educational, and psychological dynamics may also be involved. Indeed, if a biological disorder exists and is left untreated, a central aspect of the multifaceted disturbance will continue to plague the individual, making all other efforts to help them substantially more apt to fail or be limited in impact. Conversely, with the biological disorder controlled by medications, other interventions are more likely to succeed, an integrated treatment approach then yielding better results for the child or adolescent.

A bright young man who once characterized these disorders to me as "physical-mental" was apt in his description. These are "physical" (biological, neurological, medical) problems which affect "mental" (emotional, behavioral, cognitive) functions. More and more of the "mental" disorders in persons of all ages are being shown to be "physical" in origin. The descriptive classifications previously employed are being found to encompass disorders of differing etiologies but with similar phenomenological (descriptive) appearance. We are also finding that previous descriptive classifications do not adequately characterize some disorders.

Genetics and Environment - Nature and Nurture
We now know that we come into this world with many elements of temperament, intelligence, and personality determined at least in part by our genes. There is evidence for substantial genetic influence upon such cognitive factors as intelligence as determined by IQ testing, verbal and spatial abilities, reading disability, and mild mental retardation as well as upon such personality factors as extraversion, neuroticism, emotionality, activity level, sociability, and even attitudes and beliefs such as the tendency to follow rules and authority. There are also genetic determinants for schizophrenia, affective illness (depression and bipolar disorders), juvenile delinquency, adult criminality, alcoholism, panic disorder, and somatization disorders (Plomin, 1989).

The discovery of subtle genetic differences between monozygotic ("identical") twins and of differences in intrauterine experience with respect to nutrition, oxygenation, infection and even drug and alcohol effects may strengthen genetic linkage studies by providing genetic and intrauterine explanations for differences which are noted between identical twins (Horgan 1990).
As the mysteries of the human genome are unraveled, we are finding more specific connections of mental disorders to genetic influences, some of which illustrate the limitations of our present descriptive diagnostic system, and the overlapping which is found between its categories. One genetic "balanced translocation" causes affected family members to have four times the average risk of schizophrenia, schizoaffective disorders, major depression, and adolescent conduct and emotional disorders (St. Clair, 1990). In another instance a single metabolic abnormality transmitted by an autosomal recessive gene has been described to cause mental disorders, appearing as early as 12 and 15 years of age, including "impulsive verbal and physical aggression," "difficulty controlling outbursts of temper," depression, psychosis, and "organic brain syndrome" (Gorman-Swift, 1990). Somewhere there must be common denominators or keys to such disparate presentations, but at present we can only do our best to categorize by observation and try logical treatment strategies.

The work of behavioral-genetic researchers has also served to highlight the fact that environmental influences affect complex behavior at least as much as genetic influences. The operant environmental factors are not only interpersonal, familial, educational, or social, however, as many assume when this nature/nurture discussion occurs. Environmental factors include such matters as intrauterine events, nutrition, infection, trauma, hormone levels, and even fluctuations of hormone levels (Jacklin, 1989). Environmental factors also encompass interpersonal and intrapsychic events, such as parenting, including the influence of parents' beliefs, differences in parental affection, and perhaps perceived differences in parental affection whether or not these perceptions are accurate (Jacklin, 1989).

It may not always be as straightforward as it appears to separate biological from cultural factors in analyzing human behavior, since these may be fundamentally intertwined. For example, that over eighty percent of mothers carry their infants-on their left hip is probably related to differential function of the left and right cerebral hemispheres. The mother's left field of view is reported to and interpreted by the right hemisphere, which is better equipped than the left hemisphere for recognition of facial characteristics, and emotional/non-verbal communication. This behavior is also found in chimpanzees and gorillas, our closest primate relatives, but not in the more primitive apes (Chamberlain, 1990). Is this culture or biology? Nurture or nature? These may be inseparable concepts in many instances.

There are also emerging lines of evidence which run counter to many of our traditional assumptions about "nurture." One is that the shared family environment has only slight impact, in the long term, on children growing up in the same family. Nonshared environmental influences appear to be much more important, siblings experiencing different environments within the same family. Others are concepts of gender schemas, subtle information processing differentials, the influence of the individuals with whom we interact upon our behavior, and the process of "self-socialization" (Jacklin, 1989). We are making progress in sorting out the nurture as well as the nature aspects of emotional disorders. For example, schizophrenia, which often is first manifest in late adolescence or early adulthood (Cumby, 1990) is known to have a necessary genetic vulnerability as a component of "cause," as well as an environmental event, perhaps viral infections (Mednick, 1988) or maternal extreme emotional distress or low blood pressure at a critical time in embryogenesis, as the environmental cofactor leading to abnormal fetal brain development underlying the eventual appearance of the illness we see in 1% of the general population but in 8% of the members of families with the genetic trait.

Many of the biological disorders which trouble adult mental health are also found in children and adolescents, often in familial patterns. The disorders tend to be manifest in spectra, with broad ranges of severity. Only the worst are "severe," with a considerable number of children and adolescents having disorders of less extreme impact, but with potential to respond to medical treatment. While this may be an upsetting concept to those who have imagined that simple perfection underlies the effects of the pernicious world on children, the fact is the new understanding affords opportunities to be of enormous help to emotionally disturbed children if these neurobiological disorder components are recognized, properly diagnosed, and adequately treated. Early intervention affords the promise of reducing the effects of these disorders on the lives and development of these children (McClellan, 1989) and of subsequent generations.

Prevalence

Estimates of the incidence and prevalence of these serious emotional disorders vary a good deal, in part reflecting different definitions applied in different populations. Approximately 12% of children and adolescents
have a psychiatric disorder (AMA; 1990) but all of these are not necessarily a severe emotional disturbance. Using a conservative criteria-referenced approach for definition of severe emotional disturbance, (SED), a carefully-done study in Washington State (Trupin, 1988) estimated the SED prevalence to be 6.7% of the public school population, grades K through 12. This involved 4.8% of girls and 8.9% of boys across grade levels, with 6% of children affected through 8th grade and 8.7% defined as SED in high school grades. This criteria-referenced approach was based on 5 descriptive (not diagnostic) variables, with scores statistically indistinguishable from those of a criterion group of children and adolescents drawn from the state’s most comprehensive, intensive, and expensive mental health treatment services. The five variables composing the SED score were: a mental health risk index, a chronicity index, a service need index, an Achenbach Child Behavior Checklist (CBCL) internalizing score, and an Achenbach CBCL externalizing score.

When certain subgroups of the child and adolescent population in Washington State were characterized, the prevalence of severe emotional disturbance was found to be much greater. It was 71% in Children and Family Services programs; 67% in child welfare programs; 76% in juvenile rehabilitation institutions, group homes, and parole programs; 54% in those with developmental disabilities; 83% in mental health programs; and 78% in special education programs. Thus it was demonstrated that a great proportion of children and adolescents in special education programs and in state custody for neglect, abuse, or unmanageability were found to have a serious emotional disturbance.

A number of such children may, with proper medical assessment, be found to have neurobiological disorders, some of which might be substantially helped with medication. Without medication many of the disorders will not improve, limiting the possible effects of the best efforts of counselors, educators, parents, social workers, and legal authorities who undertake to help these youngsters.

There is no doubt that family dynamics and socioeconomic status are correlates of some of these disorders. The extent to which the same biological disorders in multiple generations have affected or determined these correlates is not yet well studied. Most of these disorders have strong familial transmission, and may affect generation after generation of family members. For example affective disorders are twice as prevalent and schizophrenia is eight times as common in lower socioeconomic classes as in the higher socioeconomic groups (Gunby, 1990).

The relationship of socioeconomic status to these disorders may not be a simple matter of cause and effect however. There are likely to be complex and reciprocal influences. Socioeconomic status may be determined in part by the debilitating effects of mental illness, rather than the illness being caused by the situational problems or deprivation reflected in lower socioeconomic status. Cause and effect here are difficult to separate.

Those of us who practice clinical medicine as Family Physicians certainly see multiple generations of family members suffering depression, bipolar disorder or anxiety disorders, with substantial effects on family stability and interactions and on educational and socioeconomic success. So it comes as little surprise that 60% of the Washington SED children were from the lower socioeconomic class (determined by educational level of the head of household). But 40% were from upper middle and working class homes. One third of the SED children had a recognized age of onset of their disorder(s) before the age of 6 years old. Drug or alcohol abuse problems were related to SED status in 30% of the Washington sample. Two thirds had a family history of drug or alcohol abuse. Almost 30% had a known family history of mental illness. Only 6% of the SED children were receiving specific mental health services.

The situation in Washington State is not an aberration. That there are many SED children, (Anonymous, 1991) particularly concentrated in state human services program clientele (Anonymous, 1990), that these children go largely unrecognized as having potentially treatable disorders, medical or otherwise, and that most of them are not receiving mental health services is the case in many locations (Anonymous, 1990). This includes Vermont, where it is conservatively estimated that only one fifth of the most severely emotionally disturbed young people are receiving mental health services (Vermont, 1990).

Impact

A number of social problems of the larger society are intimately related to the neurobiological disorders we are discussing. A number of these disorders may be first evident in childhood or adolescence and tend to
Persist into adulthood if left untreated. Additional members of the affected cohort first come to attention in young adulthood.

The affective disorders disrupt personality growth, interrupt development tasks, and delay maturation (Biederman, 1985), interfering with progression toward adulthood. Also, these disorders, particularly in boys, are associated with violence and with inappropriate assertion of independence when in fact the young person is less capable than his peers of functioning independently because of his disorder and its detrimental effects on education, interpersonal relationships, and self-control (Miller, 1989). Even subtle precursors of some affective disorders cause serious disruption of the lives of affected young people (Akiskal, 1985).

There are other effects of affective disorders which are worth noting. If the mind does not exist apart from the brain, we must remember that the reverse is also true—these brain disorders have direct and less direct effects on "mind", causing distortions of self-concepts, state dependent alterations in perceptions of life events, and dysfunctional attitudes which diminish as depression resolves. Apparent personality, characterologic, or temperamental characteristics of individuals may result from the more subtle manifestations of, or milder variants of, affective disorders (Akiskal, 1984; Akiskal, 1985).

In children and adolescents, these disorders are signified by problems in the home, in school, and with community authorities (Biederman, 1985). Adolescent mood disorders are highly correlated with risk-taking behaviors, drug and alcohol abuse, and cigarette smoking (Buizstein, 1989; DeMello, 1989). The use of LSD and ef-cocaine have been shown to induce permanent epilepsy-like changes in brain function and may increase the severity of affective disorders described later in this publication (Bear, 1987; Post, 1982).

Persons with untreated neurobiological disorders have potential not only for having disrupted educations, personal/lives, and employment as they grow older, but also increased chances of substance abuse, alcoholism, criminal activity, psychosis, and suicide. The prison population of Quebec, perhaps the best studied in North America, contains at least twice the population rate of depressives, at least four times the expected prevalence of manic-depressives; and several times the population rate of schizophrenics (Hodgins, 1990). The neuropsychological deficits sometimes associated with neurobehavioral disorders are highly correlated with antisocial behavior and delinquency (Moffitt, 1990).

Clearly the early identification and proper management and treatment of SED children and adolescents has major implications for the future of these individuals and potential impact on the society at large.

Lack of Care

Complicating the picture is a substantial shortage of child and adolescent psychiatrists, with training programs under-enrolled and difficulty finding teaching faculty and qualified trainees in this discipline (Beresin, 1989). A 45% undersupply of child psychiatrists by 1990 was projected by the Graduate Medical Education National Advisory Committee (GMENAC, 1980). This takes into account presently known demand, not the many unrecognized and undiagnosed children and adolescents highlighted in samplings such as the Washington State study.

This marked shortage of well-trained experts, which is more a problem in rural areas (AMA, 1990), requires that those in other fields, such as psychology, become better able to recognize the possible existence of these disorders and take part in evaluations for these "physical-mental" problems. Especially pediatricians, family physicians, and general psychiatrists need to become better versed in the evaluation of youngsters with SED. These physicians should be undertaking the diagnosis and treatment of those who prove to have more clear-cut disorders or straightforward presentations and handling the management of medications. This will free the very limited number of more expert child and adolescent psychiatrists for performing evaluations of those with more complicated disorders or confusing presentations.

Assessment

Evaluations of children and adolescents are often not systematic with respect to medical disorders, much less well integrated with the work of other disciplines. This is particularly so in situations which involve poor understanding and acceptance of the "medical model" and of the use of medications by psychologists and social workers. Additionally, much of the medical community does not have up-to-date knowledge concerning these disorders. SED children and adolescents; their families, and the individuals and agencies which attempt to help
them face an uphill battle in finding competent care. The problem is made even more difficult by lack of resources in the families and agencies involved to pay for assessments.

As in other areas of medicine and psychiatry, cases vary in complexity and in the ease with which a reasonably certain diagnosis can be made. Some disorders, particularly the more straightforward instances of depression, bipolar disorders in families with known bipolar illness, panic disorder, and neurobehavioral disorders with reasonably typical presentations, can be adequately sorted out in a primary care office setting by an interested physician. The physician may ask for consultation if it appears necessary, but could be comfortable diagnosing and treating the more straightforward cases.

In other situations there may be a good deal of diagnostic confusion, particularly if the disturbance is unusually severe, atypical, complex, multifactorial, or disruptive. Such situations require more detailed and systematic assessments as outlined in the following chapters. These may at times have to be undertaken in inpatient facilities; especially if the young person must be contained to prevent self-injury, drug and alcohol abuse, or running away or if a longer interval of close observation is needed. Others may be handled at a series of outpatient evaluation visits.

All too often such assessments are entirely unavailable or, when undertaken, are not systematic and thorough, or are left in the hands of resident physicians still in training with only perfunctory participation by experienced attending physicians. The accuracy of diagnosis in such situations is compromised, compounding the problem of difficulty in reaching reliable diagnosis in this age group (Vitiello, 1990).

Parents and others involved in seeking help for these young people must insist that adequate assessment is performed and that the most experienced physicians be intimately involved in the process, from initial interviews to follow-up visits and trials of medications, if recommended.

Parents must also be full participants and partners in the evaluation process, providing essential information; and, as the evaluation concludes, learning all they can be taught concerning any illness their child may have. In this regard psychiatric illness should be approached no differently than other illness. Often clinicians exclude the parents, fail to inform them, or blame them for the child's status (Castaneda, 1989; Appleton, 1974) adding to stressed family dynamics, increasing parental anguish, and undermining the child's essential primary relationship with his parents. An approach empowering parents of adolescents hospitalized for diagnosis and treatment by restoring parental authority not only restores family structure but also sharply reduces length of hospitalization (Byslin, 1990).

While lay persons may be impressed by the technology available to physicians - and while CT scans, EEGs and blood tests certainly have their place in thorough neurobiological assessment - often neither these nor physical exams yield much diagnostic information. The "paydirt" of such assessments is from thorough semistructured interviews. Diagnoses are more likely to be inaccurate if unstructured interviews are utilized and are most likely to be inaccurate if the child or adolescent is the only party interviewed. Information from parents is the best single source for diagnostic accuracy, while semistructured interviewing of the young person and of the parents provides greatest accuracy (Vitiello, 1990).

Other than neurobiological/psychiatric assessment, a good medical evaluation should include a general health history and physical examination, screening for neurological problems which may present as emotional disorders (for example, tumors, cysts, subacute encephalitis, Tourette's Syndrome or epilepsy) and consideration of drug and alcohol abuse, teen pregnancy, sexually transmitted disease, child abuse or neglect and sexual abuse, all of which are of no small importance in the care of children and adolescents, particularly those with emotional disturbances. But any medical evaluation of a youngster with SED, if confined to a "physical," ruling out confusing medical conditions, or the use of technology, is baldly inadequate without informed diagnostic interviewing for the treatable medical conditions which may cause serious emotional disturbances.

This is not a simple process of open-ended unstructured interviewing. Excessive irritability and overly aggressive behavior, for example, may be seen in depression, in bipolar disorders, or in neurobehavioral disorders as well as in what are labeled conduct disorders. Rages or furors can occur in bipolar (manic) illness and in temporolimbic epilepsy. Depression is cross referenced with 26 other diagnoses in DSM III. Well organized seeking of information from multiple sources, with a contingency of trials of medications, which may clarify a diagnosis, is the cornerstone of good assessments.

Finally, neuropsychological testing - not to be confused with psychological testing or psychoeducational
testing - is of enormous value as a component of assessment because it can pinpoint problems in neurological functioning which may affect school performance, behavioral control, understanding of instructions, memory functions, and so on. Very often the treatable medical condition(s) which SBD children and adolescents have are accompanied by "neuropsych" deficits, sometimes subtle but often of substantial importance. These will not be "fixed" by medication, but must be taken into account by parents, teachers, counselors and the child or adolescent.

Physicians who can't screen for depressive or anxiety disorders, bipolar conditions, temporal-limbic epilepsy, and other common neuropsychiatric diseases are performing an incomplete medical evaluation and should refer for this essential component of the assessment. Similarly, only a neuropsychologist is best able to perform and interpret the neuropsychological evaluation. This referral, which indeed is for assessment of biological functions or brain-behavior relationships, is usually set up by the physician.

When the medical assessment - medical history, physical exam, lab tests, imaging, EEG, semi-structured interview, neuropsych testing, and possible medication trials - is "completed," many, but by no means all, children and adolescents with severe emotional disturbance will prove to have one or more definable neurobiological conditions or illness. This illness may be a predominant determinant of their difficulties, but it is often an important component of a multifaceted problem which challenges the diagnostic and therapeutic skill of the various disciplines attempting to help the youngster.

Three of the more common and more disruptive groups of these neurobiological illnesses are depressive disorders, bipolar conditions, and neurobehavioral disorders. These are covered in some detail in chapters which follow in this section of this publication, so are only introduced here. These three groups of illnesses by no means constitute all of the "physical-mental" disorders with which we must be concerned. However, there are amongst the more common and sometimes most disabling disorders and all of these have effective medical treatments available.

**Depressive Disorders**

Depressive disorders major depression and dysthymia, its milder but more chronic manifestation are common disorders of mood which have high familial/genetic determination and affect children, including preschool children (Puig-Antich 1989), and, at increasing rates with increasing age, adolescents (Kashani, 1987). There appears to be an inherited biological vulnerability to these disorders, with life events or stresses also playing an interactive etiologic role in some cases. In other instances biology appears to predominate, depression occurring despite all life and psychological events going well. In other cases depression occurs without an apparent family history of depression. These disorders are increasing in prevalence and occurring at younger ages as each cohort of the population is examined (Klerman, 1989), a rate of increase which cannot be accounted for by genetic changes and therefore must be due to environmental influences.

Depressive disorders affect 4.3% of school age children (1.8% major, 2.5% dysthymia) (Kashani, 1983), and 8% of adolescents (4.7 major, 3.3% dysthymia) (Kashani, 1987). Recognizing depressive disorder can be difficult since its first symptoms are often educational and behavioral, rather than explicitly psychological. Also, conduct, oppositional, and anxiety disorders (Kashani, 1985; Kashani, 1987; Puig-Antich, 1989), withdrawal, antisocial acts in adolescent boys, aggressive behavior, irritability and anger (Kashani, 1985; Kashani, 1986) drug and alcohol abuse, and other risk taking behaviors often co-occur (Gilles, 1985; Kaplan 1984) and may obscure the depression. In addition, the suicide rate among young people has increased progressively. It had become two and one half times the 1960 rate by 1980 (Alper, 1986). A child or adolescent suicide is attempted every 90 seconds and one succeeds every 90 minutes in our country (Emergency Medicine, 1985).

Depression is associated with all measures of social maladjustment and frequently follows a course, if untreated, of recurrence, persistence, and chronicity with "accumulating widespread functional and psychosocial deficits" (Ryan, 1985). Early intervention is important. Medical treatment, guided by serum levels of medications, is an important component of therapy. Counseling has not been demonstrated to be effective in serious depressions but may become useful once concentration, motivation and vegetative symptoms have been helped with medication. The goals of psychotherapy are to help self esteem deficits, interpersonal relationships and social skills.
Given the increasing prevalence of, and the morbidity and mortality associated with, mood disorders, everyone who deals with children and adolescents needs to become familiar with the manifestations of depression and know how and where to route young people for medical help.

Bipolar Spectrum Disorders

Bipolar illnesses are the less common but often the more disruptive of the "mood" (affective) disorders. These vary from those with the most severe mood swings, affecting roughly 1.5% of the population, through a spectrum of less intense, but often more chronic, mood instability affecting perhaps 3 or 4% of the population (Akiskal, 1983). A substantial number, perhaps as many as 30%, of those who are eventually diagnosed with the severe form begin in bipolar illness in later childhood or early adolescence (Keller, 1987; Lorringer, 1978), sometimes with features which may lead to confusion with conduct disorder, attention-deficit disorder or borderline personality disorder (Kovacs, 1988; Keller, 1987). Most of the milder forms begin in adolescence or young adulthood (Akiskal, 1985), and may cause serious disruption of their victims' lives. There have even been rare reports of prepubertal children with bipolar disorders (Varanka, 1988).

There appears to be a strong genetic component to bipolar disorders (Rice, 1987). Parents, siblings, and offspring of individuals with bipolar disorders have up to 24 times the 1.5% to 3% lifetime risk of the general population. The spectrum of severity tapers off into milder forms which are easily confused as temperamental or characterological problems (Akiskal, 1979) but may develop into increasingly severe forms over time. (Ryan, 1985) The age of onset in bipolar illness is accelerating with birth cohort and the cohort effect of increasing prevalence in more recent cohorts, as also seen in depression, has been demonstrated (Rice, 1987). We will probably see more and more of both disorders, and at earlier ages.

Mild episodes of depression or hypomania are often unrecognized, particularly in adolescence, when adults tend to wrongly attribute turmoil to "normal" developmental events (Gallemore, 1972; Ryan, 1986) or conflicts with family or friends, though there is no indication that 25% of adolescents have such problems (Offer, 1989) and defiant, alienated, or provocative behaviors have a lower prevalence in the general adolescent population (Kaplan, 1984-A). Early intervention is important because inadequately treated or unrecognized episodes seriously disrupt social, educational and vocational adjustment. Misdagnosis is also common because mixed and rapidly cycling bipolar conditions (Ryan, 1986) are quite often seen in young adults and may be confusing to clinicians as well as being more difficult to treat (Himmelhoch, 1986).

At the milder end of the spectrum, but likely to accelerate over time to progressively more severe mood swings, the hypomanic or cyclothymic (Akiskal, 1984) disorders may result in haughty, cold, condescending comportment, recklessness, irritability, or marked displeasure at being thwarted. Adolescents exhibiting such traits are easily dismissed as narcissistic (Fisman, 1985), conduct disordered, or oppositional (Hsu, 1986). Drug and alcohol abuse may further confuse the picture.

Neurobehavioral Disorders

Before the advent of effective medications for epilepsy, psychiatrists took care of epileptics and observed their behavior patterns. It was well recognized that, other than motor seizures, some epilepsies suffer a variety of problems, which might include rapid shifts of intense mood, brief states of diminished awareness or memory lapses, schizophrenia-like psychosis, sensory alterations or intervals of unusual thinking or behavior (Bennett, 1987; Podley, 1986). It was also known that there might be no overt "seizures," only subtle seizures, or very infrequent seizures while the other symptomatology continued, often in an again-off again fashion, or in subtle form (Monroe, 1982).

This knowledge seemed to be largely lost in the decades after effective medication for grand mal epilepsy was developed, and epilepsy became a treatable disorder in the hands of neurologists. The psychiatric disorders related to epilepsy have fallen in a borderland between specialties and have only recently again received due attention.

It is estimated that about one million people in the United States have epilepsy-related disorders misdiagnosed as psychiatric disorders (Blumer, 1989). Also, great numbers are not diagnosed or in medical care at all. Temporal-lobe epilepsy per se affects about one percent of the population, while the temporolimbic disorders of more attenuated form, or without known discreet seizures, are thought to affect perhaps another...
percent or so of the population. In addition, roughly 70% of grand mal (generalized motor) seizures are thought to originate in the temporal lobes and those individuals with grand mal epilepsy often have neurobehavioral disorders not adequately controlled by the traditional medications which control motor seizures.

These disorders can imitate, or coexist with virtually all the "functional" psychiatric disorders (Himmelhoch, 1986; Siem, 1984): These disorders may coexist with or imitate other psychiatric disorders and are often found in individuals with normal scalp electroencephalograms, even in the midst of abnormal electrical activity in the individual's brain (Bennett, 1987; Blumer, 1989; Pincus, 1985; Monroe, 1982; Devinsky, 1988; 1989; 1989; Gloor, 1982; Wieser, 1985; McKenna, 1985). Other epileptic individuals have diffuse EEG slowing (Theodore, 1983; Moody, 1988) sometimes induced by hyperventilation (Lee, 1988). Epileptics commit suicide at rates 5 times the average rate for the population. Temporal lobe epileptics are at 25 times the average risk for suicide (Blumer, 1985). Intervals of intense depression, impulsive behavior, and intense rage sometimes seen in those suffering these disorders may account for these unfortunate statistics.

We will be seeing even more of these disorders, which have a substantial familial agglomeration (Ottman, 1989) but may also be environmentally-induced. Even subtle head injuries, such as those from auto and motorcycle accidents and contact sports, are most likely to injure the limbic structures of the temporal and frontal lobes, which in normals have the lowest threshold for spontaneous discharge (Stevenson, 1987). Cocaine and similar drugs can "kindle" temporal lobar electrical malfunctions in animals (Post, 1982) and may induce permanent epilepsy-type changes in individuals who appear to have been entirely normal prior to drug use (Bear, 1988).

Other Neurobiological Disorders

In addition to the disorders discussed in the chapters of this section, it is important that the reader understand that many other serious emotional disturbances of children and adolescents may have biologic roots and respond, at times remarkably well, to medications. The current diagnostic nosology is largely descriptive and has "limited etiologic or prognostic validity" (Quay, 1986). "Many SBD children and adolescents qualify for several of these descriptive diagnosis." Fitting their disorder to a biological hypothesis and making trials of medication may afford these youngsters their only chance of controlling these disorders. For example, treatment-resistant aggressive children described as having conduct disorder may respond to medications originally found useful for manic depressive illness (Carroll, 1987; Sargent, 1989).

Panic attacks can occur prepubertally and are described by 11% of 9th graders (currently or in the past) (Hayward, 1989). This anxiety disorder has substantial overlap with depression (Moreau, 1989) and in full-fledged form affects 2-5% of the general population, with a specific defect in the parahippocampal gyrus (a brain structure in the temporal lobe) described as a correlate (Reiman, 1984).

Obsessive compulsive disorder, affecting about 2% of the general population, does occur in children and adolescents (Rappaport, 1987). It is thought to be related to a defect in the caudate nucleus of the brain (Luxenberg, 1988) and will respond to certain medications. Adolescents with the diagnosis of narcissistic personality disorder often prove to have instead a variant of cyclothymia (in the bipolar spectrum) in which they are more often than not "up" in mood (Fisman, 1985). They respond to bipolar medications such as lithium, and, untreated, may progress to full-fledged, more severe bipolar illness as they grow older (Akiskal, 1983). Some children who meet descriptive criteria for "oppositional defiant disorder" are much improved when treated with antiepileptic medications (Hsu, 1986) and/or lithium, as are some children with "Intermittent Explosive Disorder" (Monroe 1982 A). Anxiety disorders other than panic disorders are also caused at least in part by genetic influences and may appear in children and adolescents in varying degrees of severity (Bernstein, 1989; Kashani 1990). Seasonal affective disorder, with mood determined by changes in environmental light, has been reported in both children and adolescents (Roseenthal, 1986). Even antisocial behavior has been shown to involve genetic vulnerability, potentiated by environmental factors (Crowe, 1974).

Another section of this publication includes discussion of "attention deficit hyperactivity disorder" (ADHD), which affects 3-5% of school age children (Greenhall, 1990). ADHD is a heterogeneous disorder of unknown etiology. It is not necessarily in and of itself a "serious emotional disturbance," but it involves, in about 60% of instances, another coexistent psychiatric disorder, roughly one third of which are major affective (mood) disorders (Biederman, 1987). It is also often the first diagnosis made in children who later turn out to
have neurobehavioral disorders. ADHD appears to be inherited in certain families (Biederman, 1986) and has been demonstrated to involve reduced glucose metabolism in many brain areas, with greatest reduction in prefrontal cortex and superior prefrontal cortex areas involved in the control of motor activity and attention (Zametkin, 1990). The disorder involves the inability to sustain attention normally and excessive motor restlessness, distractibility and impulsiveness. Children with ADHD perform at lower levels than unaffected children on cognitive tasks testing higher, cortical functions and about 25% have specific learning disabilities (Biederman, 1991).

Other than the high rate of coexistent depression seen in ADHD, about 40% of those affected with ADHD also meet descriptive criteria for conduct disorder (starting fights, lying, stealing) or oppositional disorder (disobedience, defiance, rule breaking). Thirty to sixty percent of those with ADHD continue to have symptoms of the disorder into adulthood (Weiss, 1990; Zametkin, 1990). Persisting ADHD correlates with increased risk of antisocial behavior and drug abuse (Glattman, 1989; Weiss, 1985).

There are also a number of illnesses traditionally considered "medical" which are apt to appear in childhood or adolescence with psychological symptoms. Examples are Wilson's disease, a familial disorder in which excessive copper is absorbed from the diet (Woods, 1989), and Tourette Syndrome, a familial neurological disorder with co-morbid obsessive-compulsive, anxiety, and phobic disorders as well as associated attention deficit and specific learning disorders (Singer, 1991).

Medications

Finally, a word about medications. There are a number of points which those not familiar with the benefits of medications in this realm ought to understand.

The first point is that there is no evidence that "child psychotherapy as generally practiced" is "very effective in treating the depressive symptomatology or any other aspect of the child's psychopathology so long as he is severely depressed" (Paig-Antich, 1984). There is no study which has shown psychotherapy helps childhood or adolescent depression (Carlson, 1989). There is good evidence that medications are of great help to a substantial proportion of depressed children and adolescents (Campbell, 1983) and this is the case without respect to the apparent etiology of their depression (McDaniel, 1986).

The second is that one harms these young people if they are not given the opportunity to benefit from medications, since without them the ravages of these disorders in their young lives will continue unabated or return in cycles, often of increasing severity and duration (Carlson, 1989).

The third is that these medications have minimal side effects and small risks, while benefiting only those who need them. Their use in situations for which medications are not effective and helpful does not result in therapeutic effect (Greenberg, 1989).

And finally, a fourth point is that one may—in fact, ought to—approach the use of medication as a trial of medication, if possible in a collaborative fashion with the child or adolescent and their family as well as their teacher(s) and counselors. Trying various medications may be necessary to find that which is most helpful. Medications failing to provide substantial benefit are discontinued (Greenberg, 1989). Medications in use must also be reevaluated periodically. Dosage adjustments may be required as youngsters grow. Also a trial off of medications is often warranted after an interval, for example in anxiety or depressive disorders.

Knowing that one should employ a particular medication, or even that trials of medication(s) may be necessary to clarify a diagnosis, is often easier than actually getting the medication into use, even when its potential benefits may be considerable.

A substantial barrier is often resistance from well intended but poorly informed adults who may equate all medications with major tranquilizers such as Thorazine, who don't understand the essential biological nature of some emotional disturbances in young people, or who feel that using medication "controls" or "drugs" children. These individuals are often case workers, counselors, or the divorced parent who have only occasional contact with the young person and don't participate in the understanding that involved parents achieve through constant long term contact with their child and through conversations with prescribing physicians.

Teachers, in my experience, who have six or eight hours a day of in school contact with these youngsters and parents, with their lifetime exposure to the child, often recognize that there is something organically wrong or are willing to try any promising avenue to help these kids feel, learn, and behave more normally. Parents
in particular are often much relieved to understand that their parenting isn’t at fault, that they are often doing remarkably well in very difficult circumstances, and that there are potential improvements available through the use of therapeutic medications.

The second barrier to the use of these often remarkably beneficial medications is resistance from the teenager him or herself. Not fully grasping the nature of their medical disorder, these young people often feel taking a medication involves loss of control or autonomy or admitting there is something wrong with me. Alternatively, they may wish to “try to control this myself.” It occasionally happens, in fact, that teenagers who have taken and clearly benefited from medication prematurely discontinue the medication on their own, again wishing “not to have to need” medication. Others, though, seeing the disorder, destruction and distress these illnesses can cause, are equally as emphatic about not being without their medication.

If one can get beyond the resistance of the uninformed and the desire of adolescents to have nothing wrong with themselves and not to submit to “control,” trials of medications are relatively simple. Medication trials often clarify the biological diagnosis and usually involve few side effects, though some may be needed to get through trials of several agents if this proves necessary. Careful explanation of potential benefits, of the expected time course of medication effects and of possible side effects, as well as availability for questions and concerns which may later arise, are necessary components of this area of medical therapy, as with all others. Serum levels allow precision in the use of many of these agents and serious adverse effects are extremely rare.

Medications are not, however, magical potions. They don’t address all of the problems of seriously emotionally disturbed children and adolescents, even when the medication may prove to be of substantial benefit for a clearly defined disorder. There are no effective medications for some disorders. Some SED children have multiple problems, both biological—for example, a mood disorder and substantial neuropsychological deficits—and psychosocial.

Some SED children’s families are seriously troubled, with multiple members affected by multiple problems, including alcohol or drug abuse, psychiatric disorders, and poor socioeconomic status. We do not have medications which are effective in enhancing cognitive limitations or improving social skills. Even in families with no obvious problems there may be considerable need for counseling to reconstruct disrupted family relationships and help parents with limit setting after a child or adolescent responds to appropriate medications.

Similarly, neuropsychological deficits, specific learning disorders, the psychological effects of physical or sexual abuse, the consequences of maternal drug use in pregnancy, many aspects of the Fetal Alcohol Syndrome, and many of the effects of traumatic injury to the brain’s structure are beyond the reach of presently available medications. There is a great need for continuing research to better understand neurological development, to devise new and improved medications, and to better understand the utility of medications for the various disorders which affect emotionally disturbed children and adolescents.

So, while medications at times do work wonders, particularly when there is a relatively discrete disorder which is found and attended to promptly, often medications are but an important component of a multifaceted treatment approach also involving important counselling, educational, and social work efforts.

Summary

Clearly, we are at a watershed of redefining many of the disorders which may adversely affect the mood, behavior, and cognition of children and adolescents. We also have better understanding of the secondary adverse affects of these disorders on self concepts, social skills, educational attainment, interpersonal relationships, employability, risk-taking behavior, and even criminal activity. At the same time, we now know a great deal more about identifying and helping those who suffer bipolar disorders and depression, as well as the less well known but prevalent neurobehavioral or epilepsy-related disorders of brain function.

No one working with children and adolescents in human services fields, such as SRS and special education, or in clinical fields, such as counseling, psychology, and medicine, should be without a thorough familiarity with the concepts involved and the potential benefits available to these youngsters through proper medical diagnosis and treatment.
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References


