Practice Parameters for the Assessment and Treatment of Children and Adolescents With Schizophrenia

ABSTRACT

These practice parameters review the literature on children and adolescents with schizophrenia. Because this literature is sparse, information is also drawn from research with adults. Clinical features in youth with schizophrenia include predominance in males, high rate of premorbid abnormalities, increased family history of schizophrenia, and often poor outcome. Diagnostic issues include the overlap, and therefore potential for misdiagnosis, between the first presenting symptoms of schizophrenia and those of psychotic mood disorders, developmental disorders, organic conditions, and other nonpsychotic emotional/behavioral disorders. Treatment should include using antipsychotic medications in conjunction with psychoeducational, psychotherapeutic, and social and educational support programs. These parameters were previously published in J. Am. Acad. Child Adolesc. Psychiatry, 1994, 33:616–635. J. Am. Acad. Child Adolesc. Psychiatry, 1997, 36(10 Supplement):177S–193S. Key Words: schizophrenia, children, adolescents, psychosis, practice parameters, guidelines.

In keeping with the requirement that practice parameters be developed by experienced clinicians and researchers, some of the contributors to these practice parameters are in active clinical practice. Through their practices, it is likely that most of these child and adolescent psychiatrists have received income related to treatments discussed in these parameters. Some contributors are primarily involved in research or other academic endeavors; it is possible that through such activities, many of them have also received income related to treatments discussed in these parameters. A number of mechanisms are in place to minimize the potential for producing biased recommendations due to conflicts of interest. First, the development process calls for extensive review of the document before it is finalized. All members of the Academy have the opportunity to comment on the parameters before they are approved. Comments have been solicited and received from a broad group of reviewers from child and adolescent psychiatry. Second, the contributors and reviewers have all been asked to base their recommendations on an objective evaluation of the available evidence. Third, we ask that any contributor or reviewer who believes that he or she has a conflict of interest that may bias or appear to bias his or her work should notify the Academy.

Psychiatrically impaired children and adolescents have significant disruptions in their emotional, cognitive, physical, and/or behavioral functioning. Child and adolescent psychiatrists evaluate such youth in the context of their families, schools, communities, and cultures and develop treatment plans to address the identified symptoms with their associated impairments in developmental functioning. The physician must prioritize symptoms and diagnoses so that a reasonable treatment plan will address multiple problems. Many children and adolescents have comorbid disorders that span several DSM categories. Therefore, the physician in an individual situation should consider, but not be limited to, the treatment guidelines for a single diagnosis.

Practice parameters are strategies for patient management, developed to assist physicians in clinical decision-making. These practice parameters, based on a thorough evaluation of the scientific literature and relevant clinical experience, describe a range of generally acceptable approaches to diagnose or treat specific illnesses or conditions. These practice parameters attempt to define principles of practice that should generally meet the needs of most patients in most circumstances. However, these practice parameters should not be construed as rules nor should they be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed at obtaining the appropriate results. It is anticipated that it will be necessary to approach some patients' (and families') needs in different ways. The ultimate judgment regarding the care of a particular patient must be

These parameters were developed by Jon McClellan, M.D., and John S. Werry, M.D., principal authors, and the Work Group on Quality Issues: William Ayer, M.D., Chair; Members: Elisa Benedek, M.D., Gail A. Bernstein, M.D., Eta Bryant, M.D., Richard L. Gross, M.D., Steven Jaffé, M.D., Robert King, M.D., Henriette Leonard, M.D., William Licamele, M.D., Jon McClellan, M.D., and Katie Shaw, M.D. AACAP Staff: Mary Steppich, and Amy Sonne. A draft of these parameters was distributed to the entire American Academy of Child and Adolescent Psychiatry membership for comments. The parameters were approved by the AACAP Council on January 14, 1994. They were also peer reviewed and accepted as a Special Article by the Journal of the American Academy of Child and Adolescent Psychiatry. Developed with partial funding from the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.

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made by the physician in light of all the circumstances presented by the patient and his or her family, the diagnostic and treatment options available, and available resources.

These practice parameters are not intended to define or serve as the standard of medical care. Standards of medical care are determined on the basis of all of the facts or circumstances involved in an individual case and are subject to change as scientific knowledge and technology advance and practice patterns evolve. These practice parameters reflect the current state of knowledge at the time of publication. Given the inevitable changes in the state of scientific information and technology, periodic revisions will be developed as appropriate.

These parameters of practice were approved as of the date indicated, and they should not be applied to clinical situations occurring before that date.

Literature Review Process

The literature review involved a National Library of Medicine search of the following topics: adolescents and schizophrenia (94 articles) and childhood and schizophrenia (132 articles). The search covered a 5-year period ending in March 1993. The abstracts generated from this research were reviewed, and those papers relevant to early-onset schizophrenia were then reviewed in more detail. Pertinent papers published before this 5-year period were also reviewed, as were review articles addressing the current state of knowledge in the diagnosis and treatment of adult-onset schizophrenia. Finally, the authors drew from their own work in this area.

This literature review was then incorporated into the initial drafts of this manuscript, which was distributed to a panel of experts. The experts who commented on this draft were David Berland, M.D., Rochelle Caplan, M.D., Carlo P. DeAntonio, M.D., Marty Drell, M.D., Mina Dulcan, M.D., Barbara Fish, M.D., Bernard Friedberg, M.D., P.A., Stanley Greenspan, M.D., Kim J. Masters, M.D., Renuka N. Patel, M.D., Theodore A. Petti, M.D., M.P.H., Robert Racusin, M.D., George Realmuto, M.D., Peter Tanguay, M.D., Fred R. Volkmar, M.D., and Deborah Zarin, M.D. Their comments were incorporated into the manuscript, including additions and clarifications of the literature review.

Since the initial literature search, newly published papers have been reviewed and added to the document. A subsequent literature search was conducted in December 1993 to update the manuscript with any recently published articles. Those articles that were used most frequently are noted by an asterisk in the reference section.

CHILD AND ADOLESCENT (EARLY-ONSET) SCHIZOPHRENIA

Although schizophrenia rarely occurs in children, its incidence increases steadily during adolescence. Effective treatment requires a knowledge of the disorder, its diagnosis, symptomatology, and course, plus an understanding of the youth's developmental, social, educational, and psychological needs. Child and adolescent psychiatrists must therefore know how to diagnose and treat patients with early-onset schizophrenia. Treatment strategies need to focus on the clinical symptoms and morbidity of the disorder while also addressing any comorbid disorders and/or biopsychosocial stressors. Such strategies must be developed with recognition of the developmental, social, and cultural aspects of the youth and his or her family. This review is divided into two parts, the first about schizophrenia and the second about its pharmacotherapy and supportive interventions.

SCHIZOPHRENIA: DIAGNOSIS AND CHARACTERISTICS

Historical Review

Childhood schizophrenia was initially believed to be similar to the adult form of the disorder and distinct from autism and pervasive developmental disorders (Werry, 1979). However, beginning with the works of Bender, Kanner, and others (Fish and Rirvo, 1979), childhood schizophrenia was considered to fall under the broader category of childhood psychoses. This cluster of syndromes (which also included infantile autism) was defined by developmental lags in the maturation of language, perception, and motility (Fish and Rirvo, 1979). While psychotic speech and thought were considered inherent components of childhood schizophrenia, hallucinations and delusions were not required criteria (Fish and Rirvo, 1979). DSM-II adopted this nosology by grouping all childhood psychoses under childhood schizophrenia. As a result, the literature from this period regarding childhood schizophrenia overlaps with that of autism and other psychotic disorders. The work of Kolvin (1971) and others demonstrated the distinctiveness of the various childhood psychoses and the similarity between child and adult schizophrenia. Therefore, beginning with DSM-III (American Psychiatric Association, 1980), the diagnosis of schizophrenia in childhood has been made using the same criteria as for adults, regardless of age of onset. Research since the advent of DSM-III has generally validated this decision (Beitchman, 1985; Werry, 1992).

Because of these conceptual shifts, there are only a small number of studies available that have adequately distinguished childhood schizophrenia from autism. Methodological problems exist even in those studies that have used appropriate diagnostic criteria. Most have focused on childhood onset, rather than onset in early adolescence, even though the former is rare. Other methodological difficulties include the use of retrospective designs, a lack of standardized...
assessment tools such as diagnostic interviews, small subject pools, and lack of comparison groups (Werry, 1992). Treatment studies are particularly lacking. However, despite these limitations, there are enough data to draw some reasonable conclusions regarding the diagnosis and treatment of schizophrenia in youth. The available data also suggest that the research on adults can be reasonably extrapolated to children with appropriate developmental adjustments.

It has become customary to refer to schizophrenia in children younger than 13 years of age as "prepubertal," but such a term is inappropriate because puberty is not set by age but by physical development. To avoid ambiguity, we will define early-onset schizophrenia (EOS) as onset before 18 years of age, with a subgroup of very-early-onset schizophrenia (VEOS) with onset before 13 years of age.

**Diagnosis**

The diagnostic criteria for schizophrenia are outlined in the DSM-IV (American Psychiatric Association, 1993), and it is important that these be followed closely with respect to duration, type, number, and combinations of symptoms required for diagnosis. There are structured interviews, symptom scales, and diagnostic decision trees (including one in the DSM manual) that can serve as important aids to ensure reliability and veracity of diagnosis (Kay, 1991; Russell, 1992; Werry and Taylor, 1994). Other techniques, such as laboratory evaluations and neuroimaging techniques, are used mostly to rule out other disorders, such as organic psychoses. Neuropsychological tests are helpful with diagnosis, the assessment of functioning, and management planning.

Because schizophrenia is a serious disorder with ominous prognosis and social stigma, some clinicians are hesitant to make this diagnosis, even when there is sufficient evidence to do so. This potentially denies the child and family access to appropriate treatment, knowledge about the disorder, and specialized support services. Therefore, when the diagnostic criteria are met, the initial diagnosis may be inaccurate given the overlap in symptoms between schizophrenia, affective disorders with psychotic features, and possibly personality and dissociative disorders (Carlson, 1990; McClellan et al., 1993; Werry et al., 1991). The patient must then be followed longitudinally, with periodic diagnostic reassessments, to ensure accuracy. Patients and families should be educated about these diagnostic issues.

**DSM-IV Diagnostic Criteria**

*Psychotic Symptoms.* These are the hallmark symptoms of the disorder. At least two of the following are needed, each present for a significant period of time during a 1-month period: (1) delusions, (2) hallucinations, (3) disorganized speech, (4) grossly disorganized or catatonic behavior, and/or (5) negative symptoms (e.g., affective flattening, paucity of thought or speech). However, only one symptom is needed if (1) the delusions are bizarre, (2) the hallucinations include a voice providing a running commentary on the person's behavior or thinking, or (3) two or more voices are conversing with each other. Finally, the duration of symptoms may be less if the symptoms have been resolved with medication.

**Social/Occupational Dysfunction.** For a significant portion of the time since onset of the disorder, the level of social, occupational, and self-care functioning has markedly deteriorated below the level achieved before onset. In children and adolescents, this may include the failure to achieve age-appropriate levels of interpersonal, academic, or occupational development.

**Duration.** The disturbances must be present for a period of at least 6 months. This includes an active phase of overt psychotic symptoms (criterion A) with or without a prodromal or residual phase. A prodromal phase involves deterioration in functioning before the onset of psychotic symptoms, and the residual phase follows the active phase. Symptoms characteristic of both prodromal and residual phases include marked social isolation; deterioration in occupational functioning; peculiar behavior such as food hoarding, poor hygiene, blunted or inappropriate affect; disordered thought processes (tangentiality, circumstantiality); poverty of speech or speech content; odd beliefs or perceptions; and anergia.

**Schizoaffective and Mood Disorder Exclusion.** Schizoaffective disorder and mood disorder with psychotic features have been ruled out. This is especially pertinent for adolescents with bipolar disorder, inasmuch as manic episodes in this age group frequently include schizophrenic-like symptoms at onset (Carlson, 1990; McClellan et al., 1993; McGlashan, 1988; Werry et al., 1991). This criterion needs to be systematically reassessed in patients, because continued follow-up may be the only accurate method for distinguishing the two disorders.

**Substance Abuse/General Medical Condition Exclusion.** Other medical conditions, including drug abuse or medications, have been ruled out.

The ICD-9 criteria for schizophrenia are similar to those of the DSM-IV, except that the diagnosis can be made once sufficient symptoms have been present for a period of 1 month or more instead of 6 months (World Health Organization, 1979).

**Diagnostic Issues**

Although the same diagnostic criteria are used as for adults, there are certain clinical features in children and adolescents that create diagnostic dilemmas. One problem is distinguishing true psychotic phenomena in children from nonpsychotic idiosyncratic thinking and perceptions caused by develop-
Differential Diagnosis

When assessing a child or adolescent with symptoms suggestive of schizophrenia, a thorough diagnostic evaluation is needed to rule out other conditions that present with similar symptomatology. While a detailed discussion of all possible disorders that may mimic schizophrenia is not possible here, we will briefly elaborate on those that are most important to consider. A thorough review of presenting symptoms, course and premorbid functioning, adherence to DSM-IV criteria, familiarity with how psychotic symptoms present in this age group, and determination of family psychiatric history will all help improve the accuracy of diagnosis. However, discriminating among these various disorders still may be difficult, especially at the initial presentation, and periodic diagnostic reassessments are always indicated (McClellan and Werry, 1992).

Mood Disorders. Both schizophrenia and psychotic mood disorders (especially bipolar disorder) typically present with a variety of affective and psychotic symptoms (Carlson, 1990; Joyce, 1984; McClellan et al., 1993; Werry et al., 1991). This overlap in symptomatology increases the likelihood of incorrect diagnosis at the time of onset. Approximately one half of adolescents with bipolar disorder may be originally misdiagnosed as having schizophrenia (Carlson, 1990; Werry et al., 1991). Longitudinal reassessment is needed to ensure accuracy of diagnosis. Family psychiatric history may also be a helpful differentiating factor, although studies have found an increased family history of depression in schizophrenic youth (Werry, 1992).

Organic Disorders. All psychotic children and adolescents should receive a thorough pediatric and neurological evaluation. The possibility of an organic psychosis needs to be considered when obtaining the history, completing the physical examination, and selecting initial laboratory investigations. Evidence of neurological dysfunction may warrant a more thorough evaluation, including consideration of an electroencephalogram, neuroimaging studies, and/or a neurological consultation. The list of potential organic etiological agents is exhaustive. However, some of the entities that must be considered include (1) delirium; (2) seizure disorders; (3) central nervous system lesions (e.g., brain tumors, congenital malformations, head trauma); (4) neurodegenerative disorders (e.g., Huntington's chorea, lipid storage disorders); (5) metabolic disorders (e.g., endocrinopathies, Wilson's disease); (6) toxic encephalopathies (e.g., substances of abuse such as amphetamines, cocaine, hallucinogens, phencyclidine, alcohol, marijuana, and solvents; medications such as stimulants, corticosteroids, or anticholinergic agents; and other toxins such as heavy metals); and (7) infectious diseases (e.g., encephalitis, meningitis, and/or human immunodeficiency virus-related syndromes).

Given the significant rates of comorbid substance abuse with schizophrenia and psychotic mood disorders in adolescents (as high as 50% comorbidity in some studies), it is common for a history of substance abuse to be obtained at the first onset of the psychotic disorder (McClellan et al., 1993). If the psychotic symptoms persist for longer than a week despite documented detoxification from the abused substance(s), the clinician must consider whether or not these...
represent a primary psychotic disorder, rather than an organic psychosis due to the substance(s) of abuse. In adolescents, it is not uncommon for the first psychotic break to occur with comorbid substance abuse, which acts as an exacerbating (and possibly a triggering) factor rather than a primary etiological agent (Unis and McClellan, 1993).

Nonpsychotic Behavioral and/or Emotional Disorders (Including Dissociative and/or Personality Disorders). Youth with conduct and other nonpsychotic emotional disorders may report psychotic-like symptoms and thus be improperly diagnosed as having a primary psychotic disorder (Del Beccaro et al., 1988; Garralda, 1984a, b; Horstein and Putnam, 1992; Lewis, 1990; McClellan et al., 1993; Nurcombe, 1990). When compared to psychotic children, these youth have lower rates of delusions and thought disorder (Garralda, 1985). At follow-up, an increase in personality dysfunction, including personality disorders but not psychotic disorders, has been found (Garralda, 1984a, b; Lofgren et al., 1991). When there is a history of abuse or neglect, the psychotic-like symptoms may represent dissociative symptoms (Horstein and Putnam, 1992; Nurcombe, 1990). It is important that these children be accurately diagnosed, since an incorrect diagnosis of schizophrenia may unnecessarily expose them to the long-term side effects of neuroleptics.

Included in this broadly defined group are children described as having borderline disorder who have noted difficulties with poor reality testing, tumultuous relationships, behavioral and affective dysregulation, and fluctuation between neurotic and psychotic-like states (King and Noshpitz, 1991; Lofgren et al., 1991). The overlap in presenting symptoms can make it particularly difficult to differentiate these children from those with schizophrenia. The lack of delusions and formal thought disorder, plus the characteristics of their relationship skills (the chaotic nature of borderline relationships versus the socially isolated and awkward relationships of the schizophrenic child), may help distinguish these two diagnoses. At follow-up, borderline children do not seem to have an increased risk for either schizophrenia or affective disorders, when compared to other mentally ill children (Lofgren et al., 1991).

Schizoaffective Disorder. Early-onset schizoaffective disorder has not been well defined in this age group. Eggers (1989) found that 28% of his EOS sample at follow-up had schizoaffective psychoses, an ICD-9 diagnosis that overlaps with DSM-III-R (American Psychiatric Association, 1987) diagnoses of bipolar disorder and schizoaffective disorder. Other follow-up studies of psychotic youth have also found this disorder, but at lower rates (McClellan et al., 1993; Werry et al., 1991).

Pervasive Developmental Disorders/Autism. Autism and pervasive developmental disorders are distinguished by the absence or transitory nature of the required positive psychotic symptomatology, i.e., hallucinations and delusions, as well as by the predominance of the characteristic deviant language patterns, aberrant social relatedness, and other key symptoms that characterize these disorders (Green et al., 1984; Kolvin, 1971; Volkmar et al., 1988; Volkmar and Cohen, 1991). The earlier age of onset and the absence of a normal period of development are also indicative, although some schizophrenic children have a lifelong history of developmental delays (Watkins et al., 1988). However, compared to pervasive developmental disorders, the premorbid abnormalities in EOS tend to be less pervasive and severe. Inasmuch as early central nervous system developmental abnormalities have been associated with both schizophrenia and autism (Akbarian et al., 1993; Fish et al., 1992; Kemper and Bauman, 1993; Weinberger, 1987), it is possible that both illnesses may occasionally coexist, linked by a common defect that occurred early in central nervous system development. However, if this occurs, the onset of schizophrenia will be later than that of autism, generally after 5 years of age.

Childhood disintegrative disorder (Volkmar, 1992) resembles autism except that the onset occurs after 2 or more years of normal development. Children with Asperger's syndrome lack the marked language disturbances associated with autism but present with deficits in social relatedness and contextual communication (especially with social cues) and a restricted (and possibly bizarre) range of interests (Szatmari, 1991). The lack of overt hallucinations and delusions distinguishes both of these conditions from schizophrenia.

Obsessive-Compulsive Disorder. Children with obsessive-compulsive disorder suffer from intrusive thoughts and repetitive ritualistic behaviors, symptoms that may be misconstrued as psychosis (e.g., the fear of being contaminated may be either an obsessive symptom or a paranoid delusion). Patients with obsessive-compulsive disorder recognize their symptoms as being unreasonable and excessive products of their own thinking, whereas psychotic symptoms are experienced as phenomena occurring independently of the patient's own cognitive processes. However, some obsessive-compulsive disorder symptoms are so severe that distinguishing them from true delusions is difficult. Conversely, patients with schizophrenia may have significant obsessive-compulsive features.

Developmental Language Disorders. Children with developmental speech and language disorders may be mistakenly diagnosed as being thought-disordered. Such children do not, however, have other prerequisite schizophrenic symptoms, such as hallucinations, delusions, or odd social relatedness (Baker and Cantwell, 1991).

Other Disorders. Other disorders that need to be differentiated from schizophrenia include schizotypal disorders, schizoid personality disorder, and other psychotic disorders (e.g., delusional disorders and schizophasiform disorder). Finally,
there are children with multiple complex developmental lags, including disturbances in affect modulation, social relatedness, and thinking, whose symptoms do not fit well within the current criteria for schizophrenia (Fish and Rivoo, 1979; Towbin et al., 1993). Research efforts are trying to better characterize this group (Towbin et al., 1993).

Associated Clinical Features

The available research is limited, but it does suggest that, as in adult schizophrenia, there is a wide variety of associated symptoms and phenomena seen in EOS.

Prevalence and Age of Onset. Although there are little epidemiological data, clinical experience suggests that schizophrenia rarely occurs before 12 years of age, but the rate of onset increases during adolescence to achieve adult rates of approximately 0.1% incidence (new cases) per year (Werry, 1992). The youngest reported cases had onset at 3 years (Russell et al., 1993). Research efforts are trying to better characterize this group (Towbin et al., 1993).

Positive symptoms of schizophrenia refer to the more florid hallucinations, delusions, and thought disorder, whereas negative symptoms are those of deficits, i.e., flat affect, anergy, and paucity of speech and thought (Andreasen et al., 1990). Both positive and negative symptoms represent semi-independent predictors of outcome in adult-onset schizophrenia (Strauss and Carpenter, 1978). Negative symptoms are more frequently associated with chronicity, poor premorbid adjustment, impaired cognitive functioning, and brain injury. Positive symptoms are associated with better premorbid functioning, higher overall level of functioning, no cerebral atrophy, and a normal sensorium (Andreasen et al., 1990; Pogue-Geile and Harrow, 1985). One study found that, in schizophrenic and other psychiatrically disturbed children, positive symptoms increased linearly with age and were associated with IQs greater than 85, whereas negative symptoms were associated with brain damage (Bettes and Walker, 1987).

Significant rates of formal thought disorder have been reported in children with schizophrenia, other psychotic disorders, and in those at risk for psychosis by virtue of having a psychotic mother (Arboleda and Holzman, 1985; Cantor et al., 1982; Caplan et al., 1989; Kolvin, 1971; Watkins et al., 1988). Caplan et al. (1989) reliably differentiated schizophrenic children from normal controls on measures of illogical thinking and loose associations. However, rates of incoherence and poverty of speech content were low in both groups (Caplan et al., 1989). When assessing a child's thinking, it is important to differentiate the thought disorder of psychosis from developmental delays or language disorders.

Cognitive and Neurological Dysfunction. Approximately 10% to 20% of children with EOS have low IQs (Asarnow et al., 1986; Kolvin, 1971; Watkins et al., 1988; Werry et al., 1991). The personality abnormalities most frequently described are withdrawal, oddness, and isolation. However, all forms of personality dysfunction (including conduct problems) have been observed. Multiple developmental delays, including lags in cognitive, motor, sensory, and social functioning, are also noted (Cantor et al., 1982; Fish et al., 1992; Watkins et al., 1988).

Symptomatology in EOS. Developmental differences in language and cognition may affect the range and quality of symptom presentation (Caplan et al., 1989; Volkmar et al., 1988; Watkins et al., 1988; Werry, 1992). Hallucinations, thought disorder, and flattened affect all have been consistently found in EOS, while systematic delusions and catatonic symptoms may be less frequent (Green et al., 1992; Russell et al., 1989; Werry et al., 1991). In regard to DSM subtypes, reports vary as to whether the paranoid subtype (Eggers, 1978) or the undifferentiated subtype (McClellan et al., 1993; Werry et al., 1991) is more common. Sufficient evidence to justify categorizing EOS as a separate diagnostic subcategory currently is lacking (Werry, 1992).

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and Ben-Meir, 1988; Eggers, 1978; Green et al., 1992; Kolvin, 1971; McClellan et al., 1993; Werry et al., 1991). One study, using the WISC-R, found greater deficits in factor III scores (freedom from distractibility, as measured by the coding, arithmetic, and digit span subtests) in a VEOS group when compared to autistic patients (Asarnow et al., 1987). In view of the paucity of comparison groups, the finding of low IQ may not be specific to EOS but instead may represent a general risk for psychopathology. Some studies have excluded patients with primary mental retardation (Betts and Walker, 1987; Russell et al., 1989).

Despite the noted association between developmental abnormalities and EOS, when more defined neurological criteria have been examined (including EEGs and head computed tomography scan findings), an association between EOS and neurological damage has not been found (Kolvin, 1971; McClellan et al., 1993; Werry et al., 1991).

**Psychological Factors.** A lack of solid research prevents any firm conclusions regarding predisposing family dynamics or individual psychological factors. There is some evidence to suggest the communication deficits are often found in families of children with VEOS, although these are probably genetic traits rather than etiological agents (Asarnow et al., 1988). Studies in adults suggest that psychological factors, including measures of expressed emotion, are important in predicting postillness functioning and risk of relapse (Goldstein, 1989).

**Social Class.** It is not possible to say whether there is any relationship to socioeconomic status. The available studies have a selection bias toward inpatient samples, with higher rates of low socioeconomic status found in some studies (Green et al., 1992; Kolvin, 1971; McClellan et al., 1993) but not in others (Russell et al., 1989; Werry et al., 1991).

**Familial Patterns.** An increased family history of schizophrenia has been found in patients with EOS (Eggers, 1978; Green et al., 1992; Kolvin, 1971; McClellan et al., 1993; Werry et al., 1991). However, these findings are limited by small sample size and by methodological limitations in the ascertainment and assignment of diagnoses in relatives (Werry, 1992). An increased family history of affective disorders also has been reported (Eggers, 1978; Werry et al., 1991). While this may represent a true familial association, it also highlights the potential diagnostic confusion between EOS and bipolar disorder.

**Prognosis.** The clinical consensus has been that EOS (especially VEOS) has a uniformly poor prognosis. However, the few available follow-up studies suggest that EOS appears to have the same range of outcomes as reported in adults, although the majority of patients have some degree of chronic impairment (Eggers, 1978; McClellan et al., 1993; Werry et al., 1991). The poor outcomes noted in EOS may relate to the increased frequency of poor premorbid function-
choeducational services, family support, vocational, and rehabilitative assistance; and, in some cases, longer term residential programs.

Although there is a large body of research available on the treatment of schizophrenia, little of it relates directly to EOS. However, differences between early-onset and adult schizophrenia seem at most to be only quantitative and developmental (Beitchman, 1985; Werry, 1992). Thus, it is reasonable to assume that they are the same disorder or, more likely, the same group of disorders, and that research on treatment of adults should form the knowledge base for the treatment of early-onset cases. However, it is prudent for child and adolescent psychiatrists to regard this knowledge as tentative and to be prepared to make clinical adjustments in care as appropriate given the developmental needs of their patients.

PSYCHOPHARMACOLOGY

The only specific treatment of documented efficacy in schizophrenia is antipsychotic (neuroleptic) medication. The effectiveness of neuroleptics in schizophrenic adults has been shown in more than 100 double-blind, randomly assigned, controlled studies (Davis et al., 1987). However, there are few studies with adolescents and children (Campbell et al., 1993; Campbell and Spencer, 1988; Realmuto et al., 1984; Teicher and Glod, 1990). Clinical experience suggests that children with schizophrenia may respond less well to antipsychotics than do adults (Campbell and Spencer, 1988). However, one of the few controlled studies suggests that the response is similar (Spencer et al., 1992). In acutely psychotic adolescents, haloperidol and loxapine have been shown to be effective when compared to placebo (Campbell et al., 1993; Pool et al., 1976; Spencer et al., 1992), but long-term follow-up studies are lacking (Campbell and Spencer, 1988). There are a few open studies of the "atypical" antipsychotic clozapine (see Campbell et al., 1993), and its use should be considered when patients with EOS are either nonresponsive to traditional antipsychotics or have developed tardive dyskinesia. Although the use of antipsychotics in youth with schizophrenia is justified primarily by extrapolation from adults, there is no reason to suppose that this is other than a legitimate practice.

Procedures for Use of Medication

Informed Consent. Informed consent (which addresses the rationale for treatment and potential risks and benefits of the therapy) should be obtained from both the youth and the parents/guardians. If the psychotic state or developmental level of the patient precludes this, or if therapy is refused, invoking the relevant statutory mechanisms for involuntary treatment may become necessary. For patients under the legal age of consent, basic information regarding treatment should be provided in a developmentally appropriate manner.

Examinations. Before neuroleptic therapy, a thorough psychiatric evaluation is needed. The psychotic symptoms for which treatment is targeted should be documented. A thorough physical examination is also necessary, with particular attention to any preexisting abnormal movements. Such symptoms should be documented to establish a baseline and to prevent them from being mistaken for side effects.

Medication Choice. With the exception of clozapine, there is no evidence to suggest that any one antipsychotic agent is superior in the treatment of schizophrenia (Campbell et al., 1993). The choice of medication should be made based on the agent's relative anticholinergic potency and side effect spectrum and the patient's history of medication response. Individual responses to different antipsychotics are variable, and if insufficient effects are evident after a 6-week trial using adequate dosages, a different neuroleptic should be tried.

The side effect profile of an antipsychotic generally relates to its effects on different neurotransmitter receptors (Campbell et al., 1993). High-potency agents (e.g., haloperidol) tend to produce extrapyramidal symptoms, whereas low-potency agents (e.g., thioridazine and chlorpromazine) have more anticholinergic side effects, including sedation and potential deficits in memory. Some side effects are specific to a particular agent, such as lenticular stippling with thioridazine, whereas others, such as extrapyramidal symptoms, tardive and withdrawal dyskinesias, and neuroleptic malignant syndrome, need to be monitored with all of the antipsychotics.

Depot antipsychotics have not been studied in pediatric age groups and have inherent risks with long-term exposure to neuroleptic side effects. Therefore, they should only be considered in schizophrenic adolescents with documented chronic psychotic symptoms and a history of poor medication compliance. Depot agents are not recommended for children with VEOS.

Acute Phase. A trial of at least 4 to 6 weeks is necessary to assess the efficacy of any neuroleptic. Dosages used in children and adolescents range from 0.5 to 9.0 mg/kg daily in chlorpromazine equivalents (Table 1), although additional research is needed to clarify adequate dosages for treating EOS (Campbell et al., 1993; Campbell and Spencer, 1988). The immediate effect of the medication is generally sedative, with the antipsychotic effects becoming more apparent only after the first week or two. Instituting large dosages during the early part of treatment generally does not hasten recovery, and more often it results in unnecessarily high dosages and side effects. For acutely psychotic and agitated patients, the short-term use of benzodiazepines as adjuncts to neuroleptics may help to stabilize the clinical situation. If no results are apparent after 4 to 6 weeks, or if side effects are not manage-
### TABLE 1
Commonly Used Antipsychotic Agents, With Their Relative Potency and Dosage Range

<table>
<thead>
<tr>
<th>Class</th>
<th>Generic Name</th>
<th>Chlorpromazine Equivalents</th>
<th>Daily Dose in mg (mg/kg)</th>
<th>Children</th>
<th>Adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenothiazines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aliphatic</td>
<td>Chlorpromazine</td>
<td>100</td>
<td>10–200 (0.5–3.0)</td>
<td>50–600</td>
<td></td>
</tr>
<tr>
<td>Piperidine</td>
<td>Thioridazine</td>
<td>97</td>
<td>10–200 (0.5–3.0)</td>
<td>50–600</td>
<td></td>
</tr>
<tr>
<td>Piperazine</td>
<td>Trifluoperazine</td>
<td>2.8</td>
<td>2–20</td>
<td>Not studied</td>
<td></td>
</tr>
<tr>
<td>Butyrophenones</td>
<td>Haloperidol</td>
<td>1.6</td>
<td>0.25–6.0</td>
<td>1.0–16</td>
<td></td>
</tr>
<tr>
<td>Thioxanthenes</td>
<td>Thiopropizine</td>
<td>8.8</td>
<td>1.0–6.0 (0.1–2.0)</td>
<td>5.0–45</td>
<td></td>
</tr>
<tr>
<td>Dibenzoxazepines</td>
<td>Oxaprine</td>
<td>17.4</td>
<td>Not studied</td>
<td>0.3–0.5*</td>
<td>1–6</td>
</tr>
<tr>
<td>Dibenzoazepines</td>
<td>Clozapine</td>
<td>50*</td>
<td>Not studied</td>
<td>0.3 mg/kg</td>
<td>0.3 mg/kg</td>
</tr>
</tbody>
</table>


Note: Table modified from Campbell et al. (1993).

able, a trial of a different neuroleptic should then be undertaken (Kane, 1987).

**Recuperative Phase.** This generally occurs after 4 to 12 weeks, provided the acute phase can be controlled. Even as positive symptoms improve, the patient may have ongoing confusion, disorganization, and dysphoria. During this period, antipsychotic medication should be maintained, but attempts to gradually lower the dosage should be made to decrease side effects, including exacerbation of negative symptoms. This is especially true if high dosages were needed to control the acute psychotic phase. Obviously, the positive symptoms must be carefully monitored to avoid causing relapse.

**Recovery/Residual Phase.** In this phase, antipsychotic therapy has well-documented efficacy in preventing relapse. Approximately 70% of adult patients taking placebo will have a relapse within 1 year of their acute psychotic phase, compared to 30% of those taking antipsychotics (Kane, 1987; Simpson and May, 1985). However, in newly diagnosed patients who have been stabilized for at least 6 months, an attempt to taper off the medications may be prudent, since a small percentage of patients will not relapse and therefore should not be exposed to the long-term side effect risks of neuroleptics. In patients with relapses or chronic illness, or in newly diagnosed patients with persistent psychotic symptoms, the maintenance medication should be maintained indefinitely at the lowest effective dose. This requires periodic reassessment, with gradual lowering of the dosage as tolerated. Unless otherwise indicated by either side effects or symptoms, dosage readjustments should occur at approximately 6-month intervals. Physician contact, however, should be maintained on a much more frequent basis (at least monthly). This contact is necessary to adequately monitor symptom course, side effects, and compliance, while also monitoring and implementing the necessary psychotherapeutic interventions described later in this text.

**Nonresponders to Neuroleptics.** It is estimated that at least 25% of adult-onset patients with schizophrenia do not respond adequately to neuroleptics (Simpson and Wilson, 1989). However, before declaring that a patient is a nonresponder, certain steps need to be taken. Trials of at least two different antipsychotics should be tried, with selection of medications from different chemical classes, using adequate dosages (Table 1). Although drug levels have not been found to be predictive of therapeutic response, they may be helpful to check compliance, absorption, and unexpected toxicity (Campbell et al., 1993; Van Putten et al., 1991). If the patient fails to respond to two or more separate trials, a drug-free period should be considered to reassess the diagnosis (Simpson and Wilson, 1989).

Clozapine should be considered for adolescents with EOS who have not responded to standard neuroleptic therapy. Clozapine is an atypical antipsychotic recently approved for use in the United States. It is a serotonergic antagonist, with a strong blockade of D4 receptors and greater blockade of D1 rather than D2 receptors (Meltzer, 1992). Therefore, its antipsychotic activity is derived from a different mechanism than that of standard antipsychotics. It has been found to be effective in at least 30% of adult patients with treatment-resistant schizophrenia (Meltzer, 1992; Safferman et al., 1991), and there are reports of its efficacy in adolescents (Birmaher et al., 1992). It has the advantage of not producing antidopaminergic side effects, including tardive dyskinesia. However, it has significant side effects of its own, including weight gain, agranulocytosis in approximately 2% of patients, and seizures. It can be prescribed safely in conjunction with...
an extensive blood-monitoring program (Safferman et al., 1991). There is little experience with it in individuals younger than 16 years of age.

Alternative medications have been studied for their antipsychotic effects. Lithium has been shown to have some efficacy, both alone and in conjunction with neuroleptics. Other medications with some reported antipsychotic effects include benzodiazepines, anticonvulsants, and β blockers (Simpson and Wilson, 1989). However, all of these reports are preliminary, and there are no studies of their use in youth with EOS. Therefore, both their potential for side effects and lack of documented efficacy in this age group need to be weighed when considering their use.

Electroconvulsive therapy (ECT) is used in some adult schizophrenic patients, specifically patients who are catatonic or have failed 3 months or more of neuroleptic treatment (Lehmann et al., 1989). However, there is insufficient information available to make a judgment regarding its use in youth with EOS (Bertagnoli and Borchardt, 1990). Therefore, the decision to use ECT in children and adolescents with EOS who are either medication nonresponders or catatonic must be made based on adult literature, incorporating the relative risks and benefits of using this treatment in the face of the morbidity of the disorder, the attitudes of the patient and family, and the experience of the clinician with using ECT. Obtaining informed consent from the parents, including a detailed discussion of the potential cognitive deficits, is necessary.

Medication Management

Clinical monitoring of both efficacy and side effects is a necessary component of neuroleptic therapy that varies with the stages of the disorder. During the acute psychotic phase, either frequent outpatient visits or more often hospitalization is needed to address the degree of psychosis, as well as potential danger to self and/or others. Once the patient is stabilized, the monitoring should first occur at least weekly to help establish rapport and ensure compliance, with the frequency then decreasing as clinically indicated. Integrating the medication follow-up with ongoing psychosocial therapies helps to increase compliance and decrease relapse rates (see below).

Extrapyramidal Side Effects. In monitoring for side effects, the acute extrapyramidal side effects, particularly dystonia, are most likely during the initial phases of treatment. The use of prophylactic antiparkinsonian agents is controversial. While certainly not indicated in all cases, the use of prophylactic antiparkinsonian agents should be considered in patients who are at high risk for developing acute dystonias (i.e., adolescent males), patients who will require higher dosages of high-potency agents, and those with a previous history of dystonic reactions (Simpson and May, 1985). This is particularly true in patients with paranoid delusions, where the development of an acute dystonia may significantly impair future willingness to comply with treatment. Once antiparkinsonian agents are started, attempts should be made to taper them after 2 to 3 months, because approximately two thirds of patients will no longer need them (Simpson and May, 1985).

Akathisia is a common side effect seen in patients with schizophrenia, and it is often misinterpreted as psychotic agitation or anxiety. It is important to identify akathisia because it is a common reason for medication noncompliance. It is, unfortunately, also at times difficult to treat, especially when it develops during the chronic phases of schizophrenia. If clinically feasible, lowering the antipsychotic dose should be attempted. Antiparkinsonian agents are not consistently helpful, although relief has been reported with β blockers and benzodiazepines (Campbell et al., 1993).

Tardive Dyskinesia. Tardive dyskinesia is a major public health concern in the treatment of schizophrenia, with both clinical and medicolegal implications (American Psychiatric Association, 1992). The prevalence of neuroleptic-induced dyskinesias in children ranges from 8% to 51% (Campbell et al., 1983, 1993; Gualtieri et al., 1984). This includes both tardive dyskinesia, which has been reported in children even after short-term neuroleptic usage, and withdrawal dyskinesia. Withdrawal dyskinesia may occur with either gradual or sudden cessation of neuroleptic agents, with one third or more of children developing these movements when the antipsychotic is abruptly withdrawn (Campbell et al., 1993). Withdrawal dyskinesias almost always resolve over time, whereas tardive dyskinesia may persist even if the antipsychotic agent is discontinued.

Because there is no specific treatment for tardive dyskinesia other than discontinuing the medication, strategies for prevention and early detection need to be followed (American Psychiatric Association, 1992; Campbell et al., 1993; Kane et al., 1989). The concern over tardive dyskinesia should not outweigh the potential benefits provided by antipsychotics for patients with schizophrenia, but they do require judicious use. Informed consent is necessary, and baseline measures of abnormal movements should be recorded. Once neuroleptic therapy has been started, assessment for dyskinesias should occur at least every 3 to 6 months. The Abnormal Involuntary Movement Scale (National Institute of Mental Health, 1985) is a useful measure for monitoring this problem.

Cognitive Effects. Although there are no studies of cognitive changes with antipsychotic therapy in EOS, the potential for sedation, cognitive blunting, apathy, and memory deficits, especially when using low-potency agents with greater anticholinergic activity, raises concerns (Campbell et al., 1993; Realmuto et al., 1984). Cognitive dysfunction, including lan-
syndrome (NMS) is a rare idiosyncratic reaction that may occur at any time during the course of antipsychotic therapy. It is characterized by severe rigidity, hyperthermia, confusion, and markedly elevated creatinine phosphokinase. Mortality rates of up to 30% are reported in adults. There are case reports of NMS occurring in youth. When NMS is suspected, the antipsychotic agent should be discontinued and supportive medical care should be sought. Bromocriptine and dantrolene have been used to treat adult patients with NMS, although their efficacy needs to be studied further (Campbell et al., 1993).

Neuroleptic Malignant Syndrome. Neuroleptic malignant syndrome (NMS) is a rare idiosyncratic reaction that may occur at any time during the course of antipsychotic therapy. It is characterized by severe rigidity, hyperthermia, confusion, and markedly elevated creatinine phosphokinase. Mortality rates of up to 30% are reported in adults. There are case reports of NMS occurring in youth. When NMS is suspected, the antipsychotic agent should be discontinued and supportive medical care should be sought. Bromocriptine and dantrolene have been used to treat adult patients with NMS, although their efficacy needs to be studied further (Campbell et al., 1993).

PSYCHOSOCIAL THERAPIES

In schizophrenic adults, multimodal treatment plans that integrate medication management with psychoeducational, family, and supportive psychotherapies appear to be the most effective at reducing morbidity and decreasing relapse rates, while traditional insight-oriented psychotherapies, by themselves, have not been shown to be helpful (Goldstein, 1989). Although most of the available treatment literature derives from studies of patients with adult-onset schizophrenia, much of it remains applicable to those with EOS. However, the potential developmental variations in those with EOS must be addressed by clinicians treating these youth. Because EOS occurs at an earlier age, the morbidity stems both from the pathogenic manifestations of the disorder and the resultant deviations in normal development. Hence, the goal of therapy is not only to help the child return to his or her premorbid level of functioning but also to help him or her proceed with age-appropriate developmental tasks. Equally important is that the therapies address the needs of the child as an individual rather than focus on those needs specific to a diagnosis of schizophrenia. Thus, treatment interventions must also be directed at any comorbid psychiatric condition (e.g., substance abuse), as well as at ongoing environmental and/or psychological stressors, or other factors complicating recovery.

Therapies directed at improving family interactions, primarily using psychoeducational models, have decreased relapse rates in adults with schizophrenia. This work has emerged from the reports that families characterized as having high expressed emotion had higher relapse rates in their offspring with schizophrenia (Goldstein, 1989; Leff and Vaughn, 1985). Expressed emotion refers to attributes of overprotectiveness or criticism expressed toward the patient. Caution should be used in interpreting these findings. One cannot assume a linear causality between family characteristics and patient functioning because these interactions are quite complex and multidimensional (Goldstein, 1989). However, the studies of expressed emotion have provided a model for designing family intervention strategies.

Family intervention programs, in conjunction with medication therapy, have been shown to significantly decrease schizophrenia relapse rates during the first year of treatment (Falloon, 1992; Goldstein, 1989). Unlike more traditional family therapies, these interventions have been primarily psychoeducational, providing the family members with a greater understanding of the illness, its potential causes and treatments, and intervention strategies for dealing with the symptoms of the schizophrenic relative.

The combination of family treatment, social skills training, and medication therapy has also been shown to decrease relapse rates (Falloon, 1992; Hogarty et al., 1986). Social skills training focuses on improving the patients' strategies for dealing with conflict, identifying the correct meaning, context, and content of verbal messages within their families, and enhancing their socialization and vocational skills. It is encouraging that the effects of social skills training and family treatment appear to potentiate one another.

Given the above findings from the adult literature, patients with EOS should benefit from the combination of individual, family, and/or group therapies as adjuncts to medication therapy. Such treatment should be developed in accordance with the developmental level of the child and should focus on psychoeducational information regarding the symptomatology, etiological factors, prognosis, and treatment factors for schizophrenia. In addition, cognitive-behavioral strategies, such as social skills, problem-solving strategies, self-help skills, and therapies directed at family function, should be incorporated into the treatment plan. Traditional insight-oriented therapies, by themselves, are not generally recommended, especially during the acute phases of the disorder. However, as the patient stabilizes, the incorporation of more traditional techniques with the ongoing supportive therapies may be useful to address the associated adjustment difficulties seen in all patients with a serious psychiatric disorder, as well as for addressing other comorbid or complicating individual or family factors. One of the long-term needs is to maintain a consistent, stable therapeutic relationship, which both serves to better monitor relapse and noncompliance, while also focusing on the more disabling negative symptoms of the disorder (i.e., social withdrawal, problems with relationship building, apathy, and anhedonia).

The complexity of treating youth with EOS often requires a continuum of services and treatment providers. In addition
to psychopharmacology management and psychotherapy, many of these youth will need extensive case management and community support services. Such services may include crisis intervention, family support programs, and in-home services. Families also may benefit from being involved in a parent advocacy group.

Appropriate special education services are a necessary component of a comprehensive treatment program. Children and adolescents with schizophrenia generally do not do well in standard classroom settings. They usually need a specialized classroom with low levels of stimulation, an individualized curriculum that recognizes their potential cognitive impairments, and a teaching staff that is specifically trained to deal with emotionally disturbed youth. Day treatment or partial hospitalization programs, with both educational and mental health services, are often indicated. Specific attention should be paid to the long-term needs of these patients, with provision of vocational and independent life skills training.

SCIENTIFIC AND CLINICAL RATINGS

Decisions regarding the appropriateness of diagnostic and treatment recommendations were made by considering both the available scientific literature and the general clinical consensus of child and adolescent psychiatry practitioners. The validity assigned to any particular scientific finding was judged using the pertinent criteria by which that research is assessed (i.e., the appropriateness of design, sample selection and size, inclusion of comparison groups, generalizability, and agreement with other studies). The limitations in the available research literature, as well as the relative indications for specific interventions, are noted in both the literature review and the specific parameters.

The recommendations regarding specific diagnostic evaluations and treatment interventions reflect those methods of practice that are either supported by methodologically sound empirical studies and/or are considered a standard of care by competent child and adolescent psychiatrists. However, the general paucity of sound scientific data regarding childhood psychiatric disorders and their treatment necessitated that most of the recommendations set forth in these parameters be based on clinical consensus.

Those practices that are described as having limited or no research data and also lack of clinical consensus regarding their efficacy may still be used in some selected cases, but the clinician should be aware of the limitations and document the rational for their use.

Clinical consensus was initially derived by the members of the Work Group on Quality Issues. A preliminary draft was sent to experts for review and their comments were incorporated. A draft was then distributed to the entire membership of the American Academy of Child and Adolescent Psychiatry for review. In addition, the proposed recommendations were discussed at an open forum held at the Academy's 1993 annual meeting. The Work Group incorporated suggested revisions into the final version of the parameters, which then was sent to the Academy's Council for review and approval.

Those practices that are not recommended represent areas in which there are neither sound empirical data nor high clinical consensus that such practices are effective or areas in which the potential risks are not justified. If such practices are to be used, the clinician should clearly document the justification for that decision.

PRACTICE PARAMETERS FOR THE ASSESSMENT AND TREATMENT OF CHILDREN AND ADOLESCENTS WITH SCHIZOPHRENIA

I. Diagnostic assessment.
   A. Premorbid history.
      1. Developmental history.
         a. Prenatal or perinatal complications (prenatal viral infections and obstetrical complications).
         b. Cognitive, motor, sensory, and/or social developmental problems.
         c. Premorbid personality characteristics, i.e., temperament, social withdrawal, self-isolation, or other odd or bizarre behavior.
         d. Document highest level of functioning prior to prodrome.
      2. History of present illness.
         a. Document DSM-IV target symptoms, i.e., an active phase that involves hallucinations, delusions, and/or thought disorder and a prodromal or residual phase involving deterioration in level of functioning.
         b. Course of illness with rapidity of onset and evidence of cyclical patterns should be noted. Document any specific precipitating stressors.
         c. Assessment for associated or compounding symptoms, especially mood disturbances, substance abuse, and organic factors. To make the diagnosis of schizophrenia in children with autism, prominent hallucinations and delusions must be clearly present.
      4. Family history.
         a. Family emotional, communicative, interactional, and coping styles and resources.
         b. Obtain a thorough family history of psychotic disorders (particularly schizophrenia), mood disorders, suicidality, neurological conditions, and substance abuse.
C. School information.
   1. Obtain information about school functioning, either directly or from written reports from appropriate staff such as principal, school psychologist, teacher, and/or nurse (after release of information is granted by parents).

D. Suspected deficits in intellectual functioning, communication abilities, and/or motor skills should be evaluated, including consideration of referral for either psychological testing (IQ, projective testing, adaptive functioning, and/or academic testing), speech and language assessment, and/or an occupational/physical therapy evaluation.

E. Consultation and collaboration with other social service providers as necessary.

F. Physical evaluation of the child. A thorough evaluation is needed to rule out organic psychotic conditions, especially at the time of the first psychotic break.
   1. A pediatric examination is needed. This should include a thorough neurological evaluation, including consideration of neurological consultation, EEG, and head computed tomography or magnetic resonance imaging scan. This may be done in collaboration with the primary family physician or other health care providers.
   2. Medical conditions that mimic schizophrenia, such as metabolic, endocrine, or infectious disorders or acute intoxication, need to be evaluated as indicated, including consideration of routine laboratory tests such as blood counts, serum chemistries, thyroid functions, syphilis serology and urinalysis. If the risk factors are present, testing for human immunodeficiency virus should be done following appropriate procedures.

II. Diagnostic formulation.
A. Diagnosis of schizophrenia is made when the required DSM-IV target symptoms are present, and other disorders such as affective disturbances have been adequately ruled out. Associated features that help confirm the diagnosis include chronicity and positive family history of schizophrenia. Even though the diagnosis has been established, it needs to be reassessed longitudinally because of the difficulty in distinguishing bipolar patients from schizophrenic patients during the early phases of the disorder.
B. In the assessment of children and adolescents presenting with symptoms suggestive of schizophrenia, evaluation includes consideration of:
   1. Recent onset of biopsychosocial stresses.
   2. Educational and vocational potential, disabilities, and achievement.
   3. Peer, sibling, and family problems and strengths.
   4. Environmental factors, including disorganized home, presence of child abuse/neglect, or mental illness in parents or guardians.
   5. Developmental abnormalities (motor and language delays).
   6. Child/adolescent interpersonal strengths, especially the ability to form adult and peer relationships.

C. Differential diagnosis.
1. The following conditions may be misdiagnosed as schizophrenia:
   a. Bipolar disorder (especially mania).
   b. Major mood disorder with psychotic features.
   c. Schizoaffective disorder or other psychotic disorders (delusional disorders, schizophreniform disorder, psychosis not otherwise specified).
   d. Organic psychoses (see below).
   e. Dissociative disorders.
   f. Factitious disorder.
   g. Obsessive-compulsive disorder.
   h. Pervasive developmental disorders.
   i. Childhood disintegrative disorder.
   j. Asperger's syndrome.
   k. Personality disorder (schizoid, schizotypal, paranoid and/or borderline).
   l. Developmental language disorders.

2. The following conditions often occur comorbidly with schizophrenia:
   a. Substance abuse disorders.
   b. Developmental delays, including mental retardation.

3. The following medical conditions may mimic schizophrenia.
   a. Delirium.
   b. Toxic encephalopathies.
      i. Toxic psychoses due to substance abuse (amphetamines, cocaine, phencyclidine, and solvents).
      ii. Toxic psychoses due to prescribed medications, such as stimulants, corticosteroids, or anticholinergic agents.
      iii. Other toxins, such as heavy metals.
   c. Neurological conditions.
   d. Seizure disorders, especially with a temporal lobe focus.
   e. Central nervous system tumors.
   f. Central nervous system anatomic defects.
g. Degenerative neurological disorders such as Wilson's disease or Huntington's chorea.

h. Infectious diseases, e.g., encephalitis, meningitis, and/or human immunodeficiency virus-related syndromes.

i. Metabolic disorders, e.g., endocrinopathies.

III. Treatment.

A. At the initial presentation of psychotic symptoms, hospitalization may be necessary, depending on the severity and potential dangerousness of the symptomatology and on the social supports of the family. Hospitalization may also be necessary given the extensive array of psychiatric and neurological evaluation resources required to complete the initial assessment. The following issues need to be addressed at the initial presentation:

1. Complete diagnostic assessment including neurological evaluation.

2. Identify other pertinent issues, i.e., family dysfunction, school difficulties, premorbid and/or comorbid disorders, that will also need ongoing treatment.

3. Evaluation and initiation of medication therapy.

4. Educate the patient and family about the nature of the illness, potential prognostic issues, and treatment needs.

5. Develop a long-term treatment plan that includes medication management, appropriate psychotherapy, psychoeducational services for the patient, supportive services for the family (advocacy groups, support groups), appropriate educational and vocational services, and, when indicated, residential services.

6. Because of the wide range of services needed, a case manager should be designated for chronically disabled individuals.


B. Treatment modalities. There is substantial scientific evidence in the adult literature to suggest that the treatment of schizophrenia involves the use of antipsychotic medications in conjunction with multimodal psychotherapeutic interventions. Specialized psychoeducational programs for patients and families, when used to augment medication therapy, have been shown to decrease relapses. The phase of the illness needs to be considered when making decisions about medication therapy. The literature specific to EOS is limited, but the available research does support extrapolating the adult treatment literature to this population as long as relevant developmental factors are incorporated into the treatment plan.

1. Acute phase.

a. Before initiating antipsychotic therapy, a thorough psychiatric evaluation is needed, which should include documentation of the psychotic symptoms targeted for the therapy. Preexisting abnormal movements should also be noted. Informed consent is needed from the parents and adolescent patients, while consent, when possible, should be obtained from preadolescents.

b. The choice of antipsychotic medication should be made based on the agent's relative potency, spectrum of side effects, and history of medication response in the patient and his or her family. Side effects noted with all antipsychotics (except clozapine) include extrapyramidal symptoms, anticholinergic symptoms, withdrawal dyskinesia, tardive dyskinesia, and neuroleptic malignant syndrome. There are also side effects specific to a particular agent, such as lenticular stippling with thioridazine, that need to be monitored when that agent is used.

c. When using antipsychotics, antiparkinsonian agents may be needed for the treatment of extrapyramidal side effects. Prophylactic use of antiparkinsonian agents should be considered in situations where extrapyramidal symptoms are likely, such as when using high-potency neuroleptics, when treating new patients, or when treating paranoid patients in whom a dystonic reaction may significantly impair compliance.

d. To determine whether or not an antipsychotic medication is effective, it must be used for at least 4 to 6 weeks at adequate dosages. If no effects are seen at that point, consideration should be given to changing to a different class of antipsychotic medication.

2. Recovery phase.

a. Once the acute psychotic symptoms are stabilized, the patient may still have ongoing difficulties with confusion, disorganization, amotivation, and possible dysphoria. Antipsychotic medication should be maintained through this phase to prevent acute exacerbations. The goal of therapy is to reinteject the patient back to his or her home and school, if possible.

3. Residual or remission phase.

a. The patient should be maintained on the lowest effective dose of antipsychotic medic-
ication. Once the patient is clinically stable, the dosage should be reassessed approximately every 6 months. Many patients will be chronically impaired and need to be maintained on long-term antipsychotic agents.

b. When discontinuing these agents, they should be tapered, given the increased risk in children for withdrawal dyskinesia. The exception to this is when neuroleptic malignant syndrome occurs. Careful monitoring is needed during times in which the dosage is being changed to assess for symptoms of relapse.

c. Longitudinal medication management is needed to monitor side effects, including tardive dyskinesia.

4. Relapse of symptoms.

a. When a patient relapses, it should first be determined whether or not the patient was compliant with his or her antipsychotic medications. If not, resumption of the medication should occur. If the patient was compliant and had been previously responding and tolerating the agent, an increase in the medication dose may stabilize the psychotic symptoms (keeping in mind the standard dosage ranges).

b. If symptoms relapse and the patient is not adequately responding to the current antipsychotic agent (while being used at adequate dosages), a trial of a different neuroleptic should then be undertaken.

c. Patients who relapse may require acute hospitalization. This decision should be based on the severity of psychotic symptoms, potential danger to self or others, degree of impairment in the patient's ability to maintain basic self-care, and the availability of supportive services in the community.

5. Patients who do not respond to antipsychotics.

a. Before it is decided that the patient is a non-responder, the patient must receive at least two adequate trials of different antipsychotic agents.

b. In adults, there are reports of successfully augmenting antipsychotic therapy with lithium, anticonvulsants, benzodiazepines, and fluoxetine. However, these are yet unproven and have not been studied in children and adolescents.

c. There are reports of clozapine being used successfully for adolescents with schizophrenia; however, in the United States, there is little experience with its use in patients younger than 16 years of age. If it is to be used, close monitoring for potential seizures, agranulocytosis (with periodic blood cell counts), and weight gain is necessary.

6. Psychosocial therapy.

a. Psychoeducational therapy for the patient, including ongoing education about the illness, medication effects, and basic life skills training. In addition, cognitive-behavioral strategies, such as social skills and problem-solving skills, should be taught.

b. Psychoeducational therapy for the family focusing on increasing the understanding of the illness, treatment options, and prognosis and developing strategies to cope with the symptoms of the patient.

c. Individual (usually supportive rather than insight-oriented), group, or family psychotherapy to address the associated psychosocial problems inherent to the disorder and any other ongoing environmental and/or psychological stressors.

7. Treatment of associated disorders or symptoms, such as substance abuse disorder, depression, or suicidality.

8. Partial hospitalization or day treatment programs.

a. Many patients will need the specialized educational and psychiatric services available in either a partial hospitalization or day treatment program in order to be maintained at home within their community.


a. In some cases, the severity of the individual's illness, lack of effective response to treatment, or chaotic social situations may necessitate long-term hospitalization or residential treatment. This option should be considered only after less restrictive alternatives have been unsuccessful. Once in a long-term residential setting, the patient's status needs to be reassessed at regular intervals, with the goal of returning the patient to a less restrictive setting when possible.

10. Flexible models of care.

a. Given the complex and often chronic clinical needs of youth with EOS, many patients will need an integrated continuum of clinical providers and services. Such resources may
include case management, intensive community and family support, in-home services, specialized foster care or other out-of-home placement, and specialized educational and/or vocational programs.

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