SCHIZOPHRENIA

Introduction

Schizophrenia is a pervasive, devastating, neuropsychiatric disorder associated with extreme deficits in cognition, behavior, and social functioning (McClellan & Werry, 2001). Estimates indicate that schizophrenia occurs in one percent of populations worldwide and in all known cultural and ethnic groups (McDonell & McClellan, 2007). Onset of schizophrenia typically occurs between age 16 and 30; the rate of onset increases during adolescence, peaking at age 30 (Mueser & McGurk, 2004; McClellan & Werry). Schizophrenia in youth is rare, only accounting for one percent of individuals with schizophrenia. Therefore, most information used to diagnose and treat this group of people has been attained from studies with adult participants (Brown et al., 2008; Kumra, 2008).

Onset before age 18 is categorized as early-onset schizophrenia (EOS) whereas onset before age 13 is categorized as childhood-onset schizophrenia (COS) (McClellan, Stock & American Academy of Child and Adolescent Psychiatry [AACAP] Committee on Quality Issues [CQI], 2013). This very early onset is exceedingly rare and much more severe than EOS. Although earlier onset is associated with poorer outcomes, earlier treatment of schizophrenia may reduce the likelihood of the child's functional decline and long-term impairment (NAMI, 2010). For the purposes of this section of the *Collection,* the terms schizophrenia and EOS will be used interchangeably.

Males are 1.4 times more likely to be diagnosed than females and most youth with EOS maintain the diagnosis over time (NAMI, 2010; McClellan, Stock & AACAP CQI, 2013; McClellan & Werry, 2001; Asarnow, Tompson & McGrath, 2004). Studies have shown that the most common criteria in EOS are hallucinations, formal thought disorder, and flattened affect, (i.e., lack of emotions or emotional response). Systematic delusions and catatonic symptoms (i.e., motor immobility and stupor) are less common (McClellan & Werry; Pavuluri, Herbener & Sweeney, 2004). Although these criteria are consistently found in EOS, it is important to note that EOS is a phasic disorder with much individual variability (Werry, McClellan & Chard, 1991; Asarnow & Tompson, 1999).

Recent Changes from the DSM-IV to the DSM-5

In 2013, the American Psychiatric Association released the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*). Several key changes were made to the schizophrenia category. The *DSM-5* raises the symptom threshold, requiring that an individual exhibit at least two of the specified symptoms (the threshold was previously one in the *DSM-IV*) (American Psychiatric Association [APA], 2013a). Additionally, the diagnostic criteria no longer identify schizophrenia subtypes. Subtypes were previously defined by the predominant symptom at the time of evaluation but were not always helpful to clinicians because patients' symptoms often changed from one subtype to another. Thus, patients could have overlapping subtype symptoms, which blurred distinctions and decreased their validity (APA). Some of the former subtypes are now specifiers to help provide further detail in diagnosis. For example, catatonia is now used as a specifier for schizophrenia.

According to the AACAP Practice Parameters, the diagnosis of EOS is made using the same *DSM-5* criteria as those for adults. Evidence shows that EOS and adult-onset schizophrenia are most likely the same disorder (McClellan, Stock & AACAP CQI, 2013).

The *DSM-5* is a manual for assessment and diagnosis of mental health disorders and does not include information for treatment of any disorder. In the future, more evidence supporting treatments of disorders with *DSM-5* classifications will be available as clinical studies using *DSM-5* criteria are conducted. As a result, the *Collection* will reference studies that utilize *DSM-IV* diagnostic criteria to explain symptoms and treatments.

Causes and Risk Factors

It is likely that genetic, behavioral, and environmental factors influence the development of EOS (Kodish & McClellan, 2008). Developmental and/or behavioral abnormalities are common with EOS; some reports indicate incidence as high as 90 percent (McClellan & Werry, 2001; McDonell & McClellan, 2007). Environmental factors can intensify genetic or neurodevelopmental deficiencies; thus, findings point to a combination of and interaction between genetic and environmental influences (U.S. Department of Health and Human Services, 1999). Environmental factors associated with schizophrenia include maternal malnutrition, infections during critical periods of fetal development, fetal hypoxia (a lack of oxygen to the brain), and other birth and obstetric complications (Carpenter, 2004). Prenatal malnutrition may also increase the likelihood of schizophrenia, including a lack of folate in the mother's diet (Susser et al., 1996; Kirkbride et al., 2012).

Research indicates that early central nervous system lesions have been shown to affect the normal maturational processes of the brain in youth with schizophrenia (McClellan & Werry, 2001). The initial findings of a National Institute of Mental Health (NIMH) study of EOS showed that youth who had psychotic episodes before puberty demonstrated evidence of progressively abnormal brain development (NIMH, 2001). Major changes occur in the brain during puberty, which could trigger symptoms of schizophrenia (NIMH, 2007). This study revealed that ventricles enlarged abnormally in youth ages 14 to 18 with EOS, suggesting a shrinking of brain tissue volume. This shrinking is significant because losses in the rear of the brain are influenced primarily by environmental factors and suggest that a non-genetic cause may play a role in the initial progression of the disorder. The brain loss pattern in youth is consistent with that seen in adults with schizophrenia.

The literature shows no evidence that psychosocial factors cause schizophrenia (McClellan, Stock & AACAP CQI, 2013). Evidence does suggest that the onset, course, and severity of schizophrenia are due to the interaction between environmental and biological risk factors. Psychosocial factors play a part by influencing the onset, episode intensity, and relapse rate. Earlier onset age has been associated with more severe impairments (Kodish & McClellan, 2008). EOS is linked to poorer functional outcomes and increased negative symptoms in adulthood (McClellan & Werry, 2001).

There are strong correlations with the incidence of schizophrenia and other seemingly unrelated symptoms. People who are left-handed or ambidextrous make up a significant portion of those with schizophrenia, and, although being left-handed does not cause schizophrenia, there is a relationship between the two factors (Webb et al., 2013). The same link without causation is true for children who exhibit motor difficulties. While these connections exist, they may be primarily anecdotal and should not be cause for concern alone. The presence of these attributes does not ensure that there is a definitive correlation (*New York Times,* 2013).

Studies have shown that schizophrenia is highly influenced by genetics. Compared to the general population, the risk of being diagnosed with schizophrenia is five times higher for second-degree relatives of persons who have schizophrenia, ten- to fifteen-fold higher for first-degree family members (including dizygotic (fraternal) twins), and forty to fifty times higher for monozygotic (identical) twins or when both parents have schizophrenia (Carpenter, 2004).

Prevalence

Figure 1 describes the prevalence of EOS.

Figure 1
Prevalence of Early-Onset Schizophrenia (EOS)

Prevalence of EOS: 0.1%

Approximately 1 in 100 people are diagnosed with schizophrenia (1%). An estimated 1 in 100 of those with schizophrenia developed it in childhood (0.1%).

Ratio of males to females: 1.4:1

Males are 1.4 times as likely as females to develop schizophrenia. Boys are more likely to develop EOS between age 15 and 24, whereas women are more likely to develop schizophrenia between 25 and 34. The earlier a girl starts menstruating, the more protection she has against developing schizophrenia.

Heredity

Genetics may affect prevalence as well, as one is 5 to 20 times more likely to develop schizophrenia than the general population if one is a first-degree relative of affected persons.

Sources: NAMI, 2010; McCLellan, Stock & AACAP CQI, 2013; *New York Times,* 2013; McClellan & Werry, 2001).

Assessment

Proper assessment of EOS in youth is essential in early diagnosis, intervention, and treatment. Although no information on early intervention is available in the EOS literature, research shows that the duration of untreated psychosis predicts poorer outcomes in adults with schizophrenia (Harrigan, McGorry & Hrstev, 2003). Unfortunately, EOS is often misdiagnosed because of its rarity and because its symptoms are similar to other mood disorders (McClellan & Werry, 2001). To prevent misdiagnosis and increase the chance of a better prognosis in youth, a complete, multi-informant, multi-method assessment is key (McDonell & McClellan, 2007). The AACAP practice parameter recommends that the assessment also incorporate an understanding of the youth's developmental, social, educational, and psychological needs (McClellan & Werry; McClellan, Stock & AACAP CQI, 2013).

The *DSM-5* outlines several related symptoms that may assist in a schizophrenia diagnosis (APA, 2013b). Along with a lack of awareness of his or her illness, a youth may display:

- Inappropriate affect, such as laughing without the appropriate stimulus
- Disturbed sleep pattern
- Dysphoric mood that might mimic depression, anxiety, or anger
- Lack of interest in food or food refusal
- Depersonalization, derealization, and/or somatic concerns, all of which may reach delusional levels
- Anxiety and phobias
- Cognitive deficits, including slower processing speed and decreased:
  - Declarative memory
  - Working memory
  - Language function
  - Other executive function
- Deficits in the ability to infer others' intentions
- Abnormalities in the following:
  - Sensory processing
  - Inhibitory capacity
  - Attention
- Hostility or aggression

A comprehensive diagnostic assessment should include interviews with the youth and his or her family, a review of past records and other pertinent information, and a detailed evaluation of the psychotic symptoms (McClellan & Werry, 2001). Symptom presentation, course of illness, confounding factors, family psychiatric history, and a mental status examination are important issues that should be addressed during the assessment. During the initial assessment period, the clinician should choose both broadband (general screening tools) and narrowband (specific to disorder) measures in order to eliminate or confirm other possible diagnoses or comorbid disorders.

One of the first steps in assessing for EOS is an examination by a primary care provider to rule out a medical reason for the youth's change from normal behavior. Many medical conditions, such as delirium, seizure disorders, central nervous system lesions, neurodegenerative disorders, and developmental disorders, can cause organic psychosis (McClellan & Werry, 2001). Psychotic symptoms brought on by substance abuse should also be ruled out. Other conditions that should be ruled out prior to a diagnosis of schizophrenia include psychotic mood disorders, behavioral/emotional disorders, schizoaffective disorder, autism spectrum disorder, obsessive-compulsive disorder, and delusional disorders.

McClellan, Stock, and the AACAP CQI (2013) published a report that included recommendations for the appropriate diagnosis of schizophrenia in children and adolescents. The following are their recommendations for diagnosing youth with EOS.

1. Psychiatric assessments for children and adolescents should include screening questions for psychosis.
2. The diagnosis of schizophrenia in children and adolescents should follow DSM-5 criteria.
3. Youth with suspected schizophrenia should be carefully evaluated for other pertinent clinical conditions and/or associated problems, including suicidality, comorbid disorders, substance abuse, developmental disabilities, psychosocial stressors, and medical problems (McClellan, Stock & AACAP CQI).

Suggested assessment tools for schizophrenia are outlined in Table 1.

Table 1
Suggested Assessment Tools

Measure Type	Name of Measure	Who Completes	Data Generated
Clinical interview	Schedule for Affective Disorders and Schizophrenia for School-Age Youth present and lifetime (K-SADS-P/L)	Clinician w/ youth/parent	Diagnosis
Clinical interview	Structured Clinical Interview for *DSM-IV*, Childhood Diagnoses (KID-SCID)	Clinician w/ youth/parent	Diagnosis
Symptom rating scale	Scale for the Assessment of Positive Symptoms (SAPS)	Clinician with youth	Symptom ratings
Symptom rating scale	Scale for the Assessment of Negative Symptoms (SANS)	Clinician with youth	Symptom ratings
Symptom rating scale	Positive and Negative Syndrome Scale	Clinician with youth	Symptom ratings
Behavior checklist	Youth Self-Report (YSR)	Youth	Syndrome scale scores; competence scores
Behavior checklist	Child Behavior Checklist (CBCL)	Parent	Syndrome scale scores; competence scores

Source: McDonell & McClellan, 2007.

In addition, clinicians must acknowledge developmental, cultural, and intellectual factors that may influence assessment and diagnosis. This will allow the clinician to interpret clinical data correctly and to differentiate between appropriate and inappropriate behavior. It is also imperative that the clinician assesses not only for symptoms, but also for functional impairment and the degree to which the youth functions at home, school, and in play.

Personality and projective tests are not indicated as a method of diagnosing schizophrenia in youth; research indicates no demonstrated ability to increase the diagnostic accuracy of EOS when using tools such as the Rorschach (McDonell & McClellan, 2007).

Diagnostic Criteria

In order to receive a diagnosis of schizophrenia, there must be ongoing signs for six months. Two or more of symptoms below must be present for at least one month, one of which must be (1), (2), or (3).

1. Delusions
2. Hallucinations
3. Disorganized speech (indicating disorganized thinking)
4. Grossly disorganized or abnormal motor behavior (including catatonia)
5. Negative symptoms such as:
    - Diminished emotional expression
    - Avolition (lack of motivation to complete goals)
    - Alogia (diminished speech, even when pressured to engage)
    - Anhedonia (inability to experience pleasure from positive stimuli)
    - Asociality (lack of interest in social interactions)

Clinicians must rule out schizoaffective disorder and depressive or bipolar disorder with psychotic episodes, as well as a drug or medicine causing the symptoms (APA, 2013b). Finally, if a child has a history of autism spectrum disorder or a communication disorder, the child must experience prominent delusions or hallucinations for at least one month (APA). If the delusions, hallucinations, and/or disorganized speech do not persist for most of a month due to treatment, a schizophrenia diagnosis may still appropriate if the symptoms would have persisted without the treatment (APA). Additionally, the child's functioning level must be significantly below the functional level prior to onset (APA). Areas of functioning include academics, occupational functioning, or personal relationships.

Table 2 outlines associated features of schizophrenia that may persist during remission of other symptoms.

Table 2
Associated Features of Schizophrenia

Feature	Explanation
Inappropriate affect	For instance, laughing without appropriate stimulus or at inappropriate times
Dysphoric mood	Exhibiting signs of depression, anxiety, or anger
Disturbed sleep pattern	Daytime sleeping and nighttime activity
Disturbed eating	Lack of interest in or refusal of food
Cognitive defects	Vocational and functional impairments in declarative and working memory, language function, other executive functions; slower processing speed
Social cognition defects	Difficulty inferring the intentions of others; interpreting irrelevant stimuli as meaningful, leading to the generation of explanatory delusions
Anosognosia	Lack of insight of schizophrenia symptoms and/or illness; typically a symptom rather than a coping strategy

Source: APA, 2013b.

Symptoms of schizophrenia can be divided into three groups: positive, negative, and cognitive symptoms (NIMH, 2009). Positive symptoms are defined as psychotic behaviors not seen in healthy individuals. Individuals with positive symptoms will have lost their hold on reality (NIMH). Negative symptoms, which are more subtle, are disruptions in normal emotions and behaviors (NIMH). Finally, cognitive symptoms, which are similar to negative symptoms in their subtlety, are disruptions in the functionality of the brain in everyday processes (NIMH). The three categories are described in Table 3.

The most common criteria for EOS are vivid hallucinations (this is unique to EOS as compared to adult schizophrenia), formal thought disorder, and flattened affect. Systematic delusions and catatonic symptoms are less common (McClellan & Werry, 2001; Pavuluri, Herbener & Sweeney, 2004). The variation of language and cognition in children may affect the symptoms present (McClellan Stock & AACAP CQI, 2013). Cognitive delays often co-occur with EOS, including memory, executive functioning, attention deficits, and global impairments (McClellan, Stock & AACAP CQI). At onset of schizophrenia, children often show cognitive decline (McClellan, Stock & AACAP CQI).

Prior to diagnosis, children often exhibit social withdrawal, disruptive behavior disorders, difficulty in school, and speech and language problems (McClellan, Stock & AACAP CQI, 2013). Signs of schizophrenia often present slowly over time, so parents often have difficulty recognizing psychotic symptoms in children with language delays and social withdrawal (McClellan, Stock & AACAP CQI).

Parents should look for unusual, suspicious, or paranoid thoughts along with language and social decline (McClellan, Stock & AACAP CQI).

In a recent study, over 50 percent of children thought to have schizophrenia were eliminated from participation because they had another mental health issue with symptoms similar to schizophrenia (Rapoport, 2013). Because misdiagnosis is a major issue in the assessment and diagnosis of EOS, clinicians should take care to differentiate true psychotic symptoms from overactive imaginations, idiosyncratic thinking, and perceptions caused by developmental delays and/or exposure to traumatic events. Symptoms must represent a marked change in mental status or level of functioning (McClellan & Werry, 2001).

Since EOS is a phasic disorder, individual variability must be considered when working with youth. Differences in clinical presentation of EOS across the phases must be taken into account during assessment and diagnosis. These phases and corresponding descriptions are listed below (Centre for Addiction and Mental Health [CAMH], n.d.).

Prodromal Phase: Prior to developing overt psychotic symptoms, affected youth will experience some period of deteriorating function, which may include social isolation, idiosyncratic or bizarre preoccupations, unusual behaviors, academic problems, and/or deteriorating self-care skills. However, while the presence of these problems should raise concerns, psychotic symptoms must be present before a diagnosis of schizophrenia can be made.

Active Phase: During schizophrenia's active phase, those affected may experience delusions, hallucinations, marked distortions in thinking, and disturbances in behavior and feelings. This phase most often appears after a prodromal period. On occasion, these symptoms can appear suddenly.

Residual Phase: After an active phase, those affected may be listless, have trouble concentrating, and be withdrawn. The symptoms in this phase are similar to those outlined under the prodromal phase. If there have been no symptoms before the first episode, few or no symptoms may be experienced afterward. During their lifetimes, people with schizophrenia may become actively ill only once or twice or may have many more episodes. Unfortunately, residual symptoms may increase and ability to function may decrease after each active phase. It is important to try to avoid relapses by following the prescribed treatment. Currently it is difficult to predict at the onset how fully a person will recover.

While schizophrenia symptoms must be present for one month, the disorder cannot be further clarified by a specifier until certain symptoms persist for at least one year (APA, 2013b). In such cases, longitudinal assessment is essential for confirming a tentative EOS diagnosis. Clinicians should rule out other disorders (e.g., schizoaffective disorder, mood disorders with psychotic features) before making a diagnosis of EOS.

Comorbidity

Youth suffering from EOS also have high rates of comorbid conditions (McDonell & McClellan, 2007). These disorders include:

- Depression
- Anxiety
- Externalizing disorders, such as:
- Attention-deficit/hyperactivity disorder (ADHD),
- Conduct disorder, and/or
- Oppositional defiant disorder (McClellan, Breiger, McCurry & Hlastla, 2003)

Table 3
Positive, Negative, and Cognitive Symptoms of Schizophrenia

Positive Symptoms	
Delusions	Types described below. May also involve thought withdrawal or insertion, or the belief that one is controlled by an outside force.
Persecutory:	Belief that a person or group will harm, harass, or otherwise bother the individual; most common type of delusion
Referential:	Belief that certain gestures, comments, and environmental cues are directed at the individual
Grandiose:	Individual believes he/she has exceptional abilities, wealth, or fame
Erotomanic:	Individual falsely believes someone is in love with him/her
Nihilistic:	Belief that a major catastrophe will occur
Somatic:	Focus on preoccupations on health and organ function
Religious:	Belief that one is a religious figure
Hallucinations	Auditory, visual, tactile and/or olfactory (smell) experiences which occur without an external stimulus
Disorganized speech	Loosening of associations; tangential or incoherent speech – adequate to impair communication
Disorganized behavior	Behavior that ranges from silliness to erratic tension; difficulty in sustaining goal-oriented behavior
Catatonic behavior	Lack of response to environment, motor immobility, mutism, posturing or stereotyped behavior, excessive motor behavior, echolalia (unconventional verbal behaviors), or echopraxia (imitation of movements of others)
Negative Symptoms	
Diminished emotional expression	Reductions in facial expression, eye contact, hand movements, and speech intonation
Avolition	Difficulty initiating and maintaining motivation to complete tasks
Alogia	Diminished amount and quality of speech
Anhedonia	Less able to experience pleasure from positive stimuli or forgetting previous pleasures experienced
Affective flattening	Limited facial affective expression, eye contact, and body language
Cognitive Symptoms	
Poor Executive Functioning	Inability to learn/understand information and then use it to make decisions
Trouble focusing	Inability to sustain attention over long periods of time
Limited working memory	Inability to effectively utilize information immediately after learning it

Sources: McDonell & McClellan, 2007; APA, 2013b; NIMH, 2009.

In addition, developmental delays and cognitive difficulties are found at a high rate in youth with EOS. Autism spectrum disorder is also a common first diagnosis and/or comorbid disorder (McDonell & McClellan).

In adolescents with EOS, comorbid substance abuse is also a major issue (Kumra, Thaden & Kranzler, 2005). Although no research has been conducted with youth diagnosed with schizophrenia and comorbid substance abuse, research in adults has shown that nicotine use is the most common form of substance abuse, and that over half of adults with schizophrenia use tobacco products regularly (NIMH, 2007; APA, 2013b).

At least one study considered the frequency of comorbid disorders in children with EOS. The rates are outlined in Table 4.

Table 4
Prevalence of Comorbid Disorders in Youth with EOS

Disorder	Comorbidity Prevalence Rate
ADHD	84%
Oppositional defiant disorder	43%
Depression	30%
Separation anxiety disorder	25%

Source: Ross, Heinlein & Tregellas, 2006.

Suicide Risk

The *DSM-5* warns of the salient risk suicide poses for those with schizophrenia (APA, 2013b). Between five and six percent of individuals with schizophrenia die of suicide, and approximately 20 percent attempt it (APA). Even more of these individuals experience suicidal ideation (thoughts of suicide) (APA). According to the *DSM*-5, suicide risk is high throughout the life of both males and females. However, it may be highest in young males who also use or abuse drugs and similar substances. The likelihood of suicide is highest when a youth is in a depressive state or is experiencing depression-like symptoms, after a psychotic episode, or after being discharged from the hospital (APA). Monitoring youth with EOS for suicide risk is extremely important. A review of suicide assessment tools is provided in the *Collection*'s "Youth Suicide" section.

Treatments

The AACAP Practice Parameter for treatment of EOS recommends a comprehensive, multimodal combination of both psychopharmacology and psychosocial therapies (McClellan, Stock & AACAP CQI, 2013). Antipsychotics are usually prescribed immediately following a diagnosis of schizophrenia. Typically, antipsychotics and therapy are continuous throughout a child's or adolescent's life, as relapses are linked with the discontinuation of either forms of treatment (McClellan, Stock & AACAP CQI). Once an individual relapses for any reason, it becomes harder to maintain a baseline. Furthermore, after each subsequent relapse, it becomes more difficult to return to normal health and functioning, and the likelihood of more relapses and staying unhealthy increases. This decline can have irreversible effects; therefore, vigilance is essential (Emsley, Chiliza, Asmal, & Harvey, 2013).

The AACAP also advises that treatment should acknowledge several factors, including treatment setting, the age of the youth, and the family environment. The focus of therapy, as set out by the AACAP, is to

alleviate symptoms, reduce long-term mortality, and prevent relapse, while maintaining youth in their homes and communities.

Currently, there are no pharmacological or psychosocial therapies with enough evidence in youth samples to meet the highest standard for evidence-based treatments (McClellan, Stock & AACAP CQI, 2013). Thus, research on treatment of EOS is recent and sparse.

Table 5 summarizes treatments for EOS.

Table 5
Summary of Treatments for Early-Onset Schizophrenia

What Works	
There are no evidence-based practices at this time.	
What Seems to Work	
Psychopharmacological treatment with second-generation (atypical) antipsychotics	Risperidone Aripiprazole Quetiapine Paliperidone Olanzapine
Psychopharmacological treatment with traditional neuroleptics/first generation antipsychotics	Molindone Haloperidol
Family psychoeducation and support	Helps to improve family functioning, problem solving and communication skills, and decrease relapse rates.
Cognitive behavioral therapy (CBT)	Includes social skills training, problem-solving strategies, and self-help skills.
Cognitive remediation	Pointed tasks to help improve specific deficiencies in cognitive, emotional, or social aspects of a patient's life.
Not Adequately Tested	
Electroconvulsive therapy (ECT)	Small electric currents are passed through the brain, intentionally triggering a brief seizure to reverse symptoms of certain mental illnesses. Unproven as effective in youth. Should only be used as a last effort after all risks are weighted against possible benefits.
What Does Not Work	
Psychodynamic therapies	Talk therapies that focus on a client's self-awareness and understanding of the influence of the past on present behavior. These therapies are considered to be potentially harmful for youth with schizophrenia.

Pharmacological Treatments

Because there are few controlled studies on the efficacy and safety of-psychopharmacological medications for youth with EOS, pharmacological treatment of youth diagnosed with schizophrenia is modeled after treatment studies with adults (McClellan & Werry, 2001; Brown et al., 2008; Kodish & McClellan, 2008). Although there have been studies of these drugs, many are limited in their scope and external validity. Serious side effects include seizures and neutropenia, a blood condition in which the cells that defend the body against bacterial infections (neutrophils) are significantly reduced (McClellan & Werry, 2001; Godwin & Braden, 2009). These adverse side effects have been shown to occur at a higher rate in youth than in adults (McClellan & Werry).

The most widely prescribed class of drugs for youth under 18 years of age are second-generation antipsychotics. Second generation antipsychotics show no significant difference in efficacy between first generation antipsychotics, but their side effects are far less severe, making them the preferred choice of treatment for youth (McClellan, Stock & AACAP CQI, 2013). The FDA has approved risperidone, aripiprazole, quetiapine, paliperidone, and olanzapine for the purposes of treating children over the age of 13, but these medications still do not meet the criteria for evidenced-based treatments (McClellan, Stock & AACAP CQI; Paglsberg et al., 2014).

One of the largest studies to date of the efficacy of antipsychotics in youth compared two second-generation antipsychotics (risperidone and olanzapine) to haloperidol, a conventional antipsychotic. After eight weeks of treatment, the study measured a treatment response in 88 percent of youth taking olanzapine and 74 percent in those taking risperidone, as compared to 53 percent in those taking haloperidol (Sikich, Hamer, Bashford, Sheitman & Lieberman, 2004). Clozapine also has documented efficacy in youth in over 15 studies (Brown et. al., 2008; McClellan & Werry, 2001; McClellan, Stock & AACAP CQI, 2013). However, owing to its potential side effects, clozapine is reserved for treatment in patients with two or more failed trials of a first-line antipsychotic agent. Before using clozapine, it is important to review the youth's clinical status and treatment history. Moreover, when using clozapine, systematic monitoring of side effects, including following established protocols for blood count monitoring, is required (McClellan, Stock & AACAP CQI, 2013).

A randomized clinical trial looking at therapies appropriate for EOS found that youth remained on olanzapine significantly longer than risperidone and haloperidol. Another study showed no difference in efficacy or tolerability of risperidone and quetiapine on first-onset psychosis (McClellan, Stock & AACAP CQI, 2013).

Long-term monitoring of therapy compliance and side effects is essential for any treatment regimen requiring antipsychotic agents (McClellan & Werry, 2001). A common side effect of atypical antipsychotics is weight gain, which can result in many general metabolic disorders in youth (Kowatch et al., 2005). Cognitive side effects, such as problems with word retrieval, working memory, and cognitive dulling, can also occur. Other side effects for both first- and second-generation antipsychotics include abnormal involuntary movements and neuroleptic malignant syndrome (McClellan & Werry; Brown et al., 2008). Youth may be at higher risk than adults for extrapyramidal side effects (i.e., repetitive, involuntary muscle movements or an undeniable urge to be moving). Because these medications may have serious side effects, parents and clinicians must educate themselves in order to make informed decisions, keeping the risks of side effects and potential adverse reactions in mind.

In addition to the side effects, there are different factors that go into choosing the correct medication for a youth with schizophrenia. Clinicians and families must make the best decision based on FDA recommendations, cost, clinician familiarity, patient profile, and family preference (McClellan, Stock & AACAP CQI, 2013).

Pharmacological treatment is considered first-line therapy for children with schizophrenia. However, it must be used in addition to psychotherapeutic interventions for a more holistic treatment approach with a higher rate of effectiveness (McClellan, Stock & AACAP CQI).

Psychological Treatments

There are many different psychological treatment options for youth with schizophrenia. Although studies are limited and patient access can be an issue, there is significant evidence suggesting their efficacy (McClellan, Stock & AACAP CQI, 2013). A proper psychological treatment paired with medication can be extremely effective in improving a patient's functioning (emotionally, socially, and cognitively) and their overall cost of care (Penn et al., 2005). The incidence of re-hospitalization is also significantly reduced with an effective psychological treatment plan (McClellan, Stock & AACAP CQI). An integrated treatment protocol of medication, monitoring, and access to rehabilitation programs will help prevent relapse better than medication alone (*New York Times*, 2013).

The AACAP Practice Parameters state that the goal of therapy is both to help the youth return to a premorbid level of functioning (i.e., prior to the development of the disorder) and to promote the mastery of age-appropriate developmental tasks (McClellan & Werry, 2001). With the addition of these adjunctive psychotherapies, it is easier for youth to adhere to treatment protocols and remediate morbidity (McClellan, Stock & AACAP CQI, 2013). Family involvement in treatment for EOS is especially important because youth are usually dependent on their families (Brown et al., 2008). Evidence suggests that family involvement can make treatment more effective and decrease the amount of time a youth spends in institutional care (Lenior et al., 2001).

Treatment Considerations

Treatment protocols may vary, depending on the phase of illness (McClellan & Werry, 2001). Specialized educational programs and/or vocational training programs, such as adjunctive psychotherapies or cognitive remediation, may be crucial for some youth to address related cognitive and functional deficits (McClellan, Stock & AACAP CQI, 2013; McClellan & Werry, 2001). Some youth will likely require more intensive community support services. There are some cases in which the severity of symptoms necessitates long-term placement in a residential facility. However, as in treatment for all disorders in youth, the least restrictive setting option should always be utilized as appropriate. In addition to those treatments provided specifically for schizophrenia, other treatments may be needed to address comorbid conditions or other treatment implications, such as substance abuse, depression, and thoughts of suicide (McClellan & Werry). Treatment for schizophrenia is a lifelong process (NIMH, 2007).

Follow-up studies have shown that family acceptance, appropriate medication management, appropriate psychological treatment, and appropriate school placement are predictors of good response to treatment in youth with EOS (Findling, Boorady & Sporn, 2007; McClellan, Stock & AACAP CQI, 2013).

Unproven Treatments

Psychodynamically-oriented therapies are considered to be potentially harmful for youth with schizophrenia; thus their use is not recommended (U.S. Department of Health and Human Services, 1999). Case studies have described the use of electroconvulsive therapy (ECT) for youth with treatment-refractory schizophrenia. The overall effectiveness of ECT in youth remains in question, and it has not been studied to the degree necessary to be considered evidence based. ECT should be a last effort after all other treatment options have been exhausted and after the cost to benefit ratio has been discussed in depth with the treating clinician (McClellan, Stock & AACAP CQI, 2013). Social skills training is also not currently supported as a treatment for EOS (Asarnow et al., 2004; Penn et al., 2004).

Cultural Considerations

When assessing, diagnosing, and treating youth with mental health disorders, clinicians should take into consideration the youth's cultural background. Unfortunately, little is known about cultural differences in the prevalence or presentation of EOS. However, research has shown that minority youth have a higher chance of being diagnosed with a behavior disorder or schizophrenia (DelBello, Lopez-Larson, Soutullo & Strakowski, 2001). In addition, in some cultures and religious groups, certain delusions and hallucinations (e.g., hearing or seeing religious figures or spirits) are part of a standard religious practice. When taken out of context, cultural or religious beliefs could be misinterpreted as possible psychosis (McClellan & Werry, 2001). To avoid misdiagnosis, a clinician should carefully assess minority youth, especially when the presenting complaint involves psychotic symptoms (Youngstrom, 2007). Garb suggests that, when assessing minority youth, clinicians should gather family history data at the symptom level, if possible, and be cautious about face value interpretation due to the potential for cultural bias (1998). Clinicians treating youth with EOS should also acknowledge family dynamics in developing treatment plans.

There is also a negative stigma against schizophrenia in society in general. Stigmas are defined as a negative misrepresentation of a group (Benbow, 2007). Negative stigmas surrounding the diagnosis of schizophrenia can deter individuals from seeking initial assessment and continuing care (Benbow). Schizophrenia is also grossly misunderstood in society (Owens, 2007). This lack of knowledge can lead to the limited advancement of those with schizophrenia, as many rely on preconceived notions of the illness to evaluate individuals suffering from schizophrenia (Link, Cullen, Frank & Wozniak, 1987; Schulze, 2008).

Overview for Families

Schizophrenia is an illness that causes strange thinking and unusual behavior (AACAP, 2013). Schizophrenia in youth, or early-onset schizophrenia, is both uncommon and hard to recognize (AACAP). The source of schizophrenia is unknown, and it is a life-long disease (AACAP). Some early signs of the disorder include talking about strange fears and ideas, clinging to parents, and speaking incoherently or nonsensically (AACAP). Typically, the onset of the disease is slow and changes are gradual.

The symptoms of schizophrenia in children and adolescents differ from those in adults. They include but are not limited to:

- Hallucinations (the most common criteria for youth)
- Paranoia
- Odd behavior and speech
- Bizarre thoughts and ideas
- Inability to discern television and dreams from reality
- Extreme moodiness
- Withdrawn and increased isolation
- Decline in personal hygiene (AACAP, 2013).

Families should look for the symptoms listed above, but also realize that schizophrenia progresses in phases. Psychosis (a condition in which thought and emotions are so impaired that contact is lost with external reality) must be present prior to a diagnosis of schizophrenia.

Prodromal Phase:

Before a child displays very obvious symptoms they may decline in any of the following ways:

- Social function
- Odd preoccupations
- Idiosyncratic behaviors
- Trouble in school
- A lack of self-care

Active Phase

- Hallucinations
- Delusions
- Marked distortions in thinking
- Disturbances in behavior and feelings

Residual Phase

- Listless
- Trouble concentrating
- Other symptoms similar to Prodromal Phase (CAMH, n.d.)

It should be noted that the active phase is often the most frightening phase to both the youth with schizophrenia and those closest to the youth (CAMH). Also, if a child does not respond to treatment and still exhibits symptoms, treatment should continue and alternative treatments should be explored (McDonnell & McClellan, 2007).

If families suspect that a child has schizophrenia, they should ask their family physician or pediatrician to refer them to a child or adolescent psychiatrist with special training in evaluating and diagnosing children with schizophrenia (AACAP, 2013).

Resources and Organizations

American Academy of Child and Adolescent Psychiatry (AACAP)

Facts for Families: Schizophrenia in Children

http://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Schizophrenia-In-Children-049.aspx

Brain & Behavior Research Foundation

https://www.bbrfoundation.org/

Mental Health America (MHA)

(formerly National Mental Health Association)

http://www.mentalhealthamerica.net

National Alliance for Mental Illness (NAMI)

Schizophrenia

https://www.nami.org/Learn-More/Mental-Health-Conditions/Schizophrenia

National Institute of Mental Health (NIMH)

http://www.nimh.nih.gov

Substance Abuse and Mental Health Services Administration (SAMHSA)

National Mental Health Information Center

http://mentalhealth.samhsa.gov

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