eMentalHealth.ca

Psychosis and Schizophrenia in Children and Adolescents: Information for Psychiatry Residents

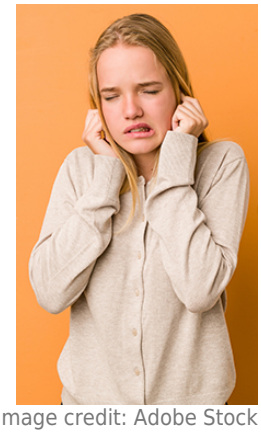

Image credit: Adobe Stock

Summary: Psychosis is a syndrome characterized by delusions, hallucinations and disorganization. Early detection and intervention is crucial to optimize long-term outcomes.

Case, Part 1

Identifying data	• 17 yo male, previously well, brought to ED by parents because he threatened them with a knif
Reason for Referral	• Parents: “He’s just not himself” • Youth: “All my family cares about is that I go to school. They don’t understand how stressful it is.”
HPI	• Few months ago • Onset of withdrawal from usual behaviours and activities, and skipping classes, stating that peers have been spying on him and stalking him online. • • Last week, suspicious about food being poisoned, and now prefers to eat take out food, or pre-packaged foods, e.g. granola bars and individual sealed yogurt. • Now unable to attend school.
Substance Use	• Cannabis use for at least few weeks
Family Psychiatric History	• Maternal grandmother: History of paranoia, but never formally diagnosed.
School History	• Average student

Etiology

Genetic

- Monozygotes 40-50% concordance
- No one gene
- Different in different individuals/families

Environmental

- In utero maternal famine
- Paternal age
- Prenatal infections
- Obstetric complications
- Immigration

Risk Factors for Psychosis

- Familial risk
- Recent deterioration in functioning (poor GAF)
- Unusual, suspicious, paranoid thought content (abnormal thought content)
- Greater social impairment
- Substance use

Does cannabis cause schizophrenia?

- Prevalence for psychosis has been historically stable despite increasing rates of use and potency of cannabis.
- Cannabis may accelerate onset of worse prognosis in those who are already vulnerable
- More study is underway

Neuropathophysiology

Pathophysiology in Early Onset Schizophrenia

- ↑'d lateral ventricle volumes (as adults)
- ↓ gray matter volumes (EOS)
- ↓ cortical folding (EOS)
- Thought to arise from disruption neuro developmental process in adolescence
- One study - unaffecting siblings shared similar cortical deficits (ie familial traits with variable impact on disease risk)

Epidemiology

How common are symptoms of psychosis?

- Approximately 9-14 out of 100 adolescents report symptoms of psychosis such as auditory hallucinations (Bartels-Velthuis, 2010; Horwood, 2008)
- Symptoms are usually subclinical and do not come to clinical attention

How common is psychosis?

- Approximately 3 out of every 100 people will experience at least one psychotic episode in their lifetime

How common is schizophrenia?

- Approximately 1 in 100 will be diagnosed with schizophrenia
- Age of onset
    - First episode of psychosis usually occurs in adolescence or early adulthood.
    - 20% of adults who have a diagnosis of schizophrenia report that their symptoms started before age 18 (Maloney, 2012)
- Childhood onset schizophrenia
    - Rare, incidence less than 1 in 10,000 (Shaw, 2006)

Red Flags

Psychotic symptoms in children/youth are a red flag as they indicate an increased risk (5-11 fold increase) of later developing psychotic illness (Poulton, 2000) including increased suicide risk (Kelleher, 2013)

Symptomatology

Psychotic like experiences (PLE) occurs in

- 15% of children <10 yo
- 10% of children aged 10-15
- 5% of teens > 15+
- PLEs may be
    - PLE - normal
    - PLE associated with other disorders
        - E.g. anxiety, depression, stress, grief/loss, trauma, borderline personality disorder
    - PLE associated with psychotic disorder
        - Risk factors include
            - Family history
            - Social isolation
            - Cannabis exposure

Terms

Early onset schizophrenia: Onset of schizophrenia before age 18

- Types:

1. Adolescent onset-schizophrenia Onset of schizophrenia during adolescence (i.e. aged 13-18)
2. Childhood onset schizophrenia (aka “very early onset”):
    - First episode of psychosis (of what will eventually become diagnosed as schizophrenia) occurs in childhood (i.e. under age 13)

First episode psychosis

- When psychotic symptoms are impairing, the patient is no longer deemed to be in the prodromal phase of illness, but the ‘first episode’.

Psychosis vs. Schizophrenia

Psychosis is a very general symptom that occurs in many conditions and situations. Saying someone has psychosis is like saying someone has a fever.
Psychosis is not synonymous with schizophrenia, in fact, most patients with psychotic symptoms do not have schizophrenia, rather symptoms are part of another presentation such as:

- Depression with psychotic features,
- Bipolar disorder,
- Anxiety and trauma,
- Substance induced psychosis, etc.)

Clinical Presentation of Psychosis

Psychosis can present differently, depending on the age of the individual.

Childhood

- Language delays
- Motor problems such as late or unusual crawling; late walking

Adolescents/ youth

- Withdrawal from friends and family
- A drop in performance at school
- Trouble sleeping
- Irritability or depressed mood
- Lack of motivation
- Strange behavior
- Compared with adults, teens may be less likely to have delusions and more likely to have visual hallucinations

Adults

- "Positive" symptoms
    - Hallucinations: May involve any of the senses though most common are visual or auditory hallucinations.
    - Delusions: False beliefs that are not based in reality such as
        - Paranoid delusions: Believing that one is being harmed or harassed; certain gestures or comments are directed at you;
        - Delusions of grandeur, grandiose delusions: Feeling that one has exceptional ability or fame
        - Erotomanic delusion: False belief that another person is in love with you
    - Disorganized thinking (speech): Disorganized thinking is inferred from disorganized speech. Effective communication can be impaired, and answers to questions may be partially or completely unrelated. Rarely, speech may include putting together meaningless words that can't be understood, sometimes known as word salad.
    - Disorganized or abnormal motor behavior: Behavior is not focused on a goal, which makes it hard to perform tasks. Abnormal motor behavior can include resistance to instructions, inappropriate and bizarre posture, a complete lack of response, or useless and excessive movement (catatonia).
- "Negative" symptoms
    - Lack of or reduced ability to function normally
    - Examples:
        - Patient lacks emotion
        - Patient does not make eye contact;
        - Patient’s facial expressions are blunted;
        - Patients may talk less, neglect personal hygiene, lose interest in everyday activities or socially withdraw.

Assessment / History

Do a comprehensive psychiatric assessment
Ask caregivers:

- Hallucinations
    - Visual: Does s/he see any things that others can’t see?
    - Auditory: Does s/he hear any things that others can’t, e.g. voices?
- Delusions
    - Does s/he have any strong beliefs that seem a bit extreme? E.g. paranoia, a worry that others are out to get him/her?
- Has s/he had troubles functioning?
    - Trouble with relationships?

    - Troubles at school?
    - Troubles at work?

Ask youth:

- Hallucinations:
    - General
        - Do you think that your senses may be playing tricks on you?
    - Visual:
        - Do you see any things that others can't? E.g. Do you ever see things out of the corner of your eye, shadows, shapes or people whom others don't appear to see?
    - Auditory
        - Do you hear any things that others can't? E.g. Hear any voices talking to you or about you when no one was there?
    - Tactile:
        - Any unusual sensations on your skin?
    - Olfactory
        - Any unusual smells or tastes?

- Delusions:
    - Normalizing statement: Everyone has beliefs in certain things. Some people are religious. Some people believe in UFOs.
    - General: Any ideas ideas that you just can't get out of your mind?
    - Paranoia: Are you worried that there might be people out to get you? Do you ever fear for your safety?
    - Hyperreligiosity: Are you religious? How religious? Do you feel a special connection with (your religion, e.g. God) that goes beyond what others have?
    - Grandiosity: Any special abilities that you have? Tell me more…
    - Thought broadcasting: At times does it feel as though people know, and can hear all of your thoughts?
    - Ideas of reference: Do you ever feel that the radio, or TV are talking about you?
    - Somatic delusions: Any worries about your health?

Phases of Illness

1. Prodrome

- Social withdrawal
- Bizarre preoccupations
- Unusual behaviours
- Academic failure
- Deteriorating self-care
- Dysphoria

2. Acute Phase

- Onset of overtly positive symptoms, e.g. hallucinations, delusions, inability to function, often requiring inpatient admission.

3. Recovery Phase

- Even as positive symptoms improve from treatment, there is still a period lasting several months of ongoing impairment.
- Negative symptoms may predominant, though there may still be some residual positive symptoms.
- After the psychotic episode, there may be post-psychosis depression.
- The patient may need support and help with grieving the loss of their previous state of health that they had

prior to now having a history of psychosis.

4. Residual Phase

- Some negative symptoms may continue to persist.

Diagnoses

DSM-5 Schizophrenia

A. Two or more for 1 month (one from 1,2 or 3)
1. Delusions
2. Hallucinations
3. Disorganized speech
4. Grossly disorganized or catatonic behaviour
5. Negative Sx
B. Decline in level of functioning (CAP - not reach expected LOF)
C. Disturbance for 6 months (may include prodrome)
D. Not schizoaffective, bipolar, or MDD with psychotic features
E. Not substance / other medical
F. If ASD, must have prominent delusions and hallucinations > 1 month
Types of schizophrenia by age of onset

- Early onset schizophrenia
    - Symptoms
        - Delusions and hallucinations less elaborate
        - Visual hallucinations more common
    - Premorbid factors:
        - Emotional/behavioral disturbances
        - Speech and language problems
        - Cognitive delays
        - Subtle motor delays

Differential Diagnosis: Medical

Psychosis secondary to other causes such as general medical conditions is known as secondary psychosis.
DSM-5 defines “psychotic disorder due to general medical condition”, when delusions or hallucinations are the direct physiologic due to a general consequence of a medical condition, and occur in the medical condition in the absence of delirium.
About 3% of new onset presentations of psychosis are due to medical causes (Freudenreich, 2009)
Medical conditions to rule out include:

- Developmental conditions:
    - Prader-Willi
    - Velocardiofacial syndrome (aka DiGeorge syndrome)
- Neurological:
    - Epilepsy, such as temporal lobe epilepsy (TLE)
    - Anti-NMDA encephalitis
        - Early symptoms: Fever, headache, fatigue
        - Over time, symptoms become more severe, requiring hospitalization such as
            - Psychosis: Psychosis with delusions, hallucinations
            - Delirium: Agitation, confusion, loss of consciousness.
            - Seizures, autonomic dysregulation of breathing, blood pressure, heart rate.
- Neoplasm:

    - Trauma to frontal or limbic areas
- Infectious:
    - HIV
    - Neurosyphilis
    - Creutzfeld-Jakob Disease (CJD)
    - Herpes encephalitis
- Metabolic:
    - Hyper/hypothyroidism,
    - Hyper/hypoparathyroidism
    - Acute intermittent porphyria
    - Homocystinuria
    - Wilson's disease
    - Wernicke's encephalopathy
- Auto-immune:
    - Systemic lupus erythematosus (SLE)
    - Cerebral lipoidosis
- Toxic / poisoning:
    - Heavy metals
    - Carbon monoxide (CO), Solvents
- Nutritional:
    - B12 deficiency
    - Folate deficiency
- Substance-induced disorder (DSM-5)
    - Delusions or hallucinations that are triggered by substance use, which starts within 1-month of substance use (or withdrawal)
    - Examples include
        - Cocaine, amphetamines, ecstasy, LSD, PCP, anabolic steroids
        - Alcohol, benzodiazepine, barbiturate, GHB withdrawal
        - Prescription medications
- Medication induced

• Analgesics	NSAIDS, opioids, salicylates
• Antiparkinsonian	Amantadine, antimuscarinics, dopaminergics (L-dopa), selegiline
• Cardiovascular	ACE inhibitors, antiarrhythmics, beta-adrenergic blockers, calcium channel blocks, clonidine, digitalis preparations
• Endocrine	Anabolic steroids, corticosteroids
• Gastrointestinal	H2-receptor antagonists, proton pump inhibitors
• Infectious	Antibiotics, e.g. anti-tubercular agents Antimalarials: chloroquine, mefloquine Antivirals
• Muscle relaxants	Baclofen, cyclobenzaprine, tizanidine
• Psychotropics	ADHD medications specifically stimulant medications

Reference: Ambizas, 2014

Differential Diagnosis and Comorbid Diagnoses: Psychiatric

The following is a list of various conditions to consider as better explanations for symptoms of psychosis

(differential diagnoses) as well as other conditions that can occur alongside in a patient with psychosis (comorbid diagnoses):

Psychotic disorders

• Schizophrenia:	Signs of illness for > 6 months; Psychotic symptoms (two or more of a) delusions, b) hallucinations, c) disorganized speech, d) disorganized or catatonic behavior, e) negative symptoms) for > 1 month; f) social/occupational dysfunction.
• Schizophreniform:	Similar to schizophrenia except duration of psychosis < 6 months.
• Schizoaffective disorder:	Symptoms of schizophrenia and mood disorder occur at the same time together, and > 2 weeks of delusions or hallucinations in absence of prominent mood symptoms.
• Delusional disorder:	Non-bizarre (i.e. within the realm of possibility) delusions for > 1 month and does not meet criteria for schizophrenia.
• Brief psychotic disorder:	By definition in the DSM, psychotic symptoms that last anywhere between 1-30 days, and may or may not be related to a marked stress. Resolves, with the patient eventually returning to premorbid level of functioning.
• Psychotic disorder not otherwise specified:	Psychotic symptoms present but criteria for a specific otherwise specified disorder is not met, or there is insufficient or contradictory information. For example, a patient has isolated hallucinations, but otherwise, does not meet criteria for any other condition.

Mood disorders

• Major depression with psychotic features:	Major depressive episode with mood congruent psychotic features (most common), or mood incongruent psychotic symptoms.
• Bipolar disorder:	Similarity to psychotic disorder • May have hallucinations and delusions What is different • Delusions tend to be mood congruent (e.g. in mania, patient will have delusions of grandeur and special powers), however note that mood incongruent delusions are possible as well • Patient will have mania

Anxiety disorders / OCD / PTSD

• Obsessive compulsive disorder (OCD)	Similarity to psychotic disorder • May have hallucinations and delusions What is different • Delusions tend to be mood congruent (e.g. in mania, patient will have delusions of grandeur and special powers), however note that mood incongruent delusions are possible as well • Patient will have mania
• PTSD, trauma and severe stress	Similar to psychotic disorder • May have hallucinations What is different • Hallucinations in trauma will be around the theme of being unsafe, and will improve with interventions (Kaufman, 1997) • Person with trauma will be less likely to have formal thought disorder, or bizarre delusions.

- Cluster A personality disorders
    - Patients with cluster A personality disorders are classically “odd” and “eccentric”, thus query psychotic disorder and ASD.
    - Schizotypal personality disorder:
    - Paranoid personality disorder
    - Schizoid personality disorder

Autism spectrum disorder (ASD)

- What is similar?
    - Individuals with ASD may have unusual beliefs, and be socially awkward
- What is different?
    - Child/youth with ASD tends to have a long, consistent history of troubles with reciprocal interactions, narrow focus in one area, and stereotypy.
    - Child/youth with ASD may have a history of always being withdrawn, but not sufficient to meet criteria for ASD.

Communication disorder

- Language disorders: Persistent difficulties in learning and using language that are below age appropriate norms.
- Social (Pragmatic) Communication Disorder: Deficits in using communication for social purposes, such as in the use of verbal / non-verbal communication.

Malingering

- Person may feign psychosis for secondary gain, such as 1) ‘avoiding pain’ (e.g. legal consequences of actions), or 2) ‘seeking gain’ (e.g. a prison inmate seeking drugs or attention).
- What is similar
    - Person may report any of the symptoms
- What is different
    - Persons that malinger may not have feigned symptoms with others; collateral history from others who have observed the person can be helpful.
    - Persons that malinger tend to over endorse symptoms; consider asking about improbable symptoms:
        - “When people talk to you, do you see the words spelled out?” (Miller, 2001)
        - “Do you feel that automobiles are members of an organized religion?” (Rogers, 1987)

Borderline Personality Disorder (BPD)

- Symptoms of psychosis (“stress-related paranoid ideation”, aka “micropsychosis”) can be seen in borderline personality disorder (BPD)
- Features of so-called “micropsychosis” of BPD
    - Enduring
    - Immense distress levels
    - Lack of insight
    - Increase during stress
- DSM-5 Criteria for BPD (includes psychotic symptoms)

A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity, with 5+ of:
1. Avoid abandonment
2. Unstable and intense relationships
3. Identity disturbance
4. Impulsivity in at least two areas that are self-damaging
5. Recurrent suicidal behaviour
6. Affective instability
7. Chronic feelings of emptiness
8. Inappropriate, intense anger

9. Transient, stress-related paranoid ideation or severe dissociative symptoms

Physical Exam (Px)

Patients presenting with psychosis should receive a full physical exam, with a focus on looking for findings that might suggest medical causes.
General observations

- Patients may appear distracted by hallucinations.
- Any involuntary movements or signs of extrapyramidal symptoms?

Mood:

- May be down. Generally not elevated.

Affect

- Often described as “flat”, with restricted emotions. May be anxious/scared if there is paranoia.

Hallucinations

- May have auditory/visual hallucinations.

Insight:

- May or may not acknowledge their difficulties; may or may not be able to seek help for them.

Investigations

Patients presenting with first episode psychosis should receive a workup to rule out medical causes.
Investigations generally include:

- CBC
- Electrolytes
- BUN/creatinine
- Glucose
- Calcium / phosphorus
- TSH
- Liver function tests
- ESR for chronic inflammatory causes.
- Vitamin B12 and folate
- Urinalysis
- Urine drug screen

If suspected, consider:

- Antinuclear antibodies
- Ceruloplasmin for WIlson’s disease.
- HIV screening
- FTA-Abs for syphilis
- Imaging: MRI to rule out demyelinating disease and brain tumor (e.g. meningioma)
- EEG
- Anti-NMDA receptor encephalitis

Treatment: Non-Medication

Educate the patient and family about psychosis. Resources that might be helpful:

- Psychosis: Information for Parents and Caregivers
- Psychosis: Information for Youth Coping with Psychosis
- Psychosis: Information for Siblings About Psychosis

Lifestyle recommendations

- Have a regular bedtime and get enough sleep
- Have regular exercise
- Eat a healthy diet
- Avoid recreational drugs especially marijuana, stimulants, and hallucinogens
- Avoid taking any stimulants such as ADHD medications.
- Avoid stimulants such caffeine, nicotine.

Psychotherapy

- In the early stages while the youth is more acutely ill, consider more supportive forms of psychotherapy to support strengths and provide emotional validation.
    - Example:
        - Clinician: “It must be pretty scary thinking that people are out to poison you. How hard that must be. I'm here to help you get through this. How can I support you?”
- Family interventions
    - Is there stress and tension between family members? Family interventions and therapy can be helpful to improve relationships between the patient and family members, or between family members. E.g. helping family understand that their loved one has a medical condition, and is not purposely trying to be difficult; that being calm and validating is always the best strategy, etc.
- Cognitive behavioural therapy (CBT) has been adapted for those with psychosis.

Treatment: Psychosocial Interventions

Reduce stress in the environment.
Teach caregivers:

- How to keep an environment which is calm and low arousal with consistent, stable sleep-wake routines (as opposed to a highly stimulating environment with excessive screen time, and inconsistent routines);
- How to respond to positive symptoms such as hallucinations, delusions, i.e. with empathy and validation, as opposed to criticizing and rejection.
- How to monitor through ensuring good communication with the youth
    - Parent: “If 0 is none at all, and 10 is worst, how are the voices today?”
- Where to get help if things worsen

Liaise with the school to ensure that they are providing accommodations/modifications for the patient.

- [Link to sample school letter]

Treatment: Medications

Treatment: Psychosis Due to Underlying Medical Condition

Treat the underlying medical condition causing the psychosis.
Consider using an antipsychotic medication as well, while medical treatment is being for the safety of the patient and the treating medical team.

- Use low dosages, as the patient will be antipsychotic naive and thus more sensitive to side effects.

General Principles

Stop any medications that might cause or contribute to psychosis such as:

- Stimulants (e.g. ADHD medications, or caffeine)
- Dopamine agonists
- Steroids
- Recreational drugs (e.g. marijuana, stimulants)

First-Line Anti-Psychotic Medications

"For children and young people with a first episode of psychosis, offer antipsychotic medication in conjunction with psychological/psychosocial interventions."
Recommendation 3 from Canadian Guidelines for the Pharmacological Treatment of Schizophrenia Spectrum and Other Psychotic Disorders in Children and Youth
Start with a low dose of an atypical antipsychotic chosen on the basis of potential side effects and target symptoms, for example:

- Olanzapine for patients with comorbid mood/bipolar symptoms
- Quetiapine for patients with insomnia/anxiety
- Aripiprazole or ziprasidone for patients who are overweight or have a history of diabetes.

Risperidone (Risperdal™)	Start at 0.25-0.5 mg daily Target 0.25-10 mg/kg/day or 1-4 mg daily Doses of less than 3 mg have been shown optimal in first-episode cases Dosing is typically bid or tid; available in oral solution and orally disintegrating tablets
Olanzapine (Zyprexa™)	Start 2.5-5 mg daily Increase 2.5-5 mg daily in weekly intervals up to target dosage Initial therapeutic target 10 mg daily Max 20 mg daily Available in orally disintegrating tablets (Zydis) Compared to Risperidone, lower risk of motor side effects and elevated prolactin but higher risk of sedation and weight gain
Quetiapine (Seroquel™)	Dosing for schizophrenia in adolescents is below, from the monograph. Immediate-release tablet (IR): Day 1: 25 mg twice daily Day 2: 50 mg twice daily Day 3: 100 mg twice daily Day 4: 150 mg twice daily Day 5: 200 mg twice daily target dosage Usual dosage range: 200 to 400 mg twice daily; maximum daily dose: 800 mg/day. Studies show no additional benefit was seen with 400 mg twice daily vs 200 mg twice daily. Extended-release tablet (XL): Day 1: 50 mg once daily Day 2: 100 mg once daily Day 3: 200 mg daily Day 4: 300 mg daily Day 5: 400 mg once daily Usual dosage range: 400 to 800 mg once daily; maximum daily dose: 800 mg/day. Ophthalmologic monitoring for cataracts no longer felt necessary in most cases.
Ziprasidone (Geodon™)	Start 20 mg daily Target 20-160 mg daily Monitor for QTc prolongation
Aripiprazole* (Abilify™)	Start 5-10 mg daily Target 5-30 mg daily Favorable side-effect profile in adults

Dosing

Increase dosage as needed with the expectation of evidence of clinical improvement in 6-8 weeks.

Third-Line

Have trials with 2 atypical antipsychotics been ineffective or not tolerated?

- Consider a trial with a typical antipsychotic (e.g. chlorpromazine, perphenazine, haloperidol) (Stevens, 2014).
- Second generation (atypical) antipsychotics (excluding clozapine) are not necessarily more effective than first-generation (typical) agents for children/adolescents with early onset schizophrenia or schizoaffective disorder (TEOSS study, Sikich, 2008).

Medication	Starting dosage	Initial Target Dosage	Maximum dosage	Monitoring
Chlorpromazine (Largactil®)	Less acutely disturbed: 25mg tid Outpatient: 10mg, tid-qid or 25mg, bid-tid Severe cases: 25mg tid	400-600 mg daily	Less acutely disturbed: 400mg / daily Outpatient: 200–800 mg daily Inpatient: 500–1000 mg daily Low doses (<400 mg daily) preferable due to less side effects	Follow CAMESA guidelines
Perphenazine (Trilafon®)	Outpatient with schizophrenia: 4-8 mg tid initially; reduce as soon as possible to minimum effective dosage. Inpatient with schizophrenia: 8-6 mg bid to qid	See starting dosage	64 mg daily	
Haloperidol (Haldol®)	2-5 mg IM q4-8h 0.5-5 mg po tid 0.2 mg/kg/d po		20-30 mg daily	Start low, go slow Watch for EPS

Reference: CPS Monograph.
Is there a lack of response to atypicals, plus typicals?

- Consider Clozapine

Clozapine (Clozaril™)	Start at 12.5 mg daily Target 25-800 mg daily For treatment resistant psychosis when other options have failed Required weekly blood count for first six months and then every other week, reporting to the National Clozapine Registry

Monitoring

- Baseline monitoring includes the following
  - BMI, personal/family history, waist circumference
  - Symptoms of hyperglycemia (advise patients of hyperglycemia symptoms)
  - At week 4,8, and 12-weeks
  - Reassess weight change at 4, 8, and 12 weeks after initiation or change in antipsychotic therapy and quarterly thereafter
  - At 3-months and annually

    - Reassess fasting plasma glucose, lipids, and blood pressure at 3 months and annually thereafter
- See CAMESA guidelines for full details on monitoring.
  http://camesaguideline.org
- For information about Extrapyramidal Symptoms (EPS)

Duration of treatment

- Canadian guidelines recommend med treatment for first episode psychosis continues at least 1-2 years

Neuropsychopharmacology

Antipsychotic response optimized (especially + symptoms) at a threshold of 65-70% D2 occupancy; exceeding 80% D2 occupancy leads to increased risk of EPS.

Antipsychotic	Approximate dose equivalency (65% occupancy)
Haloperidol	2 mg
Loxapine	15 mg
Olanzapine	10 mg
Risperidone	3 mg
Ziprasidone	80 mg

Treatment: What about Injectables?

There is little data for injectables in children/youth, however, some authors recommend considering this an option for schizophrenia and psychotic disorders when medication adherence is an issue (Stevens, 2014).

Treatment: Side Effects

Younger patients are more sensitive to side effects than adults.
Monitor closely for all the same side effects that may be seen in adults including: :

- Metabolic changes (eg, dyslipidemia, weight gain)
- Hormonal changes such as prolactin elevation
- Sedation
- Extrapyramidal symptoms, e.g. acute dystonia, akathisia (motor restlessness), parkinsonism (bradykinesia, tremor, and lack of facial expressions)
- Akathisia
- Dyskinesias
- Drowsiness
- Anticholinergic effects (eg, dry mouth, nasal congestion, blurred vision)

Typical Side Effects and Strategies

Side Effect	**Possible Strategy**
Sedation	Give at bedtime. Try to reduce dosage.

Increased appetite, weight gain	Dietary strategies such as • Restricting fast food, junk foods, high salt/fat foods in the home • Ensure that there are healthier foods in the home, e.g. whole grains, fruits, vegetables. Increase exercise Change to antipsychotic with lower risk of weight gain such as: • Haloperidol, lurasidone, ziprasidone, aripiprazole and amisulpiride (Dayabandara, 2017)
Akathisia	Akathisia is a movement disorder with anxiety and an inability to sit still. May be a particular problem in children/youth due to under recognition, or being misdiagnosed as ADHD. Red flags • Child or adolescent starts an antipsychotic and becomes acutely agitated with an associated inability to sit still (and/or with aggressive outbursts). Treatment • Reduce the offending agent to the lowest effective dose and then, • Use either a benzodiazepine (eg, lorazepam, 0.5 to 1 mg 3 times per day), or • B-blocker (e.g. propranolol, initiated at 10 mg 2 or 3 times per day with an increase every few days until the desired effect is achieved)

Treatment: Problems with Adherence

Are there problems with adherence?

- Explore barriers to treatment (such as medications) such as
- Denial of illness and lack of insight: Consider motivational interviewing type strategies. Find a mutual goal.
    - For example, in a patient with paranoia, the patient may not agree to the goal of reducing paranoid ideation as they truly feel they are being persecuted. However, the patient is probably feeling unsafe, and having troubles sleeping, which certainly doesn't help in coping with the situation. Perhaps a mutual goal of sleeping better, in order to better cope with the situation, such as by using a medication to help sleep as Quetiapine.
- Psychosis itself impairs insight.
- Belief that meds not needed
    - The patient may worry about being 'addicted', and prefer to 'do things naturally'.
    - Thus, ensure that holistic and healthy lifestyle and nutrition is part of the treatment plan. Recommend dietary omega 3 fatty acids, sleep, nutrition and nature time.
- Lack of support network and/or unhelpful friends and family
    - Unfortunately, friends and family may have negative views such as 'medications aren't healthy' which impede treatment.
    - Or they may be critical and contribute to the patient's stress.
    - Consider meeting with friends and family in order to find a mutual goal and work collaboratively on those mutual goals.
    - For example, if the family insists on 'natural alternatives', agree that you want to start with natural alternatives. However, agree that if 'natural alternatives' do not work, then it is important to consider alternate options such as conventional antipsychotic medications.
    - Help the patient build a support network, e.g. peer support and psychosis organizations.
- Stigma
    - There may be guilt and shame associated. Consider self-compassion (e.g. we are all imperfect, and we all experience loss, rejection and disappointment at some point, and this is part of being human, and it is okay).
- Side effects (drug-induced dysphoria or akathisia)
    - Monitor closely for side effects and address them.
- Cost
    - Are there cost issues? Explore financial aid options.
- Route of administration
    - Is the patient having troubles taking a certain type of formulation, or route of administration (e.g. orally), etc.?

- Address the specific barrier.

Prognosis / Course of Illness

What happens after a first episode psychosis?
Good news

- Majority of patients initially achieve remission (Lally, 2017)
- A minority of patients have early, sustained recovery (Lappin, 2018)
    - Positive prognosticators include female; employed; in a relationship; short duration of untreated psychosis; core diagnosis is not schizophrenia, but rather mania or brief psychosis)
- A small minority of patients with acute onset of FEP and early remission may thus actually benefit from stopping antipsychotics (Suvisaari, 2018).

Not so good news

- Most patients have an episodic course (e.g. will have remission, but then relapse later), though the period of remission is usually at least 2-years (Lally, 2017)
- Some will have an antipsychotic treatment-resistant illness from the onset of the illness (Demjaha, 2017). For this reason, Demjaha recommends considering clozapine if there is early treatment resistance.

Negative prognosticators:

- Childhood-onset schizophrenia (the childhood version of schizophrenia in adolescents and adults) carries a worse prognosis than adult onset;
- Longer duration of untreated psychosis (DUP),
- Poor premorbid adjustment;
- Insidious mode of onset;
- Greater severity of negative symptoms;
- Comorbid substance use disorders (SUDs);
- History of suicide attempts and suicidal ideation and having non-affective psychosis

When and Where to Refer

Urgently refer all children and young people with a first presentation of sustained psychotic symptoms (lasting 4 weeks or more) to a specialist mental health service or early interventions in psychosis service, which includes a consultant psychiatrist with training in child/adolescent mental health.
Recommendation 1 from Canadian Guidelines for the Pharmacological Treatment of Schizophrenia Spectrum and Other Psychotic Disorders in Children and Youth
Services for patients with first episode psychosis include:

- First episode psychosis clinics (if available).
- Psychiatrist for ongoing follow-up.
- Day hospital or therapeutic school environment as needed
- Psychologist
    - Psychoeducational and neuropsychological testing to look for cognitive deficits, learning styles, strengths and weaknesses to be repeated once stabilized and used for school/work planning.
    - Psychological testing to clarify diagnosis if needed: if substances, pervasive developmental disorders, OCD, mood disorders, personality disorders also suspected
- Allied health referrals
    - Occupational therapy (OT): Can help with scholastic/vocational re-entry
    - Social work (SW): Can help with family support, housing, financial disability supports, liason with schools/work
    - Dietician: Can help if there are problems with appetite increase or weight gain, common with

antipsychotic medications

Supports for families include:

- In Canada: Schizophrenia Society of Canada (https://schizophrenia.ca/), which has branch societies throughout all provinces and many cities.

Case, Part 2

You decide to admit Dave to hospital. You agree with Dave, that he has been under extreme stress at school, and home, as well as troubles sleeping. He agrees to come into hospital.
Given that his symptoms of psychosis appear to have started even before he began using cannabis, you decide to start a low dose antipsychotic.
He responds within a few days, and after 2-weeks, is discharged home with follow-up with a first episode psychosis clinic for ongoing monitoring.

Education for Families

Kelty Mental Health has great information for families about medication side effects and strategies.
https://keltymentalhealth.ca/collection/medication-monitoring-forms-parent-info-sheets

References

Ambizas E: Nonpsychotropic Medication-Induced Psychosis, US Pharmacist. 2014; 39(11): HS8-HS15.
https://www.uspharmacist.com/article/nonpsychotropic-medicationinduced-psychosis
Bartels-Velthuis AA, Jenner JA, van de Willige G, et al. Prevalence and correlates of auditory vocal hallucinations in middle childhood. Br J Psychiatry. 2010;196(1):41–46.
https://www.ncbi.nlm.nih.gov/pubmed/20044659
Dayabandara M, Hanwella R, Ratnatunga S, Seneviratne S, Suraweera C, de Silva VA. Antipsychotic-associated weight gain: management strategies and impact on treatment adherence. Neuropsychiatr Dis Treat. 2017 Aug 22;13:2231-2241. doi: 10.2147/NDT.S113099. PMID: 28883731; PMCID: PMC5574691
Demjaha A, Lappin JM, Stahl D, Patel MX, MacCabe JH, Howes OD, et al. Antipsychotic treatment resistance in first-episode psychosis: prevalence, subtypes and predictors. Psychol Med. (2017) 47:1981–9. doi: 10.1017/S0033291717000435
https://doi.org/10.1017/S0033291717000435
Freudenreich O, Schulz SC, Goff DC. Initial medical work-up of first-episode psychosis: a conceptual review. Early Interv Psychiatry. 2009;3(1):10–18.
https://www.ncbi.nlm.nih.gov/pubmed/21352170
Horwood J, Salvi G, Thomas K, et al. IQ and non-clinical psychotic symptoms in 12-year-olds: results from the ALSPAC birth cohort. Br J Psychiatry. 2008;193(3):185–191.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2806573/
Kaufman J, Birmaher B, Clayton S, et al. Case study: trauma-related hallucinations. J Am Acad Child Adolesc Psychiatry. 1997;36(11):1602–1605.
Kelleher I, Corcoran P, Keeley H, et al. Psychotic symptoms and population risk for suicide attempt: a prospective cohort study. JAMA Psychiatry. 2013;70(9):940–948.
Lally J, Ajnakina O, Stubbs B, Cullinane M, Murphy KC, Gaughran F, et al. Remission and recovery from first-episode psychosis in adults: systematic review and meta-analysis of long-term outcome studies. Br J Psychiatry (2017) 211:350–8. doi: 10.1192/bjp.bp.117.201475
https://doi.org/10.1192/bjp.bp.117.201475
Lappin JM, Heslin M, Lomas B, Jones PB, Doody GA, Reininghaus UA, et al. Early sustained recovery following first episode psychosis: evidence from the AESOP10 follow-up study. Schizophr Res. (2018) 199:341–45. doi: 10.1016/j.schres.2018.03.014
https://doi.org/10.1016/j.schres.2018.03.014
Maloney AE, Yakutis LJ, Frazier JA. Empirical evidence for psychopharmacologic treatment in early-onset psychosis and schizophrenia. Child Adolesc Psychiatr Clin N Am. 2012;21(4):885–909.
https://www.ncbi.nlm.nih.gov/pubmed/23040906
Miller HA. M.-FAST interview booklet. Lutz, FL: Psychological Assessment Resources; 2001.
Morgan C, Lappin J, Heslin M, Donoghue K, Lomas B, Reininghaus U, et al. Reappraising the long-term course and

outcome of psychotic disorders: the AESOP-10 study. Psychol Med. (2014) 44:2713–26. doi: 10.1017/S0033291714000282
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4134320/
Poulton R, Caspi A, Moffitt TE, et al. Children's self-reported psychotic symptoms and adult schizophreniform disorder: a 15-year longitudinal study. Arch Gen Psychiatry. 2000;57(11):1053–1058.
https://www.ncbi.nlm.nih.gov/pubmed/11074871
Resnik P, Knoll J: Faking it: How to detect malingered psychosis. Current Psychiatry. 2005 Nov; 4(11): 11-25.
https://www.mdedge.com/psychiatry/article/61060/schizophrenia-other-psychotic-disorders/faking-it-how-detect-malingered/page/0/2
Ritchie EC, Block J, Nevin R: Psychiatric Side Effects of Mefloquine: Applications to Forensic Psychiatry. J. Am. Acad. Psychiatr. Law Online June 2013, 41(2): 224-235.
http://jaapl.org/content/41/2/224.full
Rogers R. Assessment of malingering within a forensic context. In Weisstub DW (ed.). Law and psychiatry: international perspectives. New York: Plenum Press; 1987;3:209-37.
Shaw P, Sporn A, Gogtay N, et al. Childhood-onset schizophrenia: a double-blind, randomized clozapine-olanzapine comparison. Arch Gen Psychiatry. 2006;63(7):721–730.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4116281/#bib12
Sikich L, Frazier JA, McClellan J, et al. Double-blind comparison of first- and second-generation antipsychotics in early-onset schizophrenia and schizo-affective disorder: findings from the treatment of early-onset schizophrenia spectrum disorders (TEOSS) study. Am J Psychiatry. 2008;165(11):1420–1431.
https://www.ncbi.nlm.nih.gov/pubmed/18794207
Stevens JR, Prince JZB, Prager LM, Stern TA. Psychotic Disorders in Children and Adolescents: A Primer on Contemporary Evaluation and Management, Prim Care Companion CNS DIsord. 2014; 16(2): PCC. 13f01514.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4116281/#bib15
Suvisaari J et al.: Is It Possible to Predict the Future in First-Episode Psychosis? Front. Psychiatry, 13 Nov 2018.
https://doi.org/10.3389/fpsyt.2018.00580

Clinical Practice Guidelines

McClellan J, Werry J. American Academy of Child and Adolescent Psychiatry. Practice parameter for the assessment and treatment of children and adolescents with schizophrenia. J Am Acad Child Adolesc Psychiatry. 2001;40(suppl):4S–23S.
Abidi S, Mian I, Garcia-Ortega I, Lecomte T, Raedler T, Jackson K, Jackson K, Pringsheim T, Addington D: Canadian Guidelines for the Pharmacological Treatment of Schizophrenia Spectrum and Other Psychotic Disorders in Children and Youth. Can J Psychiatry. 2017 Sep;62(9):635-647. Doi: 10.1177/0706743717720197. Epub 2017 Aug 2.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5593251/

About the Authors

Written by the mental health professionals at the Department of Psychiatry at the University of Ottawa.
Special thanks to Katherine Matheson for her powerpoint presentation on psychosis in children/youth.

Conflict of Interest Declaration

Authors for this article have provided their services 'in kind' for this article; authors for this article are paid via an alternate funding plan with the Ontario Ministry of Health.
Mitigating Potential Bias:

- Recommendations are consistent with published literature.
- Recommendations are consistent with current practice patterns.

Creative Commons License