New Onset Psychosis

Behavioral Health Pavilion (BHP) Inpatient

Nationwide Children's — When your child needs a hospital, everything matters.

Center for Clinical Excellence

[Inclusion & Exclusion Criteria]

[Medical Management of Psychosis-Related Agitation and Aggression]

Diagnostic Timeout
- [Definition & Diagnosis]
- [Differential Diagnoses]

Patient presents to the Psychiatric Crisis Department (PCD) with symptoms concerning for [psychosis]

Triage RN concerned for acute medical illness or injury?
- No → **Psychiatry evaluation**
- Yes → **PCD Medical Provider evaluation**

PCD Medical Provider evaluation → Patient with [medical instability or acute illness] in need of emergent medical management?
- No → **Psychiatry evaluation**
- Yes → Transfer to NCH Main ED

Psychiatry evaluation → Current symptoms explained by established primary psychiatric diagnosis?
- Yes →
  - Disposition per Psychiatry
  - Obtain UDS, UA, and urine hCG (if applicable)

  → Psychiatric management as clinically indicated
- No → Psychiatry concerned for new onset psychosis?
  - No → **Off Pathway**
  - Yes → **PCD Medical Provider evaluation**
    - Obtain [medical history and exam] for new onset psychosis

    → Any [risk factors for medical causes of psychosis?]
    - No → **Remain at the BHP**
    - Yes → Is [neurodiagnostic testing clinically indicated?]
      - No → **Remain at the BHP**
      - Yes → **Transfer to NCH Main Hospital**

Remain at the BHP
Medically cleared for primary psychiatric care
- Disposition per Psychiatry
- Obtain [screening labs] while in the PCD
- Obtain [additional diagnostic testing] as clinically indicated
- Psychiatry to consult Hospital Pediatrics if lab results are clinically significant or if additional medical evaluation is needed
- Consider subspecialty consultations as clinically indicated

Transfer to NCH Main Hospital
Not medically cleared for primary psychiatric care
- Directly admit to Hospital Pediatrics (HP1, HP2, HP4, or HP6) from the PCD
- Obtain [screening labs] after transfer to Main
- Obtain [additional diagnostic testing] as clinically indicated
- Consult Neurology and Psychiatry for all patients
- Consider additional subspecialty consultations as clinically indicated

Inclusion & Exclusion Criteria

Inclusion criteria

- Patient <18 years of age
- New diagnosis of psychosis or primary presenting symptoms concerning for psychosis

Exclusion criteria

- Psychosis explained by an established medical diagnosis

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Definition & Diagnosis

Definition

- Psychotic disorders are defined by abnormalities in one or more of the following five domains:
  - Delusions
  - Hallucinations
  - Disorganized thinking or speech
  - Grossly disorganized or abnormal motor behavior (including catatonia)
  - Negative symptoms

DSM-5 diagnostic criteria

- Generally intact level of consciousness unless there is catatonia

- **Delusions:** fixed beliefs that are not amenable to change in light of conflicting evidence; persecutory, referential, somatic, religious, grandiose, erotomaniac, nihilistic, bizarre vs. non–bizarre

- **Hallucinations:** perception-like experiences that occur without an external stimulus; vivid and clear with the full-force and impact of normal perceptions; not under voluntary control; they may occur in any sensory modality though auditory hallucinations are the most common in primary psychiatric disorders

- **Disorganized thinking or speech:** typically inferred from the patient's speech, loose associations, tangentiality, incoherence or "word salad"

- **Grossly disorganized or abnormal motor behavior (including catatonia):** childlike "silliness," unpredictable agitation, difficulty performing ADLs because of problems with goal-directed behavior; catatonia can include resistance to instructions, maintaining a rigid or inappropriate posture, mutism, stupor, purposeless and excessive motor activity without obvious cause (catatonic excitement), repeated stereotyped movements, echoing of speech

- **Negative symptoms:** diminished emotional expression (facial movements, intonation of speech, head and hand movements that accompany and give emotional expression to speech), avolition (decreased motivated self-initiated purposeful activities, alogia (diminished speech output), anhedonia, asociality

Consider alternate diagnoses when

- The patient does not have at least 1 of the following: delusions, hallucinations, disorganized thinking or speech, grossly disorganized or abnormal motor behavior (including catatonia), or negative symptoms
- The patient does not have disorganized thought processes
- The patient has a neurologic exam with focal findings or altered level of consciousness
- Review **Differential Diagnoses**

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Differential Diagnoses

Primary psychiatric disorders
- Delusional disorder
- Brief psychotic disorder
- Schizophreniform disorder
- Schizophrenia
- Schizoaffective disorder
- Schizotypal personality disorder
- Bipolar disorder
- Depression with psychosis

Autoimmune disorders
- Systemic lupus erythematosus (SLE)
- Sarcoidosis
- Paraneoplastic syndrome
- Autoimmune encephalitis
- Post-infectious encephalitis or ADEM

Endocrinopathies
- Hyper/hypothyroidism (Hashimoto encephalitis, thyroiditis)
- Hyper/hypoparathyroidism
- Hypoglycemia
- Addison's disease
- Pheochromocytoma
- Cushing disease
- Catamenial disorders

Chromosomal abnormalities
- 22q11 deletion syndrome
- Klinefelter syndrome
- Microdeletions
- Prader-Willi syndrome
- Niemann-Pick disease
- Fragile X syndrome

CNS disorders
- Head trauma
- Epilepsy
- Delirium
- Stroke
- Migraine
- Brain mass (tumor, arteriovenous malformation, cyst, abscess, tuberous sclerosis)
- Multiple sclerosis
- Adrenoleukodystrophy
- Wilson's disease
- Narcolepsy
- Kleine-Levin syndrome
- CNS vasculitis
- Juvenile Huntington disease

Infections
- HIV
- Neurosyphilis
- Viral or bacterial encephalitis
- Meningitis
- Neurocysticercosis

Substance use-related disorders
- Intoxication or withdrawal

Metabolic disorders
- Porphyria
- Urea cycle defects, fatty acid oxidation defects
- Niemann-Pick disease

Other
- Nutritional deficiencies (Mg, vitamin A/B1/B3/B12)
- Malignancy
- Heavy metal poisoning

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Return to Definition and Diagnosis

Medical Instability or Acute Illness

Signs of medical instability or acute illness

- Fever
- Unstable vital signs:
  - Hypotension or severe hypertension
  - Persistent tachycardia
  - Persistent tachypnea
  - Oxygen desaturations
- Respiratory distress
- Toxic appearance
- New neurologic deficits
- Seizure or status epilepticus
- Altered level of consciousness

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Medical History & Exam

History of present illness

- Symptoms of psychosis – delusions, hallucinations, disorganized thinking, abnormal motor behaviors, negative symptoms
  - Onset of symptoms – acute, chronic, gradual, rapid, progressive, stable/steady
  - Duration of symptoms
  - Previous episodes of similar abnormal behavior
  - Known or suspected triggers
    - Recent illness, surgery, or medical treatment

Review of systems

- Cognitive or developmental regression – clarify the patient's baseline compared to current presentation
- Neurologic symptoms
  - Seizures
  - Focal deficits
  - Abnormal movements excluding tics
  - New headaches
  - Recent or previous head trauma
  - Excessive laughing or hypersomnia
- Unexplained change in weight
- Unexplained fevers
- Autoimmune symptoms of hair loss, photosensitive rash or malar rash, sores in the mouth or nose, pleuritic chest pain, joint pain with swelling or morning stiffness

Social history

- Substance abuse
- Sexual activity

Family history

- Psychiatric diseases
- Autoimmune diseases

Exam

- Vitals signs
- Growth curve – unexpected weight gain or weight loss
- HEENT – dysmorphic features, Kayser-Fleischer rings, oral ulcers
- Dermatologic exam – hyperpigmentation, malar rash, vasculitic rash, palmar or plantar rash, erythema nodosum, nail changes, alopecia
- MSK exam – joint pain or swelling
- Neurologic exam
  - Mental status – somnolence, lethargy, altered level of consciousness, disorientation
  - Speech – aphasia, mutism, dysarthria, incoherent speech
  - Cranial nerves – facial asymmetry, pupillary changes, diplopia, blurry vision, weak cough or gag
  - Motor/Tone – dystonia, clonus, rigidity, weakness, choreiform movements
  - Reflexes – hyper/hyporeflexia
  - Coordination/gait – ataxia, nystagmus, dysmetria

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Risk Factors for Medical Causes of Psychosis

Risk factors for medical cause of psychosis (i.e., secondary psychosis)

Demographics
- Age ≤13

History
- Seizure
- Headache +/- associated photophobia, phonophobia, diplopia, blurry vision, visual field defects, aura
- Acute head trauma
- Adverse neurologic reactions to anti-psychotics (e.g. dystonia)
- Abnormal movements excluding tics
- Significant unexplained weight change
- Multisystem complaints/abnormalities
- Cognitive or developmental regression
- Baseline developmental delay
- Acute onset of symptoms without any prodromal symptoms
- Onset of symptoms thought to be triggered by illness, surgery, or medications
- Substance abuse

Other
- Lack of appropriate response to significant psychiatric treatment (see below)

Exam
- Toxic appearance
- Fever +/- abnormal vitals
- Altered level of consciousness
- Neurologic deficits
- Acute intoxication
- Catatonia (see below)

Lack of appropriate response to significant psychiatric treatment is not diagnostic of an underlying medical cause of new onset psychosis but should prompt increased consideration of medical causes of symptoms and may indicate need for additional (or repeat) more invasive medical evaluation (e.g. imaging and procedures). Treatment responsiveness must be determined over time and primarily by Psychiatry given their expertise in the field.

The presence of **catatonia** in patients with psychosis should prompt increased consideration of medical causes of symptoms and may indicate need for additional more invasive medical evaluation (e.g. imaging and procedures). A diagnosis of catatonia must be made by Psychiatry given their expertise in the field.

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Catatonia

Catatonia

- This is a complex syndrome with a mixture of motor, behavioral, cognitive, emotion, and physical symptoms combined with variable responsiveness to external stimuli
- It occurs most often with medical illnesses, bipolar disorder, depression, psychosis, and autism spectrum disorder
- It occurs due to various mental and medical disorders but requires specific treatment separate from the primary illness
- Catatonia is defined by the presence of 3 or more of the following:
  - Catalepsy – passive induction of a posture held against gravity
  - Waxy flexibility – slight and even resistance to positioning by examiner
  - Stupor – lack of psychomotor activity; not activity relating to environment
  - Agitation (not influenced by external stimuli) or hyperexcitability
  - Mutism – no, or very little, verbal response; difficulty talking
  - Negativism – opposing or not responding to instructions or external stimuli; difficulty following instructions
  - Posturing – spontaneous and active maintenance of a posture against gravity
  - Mannerisms – odd caricature of normal actions
  - Stereotypies – repetitive, abnormally frequent, non-goal directed movements
  - Grimacing
  - Echolalia – mimicking another's speech
  - Echopraxia – mimicking another's movements
- Unrecognized and untreated catatonia has significant morbidity and mortality

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Return to Risk Factors for Medical Causes of Psychosis

Screening Labs

Screening labs

- Urine drugs of abuse screen
- Urinalysis with reflex urine culture
- Urine protein:creatinine ratio
- Urine hCG (if applicable)
- CBC with differential
- ESR
- CRP
- Complete metabolic panel
- TSH, free T4

Additional diagnostic testing – obtain as clinically indicated

Neurodiagnostic testing – obtain as clinically indicated

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Additional Diagnostic Testing

Test name	Clinical indications
Rheumatologic/Autoimmune	
ANA	Historical: unexplained fevers or weight loss, hair loss, photosensitive rash or malar rash, sores in the mouth or nose, pleuritic chest pain, joint pain with swelling or morning stiffness, chorea, family history of SLE Laboratory: elevated ESR, any cytopenia or ALC <1000, elevated creatinine, hypoalbuminemia, proteinuria, or hematuria >5 RBC when not menstruating
SLE specific labs: C3, C4, crithidia, ENA (SSA and SSB), ENA (Sm and RNP), anticardiolipin antibody, lupus anticoagulant, anti-beta-2-glycoprotein 1	Meet criteria to obtain ANA and ANA is positive ≥1:80
Genetic	
Targeted genetic testing	Age <13, dysmorphic features, developmental delay
Infectious	
HIV, RPR/FTA-ABS	Sexually active, perinatal exposure
Toxicologic	
Heavy metal panel	Known environmental exposure (residence built before 1978, high-risk occupations, waste exposure, pesticide exposure, well-water)
Endocrine & Metabolic	
Vitamin B12, folate, MMA, vitamin A, vitamin B1, vitamin B3	Malnutrition, vegan diet
Copper and ceruloplasmin	Kayser-Fleischer rings, elevated LFTs, jaundice, signs/ symptoms of liver disease
Plasma metanephrines	Altered mental status with headache, palpitations, sweating/flushing, elevated HR, elevated BP
Anti-TPO Ab, Antithyroglobulin Ab	Altered mental status with signs of hyper/hypothyroidism
Hgb A1c	Obesity, hyperphagia, initiation of antipsychotics
Lipid panel	Obesity, initiation of antipsychotics

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Return to Screening Labs

Neurodiagnostic Testing

Clinical indications

Further neurologic evaluation is generally recommended for:
1. Patients age ≤13 years

2. Patients meeting criteria for possible autoimmune encephalitis
- Acute or subacute onset of symptoms ≤3 months *and*
- Evidence of neurologic dysfunction with ≥2 of the following features:
  - Altered mental status/level of consciousness
  - Focal neurologic deficits
  - Cognitive dysfunction
  - Acute developmental regression
  - Movement disorders except tics
  - Psychiatric symptoms
  - Seizures not explained by a previously known seizure disorder

Test name

Neuroimaging
- MRI brain with and without contrast
  - Consider addition of MRA/MRV if high suspicion for CNS vasculitis

Procedures
- Lumbar puncture with CSF studies (below)
- EEG

Labs
- **From serum**
  - Oligoclonal bands
  - Epic order name: Pediatric Encephalopathy, Autoimmune Evaluation, Serum; Mayo send-out test code: Pediatric Autoimmune Encephalopathy/CNS Disorder Evaluation, Serum (PCDES)

- **From CSF**
  - Cell count
  - Protein, glucose
  - Meningoencephalitis ID panel
  - Bacterial culture
  - Oligoclonal bands
  - Epic order name: Pediatric Encephalopathy, Autoimmune Evaluation, Spinal Fluid; Mayo send-out test code: Pediatric Autoimmune Encephalopathy/CNS Disorder Evaluation, CSF (PCDEC)
  - 4th tube of CSF to hold and freeze

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Return to Screening Labs

Medical Management of Psychosis-Related Agitation & Aggression

- Patients with psychosis may present with significant agitation and/or aggression
- These behaviors should ideally be managed with verbal de-escalation and redirection rather than physical restraints or medications
- If medical management is necessary, however, the following medications are preferred

Medication	Weight Range	Recommended Dose	Frequency	Indication	Contraindications and Side Effects
Haloperidol	20-39 kg	1 mg PO or IM	Q6H PRN	Aggression, agitation	**Contraindications**: history of NMS, severe dystonia **Side effects**: EPS, hypotension, QTc prolongation, decreased seizure threshold
	40-69 kg	2 mg PO or IM			
	≥70 kg	5 mg PO or IM			
Olanzapine	20-49 kg	2.5 mg PO	Q6H PRN	Aggression, agitation	**Contraindications**: history of NMS, avoid within 1 hour of IM lorazepam **Side effects**: EPS, hypotension, QTc prolongation, decreased seizure threshold, anticholinergic effects
	≥ 50 kg	5 mg PO			
Diphenhydramine	20-39 kg	12.5 mg PO or IM	Q6H PRN	EPS prophylaxis with haloperidol	**Contraindications**: history of paradoxical reaction, avoid in delirium or intoxication **Side effects**: QTc prolongation, disinhibition
	40-69 kg	25 mg PO or IM			
	≥ 70 kg	50 mg PO or IM			
Benztropine	20 – 35 kg	1 mg PO or IM	Once PRN	Treatment of EPS	**Side effects**: anticholinergic effects, hyperthermia, delirium, psychosis
	36-49 kg	1 mg PO or IM			
	≥ 50 kg	2 mg PO or IM			
Lorazepam	20-39 kg	0.5 mg PO or IM	Q4H PRN	Agitation	**Contraindications**: history of paradoxical reaction, avoid in delirium, avoid IM lorazepam within 1 hour of olanzapine **Side effects**: delirium, disinhibition, respiratory depression if administered with antipsychotics
	40-69 kg	1 mg PO or IM			
	≥ 70 kg	2 mg PO or IM			

* Consider obtaining an EKG when patients are known to have a history of prolonged QTc, are taking multiple chronic QTc-prolonging medications, or have received multiple PRN doses of QTc-prolonging medications

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Metrics

Goals
- Earlier diagnosis of medical causes of psychosis in patients presenting with new onset psychosis
- Standardization of the medical evaluation for patients presenting with new onset psychosis
- Decreased transfers and admissions from the BHP to NCH Main Campus for medical evaluation of patients presenting with new onset psychosis

Outcome metrics
- Decreased length of stay
- Decreased number of labs and images ordered for patients presenting with new onset psychosis

Process metrics
- Order set utilization

Access metrics
- Number of internet and intranet views of the pathway per month

Balancing metrics
- Readmission for psychosis within 90 days

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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