

Hallucinations in children: Diagnostic and treatment strategies

Consider developmental, medical, and other causes to identify nonpsychotic hallucinations

Hallucinations in children are of grave concern to parents and clinicians, but aren't necessarily a symptom of mental illness. In adults, hallucinations usually are linked to serious psychopathology; however, in children they are not uncommon and may be part of normal development (*Box, page 54*).

A hallucination is a false auditory, visual, gustatory, tactile, or olfactory perception not associated with real external stimuli.¹ It must be differentiated from similar phenomenon such as illusions (misperception of actual stimuli), elaborate fantasies, imaginary companions, and eidetic images (visual images stored in memory).

Common, yet a cause for concern

Epidemiologic studies show 2.8% of adults report hallucinations before age 21.² Nonpsychotic children as young as age 5 have reported hallucinations.³ Hallucinatory phenomenon may be present in 8% to 21% of all 11-year-old children; two-thirds of these patients have no DSM-IV-TR diagnosis.^{4,5} However, 1 evaluation of 62 nonpsychotic hallucinating children treated in a psychiatric emergency department (ED):

- 34% had depression
- 22% had attention-deficit/hyperactivity disorder (ADHD)
- 21% had disruptive behavior disorders
- 23% had other diagnoses.⁶

Studies suggest that children who have hallucinations but no other psychotic symptoms have a better long-term prognosis than those with additional psychotic



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Hallucinations in children

Clinical Point

Studies suggest that children who have hallucinations but no other psychotic symptoms have a better long-term prognosis

Box

In children, hallucinations are not always a sign of psychosis

Although hallucinations frequently are considered synonymous with psychotic disorders, in children this rare. Neurobiologic studies (fMRI) of adults show activation of Broca's area (left inferior frontal gyrus) seconds before patients perceive auditory verbal hallucinations, which suggests that auditory hallucinations may be misidentified self-talk.^{a,b} According to Piaget,^c children age <7 may have difficulty distinguishing between events occurring while dreaming and awake. He further theorized that nonpathologic hallucinations could become pathologic when combined with trauma such as abuse. Strauss^d suggested that psychosis might lie on a continuum with normal phenomenon. In a case series, Wilking and Paul^e described

how developmental difficulties, deprivation, sociocultural conditions, and family relationships could contribute to impaired reality testing.

Imaginary friends or companions are common among all children. Children who have imaginary friends are more likely to report hearing "voices."^f Imaginary friends:

- appear, function, and disappear at the wish of the child
- pose no threat and often are a source of comfort
- often can be described in detail
- are not ego-dystonic.^g

Also, children with imaginary friends will not show evidence of a thought disorder.

Source: For reference citations, see this article at CurrentPsychiatry.com

Table 1

Possible causes of hallucinations in children and adolescents

Normal development
Nonpsychotic psychopathology
Psychosocial adversity
Psychotic illness
Stress
Family dysfunction
Deprivation
Developmental difficulties
Sociocultural interaction (immigration)
Poorly differentiated male and female family roles
Presence or absence of different mother figures
Cultural factors (witches, ghosts, spiritualism)
Hallucination of deceased parent, when unresolved mourning persists in the surviving parent
Source: References 6,10-13

symptoms.⁷ A 17-year longitudinal study of children with hallucinations and concurrent emotional and conduct problems found:

- up to 50% of patients still experience hallucinations at age 30
- hallucinations did not significantly predict clinical outcome at age 30
- childhood hallucinations did not increase the risk for psychosis, depression, organic brain disorder, or other psychiatric illnesses.⁷

In a study of children with psychosis and disruptive disorders, at 2- to 8-years follow-up 50% met criteria for major depressive disorder, bipolar disorder, or schizophreniform disorders.⁸ In a 15-year longitudinal study of 11-year-olds, self-reported psychotic symptoms—such as delusional beliefs and hallucinatory experiences—predicted a high risk of schizophreniform disorder at age 26.⁹ These studies suggest that experiencing significant disruptions in thoughts and perceptions during childhood may be related to later development of prominent mood and thought disorders.

Differential diagnosis

Table 1 lists possible causes of hallucination in children.^{6,10-13} Hallucinations during childhood can occur in the context of several psychiatric disorders, including:

- schizophrenia
- schizophreniform disorders
- mood disorders with psychotic features (**Table 2**).¹⁴

They can also manifest as comorbid or associated symptoms of disorders not commonly associated with hallucinations, such as ADHD, disruptive disorders, anxiety disorders, and prodromal clinical states. Medications, substance use, and organic and metabolic disorders also must

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Table 2

Content of hallucinations may point to their cause

Schizophrenia or other psychotic disorders	May hear several voices making a critical commentary Command hallucinations telling patients to harm themselves or others Bizarre voices like 'a computer in my head' or aliens Voices of someone familiar or a 'relative' Visual hallucinations of devils, scary faces, space creatures, and skeletons
Depressive disorders	Usually a single voice speaking from outside the patient's head with derogatory or suicidal content
Bipolar disorder	Usually involves grandiose ideas about power, worth, knowledge, family, or relationship
Bereavement	Usually a transient (visual or auditory) perception of the deceased person
Posttraumatic stress disorder	Transient visual hallucinations, usually with phobic content

Source: Reference 11

be considered in the differential diagnosis (Table 3, page 56).

Hallucinations may occur in low-functioning or anxious children, in the context of psychosocial adversity or abuse, and during bereavement of a deceased parent

when the surviving parent is emotionally unavailable.^{11-13,15-17} Rule out hypnagogic and hypnopompic hallucinations, which are predominantly visual hallucinations that occur immediately before falling asleep and during the transition from sleep

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Children with language disorders may talk about 'voices' because they cannot describe their own thoughts

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A diagnosis of psychotic disorder NOS should be avoided when hallucinations occur in nonpsychotic children

Table 3

Hallucinations in young patients: Differential diagnoses

Psychiatric disorders that are usually defined by psychotic features, including:

- schizophrenia and schizophreniform disorders
- bipolar disorder with psychotic features
- major depressive disorder with psychotic features

Psychiatric disorders that commonly do not include hallucinations but in which hallucinations can occur as comorbid or associated symptoms, such as:

- disruptive behavior disorders
- anxiety disorders
- posttraumatic stress disorder
- adjustment disorder
- grief or bereavement
- dissociative disorders
- attention-deficit/hyperactivity disorder
- oppositional defiant disorder
- Tourette syndrome
- language disorders

Prodromal and at-risk clinical states of psychiatric disorders (psychotic and mood disorders)

Medications (steroids, anticholinergics, stimulants)

Drug intoxication and abuse

- hallucinogens
- cannabis
- ecstasy (3,4-methylenedioxymethamphetamine)
- cocaine
- amphetamines
- barbiturates
- opiates

Organic or nonpsychiatric disorders

- infections
- fever
- migraine
- seizures
- neoplasms

Metabolic disorders

- thyroid disorders
- parathyroid disorders
- adrenal disorders
- Wilson's disease
- porphyria
- beriberi
- electrolyte disturbances

Source: For reference citations, see this article at CurrentPsychiatry.com

to wakefulness, respectively.¹⁸ Rarely, a child who has had hallucinations for some time may learn to complain of them when he or she is not hallucinating in order to obtain a primary or secondary gain, such as getting attention from caregivers.

Little is known about psychosis and hallucinations in preschoolers (age ≤ 5); therefore, their language use may help assessment. Because of cognitive immaturity, children often use illogical thinking and loose association and may describe their thoughts as “voices.” This is common in children with language disorders—and sometimes in healthy patients—who may talk about voices because they cannot describe their own thoughts.

Children with ADHD and/or oppositional defiant disorder often are impulsive and show poor judgment and may blame voices for telling them to do bad things. These “hallucinations” may represent internal thoughts battling with the child’s conscience.⁶ Auditory and visual hallucinations have been reported in children with Tourette syndrome, especially when associated with ADHD or obsessive-compulsive disorder.¹⁹

Medical causes. Electrolyte disturbances, metabolic disorders, fever, and serious infections are common nonpsychiatric causes of hallucinations.²⁰ Brain neoplasm—particularly in visual association areas, the temporal lobe, or portions of the optic nerve or retina—also may produce hallucinations, which can be complex with full images.²¹

Medications such as steroids and anticholinergics may cause hallucinations. Case studies report visual and tactile hallucinations with methylphenidate therapy that resolve after discontinuing the medication.²² Illicit substances, including cannabis, lysergic acid diethylamide (LSD), cocaine, amphetamines, 3,4-methylenedioxymethamphetamine (ecstasy), opiates, and barbiturates, can induce hallucinations.

Suspect substance-induced hallucinations if your patient shows:

- acute onset of hallucinations
- dilated pupils
- extreme agitation or drowsiness
- other signs of intoxication.

Hallucinations caused by seizure disorders are rare but can be somatosensory, visual (occipital lobe focus), auditory, olfactory (uncinate, complex partial), or gustatory. The hallucinations may be unformed (flashing lights or rushing noises) or formed (images, spoken words, or mu-

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sic) and could be part of the aura arising from the temporal lobe (dreamlike, flashbacks). Command hallucinations are rare and adult and pediatric patients usually sense they are not real.²³

Migraines occur in approximately 5% of prepubertal children and often are comorbid with affective and anxiety disorders.²⁴ Hallucinations associated with migraine commonly are visual, but gustatory, olfactory, and auditory hallucinations also can occur, with or without headaches.³ Any hallucination associated with headaches should be investigated neurologically. Other diagnostic aspects of hallucinations to consider while interviewing children are listed in *Table 4 (page 58)*.²⁵⁻²⁸

Psychotic disorder not otherwise specified (NOS) in children often is overused and misused. One reason could be that DSM-IV-TR does not have a category for hallucinations in nonpsychotic children or for children who are at risk for psychosis. However, recommendations regarding the diagnosis of psychotic disorder NOS note it:

- may be used if uncertainty persists after ruling out all other diagnoses
- should be avoided when hallucinations occur in nonpsychotic children
- should not be used longitudinally if a clinician later determines a specific disorder accounts for the hallucinations.²⁹

Treatment

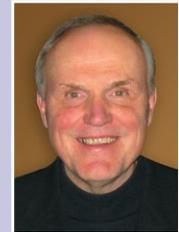
Addressing underlying medical or psychiatric illness, including substance use, is primary. Some adolescents or children may think that cannabis use is relatively benign. Discuss the risks of cannabis use in an age-appropriate manner.

In the ED. Children or adolescents who present with hallucinations in the ED should undergo a thorough evaluation that explores the differential diagnoses. Suggestions for evaluating patients in this setting appear in *Table 5 (page 59)*.²¹

Prodromal or at-risk children. There is no consensus on how early to initiate treatment for children in the prodromal stages

Depression News You Can't Afford To Miss

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The screenshot shows the homepage of the 'Current Psychiatry e-News' 'DEPRESSION UPDATE' newsletter for September 2010. At the top, there is a banner for Pristiq (desvenlafaxine) with a warning about adverse reactions in clinical studies. Below this is the newsletter title and a navigation menu with links for HOME, CURRENT ISSUE, BACK ISSUES, MULTIMEDIA LIBRARY, and PSYCHIATRY FIND IT. The main content area features three articles:

- Editor's note:** Major depression (MD) often is associated with critical life events and comorbid conditions. In this context, Dave et al report an increased risk of parental depression in the first year following childbirth and Moses-Kolko et al observed dysregulation in a specific neurocircuit (ie, left dorsal medial PFC and left amygdala) in postpartum depressed mothers compared with healthy controls. MD is known to involve the prognosis of coronary artery disease patients, with a recent study identifying somatic symptoms (eg, appetite, sleep, fatigue) as critical contributors to this process. Many patients with depression do not benefit from current treatments, and some consider alternative therapies. Research and clinical experiences support the efficacy of transcranial magnetic stimulation (TMS) and a pilot study reports benefits for Parkinson's disease patients with comorbid depression. Although a controlled trial using adjunctive 3-adrenergic modulator (SAMe) for inadequately responsive MD found it superior to placebo, concerns remain regarding the content and dilution of the oral formulation of this supplement. Adolescents frequently use snorials to alleviate depressive symptoms. A 3-year study, however, found that smoking actually worsened depression. Perceived antidepressant benefit may stem from reduction in nicotine withdrawal and craving symptoms. —Philip G. Janicak, MD, Professor of Psychiatry, Rush University Medical Center, Chicago, IL.
- Specific brain activity changes found in women with postpartum depression:** Moses-Kolko EL, et al. *Am J Psychiatry*. 2008. *Epub ahead of print.* Functional MRI of brain activity in response to a face-matching test in 14 depressed and 14 healthy women—all of whom had delivered a healthy full-term infant within the past 12 weeks—found that angry and scared faces activated the left dorsomedial prefrontal cortex significantly less in depressed mothers. Researchers suggested that this difference might represent diminished awareness of the emotions of others. Greater infant-related hostility and more severe depression were associated with reduced face-related amygdala activity. [Read more](#)
- Physical symptoms of depression linked to risk of cardiovascular events:** Hove PW, et al. *J Am Coll Cardiol*. 2008;50:848-854. Using the Patient Health Questionnaire to assess a cross patients (mean age 67; 82% male) with stable coronary heart disease for depressive symptoms, researchers determined that compared with cognitive symptoms of depression, somatic symptoms were more strongly predictive of cardiovascular (CV) events—myocardial infarction, stroke, transient ischemic attack, or congestive heart failure. Fatigue, appetite problems, and sleeping difficulties were the strongest predictors of CV events. [Read more](#)

At the bottom, there is another article: **Parents' depression risk is highest in first year of their child's life** (Dave S, et al. *Arch Pediatr Adolesc Med*. 2008. *Epub ahead of print.*) and a small advertisement for Pristiq (desvenlafaxine) with a 'In real time.' slogan and a photo of a man in a white coat.



Hallucinations in children

Clinical Point

Early treatment is indicated when hallucinations are among a patient's psychotic symptoms; antipsychotic use lacks consensus

Table 4
Diagnostic considerations when assessing a hallucinating child

General:
Hallucinations are a symptom, not a diagnosis
They can have a developmental, neurologic, metabolic, or psychiatric basis
Visual, gustatory, and olfactory hallucinations suggest a medical- or substance-related origin
Schizophrenia is rare before age 11
In pervasive developmental disorders, schizophrenia is diagnosed only if prominent delusions and hallucinations are present for at least 1 month
Hallucinations are not uncommon in major depressive disorder but may be associated with higher risk of bipolar disorder
During interviewing, remember that children:
are highly suggestible
may answer questions in the affirmative to get attention or to please the interviewer
may not fully or partially understand what is being asked
may blame their misbehavior on voices to escape punishment
may not distinguish between night terrors and illusions
Source: References 25-28

of psychosis. Early identification and treatment is imperative because duration of untreated psychosis (DUP) is a primary predictor of treatment response in first-admission patients, and longer DUP corresponds to poorer prognosis in children.³⁰

Assessment scales for early identification of psychosis have limitations because most are not standardized for use in children age <14. To assess symptoms and predict future psychosis in children consider using:

- Scale of Prodromal Symptoms
- Structured Interview for Prodromal Symptoms
- Comprehensive Assessment of At-Risk Mental States
- Bonn Scale for the Assessment of Basic Symptoms.

A hallucinating child may be considered prodromal if he or she has:

- 30% drop in Global Assessment Functioning score in the past month
- a first-degree relative with affective or nonaffective psychotic disorder or schizotypal personality disorder.³¹

Antipsychotics. When treating children, use antipsychotics with caution and consider short- and long-term risks and benefits. Early treatment is indicated when hallucinations are among a patient's psychotic symptoms; however, antipsychotic

use for children in the prodromal phase lacks consensus. McGlashan et al³² showed that in 60 high-risk patients (mean age 16), olanzapine, 5 to 15 mg/d, reduced conversion to psychosis by 50% over 6 months. McGorry et al³³ observed that in 59 ultra-high risk patients (mean age 20), adding low-dose risperidone (1 to 2 mg/d) and cognitive-behavioral therapy (CBT) was superior to case management and supportive psychotherapy in preventing psychosis after 6 months of treatment, but this difference was not maintained at 6 months of follow-up.

CBT slows progression to psychosis in ultra-high risk patients and reduces positive symptoms more specifically than it improves emotional dysfunction.³⁴ CBT for psychosis is based on the concept that auditory hallucinations have an underlying personalized meaning or cognitive schema.³⁵ The initial goal of treatment is to engage the child and understand:

- What do the hallucinations mean to the patient?
- How did they start?
- Can the child start or stop them?
- What does the patient think they are?

The clinician then strives to help the child identify alternative explanations for these hallucinations and develop coping strate-

gies.³⁶ “Normalizing” the voices helps the child attribute these voices to a less anxiety-provoking cause.³⁷ Consider suggesting common reasons for the hallucinations, such as:

- lack of sleep
- isolation
- dehydration
- extreme stress
- strong thoughts (obsessions)
- fever and illness
- lack of food
- drugs and alcohol.

If your patient learns that any of these reasons could explain the hallucinations, he or she may start to have a less delusional understanding of them. Suggest that the voices are “real” only if your patient believes it.

Help children develop coping strategies to control auditory hallucinations such as:

- humming
- listening to music
- reading (forwards and backwards)
- talking to others
- exercising
- singing
- medication
- ignoring the voices.

With normalization and other coping strategies, children with visual hallucinations can learn to transform in their mind the frightful image to a funnier one, which is less anxiety-provoking and gives them a sense of control.

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Table 5

Suggestions for evaluating hallucinating children in the ED

Evaluate risk factors for suicidality
Rule out medical and neurologic causes, including substance abuse/intoxication
Identify underlying psychopathological, psychosocial, and cultural factors
Contact key adult informants for collateral information
Decide if hallucinations are psychotic or nonpsychotic
Reassure your patients that hearing voices does not mean that they are ‘crazy’
Evaluate hallucinations in the context of other features of psychoses (onset, frequency, severity, and chronicity)
Initiate psychotherapy and antidepressants if needed for patients with underlying depression, anxiety, or PTSD
ED: emergency department; PTSD: posttraumatic stress disorder
Source: Reference 21

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continued

Clinical Point

CBT slows progression to psychosis in ultra-high risk patients and reduces positive symptoms



Hallucinations in children

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Children with visual hallucinations can learn to transform in their mind the frightful image to a funnier one

Related Resources

- 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.
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Drug Brand Names

Methylphenidate • Ritalin Risperidone • Risperdal
Olanzapine • Zyprexa

Disclosure

The authors report no financial relationship with any company whose products are mentioned in this article or with manufacturers of competing products.

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Bottom Line

Hallucinations in children and adolescents are not necessarily a sign of psychosis. Consider developmental, neurologic, medical, and other causes in the differential diagnosis. Normalization and other coping strategies can reduce children's anxiety and give them a sense of control.

Box

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Table 3

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