Auditory Hallucinations in Youth: The Good, the Bad, and the Reassuring

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Objectives

- Participants will learn about the prevalence and patterns of auditory hallucinations in youth.
- Participants will become familiar with approaches to assess possible auditory hallucinations in youth.
- Participants will be able to describe appropriate management of possible auditory hallucinations in youth.

Disclosures

- I have no financial interests to disclose.
- I will discuss FDA off-label use of medications, but I will designate it as such.

Key Points

- Psychotic-like symptoms are fairly common in childhood and adolescence
- Schizophrenia is exceedingly rare in children (<1/10,000), and still very uncommon in adolescents
- Most youth who experience psychotic-like symptoms will never develop a primary psychotic disorder
- Most people who do develop schizophrenia will pass through a non-specific "prodrome" that may only be identifiable in hindsight

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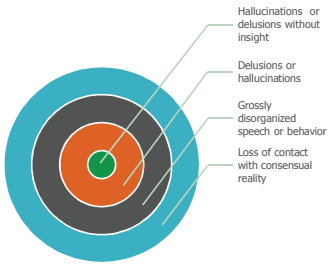
What is psychosis?



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The Continuum Perspective

- Hallucinations and perceptual abnormalities occur outside of psychopathology in children, adolescents, and adults (PLIKS)
  - Barrett and Etheridge 1992, Verdoux and van Os 2002
  - Adolescents: McGorry 1995
  - Poulton 2000: 14.1% of 11 year old children in population sample had psychosis-like symptoms
  - Self-report questionnaires have shown 6.0-58.9% of adolescents reporting psychosis-like symptoms

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The Continuum Perspective: The ALSPAC Cohort

- 6455 general population 12.9 year olds given a structured questionnaire followed by a triggered semi-stuctured interview (PLIKSi)
- 5.6% of 12 year old children in population sample assessed as having had definite psychotic spectrum symptoms. 3.62% had definite or suspected core symptom of schizophrenia

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Table 1 Number of children reporting psychosis-like symptoms: comparisons between self-report and observer-rated assessments (*N*=6435–6455)

Item	Self-report: stem questions[a]			Observer rated[b]			Frequency,[c] suspected or definitely present[d]	Positive predictive values[d,e]
	Yes	Maybe	Total	Suspected	Definite	Total		
Hallucinations, *n* (%)								
Auditory	489 (7.6)	155 (2.4)	644 (10.0)	227 (3.5)	243 (3.8)	470 (7.3)	84 (18.8)	70.6 (67.1–74.2)
Visual	393 (6.1)	111 (1.7)	504 (7.8)	102 (1.6)	166 (2.6)	237 (4.0)	21 (12.1)	50 (45.6–54.4)
Delusions, *n* (%)								
Being spied on	1864 (14.3)	192 (2.3)	1394 (15.7)	142 (2.2)	57 (0.9)	199 (3.0)	51 (25.3)	14.1 (9.4–18.7)
Persecution	509 (7.9)	114 (1.8)	623 (9.7)	16 (0.2)	1 (0.2)	17 (0.3)	7 (46.7)	2.7 (1.5–4.0)
Thoughts being read	424 (6.6)	126 (2.7)	600 (9.3)	37 (0.6)	3 (0.5)	40 (0.6)	11 (28.2)	6.0 (4.1–7.9)
Reference	115 (1.8)	71 (1.1)	186 (2.9)	32 (0.5)	16 (2.5)	48 (0.7)	8 (19.5)	25.2 (19.9–31.5)
Control	102 (1.6)	38 (0.6)	140 (2.2)	33 (0.5)	11 (0.2)	44 (0.7)	12 (28.6)	31.4 (23.7–39.1)
Grandiose ability	147 (2.4)	81 (1.3)	348 (5.4)	37 (0.6)	15 (0.2)	72 (1.1)	22 (35.5)	28.2 (22.6–33.8)
Other, unspecified				14 (0.2)	7 (0.1)	21 (0.3)	8 (47.1)	
Thought, *n* (%)								
Broadcasting	212 (3.3)	90 (1.4)	303 (4.7)	45 (0.7)	20 (0.3)	65 (1.0)	21 (34.9)	28.1 (23.1–33.2)
Insertion	244 (3.8)	89 (1.4)	333 (5.2)	71 (1.1)	18 (0.3)	89 (1.4)	15 (18.8)	26.6 (21.9–31.4)
Withdrawal	80 (1.2)	37 (0.6)	117 (1.8)	15 (0.2)	8 (0.1)	23 (0.4)	4 (19.2)	19.8 (12.6–27.1)
Overall, *n* (%) (95% CI)	2685 (32.3) (31.2–33.5)	839 (13.0) (12.1–13.7)	2929 (38.9) (37.7–40.1)	444 (10.2, 9.3–11.1)	364 (5.6) (5.1–6.2)	881 (13.7) (12.8–14.5)		34.6 (32.1–36.4)
Overall, complex,[f] unadjusted % (95% CI)	32.1 (30.9–33.3)	12.8 (12.0–13.7)	38.7 (37.5–42.0)	9.9 (9.2–10.7)	5.92 (5.6–6.7)	13.6 (12.5–14.3)		
Overall, weighted[g] % (95% CI)	32.5 (32.1–33.7)	12.8 (11.9–13.7)	39.1 (37.7–42.3)	12.1 (9.3–10.8)	5.8 (5.1–6.4)	13.8 (12.8–14.7)		

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Table 2 Number of children receiving a 'definite' observer rating for the four categories of symptoms and associated attributions[a]

Item	Definite, *n* (%)	Definite and no attribution, *n* (%)	Definite with attribution, *n* (%)		
			Hypnagogic/pompic	High temperature	Any attribution
Auditory hallucinations	243 (3.8)	189 (2.9)	49 (20.2)	10 (4.1)	54 (22.2)
Visual hallucinations	105 (1.6)	81 (1.3)	20 (19.0)	5 (4.8)	24 (22.9)
Delusions	90 (1.4)	85 (1.3)	3 (3.3)	2 (2.2)	5 (5.6)
Bizarre delusions	39 (0.6)	37 (0.6)	1 (2.6)	1 (2.6)	2 (5.1)

a. Data presented as prevalence in the past 6 months.

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The Continuum Perspective

- In a non-clinical population of German adolescents 5.2% experienced "thought interference" and 4.2% experienced "thought perseveration." (Meng, 2009)
- In non-clinical populations of adolescents "prodromal" symptoms have been found in 10-50% of subjects (McGorry 1995)
- In clinical populations of adolescents with non-psychotic disorders, 15% have been found to have "ultra high risk" characteristics (Salokangas 2004)

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Interview: Basic

- Target to developmental level
- Join first, ask later
- Start positive or neutral, then ask ?'s in increasing order of severity(…mostly)
- Maintain a consistent tone
- Avoid compound and leading questions
- Watch for nonverbal cues and avoidance
- Normalize: "Lots of kids have heard voices. Have you heard voices?"

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Interview: Conviction

- How sure are you?
  - "Really, really sure?"
  - "60% sure?"
- Is it possible it's your imagination?
- Could the voice actually be your own thoughts?
- Could your mind be playing tricks on you?
- How would you know if you were wrong?
- BUT DON'T CONFRONT OR CHALLENGE!

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Interview: Developmental Issues

- Younger children can have difficulty distinguishing inner speech from hallucination
- But..even young children, when pressed, can often distinguish between real and "make believe" or "imaginary"
- Illogical thinking and loosening of associations decreases in normal children by age 7, and are rare by age 10 (Caplan 1994)
- Imaginary friends rarely cause distress/impairment
- Teens may be trying to assume outsider identity

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Interview: Auditory Hallucinations

- Onset
- Frequency
- Duration
- Context/Triggers
- Explanatory Models / Delusional Interpretations
- Degree of Distress or Preoccupation

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Interview: Parents

- Parents better at describing observable than internal symptoms
  - 57% of mothers of adolescents admitted with 1st episode of psychosis unaware of the psychotic symptoms (de Haan 2004)
- Be attuned to the many influences of family history:
  - Parent may have psychosis
  - Parent may have specific model of psychosis

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Interview: Obstacles

- Patients and families may need breaks or diversions to less troubling topics or activities
- Active symptoms may make participation difficult
  - Look for signs of distraction, preoccupation, paranoia
- Disorganization and cognitive impairment may require developmental adjustments, closed-ended questions, redirection, limit-setting, temporal or spatial anchors, or just patience
- Negative symptoms can block expression of affect, so ask

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"Atypical" Symptoms

- Inconsistent reports
- Overly detailed descriptions suggestive of fantasy or imagination
- Highly context-dependant symptoms

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Reimherr 2004

Differential Diagnosis of Psychotic Symptoms

- Fantasy
- Bereavement
- Anxiety (in Younger Children)
- Trauma and abuse
- Substances
- Medical Illness
- Psychiatric Illness
- Personality Disorders
- Developmental Disorders

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Differential Diagnosis: Mood Disorders

- Psychosis common in severe mood disorders:
  - Hallucinations in 9-27% of children with MDD, delusions in 6%
  - Psychosis in 16-75% of samples with BAD
- Mood symptoms do not rule out prodromal state
- Mood-congruent psychosis and psychosis present exclusively during mood episode help with diagnosis

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Differential Diagnosis: Anxiety Disorders

- OCD
  - OCD symptoms common in prodrome and in primary psychotic disorders (26% of EOS per Nechmad 2003)
  - Some obsessions take on delusional intensity, but may still be best understood as OCD (Insel 1986)
- Children will sometimes have anxiety-based psychosis

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Differential Diagnosis: Substances

- Can be mimics or precipitants
- Average age of first substance use in US is now between 11-12
- Marijuana use appears to be risk factor for psychosis

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Solhkhah 2003, Kristensen 2007, Stirling 2008

Trauma…not just differential diagnosis

- Maltreatment increases risk of psychotic symptoms
- Peer victimization at age 8 increased risk of psychotic symptoms at 12.9 (OR=1.94)
- Acute stress can cause brief psychotic symptoms
- Dissociation can be hard to distinguish from psychosis
- Some youths diagnosed with schizophrenia are later found to have borderline personality disorder
- But…disorganized communication, bizarre delusions, voices making running commentary, persistent negative symptoms are rare in trauma alone

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Read 2005, Schreier 2009, McClellan 1993,Findling 2001

Differential Diagnosis: Developmental Disorders

- MR and ASD elevate risk for psychosis, but also can confuse diagnosis
- Intellectual disability can overlap with psychosis, and is a risk factor for psychosis
- Thought disorder often present in ASD
- Fantasy with transient conviction common ASD
- Normal early childhood excludes DD/ASD

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20% of COS/EOS has IQ<80 (Werry 1994)

Differential Diagnosis: General Medical

- Seizure Disorders
- Neurodegenerative Disorders
- Rheumatologic Disorders
- Endocrinologic Disorders
- Deficiencies
- Infectious Diseases
- Head Injury
- Neoplasms
- Delerium

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Medical Evaluation

- Consider: Physical Exam, UTox, UTox, UTox, UPreg, TSH,Metabolic Panel, VDRL, HIV
- Sometimes: EEG, MRI, ESR
- Rarely: LP, Copper and Ceruloplasm, Cortisol, Heavy Metals
- Really Rarely: Arylsulfatase A, Karyotype, Cytogenetics

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Worry Signs

- Family history of psychotic disorder
- Motor symptoms
- Very poor family function
- Insidious decline prior to emergence of hallucinations
- Cognitive decline
- Social anhedonia, and other negative symptoms
- More severe symptoms
- Acting on symptoms with bizarre behaviors

O' Brien 2009

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Negative Symptoms in Children

- Social withdrawal, social anhedonia
- Amotivation
- Reduced motor movements
- Reduced number or quality of thoughts
- Diminished emotional expression

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Normalize, Don't Minimize!

- Explain that its more common than thought
- Doesn't mean youth is "going crazy"
- Doesn't mean youth can't recover
- Doesn't mean youth has to take medications
- Doesn't mean youth is going to end up homeless

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The "Prodrome"

- Early: impaired concentration, decreased motivation, depressive or labile mood, sleep disturbance, anxiety, social withdrawal, suspiciousness, irritability, defiance, aggression, obsessions, compulsions, dissociation
- Later in course (~ 1 year before conversion): perceptual disturbances

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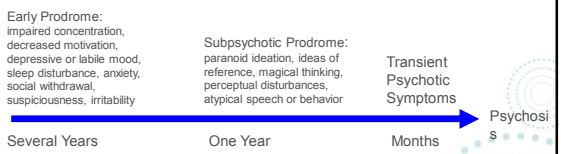
The Psychosis Prodrome



Meyer 2005

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PQ-B

1. Do familiar surroundings sometimes seem strange, confusing, threatening or unreal to you? YES NO
2. Have you heard unusual sounds like banging, clicking, hissing, clapping or ringing in your ears? YES NO
3. Do things that you see appear different from the way they usually do (brighter or duller, larger or smaller, or changed in some other way)? YES NO
4. Have you had experiences with telepathy, psychic forces, or fortune telling? YES NO
5. Have you felt that you are not in control of your own ideas or thoughts? YES NO
6. Do you have strong feelings or beliefs about being unusually gifted or talented in some way? YES NO
7. Do you sometimes get strange feelings on or just beneath your skin, like bugs crawling? YES NO
8. Do you sometimes feel suddenly distracted by distant sounds that you are not normally aware of? YES NO
9. Have you had the sense that some person or force is around you, although you couldn't see anyone? YES NO

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PQ-B

10. Do you worry at times that something may be wrong with your mind? YES NO
11. Have you ever felt that you don't exist, the world does not exist, or that you are dead? YES NO
12. Have you been confused at times whether something you experienced was real or imaginary? YES NO
13. Do you hold beliefs that other people would find unusual or bizarre? YES NO
14. Do you feel that parts of your body have changed in some way, or that parts of your body are working differently? YES NO
15. Are your thoughts sometimes so strong that you can almost hear them? YES NO
16. Have you seen unusual things like flashes, flames, blinding light, or geometric figures? YES NO
17. Have you seen things that other people can't see or don't seem to see? YES NO
18. Do people sometimes find it hard to understand what you are saying? YES NO

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GRANDIOSE IDEAS

INQUIRY:

1. **Do you feel you have special gifts or talents?** Do you feel as if you are unusually gifted in any particular area? Do you talk about your gifts with other people?
2. **Have you ever behaved without regard to painful consequences? For example, do you ever go on excessive spending sprees that you can't afford?**
3. **Do people ever tell you that your plans or goals are unrealistic?** What are these plans? How do you imagine accomplishing them?
4. **Do you ever think of yourself as a famous or particularly important person?**
5. **Do you ever feel that you have been chosen by God for a special role?** Do you ever feel as if you can save others?

GRANDIOSE IDEAS	Severity Scale (circle one)					
0 Absent	1 Questionably Present	2 Mild	3 Moderate	4 Moderately Severe	5 Severe but Not Psychotic	6 Severe and Psychotic
	Private thoughts of being generally superior in intellect or talent.	Thoughts of being particularly talented, highly understanding, or gifted in one or more areas. Thoughts kept mostly private.	Notions of being unusually gifted, powerful, or special. May be expansive. Promotes significantly unrealistic plans, but easily reoriented.	Loosely organized beliefs of power, wealth, talent, or abilities. Unrealistic goals that may affect plans and functioning.	Persistent beliefs of having superior intellect, attractiveness, power, or fame. Skepticism about belief can be elicited. Often influences behavior or actions.	Delusions of grandiosity with conviction (no doubt) at least intermittently. Influences behavior and beliefs.

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Risk Stratification

- Ultra-High Risk (UHR) → 9-54% Conversion at 1 year
  - Attenuated positive psychotic symptoms
  - BLIPS or BIPS
  - Family History or Schizotypal Personality Disorder + Functional Decline

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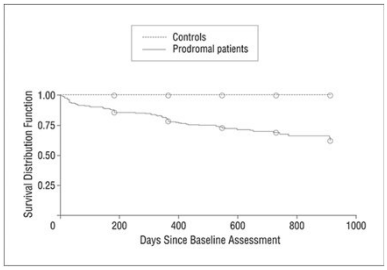
Conversion of High Risk Patients to Full Psychosis



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Controlled Studies for UHR: All off-label

- Risperidone +psychosocial treatment (non-blind).
  - Reduction in 6-month conversion rate, but no difference by 12 months
- Olanzapine
  - Trend of reduction of 12-month conversion rate.
- CBT (non-blind)
  - Reduction in 12-month conversion rate.
- Omega-3 Fatty Acids
  - Reduction in 12-month conversion rate (5% v. 28%).

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Safety Risk Assessment

- Psychosis increases risk of suicide, violence, victimization and abuse
  - In inpatient sample, children with psychosis were 3x more likely to have attempted or threatened suicide
  - Suicide risk may be highest early in course
- Assess for hopelessness, command auditory hallucinations, paranoia

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