

# Differential Diagnosis of Patients Presenting with Hallucinations

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Hallucinations often occur in the context of a variety of psychiatric, substance use, and medical conditions. Recent research has also shown that hallucinatory events may occur in the absence of any organic or known psychiatric disorders. This article reviews the types of hallucinatory experiences that may present to an osteopathic family physician and considers issues related to making differential diagnoses.

## INTRODUCTION

Patients presenting with hallucinations can be a challenging situation for a family physician. Although hallucinations are often part of primary psychotic disorders, they can also be found associated with a number of other psychiatric and non-psychiatric conditions. Automatically equating all perceptual disturbances with psychosis can lead to significant misdiagnosis and inappropriate medical treatment. Psychotic symptoms often have a long lasting and severe negative impact on patients and their families. The classical course of psychosis is one of recurrent exacerbations and remissions with deterioration of baseline functioning with each relapse.<sup>1</sup>

The most common psychotic disorder, schizophrenia, is a profoundly disruptive form of mental illness that involves distortions in a patient's cognition, emotions, perceptions and behavior. Once diagnosed, the mainstay of treatment for schizophrenia is the antipsychotic medications with adjunctive psychosocial interventions. Accurate diagnosis is particularly important since the antipsychotic medications are often associated with an array of potentially problematic side effects, including the metabolic syndrome and movement disorders such as tardive dyskinesia and pseudoparkinsonism. Although the therapeutic benefits of the antipsychotic medications may be delayed for weeks, side effects may begin soon after the initiation of treatment.<sup>2</sup>

Hallucinations as part of the clinical picture of schizophrenia are classified as positive symptoms meaning that there is an excess or distortion in sensory perceptions such as seeing or hearing things that are not physically present. Hallucinatory experience can involve any of the five senses with auditory hallucinations being the most common. Visual, tactile,

olfactory, and gustatory manifestations occur with less frequency. In general, if a patient presents with only visual hallucinations, hallucinations that are multimodal for sensations, or manifest for the first time in mid-life or later, diagnoses other than psychiatric, especially neurologic or substance abuse conditions should be strongly considered.<sup>3</sup>

The differential diagnosis for hallucinations must be broad, because they can present as part of primary psychotic disorders like schizophrenia, other mental disorders, substance abuse and addiction, general medical/neurologic conditions. Even "normal", nonclinical populations often experience a single hallucinatory event at rates of occurrence that are as high as 71% of persons surveyed.<sup>4</sup>

## CLINICAL APPROACH

It should be noted that patients frequently underreport hallucinatory events. Physicians need to obtain detailed histories from their patients to assure accurate recording of hallucinatory experiences. Patients should be encouraged in a nonjudgmental manner to describe any hallucinatory experiences in order to enhance diagnostic accuracy. Avoid prefacing questions with statements such as, "I have to ask you something that might sound silly," or "You haven't heard any voices. Have you?" Information from the patient about the hallucinations should include triggers, duration, frequency, involvement of the visual field, insightfulness, whether or not the hallucinations command the patient to do something, and any symptoms associated with the hallucinations.

## HALLUCINATIONS: TYPES

Hallucinations can affect any sensory system, and these disturbances in perception can be classified into a number of types.

### Auditory

Auditory hallucinations (paracusia) usually involve the false perception of sounds that lack any external source. A common

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manifestation is hearing voices speaking full sentences or single words but auditory hallucinations can also include a variety of sounds such as music, animal sounds, or tapping. Persons having auditory hallucinations are convinced of the objective reality of the experience. The patient's response to the hallucination can be positive or negative. Some patients welcome the experience while others find them to be intrusive and unwanted. Voices heard can be either male or female from real or imagined (fantasy) persons. More than one voice may be heard and 2 or more voices may be heard talking about the patient. Patients may report that the voices are internal or external.

Auditory hallucinations, paracusia, that are simple and unformed can be caused by diseases of the middle or inner ear and take on the sound of tones with varying pitches. Partial seizures or central nervous system neoplasms may produce an auditory hallucination sounding like music. Epilepsy can be associated with hallucinations that are brief and formed into trivial sentences or commands.<sup>5</sup>

### Visual

Visual hallucinations are experienced as visual sensory events that take place in the absence of any external stimuli. The false perceptions of visual hallucinations can involve either specific images such as persons, parts of bodies, or objects but can also be unformed experiences such as flashes of light. Visual hallucinations, while sometimes part of psychiatric disorders, are most often caused by substance abuse (intoxication or withdrawal) or general medical conditions. It is important to establish the temporal relationship between the substance use and onset of psychotic-like symptoms when ruling out primary psychiatric disorders, such as schizophrenia. When evaluating a patient with perceptual disturbances, it is important to determine if the images are visual illusions rather than hallucinatory events. A visual illusion is a modification of real external stimuli that may involve a distortion of size, shape or color. Visual hallucinations can be simple or elementary and would include perceiving lights, lines, geometric designs, or colors. Formed or complex hallucinations can be reported as involving people, animals, objects or entire lifelike scenes.<sup>6</sup>

A number of medical conditions should be considered when a patient reports simple hallucinations including retinal pathology, migraine headaches, Charles Bonnet syndrome, and occipital seizures. Epileptic visual hallucinations are usually simple and brief in duration consisting of colored spots or flashing shapes. Complex hallucinations in epilepsy are not common.

Simple as well as complex visual hallucinations are frequently reported in a variety of medical conditions including

Parkinson's disease in which up to 50% of patients have hallucinatory perceptions ranging from seeing shapes and colors to vivid scenes that involve people and animals. Dementia due to Lewy bodies is also associated with complex visual hallucinations. Approximately 20% of the patients perceive entire scenarios populated with people and various objects. Visual hallucinations are also apparent in dementia due to Creutzfeldt-Jakob disease. The discovery of visual hallucinations during dementia usually differentiates the Lewy bodies and Creutzfeldt-Jakob disease forms from dementia of the Alzheimer's type. Patients with delirium have a high incidence of visual hallucinations, over 25%, as well as auditory and tactile false perceptions over 18% of the time.<sup>7</sup> It is helpful to remember that while delirium develops rapidly, schizophrenia typically has a slower onset. This is especially true in the elderly population who could be at risk for delirium and have no prior psychiatric history. The acute onset and fluctuating symptoms associated with delirium are key features in differentiating the hallucinations from those seen in psychiatric disorders. The acute changes in mental status found in delirium, including disorientation and inattention, can fluctuate over the course of hours or days.

### Other Senses

Olfactory and gustatory hallucinations involve pleasant or disturbing odors and tastes that are not due to any physical stimulus. Olfactory hallucinations (phantosmia) can be related to medical disorders as well as to psychiatric disorders. Delusional bromosis is a psychiatric condition in which patients perceive that they are emitting an unusually strong odor. These patients may wash excessively and overuse deodorants and withdraw socially. Such patients may be misdiagnosed with obsessive-compulsive disorder. Though infrequent, other conditions that can show olfactory hallucinations include vascular dementia, Alzheimer's disease, epileptic activity, and medial temporal lobe tumors.

Tactile or haptic hallucinations relate to perceptions of touch or surface sensations. The phantom limb experienced by amputees is an example. The sensation of an infestation under the skin (formication) can be seen in the psychiatric condition known as delusional parasitosis and would be treated as a form of psychosis. Tactile hallucinations are common in cocaine or amphetamine intoxication.<sup>8</sup>

False sensations of objectionable changes in the body and internal organs are somatic or cenesthetic hallucinations. Patients with schizophrenia may express this type of false sensation. Cenesthetic hallucinations have also been found to be a possible side effect found in treatment with levodopa and dopamine agonists. Hallucinoses is the term for hallucinations most typically auditory and including threatening voices, that are associated with chronic alcohol abuse, especially

withdrawal. This type of hallucination is differentiated from delirium tremens, also associated with alcohol withdrawal. In contrast to alcoholic hallucinosis, delirium tremens involves a clouded sensorium, including prominent visual hallucinations and an overall disconnect from reality.<sup>9</sup>

## SLEEP DISORDERS

Patients with narcolepsy can report visual hallucinations that are vivid, colored, complex and frequently frightening. The content is primarily visual, but any of the other senses can be involved. Although most patients know the hallucinations are not real, a significant number lack this insight because of the vivid realistic imagery. These are called hypnagogic hallucinations when accompanying sleep onset and hypnopompic hallucinations when they occur during awakening. The patient with narcolepsy will typically report a number of additional symptoms including excessive daytime sleepiness, sleep paralysis, and cataplexy. These hallucinations can cause the patient to worry about sleep. Disruption in the patient's sleep architecture with intrusion of rapid eye movement sleep into wakefulness is seen as a contributing factor to the experience of hypnagogic and hypnopompic hallucinations.<sup>10</sup>

## HALLUCINATIONS IN A NONCLINICAL POPULATION

Hallucinations are found within the "normal" nonclinical population as well. A number of recent research studies have found that between 30-70% of the college student population has experienced auditory hallucinations at least once in their lives.<sup>4</sup> The Epidemiologic Catchment Area study that examined hallucinations in the general population have presented estimates of the prevalence of hallucinations between 10-25% depending on age. This study showed the lifetime prevalence of auditory hallucinations to be 10% in men and 15% in women.<sup>11</sup> The National Comorbidity Survey reported that 8.3% of respondents experienced auditory hallucinations.<sup>12</sup> Other survey results have estimated that approximately 4% of the general population has had auditory hallucinatory events.<sup>13</sup> Researchers have found that adolescence is a period of heightened frequency of hallucinatory experiences increasing soon after puberty to a peak in young adulthood and declining steadily into old age. Considering gender, females in the general population usually report more hallucinatory events than males; reported percentages vary widely.<sup>14</sup>

It has been suggested that hallucinatory experiences exist on a spectrum or continuum of severity. What is deemed to be normal or an indicator of mental illness is determined by such variables as frequency of occurrence, content of the hallucination, subjective distress over the event, level of insight, and evidence of other symptoms associated

with mental illness. This continuum model emphasizes the importance of the degree of impairment and distress due to the hallucinations that an individual is experiencing.

Auditory hallucinations can be perceived as negative voices; the individual hears content that is personally derogatory or insulting. Negative voices may take the form of commands that direct the individual to perform previously unacceptable or repugnant actions. In contrast, positive voices are perceived as pleasant and provide the individual with welcoming content about the self or surroundings. Although auditory hallucinations with positive content can be found among both clinic and nonclinical populations, negative voices associated with distress is related to severity of mental illness. Consequently many patients report feelings of loss when positive voices diminish or disappear as a result of treatment with antipsychotic medications.

With the recent studies finding hallucinations among a nonclinical or "normal" population, a shift in mental health care has been taking place. Since hallucinations were previously viewed as definite indicators of mental illness, family physicians were advised not to engage patients about the content of the hallucinatory experience in order to avoid showing agreement with the false perceptions. Previous advice was to consider only such conditions as schizophrenia, schizoaffective disorder, schizophreniform disorder, or bipolar disorder and immediately treat patients with hallucinations with antipsychotic medications to reduce any delusions and hallucinations. Rather, it may be clinically advantageous to engage patients who report auditory hallucinations without reflexively prescribing antipsychotic medications. An example of hallucinations considered to be helpful and comforting are those frequently experienced during bereavement. Up to 33% of elderly widows during bereavement experience auditory or visual hallucinations following the death of a long term spouse. Such hallucinatory experiences do not require pharmacotherapy, unless the hallucinations are in the context of major depression.<sup>15</sup>

When considering the appropriateness of antipsychotic medications, it is important to note that auditory hallucinations associated with psychosis are usually high in frequency, localized outside of the head, linguistically complex, trigger strong emotions, intrusive, and are believed to be shared by others. Patients with schizophrenia experience hallucinations, in order of highest to lowest frequency, that are auditory, visual, tactile, olfactory and gustatory in nature.<sup>3</sup>

## HALLUCINATIONS IN PSYCHIATRIC DISORDERS

Although the understanding of hallucinatory experiences has been expanded to a continuum approach, it is important

to remember that they are still closely associated with a variety of psychiatric illnesses. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM), hallucinations may be part of the clinical picture of a number of disorders including: schizophrenia, schizoaffective disorder, schizophreniform disorder, brief psychotic disorder, delusional disorder, bipolar I disorder, major depressive disorder, postpartum depression, conversion disorder, posttraumatic stress disorder, schizotypal personality disorder, borderline personality disorder, substance intoxication or withdrawal, substance induced psychotic disorder, dementia, and delirium. Psychotic symptoms may also sometimes be malingered, especially in cases where the patient is seeking some form of monetary compensation or facing legal charges. It should be noted that childhood-onset schizophrenia is very rare, and children presenting with hallucinations should be carefully screened for other psychiatric and non-psychiatric conditions, and the possibility that the symptoms are part of normal development should also be considered.

#### **Posttraumatic Stress Disorder (PTSD)**

Hallucinations may be found in individuals who have had traumatic experiences. Hallucinations in PTSD have been documented among combat veterans. The hallucinations are often associated with the sights and sounds associated with combat and can be a variant on re-experiencing the traumatic situation. But this is not always the case, as combat veterans experiencing PTSD also show hallucinations unrelated to combat events.<sup>4</sup> Among patients showing PTSD symptoms, it is important to also assess for major depression. Major depression can present with psychotic features such as hallucinations. A cautionary note: when treating a combat veteran with PTSD, it is important to assess if the patient is experiencing suicidal and/or homicidal ideation. These ideations, and related violence toward self or others, can co-occur among individuals with PTSD. Command hallucinations may be directing the person to act out on the ideation. Direct and nonjudgemental questioning about the possible existence of such auditory hallucinations is indicated.<sup>4</sup>

In addition to combat veterans, children and adolescents who have developed PTSD, especially from sexual abuse, frequently experience hallucinations. These hallucinations are typically auditory and are usually distressing to the

patient. The majority of the auditory hallucinations are related to self-harm, or derogatory/persecutory to the patient. The hallucinatory experiences are usually connected to the traumatic nature and actions of the abuse.<sup>16</sup> Although auditory hallucinations occurred with less frequency in PTSD compared to schizophrenia, the PTSD patients perceive the hallucinations as more distressing than in schizophrenia.<sup>17</sup>

#### **Schizophrenia and Schizoaffective Disorder**

Auditory hallucinations occur in up to 90% of patients diagnosed with schizophrenia or schizoaffective disorder. Auditory hallucinations are often complex and formed. Voices that are commenting on or discussing the patients' actions in the third person have long been considered to be of particular significance in the diagnosis of schizophrenia.<sup>18</sup>

#### **Borderline Personality Disorder**

Approximately 25% of patients with borderline personality disorder have reported auditory hallucinations, especially in relation to environmental stressors. Paranoia is also common. These patients find the hallucinations to be distressing, as they often critical of the patient, and occur with significant frequency during extended periods of time. The hallucinations often influence the patient's actions and may contribute to self-destructive behaviors.<sup>19</sup> While most hallucinations as part of psychiatric disorders respond to antipsychotics, medications are not well-established treatments for symptoms of borderline personality disorder.

Table 1 provides an overview of possible causes and interventions when hallucinations have been identified.

### **SUMMATION**

The osteopathic family physician is often presented the challenge of making an accurate diagnosis when a patient presents with a hallucinatory experience. Clinical research has shown that hallucinations are experienced by children, adolescents and adults with and without psychotic disorders. Awareness of the scope of disorders that can be associated with hallucinatory experiences is an important factor leading to accurate diagnosis and treatment.

**TABLE 1: Overview of Hallucinations: Possible Causes and Interventions**

Type	Possible Cause(s)	Typical Interventions
Medical	<p><b>Medical or Surgical Diseases:</b>  Delirium  Metabolic Disorders  Sepsis  Congestive Heart Failure  Postoperative and Posttraumatic States</p> <p><b>Medication and/or Substance Induced:</b>  Hallucinogens  Hallucinoses</p> <p><b>Diseases of the Nervous System:</b>  Cerebral Vascular Disease  Tumor  Abscess  Contusion  Subdural Hematoma  Meningitis and Encephalitis  Ophthalmic Disorders / Diseases  Inner or Middle Ear Disorders / Diseases  Migraine Headaches  Epilepsy</p>	<p><b>Appropriate Diagnostic Evaluation followed by:</b>  Medical Management  Treat Disease  Withdraw Toxic Agent</p>
Psychiatric	<p><b>Substance-Related Disorders:</b>  Alcohol Withdrawal / Intoxication  Drug Withdrawal / Intoxication</p> <p><b>Psychotic Disorders:</b>  Schizophrenia  Major Depression with Psychosis  Dementia</p> <p><b>Posttraumatic Stress Disorder</b></p> <p><b>Mania</b></p> <p><b>Personality Disorders (Stress-induced symptoms)</b></p>	<p><b>Psychiatric Management:</b>  Stop Toxic Agent  Prescribe Antipsychotic Medications  Manage Behavioral Disturbances</p> <p><b>Reduce Overstimulation in the Environment</b></p> <p><b>Consider Referral</b></p>
Transient	<p><b>Chemical Stimulation:</b>  Olfactory  Gustatory</p> <p><b>Sleep-Wake Disturbances:</b>  Hypnagogic  Hypnapompic</p> <p><b>Diminished Acuity in Visual Periphery</b></p> <p><b>Sleep, food, or sensory deprivation</b></p> <p><b>Fatigue</b></p> <p><b>Bereavement</b></p> <p><b>Abuse</b></p> <p><b>Prolonged isolation</b></p>	<p><b>Evaluate Changes in Health Status, Losses, Medications, Stressors and provide patient education/reassurance.</b>  Assess Need for Comprehensive Diagnostic Work-Up</p>

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