# Altered Mental Status and Endocrine Diseases

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**KEYWORDS**

• Altered mental status • Diabetic ketoacidosis • Thyroid storm • Myxedema coma • Pheochromocytoma • Addison disease

**KEY POINTS**

- Although altered mental status is a common presentation in the emergency department, altered mental status caused by endocrine emergencies is rare.
- The differential diagnosis for altered mental status is always varied and it is sometimes difficult to uncover the ultimate cause in the emergency department.
- When considering the differential diagnosis of an altered patient, clinicians must consider the age and sex of the patient, prior medical history, medications, and risk factors for developing endocrinopathies.

## INTRODUCTION

The chief complaint of altered mental status represents up to 10% of all emergency department (ED) visits, and 5% of these are ultimately diagnosed with endocrine causes.[1] Being altered is a term that includes a spectrum of presentations including being comatose, combative, confused, having personality changes, or being difficult to arouse. It could pose a challenge to diagnose a patient with altered mental status secondary to an endocrine disorder, especially if a prior history of an endocrine disease is unknown. The diagnosis of these diseases requires a high clinical suspicion, and information gleaned from the history, physical examination findings, and laboratory studies. When considering the differential diagnosis of an altered patient, clinicians must consider the age and sex of the patient, prior medical history, medications, and risk factors for developing endocrinopathies. The cause of the endocrine disease and the precipitating factor for the diseases commonly have similar presentations, which causes increasing complexity in the diagnosis of these diseases.

The authors have nothing to disclose.

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## EVALUATION AND TREATMENT OF THE PATIENT

### *History*

All patients who present to the ED should be approached with a stepwise algorithm. As with any patient who presents to the ED, a thorough assessment of the ABCs (airway, breathing, and circulation) is required. After the patient's airway and circulatory status are assessed and stabilized, the cause of the presentation can be sought. The act of taking the history may prove difficult depending on the patient's mental status. The emergency physician may develop a plausible differential diagnosis primarily from speaking with the patient, or this may necessitate involvement of family members or caretakers. Because of the wide variety of presentations, from the subtle alterations of sensorium to a floridly psychotic state, eliciting a history that suggests an endocrinopathy as the cause of the mental status change can be difficult. Any information could be vital to diagnosing and treating the patient appropriately.

The history should begin with an adequate understanding of baseline mental status, and any reports of bizarre behavior need to be supported with specific examples. The history should focus on the onset of the symptoms and variability of the symptoms through time. Emergency physicians should not hesitate to call those who can provide the most accurate information, such as the nursing home staff, family and friends, or other health care providers who may have information about the patient. To the extent that it is possible, the history should also include a thorough medical history, and this may require a review of the patient's medical records, if available. The pertinent aspects of the medical history include any new or changed medications, substance abuse, and any antecedent illnesses.

Part of the difficulty in diagnosing endocrinopathies is that they can be exacerbated, or masked, by other processes. A thorough review of the history is necessary to evaluate the possibility of other processes, which include infection, polysubstance abuse, cerebrovascular accidents, psychiatric illness, dementia, or head trauma.

### *Physical Examination*

The physical examination should always begin with an overview of the vital signs, which may provide an initial clue to the underlying cause. Examples of vital sign abnormalities associated with endocrinopathies are listed in **Table 1**.

After an assessment of the vital signs, a thorough head-to-toe physical examination should be performed. The examination should start with a general overview of the patient's appearance because this may give clues to the cause of their presentation. As with any patient who presents with a change in mental status, a complete neurologic examination is warranted. The neurologic examination should begin with an assessment of mental status; a commonly used tool is the mini-mental screening examination (MMSE). A quick MMSE allows the practitioner to easily and reliably determine the patient's cognitive ability. Next, the assessment should include a neurologic examination with focus on the cranial nerves to evaluate for a possible cerebrovascular accident. Other crucial components of the neurologic examination include examination of muscle tone, strength, and reflexes. Although an extensive examination of the integumentary system is rarely performed, this can be beneficial in the obtunded patient. For example, abnormalities of the skin and hair can give clues to previous hypothyroidism. **Table 2** shows other endocrinopathies and examples of pertinent physical examination findings that can be associated with them.