

E02: Adrenal Crisis

Richard Armour and Chris Millar

Updated: September 29, 2023

Reviewed: March 01, 2021

Introduction

Acute adrenal insufficiency, or adrenal crisis, is a life-threatening endocrine emergency caused by a lack of cortisol (the most common glucocorticoid). Primary adrenal insufficiency is caused by a loss of function of the adrenal gland while secondary adrenal insufficiency is a result of compromised adrenal function, due to a lack of adrenocorticotropic hormone. Patients who are unwell with a past medical history of Addison's disease (the incidence of which varies from 1-6 out of every 100,000 individuals) should be routinely evaluated for signs of an adrenal crisis; these individuals may carry their own hydrocortisone injections.

Paramedic and EMR/FR treatment for adrenal insufficiency includes the maintenance of airway patency, supporting oxygenation and ventilation, providing adequate fluid resuscitation, correction of hypoglycemia, and the early recognition of these crises leading to the timely administration of hydrocortisone.

Essentials

- In undifferentiated, critically ill patients, routinely assess for a history of Addison's disease or a pre-existing prescription for hydrocortisone injection.
- The administration of a single dose of hydrocortisone to patients with adrenal insufficiency is never harmful. The failure to recognize and treat an adrenal crisis may rapidly result in death.
- In patients with suspected adrenal crisis, hydrocortisone should be administered prior to movement, as some patients may lack a sufficient adrenal reserve to allow for safe transfer to a stretcher.
- Intravenous administration of hydrocortisone is preferred over the intramuscular route. However, IM administration should be provided early when IV access is delayed or unobtainable.
- Patients on long-term (> 3 weeks) glucocorticoid therapy are at risk for secondary adrenal insufficiency.
- Any source of stress (illness, trauma, mental health crisis) in patients with chronic adrenal insufficiency may be sufficient to provoke a crisis.

Additional Treatment Information

- **Caution: Patients with suspected adrenal crisis should never be ambulated to the ambulance.**
- Hydrocortisone should be administered to patients with suspected adrenal crisis, regardless of whether the patient received hydrocortisone prior to paramedic or EMR/FR arrival.
- Adrenal insufficiency may commonly co-occur with diabetes mellitus. Ensure blood glucose is assessed in all patients with suspected adrenal crisis and treat accordingly.
- In the rare circumstance where a patient with known or suspected adrenal insufficiency also presents with anaphylaxis, administer [EPINEPHrine](#) before hydrocortisone.
- Glucocorticoids are used in many chronic medical conditions such as autoimmune disorders, asthma, inflammatory bowel disease, and cancer. In patients with prolonged use of glucocorticoids (3 weeks or more), this may cause suppression of ACTH release, and place the patient at risk of secondary adrenal insufficiency.
- Common glucocorticoids include prednisone, prednisolone, dexamethasone, betamethasone, and hydrocortisone.
- Previous adrenal crisis places the patient at greater risk for future adrenal crises.

General Information

Prior to considering treatment with glucocorticoids, patients must be evaluated appropriately. Hydrocortisone therapy is appropriate in those patients who have:

Signs and symptoms of an adrenal crisis:

- Nausea and vomiting

- Hypoglycemia
- Hypotension
- Weakness
- Dizziness
- Confusion or altered levels of consciousness

And:

- A history of any of:
 - 3 weeks or more of glucocorticoid use
 - Non-compliance or cessation of chronic glucocorticoid therapy (including difficulties with compliance because of nausea/vomiting or prolonged illness)
 - Addison's disease
 - Pituitary insufficiency

And:

- Been prescribed hydrocortisone for management of adrenal insufficiency.

Steroid use should be avoided in patients with acute traumatic head injuries.

Interventions

First Responder

- Position supine to improve blood pressure and do not walk the patient.
- Provide supplemental oxygen as required.
 - → [A07: Oxygen Administration](#)

Emergency Medical Responder – All FR interventions, plus:

- Provide supplemental oxygen to maintain SpO₂ ≥ 94%.
 - → [A07: Oxygen Administration](#)
- May assist patient in administering own hydrocortisone injection if available. Assistance is limited to physically collecting medication. EMRs **must not prepare or administer hydrocortisone.**
- Obtain capillary blood glucose sample; if hypoglycemic:
 - → [E01: Hypoglycemia and Hyperglycemia](#)

Primary Care Paramedic – All FR and EMR interventions, plus:

- Consider vascular access for drug administration; do not delay hydrocortisone in cases of failed or difficult vascular access
- → [D03: Vascular Access](#)
 - Normal saline to correct hypoperfusion or hypotension
- Dextrose to normalize blood glucose
 - → [E01: Hypoglycemia and Hyperglycemia](#)
- **Requires completion of PCP scope expansion education:**
 - [Hydrocortisone](#) IV (IM is acceptable if vascular access is unavailable)
 - [On-Call consultation required](#) prior to the administration of hydrocortisone

References

1. Baines A. Adrenal insufficiency: Improving paramedic practice. 2015. [\[Link\]](#)

Practice Updates

- 2023-09-29: enabled guideline

