

E02: Adrenal Crisis

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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 to 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 treatment for adrenal insufficiency includes the maintenance of airway patency, supporting oxygenation and ventilation, providing adequate fluid resuscitation, the correction of hypoglycaemia, as well as early recognition of these crises and 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 a 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

- Hydrocortisone should be administered to patients with suspected adrenal crisis, regardless of whether the patient received hydrocortisone prior to paramedic 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.
- Patients with suspected adrenal crisis should never be ambulated to the ambulance.
- In a rare circumstance where a patient with known or suspected adrenal insufficiency also presents with anaphylaxis, administer [EPINEPHrine](#) before hydrocortisone.

General Information

- 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 or hydrocortisone.
- Previous adrenal crisis places the patient at greater risk for future adrenal crisis.
- Signs and symptoms of an adrenal crisis are general and should be correlated with clinical history:
 - Nausea and vomiting
 - Hypoglycemia
 - Hypotension
 - Weakness

- Dizziness
- Confusion or altered levels of consciousness
- Evaluate the patient's medical history for any of:
 - 3 weeks 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

Interventions

First Responder

- Position supine to improve blood pressure and do not walk the patient
- Provide supplemental oxygen to maintain $\text{SpO}_2 \geq 94\%$
- → [A07: Oxygen and Medication Administration](#)

Emergency Medical Responder – All FR interventions, plus:

- May assist patient in administering own hydrocortisone injection, if available
- 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](#)

References

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

