

Emergency Care of Adrenal Insufficiency



**Seattle and
King County**

Emergency Medical Services Division
Public Health – Seattle & King County

Adrenal Insufficiency (AI)

What is the anatomy and function of the adrenal glands?

What is adrenal insufficiency (AI)?

What are the causes of AI?

How common is AI?

How is AI diagnosed and treated?

What about the medical emergency for the AI patient?

How do I recognize the AI patient with a medical emergency?

What special care is required for the AI patient with a medical emergency?



Anatomy and function of the adrenal glands



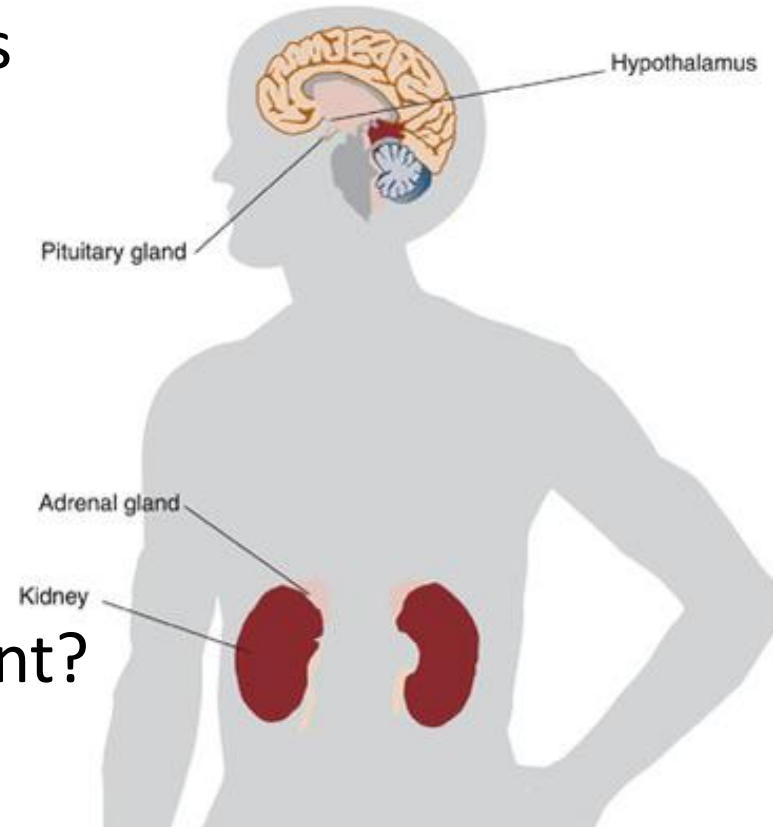
Anatomy and function of the adrenal glands

Adrenal gland produces hormones

- Cortisol
- Aldosterone
- Epinephrine
- Androgens

When the body is stressed, which adrenal hormone is most important?

Cortisol



Adrenal insufficiency

Adrenal insufficiency occurs when the adrenal gland no longer is able to adequately produce one or more hormones.

Primary versus Secondary



Primary versus Secondary

Primary AI occurs with the adrenal gland fails on its own.

Primary AI is due most often to autoimmune causes.

Primary AI is uncommon – affecting $\sim 1/10,000$. Estimates are that ~ 200 persons in King County are diagnosed with AI

Secondary AI occurs because medications the patient is taking suppress the adrenal glands' ability to produce cortisol on its own.

This most common of these treatments is prednisone.



Adrenal Insufficiency

Adrenal insufficiency can be challenging to diagnose

Symptoms are often nonspecific:

Fatigue

Decrease energy

Poor appetite

Nausea & vomiting

Abdominal discomfort

Diagnosis requires specialty lab testing



Adrenal Insufficiency Treatment

Primary chronic treatment is with hydrocortisone tablets



Adrenal Insufficiency during a medical emergency

In a patient *without* AI, cortisol production changes during the medical emergency by:

- A. Increases 2 fold
- B. Declines by half
- C. No change
- D. Increases 10 fold



True or False?

In an acute severe illness, the lack of cortisol in a person with AI can be fatal.

True



Mechanisms of Physiologic Stress

Patients in AI cannot mount a physiologic response to stress and so are at risk of shock physiology.....

AND

AI patients do not respond well to routine treatments for shock such as IV fluids or pressor medications.....unless they have stress dose cortisol

Adrenal insufficiency and acute emergency

How do we identify the emergency patient with acute adrenal insufficiency?



Identification

If a patient has AI, any sign of shock/physiologic distress/brain injury is an acute medical emergency appropriate to administer stress-dose cortisol.

Symptoms and signs include:

Hypotension (SBP<100)

RR > 24

Decreased level of consciousness

Major trauma

Pulse > 100

O2 sat < 92%

Febrile illness

Brain injury

Action Items

Activate ALS

Administer the patient's cortisol (solu-cortef)



Cortisol (solu-cortef) administration

Assure personal protective equipment.

Mix the powder drug and solvent by depressing the lid.

Gently mix.

Remove the center cap.

Draw up the full amount (100 mg – 2 mls)

Confirm with your crew.

Prep the skin.

Administer in the anterior-lateral thigh muscle.

Remove needle and apply pressure for ~10 seconds.



See the handout for illustrations

Paramedic Role and Responsibility

Paramedics must undertake a patient evaluation. These patients will almost always benefit from IV hydration and may require pressor therapy for refractory signs of shock.

If paramedics are on-scene, the cortisol may be administered via slow-push (30 seconds) via an IV line.

Patient only requires one field dose of IM/IV stress-dose cortisol.



Documentation

Document dose, time, and location of administration.

Document at least one set of vitals after the administration of cortisol 5-10 minutes after administration.

Dispose of supplies in a safe manner.



Case studies

35 yo man has “had a cold” for the past few days but then this morning developed chills, nausea, and repeated vomiting X 5. No blood in the emesis. No other symptoms.

He reports AI and took a double dose of his prednisone (20 mg) this morning because of his cold.

His vitals are BP 84/p P 120 RR 20 O2 97% GCS 15

Do you treat with cortisol?

Case studies

38 yo woman was released 1 day prior following surgery to remove her gall bladder. She now has several hours of fever, increasing pain with breathing, and worsening nausea.

Her vitals are BP 110/80 P 140 RR 22 O2 95% GCS 15

The skin over her surgical site looks normal. However her abdomen is quite tender upon palpation.

Do you treat with cortisol?

Case studies

42 yo man is involved in a motor vehicle crash. He appears confused and may have suffered a head injury.

His vitals are BP 120/80 P 90 RR 20 O2 97% GCS 11

No overt injury. However he continues to provide only mumbled words and does not follow commands but withdraws to pain.

Passenger lets you know he was fine before the crash.

Do you treat with cortisol?

Case studies

42 yo woman is involved in a motor cycle crash. She was helmeted. She is awake and alert but has obvious extremity injuries and complains of severe pain.

Her vitals are BP 130/80 P 90 RR 20 O2 95% GCS 15

Her extremity exam reveals an apparent angulated fracture of her femur and open fracture of her ankle and degloving/mangle of her hand.

Do you treat with cortisol?

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