



Clinical Practice Guidelines: Medical/Adrenal insufficiency

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Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
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Adrenal insufficiency

July, 2022

Adrenal insufficiency (AI) is an endocrine disorder caused by a reduced production of the adrenal hormone cortisol (i.e. hydrocortisone), the major glucocorticoid.^[1] This hormone facilitates the body's ability to respond to stress and maintain other essential life functions. If adrenal insufficiency is left unmanaged, it can progress to an acute adrenal crisis which can result in severe morbidity or even death.^[1-4]

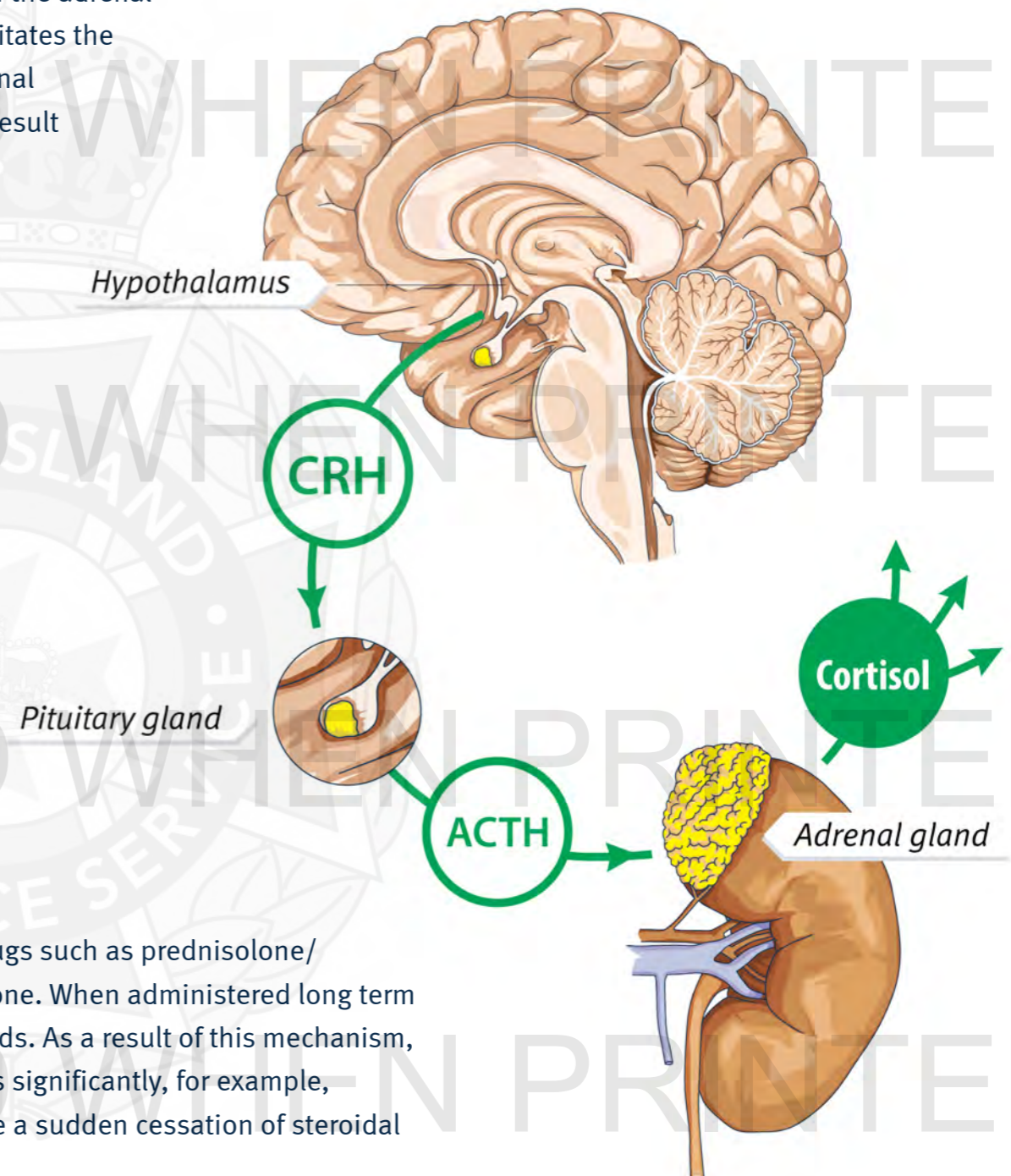
There are three categories of adrenal insufficiency:

Primary adrenal insufficiency (PAI) – This occurs as a result of direct adrenal gland dysfunction. Typically, it is caused by an autoimmune disease such as Addison's disease.

Secondary adrenal insufficiency (SAI) – This occurs due to a deficiency in adrenocorticotropin hormone (ACTH) secretion by the pituitary gland.

Tertiary adrenal insufficiency (TAI) – This occurs secondary to hypothalamic dysfunction, resulting in a decrease in corticotropin-releasing hormone (CRH), the hormone which stimulates the pituitary gland to produce ACTH. Sudden withdrawal from long-term exogenous steroid use is the most common cause of TAI.

Adrenal insufficiency is typically treated with daily steroidal replacement therapy drugs such as prednisolone/prednisone, hydrocortisone, cortisone acetate, dexamethasone or methylprednisolone. When administered long term (4 weeks or greater), the adrenal glands cease to produce endogenous glucocorticoids. As a result of this mechanism, an acute adrenal crisis can occur: (1) when the body's cortisol requirement increases significantly, for example, during periods of severe physical or psychological stress; or (2) in patients who have a sudden cessation of steroidal replacement therapy.





Clinical features

Any patient with an exposure to severe physical or psychological stress, who meet any of the following criteria should be considered at risk of an acute adrenal crisis and therefore, should be considered for hydrocortisone administration:

- Known history of adrenal insufficiency (e.g. Addison's disease, congenital adrenal hyperplasia, panhypopituitarism); or
- Current history of, or recent cessation of long term (4 weeks or greater) glucocorticoid therapy.

Examples of presentations requiring hydrocortisone administration include:

- Exposure to severe physical stress, for example:
 - Altered vital signs;
 - Vomiting and/or diarrhoea;
 - Infection requiring antibiotics;
 - Serious illness;
 - Significant undifferentiated pain;
 - Childbirth (labouring); or
 - Trauma requiring medical intervention.
- Exposure to severe psychological stress

Symptoms of an adrenal crisis:

- Severe weakness
- Altered level of consciousness or confused
- Syncope or postural hypotension
- Abdominal pain
- Nausea and/or vomiting
- Back pain
- Hypoglycaemia



Risk Assessment

- Diagnosis of AI can be challenging as the clinical signs are not specific and may progress insidiously over time.
- The administration of short-lasting glucocorticoids (i.e. hydrocortisone) has a proven safety profile.^[5,6] Ambulance clinicians should therefore have a low threshold for administering hydrocortisone to patients who are at risk of an acute adrenal crisis.



Additional information

- The long-term systemic use of glucocorticoids (mainly by oral administration) as anti-inflammatory or immunosuppressive therapy is the most common cause of adrenal insufficiency.^[7]
- Many AI patients are supplied with a written 'Adrenal Insufficiency Action Plan' and hydrocortisone (Act-O-Vial®) for emergency intramuscular administration.
- Ambulance clinicians should have a low threshold to administer hydrocortisone to known AI patients when requested by the patient or guardian/carer.
- Any patient presenting with an established 'Adrenal Insufficiency Action Plan' should be managed in accordance with the documented instructions.
- Dexamethasone is considered less favourable for the management of AI because it has no mineralocorticoid effects.

+ Additional information (cont.)

- Intravenous hydrocortisone dosing is preferred, however if delays to administration are expected, intramuscular administration is acceptable.
- Do not hesitate to administer hydrocortisone to a pregnant woman if clinically indicated. Hydrocortisone is inactivated by the placenta and does NOT affect the unborn baby. Conversely, failure to treat a pregnant woman with adrenal insufficiency can result in death the of mother and/or loss of the child. [8,9]

