Worcestershire Acute Hospitals NHS Trust

Guideline for the Management of Adrenal Insufficiency in Adults

This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

Introduction

Adrenal crisis is a life-threatening emergency that can occur in patients with adrenal insufficiency.

Patients with adrenal crisis frequently present with non-specific symptoms, therefore, there should be a high degree of suspicion in individuals with adrenal insufficiency who present acutely.

If adrenal crisis is suspected clinically, treatment should be given **WITHOUT DELAY**. It is safer to treat and reassess later if there is any doubt whether an adrenal crisis may be occurring.

This guideline is for use by the following staff groups: Doctors, Advanced Nurse Practitioners, Nurses, Physician Associates & Pharmacists.

Lead Clinician(s)

Dr Ramalingam Bhaskar	Consultant, Diabetes & Endocrinology. Lead Endocrinogist.
Dr Mohammad Abdus Salam	Locum Consultant, Diabetes & Endocrinology
Dr Irfan Babar	Consultant Physician in Diabetes & Endocrinology
Swapna George	Endocrine Specialist Nurse
Approved by the Specialty Medicine Divisional Management Board on:	22nd October 2025
Approved by Medicines Safety Committee on:	12th November 2025
Review Date: This is the most current document and is to be used until a revised version is available	22nd October 2028

Key amendments to this guideline

Date	Amendment	Approved by:
24/09/2021	New document approved	Specialist Medicine DMB/ MSC
May 2025	Document extended for 6 months whilst review process is undertaken	Swapna George
	This Trust guideline has been updated in accordance with the NICE guideline NG243 (2024) on adrenal insufficiency. Key amendments include replacing the term "double dose" with "stress dose" of steroid tablets during episodes of acute illness to reflect current national terminology. The guideline now includes management protocols for both diagnosed adrenal insufficiency and patients at risk during acute hospital admissions, including those on PRN steroid therapy. Anaesthetic considerations have been expanded to ensure appropriate perioperative steroid coverage for these patient groups. Additional updates address the care of ante-natal patients with adrenal insufficiency, end-of-life care planning, and the acute management of hyponatraemia. Guidance has also been added regarding the provision and use of hydrocortisone emergency injection kits, including prescription pathways via primary care. Furthermore, the guideline outlines safe withdrawal strategies for long-term oral corticosteroid treatment in patients not diagnosed with adrenal insufficiency. These amendments aim to enhance patient safety, reduce the risk of adrenal crisis, and standardise care across emergency, surgical, maternity, and palliative care settings.	Specialist Medicine DMB/ MSC
April 2026	**Page 5, contact endocrine**: removed Endo SpR bleep number (bleep not held). **Page 19 under Emergency Hydrocortisone Injection Kit, removed**: Please note that the kit may also contain a prefilled ampoule of 100mg hydrocortisone sodium phosphate (Efcortesol®) instead of Solu-Cortef®. **Page 19 under repeat prescription, removed**: OR • Two ready diluted liquid version Hydrocortisone Sodium Phosphate injection 100mg ampules (not required water for injection to dilute).	Swapna George

Guideline for the Management of Adrenal Insufficiency in Adults

This guideline will focus on following aspects as promoted by NHS England national patent safety alert (NatPSA)

- **Emergency management of adrenal crisis**
- **Management of adult patients with adrenal insufficiency during surgery & procedures**
- **Long term management with patient education**
- **Steroid Emergency card**
- **Sick day rules**
- **Injection hydrocortisone kit to take home**
- **Antenatal care**
- **People receiving end of life care**
- **Steroid withdrawal information**

Introduction

Adrenal insufficiency is an often-unrecognised endocrine disorder, which can lead to adrenal crisis and death if not identified and treated.

The commonest causes of primary adrenal insufficiency include Addison's disease, congenital adrenal hyperplasia, bilateral adrenalectomy and adrenal haemorrhage.

Causes of secondary adrenal insufficiency are pituitary disease, pituitary tumours and their treatment (surgery and radiotherapy), and, also termed tertiary adrenal insufficiency, hypothalamic–pituitary–adrenal axis (HPA) suppression from exogenous steroids or, more rarely, from treatment of primary brain or nasopharyngeal tumours with radiotherapy when the hypothalamus and/or pituitary is included in the treatment field.

Omission of steroids in patients with adrenal insufficiency, particularly during physiological stress such as an intercurrent illness or surgery, can also lead to an adrenal crisis.

The incidence of adrenal crisis has been reported as 8.3 episodes per 100 patient-years in individuals with primary adrenal insufficiency, and between 3.6 to 5.2 episodes per 100 patient-years in those with secondary adrenal insufficiency. Hospital admission data for adrenal insufficiency, collected across financial years 2018/19 to 2022/23 (1 April 2018 to 31 March 2023), indicate a substantial burden on NHS services. These data, based on Hospital Episode Statistics (HES) codes, include 57,125 episodes for primary adrenocortical insufficiency (E27.1), 12,640 for adrenal crisis (E27.2), and 79,965 for other or unspecified adrenal insufficiency (E27.4) (Murray et al., 2025). The average cost per admission in 2022/23 was estimated at £4,409 for primary adrenal insufficiency, £6,579 for adrenal crisis, and £4,726 for other or unspecified adrenal insufficiency (Ruiz et al., 2024).

Patients with adrenal crisis frequently present with non-specific symptoms, therefore, there should be a high degree of suspicion in individuals with adrenal insufficiency who present acutely. If adrenal crisis is suspected clinically, treatment should be given WITHOUT DELAY. It is safer to treat and reassess later if there is any doubt whether an adrenal crisis may be occurring. There are no adverse consequences of initiating life-saving Hydrocortisone treatment.

Clinical Features

Most commonly, patients with adrenal crisis feel 'generally unwell' with severe fatigue/lethargy, dizziness, nausea, vomiting, diarrhoea, abdominal pain and/or hypotension. Drowsiness and coma are late features.

Biochemically, patients may have hyponatraemia, hyperkalaemia (in primary adrenal failure only, in secondary or central hypoadrenalism potassium will be normal), hypoglycaemia and/or Acute Kidney Injury secondary to dehydration.

In patients with type 1 diabetes, adrenal insufficiency may present with recurrent hypoglycaemia.

Precipitating factors:

The commonest causes of crisis in known adrenal insufficiency are gastrointestinal illness (23%), other infections (25%), peri-surgery (10%) and physiological stress/pain (9%).

Investigations:

- Basic tests (all patients): FBC, U&Es, Capillary blood glucose, venous blood gas.
- Investigation of the precipitating cause (i.e., cultures for infection)

If adrenal crisis is suspected in patients not already known to have adrenal insufficiency:

- Take paired sample of cortisol and ACTH before starting hydrocortisone (if this will not delay the hydrocortisone treatment). The sample needs to be sent to the lab immediately as ACTH is a time sensitive test.
- Formal confirmation of diagnosis can be safely carried out after clinical recovery.
- Please see short Synacthen test guideline for further information.

Adrenal Crisis Suspected (Clinically)

Haemodynamically stable

Yes

No

Perform Short Synacthen® Test (SST)
- 0 min Cortisol & Plasma ACTH
- Tetracosactide (Synacthen®) 250 micrograms IM or IV
- 30 min Cortisol

Give Hydrocortisone first if unstable and SST can then be deferred

- IV or IM Hydrocortisone 100 mg stat followed by-
- IV hydrocortisone infusion 200mg/24 hrs or 50 mg IV/IM QDS maintenance**
  **Consider 100mg IV QDS in BMI of 40 or above
- IV fluid*- 500ml 0.9% Sodium Chloride over 15min
  & replace any electrolyte deficit

ABC as per ALS
- IV/ IM hydrocortisone 100 mg stat
- Maintenance IV hydrocortisone infusion 200mg/24 hrs or 50 mg IV/IM QDS **
  **Consider 100mg IV QDS in BMI of 40 or above
- IV fluid* -500ml 0.9% Sodium Chloride over 15min
  & replace any electrolyte deficit
- If hypotension persists after Hydrocortisone contact Critical Care team

* Rehydrate with 0.9% NaCl (provided no evidence of ↓Na+)

Followed by careful rehydration ~3-4L over 24hours

- ABG
- FBC, U& E, LFT, Venous Glucose, FT4, TSH
- Identify & treat underlying factors
- IV glucose if hypoglycaemia
- Inform ITU team if unstable

Contact Endocrine Team
E-mail endocrine team
WRH
wah-tr.diabetesandendocrinereferrals@nhs.net
Alex. hospital Redditch:
wah-tr.alexdiabetessecs@nhs.net

After emergency care
- Initiate stress-dose oral corticosteroids once the patient is clinically stable.
- For patients already receiving physiological equivalent dose of corticosteroid tablets, an appropriate **stress dose** should be administered during episodes of acute illness.
- Continue oral fludrocortisone at **same dose** if already on it.
- Refer to the Endocrinologist for specialist advice on adrenal insufficiency and arrange follow-up in the Endocrine outpatient clinic.
- Provide steroid safety education and inj. Hydrocortisone kit.
- Issue emergency hydrocortisone kit.

Guideline for the Management of Adrenal Insufficiency in Adults

Management of adrenal insufficiency and risk of adrenal insufficiency patients during acute admission.

Patients admitted to the Accident and Emergency Department, or any other department, who have a diagnosis of adrenal insufficiency or are at risk of adrenal crisis should be urgently assessed and managed for adrenal insufficiency. This includes patients who have recently stopped using glucocorticoids by any route of administration after taking them for more than 4 weeks, are taking glucocorticoids at physiological equivalent doses or above by any route of administration and have had an episode of physiological stress.

1. Please ask the patient or ambulance crew if the patient has received an emergency injection of hydrocortisone 100 mg, including the time and route of administration. If the hydrocortisone injection was not administered or was administered 6 hours ago, administer intravenous or intramuscular hydrocortisone for suspected or severely ill patients (e.g., dizziness, inability to get out of bed due to illness, high temperature, vomiting, or diarrhea, infection...etc). Administer 100 mg for patients who did not receive the injection, and 50 mg QDS for patients who received the injection 6 hours ago.

2. Monitor blood pressure, pulse rate, respiratory rate, oxygen saturation and blood glucose levels to assess adrenal crisis symptoms.

3. Blood samples should be collected for U&E's test to monitor sodium and potassium levels to asess for adrenal crisis.

If adrenal crisis suspected please follow adrenal crisis management flow chart.

If adrenal crisis is not diagnosed:

1. Continue to give hydrocortisone by intravenous or intramuscular 50 mg QDS until the patient is haemodynamically stable and they are able to take and absorb oral glucocorticoids.

2. Continue to give 0.9% sodium chloride intravenous infusion, determined by haemodynamic parameters and electrolyte status, until the person is haemodynamically stable.

3. Identify and treat any underlying cause of illness.

4. If the patient is haemodynamically stable and they are able to take and absorb oral glucocorticoids , switch to 40 mg oral hydrocortisone daily in 2 to 4 divided doses or at least 10 mg oral prednisolone daily in 1 to 2 divided doses until any underlying cause has resolved and the person is clinically stable.

5. After that, return to the usual physiological dose of glucocorticoids for patients taking a daily steroid tablet.

6. For all other patients, reduce the dose to hydrocortisone 20 mg daily in 2 to 3 divided doses or prednisolone 5 mg daily. Then, prescribe the medication for alternate days for one week and stop completely.

Physiological equivalent doses

The physiological equivalent dose is the dose of glucocorticoid that is equivalent to the amount that a healthy adrenal gland would normally produce:
For people aged 16 years and over this is a total daily dose of hydrocortisone 15 mg to 25 mg (for example: divided doses of 10 mg AM, 5 mg at lunch and 5 mg at evening around 5pm), or prednisolone 5 mg AM, or dexamethasone 0.75 mg AM or budesonide1mg per day.

Stress doses of steroid

Sick-day dosing

Medication Adjustment Guidelines During Periods of Stress in Patients with Adrenal Insufficiency

During periods of physiological stress, individuals with adrenal insufficiency require increased glucocorticoid dosing to replicate the body's natural rise in cortisol. Psychological stress may also necessitate dosing modifications based on clinical judgement.

Definition of Stress

Physiological stress: Includes fever, intercurrent illness, trauma, invasive procedures, surgery, and pregnancy (including labour and pregnancy loss).

Psychological stress: Sudden, intense emotional events such as bereavement, major life changes events such as getting married or divorced, or academic pressure.

The acute illness dose of glucocorticoid (Stress dose):

For people aged 16 years and over this is a total daily dose of Hydrocortisone 40 mg (divided doses of 20 mg AM, 10 mg at lunch and 10 mg at evening), or Prednisolone 10 mg AM or two divided doses (for example: 5mg AM, 5 mg PM), or Dexamethasone 1.5 mg AM.

Table 1. Recommended intra- and postoperative steroid cover for adults with adrenal insufficiency (primary, secondary, or tertiary), and for those receiving adrenosuppressive doses of glucocorticoids (equivalent to prednisolone ≥ 5 mg daily for 4 weeks or longer). This also includes patients taking physiological replacement doses of glucocorticoids who are not formally diagnosed with adrenal insufficiency.

Type of procedure	Pre-operative and operative needs Intra-operative steroid replacement	Post-operative steroid replacement
Surgery under anaesthesia (general or regional) Including major bowel surgery, procedures needing ITU, endoscopy, Caesarean delivery, joint reduction, IVF egg extraction	• Hydrocortisone 100 mg intravenously on induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg infusion in 48ml 0.9% Sodium Chloride over 24 hours IV peri-operatively • Alternatively, hydrocortisone 50 mg every 6 hourly by IV or IM injection.	• Hydrocortisone 200 mg 24 hours by IV infusion while nil by mouth or for patients with postoperative vomiting. • Alternatively, hydrocortisone 50 mg every 6 hourly by IV or IM injection. • If the patient is tolerating their diet and fluids well and is not experiencing vomiting, then the stress-dose of hydrocortisone tablets may be appropriate instead of injection hydrocortisone. • Stress dose of oral steroid dose for 48 hours or for up to a week following major surgery. • With rapid recovery stress hydrocortisone doses for 48 hours to 72 hours. • Return to normal physiological dose when symptomatically well.
A. **Endoscopy procedure.** **All endoscopic patients, regardless of whether sedation is required. Example: OGD, Colonoscopy, ERCP, Bronchoscopy, Cystoscopy and EUS**	**A.** • Stress dose of steroid tablet on the morning of the procedure. • If the procedure requires bowel preparation laxatives, start the stress dose of steroid on the day of the bowel preparation. • Administer an injection of Hydrocortisone 100 mg 30 minutes prior to the procedure.	A stress dose of steroids should be administered to patients receiving a physiological dose of corticosteroids, such as prednisolone at 5 mg or below daily or hydrocortisone between 15 mg and 25 mg daily, to ensure adequate adrenal support during periods of increased physiological demand. For all other dosage regimens,

B. Bowel procedures requiring laxatives/enema for patients taking fludrocortisone or vasopressin dependent (diabetes insipidus) patients. Please contact endocrine consultant for advice. E-mail: wah-tr.diabetesandendocrinereferrals@nhs.net	⚠ **Important:** Daily doses of ≥10 mg prednisolone, ≥40 mg hydrocortisone, ≥1.5 mg dexamethasone, or ≥2 mg budesonide typically do not require adjustment under standard conditions. For procedural stress dosing, a single morning dose of either 10 mg prednisolone or 20 mg hydrocortisone is appropriate, depending on the specific steroid formulation the patient is currently prescribed. Regardless of whether the patient received the required stress dose or has only taken their regular dose, they still need to receive an injection of Hydrocortisone 100 mg IM/IV. The procedure may proceed 30 minutes after administration. This will prevent collapse and adrenal crisis. **B.** • Consider intravenous fluids and injected glucocorticoid (hydrocortisone 50 mg IM or IV 6 hourly) during preparation, especially for fludrocortisone. • For vasopressin dependent (diabetes insipidus) patients, contact endocrine consultant advise for IV fluid and give injected glucocorticoid (hydrocortisone 50 mg IM or IV 6 hourly) during preparation. • Hydrocortisone 100 mg intravenously or intramuscularly at the start of procedure.	consultation with an endocrinologist is required to determine appropriate management. ⚠ *Important: Daily doses of:* *≥10 mg prednisolone,* *≥40 mg hydrocortisone,* *≥1.5 mg dexamethasone, or* *≥2 mg budesonide do not require adjustment under standard conditions*. Administer the stress dose of steroids on the following day. If the patient experiences symptoms such as dizziness, faintness, bloating, nausea, cold sweats, or other signs of discomfort, continue the stress dose until their condition improves. If symptoms persist beyond 24–48 hours without noticeable improvement, seek medical advice from a physician, GP, or hospital. Adhere to the adrenal insufficiency sick day rules for appropriate management. Patients may resume their regular steroid dosage once they feel well, and their symptoms have resolved.
Labour and vaginal birth	• Hydrocortisone 100 mg intravenously at onset of labour, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg infusion in 48ml 0.9% Sodium Chloride over.24 hours and then until 6 hours after delivery. • Alternatively, hydrocortisone 100 mg intramuscularly followed by 50 mg every 6 hours intramuscularly	• Administer a stress oral dose of steroid for 48 hours, with the possibility of extension if the postpartum period is complicated. If the patient remains clinically stable, transition back to the usual treatment regimen dose.

Body surface and intermediate surgery	• Hydrocortisone 100 mg, intravenously at induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg/24 hours. • Alternatively, hydrocortisone 50 mg IM 6- hourly or • Dexamethasone 6–8 mg intravenously, if used, will suffice for 24 hours.	• Administer a stress dose of glucocorticoids for 48 hours, followed by a return to the usual treatment regimen if there are no complications.
Cataract surgery or minor procedure under local anaesthesia	• Administer a stress dose of Hydrocortisone 20 mg orally or Prednisolone 10 mg orally 30 minutes before the procedure. • If patient is unwell consider injection Hydrocortisone 100 mg stat dose.	• Continue the usual doses of steroid after procedure.

Table 2

Recommended doses for intra- and postoperative steroid cover in adults at risk of adrenal crisis include:

1. Patients who have recently stopped using glucocorticoids by any route of administration after taking them for more than 4 weeks, and for 12 months after stopping oral steroids
2. Patients receiving intra-articular or intramuscular glucocorticoid injections who also use glucocorticoids by another route (e.g. inhaled steroids, nasal steroids etc.)
3. Patients who have experienced physiological stress or are taking rescue/PRN doses of steroids (e.g., flare-ups of long-term conditions, repeated dexamethasone courses, intra-articular corticosteroid injections) may include those with respiratory conditions, rheumatology conditions, gastrointestinal conditions, or those undergoing immunotherapy or chemotherapy. Additionally, patients with respiratory diseases such as COPD and asthma on high-dose inhaled steroids and receiving repeated courses of oral steroids (three or more courses over the past six months) should also be considered.

4. For patients with delayed response short Synacthen test results (partial adrenal insufficiency) (e.g., inadequate cortisol response at 30 minutes and adequate response at 60 minutes or above 400 nmol/L cortisol response 30 minutes post-Synacthen in SST), it is advised to discontinue daily steroids and administer stress doses during acute illness. Repeat short Synacthen tests should be conducted in 12 months to monitor recovery and determine if stress doses can be discontinued.

Type of procedure	Pre-operative and operative needs Intra-operative steroid replacement	Post-operative steroid replacement
Surgery under anaesthesia (general or regional) Including major bowel surgery, procedures needing ITU, endoscopy, Caesarean delivery, joint reduction, IVF egg extraction	• Hydrocortisone 100 mg intravenously on induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg infusion in 48ml 0.9% Sodium Chloride over 24 hours IV peri-operatively. • Alternatively, dexamethasone 6–8 mg intravenously, if used, will suffice for 24 hours. • Alternatively, hydrocortisone 50 mg every 6 hourly by IV or IM injection.	• Hydrocortisone 200 mg.24 hours by IV infusion while nil by mouth or for patients with postoperative vomiting. • Alternatively, hydrocortisone 50 mg every 6 hourly by IV or IM injection. • If the patient is tolerating their diet and fluids well and is not experiencing vomiting**,** start stress dose of steroid e.g. Prednisolone 10mg OD for 48 hours or for up to a week following major surgery. Then reduce the dose to 5 mg of prednisolone on alternate days for 5 -7 days and stop Prednisolone. • Alternatively, hydrocortisone 20 mg AM, 10 mg at lunch and 10 mg at 5 pm TDS dose for 48 hours or for up to a week following major surgery. Then reduce the dose of hydrocortisone to 10 mg AM, 5 mg at lunch and 5mg at 5 pm for alternate days for one week and stop hydrocortisone.

A. Endoscopy procedures. **All endoscopic patients, regardless of whether sedation is required. Example: OGD, Colonoscopy, ERCP, Bronchoscopy, Cystoscopy and EUS**	**A.** • Stress dose of steroid tablet on the morning of the procedure. • If the procedure requires bowel preparation laxatives, start the stress dose of steroid on the day of the bowel preparation. • Administer an injection of Hydrocortisone 100 mg 30 minutes prior to the procedure. ⚠ **Important:** Daily doses of ≥10 mg prednisolone, ≥40 mg hydrocortisone, ≥1.5 mg dexamethasone, or ≥2 mg budesonide typically do not require adjustment under standard conditions. For procedural stress dosing, a single morning dose of either 10 mg prednisolone or 20 mg hydrocortisone is appropriate, depending on the specific steroid formulation the patient is currently prescribed. Regardless of whether the patient received the required stress dose or has only taken their regular dose, they still need to receive an injection of Hydrocortisone 100 mg IM/IV. The procedure may proceed 30 minutes after administration. This will prevent collapse and adrenal crisis.	• If the patient is tolerating their diet and fluids well and is not experiencing vomiting, then for a physiological dose of 5 mg of prednisolone daily for 1 -2 days and then stop steroid. • Alternatively, hydrocortisone 10 mg AM, 5 mg at lunch and 5 mg at 5 pm TDS dose for 1 - 2 days and then stop steroid. • If the patient feels unwell, dizziness, faintness, bloated, nauseous, or cold sweats …etc for stress dose of steroid (prednisolone 10 mg daily or Hydrocortisone 20 mg AM, 10 mg at lunch and 10 mg at 5 pm) until the patient feeling better. If there is no improvement within 24–48 hours, consult a physician, GP, or hospital. Follow adrenal insufficiency sick day rule. • Once the patient feels well, then reduce the dose of steroid to physiological dose for alternate days for one week and stop steroid.
B. Bowel procedures requiring laxatives/enema for patients taking fludrocortisone or vasopressin dependent (diabetes insipidus) patients. Please contact endocrine consultant for advice. E-mail: wah-tr.diabetesandendocrinereferrals@nhs.net	**B•** • Consider intravenous fluids and injected glucocorticoid (hydrocortisone 50 mg IM or IV 6 hourly) during preparation, especially for fludrocortisone. • For vasopressin dependent (diabetes insipidus) patients, contact endocrine consultant advise for IV fluid and give injected glucocorticoid (hydrocortisone 50 mg IM or IV 6 hourly) during preparation. • Hydrocortisone 100 mg intravenously or intramuscularly at the start of procedure.	

Labour and vaginal birth	Hydrocortisone 100 mg intravenously at onset of labour, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg infusion in 48ml 0.9% Sodium Chloride over 24 hours and then until 6 hours after delivery. Alternatively, hydrocortisone 100 mg intramuscularly followed by 50 mg every 6 hours intramuscularly	For hydrocortisone 10 mg AM, 5 mg at lunch and 5 mg at 5 pm TDS dose for 1 - 2 days and then stop steroid. Hydrocortisone may have to be extended if postpartum period is complicated
Body surface and intermediate surgery	• Hydrocortisone 100 mg, intravenously at induction, followed by immediate initiation of a continuous infusion of hydrocortisone 200 mg/24 hours. • Alternatively, hydrocortisone 50 mg IM 6- hourly or • Dexamethasone 6–8 mg intravenously, if used, will suffice for 24 hours.	• If the patient is feeling well then for a physiological dose of 5 mg of prednisolone daily for 1 -2 days and then stop steroid. • Alternatively, hydrocortisone 10 mg AM, 5 mg at lunch and 5 mg at 5 pm TDS dose for 1 - 2 days and then stop steroid. • If the patient is unwell, administer a stress dose of steroids. Continue this until the patient's condition stabilises. Once the patient has recovered, gradually reduce the steroid to the physiological dose on alternate days for one week, before discontinuing treatment.
Cataract surgery or minor procedure under local anaesthesia	• Administer a stress dose of Hydrocortisone 20 mg orally or Prednisolone 10 mg orally 30 minutes before the procedure. • If patient is unwell consider injection Hydrocortisone 100 mg stat dose.	**Patients on regular corticosteroid tablets:** • If clinically well, continue the usual maintenance dose. • If unwell, administer a stress dose of corticosteroid during acute illness and ensure medical review. **Patients not on regular corticosteroid therapy:** • If unwell, initiate a stress dose of corticosteroid during

		acute illness and arrange medical review. • If clinically well, discontinue steroid therapy.

Safe discharge plan

During an in-patient stay, healthcare professionals, including doctors, nurses, physician associates, and pharmacists, can provide the injection hydrocortisone kit and explain adrenal insufficiency sick day management. Please refer to the endocrine consultant for advice and outpatient appointments (OPA). The endocrine consultant and the endocrine specialist nurse will review the patient in the outpatient clinic.

Healthcare professionals should add the following alert to PAS/Bluespier/ Sunrise: Click to display warning staff, enter code 242226 – "Risk of Adrenal Crisis" – and then submit to ensure appropriate clinical awareness and prompt management.

Emergency Hydrocortisone Injection Video for adrenal insufficiency education.

You can find helpful videos on emergency hydrocortisone injections from Liverpool University Hospitals on Google and YouTube. These resources demonstrate proper techniques, offer patient perspectives, and explain when and how to administer the injection during an adrenal crisis.

Here are the most relevant links:

1. https://youtu.be/ixOgrGi-a4g
2. https://www.youtube.com/watch?v=oucbVQ0Whq8
3. https://www.youtube.com/watch?v=gDIawLaYYWc

Patient (and their family) education for long term management

- Sick Day Rules as mentioned below
- Teach how to inject emergency hydrocortisone injection. Healthcare professionals, including doctors, nurses, physician associates, and pharmacists, can provide the injection hydrocortisone training.
- Provide with emergency steroid Kit. Please see below page for kit information.
- Replace emergency steroid kit before discharge if used before or during acute admission
- Encourage wearing medical alert bracelets or pendants.
- Issue emergency steroid card (National Red Colour steroid card). Available at hospital pharmacy.
- Provide adrenal insufficiency sick-day management patient information booklet and emergency hydrocortisone injection training booklet. Available on Trust intranet Endocrinology clinical guideline site.

Please provide following information:

Sick Day Rule 1

Moderate intercurrent illness: For fever, infections requiring antibiotics, or surgical procedures under local anaesthesia, start with a stress dose of 20 mg hydrocortisone or 10 mg prednisolone at the beginning of the illness (regardless of the time). Continue with 20 mg hydrocortisone in the morning, 10 mg at lunch, and 10 mg in the evening. If the patient is taking Prednisolone, the stress dose is 10 mg at the onset of illness, followed by 10 mg once daily in the morning during acute illness. If symptoms do not improve within 48 hours, the steroid dose should be reviewed by a GP/Doctor. For patients on supra-physiological doses of daily steroids, doctors should review and decide the appropriate dose during illness.

- During periods of significant physiological stress, offer at least 40 mg oral hydrocortisone daily in 2 to 4 divided doses or at least 10 mg oral prednisolone daily in 1 to 2 divided doses until the acute illness or physical trauma has resolved.
- Advise people taking a daily oral prednisolone dose of 10 mg or more that they do not need additional sick-day dosing, but they can split their total daily dose into 2 equal doses. Patients taking prednisolone for other conditions such as COPD exacerbations, rheumatological diseases, or gastrointestinal flare-ups should continue their supraphysiological steroid dosing as advised by their consultant or specialist team, since their treatment protocols differ from those managing adrenal insufficiency.
- Do not increase glucocorticoid dosing for a long duration.
- If the person vomits within 30 minutes of taking an oral dose, advise them to take a further dose once vomiting subsides at the stress dose. If vomiting recurs within 30 minutes, give intramuscular hydrocortisone and advise the person to attend the emergency department.

- As soon as the acute illness has resolved and symptoms such as fever, vomiting, or diarrhoea have subsided, patients usually revert to their usual maintenance dose of corticosteroids.

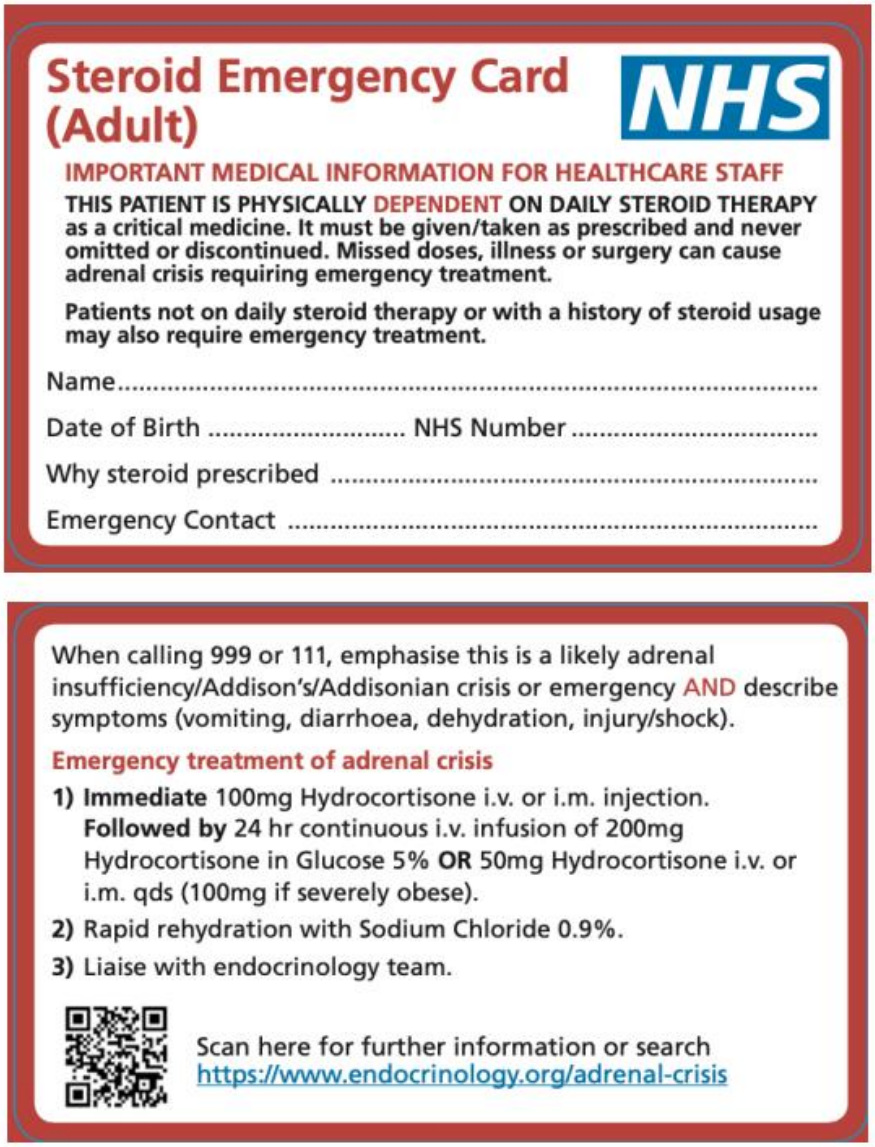
Sick Day Rule 2

In cases of severe intercurrent illness, persistent gastrointestinal symptoms (e.g., vomiting or diarrhoea), acute trauma, surgery, or bowel preparation, administer 100 mg hydrocortisone intramuscularly or intravenously at onset. This should be followed by either a continuous infusion of 200 mg over 24 hours or 50 mg every 6 hours intramuscularly or intravenously. Hospital admission is indicated during physiological stress if oral glucocorticoid absorption is impaired.
Where appropriate training has been provided, this injection may be administered by the patient, a family member, or a carer in non-hospital settings such as the home or community, prior to hospital admission. If no trained individual is available, emergency services (999) should be contacted immediately, or the patient should attend their GP or nearest emergency department (A&E), clearly stating their diagnosis of adrenal insufficiency and dependence on steroid therapy. A healthcare professional must then administer the injection without delay, followed by clinical monitoring of blood pressure, blood glucose, and serum electrolytes, with intravenous fluid resuscitation if indicated.

Provide:

- Patient information booklet sick day rule for Adrenal insufficiency: WAHT- PI – 0705
- Patient information booklet how to do injection hydrocortisone: WAHT – PI – 0703
- All clinicians prescribing steroids (e.g. in clinics or authorising repeat prescriptions) should ensure that their patients have been issued a Steroid

Emergency Card, where necessary.



Steroid Emergency Card (Adult)

NHS

IMPORTANT MEDICAL INFORMATION FOR HEALTHCARE STAFF

THIS PATIENT IS PHYSICALLY DEPENDENT ON DAILY STEROID THERAPY as a critical medicine. It must be given/taken as prescribed and never omitted or discontinued. Missed doses, illness or surgery can cause adrenal crisis requiring emergency treatment.

Patients not on daily steroid therapy or with a history of steroid usage may also require emergency treatment.

Name.....

Date of Birth ..... NHS Number .....

Why steroid prescribed .....

Emergency Contact .....

When calling 999 or 111, emphasise this is a likely adrenal insufficiency/Addison's/Addisonian crisis or emergency AND describe symptoms (vomiting, diarrhoea, dehydration, injury/shock).

Emergency treatment of adrenal crisis

1) **Immediate** 100mg Hydrocortisone i.v. or i.m. injection. **Followed by** 24 hr continuous i.v. infusion of 200mg Hydrocortisone in Glucose 5% **OR** 50mg Hydrocortisone i.v. or i.m. qds (100mg if severely obese).
2) Rapid rehydration with Sodium Chloride 0.9%.
3) Liaise with endocrinology team.

Scan here for further information or search https://www.endocrinology.org/adrenal-crisis

- For inpatients, the ward clinical team can contact the hospital pharmacy to replace the card, lost by patients or which are damaged.

- Add on PAS/ Bluespier alert: Click to display warning and enter 242226. Risk of Adrenal Crisis, then submit.

- Provide injection hydrocortisone kit.
  Each emergency hydrocortisone kit should contain two complete sets of intramuscular injection equipment, including hydrocortisone injection, syringes, and needles, to ensure redundancy in case of loss or malfunction.

Emergency Hydrocortisone Injection Kit

- 2 x Injectable hydrocortisone sodium succinate (powder that requires mixing **Solu-Cortef®**)
- 2 x 10ml sterile water for injection ampoule (advise patient to aseptically add 2 ml of sterile water for injections to the contents of one vial of Solu-Cortef® 100 mg, shake and withdraw for use)

- 2 x Syringe that can hold 2ml of liquid
- 4 × 23 G blue intramuscular needles.
- 2 × skin wipes.
- Provide patient with instruction leaflet downloadable from: https://www.addisonsdisease.org.uk/the-emergency-injection-for-the-treatment-of-adrenal-crisis the site also include links to watch administration videos for patients.
- 1 x NHS red steroid emergency card
- Emergency Kit contains 2 injection hydrocortisone 100mg, 2 water for injection 10mls, 2 syringes 2mls, 4 intramuscular needles 23G, 2 skin wipes, one red steroid emergency card, one sick day rules booklet
- **Please ensure that the patient has a full emergency kit provided at the time of discharge. Please replace any content, if used during acute admission.**

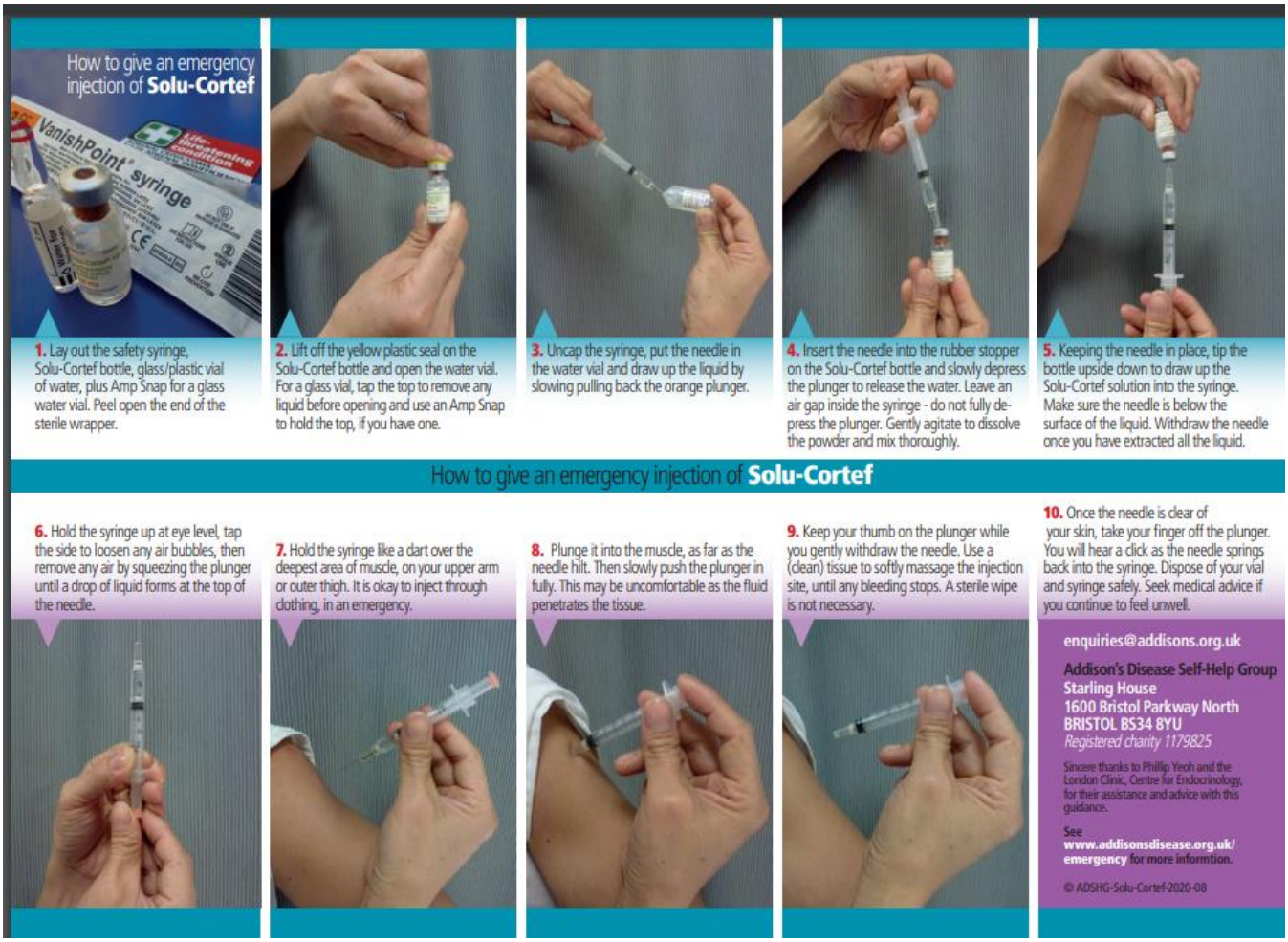
Please request GP practice to add on repeat prescription for impending Addisonian crisis.

- Two Hydrocortisone powder for injection 100mg vials Active Ingredient: hydrocortisone sodium succinate and two water for injection 10 mls or 5 mls to dilute. (required only 2mls for diluting powder form of Hydrocortisone injection).

- A sharps box.

Please provide from your stock:

- 2 syringe 2mls.
- 4 intramuscular needles for injection 23G.
- 2 disinfectant wipes for skin cleansing (2% Chlorhexidine in 70% Alcohol Skin Wipe).



Worcester Acute Hospital Trust Red steroid card and sick day rule booklet order information:

1. Steroid emergency card Xerox order number for Worcester Acute Trust: WR5 735

2. Patient information booklet sick day rule for Adrenal insufficiency: WAHT- PI – 0705

3. Patient information booklet how to do injection hydrocortisone: WAHT – PI – 0703

4. To add on PAS/ Bluespier alert: Click to display warning on PAS and enter 242226. Risk of Adrenal Crisis, then submit.

Equivalent Anti-inflammatory Doses of Oral Corticosteroids

Oral Corticosteroid	Dose Equivalent to 5 mg Prednisolone
Betamethasone	750 micrograms
Deflazacort	6 mg
Dexamethasone	750 micrograms
Hydrocortisone	20 mg
Methylprednisolone	4 mg
Prednisone	5 mg
Triamcinolone	4 mg

Note: This table does not account for mineralocorticoid activity or differences in duration of action among corticosteroids.

Steroid alert cards

There are two types of steroid alert cards: the Steroid Treatment Card (Blue) and the Steroid Emergency Card (Red).

The Steroid Treatment Card (Blue) provides treatment details (prescriber, dosage, and duration) and guidance on reducing steroid risks.
The Steroid Emergency Card (Red) helps healthcare staff identify adults with adrenal insufficiency and provides information on emergency treatment if the person is acutely ill or experiences trauma, surgery, or other significant stress.

The following patients need to be given a **Steroid Emergency Card (Red)**:

- It should be given to adults with adrenal insufficiency and steroid dependence for whom missed doses, illness, or surgery puts them at risk of adrenal crisis, such as those with Addison's disease, congenital adrenal hyperplasia, and hypothalamo-pituitary damage from tumours or surgery.

- People taking long-term or high-dose corticosteroids for other medical conditions may develop adrenal insufficiency due to suppression of the hypothalamic–pituitary–adrenal (HPA) axis and become steroid dependent.

A joint guideline by the Society for Endocrinology (SfE) Steroid Emergency Card working group and Specialist Pharmacy Services (SPS) recommends giving a Steroid Emergency Card to adults prescribed:

- Three or more short courses of high-dose oral glucocorticoids within the last 12 months, and for 12 months after stopping.

- More than 1000 micrograms of beclomethasone per day, more than 500 micrograms of fluticasone per day, or an equivalent dose of another glucocorticoid, and for 12 months after stopping.

- ICS plus any other form of glucocorticoid treatment, including potent or very potent topical glucocorticoids, intra-articular injection, and regular nasal glucocorticoids. See the joint guideline for information on ICS doses.

- Three or more intra-articular or intramuscular glucocorticoid injections within the last 12 months, and for 12 months after stopping.

- High-dose (200 g or more per week) potent or very potent topical glucocorticoids used over a large area of skin for 4 weeks or more, or where absorption is increased (assessed on a case-by-case basis), and for 12 months after stopping.

- Potent or very potent topical glucocorticoids applied to the rectal or genital areas at high doses (more than 30 g per month) for more than 4 weeks, and for 12 months after stopping.

Give a Steroid Emergency Card (Red) and sick day rules advice to:

- People taking oral prednisolone 5 mg or more (or equivalent oral glucocorticoid dose) for more than 4 weeks, and for 12 months after stopping.

- People with respiratory disease (such as asthma) on high-dose ICS receiving repeated courses of oral steroids (3 or more courses over the past 6 months).

- People receiving intra-articular or intramuscular glucocorticoid injections plus glucocorticoids administered via another route (for example, inhaled or oral).

- People taking CYP3A4 enzyme inhibitors (such as ritonavir, itraconazole, and ketoconazole) in combination with glucocorticoids (via any route, except small amounts of mild or moderate topical glucocorticoids, which should be assessed on a case-by-case basis).

Table 1: Short-term oral glucocorticoids (one week course or longer and has been on long-term course within the last year or has regular need for repeated courses)

Medicine	Dose (equivalence as per BNF)
Betamethasone	6mg per day or more
Budesonide	12mg per day or more(*)
Deflazacort	48mg per day or more
Dexamethasone	6mg per day or more
Hydrocortisone	160mg per day or more
Methylprednisolone	32mg per day or more
Prednisone	40mg per day or more
Prednisolone	40mg per day or more
Triamcinolone	4mg per day or more

(*) based on best estimate

Table 2: Long-term oral glucocorticoids (i.e., 4 weeks or longer)

Medicine	Dose (equivalence as per BNF)
Betamethasone	750 microgram per day or more
Budesonide	1.5mg per day or more(*)
Deflazacort	6mg per day or more
Dexamethasone	750 microgram per day or more
Hydrocortisone	20mg per day or more
Methylprednisolone	4mg per day or more
Prednisone	5mg per day or more
Prednisolone	5mg per day or more
Triamcinolone	4mg per day or more

(*) based on best estimate

Table 3: Inhaled or nasal glucocorticoid doses

Steroid inhaler name	Moderate dose	High dose
Beclometasone dipropionate. *Standard particle metred dose and dry powder inhalers*	600 to 800 micrograms per day in 2 divided doses.	1,000 to 2,000 micrograms per day in 2 divided doses.
Beclometasone dipropionate. *Extra-fine particle metered dose inhalers*	300 to 400 micrograms per day in 2 divided doses.	500 to 800 micrograms per day in 2 divided doses.
Budesonide *Dry powder inhalers*	600 to 800 micrograms per day as a single dose or in 2 divided doses.	1,000 to 1,600 micrograms per day in 2 divided doses.
Ciclesonide *Metered dose inhalers*	240 to 320 micrograms per day as a single dose or in 2 divided doses.	400 to 640 micrograms per day in 2 divided doses.
Fluticasone propionate *Metered dose and dry powder inhalers (excluding Seffalair Spiromax)*	300 to 500 micrograms per day in 2 divided doses.	600 to 1,000 micrograms per day in 2 divided doses.
Fluticasone furoate *Dry powder inhalers*	100 micrograms per day as a single dose.	200 micrograms per day as a single dose.
Mometasone furoate *Dry powder inhaler*	400 micrograms per day as a single dose or in 2 divided doses.	600 to 800 micrograms per day in 2 divided doses.
Mometasone furoate *Inhalation powder capsules*	160 micrograms per day as a single dose.	320 micrograms per day as a single dose.

Standard particle metered dose and dry powder inhalers: Examples include Beclometasone dipropionate (e.g., Clenil Modulite MDI), Fluticasone propionate (e.g.,

Flixotide MDI or Accuhaler DPI), and Budesonide (e.g., Pulmicort Turbohaler DPI). These inhalers deliver inhaled corticosteroids for anti-inflammatory control in asthma and COPD. **Extra-fine particle metered dose** inhalers containing inhaled corticosteroids include Qvar MDI, Kelhale MDI, Fostair MDI, and Luforbec MDI, all of which deliver beclometasone dipropionate for improved small airway deposition.

CYP3A4 enzyme inhibitors increasing cortisol concentration and risk of HPA axis suppression

Patients prescribed any form of ongoing glucocorticoid treatment, at any dose, in conjunction with any of the medications below which are potent CYP3A4 inhibitors, should be issued with a Steroid Emergency Card

Potent Protease inhibitors:
Atazanavir
Darunavir
Fosamprenavir
Ritonavir (+/- lopinavir)
Saquinavir
Tipranavir

Non-nucleoside reverse transcriptase inhibitors:
Efavirenz

Antifungals:
Itraconazole
Ketoconazole
Voriconazole
Posaconazole

Antibiotics:
Clarithromycin—long term courses only

Others:
Cobicistat

*Some of the antiretroviral therapy drugs are used as single tablet regimes; hence clinicians need to search carefully for the constituent compounds if they are not familiar with this pharmacological field.
Such cases should be flagged early to endocrinology and infectious disease team with specialist pharmacy input.

Please check for any HIV drug interactions on the following link:
https://www.hiv-druginteractions.org/checker

Hyponatraemia

- For people with primary adrenal insufficiency and persistent hyponatraemia despite having the maximum dose of fludrocortisone, consider sodium chloride supplementation according to specialist endocrinology advice.

Antenatal care

- Advise anyone with adrenal insufficiency who is pregnant to tell their GP and pregnancy specialist as soon as possible.

- Monitoring during pregnancy should be done by a multidisciplinary team experienced in managing adrenal insufficiency during pregnancy.

- Consider increasing glucocorticoid (and mineralocorticoid for primary adrenal insufficiency) replacement doses in the third trimester of pregnancy, if needed, depending on clinical symptoms, sodium levels and postural blood pressure.

- **Advise anyone with adrenal insufficiency who is pregnant about the need to increase doses of hydrocortisone or prednisolone during times of significant psychological or physiological stress:**

- **For fever, infection and physical trauma needing medical attention and short-term vomiting related to illness or early pregnancy:**

- advise the person to immediately take an additional 20 mg hydrocortisone dose and follow sick-day dosing.

- For pregnancy-related vomiting, advise the person to take glucocorticoids when not feeling nauseated and to seek advice from the multidisciplinary team if prolonged.

For hyperemesis gravidarum:

- Provide advice to immediately inject 100 mg hydrocortisone intramuscularly and go to the emergency department or early pregnancy unit.

- Manage hyperemesis gravidarum in an inpatient setting rather than an outpatient setting.

- **At the hospital, give antiemetics and hydration.**

- For people who have been admitted to hospital with hyperemesis gravidarum, give 200 mg intravenous hydrocortisone over 24 hours or 50 mg intramuscular or intravenous hydrocortisone 4 times a day.

- Seek specialist advice from the obstetric medicine team or endocrinology team about the dosage and duration of high-dose hydrocortisone during the hospital stay.

- After discharge, follow sick-day dosing until daily vomiting stops.

People receiving end of life care:

Continue glucocorticoids for people with adrenal insufficiency who are receiving end of life care, unless as part of shared decision making it has been decided to withdraw active treatment. Use once-daily formulations and routes of administration, for example, subcutaneous or intramuscular.

How to contact endocrine team?

Internal referral

Internal ward referral or community hospital referral please

For Worcester Royal Hospital endocrine referral:

Please e-mail wah-tr.diabetesandendocrinereferrals@nhs.net.

Consultant's secretary: 01905733039 or extension 33822, 01905760671 or extension 33849

For Alexandra Hospital, Redditch email address:

Ward Referrals: wah-tr.alexdiabetessecs@nhs.net

Consultant secretary: 01527 503890, Ext 43890.

External referral

GP Surgery or community hospital health care professionals and require advice and guidance for endocrinology or diabetes then please email: -

For Worcester Royal Hospital endocrine email address:

GP correspondence/Advice and Guidance: wah-tr.diabetesadvicewrh@nhs.net

Consultant's secretary: 01905733039 or extension 33822, 01905760671or 33849

For Alexandra Hospital, Redditch email address:

GP correspondence/Advice and Guidance wah-tr.diabetesadvicealx@nhs.net

Consultant secretary: 01527 503890, Ext 43890.

Steroid Withdrawal: For Temporary Use or Recovered Adrenal Function

Steroid treatment should only be withdrawn in patients whose adrenal insufficiency has resolved or in those who were prescribed steroids for temporary use and do not have adrenal insufficiency.

How should I withdraw or stop oral corticosteroid treatment (NICE, 2024)?

Owing to insufficient evidence to support any particular withdrawal regimen, the rate of withdrawal should depend on:

- The person's response to the withdrawal (if withdrawal symptoms are reported, resume a higher dose and continue the withdrawal at a slower rate).
- The disease being treated.
- The duration of treatment and dosage.

As a general principle:

- Short courses of oral corticosteroids (less than 4 weeks) can be stopped abruptly.

Gradual withdrawal should be considered for people whose disease is unlikely to relapse and who have:

- Received more than 40 mg prednisolone daily or equivalent for more than 1 week.
- Been taking repeated evening doses of corticosteroids, which increases the risks of developing adrenal insufficiency.
- Received more than 4 weeks of corticosteroid treatment.
- Recently received repeated courses of corticosteroids (especially if they have been taken for longer than 4 weeks), for example prescribed for the treatment of acute exacerbations of asthma.
- A history of previous long-term therapy (months or years).
- Other possible causes of adrenal suppression, such as excessive alcohol consumption or stress (for example due to infection, trauma, or surgery).
- If stress, for example caused by infection, trauma, or surgery, occurs up to 1 week after stopping the corticosteroid, additional corticosteroid cover should be prescribed to compensate for any potential adrenal suppression.

- During withdrawal, the dose of oral corticosteroids may be reduced rapidly down to physiological doses (3-5 mg of prednisolone or equivalent) and reduced more slowly thereafter.
- Consider reducing the physiological dose by using this dose on alternate days for 2 weeks, then twice a week for a further 2 weeks, then stopping.
- For individuals who have been taking glucocorticoids for more than 12 weeks, a slower tapering regimen should be considered to support hypothalamic-pituitary-adrenal (HPA) axis recovery. For example, to reduce prednisolone from 3 mg to 2 mg, an alternate-day dosing strategy may be used, starting with 3 mg on six days and 2 mg on one day, then gradually increasing the number of 2 mg days each week over approximately seven weeks. This approach, as outlined in the Meeran Protocol and supported by tapering guidance in the NICE Asthma Guideline (2024), helps minimise the risk of adrenal insufficiency and withdrawal symptoms.

Table 1: Suggested regimen to reduce prednisolone by 1mg over 7 weeks. Doses in mg.

Week	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
0	3	3	3	3	3	3	3
1	3	3	3	2	3	3	3
2	3	2	3	3	2	3	3
3	3	2	3	2	3	2	3
4	2	3	2	3	2	3	2
5	2	3	2	2	3	2	2
6	2	2	2	3	2	2	2
7	2	2	2	2	2	2	2

Table 2 below is a suggested regimen that can go from 5mg to 0mg over 24 weeks and includes the above from weeks 4 to 11 below. **MEERAN PROTOCOL**:

Week	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
0	5	5	5	5	5	5	5
1	5	4	5	4	5	4	5
2	4	4	4	4	4	4	4
3	4	3	4	3	4	3	4
4	3	3	3	3	3	3	3
5	3	3	3	2	3	3	3
6	3	2	3	3	2	3	3
7	3	2	3	2	3	2	3
8	2	3	2	3	2	3	2
9	2	3	2	2	3	2	2

10	2	2	2	3	2	2	2
11	2	2	2	2	2	2	2
12	2	2	2	1	2	2	2
13	2	1	2	2	1	2	2
14	2	1	2	1	2	1	2
15	1	2	1	2	1	2	1
16	1	2	1	1	2	1	1
17	1	1	1	2	1	1	1
18	1	1	1	1	1	1	1
19	1	1	1	0	1	1	1
20	1	0	1	1	0	1	1
21	1	0	1	0	1	0	1
22	0	1	0	1	0	1	0
23	0	1	0	0	1	0	0
24	0	0	0	1	0	0	0

Legal liability guideline statement

- Guidelines or Procedures issued and approved by the Trust are considered to represent best practice.
- Staff may only exceptionally depart from any relevant Trust guidelines or Procedures and always only providing that such departure is confined to the specific needs of individual circumstances.
- In healthcare delivery such departure shall only be undertaken where, in the judgement of the responsible healthcare professional, it is fully appropriate and justifiable - such decision to be fully recorded in the patient's notes.

References

1. Addison's Disease Self-Help Group (n.d.) *Supporting people affected by Addison's and adrenal insufficiency*. Available at: https://www.addisons.org.uk/ [Accessed 27 Aug. 2025]

2. Arlt, W. and Society for Endocrinology Clinical Committee (2016) *Emergency management of acute adrenal insufficiency (adrenal crisis) in adult patients*. Endocrine Connections, 5(5), pp.G1–G3. Available at: https://doi.org/10.1530/EC-16-0054 [Accessed1 December 2020].

3. BNF (2020) *British National Formulary*. BMJ Group and Pharmaceutical Press. https://bnf.nice.org.uk

4. Bornstein, S.R., Allolio, B., Arlt, W., Barthel, A., Don-Wauchope, A., Hammer, G.D., Husebye, E.S., Merke, D.P., Murad, M.H. and Stratakis, C.A., (2016). *Diagnosis and treatment of primary adrenal insufficiency: an Endocrine Society clinical practice guideline*. *Journal of Clinical Endocrinology & Metabolism*, 101(2), pp.364–389. https://doi.org/10.1210/jc.2015-1710.
5. EndoLRI (n.d.) *Steroid Replacement Treatment: Patient Information Leaflet*. Available at: http://www.endolri.org.uk/Endo_PDF/Steroid%20Replacement%20Treatment.pdf [Accessed 27 Aug. 2025].

6. Erskine, D. and Simpson, H., (2021). *Exogenous steroids, adrenal insufficiency and adrenal crisis—who is at risk and how should they be managed safely*. [pdf] Society for Endocrinology and Specialist Pharmacy Services. Available at: https://www.endocrinology.org/media/4091/spssfe_supporting_sec_-final_10032021-1.pdf [Accessed 27 Aug. 2025]

7. Hahner, S., Spinnler, C., Fassnacht, M., et al., (2015). *High incidence of adrenal crisis in educated patients with chronic adrenal insufficiency: a prospective study*. *Journal of Clinical Endocrinology & Metabolism*, 100(2), pp.407–416. https://doi.org/10.1210/jc.2014-3191.

8. Mebrahtu, T.F., Morgan, A.W., Keeley, A., et al., (2019). *Dose dependency of iatrogenic glucocorticoid excess and adrenal insufficiency and mortality: a cohort study in England*. *Journal of Clinical Endocrinology & Metabolism*, 104(9), pp.3757–3767. https://doi.org/10.1210/jc.2019-00153.

9. Meeran, K. (n.d.) *Prednisolone withdrawal*. ImpEndo. Available at: https://www.impendo.co.uk/prednisolone/prednisolone-withdrawal [Accessed 27 Aug. 2025].

10. Murray, R. D., Ruiz-Casas, L., Beckett, M., Polifka, J., Cure, S., Ritz, B., and Wass, J. (2025) The Cost of Adrenal Insufficiency in England—Analysis of NHS HES Data. Clinical Endocrinology. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/cen.15207; https://doi.org/10.1111/cen.15207 [Accessed 20 February 2025].

11. NICE (2024) *Adrenal insufficiency: identification and management. NICE guideline [NG243]*. London: National Institute for Health and Care Excellence. Available at: https://www.nice.org.uk/guidance/ng243/chapter/recommendations#emergency-management-of-adrenal-crisis [Accessed 27 Aug. 2025].

12. NICE (2024) *Inhaled corticosteroid doses for the BTS, NICE and SIGN asthma guideline*. London: National Institute for Health and Care Excellence. Available at: https://www.nice.org.uk/guidance/ng245/resources/inhaled-corticosteroid-doses-for-the-bts-nice-and-sign-asthma-guideline-pdf-13558148029 [Accessed 27 Aug. 2025].

13. NICE (2023) *Corticosteroids – oral: Management*. Clinical Knowledge Summaries. [online] London: National Institute for Health and Care Excellence. Available at:

https://cks.nice.org.uk/topics/corticosteroids-oral/management/corticosteroids/ [Accessed 27 Aug. 2025].

14. NICE (2010) *Addison's disease: assessment and management*. Clinical Knowledge Summaries. London: National Institute for Health and Care Excellence. Last reviewed: 1 December 2020. Available at: https://cks.nice.org.uk [Accessed1 December 2020].
15. Prete, A., Taylor, A.E., Bancos, I., et al., (2020). *Prevention of adrenal crisis: cortisol responses to major stress compared to stress dose hydrocortisone delivery*. *Journal of Clinical Endocrinology & Metabolism*, 105(9), dgaa133. https://doi.org/10.1210/clinem/dgaa133.
16. Ruiz, L., Ritz, B., Murray, R., Beckett, M., and Wild, J. (2024) The cost burden of hospitalisation for adrenal insufficiency patients in the NHS in England. Endocrine Abstracts, 99, EP729. Available at: https://www.endocrine-abstracts.org/ea/0099/ea0099EP729 [Accessed 1 March 2025].
17. Simpson, H., Tomlinson, J., Wass, J., et al., (2020). *Guidance for the prevention and emergency management of adult patients with adrenal insufficiency*. *Clinical Medicine*, 20(4), pp.371–378. https://doi.org/10.7861/clinmed.2020-0090.
18. White, K. and Arlt, W., (2010). *Adrenal crisis in treated Addison's disease: a predictable but under-managed event*. *European Journal of Endocrinology*, 162(1), pp.115–120. https://doi.org/10.1530/EJE-09-0706.
19. Wass, J.A.H., Stewart, P.M. and Amiel, S.A. (2003) *Oxford Handbook of Endocrinology and Diabetes*. Oxford: Oxford University Press.
20. Woodcock, T., Barker, P., Daniel, S., Fletcher, C., Wass, J.A.H., Tomlinson, J.W. and Misra, U. (2020) *Guidelines for the management of glucocorticoids during the peri-operative period for patients with adrenal insufficiency*. Anaesthesia, 75(5), pp.654–663. Available at: https://doi.org/10.1111/anae.14963 [Accessed 27 Aug. 2025].

Contribution List

This key document has been circulated to the following individuals for consultation;

Designation
Dr Ramalingam Bhaskar (Consultant)
Dr Mohammad Abdus Salam (Consultant)
Dr Irfan Babar (Consultant)
Dr Munir Babar (Consultant)
Dr Ayesha Khalil (Consultant)
Dr. Pasi Guti (Consultant)
Saffiya Khadam (Pharmacist)
Alison Hall (Lead Nurse- Diabetes)
Swapna George (Endocrine Specialist Nurse)

This key document has been circulated to the chair(s) of the following committee's / groups for comments;

Committee
Specialty Medicine Divisional Management Board
Medicines Safety Committee

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	✓	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	Dr Ramalingam Bhaskar

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
	Dr Ramalingam Bhaskar	Consultant	RAMALINGAM.BHASKAR@NHS.NET
	Dr Mohammad Salam	Consultant	Mohammad.salam@nhs.net
Date assessment completed	13/09/2024		

Section 2

Activity being assessed (e.g., policy/procedure, document, service redesign, policy, strategy etc.)	**Title:** Guideline for the Management of Adrenal Insufficiency in Adults			
What is the aim, purpose and/or intended outcomes of this Activity?	Suspect, diagnose and manage, and also prevent adrenal crisis			
Who will be affected by the development & implementation of this activity?	☐✓ ☐✓ ☐✓ ☐	Service User Patient Carers Visitors	☐✓ ☐✓ ☐ ☐	Staff Communities Other _____
Is this:	☐ Review of an existing activity			

	☑ New activity✓ ☐ Planning to withdraw or reduce a service, activity or presence?
What information and evidence have you reviewed to help inform this assessment? (Please name sources, e.g., demographic information for patients / services / staff groups affected, complaints etc.	Journal of endocrinology & metabolism Addison's disease self-group Society for Endocrinology guidelines, NICE guidelines
Summary of engagement or consultation undertaken (e.g., who and how have you engaged with, or why do you believe this is not required)	Colleagues in endocrinology department, junior doctors in medicine
Summary of relevant findings	Adrenal crisis is serious problems, but can be prevented and also if happened can be diagnosed and treated

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g., staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age	✓			Persons will be treated as per guidelines irrespective of age,
Disability	✓			Persons will be treated as per guidelines irrespective of any disability
Gender Reassignment		✓		Treatment will be given irrespective of sex reassignment
Marriage & Civil Partnerships	✓			Treatment will be given irrespective of marriage status
Pregnancy & Maternity	✓			Treatment will be given as per guidelines
Race including Traveling Communities	✓			Treatment will be given irrespective of communities' identity
Religion & Belief	✓			Treatment will be given irrespective any religion
Sex	✓			Treatment will be given irrespective of gender
Sexual Orientation		✓		Treatment will be given irrespective sexual orientation
Other Vulnerable and Disadvantaged Groups (e.g., carers;	✓			Treatment will be given irrespective of whether they belong to any group

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
care leavers; homeless; Social/Economic deprivation, travelling communities etc.)				
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)	✓			The guidelines will help to deliver care without any health inequalities

Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
	None	.		
How will you monitor these actions?	N/A			
When will you review this EIA? (e.g., in a service redesign, this EIA should be revisited regularly throughout the design & implementation)	N/A			

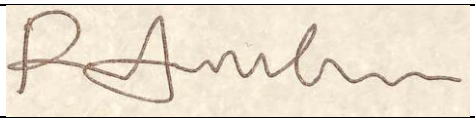
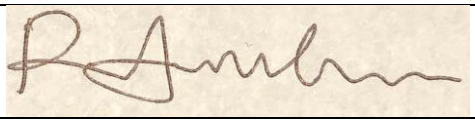
Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation

1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.

1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carers etc., and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	
Date signed	22/09/2025
Comments:	None
Signature of person the Leader Person for this activity	
Date signed	22/09/2025
Comments:	None

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue?	No
3.	Does the implementation of this document require additional manpower?	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff?	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.