Whittington Health NHS

Steroid dependent patients who are undergoing surgery or are acutely unwell

Guideline for management

Subject:	Adrenal Insufficency
Policy Number	N/A
Ratified By:	Clinical Guidelines Committee
Date Ratified:	August 2012, reviewed November 2015
Version:	2.0
Policy Executive Owner:	Clinical Director, Medicine, Frailty and Networked Services ICSU
Designation of Author:	Dr M Rossi (Consultant) Dr C Hargreaves (Consultant) Dr A Chekairi (Consultant)
Name of Assurance Committee:	As above
Date Issued:	November 2015
Review Date:	3 years hence
Target Audience:	Medicine, Surgery, Women's Health & ED
Key Words:	Steroid, prednisolone, cortisol, Addison's disease, hypopituitarism

Version Control Sheet

Version	Date	Author	Status	Comment
1.0	Nov 2012	M Rossi, C Hargreaves, A Chekairi	Off line	New guideline approved at CGC, August 2012. Published November 2012
2.0	Nov 2015	M Rossi, C Hargreaves, A Chekairi	Live	Guideline content reviewed. No new recommendations therefore no change to content required. Re-issued with new dates

➢ Criteria for use

Adult patients with adrenal Insufficiency ie:

- Addison's disease or other causes of primary adrenal insufficiency (eg congenital adrenal hyperplasia, adrenoleukodystrophy)
- Hypopituitarism with ACTH deficiency (eg patients with pituitary macroadenomas or those having undergone pituitary surgery)
- On corticosteroids at a dose of **more than 5mg of prednisolone daily** (or equivalent: this equates to hydrocortisone 20 mg, dexamethasone 750 micrograms, methylprednisolone 4 mg daily, betamethasone 750 micrograms, fluticasone 375 micrograms, cortsone acetate 25mg, deflazacort 6mg) for more than 4 weeks within the last 3 months. (1)

Who are undergoing surgery or who are admitted acutely unwell

➢ Background/ introduction

Acute stress activates the hypothalamic-pituitary-adrenal (HPA) axis, resulting in increased plasma adrenocorticotropic hormone (ACTH) and cortisol levels. This increase improves the body's ability to combat stress by increasing its sensitivity to catecholamines; cardiac contractility and output; and mobilization of energy sources with gluconeogenesis, proteolysis, and lipolysis. (2) Lack of increase in cortisol production during stress can be fatal.

Surgery is one of the most potent stressors that can cause activation of the HPA axis. The degree of activation depends on the type and duration of surgery and anesthesia. Normal daily cortisol production is about 15 to 20 mg/day. These levels can go up to as much as 75–100 mg/day with surgical stress. (2)

Surgical stress or major illness in any patient who has inadequate cortisol production is therefore **a life threatening situation**. This patient will need to be recognized, and their acute steroid requirement will have to be replaced. Failure of cortisol secretion may result in the circulatory collapse and hypotension characteristic of a hypoadrenal or 'Addisonian' crisis.

There is a wide range of diseases for which corticosteroid treatment is commonly used. It is important to remember that these conditions may also carry risk for both anaesthesia and surgery. Examples of conditions likely to have a consequence for surgery and anaesthesia include:

- Asthma
- Rheumatoid Arthtritis
- Glomerulonephritis
- Idiopathic Thrombocytopaenic Purpura
- Malignancies and chemotherapy

These conditions should be fully assessed preoperatively (3).

➢ Inclusion/ exclusion criteria

Adult patients with adrenal insufficiency who are undergoing surgery or who are admitted acutely unwell.

➢ Clinical management

Surgery or anaesthesia : Increased parenteral hydrocortisone should be given before surgery and general anaesthesia and 'stress' cover continued post-op (4).

Type of procedure	Pre-operative and operative needs	Post-operative needs
Lengthy major surgery with long recovery time eg major bowel surgery, procedures needing ITU	100mg hydrocortisone IV before anaesthesia and 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV perioperatively	Continue 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV until able to eat & drink normally and taken steroids orally. Double oral dose for 48-72 hours. Taper return to normal dose until symptomatically well
Major surgery with rapid recovery eg caesarian section, joint replacement	100mg hydrocortisone IV before anaesthesia and 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV perioperatively	Continue 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV for 12-24 hrs or until eating & drinking well and taken steroids orally. Double oral dose for 24-48 hours. Taper return to normal dose until symptomatically well.
Labour and vaginal birth	100mg hydrocortisone IM at onset of birth then 6 hourly until delivery **or** 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV until delivery	Double oral dose for 24-48 hours. If well, then return to normal dose.
Minor surgery eg cataract surgery, hernia repairs	Double steroids day of procedure. 100mg hydrocortisone IM/IV before anaesthesia	Double oral dose for 24 hours. If well, then return to normal dose.

Invasive procedures eg colonoscopy, barium enema, endoscopy	Double steroids day of procedure. 100 mg hydrocortisone IM/IV before commencing	Double oral dose for 24 hours. If well, then return to normal dose
Minor procedure eg skin mole removal with local anaesthetic	Not usually required	An extra dose if unwell

- For any nil-by-mouth regimen, arrange an intravenous 0.9% saline or Hartmann's infusion to prevent dehydration eg. 1000ml every 8 hours if >50kg.

- Monitor electrolytes and blood pressure post-operatively for all procedures requiring in patient stay.

- If the patient becomes hypotensive, drowsy or peripherally shut down, administer 100mg hydrocortisone IV or IM immediately.

- If any post-operative complications arise, eg. fever, delay the return to normal dose.

- Ensure back-up supplies of oral and injectable hydrocortisone are available for resuscitation before commencing surgery. Even at full steroid cover, post-operative resuscitation may occasionally be required.

- Please be aware there is increasing evidence of adrenal suppression occurring in patients on long term high dose inhaled steroids &/or long term high dose topical steroids. Consider steroid cover if clinical concerns in this patient group.

Patients with Adrenal Insufficiency Admitted Acutely unwell

The immediate management of patients with adrenal insufficiency who are admitted acutely unwell should include careful assessment of fluid and electrolyte balance, replacement of corticosteroids and supportive measures to ensure haemodynamic stability (4&5).

Investigations:

- U&E's, LFTs, FBC, glucose.
- BP monitoring
- Cortisol level may be useful but interpret with caution (seek Endocrine advice, depends on clinical context, time of day and type of steroid replacement and dose normally taken by the patient)

Fluid Replacement:

- Intravenous 0.9% saline or Hartmann's infusion to prevent dehydration eg. 1000ml every 8 hours if >50kg if patient has reduced oral intake or vomiting
- Larger volumes of fluid replacement may be required depending on severity of illness, level of dehydration and adrenal insufficiency at time of presentation

Hydrocortisone Replacement:

- Administer a bolus dose of 100mg hydrocortisone intravenously
- Continue 100mg hydrocortisone IM every 6 hours or 2-4mg per hour by continuous infusion eg 100mg hydrocortisone infusion in 48ml 0.9% Saline over 24 hours IV until able to eat & drink normally.
- When able to eat & drink normally double the usual steroid dose until patient well

Glucose Supplementation:

- Occasionally required because of risk of hypoglycaemia (low glycogen stores in the liver as a result of glucocorticoid insufficiency).
- Follow **Hypoglycaemia Management for Adults Guideline** if symptomatic.

Investigate and treat precipitant

Monitor Treatment:

- U&E's, glucose (if initially low) and close BP monitoring.

➢ Further Management

Education of the patient

- Patient education is the key to successful management. Patients must be taught never to miss their steroid dose. They should be encouraged to wear a MedicAlert ID &/or carry a steroid card.

- Every patient should know to double their steroid dose during illness and to seek medical attention if unable to take the tablets because of vomiting. Patients with primary adrenal insufficiency and hypopituitarism with ACTH deficiency should have a vial of 100mg hydrocortisone with syringe, diluent and needle for times when parenteral treatment may be required.

➢ Contacts (inside and outside the Trust including out-of-hours contacts)

- Endocrine SpRs bleep 3086 or 3147

- Endocrine Consultants (Dr Michela Rossi, Dr Karen Anthony, Dr Maria Barnard) via extension 5219/8 or switchboard

- Anaesthetic Consultant Dr Chris Hargreaves via switchboard

- Out of hours, bleep Medical SpR on-call bleep 3300

1. Wass JAH, Arlt W How to avoid precipitating an acute adrenal crisis. *BMJ 2012, 345:e6333*

2. Jabbour SA. Steroids and the surgical patient. *Med Clin North Am*. 2001 Sep;85(5):1311-1317.

3. http://www.patient.co.uk/doctor/Precautions-for-Patients-on-Steroids-Undergoing-Surgery.htm

4. http://www.addisons.org.uk/topics/2005/10/0021.html

5. Oxford Handbook of Endocrinology and Diabetes, Oxford University Press, 2003

6. http://www.endocrinology.org/policy/docs/11-01_PituitaryApoplexy.pdf

- **Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to) Please use the tool provided at the end of this template**

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and**		

	Title of document being reviewed:	Yes/No	Comments
	Effectiveness		
	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes	
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
1. Compliance to steroid cover for surgery	**Dr Chris Hargreaves**	**Audit 10-20 notes per year**	**1-2 yearly for all**	**Local reporting**
2. Compliance to steroid cover in acutely unwell patients	**Dr Michela Rossi**	**Audit all admissions**	**1-2 yearly for all**	**Local reporting**