LRI Children's Hospital

Methylprednisolone in Paediatric Rheumatology

Staff relevant to:	Medical and nursing staff providing IV Methylprednisolone therapy within UHL Children's Hospital
Team approval date:	March 2025
Version:	1
Revision due:	March 2027
Written by:	Demisha Vaghela – Advanced Specialist Pharmacist Children's Rheumatology Dr Chitra Sundaramoorthy – Paediatric Rheumatology Consultant
Trust Ref:	C18/2025

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1. Introduction and Who Guideline applies to

These guidelines provide prescribing and monitoring guidance for all staff providing Childrens Rheumatology IV methylprednisolone therapy within UHL Children's Hospital. It should be read in conjunction with the relevant Summary of Product Characteristics (SPC) available on https://www.medicines.org.uk/emc/ and the BNFC.

2. Methylprednisolone use in paediatric rheumatology

Methylprednisolone is an intravenous (IV) glucocorticoid and can be given for a variety of rheumatology conditions as it can rapidly supress inflammation.

These conditions include:

- Juvenile Idiopathic Arthritis (JIA) – especially Systemic JIA & Poly- articular JIA
- Juvenile Systemic Lupus Erythematosus
- Juvenile Dermatomyositis
- Systemic Vasculitis
- Idiopathic or JIA associated Uveitis

It is often used in high doses (pulse methylprednisolone) for patients who require their inflammatory disease to be brought under control quickly.

Contraindications:

- Methylprednisolone should not be given in the context of active or recent serious infection. If risk of infection likely discuss with the rheumatology registrar/consultant before giving infusion.
- Previous allergic reaction to Methylprednisolone
- Active peptic ulceration
- Methylprednisolone injectable medicine containing lactose (*Solu- Medrone*® 40 mg) should not be used in patients with cows' milk allergy

Cautions – discuss with consultant :

- High blood pressure or concomitant administration of other medicines that can cause hypertension e.g. ciclosporin
- Diabetes mellitus
- Glaucoma (including a family history or susceptibility)
- History of renal /cardiac dysfunction
- Peptic ulcer
- H/o Tuberculosis
- Psychosis
- Systemic sclerosis
- Benign intracranial hypertension
- Ocular herpes simplex (risk of corneal perforation
- Osteoporosis

Suggested dosing regime:

Methylprednisolone10- 30mg/kg/day (**maximum dose 1g**) IV once daily for three consecutive days (can be variable from 1-5 days) Dilute in 250mL of 0.9% sodium chloride to be infused over 2 hours. If well tolerated, subsequent doses can be given over 1 hour.

The dose might be reduced, given slowly over 4-6 hours or given as split doses in special circumstances eg. AKI/ hypertension/hyperglycaemia etc according to the senior clinician (consultant).

Co-prescribe gastroprotection using a proton pump inhibitor (e.g omeprazole/lansoprazole)

Pre infusion check list:

- 1. Check patient's weight and height prior to first dose.
- 2. Rule out current or recent infection
- 3. Complete a set of observations: heart rate, blood pressure, temperature, and urinalysis prior to every dose (via a urine dip stick for UTI and glycosuria). If abnormal, please discuss with consultant prior to starting the infusion
- 4. Apply Ametop/EMLA cream if desired. Check for any bloods that might be required. If the patient is newly diagnosed with the inflammatory rheumatological condition they are more likely to need bloods including autoantibodies, varicella, hepatitis and measles serology.

Administration:

- Please refer to Medusa for the preparation of the infusion.
- Usually, this is infused slowly over 2 hours. If well tolerated, the subsequent doses can be given over 1 hour. In certain situations a slower 4 hour infusion may be preferred e.g renal impairment (discuss with rheumatology team if any doubt).
- If a patient is currently receiving oral steroids, these should ideally be omitted on days of the IV methylprednisolone infusion (and re-started following the infusions at the direction of the rheumatology team). However, if an oral prednisolone dose is given on the morning of infusion, it is fine to still go ahead with the methylprednisolone infusion.
- If the patient is known to have diabetes (or if the pre-infusion urine dipstick is positive for glucose), hyperglycaemia should be expected. Insulin requirements will rise and can be unpredictable. Blood glucose must be regularly monitored and appropriate insulin cover provided. Prior discussion with the diabetes team is advised in these scenarios.

Monitoring

- Check observations - temperature, heart rate, respiratory rate and blood pressure prior to commencing the infusion and then every 30 minutes until the end of the infusion, and then check again 15- 30 minutes post infusion.
- Check urine for any glycosuria. If the urine shows glucose, check capillary blood glucose (CBG) and if the CBG is greater than 11mmol, discuss with the consultant immediately to confirm individual monitoring plan.

Side effects

Possible Side effects:

Mild common side effects which require no intervention:

- Facial flushing, metallic taste in the mouth, hyperactivity, mood changes, blurred vision, lethargy, headache and pain at infusion site.
- Some children are very lethargic after the infusion for a few hours.

Rare Side effects requiring intervention:

- Hypertension, hypotension and severe bradycardia

Very rare side effects requiring infusion to be stopped and subsequent intervention:

- Altered conscious state or psychosis
- Seizures
- Allergic reaction, presumably to an additive within the IV solution. **IF ANY OF THESE OCCUR STOP THE INFUSION AND CALL THE DOCTOR**

Discharge plan following infusion:

- Counsel patient and parent to avoid live immunisations until three months after steroid treatment.
- Seek urgent medical attention if they come into contact with chicken pox or measles until three months after steroid treatment.
- Give advice on the plan for regular oral prednisolone treatment to follow as per paediatric rheumatologist management.
- Patients receiving **long term systemic corticosteroids** (more than 3 weeks duration) should be given a steroid card and the need for calcium/vitamin D supplements should be considered. The steroid card will be given by the pharmacy dispensing the medication. If it is written on a UHL outpatient prescription, this will be provided by TrustMed Pharmacy. If it is written on a green FP10 prescription, this will be provided by whichever pharmacy dispenses the medication. (Example of steroid card shown in Appendix 1)
- Monitoring of growth and other possible steroid side effects is needed for patients who are on long term steroids. Consider need for prevention and treatment of steroid induced osteoporosis with repeat infusions.
- If there were any findings of hyperglycaemia, there should be a clear plan in place discussed with the consultant and the family prior to discharge.

3. Education and Training

Clinical staff should receive training in safe handling of all intravenous drugs (assessed via their IV competencies) and familiarise themselves with the guidance.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Monitoring of blood results are performed at the recommended intervals	Audit of ICE records	Cons/Specialist Nurse	Annually	Local audit group panel
Blood results are acted on appropriately	Audit of clinical records	Cons/Specialist Nurse	Annually	Local audit group panel

5. Supporting References

1. BNF for children https://www.medicinescomplete.com/#/content/bnfc/_390297440 accessed on 09/04/2020
2. Summary of Product Characteristics – Solu-Medrone (EMC) https://www.medicines.org.uk/emc/product/5993/smpc accessed on 09/04/2020
3. British Society of Paediatric and Adolescent Rheumatology Guidance regarding Methylprednisolone.

6. Key Words

Methylprednisolone, Juvenile Idiopathic Arthritis, infusion, monitoring

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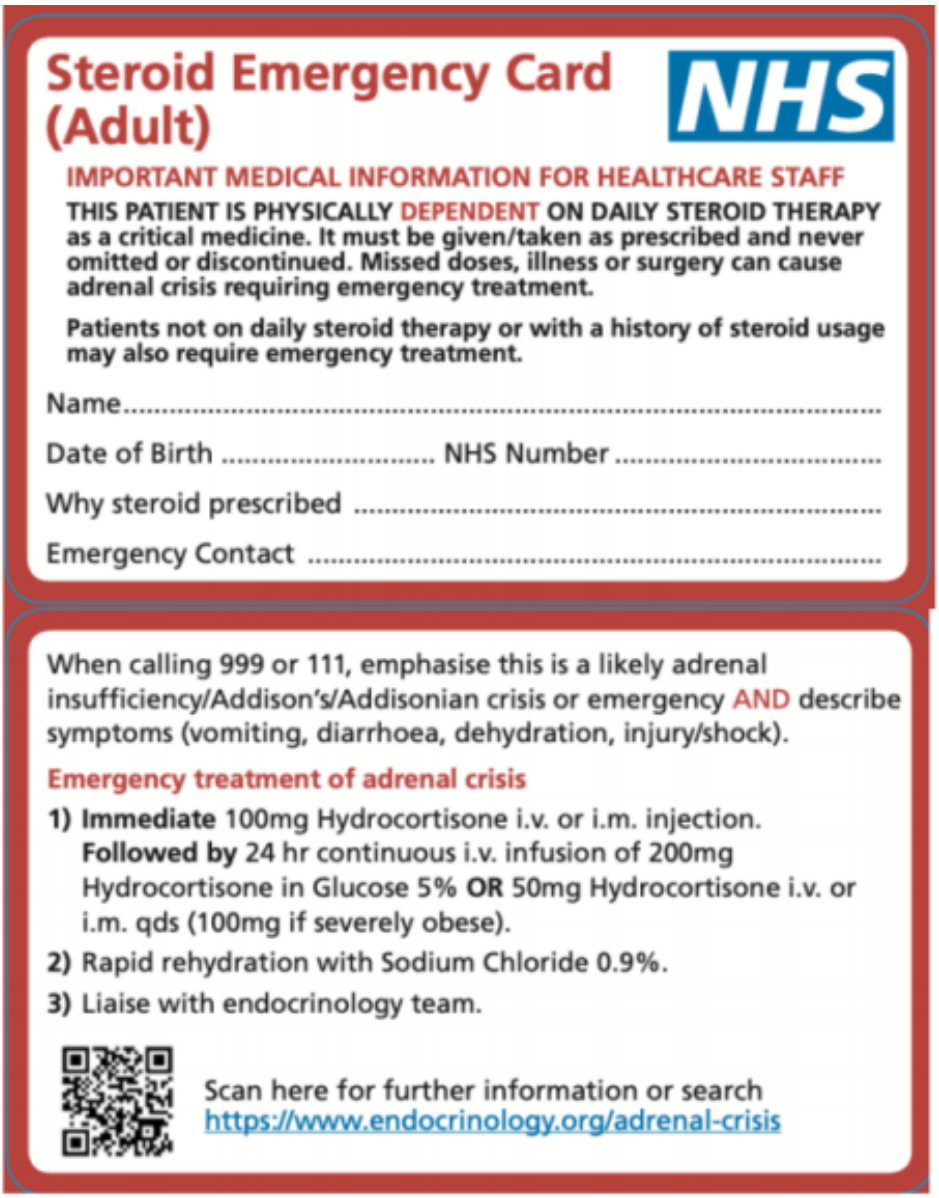
The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Demisha Vaghela – Advanced Specialist Pharmacist – Paediatric Rheumatology Jo Smallman – Regional lead nurse paediatric rheumatology Chitra Sundaramoorthy – Consultant, Paediatric Rheumatology	**Executive Lead** Chief Nurse
Details of Changes made during review: New guideline	

Appendix 1 – Steroid card example



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