Scottish Paediatric & Adolescent Rheumatology Network (SPARN)

Guideline for Methylprednisolone use

NOTE
This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined based on all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

This guidance has been prepared by NHS National Services Scotland (NSS) National Networks. Accountable to Scottish Government, NSS works at the heart of the health service providing national strategic services to the rest of NHSScotland and other public sector organisations to help them deliver their services more efficiently and effectively. Working across professional and organisational boundaries, National Networks support the delivery of safe, effective healthcare that's designed around patients, carers and families.

Contents

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Stakeholders involved	Consultant Paediatric Rheumatologists, Consultant Paediatricians, Rheumatology Nurse Specialists, Occupational Therapist, Lead Pharmacist, Highly Specialist Physiotherapist
Methodology used	• Literature search • Review of evidence • Review of available national and international guidance including previous SPARN guideline and BNFC • Engagement with key stakeholders (see above) • Guidelines drafted with review date • Guideline submitted to Steering Group (see appendix) • For comment then approval
Rationale	Methylprednisolone[1] is given at these doses for Rheumatology conditions but is rarely used in routine general paediatric care. This guideline is helpful and useful as a reference to support staff around SPARN network treat children and young people with rheumatological conditions.
Scope	Rheumatology specialists including hospital staff managing children and young people in the care of Paediatric Rheumatology network teams.
Approval process	The guideline was approved by the SPARN Steering Group on 10 June 2025. See appendix for list of Steering Group members.

[1] See Appendix 1 for more information

Background

Methylprednisolone is a synthetic glucocorticoid drug used for its anti-inflammatory and immunosuppressive effect. It can be given to suppress inflammation in a variety of conditions including:

- Polyarticular or Systemic onset Juvenile Idiopathic Arthritis
- Juvenile Systemic Lupus Erythematosus
- Systemic Vasculitis
- Juvenile Dermatomyositis
- Localised Scleroderma
- Juvenile Systemic Sclerosis
- Behcet's Disease
- Uveitis
- Macrophage Activation Syndrome
- Kawasaki Disease

Contra-indications

- pregnancy
- active peptic ulceration
- acute severe infection
- hypersensitivity to active ingredient or excipients
- live vaccines: avoid concomitant use

Cautions

- Diabetes: Insulin requirements will rise and can be unpredictable. Monitor blood glucose and provide appropriate insulin cover if required
- benign intracranial hypertension
- previous peptic ulcer disease
- Hepatic impairment
- Ciclosporin: increased risk of convulsions if used together
- history of steroid-induced psychosis
- Systemic Sclerosis: Consider reducing dose and giving infusion at slower rate due to theoretical risk of renal crisis reported in adult patients
- may enhance or reduce the anticoagulant effect of coumarins
- metabolism of corticosteroids accelerated by phenobarbital, phenytoin and carbamazepine

Pre-assessment considerations

- baseline observations (temperature, pulse, respiratory rate, blood pressure)
- baseline blood tests (fbc, esr, crp, ue, lfts, blood glucose)
- Varicella zoster status prior to first infusion
- further baseline blood tests as per unit protocol and disease indication

- baseline urinalysis checking for glycosuria
- vaccine status

Dosage and administration

- stop oral steroids on day of infusion and recommence after if required
- Gastric protection should be considered with local formulary choice proton pump inhibitor at BNF for children dose
- Methylprednisolone is administered intravenously at a dose of **30mg/kg (max 1gram)** once daily for **3 consecutive days** to achieve rapid control of inflammation. If required, this can be repeated after 1 week
- other regimes may be used depending on condition /clinical situation in discussion with a Paediatric Rheumatologist e.g. weekly pulses (30mg/kg, max 1g) for 4-6weeks or monthly (30mg/kg, max 1g)
- 800 micrograms of IV methylprednisolone is equivalent to 1mg of oral prednisolone as an anti-inflammatory agent
- preparation and administration monograph available at Medusa Injectable Medicines Guide: www.medusaimg.nhs.uk
- reconstitute methylprednisolone powder with water for injection taking account of the displacement value, then add to an appropriate intravenous fluid (eg. sodium chloride 0.9% or 5% glucose. Also compatible with Sodium chloride 0.9% and 5% glucose mixture)
- for example: Add reconstituted solution to 100ml 0.9% sodium chloride for infusion
- intravenous infusion given over 30-60 mins
- consider a lower dose in patients with **Juvenile Systemic Sclerosis** (10-15mg/kg) and a slower (e.g. 4 hours) infusion rate in view of theoretical risk of renal crisis
- consider longer infusion rate (e.g. 4 hours) in patients with **nephritis, renal impairment or hypertension**
- consider sliding insulin scale if patient has **diabetes** and monitor blood glucose regularly

Formulations

IV injection (methylprednisolone sodium succinate) 40mg, 125mg, 500mg, 1g and 2g (diluent in box)

Monitoring

Check temperature, respiratory rate, pulse and BP at 30min intervals. If patient feels unwell, check observations and blood glucose -> consider slowing the rate of infusion. See side effect profile below and expected actions.

- observe for 30-45mins after infusion

- most patients are managed as day cases, however, some Paediatric Rheumatology centres may admit a patient for the first dose

Side effects

Mild common side effects requiring no intervention

- facial flushing
- metallic taste in the mouth
- hyperactivity
- mood changes
- headache
- blurred vision
- increased appetite
- stinging during infusion: slow rate / dilute more

Rare side effects

Requiring intervention

- hypertension: may need reduced rate of infusion and occasionally anti-hypertensive prescribed
- hypotension
- severe tachycardia

Extremely rare side effects

requiring **infusion to be stopped and subsequent intervention**

- altered conscious state or psychosis
- seizures
- allergic reaction

Other considerations

- Consider the need for prevention and treatment of steroid induced osteoporosis with repeat infusions
- Give steroid card (if on long-term steroids) and advice re chicken pox exposure (follow SPARN guidelines)
- Children who have received high dose steroids (equivalent to >40mg PO prednisolone daily or >2mg/kg for patients <20kg) for more than 1 week or lower dose steroids (>20mg daily or >1mg/kg for patients <20kg) should avoid live vaccines for 3 months

Appendix 1 – Off label drugs statement

Prescribing of medicines outwith their marketing authorisation
Recommendations within this pathway are based on the best clinical evidence. Some recommendations may be for medicines prescribed outwith the marketing authorisation (MA) also known as product licence. This is known as 'off-label' use. Medicines may be prescribed 'off-label' in the following circumstances:

- for an indication not specified within the marketing authorisation
- for administration, via a different route
- for administration
- for a different dose for a different patient population.

An unlicensed medicine is a medicine which does not have MA for medicinal use in humans. Generally, 'off-label' prescribing of medicines becomes necessary if the clinical need cannot be met by licensed medicines within the marketing authorisation. Such use should be supported by appropriate evidence and experience.

"Prescribing medicines outside the conditions of their marketing authorisation alters (and probably increases) the prescribers' professional responsibility and potential liability".

The General Medical Council (GMC) recommends that when prescribing a medicine 'off-label', doctors should:

- be satisfied that there is no suitably licensed medicine that will meet the patient's need
- be satisfied that there is sufficient evidence or experience of using the medicine to show its safety and efficacy
- take responsibility for prescribing the medicine and for overseeing the patient's care, including monitoring the effects of the medicine, and any follow-up treatment, or ensure that arrangements are made for another suitable doctor to do so.

Make a clear, accurate and legible record of all medicines prescribed and when not following common practice, the reasons for prescribing an unlicensed medicine. Non-medical prescribers should ensure that they are familiar with the legislative framework and Royal Pharmaceutical Society's Competency Framework for all Prescribers.

Prior to any prescribing, the licensing status of a medication should be checked in the summary of product characteristics (www.medicines.org.uk). The prescriber must be competent, operate within the professional code of ethics of their statutory bodies and the prescribing practices of their employers.

Appendix 2 – Steering Group membership

Name	Designation	Role	Area representing
Andrew Fell	Paediatric Rheumatology Nurse Specialist	Data Lead	NHS Greater Glasgow & Clyde
Angela Cruickshank	Paediatric Rheumatology Nurse Specialist	Former Nurse Lead	NHS Fife
Catriona Anderson	Consultant Paediatric Rheumatologist	Education Lead	NHS Lothian
Elaine Wallace	Senior Child Health Physiotherapist	Physio Lead	NHS Tayside
Emma Carson	Paediatric Rheumatology Nurse Specialist	Working with Families Lead	NHS GGC
Imogen Kelly	Rheumatology Nurse Specialist	Working with Families Lead	NHS Lothian
Jane Adam	Paediatric Rheumatology Nurse Specialist	Nurse Lead	NHS Grampian
Julie Duncan	Consultant Paediatrician	Clinical Guidelines Lead	NHS Lothian
Karen Lapsley	Highly Specialist Physiotherapist	Physio Lead	NHS Forth Valley
Kirsten Healy	Consultant Paediatrician	Paediatrician with an interest	NHS Fife
Kirsty McLellan	Paediatric Rheumatology Consultant	Clinical Guidelines Lead	NHS Greater Glasgow & Clyde
Klaire Connor	Young People and Families Manager Scotland	Third Sector Representative	Versus Arthritis
Lindsay Robertson	Consultant Rheumatologist	Transition Lead	NHS Grampian
Lois Freeland	SNAC Chair	Third Sector Representative	SNAC
Mairi Dunbar	Lead Pharmacist – Paediatrics	Pharmacy Lead	NHS Tayside
Mandy Fanning	Occupational Therapist	Occupational Therapy Lead	NHS GGC
Mary Brennan	Consultant Paediatric Rheumatologist	Chair	NHS Lothian
Neil Martin	Consultant Paediatric Rheumatologist	Lead Clinician	NHS Greater Glasgow & Clyde

References

1. BNF for children
2. Department of Health Green book: Contra-indications and special circumstances, Chapter 6-5
3. BSPAR: Methyl-prednisolone use in Paediatric Rheumatology Oct 2010
4. Eleftheriou et al, Management of Kawasaki Disease, Arch Dis Child 2014 Jan;99(1):74-83
5. SPARN varicella exposure guideline available at www.nn.nhs.scot/sparn/professionals/guidelines-protocols-pathways/

Scottish Paediatric and Adolescent Rheumatology Network

Checklist for clinical guideline development, review, approval and posting on SPARN website

Process	Done	N/A	Date	Initials
Literature search and review of available evidence	☒	☐	04/25	NM
Review national and international guidance	☒	☐	04/25	NM
Review previous guidelines/ask other centres if appropriate	☒	☐	04/25	NM
Consult key stakeholders: Medical staff Specialist Nurses Physiotherapists Pharmacy Patients and Families Other	 ☒ ☒ ☐ ☒ ☐ ☐	 ☐ ☐ ☒ ☐ ☒ ☒	04/25	NM
Collate information and produce draft guideline	☒	☐	04/25	NM
Ensure guideline contains review date (max 3 years hence)	☒	☐	04/25	NM
Submit to SPARN steering group for review (see Appendix 1)	☒	☐	04/25	NM
Decision made by SPARN steering group	☒	☐	04/25	NM
Guideline re-drafted and submitted to SPARN steering group	☐	☐	04/25	NM
Final guideline accepted	☐	☐	04/25	NM
Guideline posted on SPARN website & review date noted	☐	☐	04/25	NM

Date: 09/04/2025 Signature: Neil Martin

Section	Question	Yes	No	N/A	Date	Signature
Scope and Purpose	1) Has the author demonstrated a need for a clinical guideline adequately? 2) Are the overall objectives specifically described? 3) Are the clinical question(s) covered specifically described? 4) Are the patients to whom it is meant to apply specifically described? 5) Does the title accurately reflect the content and scope?	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	04/25	NM
Stakeholder Involvement	6) Is there a clearly defined authorship? 7) Did the guideline development group include individuals from all relevant professional groups? 8) Are the target users of the guideline clearly defined?	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	04/25	NM
Costs	9) Have the potential cost implications of applying the recommendations been considered?	☒	☐	☐	04/25	NM
Clarity and Presentation	10) Are the recommendations specific and unambiguous? 11) Are the key recommendations easily identifiable?	☒ ☒	☐ ☐	☐ ☐	04/25	NM
Review	12) Does the guideline contain a review date?	☒	☐	☐	04/25	NM

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