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: http://www.injguide.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 antihypertensive 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)
- Avoid live vaccines for 3 months after administration
References:
1. BNF for children
2. Department of Health Green book: Contra-indications and special circumstances, Chapter 6; Page 43
3. BSPAR: Methyl-prednisolone use in Paediatric Rheumatology Oct 2010

Authors:
Sarveshni Naidoo, Paediatric Registrar, Royal Hospital for Children, Glasgow
Neil Martin, Paediatric Rheumatologist, Royal Hospital for Children, Glasgow

NOTE
This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of 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.