

# Methylprednisolone 40 mg, 500 mg and 1000 mg

## Powder for solution for injection

methylprednisolone (as sodium succinate)

### Read all of this leaflet carefully before you start using this medicine because it contains important information for you.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor or nurse.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor or nurse. This includes any possible side effects not listed in this leaflet. See section 4.

### WHAT IS IN THIS LEAFLET

1. What Methylprednisolone is and what it is used for
2. What you need to know before you use Methylprednisolone
3. How to use Methylprednisolone
4. Possible side effects
5. How to store Methylprednisolone
6. Contents of the pack and other information

### 1. WHAT METHYLPREDNISOLONE IS AND WHAT IT IS USED FOR

Methylprednisolone is the active substance of Methylprednisolone powder for solution for injection.

Methylprednisolone contains Methylprednisolone Sodium Succinate. Methylprednisolone belongs to a group of medicines called corticosteroids (steroids). Corticosteroids are produced naturally in your body and are important for many body functions.

Boosting your body with extra corticosteroid such as Methylprednisolone can help following surgery (e.g. organ transplants), flare-ups of the symptoms of multiple sclerosis or other stressful conditions.

Methylprednisolone may be used to treat the following diseases:

#### Allergic conditions:

Bronchial, asthma.  
Acute throat oedema of non-infectious origin.  
Severe perennial allergic rhinitis.  
Swelling of the mouth, the tongue and the trachea, which can cause difficulty in breathing (angioneurotic oedema).  
Very serious allergic reaction (anaphylaxis).

#### Skin disorders:

Severe inflammatory diseases of the skin.

Critical phases of gastro-intestinal diseases:

Inflammation of the large bowel and inflammation of the small bowel (Crohn's disease).

#### Neurological disorders:

In certain cases of brain swelling, acute spinal cord injuries, worsening or flare-up of sclerosis multiplex.

#### Respiratory diseases:

Aspiration of gastric contents.  
Severe inflammatory diseases affecting the lung.

#### Other diseases:

In certain cases of meningitis caused by the pathogen responsible for tuberculosis. To reduce the reactions of the immune system in case of organ transplantation.

You must talk to a doctor if you do not feel better or if you feel worse.

### 2. WHAT YOU NEED TO KNOW BEFORE YOU USE METHYLPREDNISOLONE

#### Do not use Methylprednisolone:

- if you are allergic to methylprednisolone (or any other corticosteroid) or any of the other ingredients of this medicine (listed in section 6).
- if you have a fungal infection, other than on the skin, which is not being treated.
- you have ever had fever, fits and loss of consciousness linked with malaria (cerebral malaria).
- you are suffering from a head injury or stroke.

#### Warnings and precautions

Talk to your doctor or nurse before using Methylprednisolone.

#### Tell your doctor or nurse immediately if any of the following apply to you:

- you have not had chicken pox, measles, shingles or a herpes eye infection. If you develop them when taking methylprednisolone they could make you very ill. If you are not immune or you are a parent of a child receiving this medicine, avoid close contact with anyone with these infections. Seek immediate medical advice if you think you have been exposed to one of these infections or if a member of your household develops one of them.
- you are being treated with digoxin (a medicine for heart failure).

#### You must tell your doctor before Methylprednisolone is given if you suffer from:

- brittle bones (osteoporosis) or if you are a woman who has gone through the menopause
- mood disorders, either currently or in the past, including severe depression, manic-depression (bipolar disorder), or problems such as delusions, hallucinations or disorganised speech after taking steroids
- high blood pressure (hypertension)
- weakness of the heart muscle (heart failure)
- a recent heart attack
- diabetes, either in you or close family. If you have diabetes, you should closely monitor blood sugar while taking methylprednisolone
- tuberculosis, either currently or in the past
- glaucoma, either in you or close family
- pain or weakness in the muscles after treatment with corticosteroid medicines in the past
- liver problems such as jaundice
- poor kidney function
- epilepsy
- an ulcer in the small intestines

- recent fistula (abnormal connections inside the intestines)
- ulcerative colitis and diverticulitis (disorders of the gut)
- inflammation and blood clots of the leg veins (thrombophlebitis)
- skin abscesses
- myasthenia gravis (a muscle weakening disease)
- underactive thyroid gland (hypothyroidism)
- Kaposi's syndrome (a type of skin cancer)
- Scleroderma (also known as systemic sclerosis, an autoimmune disorder) because daily doses of 15 mg or more may increase the risk of a serious complication called scleroderma renal crisis. Signs of scleroderma renal crisis include increased blood pressure and decreased urine production. The doctor may advise that you have your blood pressure and urine regularly checked.

Contact your doctor if you experience blurred vision or other visual disturbances.

**Before you have any operation** tell your doctor, anaesthetist or dentist that you are being treated with methylprednisolone as your body's reaction to stress is reduced.

**If you require a test** to be carried out by your general practitioner or hospital you must tell the doctor that you are being treated with methylprednisolone as this medicine could affect the test results.

#### Other medicines and Methylprednisolone

Tell your doctor or nurse if you are taking, have recently taken or might take any other medicines, including medicines obtained without a prescription.

Some medicines could be harmful if taken with methylprednisolone, or could affect the way either methylprednisolone or the other medicine works. Your doctor may need to adjust the dose of your medicine if you are taking other medicines.

Some medicines may increase the effects of Methylprednisolone and your doctor may wish to monitor you carefully if you are taking these medicines (including some medicines for HIV: ritonavir, cobicistat).

#### Tell your doctor or nurse if you are taking any of the following:

- acetazolamide for glaucoma, epilepsy and water retention
- aminoglutethimide for Cushing's syndrome and breast cancer
- antibiotics: rifampicin, rifabutin, troleandomycin or erythromycin
- anticoagulants such as warfarin, acenocoumarol and phenindione used to thin the blood. Your doctor may perform blood tests to make sure that your blood clotting is normal
- aspirin, sodium salicylate and non-steroidal anti-inflammatory drugs such as ibuprofen, naproxen and diclofenac used to treat mild to moderate pain
- carbamazepine for epilepsy, pain and manic depression
- antipsychotics
- carbenoxolone for stomach ulcers and heartburn
- ciclosporin to prevent organ rejection
- cimetidine for stomach ulcers and heartburn
- diltiazem and mibefradil for problems of the heart and blood circulation such as high blood pressure and angina
- digoxin and similar heart glycosides
- diuretics for water retention such as hydrochlorothiazide, furosemide and etacrynic acid
- methotrexate
- insulin and other drugs such as metformin for diabetes. If you have diabetes, you may need to check your blood sugar more closely when using methylprednisolone
- ketoconazole and itraconazole for fungal infections
- salbutamol
- medicines for high blood pressure such as lisinopril and losartan
- pancuronium or other medicines used for muscle relaxation during surgery and tooth extractions
- phenobarbital, phenytoin and primidone for epilepsy
- pyridostigmine and neostigmine for myasthenia gravis
- vaccinations: tell your doctor before being immunised with live vaccines such as for polio if you are taking or have been taking corticosteroids as there is a risk of infection and poor immune response to the vaccine.

#### Pregnancy and breast feeding

If you are pregnant or breast-feeding, think you may be pregnant or are planning to have a baby, ask your doctor nurse for advice before using this medicine.

You will be given this medicine during pregnancy and breastfeeding only if the doctor assesses that the benefit from the treatment is greater than the possible risks to the embryo/foetus or infant.

There is no evidence that corticosteroids would impair fertility.

#### Methylprednisolone contains sodium

Each vial of Methylprednisolone 40 mg contains less than 1 mmol sodium (23mg) per 40mg, i.e. essentially "sodium-free".

Each vial of Methylprednisolone 500 mg contains 53.18mg sodium per 500mg.

Each vial of Methylprednisolone 1000 mg contains 167.59mg sodium per 1000mg.

If you are on controlled sodium (salt) diet tell your doctor in case your sodium intake needs to be adjusted.

### 3. HOW TO USE METHYLPREDNISOLONE

#### Steroid Cards

**Remember to always carry a Steroid Treatment Card. Make sure your doctor or pharmacist has filled out the details of your medicine, including the dose and how long you will require steroid treatment.**

The recommended dose is:

#### Adults

The initial dose is usually 10-500 mg depending on the disease treated. Larger doses may be required for short-term management of severe, acute conditions. The initial dose, up to 250 mg, should be given intravenously as a bolus injection over a period of at least 5 minutes, doses exceeding 250 mg should be given as an infusion over a period of at least 30 minutes.

#### Elderly

You will normally receive the same treatment as younger adults although the doctor may decide to check the side effects of treatment more closely (see Section 4).

#### Use in children

In infancy, childhood and adolescence, corticosteroids may cause growth to be slowed down. This may be irreversible. Your doctor should limit treatment to the minimum dose for the shortest period of time.



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The following information is intended for medical or healthcare professionals only:

#### Method of administration:

Methylprednisolone may be administered intravenously or intramuscularly, the preferred method for emergency use being intravenous injection given over a suitable time interval.

#### a) Preparation of solution for injection (reconstitution):

Methylprednisolone solution for injection should be prepared by dissolving the powder in an appropriate volume of water for injection, as shown in the table.

Methylprednisolone presentation	Solvent quantity (WFI)	Final solution concentration
40 mg	1.2 ml	40 mg/ml
125 mg	2.1 ml	62.5 mg/ml
250 mg	4 ml	62.5 mg/ml
500 mg	8 ml	62.5 mg/ml
1000 mg	16 ml	62.5 mg/ml

### If you use more Methylprednisolone than you should

If you think you have been given too many injections please speak to your doctor immediately.

### Stopping/reducing the dose of your Methylprednisolone

Your doctor will decide a suitable time to stop treatment.

The dose should be gradually reduced if:

- you have been treated with corticosteroid injections for more than 3 weeks
- it has been less than one year since you stopped long-term treatment (months or years) with corticosteroid tablets
- you suffer from Addison's disease or conditions where your adrenal glands do not produce enough natural corticosteroids
- you have had a course of more than 32mg of methylprednisolone each day
- your injections were in the evening.

It is important to reduce the dose gradually to avoid withdrawal symptoms.

### Withdrawal symptoms may include:

- itchy skin
- sweating
- fever
- muscle and joint pains
- runny nose
- sticky eyes
- weight loss.

If your symptoms return or get worse as your medicine is reduced tell your doctor immediately.

### Mental health problems while using Methylprednisolone

Mental health problems can happen while taking steroids like methylprednisolone (see also Section 4). Corticosteroids, especially with high doses, can alter your mood and behaviour. Some patients become confused, irritable and suffer from delusions and suicidal thoughts early in treatment. This is particularly the case if you are already suffering or susceptible to mental problems. These effects can also occur when stopping methylprednisolone. Speak to a doctor if you or someone close to you is worried by psychological changes.

## 4. POSSIBLE SIDE EFFECTS

Like all medicines, this medicine can cause side effects, although not everybody gets them.

Methylprednisolone is used for illnesses that could get worse if not properly treated. Side-effects are more likely at high doses or during prolonged treatment. Your doctor will prescribe the lowest effective dose for the shortest possible time to minimise side-effects. Ask your doctor if you need any further advice.

### Serious side effects

Contact your doctor IMMEDIATELY if you get any of the following symptoms:

- sudden life-threatening allergic reaction (anaphylaxis) with symptoms such as rash, itching or hives on the skin, swelling of the face, lips, tongue or other parts of the body, shortness of breath, wheezing or breathing difficulties
- infections, which may be more frequent and severe, although symptoms may be less obvious
- stomach ulcers which may lead to perforation and bleeding. Symptoms are stomach pain, black tarry stools or vomiting blood
- acute pancreatitis causing severe pain in the abdomen and across the back
- increased pressure in the skull (pseudotumor cerebri) in children, usually after stopping methylprednisolone. Symptoms are headache with vomiting, lack of energy and drowsiness
- blood clots in the veins (thromboembolism), which may produce pain, tenderness or swelling in one leg; or of the lungs with symptoms of sudden sharp chest pain, breathlessness and coughing up blood
- failure of the heart to pump blood properly leading to severe breathlessness and swollen ankles (congestive heart failure).

### Other side effects

Tell your doctor if any of the following become serious:

#### Effects on the blood and lymphatic system:

- increase of white blood cells (this side effect has been reported with frequency not known, i.e. cannot be estimated from the available data).

#### Effects on the digestive system:

- indigestion, bloating, fungal infections or ulcers of the gullet
- feeling sick, vomiting and bad taste in the mouth
- methylprednisolone can damage your liver, hepatitis and increase of liver enzymes have been reported (these side effects have been reported with frequency not known, i.e. cannot be estimated from the available data).

#### Effects on the immune system:

- increased susceptibility to infections
- some skin tests may give abnormal results and inactive tuberculosis could return.

#### Effects on bones, muscles and joints:

- weakness of the muscles in the shoulder and hips
- thinning of the bones (osteoporosis) and bone fractures especially of the spine, arms and legs. Bone thinning usually requires additional treatment (particularly if you are a woman over 60) in order to prevent breakages and fractures
- loss of blood supply to the bones in the joints may lead to pain in the knee and hip
- torn muscle tendons causing pain or swelling.

#### Effects on kidney function:

- retention of sodium and water, loss of potassium possibly resulting in abnormal blood alkalinity, which in rare cases can lead to congestive heart failure (see serious side effects).

#### Effects on the skin:

- development of pale or dark areas of skin
- slow wound healing, pinhead spots under the skin and bruising, redness, thinning of the skin, stretch marks, acne. Kaposi's sarcoma (a type of skin cancer). These effects may get better if the dose of your medicine is reduced.

#### Hormonal effects:

- reduced activity of the hypothalamus, pituitary and adrenal glands which control reactions to stress, digestion, the immune system and emotions
- slow growth in infants and children
- problems with your periods (menstruation)
- rounded (moon-shaped) face typical of Cushing's syndrome
- excessive hairiness
- reduced ability to process sugars and starches with increased need for treatment with diabetes medication
- loss of muscle and bone
- increased appetite and weight gain.

#### Metabolism and nutrition effects:

- accumulation of fat tissue on localized parts of the body.

#### Changes to your mental state:

Steroids including methylprednisolone can cause serious mental health problems. These reactions are common in both adults and children. About one in twenty adults may be severely affected.

- mood changes such as irritability, extreme happiness (euphoria), depression and sudden mood swings, withdrawal symptoms including anxiety
- suicidal thoughts
- delusions, hallucinations, mania, worsening of schizophrenia
- behavioural disturbances, sleep disturbances, fits (seizures)
- problems with poor mental function including confusion and memory loss.

#### Effects on the eye:

- raised pressure in the eye, glaucoma
- swelling of the optic nerve leading to possible damage
- blurred vision (this side effect has been reported with frequency not known, i.e. cannot be estimated from the available data) or difficulty seeing (cataracts), thinning of the cornea and whites of the eye
- worsening of existing viral or fungal eye infections
- disease of the retina and choroid membrane (this side effect has been reported with frequency not known, i.e. cannot be estimated from the available data).

#### Effects on the heart, lung and blood circulation:

- tearing of the heart muscles following a heart attack
- high blood pressure which may give you headaches, or make you feel generally unwell
- sudden drop in blood pressure leading to collapse
- heart attack
- irregular heart beat
- raised levels of white blood cells
- wheezing or coughing
- increased clotting of the blood (this side effect has been reported with frequency not known, i.e. cannot be estimated from the available data).

#### Effects on your nervous system:

- convulsions and increased pressure in the head.

#### Effects on your renal and urinary system:

- Scleroderma renal crisis in patients already suffering from scleroderma (an autoimmune disorder). Signs of scleroderma renal crisis include increased blood pressure and decreased urine production (this side effect has been reported with frequency not known, i.e. cannot be estimated from the available data).

#### Other effects:

- persistent hiccupping, feeling unwell.

### Withdrawal symptoms

A 'withdrawal syndrome' may occur, see Section 3 for more information.

### Reporting of side effects

If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via the Yellow Card Scheme at: [www.mhra.gov.uk/yellowcard](http://www.mhra.gov.uk/yellowcard).

By reporting side effects you can help provide more information on the safety of this medicine.

## 5. HOW TO STORE METHYLPREDNISOLONE

Keep this medicine out of the sight and reach of children.

Store below 25°C.

Keep the vial in the outer carton in order to protect from light.

Do not use this medicine after the expiry date which is stated on the vial's label and carton after EXP. The expiry date refers to the last day of that month.

## 6. CONTENTS OF THE PACK AND OTHER INFORMATION

### What Methylprednisolone contains

- The active substance is methylprednisolone (as sodium succinate).
- The other ingredients are sodium dihydrogen phosphate dihydrate, disodium phosphate anhydrous and sodium hydroxide. The 40 mg vial also contains glucose.

### What Methylprednisolone looks like and contents of the pack

Methylprednisolone is a white or nearly white powder, packed in a clear glass vial closed with a rubber stopper and a flip-off aluminium capsule.

Each vial of Methylprednisolone 40 mg contains 53.0 mg of methylprednisolone sodium succinate, equivalent to 40 mg of methylprednisolone.  
Each vial of Methylprednisolone 500 mg contains 663.0 mg of methylprednisolone sodium succinate, equivalent to 500 mg of methylprednisolone.  
Each vial of Methylprednisolone 1000 mg contains 1,326.0 mg of methylprednisolone sodium succinate, equivalent to 1000 mg of methylprednisolone.

### Marketing Authorisation Holder and Manufacturer

Hikma Farmacêutica (Portugal), S.A.  
Estrada do Rio da Mó 8, 8A e 8B – Fervença  
2705-906 Terrugem SNT  
Portugal  
[portugalgeral@hikma.com](mailto:portugalgeral@hikma.com)

### Distributed by:

Consilient Health (UK) Ltd.  
No. 1 Church Road,  
Richmond upon Thames,  
Surrey, TW9 2QE

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### b) Preparation of infusion solution

For intravenous infusion the initially prepared solution may be diluted with 5% dextrose in water for injection, 0.9% Sodium Chloride in water for injection (isotonic saline solution), or 5% dextrose in isotonic saline solution. To avoid compatibility problems with other drugs Methylprednisolone should be administered separately, only in the solutions mentioned.

Parenteral drugs products should be inspected visually for particulate matter and discoloration prior to administration.

After reconstitution as recommended, use immediately, discard any remainder. From a microbiological point of view, the product should be used immediately. If not used immediately, in-use storage times and conditions prior to use are the responsibility of the user and would normally not be longer than 24 hours at 2 to 8°C, unless reconstitution/dilution has taken place in controlled and validated aseptic conditions.

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.