

## DEXAMETHASONE SODIUM PHOSPHATE INJECTION USP

### Corticosteroid

**Indications:** Dexamethasone sodium phosphate may be given by i.v. or i.m. injection when oral therapy is not feasible in the following conditions:

**Endocrine disorders:** Primary or secondary adrenocortical insufficiency (hydrocortisone or cortisone is the drug of choice; synthetic analogs may be used in conjunction with mineralocorticoids where applicable); in infancy, mineralocorticoid supplementation is of particular importance).

**Acute adrenocortical insufficiency** (hydrocortisone or cortisone is the drug of choice; mineralocorticoid supplementation may be necessary, particularly when synthetic analogs are used).

Preoperatively and in the event of serious trauma or illness, in patients with known adrenal insufficiency or when adrenocortical reserve is doubtful.

Congenital adrenal hyperplasia.

Nonsuppurative thyroiditis.

**Rheumatic Disorders:** As adjunctive therapy for short-term administration (to support the patient during an acute period of exacerbation) in post-traumatic osteoarthritis, synovitis of osteoarthritis, rheumatoid arthritis, acute gouty arthritis, psoriatic arthritis, ankylosing spondylitis, juvenile rheumatoid arthritis.

**Collagen Diseases:** During an exacerbation or as maintenance therapy in selected cases of systemic lupus erythematosus, acute rheumatic carditis.

**Dermatologic Diseases:** pemphigus, bullous dermatitis herpetiformis, severe erythema multiforme (Stevens-Johnson syndrome), exfoliative dermatitis, severe seborrheic dermatitis, severe psoriasis.

**Allergic States:** Initial control of severe allergic conditions: seasonal or perennial allergic rhinitis, bronchial asthma (including status asthmaticus), contact dermatitis, atopic dermatitis, serum sickness, drug hypersensitivity reactions, urticarial transfusion reactions, acute noninfectious laryngeal edema (epinephrine is the drug of first choice).

**Ophthalmic Diseases:** Severe acute and chronic allergic and inflammatory processes involving the eye and its adnexa, such as: herpes zoster ophthalmicus (but not herpes simplex), iritis, iridocyclitis, choroiderinitis, anterior segment inflammation, diffuse posterior uveitis and choroiditis optic neuritis, retrobulbar neuritis, sympathetic ophthalmia.

**Gastrointestinal Diseases:** To support the patient during a critical period of the disease in ulcerative colitis (systemic therapy), regional enteritis, (systemic therapy).

**Respiratory Diseases:** Sarcoidosis, berylliosis, fulminating or disseminated pulmonary tuberculosis when concurrently accompanied by appropriate antituberculous chemotherapy, aspiration pneumonitis.

**Hematologic Disorders:** Idiopathic thrombocytopenic purpura in adults (i.v. only; i.m. administration is contraindicated), acquired (autoimmune) hemolytic anemia.

**Neoplastic Disorders:** For palliative management of leukemias and lymphomas in adults, acute childhood leukemia, hypercalcemia associated with cancer.

**Nephrotic Syndrome:** To induce diuresis or remission of proteinuria in the nephrotic syndrome without uremia, or the idiopathic type, or that due to lupus erythematosus.

**Cerebral edema:** May be used to treat patients with cerebral edema of diverse etiologies in conjunction with adequate neurological evaluation and management.

**Miscellaneous:** Tuberculous meningitis with subarachnoid block or impending block when concurrently accompanied by appropriate antituberculous chemotherapy.

Diagnostic testing of adrenocortical hyperfunction.

When given intrasynovially or locally into soft tissue sites this product may provide relief of symptoms in: traumatic arthritis, ganglia, bursitis, tendinitis, fibrositis, localized myositis, hemoma.

**Contraindications:** Systemic fungal infections; hypersensitivity to dexamethasone.

**Warnings:** In patients on corticosteroid therapy subjected to unusual stress, increased dosage of rapidly acting corticosteroids before, during and after the stressful situation is indicated.

**While on corticosteroid therapy patients should not be vaccinated against smallpox because of potential complications. Conversely, patients with vaccinia should not receive corticosteroid therapy. Other immunization procedures should not be undertaken in patients who are on corticosteroids, especially on high doses, because of possible hazards of neurological complications and a lack of antibody response. However, immunization procedures may be undertaken in patients who are receiving corticosteroids as replacement therapy, e. g. for Addison's disease.**

**Pregnancy:** Adequate human reproduction studies have not been done with corticosteroids. Infants born of mothers who have received substantial doses of corticosteroids during pregnancy should be carefully observed for signs of hypoadrenalism.

**Lactation:** Corticosteroids appear in breast milk and could suppress growth, interfere with endogenous corticosteroid production, or cause other unwanted effects. Mothers taking pharmacological doses of corticosteroids should be advised not to nurse.

The use of corticosteroids in active tuberculosis should be restricted to those cases of fulminating or disseminated tuberculosis in which the corticosteroid is used for the management of the disease in conjunction with an appropriate antituberculous regimen. If corticosteroids are indicated in patients with latent tuberculosis or tuberculin reactivity, close observation is necessary as reactivation of the disease may occur. During prolonged corticosteroid therapy, these patients should receive chemoprophylaxis.

Prolonged use of corticosteroids may produce posterior subcapsular cataracts, glaucoma with possible damage to the optic nerves and may enhance the establishment of secondary ocular infections due to fungi or viruses.

Corticosteroids should be used cautiously in patients with ocular herpes simplex for fear of corneal ulcerations and perforation.

Corticosteroids may mask some signs of infection and new infections may appear during their use. There may be decreased resistance and inability to localize infection when corticosteroids are used. Moreover, corticosteroids may affect the nitroblue-tetrazolium test for bacterial infection and produce false negative results. If corticosteroids have to be used in the presence of bacterial infections, institute appropriate vigorous anti-infective therapy.

Average and large doses of cortisone or hydrocortisone can cause elevation of blood pressure, salt and water retention, and increased excretion of potassium. The effects are less likely to occur with the synthetic derivatives except when used in large doses. Dietary salt restriction and potassium supplementation may be necessary. All corticosteroids increase calcium excretion.

Because rare instances of anaphylactoid reactions have occurred in patients receiving parenteral corticosteroid therapy, appropriate precautionary measures should be taken prior to administration, especially when the patient has a history of allergy to any drug.

Idiopathic thrombocytopenic purpura in adults should be treated by i.v. injection.

**Precautions:** Drug induced secondary adrenocortical insufficiency may be minimized by gradual reduction of dosage. This type of relative insufficiency may persist for up to 1 year after discontinuation of therapy; therefore, in any situation of stress occurring during that period, hormone therapy should be reinstated.

When large doses are given to patients at risk of peptic ulcer disease, some authorities advise that H<sub>2</sub> receptor antagonists or sucralfate be administered between meals to help prevent peptic ulcer.

Use the lowest possible dose of corticosteroid to control the condition under treatment, and when dosage reduction is possible, the reduction should be gradual.

Use corticosteroids with caution in: ulcerative colitis if there is a probability of impending perforation, abscess or other pyogenic infection; diverticulitis, fresh intestinal anastomoses; active or latent peptic ulcer; renal insufficiency; hypertension; osteoporosis; and myasthenia gravis.

There is an enhanced effect of corticosteroids in patients with hypothyroidism and in those with cirrhosis.

Psychic derangements may appear when corticosteroids are used, ranging from euphoria, insomnia, mood swings, personality changes, and severe depression, to frank psychotic manifestations. Also, existing emotional instability or psychotic tendencies may be aggravated by corticosteroids.

Psychological and/or physiological dependency may develop with long-term use of corticosteroids. Discontinuance of therapy may lead to the development of withdrawal symptoms, including anorexia, vague pains, weakness and lethargy. Corticosteroids may increase or decrease motility and number of spermatozoa in some patients.

Advise patients to inform subsequent physicians of the prior use of corticosteroids.

Because rare instances of anaphylactoid reactions have occurred in patients receiving parenteral corticosteroid therapy, take appropriate precautionary measures prior to administration, especially when the patient has a history of drug allergy. Corticosteroids may suppress reactions to skin tests.

Intra-articular corticosteroid injection may produce systemic as well as local effects. Frequent intra-articular injection may result in damage to joint tissues. Avoid overdilatation of the joint capsule and deposition of steroid along the needle track in intra-articular injection, since this may lead to tissue atrophy.

In intercostal neuritis and neuralgia, guard against entering the pleura.

Appropriate examination of any joint fluid present is necessary to exclude a septic process. Avoid local injection of a corticosteroid into an infected site.

The slower rate of absorption by i.m. administration must be recognized.

A marked increase in pain accompanied by local swelling, further restriction of joint motion, fever, and malaise are suggestive of septic arthritis. If this complication occurs and the diagnosis of sepsis is confirmed, institute appropriate antimicrobial therapy.

Do not inject corticosteroids into unstable joints.

Avoid injection in the deltoid muscle because of high incidence of tissue atrophy.

Patients should be impressed strongly with the importance of not over using joints in which symptomatic benefit has been obtained as long as the inflammatory process remains active.

**Drug interactions:** Phenytoin, phenobarbital, rifampin and epinephrine may enhance the rate of metabolism and clearance of corticosteroids and this may require corticosteroid dosage adjustment. Interpret dexamethasone suppression test results cautiously during concurrent administration of these drugs.

When corticosteroids are administered concomitantly with potassium depleting diuretics patients should be observed closely for development of hypokalemia.

The prothrombin time should be checked frequently in patients receiving corticosteroids and coumarin anticoagulants concomitantly because of reports that corticosteroids alter the response to these anticoagulants. Studies have shown that the usual effect produced by adding corticosteroids is inhibition of response to coumarins, although there have been some conflicting reports of potentiation not substantiated by studies.

**Pregnancy and lactation:** See Warnings.

**Children:** Growth and development of infants and children on prolonged corticosteroid therapy should be carefully observed.

**Adverse Effects:** Fluid and electrolyte disturbances: sodium retention; fluid retention; congestive heart failure in susceptible patients; potassium loss; hypokalemic alkalosis; hypertension; hypotension or shock like reaction. These mineralocorticoid effects are less frequent with dexamethasone, but may occur, especially when this drug (or any corticosteroid) is given in high dosage for prolonged periods to patients with cardiovascular or severe renal disease, for even slight fluid retention may be dangerous.

**Musculoskeletal:** muscle weakness; steroid myopathy; loss of muscle mass; osteoporosis; vertebral compression fractures; aseptic necrosis of femoral and humeral heads; pathologic fractures of long bones.

**Gastrointestinal:** possible perforation and hemorrhage; pancreatitis; abdominal distention; ulcerative esophagitis.

**Dermatologic:** impaired wound healing; thin fragile skin; petechiae and ecchymoses; erythema; striae; increased sweating; burning or tingling, especially in the perineal area (after i.v. injection); may suppress reactions to skin tests; allergic dermatitis; urticaria; angioneurotic edema.

**Neurological:** convulsions, increased intracranial pressure with papilledema (pseudotumor cerebri) usually after treatment; vertigo; headache.

**Endocrine:** menstrual irregularities, development of cushingoid state; suppression of growth in children; secondary adrenocortical and pituitary unresponsiveness, particularly in times of stress, and in trauma, surgery or illness; decreased carbohydrate tolerance; manifestations of latent diabetes mellitus; increased requirements for insulin or oral hypoglycemic agents in diabetes.

**Ophthalmic:** posterior subcapsular cataracts; increased intraocular pressure; glaucoma; exophthalmos.

**Metabolic:** negative nitrogen balance due to protein catabolism.

**Other:** anaphylactoid or hypersensitivity reactions; thromboembolism, weight gain; increased appetite; malaise; psychological or physiological dependence. The following additional adverse reactions are related to parenteral corticosteroid therapy: rare instances of blindness associated with intralesional therapy around the face and head; hyperpigmentation or hypopigmentation; subcutaneous and cutaneous atrophy; sterile abscess; postinjection flare (following intra-articular use); Charcot like arthropathy; scarring; induration; inflammation; paresthesia, delayed pain or soreness.

**Overdose: Symptoms:** There are two categories of toxic effects from therapeutic use of glucocorticoids: acute adrenal insufficiency due to rapid withdrawal of corticosteroids after long-term use and induction of Cushingoid changes from continued use of large doses. Abrupt corticosteroid withdrawal results in fever, myalgia, arthralgia, malaise, anorexia, nausea, desquamation of skin, orthostatic hypotension, dizziness, fainting, dyspnea and hypoglycemia. Cushing-like changes include moonface, central obesity, striae, hirsutism, acne ecchymoses, hypertension, osteoporosis, myopathy, sexual dysfunction, diabetes, hyperlipidemia, peptic ulcer, increased susceptibility to infection and electrolyte and fluid imbalance.

**Treatment:** Recovery of normal adrenal and pituitary function may require up to 9 months. Tapering of the steroid should be gradual under the supervision of a physician. Frequent lab tests are necessary. Supplementation is required during periods of stress (i.e. illness, surgery or injury). Eventually reduce to the lowest dose that will control the symptoms or discontinue the corticosteroid completely. For large, acute overdoses, treatment includes usual supportive measures. Anaphylactic and hypersensitivity reactions may be treated with epinephrine, positive pressure artificial respiration, and aminophylline. Keep the patient warm and quiet.

**Dosage:** Dexamethasone Sodium Phosphate Injection USP can be given directly from the vial without mixing or dilution. If preferred, it can be added to sodium chloride injection, or dextrose injection, or compatible blood for transfusion, without loss of potency, and administered by i.v. drip.

When Dexamethasone Sodium Phosphate Injection USP is added to an infusion solution, use the mixture within 24 hours since infusion solutions do not contain preservatives.

Observe the usual aseptic techniques governing injections.

The dose for i.m. or i.v. administration varies from 4 to 20 mg depending on the nature and severity of the disease being treated. Give i.v. doses exceeding 6 mg slowly over a period of 1 minute. Repeat the initial dose as necessary until the desired response is noted. Maintenance doses average 2 to 4 mg daily. After achieving satisfactory control, switch the patient to oral therapy as soon as feasible.

If adrenocortical insufficiency exists or is suspected and is unresponsive to conventional therapy, high pharmacologic doses of glucocorticoids are recommended currently. Various dosage regimens have been suggested in the literature. These include the use of a single i.v. injection of 1 to 6 mg/kg, continuous infusion of 4 mg/kg/24 hours after initial i.v. bolus of 20 mg, and initial i.v. bolus of 40 mg followed by repeat i.v. injections every 2 to 6 hours while the state of shock persists. High-dose therapy should be continued only until the patient's condition has stabilized and usually should not be continued beyond 48 to 72 hours.

Whenever possible use i.v. route for the initial and for as many subsequent doses as are given while the patient is in adrenocortical insufficiency (because of irregular absorption by other routes in such patients). When the blood pressure responds, use the i.m. route until oral therapy can be substituted.

For the treatment of cerebral edema in adults an initial i.v. dose of 10 mg is recommended, followed by 4 mg i.v. or i.m. every 6 hours until maximum response has been noted. This regimen may then be tapered over several days using either parenteral or oral dexamethasone. Non-operative cases of cerebral edema may require continuous therapy to remain free of symptoms of increased intracranial pressure. The smallest effective dose may be used in children, preferably orally. This may approximate 0.2 mg/kg/24 hours in divided doses.

Some clinicians use high doses of parenteral dexamethasone in the short-term therapy of selected cases of life threatening cerebral edema. The following dosage regimens have been suggested:

Adults: 48 mg as a single dose then 8 mg every 2 hours on days 1 and 3, 4 mg every 2 hours on days 2 and 4, 4 mg every 4 hours on days 5 through 8. All doses are to be given parenterally.

Alternatively: 100 mg i.v. followed by 100 mg i.m. 6 hours later; then 4 mg i.m. every 6 hours for 8 days. Thereafter, taper daily by 4 mg.

Children: 10 to 14 years of age: 50% of adult dose; less than 10 years of age; 25% of the adult dose.

Alternatively: Adults and Children: 1.5 mg/kg as a loading dose followed by 1.5 mg/kg/day for the first 5 days. Then taper slowly over the following 5 days and discontinue. All doses are to be given parenterally.

The dose for intrasynovial administration is usually 4 mg for large joints and 0.8 to 1 mg for small joints. For soft tissue and bursal injections a dose of 2 to 4 mg is recommended. Ganglia require a dose of 1 to 2 mg. A dose of 0.4 to 1 mg is used for injection into tendon sheaths and helomata. Injection into intervertebral joints should not be attempted at any time and hip joint injection cannot be recommended as an office procedure.

Employ intrasynovial and soft tissue injections only when affected areas are limited to 1 or 2 sites. Corticosteroids provide palliation only and other conventional or curative methods of therapy should be employed when indicated.

**Supplied:** Each mL contains: Dexamethasone Sodium Phosphate equivalent to 4 mg dexamethasone phosphate (equal to 3.33 mg of dexamethasone or roughly about 100 mg of hydrocortisone). Non-medicinal ingredients per mL: 22 mg sodium citrate dihydrate, 1 mg sodium sulfite, 10 mg benzyl alcohol as preservative, in water for injection, q.s. citric acid and/or sodium hydroxide to adjust pH. In multiple dose vials of 5 mL.

Store at room temperature 15°C-30°C.

Do not autoclave. Protect from light. Protect from freezing.

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**SteriMax Inc.**, Oakville, ON L6H 6R4  
1-800-881-3550 • www.sterimaxinc.com

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