betamethasone (systemic) (bay-ta-**meth**-a-sone)

Betaject, ~~Celestone~~

Classification

Therapeutic: anti-inflammatories (steroidal)
Pharmacologic: corticosteroids

Pregnancy Category C

Indications

Management of adrenocortical insufficiency; chronic use in other situations is limited because of mineralocorticoid activity. Used systemically and locally in a wide variety of chronic diseases including: Inflammatory, Allergic, Hematologic, Neoplastic, Autoimmune disorders. Replacement therapy in adrenal insufficiency. **Unlabeled Use:** Short-term administration to high-risk mothers before delivery to prevent respiratory distress syndrome in the newborn.

Action

In pharmacologic doses, suppresses inflammation and the normal immune response. Has numerous intense metabolic effects (see Adverse Reactions and Side Effects). Suppresses adrenal function at chronic doses of 0.6 mg/day. Has negligible mineralocorticoid activity. **Therapeutic Effects:** Suppression of inflammation and modification of the normal immune response. Replacement therapy in adrenal insufficiency.

Pharmacokinetics

Absorption: Sodium phosphate salt is rapidly absorbed after IM administration. Acetate salt is slowly but completely absorbed after IM administration. Absorption from local sites (intra-articular, intralesional) is slow but complete.
Distribution: Widely distributed; crosses the placenta and probably enters breast milk.
Metabolism and Excretion: Metabolized mostly by the liver.
Half-life: 3–5 hr (plasma), 36–54 hr (tissue); adrenal suppression lasts 3.25 days.

TIME/ACTION PROFILE (anti-inflammatory activity)

ROUTE	ONSET	PEAK	DURATION
IM (sodium phosphate/ acetate)	1–3 hr	unknown	1 wk

Contraindications/Precautions

Contraindicated in: Active untreated infections (may be used in patients being treated for tuberculous meningitis); Traumatic brain injury (high doses may ↑ mortality); ***Lactation:*** Avoid chronic use; Some products contain bisulfites and should be avoided in patients with known hypersensitivity.
Use Cautiously in: Chronic treatment (will lead to adrenal suppression; use lowest possible dose for shortest period of time); Hypothyroidism; Cirrhosis; Ulcerative colitis; Stress (surgery, infections); supplemental doses may be needed; Potential infections may mask signs (fever, inflammation); ***OB:*** Safety not established; ***Pedi:*** Chronic use will result in ↓ growth; use lowest possible dose for shortest period of time.

Adverse Reactions/Side Effects

Adverse reactions/side effects are much more common with high-dose/long-term therapy **CNS:** depression, euphoria, headache, ↑ intracranial pressure (children only), personality changes, psychoses, restlessness. **EENT:** cataracts, ↑ intraocular pressure. **CV:** hypertension. **GI:** PEPTIC ULCERATION, anorexia, nausea, vomiting. **Derm:** acne, ↓ wound healing, ecchymoses, fragility, hirsutism, petechiae. **Endo:** adrenal suppression, hyperglycemia. **F and E:** fluid retention (long-term high doses), hypokalemia, hypokalemic alkalosis. **Hemat:** THROMBOEMBOLISM, thrombophlebitis. **Metab:** weight gain, weight loss. **MS:** muscle wasting, osteoporosis, avascular necrosis of joints, muscle pain. **Misc:** cushingoid appearance (moon face, buffalo hump), ↑ susceptibility to infection.

Interactions

Drug-Drug: Additive hypokalemia with **thiazide** and **loop diuretics**, or **amphotericin B**. Hypokalemia may ↑ risk of **digitalis glycoside** toxicity. May ↑ requirement for **insulins** or **oral hypoglycemic agents**. **Phenytoin**, **phenobarbital**, and **rifampin** stimulate metabolism; may ↓ effectiveness. **Oral contraceptives** may block metabolism. ↑ risk of adverse GI effects with **NSAIDs** (including aspirin). At chronic doses that suppress adrenal function, may ↓ antibody response to and ↑ risk of adverse reactions from **live-virus vaccines**.

Route/Dosage

IM (Adults): 0.5–9 mg/day as betamethasone sodium phosphate/acetate suspension in 1–2 divided doses. *Prevention of respiratory distress syndrome in newborn*—12 mg daily for 2–3 days before delivery (unlabeled).

IM (Children): *Adrenocortical insufficiency*—17.5 mcg/kg (500 mcg/m^2)/day in 3 divided doses every 3rd day or 5.8–8.75 mcg/kg (166–250 mcg/m^2)/day as a single dose. *Other uses*—20.8–125 mcg/kg (0.625–3.75 mg/m^2) of the base q 12–24 hr.

NURSING IMPLICATIONS

Assessment

- Indicated for many conditions. Assess involved systems before and periodically during therapy.
- Assess patient for signs of adrenal insufficiency (hypotension, weight loss, weakness, nausea, vomiting, anorexia, lethargy, confusion, restlessness) before and periodically during therapy.
- Monitor intake and output ratios and daily weights. Observe patient for peripheral edema, steady weight gain, rales/crackles, or dyspnea. Notify health care professional if these occur.
- ***Pedi:*** Children should have periodic growth evaluations.
- ***Lab Test Considerations:*** Monitor serum electrolytes and glucose. May cause hyperglycemia, especially in persons with diabetes. May cause hypokalemia. Patients on prolonged courses of therapy should routinely have hematologic values, serum electrolytes, and serum glucose evaluated. May ↓ WBC counts. May ↓ serum potassium and calcium and ↑ serum sodium concentrations.
- **Guaiac-test stools. Promptly report presence of guaiac-positive stools.**
- May ↑ serum cholesterol and lipid values. May decrease uptake of thyroid ^{123}I or ^{131}I.
- Suppress reactions to allergy skin tests.
- Periodic adrenal function tests may be ordered to assess degree of hypothalamic-pituitary-adrenal axis suppression in systemic and chronic topical therapy.

Potential Nursing Diagnoses

Risk for infection (Side Effects)
Disturbed body image (Side Effects)

Implementation

- If dose is ordered daily or every other day, administer in the morning to coincide with the body's normal secretion of cortisol.
- **IM:** Shake suspension well before drawing up. Do not dilute with other solution or admix. Do not administer suspensions IV.

Patient/Family Teaching

- **Stopping the medication suddenly may result in adrenal insufficiency (anorexia, nausea, weakness, fatigue, dyspnea, hypotension, hypoglycemia). If these signs appear, notify health care professional immediately. This can be life-threatening.**
- Glucocorticoids cause immunosuppression and may mask symptoms of infection. Instruct patient to avoid people with known contagious illnesses and to report possible infections immediately.
- Caution patient to avoid vaccinations without first consulting health care professional.
- Review side effects with patient. **Instruct patient to inform health care professional promptly if severe abdominal pain or tarry stools occur**Patient should also report unusual swelling, weight gain, tiredness, bone pain, bruising, nonhealing sores, visual disturbances, or behavior changes.
- Advise patient to notify health care professional of medication regimen before treatment or surgery.
- Discuss possible effects on body image. Explore coping mechanisms.
- Instruct patient to inform health care professional if symptoms of underlying disease return or worsen.
- Advise patient to carry identification describing disease process and medication regimen in the event of an emergency in which patient cannot relate medical history.
- Explain need for continued medical follow-up to assess effectiveness and possible side effects of medication. Periodic lab tests and eye exams may be needed.
- **Long-term Therapy:** Encourage patient to eat a diet high in protein, calcium, and potassium, and low in sodium and carbohydrates. Alcohol should be avoided during therapy.

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Evaluation/Desired Outcomes

- Decrease in presenting symptoms with minimal systemic side effects.
- Suppression of the inflammatory and immune responses in autoimmune disorders, allergic reactions, and neoplasms.
- Management of symptoms in adrenal insufficiency.

Why was this drug prescribed for your patient?