

32.1.3.1. Betamethasone

Betamethasone is a synthetic glucocorticoid. It has metabolic, immunosuppressive, and anti-inflammatory properties.

Molecular Formula: $C_{22}H_{30}FO_5$

IUPAC Nomenclature: (1R,2S,10S,11S,13S,14R,15S,17S)-1-fluoro-14,17-dihydroxy-14-(2-hydroxyacetyl)-2,13,15-trimethyltetraacyclo[8.7.0.0^{2,7}.0^{1,13}]heptadeca-3,6-dien-5-one

Properties: Betamethasone occurs as a white, crystalline powder with no odour. It is insoluble in water; sparingly soluble in acetone and alcohol; and very slightly soluble in chloroform and ether.

Uses: Betamethasone is used topically in many creams, lotions, and ointments for relief of the inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses. Its foams is used for the relief of inflammatory and pruritic manifestations of corticosteroid-responsive dermatoses of the scalp. It is systemically used in endocrine disorders, rheumatic disorders, collagen diseases, dermatological diseases, allergic states, ophthalmic diseases, respiratory diseases, hematologic disorders, neoplastic diseases, edematous states, gastrointestinal diseases, tuberculosis, meningitis, and trichinosis.

Stability and Storage Conditions: Betamethasone tablets should be stored in well-closed containers at 2-30°C temperature. Betamethasone oral solutions should be stored away from light in well-closed containers at a temperature below 40°C. Betamethasone sodium phosphate injections should be stored at temperature below 40°C away from light. Betamethasone sterile suspensions having betamethasone sodium phosphate and betamethasone acetate should be stored away from light and at 2-25°C temperature.

Types of Pharmaceutical Formulations: Cream, gel, ointment, lotion, foam, injection, tablet, and suspension.

Brand Names: Betafoam, Betagel, Betamil-GM, Cortiderm, Dipgenta, Gentelene-C, and Statum Plus.

32.1.3.2. Cortisone

Cortisone is a naturally occurring glucocorticoid. Therapeutic cortisone is a corticosteroid having potent glucocorticoid activity.

Molecular Formula: $C_{21}H_{28}O_5$

IUPAC Nomenclature: (1R,3aS,3bS,9aR,9bS,11aS)-1-hydroxy-1-(2-hydroxyacetyl)-9a,11a-dimethyl-1H,2H,3H,3aH,3bH,4H,5H,7H,8H,9H,9aH,9bH,10H,11H,11aH-cyclopenta[a]phenanthrene-7,10-dione

Properties: Cortisone occurs as a white crystalline powder with no odour. It is insoluble in water; and soluble in alcohol.

Uses: Cortisone is used in replacement therapy for adrenal insufficiency and as an anti-inflammatory agent. It is also used in rheumatoid arthritis, severe shock, allergic conditions, and chronic lymphatic leukaemia.

Storage Conditions: Cortisone should be stored in well-closed light-resistant containers.

Types of Pharmaceutical Formulations: Cream, gel, and ointment.

Brand Names: Cortoquinol, Crotorax-HC, Multifungin H, and Proctosedyl.

32.1.3.3. Hydrocortisone

Hydrocortisone is a synthetic or semi-synthetic analogue of natural hydrocortisone hormone formed by the adrenal glands with primary glucocorticoid and minor mineralocorticoid effects.

Molecular Formula: $C_{21}H_{30}O_5$

IUPAC Nomenclature: (8S,9S,10R,11S,13S,14S,17R)-11,17-dihydroxy-17-(2-hydroxyacetyl)-10,13-dimethyl-2,6,7,8,9,11,12,14,15,16-decahydro-1H-cyclopenta[a]phenanthren-3-one

Properties: Hydrocortisone occurs as a white crystalline powder with a bitter taste and no odour. It is very slightly soluble in water; and soluble in alcohol.

Uses: The synthetic counterpart of hydrocortisone is used either in the form of injection or topically for treating inflammation, allergy, arthritis, lupus, severe psoriasis, ulcerative colitis, collagen diseases, Crohn's disease, asthma, adrenocortical deficiency, shock, and some neoplastic conditions. It is also used for the treatment of adrenal insufficiency and Addison's disease.

Stability and Storage Conditions: Hydrocortisone is sensitive to light. Its preparations should be stored at temperature between 15-30°C. **Hydrocortisone oral suspensions** should not be frozen. **Hydrocortisone tablets** should be stored in well-closed containers. **Reconstituted solutions of hydrocortisone sodium succinate** should be stored at temperature 25°C or below.

Types of Pharmaceutical Formulations: Powder, lotion, cream, gel, ointment, tablet, and suspension.

Brand Names: Acucort, Derobin-HC, Hycoson, Lycortin, and Primacort.