# Prednisone (Glucocorticoids)

Prednisone is a synthetic glucocorticoid medication used to treat inflammatory diseases and to prevent organ transplant rejection. Side effects of exogenous glucocorticoid administration include osteoporosis, immunosuppression and hyperglycemia. Patients using this medication long term can also develop ocular disorders, like cataracts and glaucoma, ulcers, and possibly Cushing's syndrome. Caregivers should be aware that adrenal insufficiency can develop, and patients should be tapered off of the drug.




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## Mechanism

### Glucocorticoid

Glue-quarter-on-steroids

Prednisone is a glucocorticoid, or a class of steroid that binds to glucocorticoid receptors. Glucocorticoids up-regulate anti-inflammatory proteins, decreasing immune activity (inflammation). Additionally, they regulate the metabolism of glucose.

## Indications

### Inflammatory Conditions

Flames

Prednisone is used to treat various inflammatory conditions, such as asthma, COPD, rheumatic disorders, hives, allergic reactions and inflammatory bowel disorders. It does so by decreasing immune activity, and consequently, inflammation in the body.

### Organ Transplant Rejection

Organ Train-plants Rejecting

As prednisone decreases systemic inflammation, it can be used as part of a drug regimen to prevent rejection after organ transplantation.

## Side Effects

### Cataracts and Glaucoma

Cadillac-cataracts and Glock-eye

Patients develop visual impairments with long-term prednisone use, as they are prone to cataracts and open angle glaucoma. This occurs because of increased production of free radicals, along with high osmotic movement of glucose in the lens of the eye. Thus, patients should be given an eye exam every 6 months.

### Cushing's Syndrome

Cushion

Excess exogenous glucocorticoid intake can lead to Cushing’s syndrome, characterized by rapid weight gain, central obesity, moon facies, buffalo hump and abdominal striae. Excess mineralocorticoid activity can also lead to hypokalemia and fluid loss.

### Osteoporosis

Ostrich-porous

Prednisone can lead to steroid-induced osteoporosis with long-term use. Thus, patients are recommended prophylactic calcium and vitamin D. Children taking prednisone may develop growth retardation due to inhibition of osteoblast function and decreased gastrointestinal calcium absorption.

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**Immunosuppression**

Moon-suppressed

As glucocorticoid medications lead to immunosuppression, patients are more susceptible to illness. Decreased immune response may lead to infections, and patients taking prednisone should not be given live vaccines, as they may contract the illness.

**Hyperglycemia**

Hiker-glue

These medications alter glucose metabolism in the body, and patients can develop hyperglycemia. Long-term use can lead to glucose intolerance, and often patients can be found to have glycosuria.

**Ulcers**

Ulcer-volcano

Use of glucocorticoids can lead to the development of peptic ulcers, along with impaired healing of existing ulcers. Thus patients with a history of ulcer disease should not take these medications long term.

## Considerations

**Adrenal Insufficiency**

Adrenal-gland Damaged

Administration of steroid medications can lead to adrenal insufficiency, as the body decreases adrenal output of steroid hormones. Thus, patients who abruptly stop treatment can develop acute adrenal crisis, which is an emergency. During stress or illness, extra prednisone should be prescribed, and patients should carry a medical alert ID, as well as carry an emergency supply of the medication.

**Taper Gradually**

Tape-dispenser with Gradual amounts of pills

In order for the body to slowly compensate and increase output of steroid hormones, patients taking prednisone should be gradually tapered off. A sudden stop in treatment can lead to adrenal crisis.

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