

Fifth, several herbal extracts may weakly mimic cortisol activity by increasing its bioavailability and stimulating cortisol receptors, providing limited relief to adrenal-deficient patients. Plants also produce hormones that may have beneficial effects in humans. Extracts of licorice root may, for example, lessen complaints in patients with cortisol deficiency.¹⁶⁶⁻¹⁶⁷ In my experience, licorice root extract has about 10-25% of the beneficial action of an adequate cortisol or hydrocortisone treatment.

Sixth, as the storage of cortisol in the adrenal glands is small in patients with adrenal deficiency, these patients should avoid exposing themselves to any unnecessary stressors, which deplete the adrenals of their cortisol stores. Selecting jobs and leisure activities that do not put excessive strain on the adrenal glands may be a wise decision for people who do not get or want to take a cortisol treatment. Spiritual meditation has been reported to be helpful in improving cortisol levels. Regular meditators respond to stressful conditions with a greater production of cortisol than non-meditators, while the cortisol level is lower in resting states, minimizing spillage.¹⁶⁸

Table 1 summarizes the main interventions you can do yourself with the help of a nutritionist to improve your cortisol secretion.

Table 1. Interventions to Improve Cortisol Secretion

- Increase light: daylight, intense indoor light, sunny holiday resorts
- Increase fat-rich foods (butter, egg yolk, liver, etc.)
- Take vitamin C supplements: 0.5 to 2 g/day
- Avoid indoor pollutants: stay away from plastic furniture or floor coverings, wood preservatives; keep windows open
- Reduce unhealthy carbohydrate-rich foods (sugar, sweets, chocolate, unsprouted bread, muesli, porridge, rice, pasta, soft drinks, alcohol)
- Herbal extract of licorice root: 450 to 1800 mg/day
- Increase protein-rich foods (fish, poultry, meat)
- Increase fruit intake (contains vitamin C, which may increase adrenal function)
- Avoid unnecessary stressful conditions (which deplete cortisol stores); regularly relax or meditate

Glucocorticoid Treatment of Cortisol Deficiency

Glucocorticoid is the common name given to the whole family of natural or synthetically produced cortisol-like molecules, which share the property of increasing the blood sugar levels. "Gluc" means "glucose" (sugar), and "corticoid" signifies that it "comes from the cortex," the outer part of the adrenal glands that produces this type of hormone. The human body makes two major bioidentical glucocorticoids: cortisol and cortisone. Bioidentical means that these hormones have the same molecular structure as the body's own corresponding compounds. Corticosterone, which in rodents is more potent than cortisol, is another natural hormone that is found in humans.

Cortisol, also called hydrocortisone when it is used in therapy, is the body's most potent glucocorticoid hormone. Cortisone is the precursor glucocorticoid made by the adrenals. It has 80% of cortisol's action. Supplementation with cortisone is therefore always at a slightly higher dosage than with cortisol or hydrocortisone to get the same effects: To do the same job, 25 mg per day of cortisone is needed where the body requires 20 mg of hydrocortisone.

However, the name cortisone is misleadingly used nowadays to name synthetic derivatives of cortisol, such as prednisone and methylprednisolone. These compounds are not identical to the body's own cortisol and cortisone. They may have different effects and indications. They are also used at lower dosages, as they have more potent effects.

Bioidentical glucocorticoids have better psychological effects and improve the blood pressure better than synthetic derivatives. The use of bioidentical cortisol and cortisone is indicated to treat most cases of cortisol deficiency,

particularly when the predominant complaints are psychological. Bioidentical glucocorticoids better improve the mind, mood, energy, stress resistance, and other personality features compared to non-bioidentical glucocorticoids¹⁶⁹⁻¹⁷² because they are entirely adapted to the human body, particularly its glucocorticoid receptors.

Hydrocortisone is also a better choice to treat arterial hypotension because it retains salt and water more than synthetic derivatives.

Safety of Bioidentical Hormones

Because cortisol and cortisone are completely adapted to the human body, they are also safer. The risk of side effects such as skin atrophy is lower with these bioidentical glucocorticoids than with synthetic derivatives.¹⁷³ Long-term behavioral outcome and neuromotor development are also better in children who neonatally have received hydrocortisone rather than synthetic dexamethasone to avoid bronchial dysplasia.¹⁷² Whenever side effects, usually overdose symptoms, occur with these natural compounds, they persist for a shorter time (6-24 hours) because of a quicker breakdown and inactivation by the body than when caused by synthetic derivatives (a few days). For this reason, at comparable doses, cortisol and cortisone reduce the endogenous cortisol production of the adrenal glands considerably less than synthetic derivatives. The risk of adrenal gland suppression is also less with bioidentical glucocorticoids.^{51,174-175}

Table 2 (adapted from Chrousos et al., 2011)⁵¹ shows that synthetic derivatives of cortisol at equivalent doses suppress the adrenal glands more. The greater their glucocorticoid (and thus anti-inflammatory) potency, the more they suppress the endogenous cortisol secretion.

Table 2. Comparison of Synthetic Cortisol Derivatives

Glucocorticoids	Equivalent dose	Glucocorticoid potency	Hypothalamo-pituitary-adrenal axis suppression	Biologic half-life
Cortisol	20 mg	1.0	1x	8-12 h
Prednisone	5 mg	4.0	4x	18-36 h
Triamcinolone	4 mg	5.0	4x	18-36 h
Methylprednisolone	4 mg	5.0	4x	36-54 h
Dexamethasone	0.375 mg	30	8.5x	