Dehydroepiandrosterone (DHEA)

Dehydroepiandrosterone (DHEA), a hormone produced by the adrenal glands, is the most abundant hormone in the steroid family found in the bloodstream. Your body uses DHEA as the starting material for making the sex hormones testosterone and estrogen.

A meaningful body of evidence indicates that DHEA might be helpful for the autoimmune disease lupus, at least in women. DHEA may also help prevent osteoporosis (again, in women). Additionally, DHEA appears to be beneficial when taken along with standard treatment for women with adrenal failure.

Other uses with some evidence include improving sexual function in men and women and alleviating depression. DHEA does not appear to be effective for improving general well-being in seniors. Keep in mind that DHEA is not a natural supplement. The DHEA you can buy at the store is made by a synthetic chemical process, and it is a hormone, not a nutrient. Although DHEA appears to be safe to use in the short term, its safety when taken for prolonged periods is unknown.

Sources

The body makes its own DHEA; we get very little in our diets. DHEA production peaks early in life and begins to decline as we reach adulthood. By age 60, our bodies produce just 5% to 15% as much as when we were 20. It's not clear whether this decline in DHEA is a bad thing, but some believe that it may contribute to the aging process.

For use as a dietary supplement, DHEA is manufactured synthetically from substances found in soybeans. Contrary to popular belief, there is no DHEA in wild yam.

Therapeutic Dosages
A typical therapeutic dosage of DHEA is 50 mg to 200 mg daily, although some studies used dosages above and below this range. A cream containing 10% DHEA may also be used; it is typically applied to the skin at a dosage of 3 g to 5 g daily.

Physicians sometimes check DHEA levels and adjust the daily dose to achieve blood levels of 20-30 nmol/L.

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**Therapeutic Uses**

Much of the evidence of benefits with DHEA involves results seen in women.

A meaningful body of evidence indicates DHEA may help reduce symptoms in women with lupus, but it probably does not alter the long-term course of the disease.1,3,8-10,93

Some evidence hints that DHEA may be helpful for preventing or treating osteoporosis in postmenopausal women, especially those over age 70; benefits for men remain in doubt.4,5,6,23,74,85,95,107

Inconsistent evidence suggests that use of DHEA might improve sexual function in older, but not in younger, women.11-13,37,57,75

DHEA has shown some promise for improving erectile dysfunction in men who have low DHEA blood levels to begin with.14

Three double-blind studies hint that DHEA might be helpful for treating mild depression in people with HIV.86 The best evidence involves treating mild depression in people with HIV; presumably this is a related result.24,102 However, another small trial failed to find benefits.25

**Note:** DHEA does not appear to provide general benefits for people with HIV, such as improving immunity, suppressing virus levels, or aiding weight maintenance.102

DHEA might also be helpful for people with adrenal failure, according to some but not all studies. **Note:** The term "adrenal failure" refers to total loss of function of the adrenal glands, caused by surgery or infection. The term "adrenal weakness" as used by practitioners of naturopathy refers to something more subtle and vague. DHEA might also be helpful for women with inadequate pituitary function who require growth hormone replacement therapy.101

Preliminary and somewhat inconsistent evidence suggest that DHEA might enhance the effects of drug treatment of schizophrenia.8,89 In addition, DHEA might reduce Parkinson's disease-like side effects caused by antipsychotic drugs in the phenothiazine family.87

Highly preliminary evidence suggests that DHEA might help improve symptoms of chronic fatigue syndrome,17 improve immune response to vaccinations,18,19 and strengthen immunity following burns.20,21 Weak evidence also suggests that DHEA supplements might reduce the risk of heart disease, especially in men.39-44,77-79

One small double-blind study found evidence that DHEA at a dose of 25 mg daily might reduce menopausal symptoms; however, in this study, use of DHEA led to altered levels of numerous other hormones, suggesting a potential for hazardous side-effects.80

For several other proposed uses of DHEA, study results are more negative than positive.

Primarily because DHEA naturally decreases with age, this hormone has been widely hyped as a kind of fountain of youth. However, at least 10 studies have found that DHEA supplementation does not improve mood, mental function, or general well-being in older people,31-36,73,88,100,108 and 4 studies found that use of DHEA does not increase muscle mass in seniors.15,30,89,98 However, there is weak evidence that it might improve signs of aging.
One study did find potential memory-enhancing benefits in younger people. However, current evidence remains more negative than positive as to whether DHEA aids muscle building or enhances sports performance ability.

In a 6-month, double-blind, placebo-controlled trial of 58 people with Alzheimer’s disease, use of DHEA at 50 mg twice daily did not improve symptoms.

A 12-month, double-blind, placebo-controlled study failed to find DHEA helpful for Sjogren's syndrome. The researchers noted that the belief by participants that they were being given DHEA instead of placebo “was a stronger predictor for improvement of fatigue and well-being than the actual use of DHEA.” A previous double-blind, placebo-controlled study also failed to find benefit.

Another study failed to find DHEA helpful for fibromyalgia. Despite evidence from one preliminary study, DHEA does not appear to improve blood sugar control in seniors.

DHEA has been proposed as an aid to weight loss, but the little evidence that is available suggests that it does not work. A supplement related to DHEA, 3-acetyl-7-oxo-dehydroepiandrosterone (also called 7-oxy or 7-keto-DHEA), has also been advocated for enhancing weight loss, and there is at least a small amount of supporting evidence.

What Is the Scientific Evidence for Dehydroepiandrosterone?

**Lupus**

A 12-month, double-blind, placebo-controlled trial of 381 women with mild or moderate lupus (systemic lupus erythematosus, or SLE) evaluated the effects of DHEA at a dose of 200 mg daily. While participants in both treatment and placebo groups improved (the power of placebo is amazing!), DHEA was more effective, reducing many symptoms of the disease. However, DHEA was found to adversely affect cholesterol levels (specifically, the ratio of total cholesterol to HDL cholesterol) and raise levels of testosterone. For this reason, study authors recommend the monitoring of serum cholesterol and keeping watch for adverse effects caused by increased testosterone.

Similarly, in a double-blind, placebo-controlled study of 120 women with SLE, use of DHEA at a dose of 200 mg daily significantly decreased symptoms and reduced the frequency of disease flare-ups.

A smaller study found equivocal evidence that a lower dose of DHEA (30 mg daily for women over 45, and 20 mg daily for women under 45) might also work.

Positive results were also seen in earlier small studies.

Even if DHEA is not strong enough to completely control symptoms of SLE on its own, it might allow a reduction in dosage of the more dangerous standard medications. In addition, it might directly help offset some of the side effects of corticosteroid treatment, such as accelerated osteoporosis, although the evidence for this benefit remains weak and inconsistent.

A 2007 review of all published studies found that use of DHEA may meaningfully improve quality of life in the short term for people with lupus, but that it probably does not alter the long-term course of the disease.
Osteoporosis

DHEA appears to be helpful for osteoporosis in older women. A double-blind, placebo-controlled trial of 280 men and women ranging in age from 60 to 79 years evaluated the effects of 50 mg of DHEA daily for 1 year. The results suggest that DHEA can fight osteoporosis in women over 70. However, younger women did not respond to treatment with DHEA.

Other clinical trials have also found evidence that DHEA has a positive effect on bone density in older women. However, so far DHEA has failed to demonstrate a significant bone-sparing effect in older men.

DHEA might be helpful for preventing osteoporosis in women with anorexia. Women with this condition often experience bone loss, at least in part due to a decrease in estrogen levels. In a 1-year, double-blind study, women with anorexia were randomly assigned to receive either DHEA at a dose of 50 mg per day or standard hormone replacement therapy. The results showed equivalent bone preservation in both groups. However, because there is considerable doubt whether hormone replacement therapy is helpful for preventing bone loss caused by anorexia, these results mean relatively little.

Adrenal Insufficiency

Two double-blind trials support adding DHEA to the usual hormone regimen for adrenal failure. One double-blind, placebo-controlled crossover trial evaluated the effects of DHEA in 24 women with this condition. The results showed that DHEA at a dose of 50 mg daily improved sexual function, feelings of overall well-being, and cholesterol levels during a 4-month treatment period. Another double-blind crossover trial enrolled 39 men and women and found improvements in general feelings of well-being, mood, and energy level over a 3-month treatment period. However, another double-blind study failed to find benefit with a dose of 25 mg daily.

Improving Libido and Sexual Function in Women

Some evidence suggests that DHEA may be helpful for improving sexual function in older women, but not for younger women.

The 1-year, double-blind, placebo-controlled trial of 280 men and women previously described in the Osteoporosis section also looked for effects on sexual function. The results indicate that for women over 70, daily use of DHEA at 50 mg improves libido. Neither men nor younger women responded. Two other studies did not find benefit, but they enrolled much fewer people and also ran for a shorter time.

Two small, double-blind, placebo-controlled studies tested whether a one-time dose of DHEA at 300 mg could increase sexual arousability in pre- or postmenopausal women respectively. The results again indicate that DHEA is effective for older women but not for younger women.

Improving Sexual Function in Men

A double-blind, placebo-controlled study enrolled 40 men with erectile dysfunction who also had low measured levels of DHEA. The results showed that DHEA at a dose of 50 mg daily significantly improved sexual performance; however, the authors failed to provide a statistical analysis of the results, making the meaningfulness of this study impossible to determine.

Sports Performance Enhancement

A small double-blind study found no performance enhancement with DHEA at a dose of 150 mg per day for men undergoing weight training. In addition, a 12-week, double-blind study of 40 trained male athletes given either DHEA or androstenedione at 100 mg daily found no improvement in lean body mass or strength, or change in testosterone levels.
A 12-month, double-blind, placebo-controlled crossover trial of 16 people aged 50 to 65 found some evidence of fat loss and strength improvement in the male participants during the period in which they received 100 mg of DHEA daily. No improvement was seen in female participants.

### Safety Issues

DHEA appears to be safe when taken in therapeutic doses, at least in the short term. One study found no significant side effects in 50 women who took up to 200 mg daily for up to 1 year. And, in another study, 93 postmenopausal women who took 50 mg of DHEA daily, also for 1 year, experienced no adverse changes in their uterine lining, blood lipids (cholesterol), or insulin sensitivity.

However, in two other studies DHEA, at doses as low as 25 mg per day, decreased levels of HDL ("good") cholesterol. In addition, in women, DHEA may increase levels of male sex hormones along with estrogens and progesterone. This could lead to acne and growth of facial and body hair. Effects on hormones in men may be less significant, although one study in HIV-infected men found that DHEA supplements increase level of testosterone, dihydrotestosterone, androstenedione, and estrone.

Concerns have been raised by one study in rats and another in trout that linked DHEA to liver cancer. However, at least four other animal studies suggest that DHEA may have some anticancer effects.

A 15-year human observational trial looking for a connection between naturally occurring DHEA levels and breast cancer found no relationship, either positive or negative. However, another study found a relationship between higher levels of DHEA and ovarian cancer. Overall, the long-term safety of DHEA supplements remains unknown. This is the case with many supplements, but because there are animal studies suggesting that DHEA might increase the risk of liver cancer, caution is warranted. Estrogen is one example of a hormone that increases the risk for certain forms of cancer, and it took years for researchers to discover that risk. Keep in mind also that the body converts DHEA into other hormones, including estrogen and testosterone. This could be dangerous for women with hormone-influenced diseases, such as breast cancer.

We also don't know whether DHEA interacts with other hormone treatments, such as estrogen, although it certainly stands to reason that it might. The safety of DHEA in young children, pregnant or nursing women, and people with severe liver or kidney disease has not been established.

### References


6. van Vollenhoven RF, Park JL, Genovese MC, et al. A double-blind, placebo-controlled, clinical trial of...


