HANSEN CLINIC

**Dehydroepiandrosterone**
**http://umm.edu/health/medical/altmed/supplement/dehydroepiandrosterone**

**University of Maryland Medical Center Research on Dehydroepiandrosterone**

**Overview**
Dehydroepiandrosterone (DHEA) is a hormone produced by the body's adrenal glands. The body uses DHEA to make androgens and estrogens, the male and female sex hormones. DHEA levels peak at about age 25, then go down steadily as you get older. People who are 70, for example, tend to have DHEA levels about 80% lower than young adults.
Because levels of DHEA decline with age, researchers have wondered if DHEA could work as an anti-aging treatment. In older people, lower than normal levels of DHEA have been associated with osteoporosis, heart disease, memory loss, and breast cancer. But there's no proof that low levels of DHEA cause these conditions, or that taking DHEA can help prevent them. And DHEA supplements vary widely in quality. Many products tested don't have the amount of DHEA in them that the label says they do.
Also, DHEA supplements can have side effects: they may lower levels of HDL "good" cholesterol in the body, and in women they may raise levels of testosterone as well as estrogen.
The DHEA in supplements is a synthetic hormone, so you should talk to your doctor before taking it.

**Uses**

**Systemic Lupus Erythematosus (SLE)**
Lupus or SLE is an autoimmune disorder. That means that the body's immune system mistakenly attacks its own tissue, thinking it is a foreign invader. A number of clinical studies have reported that taking DHEA along with other medications helps improve quality of life for people with lupus, though it probably does not change the overall course of their disease. Several studies have found that some people who take DHEA supplements may be able take less prescription medication. DHEA may also reduce the frequency of flare-ups, enhance mental function, and boost bone mass in women with lupus. Many studies use 200 mg per day of DHEA, which can raise levels of testosterone and lower HDL "good" cholesterol. One study found that a lower dose -- 20mg - 30mg -- might also work. Most of these studies have been small, so more studies are needed to see whether DHEA is safe and effective for people with lupus.
**Adrenal insufficiency**
DHEA is one of the hormones made by the adrenal glands. With adrenal insufficiency, the adrenal glands do not make enough hormones, including DHEA and cortisol. That happens either because of problems with the pituitary gland or damage to the adrenal glands themselves (also called Addison's disease).
Several studies suggest that taking DHEA may help improve mood, fatigue, and well-being. In one study, women with this condition who took DHEA supplements reported improved sexuality and sense of well-being, including fewer feelings of depression and anxiety.
Adrenal insufficiency requires a doctor's care. You shouldn't take DHEA on your own for adrenal insufficiency. Severe adrenal insufficiency can be a medical emergency, especially when first diagnosed.
**Depression**
In a few clinical studies of people with major depression, DHEA improved symptoms compared to placebo. However, the results aren't entirely clear, and researchers don't know what the long-term effects of taking DHEA might be. More research is needed. Don't try to treat depression by yourself. People with depression need medical care.
**Osteoporosis**
Some clinical studies have shown that DHEA may help reduce bone loss in older women. It doesn't seem to have the same effect in men, and in one study it didn't help women who were under age 70.
**Obesity**
Clinical studies using DHEA to treat overweight people have found conflicting results. Animal studies have found DHEA to help reduce body weight. But studies of men and women found that taking DHEA didn't change total body weight, although total body fat and LDL ("bad") cholesterol did improve. In one study, the men lowered body fat but the women did not. More studies, with larger numbers of people, are needed.
**Erectile dysfunction**
One study found that DHEA helped men with erectile dysfunction get and sustain an erection, possibly because the body converts DHEA into testosterone. However, the study didn't fully analyze the results, so more research is needed to know whether DHEA really helps.
**Improved libido in women**
Study results have been mixed, but some seem to suggest that DHEA may help improve sex drive in older women (but

not younger women).

**Aging**

Because DHEA levels decline with age, some researchers have investigated whether taking DHEA supplements could slow or prevent age-related mental or physical problems. Preliminary results from the DHEAge study in France suggested DHEA may slow bone loss, improve skin health, and improve sexual drive in women over 70. But people in the study didn't have any improvement in muscle function and strength. And another study found that men and women over 60 who took DHEA for 2 years didn't have any improvement in bone density, muscle strength, insulin sensitivity, or quality of life. In terms of memory loss, some studies have shown that DHEA improves learning and memory in people who have low DHEA levels. But other studies have not found any improvement. More studies are needed to see whether DHEA can reduce complications of aging.

**HIV**

People with HIV tend to have low levels of DHEA, and these levels go down even more as the disease progresses. In one small clinical study, DHEA improved mental function in men and women with HIV. However, so far no human studies show whether DHEA can improve immune function in people with HIV.

**Menopause**

DHEA has been popular among perimenopausal women, who took it to relieve symptoms of menopause, including decreased sex drive, diminished skin tone, and vaginal dryness. But the studies have been mixed.

In one clinical study, DHEA supplements did raise levels of some hormones in postmenopausal women. DHEA supplementation in healthy pre- and postmenopausal women is controversial. Clinical studies show conflicting results as to whether DHEA can improve sexual function, metabolism, and overall well-being. More studies are needed to better understand how and whether DHEA works, and if it safe.

People who believe in using DHEA claim that it relieves menopausal symptoms without increasing the risk of breast cancer or cancer of the lining of the uterus -- unlike prescription hormone replacement therapy, which does increase risk of these cancers. But there is no proof that DHEA does not also increase risk of these cancers.

People with a history of cancer or at high risk for cancer should not take DHEA without their doctor's supervision. DHEA can be converted into either estrogen or testosterone in the body, which may be dangerous for women or men with a history of hormone-sensitive cancers such as breast or prostate cancer. Women with breast cancer tend to have low levels of DHEA in their bodies. Scientists don't know whether taking DHEA may increase or reduce growth of breast cancer cells.

**Inflammatory bowel disease (IBD)**

DHEA levels appear to be low in people with ulcerative colitis and Crohn's disease. A small study found that DHEA was effective for use in ulcerative colitis and Crohn's disease. But the study wasn't well designed. More studies are needed to say for sure whether DHEA helps IBD.

**Other conditions**

A few clinical studies suggest that DHEA supplementation may be beneficial for other health conditions, including infertility, schizophrenia, cocaine withdrawal, and dementia. More studies are needed to know for sure.

## Available Forms

Most DHEA supplements are produced in laboratories from diosgenin, a plant sterol extracted from Mexican wild yams (*Dioscorea villosa)*. Some extracts from wild yams are marketed as "natural DHEA." Advertisers claim that these "natural" extracts are converted into DHEA by the body, but that's not the case -- your body can't covert those extracts into DHEA. For this reason, it is best to look for labels that list DHEA rather than diosgenin or wild yam extract.

It is important to choose high quality DHEA supplements. One way to avoid buying a product with contaminated DHEA is to purchase it through a professional health care provider.

DHEA is available in capsules, tablets, chewing gum, sublingual (under the tongue) drops, and topical (on the skin) creams.

## How to Take It

If you are under 40, you shouldn't take DHEA without your doctor's supervision. Your doctor can determine whether your DHEA levels are low (less than 130 mg/dl in women and less than 180 mg/dl in men).

**Pediatric**

Don't give DHEA to a child unless your child's health care provider tells you to.

**Adult**

The dose of DHEA may depend on a person's gender, age, and condition. Laboratory tests can show your DHEA levels before you take it, and can monitor levels after you start. Talk to your health care provider to find the right dose for you.

Higher doses have been used to treat lupus. People with lupus should not take DHEA without first talking to their doctor. Your body makes DHEA primarily in the morning, so taking DHEA in the morning will mimic this natural rhythm.

**Precautions**

Because of the potential for side effects and interactions with medications, dietary supplements should be taken only under the supervision of a knowledgeable health care provider.
People under 40 shouldn't take DHEA unless they have low levels as determined by their doctors. People taking DHEA should have their blood levels checked every 6 months.
Very few studies have been done on the long-term safety of DHEA.
Because your body uses DHEA to make estrogen and testosterone, people with hormone-related cancers (such as breast, prostate, ovarian, adrenal, and testicular cancer) or a family history of these cancers should not take DHEA.
DHEA may make other hormone-related conditions, such as endometriosis or polycystic ovarian syndrome, worse.
Some experts are concerned that DHEA may make liver problems worse.
Some experts think people with a history of depression or bipolar disorder may have side effects from using DHEA including mania and irritability.
High doses of DHEA may stop the body from making the hormone itself. High doses also may be toxic to liver cells. At least one case of hepatitis has been reported. People who have liver disease should avoid DHEA.
People with diabetes should not take DHEA, because it may increase insulin resistance.
DHEA may increase the production of the male hormone testosterone. Women should be aware of the risk of developing signs of masculinization. These include loss of hair on the head, deepening of the voice, growth of hair on the face, weight gain around the waist, or acne. Men should be aware of the risks of too much testosterone, such as shrinkage of the testicles, aggression, male pattern baldness, high blood pressure, and possible higher risk for testosterone-related cancers. Call your health care provider if any of these symptoms occur.
Other side effects can include high blood pressure and reduced HDL "good" cholesterol.
The International Olympic Committee and National Football League banned the use of DHEA because its effects are similar to those of anabolic steroids.

**Possible Interactions**

If you are currently being treated with any of the following medications, you should not use DHEA without first talking to your health care provider.
**AZT (Zidovudine)** -- In a laboratory study, DHEA strengthened the effects of AZT, used to treat HIV. However, researchers don't know if that would be true -- or safe -- in humans.
**Barbiturates** -- Animal studies suggest that DHEA may strengthen the effects of barbiturates, a sedative often used to treat sleep disorders. These medicines include butabarbital, mephobarbital, pentobarbital, and phenobarbital.
**Corticosteroids** -- Laboratory studies suggest that DHEA may increase the effects of prednisolone, used to treat inflammation and other disorders.
**Estrogen and testosterone therapy** -- DHEA may affect levels of estrogen and testosterone in the body. People who are taking hormone therapy should talk to their doctor to see if their dose needs to be adjusted.
**Oral medications for diabetes and insulin** -- DHEA may make insulin and drugs used to lower blood sugar less effective, raising the risk of high blood sugar.
**Drugs that may lower DHEA levels** -- Drugs that can decrease or lower the levels of DHEA in the body include:
Antipsychotic medications, including chlorpromazine (Thorazine) and quetiapine (Seroquel)
Budesonide (Pulmicort)
Estrogens
Oral contraceptives (birth control pills)
Dexamethasone (Decadron)
Metformin (Glucophage)

**Drugs that may raise DHEA levels** -- Drugs that may increase DHEA levels in the body include:
Alprazolam (Xanax)
Amlodipine (Norvasc)
Anastrozole (Arimidex)
Nifedipine (Procardia)
Danocrine (Danazol)
Diltiazem (Cardizem)

Methyphenidate (Ritalin)
Metopirone (Metyrapone)

**Supporting Research**

Alhaj HA, Massey AE, McAllister-Williams RH. Effects of DHEA administration on episodic memory, cortisol and mood in healthy young men: a double-blind, placebo-controlled study. *Psychopharmacology* (Berl). 2006;188(4):541-51.
Andus T, Klebl F, Rogler G, Bregenzer N, Scholmerich J, Straub RH. Patients with refractory Crohn's disease or ulcerative colitis respond to dehydroepiandrosterone: a pilot study. *Aliment Pharmacol Ther.* 2003;17(3):409-14.
Arlt W, Callies F, van Vlijmen JC, Koehler I, Reincke M, Bidlingmaier M, et al. Dehydroepiandrosterone replacement in women with adrenal insufficiency. *N Engl J Med*. 1999;341(14)-1013-1020.
Barad DH, Gleicher N. Increased oocyte production after treatment with dehydroepiandrosterone. *Fertil Steril*. 2005;84(3):756.
Barnhart KT, Freeman E, Grisso JA. The effect of dehydroepiandrosterone supplementation to symptomatic perimenopausal women on serum endocrine profiles, lipid parameters, and health-related quality of life. *J Clin Endocrinol Metab.* 1999;84:3896-3902.
Barry NN, McGuire JL, van Vollenhoven RF. Dehydroepiandrosterone in systemic lupus erythematosus: relationship between dosage, serum levels, and clinical response. *J Rheumatol*. 1998;25(12):2352-2356.
Baulieu EE. Thomas G, Legrain S, et al. Dehydroepiandrosterone (DHEA), DHEA sulfate, and aging: contribution of the DHEAge study to a sociobiomedical issue. *Proc Natl Acad Sci USA*. 2000;97(8):4279-4284.
Broeder CE, Quindry MS, Brittingham K, et al. The Andro Project: Physiological and hormonal influences of androstenedione supplementation in men 35 to 65 years old participating in a high-intensity resistance training program. *Arch Intern Med*. 160:3093-3104.
Corrigan AB. Dehydroepiandrosterone and sport. [Review]. *Med J Aust*. 1999;171(4):206-8.
de la Torre B, Hedman M, Befrits R. Blood and tissue dehydroepiandrosterone sulphate levels and their relationship to chronic inflammatory bowel disease. *Clin Exp Rheumatol*. 1998;16:579-582.
Dyner TS, Lang W, Geaga J, et al. An open-label dose-escalation trial of oral dehydroepiandrosterone tolerance and pharmacokinetics in patients with HIV disease. *J Acquir Immune Defic Syndr*. 1993;6:459-465.
Finckh A, Berner IC, Aubry-Rozier B, So AK. A randomized controlled trial of dehydroepiandrosterone in postmenopausal women with fibromyalgia. *J Rheumatol*. 2005;32(7):1336-40.
Flynn MA, Weaver-Osterholtz D, Sharpe-Timms KL, Allen S, Krause G. Dehydroepiandrosterone replacement in aging humans. *J Clin Endocrinol Metabol*. 199;84(5):1527-1533.
Genezzani AD, Stomati M, Strucchi C, Puccetti S, Luisi S, Genazzani AR. Oral dehydroepiandrosterone supplementation modulates spontaneous and growth hormone-releasing hormone-induced growth hormone and insulin-like growth factor-1 secretion in early and late postmenopausal women. *Fertil Steril*. 2001;76(2):241-248.
Gordon C, Grace E, Emans SJ, Goodman E, Crawford MH, Leboff MS. Changes in bone turnover markers and menstrual function after short-term oral DHEA in young women with anorexia nervosa. *J Bone Miner Res*. 1999;14:136-145.
Grimley Evans J, Malouf R, Huppert F, van Niekerk JK. Dehydroepiandrosterone (DHEA) supplementation for cognitive function in healthy elderly people. *Cochrane Database Syst Rev*. 2006;(4):CD006221.
Hansen PA, Han DH, Nolte LA. DHEA protects against visceral obesity and muscle insulin resistance in rats fed a high-fat diet. *Am J Physiol*. 1997;273:R1704-R1708.
Hinson JP, Raven PW. DHEA deficiency syndrome: a new term for old age? [Commentary]. *J Endocrinol*. 1999;163:1-5.
Klann RC, Holbrook CT, Nyce JW. Chemotherapy of murine colorectal carcinoma with cisplatin and cisplatin plus 3'-deoxy-3'- azidothymidine. *Anticancer Res*. 1992;12:781-788.
Kohut ML, Thompson JR, Campbell J, et al., Ingestion of a dietary supplement containing dehydroepiandrosterone (DHEA) and androstenedione has minimal effect on immune function in middle-aged men. *J Am Coll Nutr.* 2003;22(5):363-71.
Labrie F. DHEA as physiological replacement therapy at menopause. *J Endocrinol Invest*. 1998;21:399-401.
Labrie F, Diamond P, Cusan L, Gomez J-L, Belanger A, Candas B. Effect of 12-month dehydroepiandrosterone replacement therapy on bone, vagina, and endometrium in postmenopausal women. *J Clin Endocrinol Metab*. 1997;82:3498-3505.
Legrain S, Girard L. Pharmacology and therapeutic effects of dehydroepiandrosterone in older subjects. *Drugs Aging*. 2003;20(13):949-67.
Libe R, Barbetta L, Dall'Asta C, Salvaggio F, Gala C, Beck-Peccoz P, Ambrosi B. Effects of dehydroepiandrosterone (DHEA) supplementation on hormonal, metabolic and behavioral status in patients with hypoadrenalism. *J Endocrinol Invest*. 2004;27(8):736-41.
Melchior CL, Ritzmann RF. Dehydroepiandrosterone enhances the hypnotic and hypothermic effects of ethanol and

pentobarbital. *Pharmacol Biochem Behav*. 1992;43:223-227.
Meno-Tetang GML, Hon YY, Jusko WJ. Synergistic interaction between dehydroepiandrosterone and prednisolone in the inhibition of rat lymphocyte proliferation. *Immunopharmacol Immunotoxicol*. 1996;18(3):443-456.
Moffat SD, Zonderman AB, Harman SM, et al. The relationship between longitudinal declines in dehydroepiandrosterone sulfate concentrations and cognitive performance in older men. *Arch Intern Med*. 2000;160:2193-2198.
Mortola JF, Yen SS. The effects of oral dehydroepiandrosterone on endocrine-metabolic parameters in postmenopausal women. *J Clin Endocrinol Metab*. 1990;71(3)696-704.
Nair KS, Rizza RA, O'Brien P, et al. DHEA in elderly women and DHEA or testosterone in elderly men. *N Engl J Med.* 2006;355:1647-59.
Nestler JE, Barlascini CO, Clore JN, Blackard WG. Dehydroepiandrosterone reduces serum low density lipoprotein levels and body fat bud does not alter insulin sensitivity in normal men. *J Clin Endocrinol Metab*. 1988;66(1):57-61.
Nordmark G, Bengtsson C, Larsson A, Karlsson FA, Sturfelt G, Ronnblom L. Effects of dehydroepiandrosterone supplement on health-related quality of life in glucocorticoid treated female patients with systemic lupus erythematosus. *Autoimmunity*. 2005;38(7):531-40.
Panjari M, Bell RJ, Jane F, Adams J, Morrow C, Davis SR. The safety of 52 weeks of oral DHEA therapy for postmenopausal women. *Maturitas*. 2009 Apr 30.
Panjari M, Davis SR. DHEA therapy for women: effect on sexual function and wellbeing. *Hum Reprod Update*. 2007;13(3):239-48.
Percheron G, Hogrel JY, Denot-Ledunois S, et al., Effect of 1-year oral administration of dehydroepiandrosterone to 60- to 80-year-old individuals on muscle function and cross-sectional area: a double-blind placebo-controlled trial. *Arch Intern Med.* 2003 Mar 24;163(6):720-7.
Piketty C, Jayle D, Leplege A, et al. Double-blind placebo-controlled trial of oral dehydroepiandrosterone in patients with advanced HIV disease. *Clin Endocrinol (Oxf).* 2001;55(3):325-30.
Poretsky L, Song L, Brillon DJ, Ferrando S, Chiu J, McElhiney M, Ferenczi A, Sison C, Haller I, Rabkin J. Metabolic and hormonal effects of oral DHEA in premenopausal women with HIV infection: a randomized, prospective, placebo-controlled pilot study. *Horm Metab Res*. 2009 Mar;41(3):244-9.
Reiter WJ, Pycha A, Schatzl G, et al. Dehydroepiandrosterone in the treatment of erectile dysfunction: a prospective, double-blind, randomized, placebo-controlled study. *Urology*. 1999;53(3):590-595.
Sawalha AH, Kovats S. Dehydroepiandrosterone in systemic lupus erythematosus. *Curr Rheumatol Rep*. 2008 Aug;10(4):286-91.
Schifitto G. Autonomic performance and dehydroepiandrosterone sulfate levels in HIV-1 infected individuals; relationship to TH1 and TH2 cytokine profile. *Arch Neurol*. 2000;57(7):1027-1032.
Stoll BA. Review: Dietary supplements of deydroepiandrosterone in relation to breast cancer risk. *Eur J Clin Nut*. 1999;53:771-775.
Tan RS, Pu SJ. The andropause and memory loss: is there a link between androgen decline and dementia in the aging male? *Asian J Androl*. 2001;3(3):169-174.
Vallee M, Mayo W, Le Moal M. Role of pregnenolone, dehydroepiandrosterone and their sulfate esters on learning and memory in cognitive aging. *Brain Res Rev*. 2001;37(1-3):301-312.
van Vollenhoven RF. Dehydroepiandrosterone for the treatment of systemic lupus erythematosus. *Expert Opin Pharmacother*. 2002;3(1):23-31.
van Vollenhoven RF, Morabito LM, Engleman EG, McGuire JL. Treatment of systemic lupus erythematosus with dehydroepiandrosterone: 50 patients treated up to 12 months. *J Rheumatol.* 1998;25(2):285-289.
Villareal DT, Holloszy JO. Effect of DHEA on abdominal fat and insulin action in elderly women and men: a randomized controlled trial. *JAMA*. 2004;292(18):2243-8.
Voznesensky M, Walsh S, Dauser D, Brindisi J, Kenny AM. The association between dehydroepiandosterone and frailty in older men and women. *Age Ageing.* 2009 Mar 9.
Weiss EP, Shah K, Fontana L, Lambert CP, Holloszy JO, Villareal DT. Dehydroepiandrosterone replacement therapy in older adults: 1- and 2-y effects on bone. *Am J Clin Nutr.* 2009 May;89(5):1459-67.
Williams JR. The effects of dehydroepiandrosterone on carcinogenesis, obesity, the immune system, and aging. *Lipids*. 2000;35(3):325-331.
Wolkowitz OM, Reus VI, Keebler A, Nelson N, Friedland M, Brizendine L, Roberts E. Double-blind treatment of major depression with dehydroepiandrosterone. *Am J Psychiatry.* 1999;156:646-649.
Yang J, Schwartz A, Henderson EE. Inhibition of 3' axido-3' deoxythymidine-resistant HIV-1 infection by dehydroepiandrosterone in vitro. *Biochem Biophys Res Commun*. 1994;201(3):1424-1432.
Yen SSC, Morales AJ, Khorram O. Replacement of DHEA in aging men and women. Potential remedial effects. *Ann NY Acad Sci*. 1995;774:128-142.
Source: Dehydroepiandrosterone | University of Maryland Medical Center

HANSEN CLINIC

http://umm.edu/health/medical/altmed/supplement/dehydroepiandrosterone#ixzz3JRQTtRpM