

REPORT

Reverse Aging by Restoring Youthful Sexual Function

By Eric Braverman, MD

One of the distressing—and most often lamented—side effects of the aging process is a loss of sexuality and its components: desire, enjoyment, and performance. At 20, a man experiences an erection daily, but at 70, he's lucky to have one every two weeks! For women, sexual desire is often lost through several age-related mechanisms.

Since healthy sexual function has strong connections to a robust vascular system as well as psychological health, it is an important cornerstone of a life enhancement strategy.¹ Healthy sex requires a multitude of components working in tandem, from brain neurotransmitters to hormonal and nutritional balance.

The encouraging news is that age-related factors contributing to sexual dysfunction can be prevented and treated, making it possible to maintain a satisfying sexual life well into advanced age.² Virtually everyone can maintain a healthy sex drive and enjoy one or two sexual events a week.

This article explores these factors and how they work together to not only keep your sex drive healthy but protect against age-related diseases.

AGING'S TOLL ON SEX IS REVERSIBLE

Aging affects all parts of the body linked with sexual function both internally and externally. In men, greater physical stimulation is required to attain and maintain erections and orgasms are less intense due to brain, hormonal, and vascular factors. In women, menopause contributes to sexual decline, both as a result of its physical symptoms (dryness, hot flashes, and weight gain) and mental symptoms (mood swings and irritability).

Cardiovascular disease, atherosclerosis, hypertension, diabetes, and virtually any disease can have significant negative effects on healthy sexuality. For men, problems like heart disease, diabetes, hypertension, and renal failure can produce erectile dysfunction.^{3,4} In women, diabetes in particular has been shown in various studies to lessen desire, arousal, lubrication, and orgasm.⁵ Diabetes damages nerves in the clitoris and penis, which literally stunts the ability to experience sensuality.

For both sexes, other factors like sleep disorders, dementia, slower metabolism, and aches and pains associated with aging decrease sexual desire and performance. Obesity is associated with lack of enjoyment of sexual activity, lack of sexual desire, difficulties with sexual performance, and avoidance of sexual encounters. Obesity causes endothelial dysfunction, which increases men's risk of developing erectile dysfunction.⁶ Obesity also affects women's arousal, lubrication, orgasm, and satisfaction.⁷

External factors like smoking, alcohol and drug abuse, stress, and side effects from almost any medication (particularly antidepressants) can impact sexual arousal and response at any age; their effects are even more marked in older people, with erectile dysfunction being a common complaint.

While well-known treatments like Levitra®, Viagra®, and Cialis® address erectile dysfunction, they mask the underlying problems and eventually may stop producing the desired effect for patients. Side effects ranging from headaches to vision abnormalities⁸ have been commonly reported with such medications. These drugs work best at treating vascular forms of erectile dysfunction (i.e., reduced blood flow to the penis, brain, and body), but this is rarely the result of vascular trouble alone. Thorough medical testing is needed to determine the root cause of erectile dysfunction. It should also be noted that erectile dysfunction, while often a result of degenerative diseases, can itself indicate more serious health problems. Erectile dysfunction has been



identified in many studies as a predictive precursor of cardiovascular disease,⁹ and a proven risk factor for diabetes, hypertension, and angina.¹⁰

Of course, the aging body isn't the only problem. There is also the brain and mind to contend with. A healthy brain leads to a healthy attitude, and a positive outlook is required for an active sex life. Significant psychological factors that affect loss of sexuality include perceived attractiveness in elderly people and reactions to societal stereotypes, which are too often trivialized. They can be remedied, however, with hormones and nutritional agents that help restore figure, physique, and psychological well-being.

WHAT YOU NEED TO KNOW: RESTORING YOUTHFUL SEXUAL FUNCTION

- One of the most common and troublesome manifestations of the aging process is loss of sexual interest, enjoyment, and performance.
- Maintaining healthy sexual function is a crucial component of an anti-aging strategy.
- Health concerns such as menopause, heart disease, diabetes, and kidney disease can take a toll on healthy sexual function, as can many common medications.
- A comprehensive sexual health program involves addressing any existing medical problems while restoring balance among the body's neurotransmitters and hormones.
- Optimizing dopamine function helps maintain desire, while healthy acetylcholine function supports arousal. GABA helps enhance sexual release, while serotonin is involved in resolution. Targeted nutritional, hormonal, and pharmaceutical therapies can help balance neurotransmitter systems.
- Optimizing levels of estrogen, progesterone, testosterone, DHEA, pregnenolone, and melatonin is also crucial to sexual health.
- The Rainbow Diet, which contains plentiful fruits, vegetables, spices, and teas, as well as healthy proteins, helps support youthful sexual function throughout life.

THE BIOCHEMISTRY OF HEALTHY SEX: HORMONES AND NEUROTRANSMITTERS

In both men and women, sexual activity and performance is determined by the levels of neurotransmitters and hormones in the brain and body. Hormones are biochemical compounds produced in the brain and in other organs and glands that regulate specific systems in the body. Like tiny chemical messengers, hormones carry signals from one cell to another. Similarly, neurotransmitters convey information between nerve cells and other cells. Many brain neurotransmitters and hormones are associated with sexual and reproductive function, for example, the neurotransmitters dopamine, acetylcholine, gamma-aminobutyric acid (GABA), and serotonin and the hormones estrogen, progesterone, and testosterone. These chemical messengers are crucial not just for sexual health, but for our overall health.

Taken to its most basic level, sexuality in humans can be broken down into four components: desire, arousal, orgasm, and resolution. Each phase is governed by a corresponding brain biochemical, along with contributing hormonal influences. The result is simple mathematics, in conjunction with a balancing act: when the brain experiences a chemical deficiency in any of the four primary areas due to normal aging, the desire for sex correspondingly diminishes. Sex doesn't seem so enticing, and the physical act itself will leave one lacking. Likewise, diminishing hormone levels with aging contribute to declining sexual function in older adults.¹¹

ASSESSING NEUROTRANSMITTER IMBALANCES

One of the first steps to achieving a balanced life—and a better sex life—is to understand which of your neurotransmitters could be brought back into better balance.

We are now able to test the brain using the brain map or BEAM (Brain Evaluation and Assessment Method) test. The BEAM test measures electrophysiology, memory, attention, personality type, temperament, and deficiencies in the four core neurotransmitters (dopamine, acetylcholine, GABA, and serotonin). You can use the results to find the correct match of nutritional and hormonal agents to enhance brain function, sexual health, and well-being. Alternately, an individual's symptom picture may provide clues revealing which neurotransmitter systems are out of balance.

DOPAMINE AND DESIRE

Dopamine has been conclusively recognized in many studies over the last decade as playing a key role in desire.^{12,13} Dopamine is a neurotransmitter that acts on the sympathetic nervous system to control libido, aggression, and power. In medication form, dopamine acts on the sympathetic nervous system to produce effects such as increased blood pressure and increased heart rate.¹⁴

Low levels of dopamine typically result in loss of libido as well as reduced interest in sex and decreased energy for sex. Sexual arousal also suffers.¹⁵ Medications that block dopamine receptors have been associated with decreased libido.¹⁶ One recent animal study determined that administration of drugs that stimulated dopamine terminals in the brain was effective in treating hypoactive sexual disorders.¹⁷

The good news is that everyone's libido can be greatly enhanced. Numerous vitamins, minerals, natural treatments, hormones, and prescription therapies can boost sexual energy in individuals who experience symptoms of low dopamine levels:

The Dopamine Brain Code¹⁸	
SUPPLEMENTS AND PRESCRIPTION THERAPIES	HORMONES (ENDOGENOUS AND REPLACEMENT WITH BIOIDENTICALS)
<ul style="list-style-type: none"> Guarana Tyrosine Phenylalanine <i>Rhodiola rosea</i> Thiamine Chromium Folic acid Ginkgo biloba Yohimbine (Rx only) L-Dopa (Rx only) 	<ul style="list-style-type: none"> Testosterone Estrogen DHEA Thyroid hormones Human growth hormone Erythropoietin Calcitonin Insulin Somatostatin Cholecystokinin



ACETYLCHOLINE AND AROUSAL

Arousal is determined and initiated by acetylcholine. While not as powerful a neurotransmitter as dopamine in terms of regulating sexual desire, depleted acetylcholine levels are known to negatively affect cognitive functioning, especially memory, attention, and creativity.^{18,19} People with acetylcholine deficiencies may find themselves unable to concentrate and focus on sex. A loss of acetylcholine particularly affects sexual arousal.²⁰ Acetylcholine also regulates internal moisture.¹⁸ Low levels can cause dryness, affecting vaginal lubrication in women—which in turn leads to lowered desire for sex. Lower moisture levels can also adversely affect semen volume in men.

Numerous nutrients, natural treatments, and hormones can boost arousal in individuals who experience symptoms of low acetylcholine levels:

The Acetylcholine Brain Code¹⁸	
SUPPLEMENTS	HORMONES (ENDOGENOUS AND REPLACEMENT WITH BIOIDENTICALS)
<ul style="list-style-type: none"> Choline Huperzine A Dimethylaminoethanol (DMAE) Acetyl-L-carnitine Phosphatidylserine Lipoic acid Fish oils Glycerol phosphocholine Manganese Ginkgo biloba 	<ul style="list-style-type: none"> Human growth hormone Vasopressin DHEA Calcitonin Parathyroid hormone

ENHANCING ORGASM WITH GABA

Orgasm release is controlled by the body's levels of gamma-aminobutyric acid (GABA). GABA (synthesized from glutamine and inositol) is considered to be one of the most important inhibitory neurotransmitters in the central nervous system. GABA helps inhibit excitatory neurotransmitters that can cause anxiety if the system is overstimulated. This is important, since chronic anxiety can lead to loss of sexual interest and sexual dysfunction.

GABA is responsible for regulating sexual tone and plays an important role in brain hypothalamic/pituitary function.²¹ Therapeutic drugs that increase the available amount of GABA typically have relaxing, anti-anxiety, and mood-soothing effects.²² Conversely, when GABA becomes depleted, it is difficult to relax and let go of fear and negative feelings. Hence, orgasm becomes difficult. GABA-enhancing compounds could help increase dopamine levels, which may enhance sexual satisfaction.

Numerous vitamins, minerals, natural treatments, hormones, and prescription therapies can support sexual release in individuals who experience symptoms of low GABA levels:

The GABA Brain Code¹⁸

SUPPLEMENTS AND PRESCRIPTION MEDICATIONS

Inositol
B vitamins
Glycine
GABA
Kava kava
Branched-chain amino acids
Taurine
Theanine
Gabapentin (Rx only)

HORMONES (ENDOGENOUS AND REPLACEMENT WITH BIOIDENTICALS)

Progesterone
Pregnenolone
DHEA
Glucagon-like peptide-1



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IMPROVING RESOLUTION WITH SEROTONIN

Resolution is related to serotonin, another neurotransmitter. Serotonin is synthesized from the amino acid tryptophan in serotonergic neurons in the central nervous system, as well as cells in the gastrointestinal tract. Serotonin modulates anger, aggression, body temperature, mood (thus its depression-busting effects), sleep, and sexuality.²³ Low serotonin levels can result in a lack of joy and decreased feelings of intimacy.



Serotonin may also play a role in the timing of sexual release. Premature ejaculation affects 20-30% of men.²⁴ Selective serotonin reuptake inhibitors (SSRIs), which delay serotonin's reuptake into nerve cells, may increase ejaculatory control and delay ejaculation in men with premature ejaculation.²⁵ SSRIs have been associated with sexual dysfunction such as low libido, erectile dysfunction, and anorgasmia.²⁶ Short-acting SSRIs are under development and might help address premature ejaculation while avoiding the unwanted sexual side effects of this class of medications.²⁷

In common with GABA, serotonin taken orally does not pass directly into the central nervous system because it does not cross the blood-brain barrier. However, tryptophan and its metabolite 5-hydroxytryptophan (5-HTP), from which serotonin is synthesized, can and do cross the blood-brain barrier. These agents are available as dietary supplements and may help promote sexual satisfaction.

Numerous vitamins, minerals, natural treatments, and hormones can support sexual resolution in individuals who experience symptoms of low serotonin levels:

The Serotonin Brain Code ¹⁸	
SUPPLEMENTS	HORMONES (ENDOGENOUS AND REPLACEMENT WITH BIOIDENTICALS)
<ul style="list-style-type: none"> Tryptophan 5-Hydroxytryptophan Vitamin B6 Fish oils Magnesium 	<ul style="list-style-type: none"> Progesterone Human growth hormone Pregnenolone Melatonin



ACHIEVING HORMONAL BALANCE

When low levels or imbalances of hormones occur, the ability to engage in healthy sex is challenging. Sex can be unsatisfying, difficult, or even impossible. Correcting these imbalances achieves rejuvenation of the body and the brain. There is no better way to make yourself feel 15 years younger than to enjoy frequent, long-lasting sex. This will also have a welcome spin-off effect, not just in heightened sexual desire and performance, but in improvements of all health-related aspects of your life, since sexuality is a marker of overall health. Sexual activity ideally should never fall to less than once weekly if we want to stay young.

Cholesterol is a precursor of all sex hormones. Estrogen, progesterone, testosterone, pregnenolone, androstenedione, and dehydroepiandrosterone (DHEA) all come from cholesterol. All of these hormones in tandem play some role in sexuality. As we age, our bodies' cholesterol levels naturally rise, but the ovaries, testicles, and adrenal glands cannot convert cholesterol into hormones. The result is reduced sexual motivation, and the typical self-image of feeling "less sexy." In men, erectile dysfunction is a frequent result, while women tend to lose interest in sex.

THE YOUNGER YOU RAINBOW DIET

Regardless of gender, healthy sexuality depends largely on a healthy diet. The Rainbow Diet—consuming foods that reflect the colors of the rainbow—guarantees high doses of vitamin-rich foods, including fresh spices, herbs, teas, fruits, and vegetables.¹⁸

Men should look for foods that are high in zinc to support reproductive health and aid hair growth. Good sources are barley, beans, nuts, seafood (also provides essential fatty acids), and soy.⁴³ Vitamin C-rich foods like broccoli, Brussels sprouts, blackcurrants, citrus fruits, sweet peppers, and pineapples⁴⁴ can improve stamina and circulation. For women, Rainbow Diet eating habits improve sexual desire and performance and help combat side effects of menopause such as obesity. Soy and fish consumption are key components of the Rainbow Diet, providing protein and other beneficial compounds.¹⁸

A decline in the level of any hormone is neither irreparable nor permanent. Anyone can turn back the clock on their sex life. A variety of blood tests can help determine which specific hormones are low and need to be corrected and can guide dosing strategies to restore biochemical balance and rejuvenate one's sex life. Maintaining blood levels within youthful ranges can provide great benefit with little or no risk. But remember—hormone replacement with bioidentical hormones, not synthetic hormones, is optimal for health.

Bioidentical Hormones—Natural and Effective

Aldosterone
Androstenedione
Calcitonin
Cholecystokinin
DHEA
Erythropoietin
Estriol
Estrone
Human growth hormone
Hydroxycortisol
Incretin

Insulin
Insulin-like growth factor
Melatonin
Oxytocin
Parathyroid hormone
Pregnenolone
Progesterone
Testosterone
Thyroid: T3, T4

Non-Bioidentical Hormones—Unnatural and Intrusive

Birth control pills
Conjugated estrogens
Diethylstilbestrol (DES)
Medroxyprogesterone
Methyltestosterone

In recent years, forward-thinking practitioners have turned their attention toward natural bioidentical compounds, as opposed to synthetic compounds. The molecular structures of bioidentical hormones are identical to hormones produced by the human body. Moreover, bioidentical therapies are generally free from side effects, unlike their synthetic counterparts. In fact, bioidentical hormones tend to be so safe that many are sold as over-the-counter supplements. Here is a list of some of the most important hormones affecting sexuality.

- **Estrogen** helps maintain youthful brain function. Increasing estrogen levels in women helps beat the aging effects of menopause and memory loss as well as improving vaginal lubrication, supporting bone density, and even enhancing healthy skin, hair, and nails. Natural, bioidentical estrogen is also under investigation for possible cardioprotective benefits.²⁸⁻³⁰ Estrogen compounds include estradiol, estrone, and estriol.
- **Progesterone** (topical formula available without a prescription) boosts mood and has calming effects. Increasing levels of this single hormone will help lower blood pressure, improve mood and sleep patterns, and help restore libido. Progesterone therapy may also help prevent breast and endometrial cancers.³⁰
- **Pregnenolone** (available as a dietary supplement), a steroid hormone, is also synthesized from cholesterol. It helps regulate GABA and serotonin levels in the brain, helping restore the feelings of pleasure derived from sex.¹⁸

- **Testosterone** elevates brain function, physical stamina, and libido. Studies also show that restoring testosterone balance in men can improve memory and concentration.³¹ Topical testosterone has been shown to be helpful in some men with erectile dysfunction.³² Testosterone is not just for men, however. Testosterone therapy is also an important component to a balanced approach to hormone replacement therapy in women, and it may help women combat numerous menopause symptoms.³³ Some women will also see improvements in sexual satisfaction and orgasm as well as increased muscle mass with testosterone therapy.^{34,35} Note that testosterone therapy in women should be approached with caution, and should not be used in women experiencing baldness or excessive facial hair.³⁶ A variety of natural testosterone formulations are available in pill, cream, patch, or gel form. Topical creams provide the easiest and most effective delivery systems. Extracts of the herb *Tribulus terrestris* have also been used to manage the symptoms of low testosterone levels.³⁷
- **DHEA**, or dehydroepiandrosterone (available as a dietary supplement), is produced in the adrenal glands, gonads, brain, and skin. In humans, DHEA is the dominant steroid hormone and precursor of all steroid sex hormones. Its role in sexual physiology (for both men and women) is that of a mood modulator.³⁸ As we age, DHEA levels start to decline, so that by 70-80 years of age, peak DHEA concentrations are only 10-20% of those in young adults.³⁹ Re-establishing DHEA balance to original youthful levels can enhance sexual desire, receptivity and performance, and restore the pleasure derived from sex.^{40,41}
- **Melatonin** (available as a dietary supplement) not only helps modulate sleep-wake cycles—it may improve sexual performance, as well as enhancing serenity and relaxation after sex.⁴²

CONCLUSION

Healthy sexual function is crucial to overall well-being and longevity. It is possible to maintain youthful sexuality well into your golden years by using targeted nutritional approaches to balance neurotransmitter profiles, along with optimal hormone balance and the healthy *Younger You* Rainbow Diet.

If you have any questions on the scientific content of this article, please call a Life Extension Health Advisor at 1-800-226-2370.

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