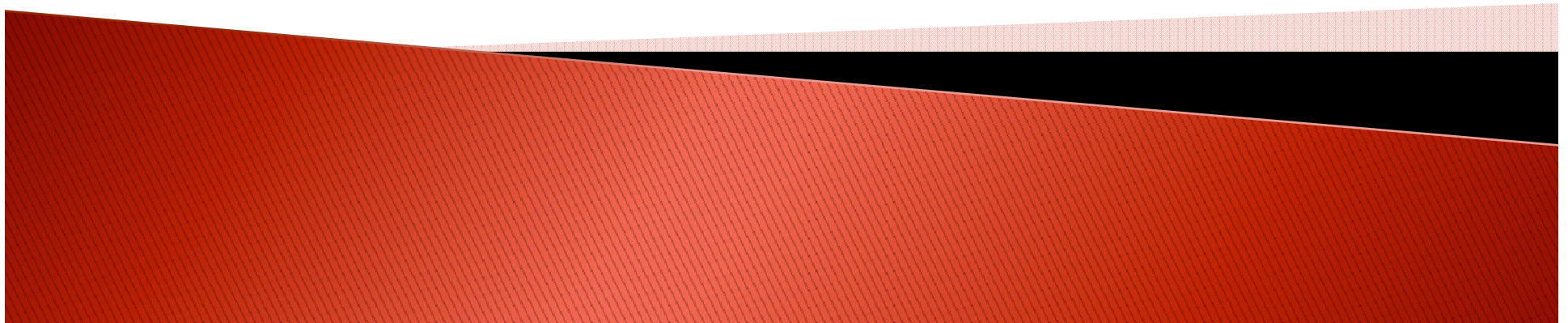


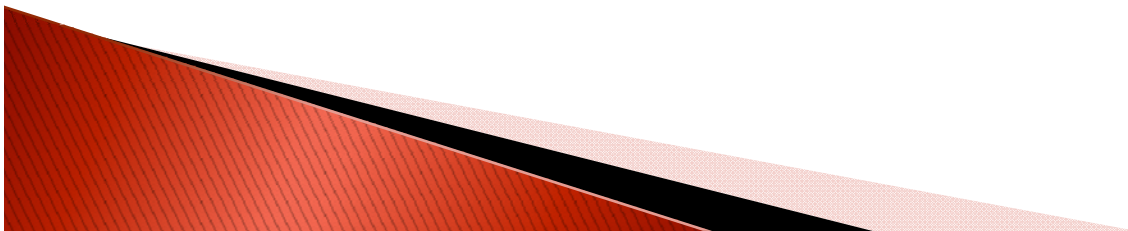
Effect of Drugs and Homeopathic Remedies on Semen Parameters

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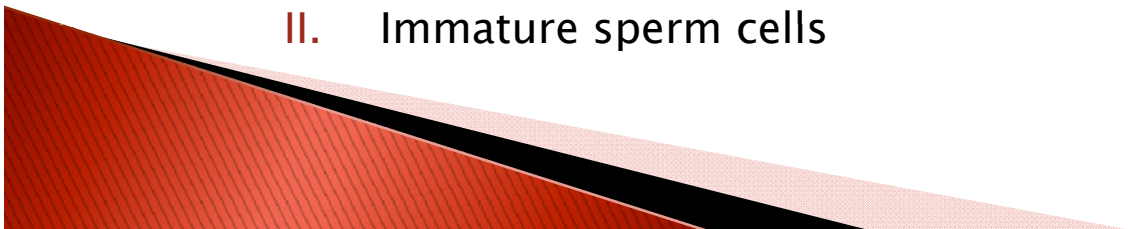
1. Effect of drugs on semen parameters.
2. Effect of homeopathic remedies on semen parameters.



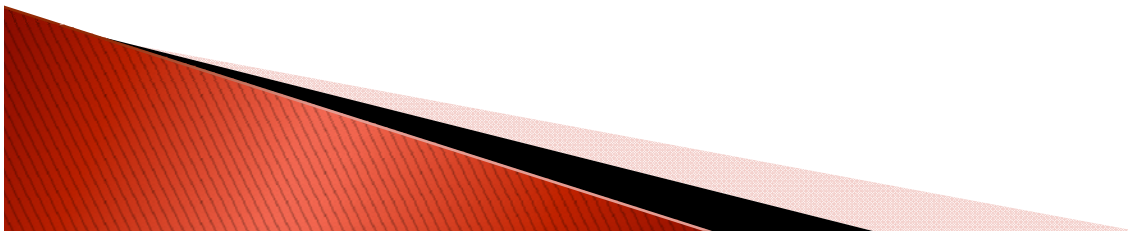
Semen (aka seminal fluid)

A viscous whitish secretion containing spermatozoa and consisting of secretions of the testes, seminal vesicles, prostate, and bulbourethral glands.

1. Spermatozoa
2. Seminal Fluid: A mixture of secretions from many glands, each with distinctive biochemical characteristics
 - A. Important glands include:
 - I. Seminal vesicles: ~65% (45–80%)
 - a. Fibrinogen: coagulation
 - II. Prostate gland: ~25% (10–35%)
 - a. Proteases: liquefaction
 - b. Seminal plasmin: antibiotic
 - III. Bulbourethral glands: 2–5%
 - a. Lubrication
3. Other cells (round)
 - I. White blood cells
 - II. Immature sperm cells

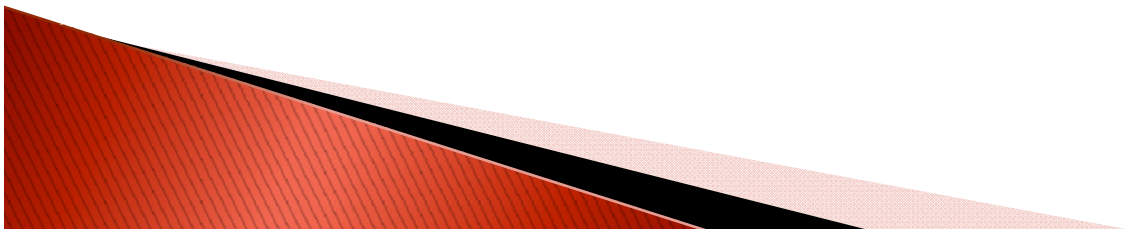


1. **Effect of drugs on semen parameters.**
2. Effect of homeopathic remedies on semen parameters.



Quick Definitions–Merriam–Webster

1. Drug: *according to the Food, Drug, and Cosmetic Act (1)*: a substance recognized in an official pharmacopoeia or formulary *(2)*: a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease *(3)*: a substance other than food intended to affect the structure or function of the body *(4)*: a substance intended for use as a component of a medicine but not a device or a component, part, or accessory of a device



Drug Classes

Allergy Drugs

Nasal Corticosteroids

Antihistamines

Cardiovascular Drugs

Antiplatelets

Beta Blockers

Diuretics

Statins

Dermatologic Drugs

Targeted Immune Modulators

Topical Calcineurin Inhibitors

Endocrine Drugs

Diabetes drugs

Hormone Therapy

Statins

Thiazolidinediones

Most prescribed

Musculoskeletal Drugs

Fibromyalgics

NSAIDs

Opioids

Skeletal Muscle Relaxants

Neurological Drugs

Alzheimers

Antiplatelets

Insomnia Drugs

Multiple Sclerosis Drugs

Neuropathic Pain Medications

Opioids

SSRIs

Triptans

Psychiatric Drugs

Antiepileptics

Atypical Antipsychotics

Drugs to treat ADHD

Antidepressants

Respiratory Drugs

Asthma Controller Drugs

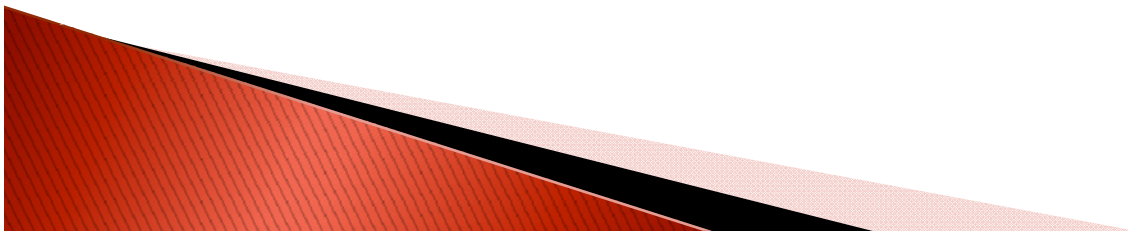
Nasal Corticosteroids

Urologic Drugs

Overactive Bladder Drugs

Drug Classes

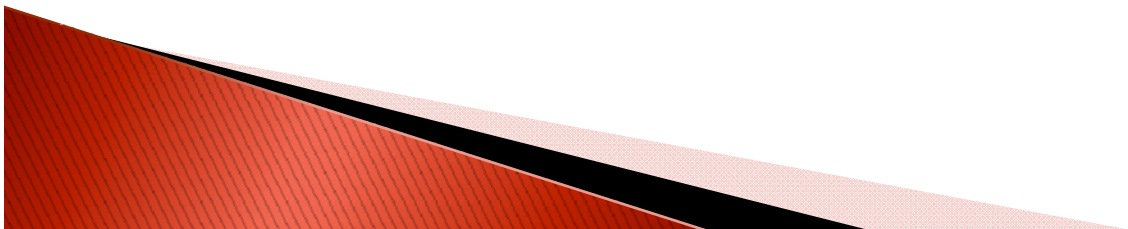
1. Stimulants
2. Depressants
3. Antipsychotics
4. Antidepressants
5. *Hallucinogens*
6. *Marijuana*
7. *Inhalants*



Drugs and Male Fertility

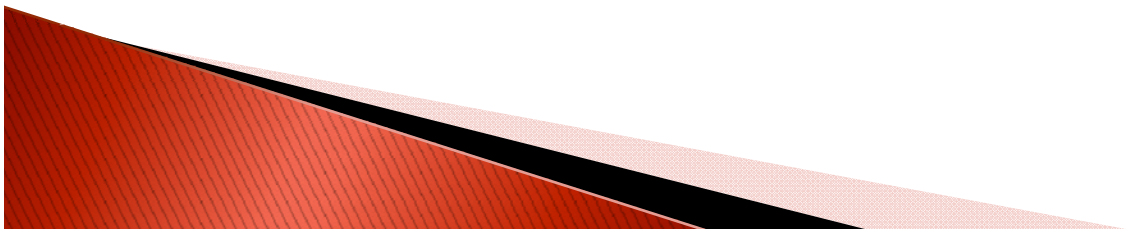
A transient or permanent inhibition of male fertility by drugs is possible, if one of the following functions interferes:

1. Spermatogenesis
2. Sperm maturation
3. sperm transport
4. sperm metabolism
5. Sperm motility
6. Semen liquefaction
7. Capacitation
8. Acrosomal reaction
9. Ovum penetration



Spermatogenesis

1. Is a complex process which takes ~70 days in the human.
2. Its endocrine control may be affected by various hormones, antihormones or psychotropic drugs.
3. Cytotoxic agents, or industrial chemicals such as dibromochloropropane, directly affect the germinal epithelium.
4. Sperm maturation may be impaired by alpha-chlorohydrin, antiandrogens, or sulphasalazine, and sperm motility in the female genital tract can be inhibited by vaginal spermicides such as nonoxynol-9 and by propranolol.
5. Drug treatment of idiopathic oligozoospermia is disappointing, though gonadotrophins or their releasing hormone are useful in treating gonadotrophin deficiency.



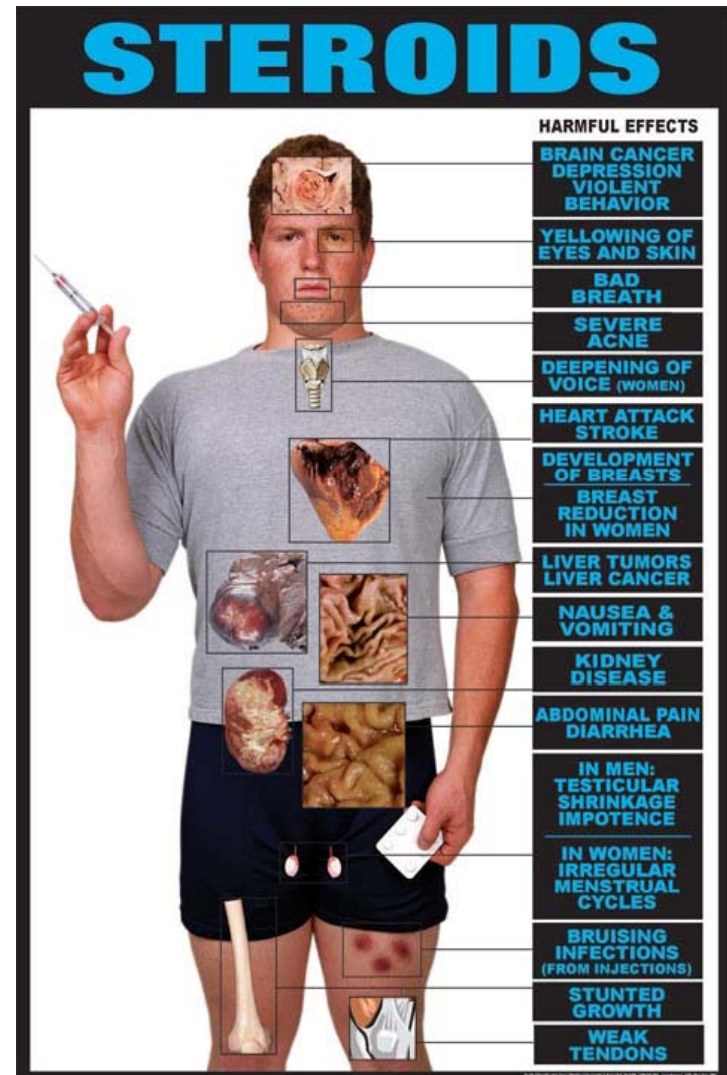
Drugs and Spermatogenesis

1. Direct inhibition of germinal epithelium
 - A. Antispermatogenic agents
 - I. Cytostatics ???
 - II. Immunosuppressive agents
 - III. Psychopharmacological compounds
 - IV. Antibiotics
2. Indirectly influencing hypothalamus–pituitary–gonad axis
 - A. Anabolics
 - B. Androgens
 - C. Antiandrogens
 - D. Estrogens



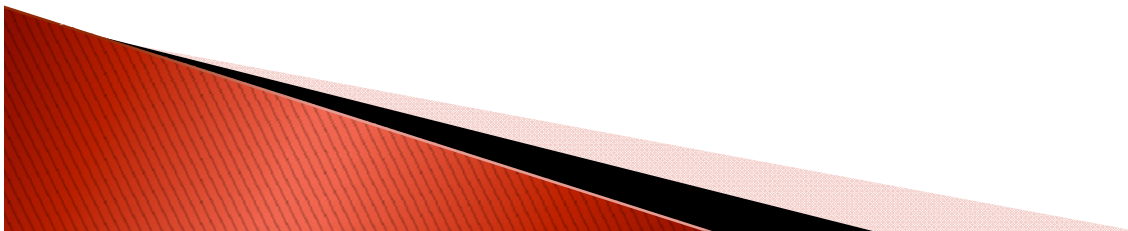
Anabolic Steroids

1. Testicular atrophy
2. Decreased sperm count
3. Impotence



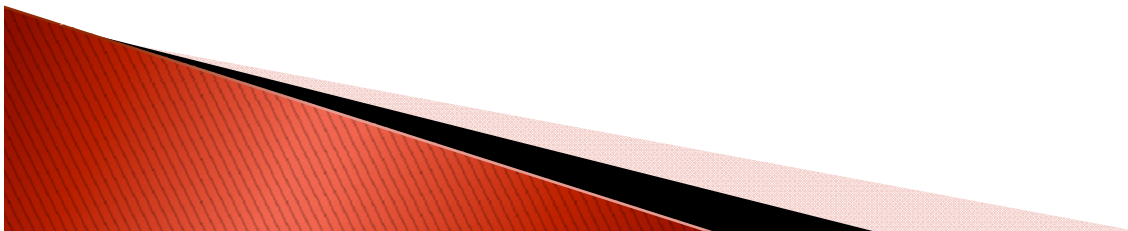
Drugs and Sperm Transport

1. Neuroleptic drugs
2. Tricyclic antidepressants
3. Antihypertensive drugs
 - A. Guanethidine
 - B. Ganglionic blocking agents



Drugs and Sperm Motility

1. Antibiotics
2. Psychopharmacological agents
3. Anthelmintics
4. Beta receptor blockers



Stimulants

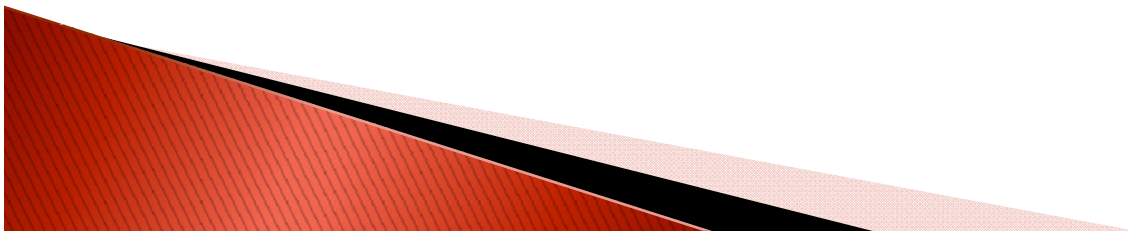
Amphetamines

Caffeine

Nicotine

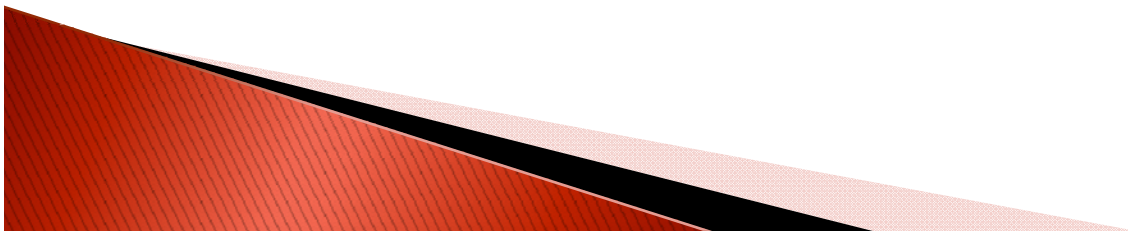
Cocaine

Excite, arousal, increase alertness, elevate mood. Increase neurotransmission.



Amphetamines

In experimental animal models, methamphetamine has been shown to cause lowered sperm count, abnormal sperm morphology, and apoptosis of the seminiferous tubules

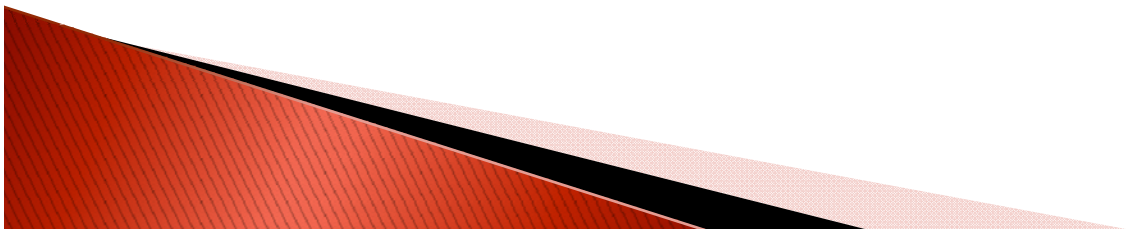


Tobacco

A number of studies have reported an association between tobacco smoking and male infertility and/or suboptimal sperm production.

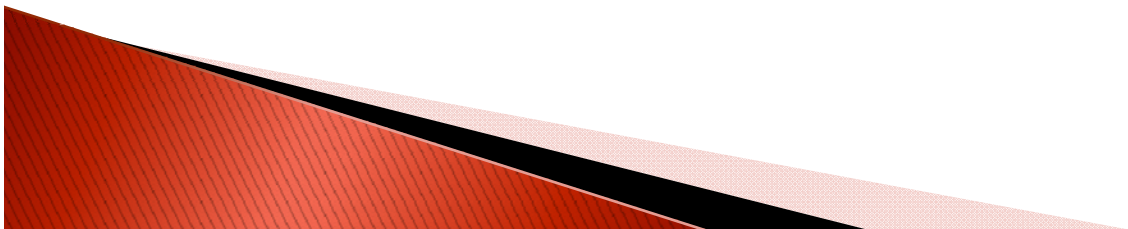
A review of observational studies on smoking and semen parameters found that 20 of the 25 studies reported

1. sperm concentration was 13% lower in smokers compared to non-smokers
2. lower average proportion of sperm that were motile
3. Lower morphologically normal sperm in smokers



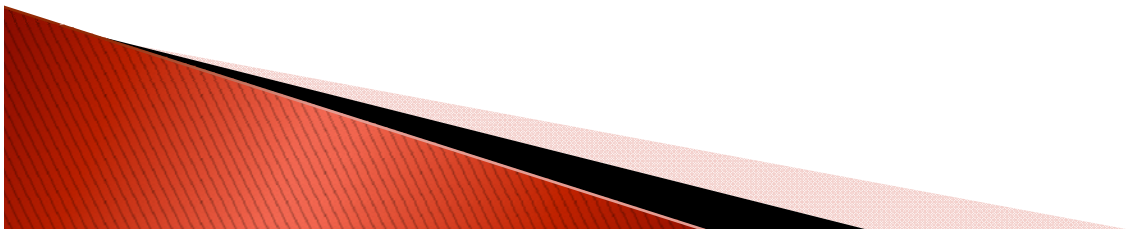
Marijuana

1. Cannabinoids derived from herbal cannabis have been shown to have a direct negative impact on sperm motility and the acrosome reaction.
2. They also down-regulate the release of leutinizing hormone (LH), which in turn lowers sperm count.



Alcohol

- Alcohol is associated with an increase in abnormal morphology of sperm nuclei and plasma membranes
- Lowered plasma levels of testosterone
- Some of the effects can be reversed if alcohol consumption is decreased or terminated



CNS Depressants

Analgesics: relieve pain

Narcotics: Opiates and Opioids

Non-narcotics: Aspirin, etc.

Sedative Hypnotics: relax, induce sleep

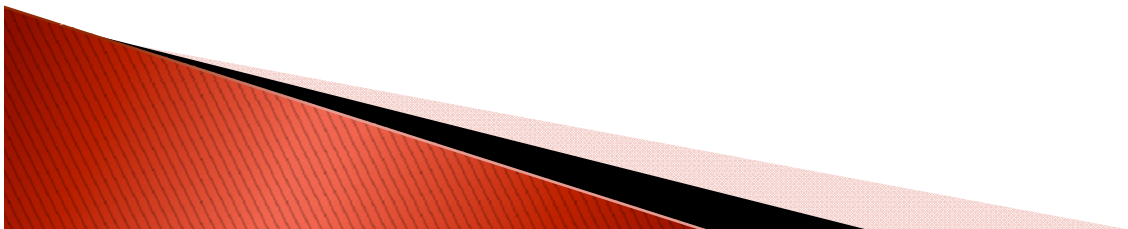
Alcohol

Anti-anxiety agents, tranquilizers

Non-Barbiturates: Qualude, Halcion

Long acting Barbiturates: Phenobarbital

Short acting Barbiturates: Seconal



Opioid Analgesics & Semen

- Opioid analgesics are commonly prescribed for pain
- Butorphanol & dezocine markedly reduce sperm motility
 - Butorphanol effectively immobilizes sperm
- Fentanyl, alfentanil, & sufentanil
 - Partially inhibit sperm motility
- Remifentanil
 - Short term effects on sperm motility

Xu B., *J. Biochem Mol Toxicol*, 2012.
PMID: 22511401

Xu et al., *Drug Chem Toxicol*, 2013.
PMID: 22931048

Anti-Psychotics

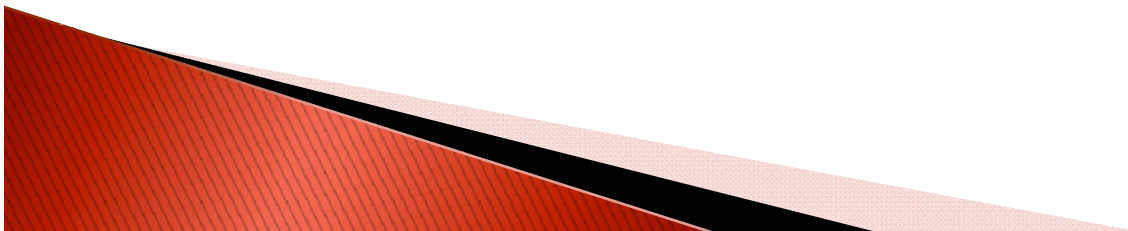
Major Tranquilizers

No "high" associated with use.

Little to no recreational use

Phenothiazines: Thorazine, Compazine, Mellaril

Psychotherapeutic Revolution: Depopulation of
Mental Hospitals



Anti-depressants

Psychotics: Bizarre and delusional behavior vs. Mood and Affective Disorder– Depression. Extreme sadness and/or despair. 15% suicidal

Uni/bipolar.

Stimulants don't seem to help

ECT: effective, yet negative image. Used more frequently in England, etc. Today, more precise, lower voltage; Yet still viewed in negative light.

Research on depression: neurochemical, inherited

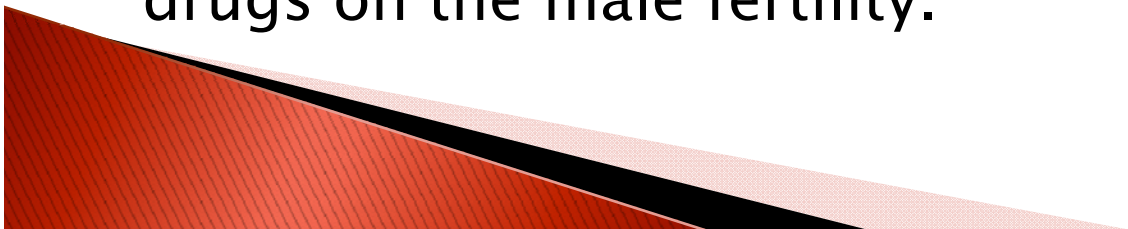
Drugs: SSRIs: Prozac, Tofranil, Elavil and Lithium (bipolar), MAOIs

No euphoria; for non-depressed: unpleasant effect



SSRI

Premature ejaculation (PE), the most common sexual dysfunction in men, is characterized by loss or absence of ejaculatory control. PE can be classified as either a lifelong or acquired condition. Although the prevalence of lifelong PE is rather low in the general male population, recent studies demonstrated that the patients who seek treatment for their rapid ejaculation mostly report lifelong PE. Although no drug for PE has been approved by regulatory bodies, chronic selective serotonin reuptake inhibitors (SSRIs) proved to be effective in treating lifelong PE. Despite the rising use and known effects of antidepressants on ejaculation, only a few reports have evaluated the impact of these drugs on the male fertility.



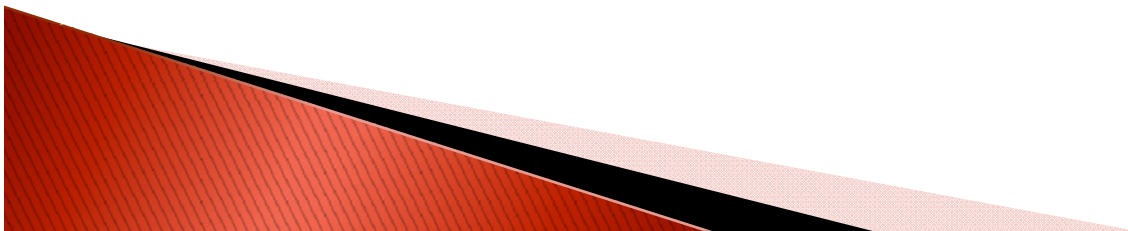
SSRI examples & Semen

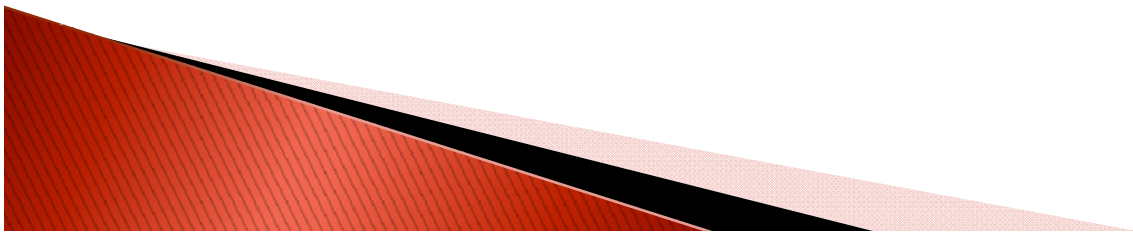
1. Escitalopram

- Decrease sperm concentration
- Decrease sperm motility
- Poor sperm morphology

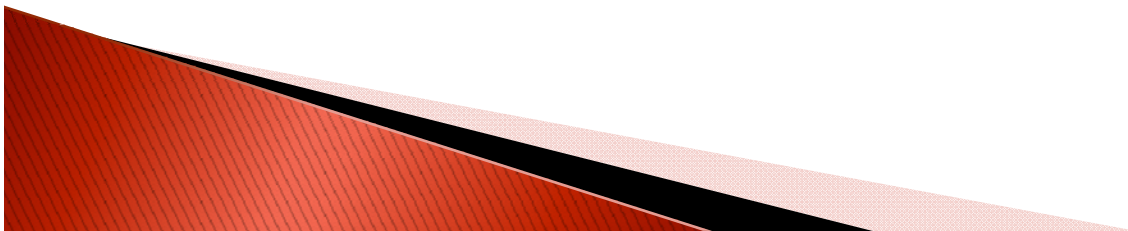
2. Paroxetine

- Increase sperm DNA fragmentation





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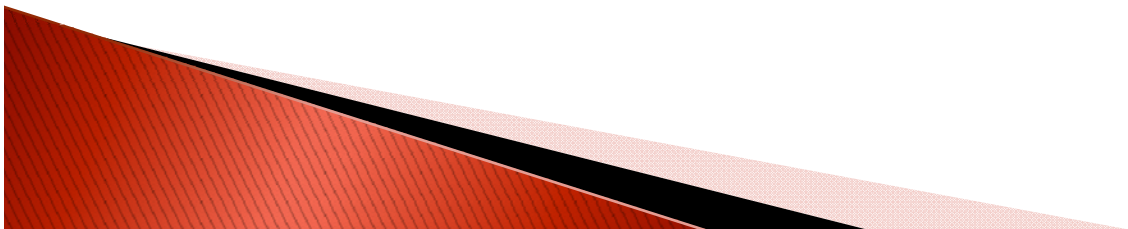
What Is Homeopathic Medicine?

1. The word homeopathy comes from the Greek words "homoios" and "phatos" and it means "similar suffering." The science of homeopathic medicine was founded by German physician, Samuel Hahnemann, who lived between 1755 and 1843.
2. Homeopathic medicine is a system of healing which treats conditions by using highly diluted remedies made by using substances derived by the mineral, animal and vegetal world. These remedies act on the human body by stimulating a healing response. In homeopathy, medicinal substances are highly diluted and administered to a person who exhibits symptoms of illness.



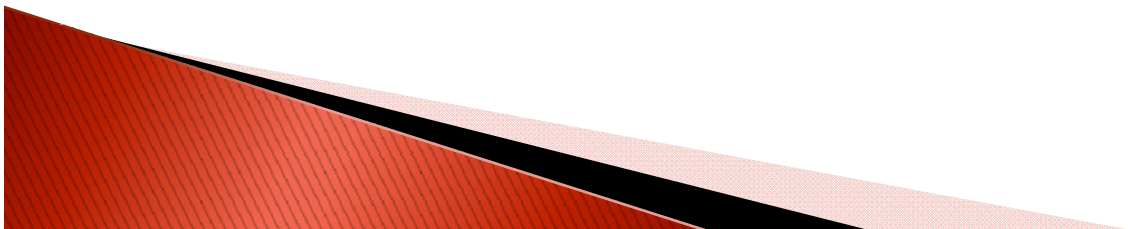
Quick Definitions: Merriam–Webster

1. Homeopathic: of or relating to homeopathy
2. Homeopathy: a system of medical practice that treats a disease especially by the administration of minute doses of a remedy that would in larger amounts produce in healthy persons symptoms similar to those of the disease.
3. Need FDA definition



Background:

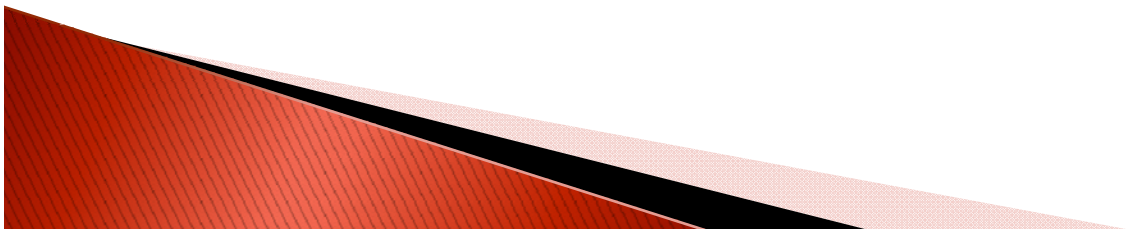
System of therapeutics founded in 1796 by Samuel Hahnemann on the principle that “like cures like.” That is, substances that in healthy persons would produce the symptoms from which the patient suffers are used to treat the patient. Hahnemann further stated that the potency of a curative agent increases as the substance is diluted. When it was introduced, homeopathy was a mild, welcome alternative to heavy-handed therapies such as bleeding, but it has since been criticized for focusing on symptoms rather than causes. With the rise of **alternative medicine**, it has seen a resurgence.



Alternative Medicine

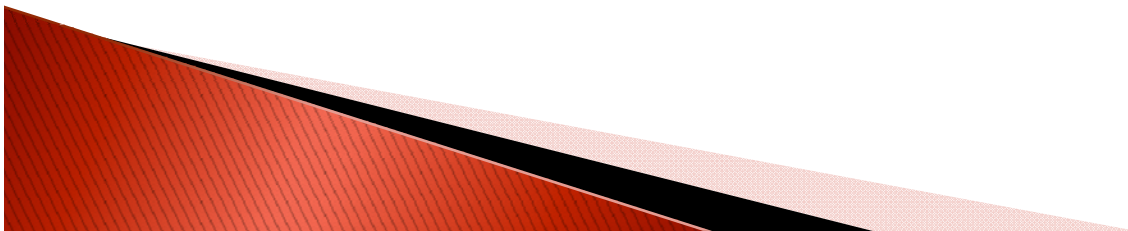
Any of a broad range of healing approaches not used in conventional Western medicine. Many are holistic; many also emphasize prevention and education. Alternative therapies include, but are not limited to:

1. Acupuncture
2. Aromatherapy
3. Ayurveda medicine
4. Chinese medicine
5. Chiropractic
6. Herbal medicine
7. Yoga



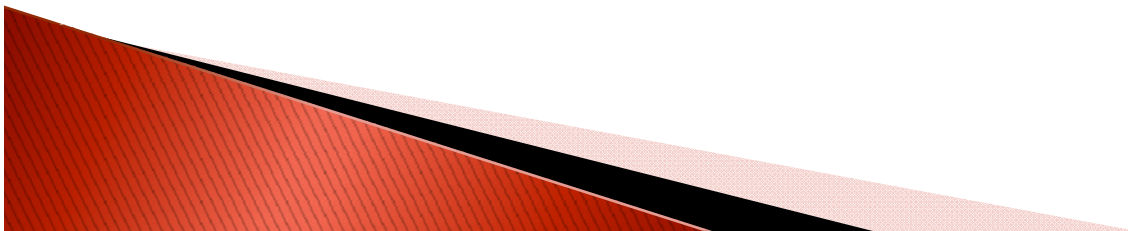
Alternative medicines

1. Herbal products
2. Nutraceuticals
3. Probiotics



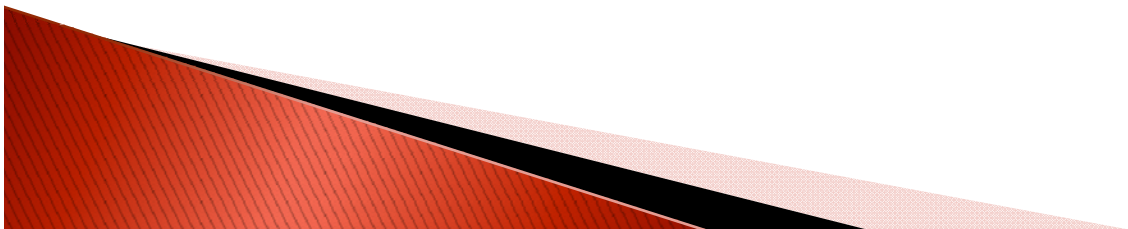
Acupuncture

1. Been used as a core practice in Chinese medicine for thousands of years for treatment of many disorders, including male fertility problems.
2. Has gained increasing popularity in the Western world.



Acupuncture

1. Shown to improve sperm count and quality, specifically:
 - A. Motility
 - B. Morphology
2. Elusive underlying mechanism, but may be related to better overall wellness, stress reduction, or other lifestyle changes.



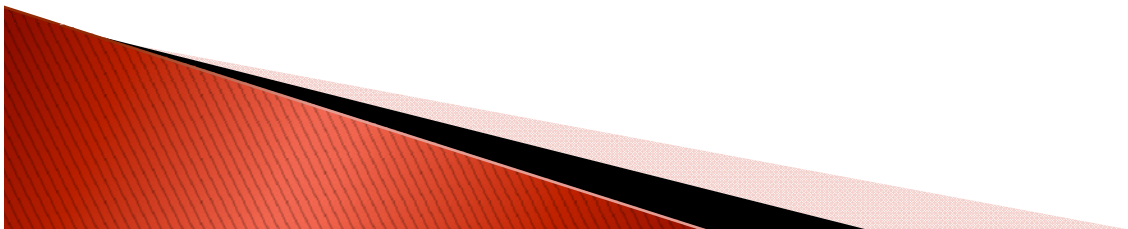
Herbal Medicine

1. Many different types of herbal products from around the world have been shown to aid in male infertility, some based on enhancing sexual performance and some may have a positive effect directly on semen parameters.
 - A. *Mucuna pruriens* (Linn)
 - B. *Eulophia campestris* (Wall)
 - C. Shengjing Zhongzi Tang
 - D. Wuziyanzong Pills
 - E. Yougui Capsules



Dietary Supplements

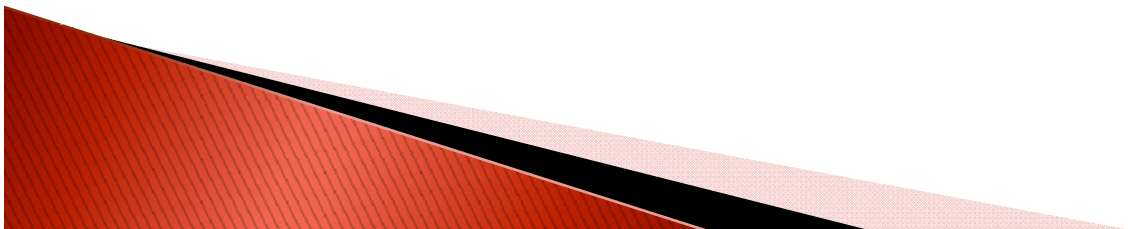
1. Alone, many vitamins have been shown to play some role in improving male fertility.
2. Among those that positively affect semen parameters are Vitamin E, L-carnitine and Selenium.
3. Research into treatments of combinations of nearly every vitamin and mineral have suggested that the combination may potentiate positive effects.



Dietary Supplements

1. Many of these combination vitamin and mineral pills aimed at improving male fertility by affecting semen parameters are marketed today.

2. These include:
 - A. ProXeed
 - B. FertilAid for Men
 - C. FertilityBlend for Men
 - D. Proceptin



Summary

1. Many drugs/supplements can affect semen parameters.
 - A. Positive vs. Negative
 - B. Most are transient.
2. Best to always inquire of any medications and, or supplements (including OTC) at time of semen analysis.
3. Consult ordering physician if drug change is an option.