

MALE ORGASM: A less than clear look at what we know

Ejaculation is a reflex controlled by neurons in the lumbar spine called the spinal ejaculation generator. Normally, erection is a prerequisite for ejaculation. Cognitive permission of the penis owner is not required or even considered.

Prerequisites and Erection

1. The unconscious primitive spinal medulla normally secretes serotonin, which suppresses both penile erection & ejaculation. Some antidepressants increase serotonin levels which can cause erectile dysfunction and/or anorgasmia.
2. The adrenal gland normally secretes low levels of adrenalin (to maintain blood pressure), which causes contraction of smooth muscle in all blood vessels (including the penile arterioles) and in the corpora cavernosa, helping to make the penis flaccid.
3. The cavernosal endothelial cells of the penis normally secrete angiotensin II, which causes contraction of smooth muscle of the corpora cavernosa¹, squeezing the blood out and thereby making the penis flaccid. The penis is self-deflating most of the time.
4. Another unconscious part of the mammalian male brain, the paraventricular nucleus, secretes dopamine to regulate production of prolactin¹, normally at low concentration in men, but suspected of suppressing erection.
5. Dopamine must bind to D4² synaptic neurotransmitter receptors found in the mesolimbic system as just one of many things necessary to induce an erection³.
6. At other times, and for unclear reasons, yet other unconsciously-controlled neurons of the parasympathetic nervous system release NO (nitric oxide) into smooth muscle cells of penile arterioles and cavernosal muscle cells. This relaxes the muscle cells, and increases blood flow to the penis.
7. The pituitary gland, at the crucial moment, and triggered by friction to the glans, secretes a pulse of oxytocin⁴ which is necessary to induce ejaculation and orgasm.

Spinal Reflex Arc and Ejaculation

8. The prostate gland contains the juncture of the bladder, the vas deferens, and the urethra. Sympathetic nerves of the spinal ejaculation center (T12-L2), at specific times of arousal,

¹ The “love muscle” actually does have a fair bit of muscle, but its normal function is to collapse, the penis to flaccidity. Thus, the penis is a self-collapsing tool.

² Melis, 2022, Dopamine, Erectile Function and Male Sexual Behavior from the Past to the Present: A Review, Brain Sciences

³ The cerebrum, where we make decisions and issue voluntary commands via the somatic nervous system, does not control penile erection and deflation.

⁴ Oxytocin also stimulates the muscles in breast glands and ducts to contract and push milk toward, and out of, the nipple.

secrete adrenalin locally to close the urinary bladder valve (in the prostate gland). This prevents retrograde ejaculation of semen into the bladder.

9. Ejaculation and orgasm usually, but not always, occur together. During ejaculation, the muscles of the vas deferens, the seminal vesicles, the prostate, and the bulbospongiosus muscle contract to expel semen. All under the control of the spinal ejaculation generator and reflex arc, in the lumbar spine.

Refractory Period

10. After ejaculation:
- the pituitary secretes a spike of prolactin, which (many researchers believe) suppresses testosterone and erection; and
 - the medulla resumes secretion of serotonin which suppresses penile blood flow;
 - cavernosal cells resume production of Angiotensin II to contract the cavernosal muscle cells; and
 - sympathetic nerves release adrenalin, which contracts penile arterioles.

Thus do prolactin, serotonin, angiotensin, and adrenalin start the male refractory period, which may last 15 minutes to 15 hours, during which no form of stimulation can induce penile erection. Orgasm and ejaculation result in penile deflation and a refractory period. The French call orgasm “la petite mort” or the little death.

Every person is different, and, for me, every orgasm is different; but the following symptoms are usually observable to varying extents: watch for respiration rate increases, inarticulate or unprintable utterances, the eyes may close, abdominal muscles may contract, knees may buckle, hips may thrust forward. Most men can and will tell you that ejaculation is imminent. After ejaculation is initiated, the sequence of reflex actions cannot be stopped. Just as with erections, human males cannot consciously start, control, nor stop ejaculations. The parasympathetic and sympathetic nervous system reflex arcs of the pelvis are in control of both processes. The subconscious male brain responds to ejaculation by suppressing secretion of some chemicals, and increasing secretion of others. These chemical changes induce part of the subjective experience called orgasm. Your orgasm and your partner’s orgasm will no doubt be different.

I wish I could tell you more, but research on orgasmic brains is problematic. What I’ve summarized here is mostly from work on rats.

Homework Test your comprehension and memory. Open book, open internet.

1. Name two biochemicals required to induce male orgasm.
2. Are the smooth muscle cells in a flaccid penis flexed or relaxed?
3. Is it fair to blame a man for having an erection?
4. A man cannot get an erection during his _____ period.

5. Once ejaculation is initiated, parasympathetic and sympathetic _____ arcs control the sequence of muscle contractions that close the bladder and eject semen.
6. Name four muscles or organs that contract during ejaculation.
7. Name the neurotransmitter secreted by the _____ nervous system to relax muscles in the penis.
8. Name the hormone secreted by the penis that causes smooth muscle contraction and flaccidity.

1. Valente, S., Marques, T. & Lima, S.Q. No evidence for prolactin's involvement in the post-ejaculatory refractory period. *Commun Biol* 4, 10 (2021).
<https://doi.org/10.1038/s42003-020-01570-4>