In men with ED subsequent to SCI, Viagra seems to be effective in 80-85%, provided that there is preservation of one component of erectile function: whether psychogenic or reflexive (if there is complete absence of any neurogenic impulse then treatment will not be successful). The usual dose is 50mg.

In a clinical trial published in the *New England Journal of Medicine,* Viagra was effective in about 70% of ED (various causes).

Studies show that even a 25mg dose may be effective, and certainly 100mg is the maximum recommended dose, greater efficacy not being related to a higher dose, although there would be a dose-related increased incidence of side effects.

VED: vacuum erection device:

Vacuum pump therapy is nonpharmacological and nonsurgical, so avoids drug interactions and has only minimal side effects.

A vacuum constriction device consists of a pump, cylinder and constrictive bands.

These enable the user to create a vacuum around the penis, thereby drawing blood into the erectile tissue of the penis, mimicking the natural process of a physiological erection.

Once the engorgement has occurred, constrictive bands are placed at the base of the penis in order to trap the blood and maintain the erection.

Successful use of this type of device relies heavily on good patient education and instruction by

a trained instructor within a discrete, private setting. This may also need to include the partner.

Disadvantages include being cumbersome and incompatible with spontaneous sexual activity. A discrete carrying case is now available.

These devices are contraindicated in patients with sickle cell disease, bleeding disorders, intermittent priapism and poorly controlled anticoagulation therapy.

Intracorporal injection therapy:

Use of **Caverject,** approved by the FDA in the United States in July 1999, involves injections into the penis, thereby mediating sexual desire and arousal. Caverject (Alprostadil) contains prostaglandin found in semen, which dilates blood vessels in the penis.

This drug should prove effective regardless of the patient's degree of physical arousal. Caverject is available in this country.

It cannot be used in patients who have anatomical abnormalities or Peyronie's disease (scar tissue on the penis) or tendency to suffer from priapism, which is a sustained erection which persists for so long it causes pain.

Patients taking MAOIs and those with severe cardiovascular or cerebrovascular disease should not use this treatment.

Alprostadil is around 70-90% effective but there is a high dropout rate amongst users, with 80% of men discontinuing treatment within 6 months([1]) of which a quarter changed to a different treatment, or had return of normal erections; 57% dropped out through ?lack of interest'

Phentolamine (Regitine) and/or Papaverine may be used for their smooth muscle relaxant properties (but note that Papaverine is not licensed for this use).

Adverse effects include priapism (sustained erection which becomes painful): patients are advised to report erections lasting 4 hours or more. Pain at the site of injection and possibly itching, rash, bruising(or haemorrhage: bleeding form injection site or urethra), swelling (oedema), inflammation and infection can all occur.

Longer-term adverse effects include fibrosis (scarring) which may interfere with normal anatomy, causing a degree of deformity and thus increasing the risk of painful erection. (similar to that seen in Peyronie's disease).

Abnormal ejaculation, testicular pain and swelling may also occur and more widespread pain may involve buttocks, legs, pelvis and back. Systemic effects include nausea, dry mouth, low blood pressure, leading to light-headedness or fainting.

More serious side effects include palpitations due to abnormal heart rhythm and swelling of leg veins and peripheral vascular disorder.

Intraurethral suppository therapy:

Alprostadil suppositories are also available, but are only 30-40% effective; penile pain is the most common adverse effect.

Suppositories of prostaglandin are marketed under the name "Medicated Urethral Suppositories for Erection" : Muse?.

This type of delivery seems to assist patients who find the intracorporal injections intolerable.

The mechanism by which erection is achieved is similar to that of prostaglandin injection. The suppositories are used about 15 minutes before intercourse. The system contains an applicator and suppositories of 125-, 250-, 500- or 1000-mcg doses. The lowest effective dose should be used.

Adverse effects include: burning sensation in the penis, perineal (saddle) pain, urethral bleeding, fainting, and also vaginal burning in the partner.

Studies of MUSE? seem to indicate a relatively poor rate of success: in a study of 100 patients, only 7% achieved well sustained satisfactory erection, whilst 30% achieved partial rigidity and 63% found it unsuccessful.

In comparison with injectable prostaglandin, only 10% of those using suppositories had erections sufficient to achieve penetration whereas some 43% of patients using the injectable form found it successful in this regard.

Penile prosthesis:

There are 3 types available: semi-rigid, malleable and inflatable. The inflatable prosthesis may be preferred as it causes a more ?natural' appearance, but there is a high rate of failure, requiring re-operation.

Mechanical failure, infection, erosions and the need for re-operation limit the use of prostheses. Infection is the major cause of implant failure, usually Staphylococcal, requiring antibiotic therapy for 10-12 weeks; this risk of infection is greater in diabetic patients and in patients with spinal cord injury; there is also increased risk of urinary tract infections

Apomorphine (Spontane?) Sublingual **apomorphine,** a dopamine agonist, at 2-4mg may be up to 60% effective in ED without major organic factors.

Nausea is a common side effect.

Designed to combat Parkinson's disease, it can facilitate erection in both normal males and those with psychogenic erectile dysfunction as well as those with impotence of a medical origin.

This is thought to result from the involvement of dopamine (a neurotransmitter) in sexual desire and arousal.

L-arginine: an amino acid that is a precursor to nitric oxide, which mediates smooth muscle relaxation (both vascular and non-vascular) Preliminary studies n men appear promising at a standard dose of 1500mg/day.

Vardenafil is a new drug developed in Germany, which appears to show promising pro-erectile properties and a good safety profile. It is currently under investigation.

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[1] Current Treatment Approaches to Erectile Dysfunction Lloyd LK et al CME Online http://www-cme.edu/onlineCourse/erectile/erectile.htm