# Viagra for impotence

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## Findings by SBU Alert

There is good* scientific knowledge concerning the short-term effects of peroral drugs (sildenafil, Viagra) in the treatment of impotence (erectile dysfunction). Most patients using the drug experience satisfactory erectile function. Side effects are mild and temporary.There is however risk for more severe complications when the drug is used by patients with severe cardiac disease especially in connection with Nitroglycerine or Nitrate drugs. There is poor* scientific knowledge on the long-term effects and cost-effectiveness of the method beyond two years use. The economic impact on health care may be substantial.

*This assessment by SBU Alert uses a 4-point scale to grade the quality and evidence of the scientific documentation. The grades indicate: (1) good, (2) moderate, (3) poor, or (4) no scientific evidence on the subject. For further information please see “Grading of evidence”.

*Alert is a joint effort by the Swedish Council on Technology Assessment in Health Care (SBU), the Medical Products Agency, the National Board of Health and Welfare, and the Federation of Swedish County Councils.*

## Technology

The most common causes for impotence (erectile dysfunction) are aging and diseases such as arteriosclerosis and diabetes. Other causes may be severe psychological problems such as acute and long-term stress. Smoking may also be a cause of erectile dysfunction. Several different pharmacological treatment alternatives have been developed in recent years. Until recently, the most common pharmacological agent (alprostadil) was injected into the penis. Since September, 1998 a drug in tablet form(sildenafil, Viagra) has been licenced in Sweden.

Sildenafil blocks the enzymes that disrupt the erectile process. The drug relaxes the smooth muscles which increases the blood flow in the penis. Erection is achieved by sexual stimulation [1]. A tablet is taken 1 hour prior to planned sexual activity, and the effect lasts up to 4 hours. The drug effectively treats most types of erectile dysfunction.

## Target group

The reported prevalence of erectile dysfunction varies in different studies, but approximately 5 percent of adult Swedish males (around 160 000 men) report erectile problems [2]. The disorder is closely related to age [3]. Men with cardiovascular disease, diabetes, and those who smoke are over-represented.

## Relation to other technology

Currently, the dominate treatment method for erectile dysfunction is injection of alprostadil (prostaglandin E1). This agent was first used in Sweden in 1994. The method involves having the male, or his partner, inject the drug into the penis, resulting in a direct, erectile effect. The drug is effective in approximately 65 percent of the cases. Prostaglandin can also be introduced through the urethral orifice. Administration in tablet form is preferable to most men since one avoids the discomfort and pain associated with injection, and erectile function is achieved only in conjunction with sexual stimulation.

For patients with more severe underlying causes of erectile dysfunction (eg, diabetes requiring insulin treatment or severe cardiovascular disease) the effects of sildenafil may be insufficient.
Other, non-pharmacological methods include devices such as the vacuum pump and penile ring. The use of these devices will probably decline, but they may be helpful in a small number of cases. Prosthetic surgery is also used to a minor extent. In the few cases where drugs can replace prosthetic surgery, this probably represents a cost-effective alternative. In most patients who are candidates for treatment, drugs do not replace any other form of treatment. Rather, they represent an additional cost that should be considered in relation to the patient benefits achieved.

## Patient benefits

Medical effectiveness and safety have been studied in more than 20 randomized controlled studies where sildenafil was compared with placebo. The largest dose-effect study, which included 532 men having various causes of erectile dysfunction, used the percentage of successful coition as the outcome measure [4]. During the final 4 weeks, of the 12 weeks in the study, 69 percent in the intervention group reported successful attempts versus 22 percent in the control group.

Side effects were rare, mild, and seldom associated with discontinuation of treatment. The most common side effects were flushing, headache (approx. 10 percent), and stomach problems (5 percent). Other studies confirm the positive effects of the drug on erectile dysfunction.

## Complications and side effects

Sildenafil lowers the blood pressure and amplifies the effects of drugs with nitroglycerin and nitrates. Using the drug simultaneously with such agents presents a risk for severe cardiovascular complications. Doses exceeding the recommended maximum dose (100 mg) offer no therapeutic benefits, but increase the risk for side effects. Side effects involving the eyes have been reported in isolated cases at high doses, but spontaneously subside after a time. Based on short-term data, the risks of sildenafil are judged

to be small. Nevertheless, some deaths have been reported in the United States. These should be considered in relation to the number of prescriptions issued. From March through July, over 3.6 million prescriptions were written. The U. S. Food and Drug Administration (FDA) verified that 69 deaths were reported in males after having taken sildenafil. The mean age of these men was 64 years (range 29 to 87 years). Twelve cases involved self-medication of unknown dose or in combination with nitroglycerin or nitrate drugs. Based on this information, the FDA decided not to take any measures other than to monitor the situation. Furthermore, it is uncertain whether the drug itself was the cause of death or if death resulted from the increased physical exertion that accompanied a higher level of sexual activity.

## Costs and cost-effectiveness

In 1997, the direct costs of pharmacological treatment (mainly involving alprostadil) of erectile dysfunction was approximately 60 million SEK. From the outset, consumption and thereby the cost for alprostadil has varied widely among different parts of Sweden, as illustrated in the following figure showing the distribution of sales per 100 000 males over the age of 45 years.

Each injection of alprostdil costs between 65 SEK and 150 SEK, depending on the dose and the packaging size. A sildenafil tablet in Sweden costs between 56 SEK and 79 SEK, depending on the dose and the packaging, and is subsidized in the same way as alprostadil. Based on the number of total sildenafil prescriptions in the United States, and the sales statistics for one week in mid August, the total costs for 1998 in the United States were estimated to be 5.9 billion SEK. Converted to conditions in Sweden, this corresponds to 200 million SEK. Added to the costs for the medication itself are the costs for physician visits. The costs for alprostadil are expected to decline. However, the introduction of sildenafil in Sweden will probably increase the overall use of impotence drugs, and thereby their costs.

No cost-benefit analyses have been published. The drug is probably more cost-effective when it replaces existing treatments. The cost-effectiveness in yet untreated groups is more difficult to determine in advance.

## Structure and organization of health services

Awaiting recommendations by the Medical Products Agency, the following cautious judgment is rendered. In most cases, no advanced investigation is required, and mainly it is the family practice specialist who should treat patients with erectile dysfunction. Only if therapy fails should it be necessary to engage a urologist. Many patients have already sought care for erectile dysfunction, and the introduction of sildenafil – an event covered extensively by the media – will encourage more patients to seek care. Education of family practice specialists, and other specialists, is essential.

## Ethical aspects

Increased costs for treating erectile dysfunction will require reallocating resources from other areas of health care. With all probability, even men without erectile dysfunction who want to improve their potency will generate demand for sildenafil. This raises questions concerning the prioritization of limited resources, and the appropriateness of subsidizing this type of utilization with public funds has been discussed. Several countries in Europe have announced that they do not intend to subsidize sildenafil. A lively debate on this subject is also taking place in the United States. Regardless of how society decides to establish the boundaries for engaging health services and public financing, the issue of rationing by placing limits on prescriptions and the number of doses will be discussed by the county councils.

## Diffusion in Sweden

Sales statistics in Sweden are not yet available.

## Expert

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## Reviewer

The National Swedish Board of Health and Welfare's Scientific Advisory Committee on Urology.

## References

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