

## Penile Rehabilitation

### How are erections created?

In order to create an erection there needs to be healthy erectile tissue & blood vessels, functioning nerves, good blood flow and the mechanism which retains blood in the penis. An erection occurs in three steps, by three different processes: 1) the penis is receiving adequate blood flow 2) sexual arousal is leading to the release of a chemical from the nerve endings, which allows for relaxation of the smooth muscles in the penis to open up space for extra blood 3) this influx of blood then becomes trapped in the penis via the “venous-occlusive mechanism”. After prostate cancer treatment, there can be damage to the blood vessels and/or the cavernous nerves (the nerves that control erections), which interferes with the ability to create and/or maintain erections. Without regular erections, the tissue in the penis will begin to degenerate because there is decreased oxygen (blood) coming in to the penis to keep it healthy. Just like the rest of our bodies, the penis needs to be exercised regularly to keep fit and stay working properly.

### What is Penile Rehabilitation?

The concept of penile rehabilitation revolves around protection of erectile tissue (i.e. cavernosal smooth muscle and endothelium) during the phase when the cavernous nerves are non-functioning or functioning poorly; this often occurs as a result of radical prostatectomy. Penile nerve damage (cavernous nerves) often occurs at the time of a prostatectomy, and the following impairment of erectile tissue results in natural erections that are of poor quality or non-existent. The aim of rehabilitation is to preserve erectile tissue such that, if and when the nerves regenerate, the patient has the best chance of returning close to his baseline erectile function.

While it is not clear how rehabilitation exerts a positive effect, it is likely that it is a multifactorial process involving tissue stretch, oxygenation, activation of endothelial factors (signaling for erection), and possibly, smooth muscle preservation and mild neurotrophic effects (promote nerve regeneration)

There are robust data that erectile tissue degeneration (collagenization and fibrosis) occurs as early as 2 months (and possibly earlier) after a prostatectomy. There are also data supporting the fact that penile dysfunction (venous leak) occurs in a time-dependent fashion after a prostatectomy. Indeed, significant rates of venous leak are evident as early as 4 months after a prostatectomy. This rate is dependent upon a number of factors, including baseline erectile function, patient age, and nerve-sparing status during the surgery. Finally, there is some data indicating that earlier institution of rehabilitation results in better long-term recovery compared to delayed commencement of rehabilitation.

### What is the Goal of Penile Rehabilitation?

The purpose of penile rehabilitation is not only to allow a man have sexual intercourse during the rehabilitation period but also, more specifically, to maximize his long-term erectile function recovery. This concept is called “back-to-baseline recovery”. Therefore, the goal of penile rehabilitation is to protect the health of the penile muscle in an effort to allow your nerves to repair and get you at, or as close to, pre-treatment erections as possible.

Beyond erections, some men will experience leakage of urine with arousal or climax (i.e. orgasm). Your sexual function may also have a significant impact on your intimacy with your partner or with potential

future partners. Our program's goal is to support you through these issues, and connect you with the appropriate health care professionals (i.e. urologists, sexual health nurses, sexual health counsellors, psychologists, psychiatrists etc.).

### **How can Penile Rehabilitation be done?**

There are various treatments or interventions that can help the penile rehabilitation process. These include pills (PDE5i inhibitors i.e. Viagra, Levitra, Cialis or Staxyn), intracavernosal injections, vacuum pump erection devices (VED), and intraurethral suppositories or gels. We generally recommend pills (PDE5i inhibitors) and penile injections as the most effective strategies.

### **Expectations with Penile Rehabilitation?**

Ultimately, numerous factors impact how well your erections will recover following prostate cancer treatment, as mentioned above. Several trials have been performed using only pills (PDE5i's i.e. Viagra, Levitra, Cialis etc.), with minimal benefit. However, the strongest evidence supporting penile rehabilitation is derived from Memorial Sloan Kettering. It suggests that at 18 months follow up, 52% of men that perform a combination of PDE5i's and intracavernosal injections (if necessary) will have naturally occurring penetration hardness erections (vs. 19% no rehab). 64% of men will obtain erections with PDE5i's (vs. 24% no rehab) and 95% of men will obtain erections with intracavernosal injections in 95% (vs. 76% no rehab). We believe that obtaining erections helps exercise the muscle in the penis and increase oxygenation, resulting in less fibrosis and 'venous leak' (i.e. inability for the penis to keep a rigid erection even after the nerves recover). Therefore, some men will meet these goals with pills alone, but the majority (85%) will likely require penile injections to obtain erections and keep their penile tissue healthy while the nerves recover.

### **Instructions for penile rehabilitation:**

#### ***From 2-weeks before surgery until 2 days prior to surgery:***

Take 25mg Viagra (or 5mg Cialis) once per night. There does not necessarily need to be any attempt at erection during this time.

#### ***From weeks 2-10 after surgery:***

Take 25mg Viagra (or 5mg Cialis) once per night for 6 days/week and 100mg Viagra (or 20mg Cialis) on the seventh day with an attempt at erection.

#### ***From 10 weeks to 2 years:***

If there are no penetration-hardness erections (85% of men) at 6 weeks, then introduce penile injections 2-3x per week to gain penetration-hard erections. Use low dose 25 mg Viagra (or 5mg Cialis) the other 4-5 days. Trial a full dose of 100mg Viagra (or 20mg Cialis) once per month to attempt to gain a penetration-hard erection as a way to gauge any recovery of erections.

The VED can also be incorporated into the penile rehabilitation. We find the injections will bring in more oxygenated blood to the penis, which is more beneficial for maintaining the health of the penis.

**Injection Teaching:** If you require injections, we will arrange a teaching session for you.

**Timeline:** We will plan to reassess progress initially within 3 months, then every 6 months for your first 2 years following treatment. Please keep track of your erectile response with both injections and full dose Viagra/Cialis trials on the 'log sheet' we have provided. This will help us manage your care as precisely as possible.

**Potential Side Effects of Viagra/Cialis:** Common potential side effects include flushing, headaches, stomach upset, muscle or back pain, blue tinged vision (Viagra), nausea & prolonged erection. Significant potential side effects include, but are not exclusive to, potential permanent vision loss - also known as non-arteritic anterior ischemic optic neuropathy (NAION).

**Potential Side Effects of Penile injections:** Some men may experience penile pain, scaring at injection site, bruising or hematoma, headache, dizziness or prolonged erections. Erections that are firm enough for penetration and last longer than 4 hours may result in permanent damage to the penis – please proceed to the emergency department if erection lasts longer than 3 hours.

**Potential Side Effects of VED:** Some men may experience penile pain or penile bruising.

*Reference:*

"Penile rehabilitation." *Clinical Care Pathways in Andrology*. Ed. John P. Mulhall et al. New York: Springer Science+Business Media, 2014. 129-134. Print.

