

THE TREATMENT OF EJACULATORY FAILURE

"Nothing has been more professionally satisfying for me than to help a paraplegic or quadriplegic become a father."
— Dr. Paul Turek

How common is anejaculation due to spinal cord injury?

Anejaculation is the inability to ejaculate. It has a variety of causes including pelvic nerve damage from diabetes mellitus, multiple sclerosis or pelvic surgery, but is most commonly associated with spinal cord injury (SCI). In the U.S. alone, there are 10,000 new spinal cord injured patients each year and almost one-third of these men are married or want to marry and desire to be fathers. Because of recent advances in [assisted reproduction](#), there is great potential to help these patients conceive. Developed over the past 15 years, Dr. Turek's approach to fertility in SCI patients is based on 3 simple unifying principles:

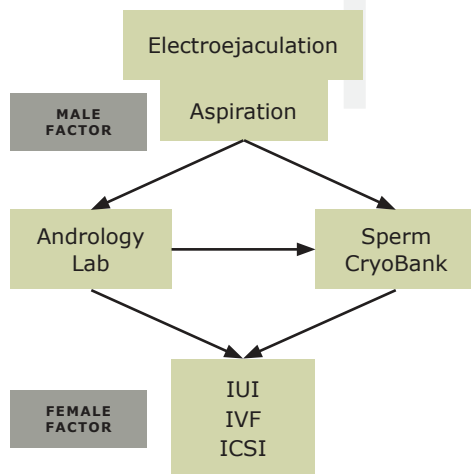


Figure 1. Important elements for fertility care in SCI patients.

- 1) Multidisciplinary approach. Care of anejaculatory couples should involve a multidisciplinary approach as outlined in Figure 1. The key elements for success include:
 - Proper male factor diagnosis and treatment
 - Proper female evaluation and treatment with assisted technology
 - Excellent Andrology laboratory expertise
 - A sperm banking facility
- 2) A single procedure to retrieve sperm should provide for multiple procedures.
- 3) Care should be coordinated and orchestrated between male and female partners.

What can be done to obtain ejaculates from spinal cord injured men?

Similar to a sneeze, ejaculation is a reflex. Also similar to a sneeze, it has a "point of no return" which occurs after the spinal reflex is stimulated. Depending on where

in the spinal cord the injury has occurred, the spinal reflex may be stimulated by one of two different nonsurgical techniques.

Penile Vibratory Stimulation

The first step is to attempt to trigger the ejaculatory reflex with a simple technique called vibratory stimulation of the penis. This is the simplest form of ejaculatory stimulation and involves placement of a high frequency, high amplitude vibrator on the bottom tip of the penis for several minutes to induce ejaculation through the penis. With this technique, ejaculation is achieved painlessly in the majority of patients with spinal cord injuries above the T10 level. Importantly, patients with high spinal cord injuries (especially above the T4 level) are also prone to autonomic dysreflexia from penile vibration, so they should be given a calcium channel blocker before the stimulation procedure to reduce symptoms.

Rectal Probe Electroejaculation

If vibratory stimulation is not successful, Dr. Turek then proceeds to artificially stimulated ejaculation with rectal probe electroejaculation (EEJ). The goal of



Figure 2. Dr Stephen Seager, the inventor of the EEJ machine, is shown here visiting Dr. Turek's clinic.

electroejaculation is to stimulate as many of the nerve fibers as possible to induce the ejaculatory reflex. This technique found its way into human clinical use in the early 1970's after an instrument was made for use in humans by Dr Stephen Seager (Figure 2).

The EEJ procedure involves the insertion of a well-lubricated probe into the rectum, as shown in Figure 3. The probe has electrodes on its surface that make contact near the pelvic nerves responsible for ejaculation. Repeated rhythmic, electrical stimulations are given until an ejaculation is produced without injuring the surrounding tissue.

In some SCI patients, semen is ejaculated backwards (retrograde) into the bladder as well as forward (antegrade) out of the penis. To collect all possible ejaculated semen, Dr. Turek prepares the bladder for this possibility before the stimulation procedure. Just before the procedure, the bladder is catheterized with a self-lubricated catheter, drained of all urine, and a small amount of culture medium is placed into the bladder and the catheter removed. Once stimulation is complete, the visible ejaculate from the tip of the penis is collected in a sterile container. In addition, the patient is recatheterized and the retrograde ejaculate

collected as well. Sperm can be processed from both specimens and used or frozen as needed (Figure 1). Overall, sperm can be obtained in virtually all patients with SCI using these methods. In about 5% of SCI men, however, sperm

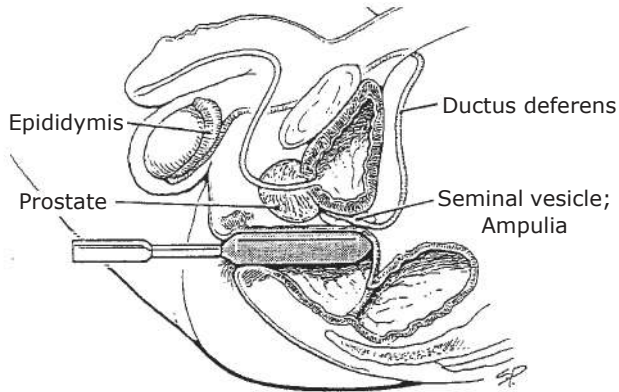


Figure 3. The technique of electroejaculation-stimulation of pelvic nerves to trigger ejaculation.

production will be lower than normal and the ejaculate will not contain sperm or the spinal cord injury will be complex and have interrupted the ejaculatory reflex. In these cases, surgical sperm retrieval techniques are needed to help couples to conceive.

To be successful, there should be at least 5-40 million motile (moving) sperm in the ejaculate (volume x concentration x motility) and at least 5 million motile sperm should be inseminated after the ejaculate is processed. Success rates vary widely and are generally related to female reproductive potential, with pregnancy rates per cycle (month) ranging from 1-12%. Once sufficient numbers of washed sperm are obtained, IUI success rates are closely linked to female age and reproductive potential. While cases of male factor infertility can benefit from IUI alone, overall pregnancy rates with IUI are generally improved if the ovaries are stimulated with medication to make more than one egg available every month (also termed ovarian stimulation).

How do patients prepare for the EEJ procedure?

Dr Turek prepares the patient for the procedure in the following manner:

- Antibiotics (usually Cipro 1000 XR) are prescribed for 24 hours before and after the procedure.
- The patient should have a bowel movement within 12 hours of the procedure so that the rectal vault is stool-free.
- Based on his work on the rat model, Dr. Turek offers patients pseudoephedrine (Sudafed) 60mg every 6 hours for 24 hours prior to EEJ to “prime the nerves” and optimize the EEJ procedure.
- Dr. Turek suggests that patients take a phosphodiesterase inhibitor such as Viagra, Levitra or Cialis the morning of the procedure to enhance the erection.

What are the complications of the EEJ procedure?

One potential complication of EEJ is thermal or heat injury to the rectum. It is quite rare (<1%) with the newer, FDA approved EEJ machines. Dr. Turek visually inspect the rectum with a small scope both prior to and following the EEJ procedure to insure that a) the anatomy is normal and b) that no injury has occurred. Occasionally, after the procedure, the next several bowel movements may be blood stained; this usually resolves quickly. In SCI patients, EEJ can trigger autonomic dysreflexia, in which the sympathetic nervous system is overstimulated and results in a rise in blood pressure, headaches, and a slow heart rate. SCI patients prone to this problem are given a calcium channel blocker (Procardia 10-20mg) under the tongue for quick uptake immediately prior to the procedure to prevent this reaction. During the procedure, the blood pressure is carefully monitored. If the medication does not control the blood pressure, the procedure is terminated and rescheduled with an anesthetic agent that will better control the blood pressure.

After the procedure, patients occasionally note a tired or "achy" feeling in the pelvis, most likely from the electrical stimulation. This resolves quickly. There can be associated temporary urinary burning and blood in the urine after catheterization. There is a remote chance of urine infection as well; this is the reason for prescribing the antibiotics. Finally, some men with severe muscle spasms will feel relief from the spasticity for a period of 24 hours after the EEJ procedure.

How is the fertility issued handled using these procedures for SCI patients?

Dr. Turek's approach to fertility in SCI patients is outlined in Figure 4. First, the male partner undergoes a comprehensive reproductive evaluation to assess his candidacy for the different procedures. Generally, this involves a single visit with a history, physical examination and blood tests. Then, a "trial run" of vibratory stimulation and EEJ (if needed) is performed on a come and go basis with blood pressure monitoring for autonomic dysreflexia. The goals of the "trial run" are twofold:

- A) To assess if and how an ejaculate can be obtained
- B) To assess the quality of the ejaculate to decide what level of assisted reproduction is needed.

The ejaculate obtained from this trial run is routinely banked if the patient elects to do this after a semen analysis is performed.

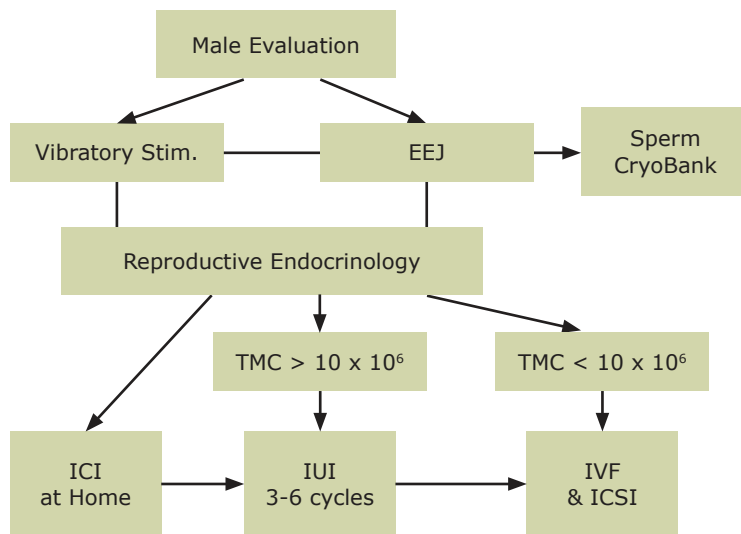


Figure 4. Dr. Turek's clinical pathway for achieving fertility in SCI patients. Note: TMC= total motile sperm count. See text for definition.

Overall, about 10% of Dr. Turek's SCI patients conceive in this way.

- Intrauterine insemination (IUI) timed to ovulation using sperm obtained by vibratory stimulation or EEJ (30% of Dr. Turek's patients).
- In vitro fertilization (IVF and ICSI) with sperm obtained by vibratory stimulation or EEJ (60% of Dr. Turek's patients).

Overall, among 44 couples that were evaluated and treated by Dr. Turek, there was a 54% pregnancy rate using this approach. In summary, urological techniques and assisted reproductive techniques have evolved to the point that fertility with spinal cord injury is not only possible but occurs routinely.

Depending on which procedure is used to stimulate ejaculation and the resultant sperm quality, patients can then take one or more of 3 pathways to conceive:

- Conception at home using vibratory stimulation and intracervical insemination (ICI) or "turkey basting" of the unprocessed ejaculate into the female partner timed with ovulation.

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